Generating Electricity from Renewable Sources in CEE & SEE

Projects, Infrastructure & Energy

Wolf Theiss

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This 2022 Wolf Theiss Guide is intended as a practical guide to the general principles and features of the basic legislation and procedures in countries included in the publication.

While every effort has been made to ensure that the content is accurate when finalised, it should be used only as a general reference guide and should not be relied upon as definitive for planning or making definitive legal decisions. In these rapidly changing legal markets, the laws and regulations are frequently revised, either by amended legislation or by administrative interpretation.

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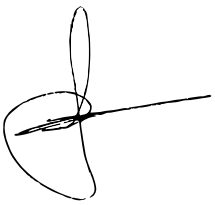
Foreword

Wolf Theiss is pleased to publish this updated ninth (9th) edition of The Wolf Theiss Guide to: Generating Electricity from Renewable Sources in Central, Eastern & Southeastern Europe for 2022 (the "Guide"), which supersedes the prior Guide published in 2020.

Since 2020, the ambitious targets adopted by EU Member States for 2030 have proven to be a significant catalyst for the development of renewable energy projects in our region over the past two years. In the meantime, the recent and ongoing conflict in Ukraine has further underscored the increased urgency and need for energy security for all European countries as they seek to transition away from vulnerability to (and dependency upon) imported Russian oil and gas. We believe these developments, coupled with technological improvements in the generation and storage of electricity from renewable energy sources (RES-Electricity) will spur increased regional investments into this sector. The laws and regulations governing the generation of RES-Electricity in Central, Eastern & Southeastern Europe therefore remain of major interest to those companies and individuals who are focused on this dynamic and increasingly important sector.

This new edition of our Guide reflects some notable modifications in the RES-Electricity legislation in 12 countries of our region since our last publication in 2020. To facilitate cross-referencing, all country chapters follow a uniform structure. Please note that defined terms in the country chapters apply only to that specific country.

My thanks to all of the teams at Wolf Theiss who have enabled us to produce this ninth (9th) edition of the highly successful RES Guide for 2022. For the reader's benefit, these contributors are all identified (with their contact details) at the end of each chapter.



Bryan W. Jardine
Partner, Wolf Theiss

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One region one firm.


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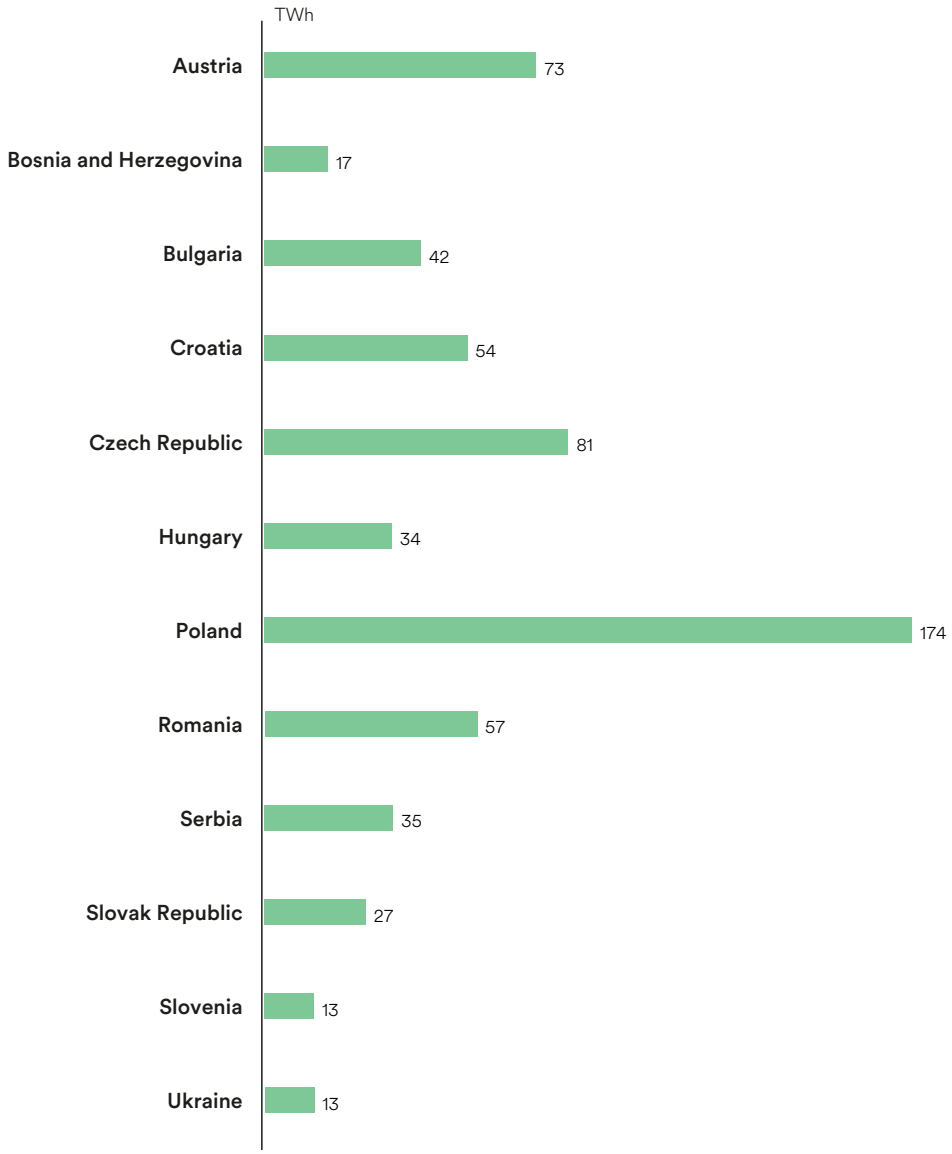
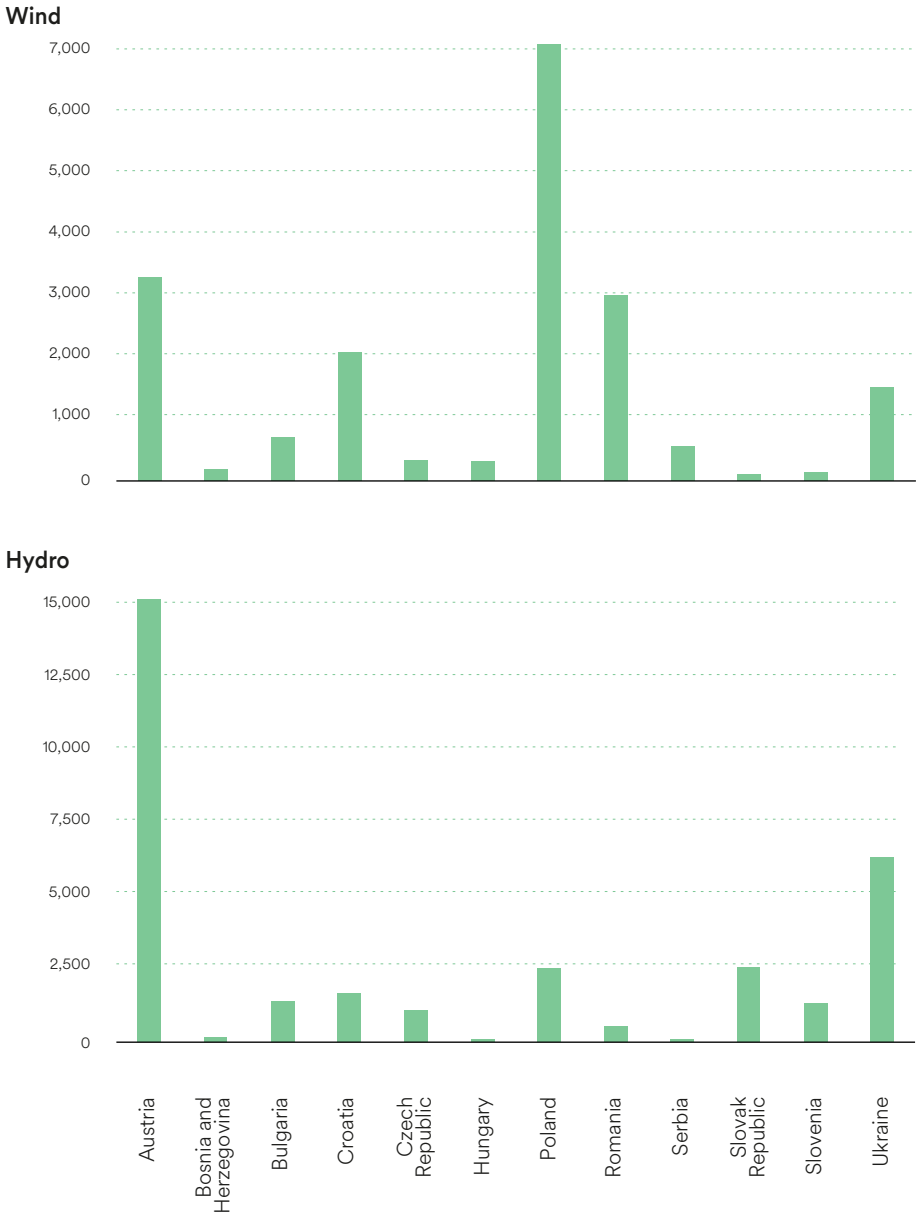
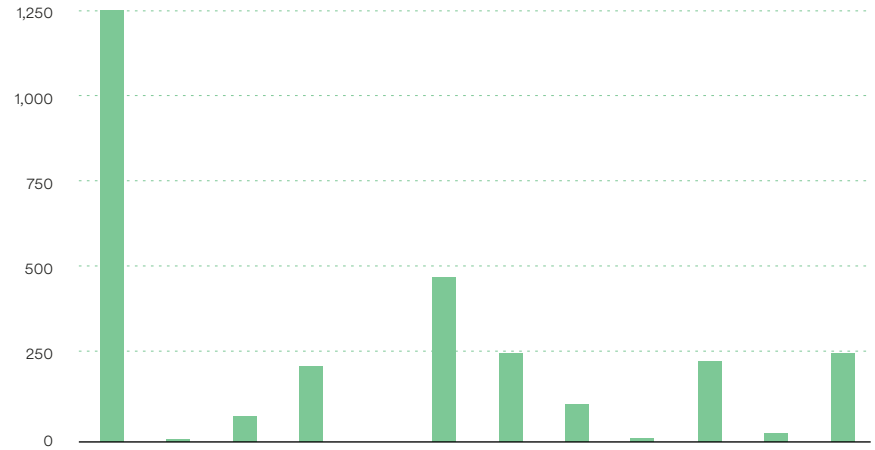
Total Installed RES-Capacity
By Country



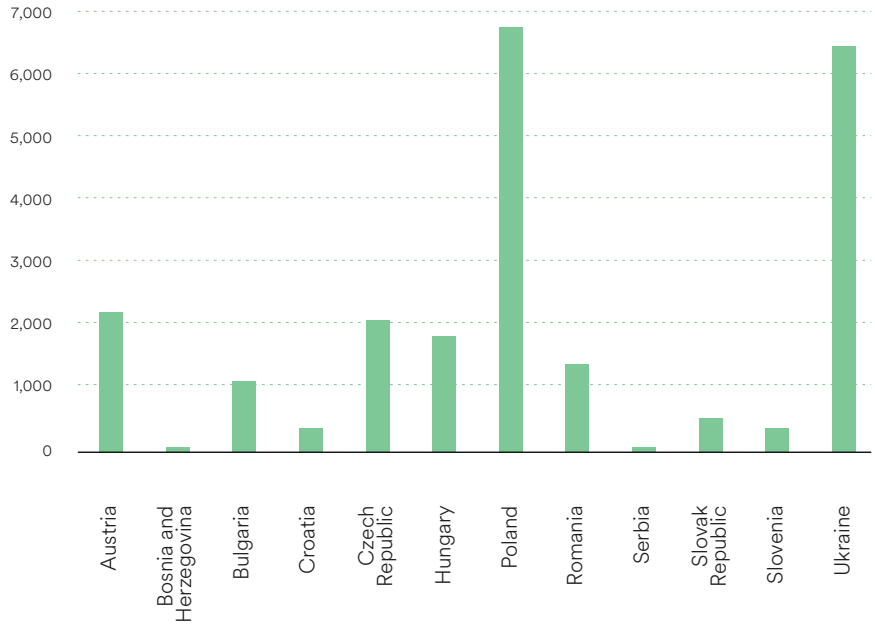
Renewable Resources in the Region
Overview



Biomass



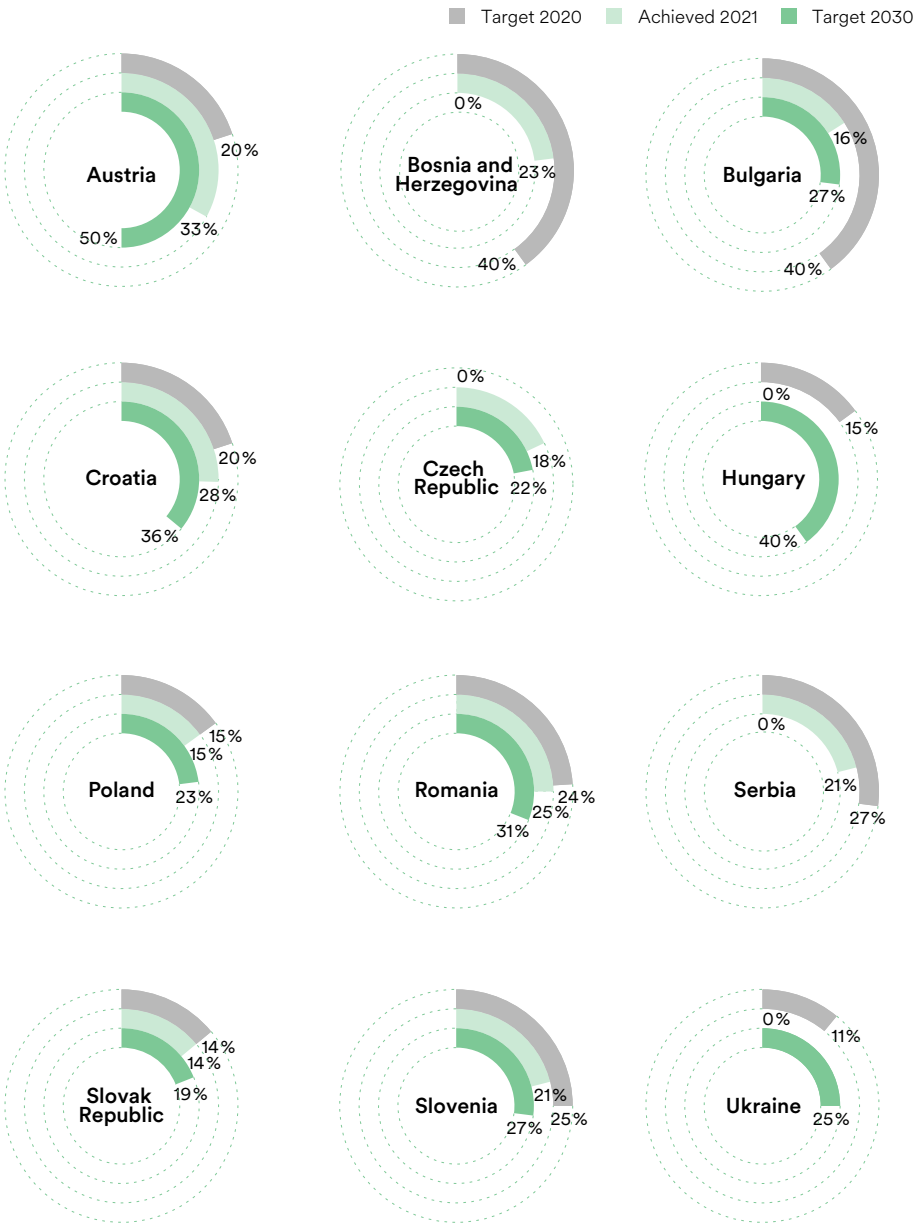
Solar



Share of energy from renewable sources
Overview

Source: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=File:Table_1_share_of_energy_from_renewable_sources_2020.png

Target 2020 and Target 2030 vs Achieved
By Country



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Generating Electricity from Renewable Sources in CEE & SEE

Projects, Infrastructure & Energy

Austria

Country Chapter

Wolf Theiss

Country General Information

Capital: Vienna

Location: Austria is a landlocked country in the southern part of Central Europe. It shares its borders with Germany, Czech Republic, Slovak Republic, Hungary, Slovenia, Italy, Switzerland and Liechtenstein and lies between the latitudes 46° and 49° N and longitudes 9° and 18° E.

Surface: 83,879 km^2

Population: 8,932,664

Climate: Predominantly alpine climate with continental features in the eastern areas and four (4) distinct seasons.

Resources: Minerals are one of Austria's most important natural resources. They include magnesite, iron ore, lignite and non-ferrous metals. Further important resources are Austria's rich farmlands, forests, water, wind and sun. Austria has its own resources of petroleum and natural gas. However, the constant growth of the industrial sector increasingly requires supplementary imports. The generation of hydroelectric power has been very strong historically and is still being expanded, which makes Austria the leader in the field of hydroelectric power in the European Union. Due to its mountainous landscape, the country is particularly strong in storage power plants including pumped storage power plants.

Electricity Grid: The total length of the Austrian electricity grid is approximately 258,907 km. The grid comprises overhead high-voltage power lines with a nominal voltage of 220 kV to 380 kV (6,728 km), a mid-voltage distribution grid with a nominal voltage between 1 kV and 110 kV (80.287 km) and a low-voltage supply grid with a nominal voltage below 1 kV (171,892 km).

Electricity Transmission, Distribution and Supply: Electricity transmission is a regulated natural monopoly and is provided by Austrian Power Grid AG. In the electricity distribution market, there are currently 122 grid operators. The electricity supply is provided by around 60 private providers. Electricity is also traded on the Austrian electricity and gas exchange market platforms.

Official EU Language(s): German. Other regionally recognised languages are Hungarian, Slovene and Croatian.

EU Member: since 1 January 1995

NATO Member: no

United Nations Member: since 14 December 1955

Currency: Euro (EUR)

Schengen: Austria is a member of the Schengen area.

Political System, Administrative Organisation and Economy: Austria is a parliamentary representative democracy with a directly elected Federal President as head of state and a Chancellor as head of the federal government. The country is divided into nine (9) federal provinces, one of which is the capital city Vienna. Austria's economy consistently ranks high in terms of GDP per capita. Next to a highly developed services and exporting industry, international tourism is one of the most important parts of the national economy.

1. Defined Terms for the Main Permits Required for RES-Electricity Generation Facilities

Authorisation Under Energy Law/Right (Concession) to Exploit Natural Resources	Provincial electricity statutes generally provide for permitting procedures for the construction and operation of power plants, including a facilitated procedure for those power plants generating electricity from RES. The exploitation of certain natural resources (e.g. hydrocarbons) requires a concession granted by the competent Federal Minister. There is, however, no Austrian legislation requiring participation in a prior tender procedure in order to be granted the right to exploit natural resources.
Balancing Group System	In order to generate or to supply consumers with electricity in Austria, membership in a balance group (*Bilanzgruppe*) is required. This membership guarantees the right to use the grid and to physically transport electricity to wholesale and retail customers. Every balance group is represented by a Balance Responsible Party (**BRP**; *Bilanzgruppenverantwortlicher*) vis-à-vis the Imbalance Settlement Responsible (**ISR**; *Bilanzgruppenkoordinator*) and the Control Area Operator (**CAO**; *Regelzonenführer*). In order to join the Balancing Group System, there are two options: (i) getting licensed as a balance responsible party (i.e. forming a new balance group); or (ii) getting affiliated with an already existing balance group. While option (ii) is less complicated and expensive than option (i), joining an already existing balance group leads to dependence on a third-party BRP who will thereby gain insight into the business activities (procurement channels, quantities, etc.). Existing balance responsible parties are not legally required to accept new members into their balance group.
Building Permit	Building permits may be required under provincial building statutes for the construction and operation of RES facilities. The permitting procedure is usually comprised of three stages: (i) issuance of a declaration declaring the relevant plot as a construction site (*Bauplatzerklärung*); (ii) issuance of a building permit prior to commencement of the construction works (*Baubewilligung*); and (iii) issuance of a usage permit upon completion of the construction works (*Benützungsbewilligung*).

	The competent authority for the permitting procedure is the mayor of the relevant municipality or – upon a delegation act – the District Administrative Authority (*Bezirksverwaltungsbehörde*), based upon provincial statutes.
Environmental Permit	An Environmental Impact Assessment (**EIA**; *Umweltverträglichkeitsprüfung*) is required for (i) wind power projects with a total capacity of at least 30 MW or 20 wind turbines each with a nominal output of at least 0.5 MW (or, under specific circumstances, wind power projects with a total capacity of at least 15 MW, or 10 wind turbines, each with a nominal output of at least 0.5 MW); (ii) hydro power plants with a maximum capacity of at least 15 MW (or, under specific circumstances, 10 MW, or in the case of power plant chains, 2 MW); and (iii) certain facilities combining waste management with power generation. The competent authority is the respective provincial government. Even if no EIA is required, a water use permit, issued by the relevant district authority or, (under specific circumstances), the relevant provincial governor, may be necessary.
E-Control	E-Control is the Austrian energy market regulating authority. Its responsibilities include monitoring the compliance of market participants with all their obligations under energy law and competition supervision – in particular, regarding equal treatment by grid operators, monitoring unbundling and monitoring trade in wholesale energy products.
Feed-in Tariffs	RES-Electricity fed into the grid from officially recognised generating facilities may receive subsidies in the form of feed-in tariffs. These are paid out by the Green Power Clearing and Settlement Agency (**OeMAG**; *OeMAG Abwicklungsstelle für Ökostrom AG*). The tariffs themselves are set forth in the Feed-in Tariff Ordinance (*Ökostrom-Einspeisetarifverordnung 2018 – ÖSET-VO 2018*) and the actual rate depends mainly on the type of generating facility.

Grid Connection	Grid operators are obliged by provincial electricity statutes to grant grid access on the basis of the approved general terms and conditions and certain system usage fees. Priority access is provided for the transport of RES-Electricity, including electricity deriving from Combined Heat and Power (**CHP**) plants, for the purpose of supplying such electricity to customers but only in case of insufficient capacities of the system.
Liability and Responsibility for Grid Connection and/or Capacity Upgrades, Improvements or Expansion of Grid	The grid operators must provide their services to all users of the electricity grid in a transparent and non-discriminatory manner, ensuring access to the electricity grid in accordance with the law and with the grid capacity to take over the output. The costs of the grid connection are borne by the grid user in the form of a one-off payment to the distribution grid operator. The costs of grid reinforcements, improvements, upgrades and other similar costs are borne by grid users and fixed in an ordinance issued by E-Control on an annual basis.
RES Support Scheme	Certain RES-Electricity facilities recognised under the Green Electricity Act (*Ökostromgesetz 2012 – ÖSG 2012*), are guaranteed for the off-take of the generated electricity at supported Feed-in Tariffs. Facilities eligible for official recognition are (i) facilities run exclusively on the basis of RES; (ii) specific hybrid plants; and (iii) specific mixed combustion plants. Furthermore, investment allowances are possible for constructing/renovating certain hydro power plants and CHP plants, amounting to a certain percentage of the investment costs. Under the Renewable Energies Expansion Act (*Erneuerbaren-Ausbau-Gesetz*), operators of various kinds of RES-Electricity facilities connected to the Austrian grid may apply for a market premium aimed at compensating the difference between the production costs of RES-Electricity and the average market price for electricity for a certain period of time. This is granted as a subsidy for the RES-Electricity marketed and actually fed into the public electricity grid for which guarantees of origin have been issued. In addition, investment grants are possible for constructing/renovating certain PV, hydro power, wind power, biomass and renewable gas plants.

RES-Electricity	Electricity obtained from RES sources such as wind, solar, aerothermal, geothermal, hydrothermal and oceanic waves, hydraulic, biomass and biogas.

2. Envisaged Need for Investments

At the end of 2019, the Austrian Federal Government submitted to the EU Commission a comprehensive plan to achieve several climate protection targets until 2030 (**#mission2030**) as required by the new EU framework. In its plan, Austria has set itself the goal of increasing the share of energy from RES in gross energy consumption to a value of 46 –50 % by 2030. Another ambitious goal is to cover 100 % of Austria's total electricity consumption from RES by 2030.

To this end, it is expected that a number of adaptations to the Austrian legal framework will occur in the years to come which may include

- strengthening of financial support for the expansion of renewable energies by increasing the subsidies (such as the new Renewable Energies Expansion Act, which entered into force in late July 2021);
- digitisation of the energy system, including the transport and distribution networks.

Consequently, it is estimated that in the following years, solar and photovoltaic capacities as well as investments in wind, biomass and other RES will increase. Furthermore, Austria is an interesting market for investors and project developers because of a guaranteed Feed-in Tariff encouraging RES project development.

3. Executive Summary – RES Market Status and Development of RES-Electricity Facilities

3.1 Market Overview – Factsheets

- Comprehensive RES Support Schemes have been available in Austria for almost twenty years and are constantly being expanded.;
- Since 2001, Austrian end-customers may freely choose their electricity supplier;
- The Austrian government has set ambitious climate protection targets which are defined by the government's #mission2030 plan;
- The first big target of #mission2030 (increasing the share of energy from RES in gross energy consumption to 46 – 50 % by 2030) is likely to be achieved, as 33.4 % of total energy consumption (and 73.1% of electricity consumption) was already produced from RES by 2018;
- Under the new Renewable Energies Expansion Act, operators of various kinds of RES-Electricity facilities can be eligible for subsidies and market premiums, for which the Austrian federal government will allocate EUR 1 billion until 2030;
- Since March 2022, a new bill to uphold strategic gas reserves – together with new rules on "renewable heat" – has been drafted in reaction to the conflict between Ukraine and Russia and its possible disruptive effects on the gas market. The bill essentially aims to stipulate obligations for holding strategic gas reserves and to drive a switching of generation capacities from gas-fired boilers to renewable heat;
- RES-Electricity certified by a guarantee of origin is traded on the markets and monitored and administrated by EControl. The operator of the grid system to which recognised RES-Electricity facilities are connected is obliged to issue a certificate of origin in relation to the quantities of RES-Electricity that have been fed into the grid, upon the request of the facility operator;
- Generation from CHP plants is an important pillar of bioenergy use in Austria. More than 6 % of Austria's electricity consumption volume and around 20 % of the total district heating is produced in CHP plants;
- Green electricity production from solid and liquid biomass as well as biogas has doubled from 23.6 TWh in 2005 to almost 50 TWh in 2018.

3.2 RES Market Status, Permitting, Grid Connection, Licensing of RES-Electricity Facilities

General Market Data	
RES target 2030 envisaged by #mission2030 (out of Final Energy Consumption)	46 – 50 % (thereby 100 % of total electricity consumption), reported achieved in 2018 was 33.4 % (and 72.2 % of electricity consumption achieved in 2017).
Overall Installed General Capacity including RES (Overall Production)	In 2020, overall electricity production was 72.87 TWh.
Installed Capacity by Technology	Biogas – 0.62 TWh Biomass – 2.55 TWh Wind power – 6.79 TWh PV – 2.06 TWh Hydro – 45.38 TWh
RES Support Scheme	
Beneficiaries of RES Support Scheme	Feed-in Tariffs, market premiums and allowances are received by the operators of RES-Electricity facilities recognised under the Green Electricity Act or the Renewable Energies Expansion Act.

Priority and Guaranteed Off-take into the Grid	*OeMAG* guarantees the off-take of electricity generated in officially recognised RES-Electricity facilities under the Green Electricity Act. Priority access to the grid is provided for the transport of RES-Electricity, including CHP plants for the purpose of supplying such electricity to customers, but only in case of insufficient capacities of the system.
Other Incentives	○ The federal provinces may enact individual incentive mechanisms within their legislative competence. Such investment incentives usually relate to the construction of photovoltaic and biogas facilities operated at a private level; ○ Investment allowances are available for constructing/ renovating certain hydro power plants and CHP plants, amounting to a certain percentage of the investment costs.
Other Conditions	○ Facilities eligible for official recognition regarding Feed-in Tariffs are (i) power generating facilities that are run exclusively on the basis of RES; (ii) specific hybrid plants; and (iii) specific mixed combustion plants; ○ The guaranteed Feed-in Tariffs for RES-Electricity from recognised facilities depend on the prices at the time of application and the type of facility; ○ The allowances for recognised RES-Electricity facilities are based on the electricity produced and fed into the public electricity grid system and the type of facility.
Grid Connection Specifics	
Approvals	Grid operators are obliged by provincial electricity statutes to grant grid access on the basis of the approved general terms and conditions and certain system usage fees.

Permitting Timing: Mainly Depending on Licensing Procedure (see below).	Connection works to the grid may fall within the licensing requirements as set out below.
Licensing	
Procedure	○ EIA required for wind power, hydro power plants reaching certain thresholds as well as for certain facilities combining waste management with power generation; ○ Possibly required building permissions may include (i) issuance of a declaration declaring the relevant plot as a construction site (*Bauplatzerklärung*); (ii) issuance of a building permit prior to commencement of the construction works (*Baubewilligung*); and (iii) issuance of a usage permit upon completion of the construction works (*Benützungsbewilligung);* ○ Provincial electricity statutes generally provide for permitting procedures for the construction and operation of power plants, including a facilitated procedure for power plants generating RES-Electricity; ○ The producer of RES-Electricity must be part of the Balancing Group System.
Duration of Administrative Procedure	Generally, authorities must issue a decision within six (6) months after submission of a full and complete application. However, the provincial electricity statutes may stipulate a facilitated administrative procedure for permission for the construction and operation of RES-Electricity facilities as a statutory privilege. Such facilitated procedure usually grants the authority a period of three (3) months for a decision on the application. Other – and much longer – time frames may apply according to specific procedural rules (e.g. in the EIA procedures).

Licence's Validity	The above-mentioned permits do not have a specific expiry date. However, it may be required to obtain new permits when changes reaching a certain threshold have been made to the RES facility. If specific permits regarding water usage are required, those may be limited in time under the Federal Water Act.

4. Key Changes to the RES Support Scheme since 2020

With #mission2030, the Austrian government goes one step beyond EU targets and is aiming for 100 % of Austria's total electricity consumption to come from RES. The most recent Coalition Agreement of the new Austrian Federal Government formed by the People's Party and the Green Party confirmed the goal set by the Austrian climate and energy strategy #mission2030. As one of the main milestones in that regard, the Renewable Energies Expansion Act was officially published and entered into force in late July 2021. This allows for subsidies and market premiums for operators of various kinds of RES-Electricity plants. The possible subsidies for each of the RES-Electricity plants under the Renewable Energies Expansion Act can briefly be summarised as follow:

RES-Production	Subsidy Scheme
Hydropower	○ Newly constructed and expanded hydropower plants with a bottleneck capacity (after expansion) of up to 25 MW, or the first 25 MW of plants with a bottleneck capacity exceeding 25 MW, are eligible for a market premium. ○ Constructions and revitalisations of hydropower plants with a bottleneck capacity of up to 2 MW are eligible for an investment grant. ○ Projects in high-value watercourses or that affect the preservation status of protected resources are not eligible for subsidies.

	○ The tender volume is at least 90 MW per year for market premiums and at least EUR 5 million per year for investment grants.
Wind Power	○ Newly constructed and expanded wind power plants are eligible for a market premium. ○ Constructions of small wind power plants (i. e. with a bottleneck capacity of 20 KW to 1 MW) are eligible for an investment grant. ○ The tender volume is at least 390 MW per year for market premiums and at least EUR 1 million per year for investment grants. ○ All newly constructed photovoltaic plants over 10 KW_{peak} and expansions of photovoltaic plants over 10 KW_{peak} are eligible for a market premium. For photovoltaic plants on areas of agricultural use or grassland, the premium amount will be reduced by 25 %. This reduction will not apply, in full or in part, if the photovoltaic plant is constructed on (i) land which is zoned for both agricultural use and for the construction of photovoltaic plants ("*Agri-PV-Fläche*"), where the agricultural use is only slightly affected, (ii) a building or another construction, (iii) a water body, (iv) a landfill or a contaminated site, (v) a mining or infrastructure site or (vi) military areas. ○ Constructions and expansions of photovoltaic plants with a bottleneck capacity up to 1,000 KW_{peak} are eligible for an investment grant. The reduction for plants on areas for agricultural use or grassland applies here as well. For innovative photovoltaic plants, a top-up of up to 30 % may be granted. ○ The tender volume is at least 700 MW_{peak} per year for market premiums and at least EUR 60 million per year for investment grants.

Biomass	○ Newly constructed and repowered biomass-based plants with a bottleneck capacity of up to 5 MW_{el}, and newly constructed and repowered biomass-based plants with a bottleneck capacity of more than 5 MW_{el}, are eligible for a subsidy on their first 5 MW_{el}. ○ Subsidies may also be granted to existing biomass-based plants after the expiry of the subsidy period provided for under the ÖSG 2012. ○ Constructions of biomass-based plants with a bottleneck capacity of up to 50 KW_{el} are eligible for an investment grant. ○ The tender volume is at least 7,500 KW per year for market premiums and at least EUR 4 million per year for investment grants.
Biogas	○ New plants with a bottleneck capacity of up to 250 KW_{el} are eligible for a market premium. ○ Existing plants are also eligible for subsidies after the expiry of the subsidy period provided for under the ÖSG 2012. ○ Constructions or modernisations of existing biogas plants for the production and processing of renewable gas are also eligible for an investment grant. ○ The tender volume is at least 7,500 KW per year for market premiums. Investment grants for the modernisation of existing biogas plants are available up to EUR 15 million per year.
Hydrogen	○ Constructions of plants for the conversion of electricity into hydrogen or synthetic gas with a minimum capacity of 1 MW are eligible for an investment grant if the plants are used exclusively to produce renewable gases and if they only use renewable electricity. ○ Investment grants are awarded up to EUR 40 million per year.

To that end, the Austrian federal government will allocate EUR 1 billion until 2030.

5. Overview of the Technical Innovations in Electricity Storage and Applicability in Austria of such Storage Technologies

RES-Electricity facilities are usually fluctuating generation plants, i.e. they do not generate electricity consistently. As a consequence, Austrian grids must become more flexible, so that more RES-Electricity can flow through them. In this regard, storage facilities for electrical energy are considered to be one of the key technologies for the transformation of the energy system as required by the new EU framework and the Austrian #mission2030.

Storage facilities enable a temporal decoupling of supply and demand and thus contribute to the further integration of RES like wind and solar power. However, the construction of large-scale storage facilities is associated with uncertainties and possible risks. In addition, storage facilities are always associated with conversion losses and therefore, are an expensive option for integrating RES-Electricity facilities. Hence, the economic operation of new storage facilities is currently only possible to a limited extent.

In principle, four technologies are available for electricity storage: mechanical, electrochemical (e.g. batteries), electrical, and chemical storage. The actual demand for (specific types of) storage facilities in the Austrian electricity system is hard to predict and depends on many other factors. However, the greatest demand in the future is expected to be in the area of long-term storage.

Apart from long-term storage, battery storage systems have long been used internationally to stabilise electricity grids and are often used to stabilise electricity systems in individual households. While there are mainly two technologies available for batterie storage (lead and lithium-ion), improved technical properties combined with a sharp drop in manufacturing costs have led to lithium-ion cells being considered for many applications today. For such battery types, analysts forecast a very strong global growth in the coming years. This is expected to be also true for Austria.

On the one hand, the consequences and risks of this technology arise in the various life cycle phases (provision of raw materials, recycling and disposal, etc.). To this end, Austrian research institutions and companies have already built up significant know-how in these fields.

6. Support Scheme for Cogeneration

The CHP Act (*KWK-Gesetz*) provides for a support scheme specifically for the operation and modernisation of existing CHP-plants. Furthermore, the Green Electricity Act provides for investment allowances granted to the operators of CHP-plants based on waste to energy under certain conditions. The operators of existing and modernised CHP-plants are compensated for the costs arising from the maintenance of on-going operation of CHP-plants.

The generation from CHP plants is an important pillar of bioenergy use in Austria. More than 6% of Austria's electricity consumption volume is produced in about 140 power plants and CHP plants based on solid biomass, in about 280 biogas plants as well as in the paper industry's lye combustions CHP plants. Almost half of the biomass district heating generation comes from CHP plants. In total, biomass CHP plants provide around 20% of the district heating generated in Austria.

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Generating Electricity from Renewable Sources in CEE & SEE

Projects, Infrastructure & Energy

Bosnia and Herzegovina

Country Chapter

Wolf Theiss

Country General Information

Capital: Sarajevo

Location: Bosnia and Herzegovina ("**BiH**") is a South-Eastern European country situated on the north-western part of the Balkan peninsula. It borders on the north, west and south with Croatia, and on the east and south with Serbia and Montenegro.

Surface: 51,197 km^2

Population: According to the last population census from 2013, BiH has 3,531,159 inhabitants.

Climate: There are three types of climate, i.e. continental and moderate-continental; mountain and mountain-basin; and Mediterranean.

Resources: BiH is rich in water resources, forests (approximately 53% of the total surface area), various minerals such as zinc, lead, bauxite, and manganese, coal (more than 60% is lignite and the rest is brown coal), metal resources (ore, stone salt, asbestos, gypsum, etc.), and fertile land. BiH rivers have great hydropotential estimated at 18,600 GWh annually, however only 40% of the hydropotential is currently used. Considering its surface area, BiH is a country which is one of the richest in Europe when it comes to forests. Furthermore, BiH also has significant wind power potential, especially in the south of the country.

Electricity Grid: The total length of the national electricity transmission grid is 6,442.86 km. The grid is comprised of overhead power lines with a nominal voltage of 400 kV, 220 kV and 110 kV, as well as electrical power stations having a voltage of 400 kV, 220 kV, 110 kV and 35 kV and underground 110 kV cables. The BiH power system comprises 153 high voltage power stations and four (4) middle voltage power stations.

Electricity Transmission, Distribution and Supply: Electricity transmission is a regulated natural monopoly and is provided by the joint stock company Elektroprijenos BiH ("**Transco**"). Transco performs all activities relating to electricity transmission in BIH, including, *inter alia*, construction, maintenance and extension of the transmission grid. The electricity distribution in BiH is performed by four (4) public enterprises, i.e. Elektroprivreda of BiH d.d.-Sarajevo and Elektroprivreda Hrvatske zajednice Herceg Bosne d.d. Mostar in the Federation of Bosnia and Herzegovina ("**FBiH**"), Mješoviti holding ERS

Trebinje in the Republic of Srpska ("**RS**") and Komunalno Brčko d.o.o. Brčko in Brčko District. The electricity market is based on bilateral transactions between licensed participants, since the country has not yet established an electricity stock exchange. The supply of electricity within the territory of BiH is performed by twenty-four (24) licensed companies out of which, six (6) are licensed by the RS Regulatory Commission for Energetics ("**RERS**"), seventeen (17) are licensed by the FBiH Regulatory Commission for Energy ("**FERK**") and one (1) is licensed by the BiH Regulatory Commission for Electricity ("**DERK**") for supply within the Brčko District territory. All those companies may freely perform their licensed activities within the territory of BiH regardless of which regulatory commission issued their licences.

Official Language(s): Bosnian, Croatian and Serbian

EU Member: No. BiH signed the Stabilisation and Association Agreement with the EU on 16 June 2008 by which it established the framework for implementation of comprehensive legal, administrative and economic reforms that will lead the country to EU membership. BiH submitted its application for EU membership on 15 February 2016.

NATO Member: No. BiH was invited to join the Membership Action Plan (MAP) in 2010.

United Nations Member: Yes, since 22 May 1992

Currency: Bosnian convertible mark (BAM). The Central Bank of BiH maintains monetary stability by issuing domestic currency according to the currency board arrangement with full coverage in freely convertible foreign exchange funds under the fixed exchange rate (BAM 1 = EUR 0.51129).

Schengen: not a member of the Schengen area

Political System, Administrative Organisation and Economy: BiH is a country consisting of two separate entities: FBiH and RS and one special autonomous district under the direct sovereignty of the state, i. e. Brčko District. In each of the three areas in principle

different legal regimes are applicable, however certain matters are regulated by the national laws which are applicable in both entities and Brčko District. FBiH is further divided into ten (10) smaller administrative units called cantons. Besides the cantons in BiH there are also municipalities, of which there are 79 in FBiH and 64 in RS. The political system of BiH is a parliamentary democracy which provides for the Parliament Assembly as the highest legislation authority and which is comprised of two (2) houses, i.e. House of Peoples and House of Representatives. The Presidency of BiH consists of three (3) members, each member representing one of the three (3) constituent ethnic groups in BiH (Bosnian, Croatian and Serbian). The Council of Ministers of BiH is the highest executive authority at the state level. At an entity level, both FBiH and RS have their constitutions and they are rather autonomous. The Constitution of BiH provides that state institutions have jurisdiction over the following matters: foreign affairs, foreign trade, customs, monetary politics, financing of the institutions and international undertakings of BiH, regulation of immigration, refuges and asylum, implementation of the international and inter-entity criminal regulations including relations with Interpol, establishing and functioning of the means of mutual and international communication, regulation of inter-entity transport and air traffic control. All governmental functions and competencies which are not explicitly delegated to the BiH institutions belong to the entities. Entities also have their legislative authorities, i. e. the FBiH Parliament and National Assembly of RS. The entities have presidents and governments which consist of 16 ministers and a prime minister. Brčko District has a Government comprised of mayor, deputy mayor and departments such as the executive authority and the Council of Brčko District as the legislative authority.

The BiH economy is essentially a transitional economy which relies primarily on the export of metals, energy, textiles and furniture. BiH has preferential trade agreements with Member States of the Central European Free Trade Agreement (CEFTA). In the BiH financial system, the banking sector is dominated by foreign banks, especially those from Austria and Italy with the exception of only one domestic state-owned commercial bank. The sector is fairly liquid and well capitalised. BiH has the status of an observer of the WTO since 1999 and negotiations for joining this organisation are still ongoing. The energy sector in BiH is one of the current and future key drivers of the BiH economy, considering that there are plenty of possibilities to invest in RES, since the RES potential is high but still not significantly developed. The energy sector can potentially be a source of national employment in the future by opening up new job opportunities and attracting foreign direct investment in the country. The national currency is pegged to the euro through a currency board arrangement, established by the Law on the Central Bank of BiH in 1998. The currency board established and maintained trust in the national currency and has created strong trade links with the EU partners.

1. Defined Terms for the Main Permits Required for RES-Electricity Generation Facilities

Building Permit	Administrative deed issued by the competent entity, cantonal or municipal body before commencement of the construction of the RES-Electricity facility. The building permit in BiH includes an obligation of the investor to commence with the construction of the RES-Electricity facility within a certain period of time, usually between one (1) and three (3) years from the date of issuance of the construction permit.
Concession Right[1]	If the applicable concession law requires, the investor must obtain a concession right in order to exploit a natural resource and/or to produce RES-Electricity. The concession is granted by the decision issued by the concession grantor following the completion of the tender or self-initiative procedure in accordance with the applicable concession law. Upon issuance of the decision granting the concession right, the concessionaire signs a concession agreement with the concession grantor which regulates the rights and responsibilities of the parties in relation to the granted concession and performance of the future concession activity.
Connection Conditions	Technical document issued by Transco if the RES-Electricity facility is to be connected to the transmission grid. The Connection Conditions are issued based upon a technical solution for connection to the transmission grid. Once the Connection Conditions are issued, the investor must submit a statement to Transco, declaring the acceptance of the Connection Conditions.
Environmental Permit	Administrative deed evidencing the compliance of the RES-Electricity facility with the environmental requirements as provided by the law, and which also prescribe all relevant conditions and measures for mitigation and prevention of adverse effects on the environment during construction and operation of the RES-Electricity facility.

1 In BiH there are 14 applicable laws on concessions, i.e. one (1) on the state level, two (2) on the entities level, one (1) on the Brčko District level and ten (10) on the cantonal levels. Each law provides the list of the activities and natural resources for which the concession should be obtained in order to perform the certain commercial activity.

Liability and Responsibility for Grid Connection and/or Capacity Upgrades, Improvements or Expansion of Grid	The applicable statutory regulations provide that electricity producers bear the cost of connection of the RES-Electricity facility to the distribution or transmission grid. One of the advantages defined in the BIH Rulebook on Access is that producers of RES-Electricity pay only 50 % of the regular access fee to the transmission grid. Furthermore, the Grid Code of Independent System Operator ("**ISO**") provides that all electricity producers connected to the transmission grid which change technical parameters of their system must not create a negative influence on the transmission grid. All producers connected and using the transmission grid may be temporarily curtailed with or without prior written notice only for those reasons prescribed in the Grid Code. If a producer is curtailed without justified reason by the operator of the grid it is entitled to damage compensation. All producers connected and using the grid shall be treated in a non-discriminatory manner.
Licence for Generation of the Electricity from the RES-Electricity Facilities	The licence is issued by the competent regulatory commissions (i. e. FERK, RERS or DERK, depending on the location of the facility) enabling the investor to produce electricity from the constructed RES-Electricity facility. In RS, the licence for generation of RES-Electricity is required for facilities with an installed capacity exceeding 1 MW. In FBiH such licence is required for all facilities regardless of their installed capacity.
RES-Electricity	Electricity obtained from RES sources, such as wind, solar, aerothermal, geothermal, hydrothermal and waves, hydraulic, biomass and biogas;
RES Support Scheme	A comprehensive incentivising system established in accordance with the FBiH and RS laws on use of RES and efficient cogeneration. In FBiH, the RES Support Scheme is based on feed-in tariffs, which provide for a guaranteed repurchase of electricity from producers that obtained the status of a privileged producer.

In FBiH, the mandatory repurchase of electricity at the price set by the feed-in tariffs may be granted for a maximum period of twelve (12) years. Furthermore, producers of RES-Electricity in FBiH have priority access to the grid, while qualified producers also have priority of dispatch.

The RS RES Support Scheme for small installations is based on feed-in tariffs or premiums for consumption of electricity for personal use or sale on the market. In RS, the mandatory repurchases of electricity at the feed-in tariff or the right to premiums may be granted for a maximum period of fifteen (15) years. The RES Support Scheme for large installations is based on the market premium, which is variable and calculated as the difference between the selling price from the auction procedure and the reference market price.

In addition to the monetary aspects of the RES Support Schemes in both FBiH and RS, the RES Support Schemes are financed by the funds paid and collected from all end-customers of electricity.

Currently, there is no RES Support Scheme in place in Brčko District.

Energy Permit and Permit for Construction of the RES-Electricity Facility

In FBiH, an energy permit is an administrative act issued by the Federal Ministry for Energy, Mining and Industry by which the investor will obtain the right to construct or reconstruct a RES-Electricity facility. An energy permit must be obtained before submitting a request for a building permit to the competent authority.

In RS, the investor is obliged to obtain a permit for construction of the RES-Electricity facility, except for:

- Electricity installations (*energetska postrojenja*) of biomass, biogas, landfill gas and gas from wastewater treatment plants:

- Plants for landfill gas and gas wastewater treatment plants;
- Solar plants with photovoltaic cells of installed capacity up to and including 250 KW, on the ground and on buildings, regardless of the installed power.

As with the energy permit, this permit is obtained subject to having a building permit. In the *Brčko* District, DERK issues the licence for the construction of a RES-Electricity facility where the installed capacity exceeds 1 MW.

2. Strategic Priorities for Development of the RES Sector until 2035

The BiH Framework Energy Strategy established the following five (5) strategic priorities for development of the RES sector until 2035:

- Standardisation of cooperation mechanisms with other countries in order to implement measures and programmes for stimulating RES-Electricity production;
- Prescribing the benefits of connecting to the transmission system for power plants that generate RES-Electricity, if it provides a safe system of operation and is based on transparent and non-discriminatory data;
- Increase of the share of RES-Electricity generation (that enters the incentive system) in overall electricity generation, along with adequate system organisation;
- Regulating the utilisation of the minimum levels of energy from RES for construction of new or renovating existing facilities and enactment of regulations to govern the implementation of cogeneration in the heating and cooling sector; and
- Achievement of the goal of 10 % share of RES in energy generation in transport in 2020, and continued promotion of biofuels by 2035.

3. Executive Summary – RES Market Status and Development of RES-Electricity Facilities

3.1 Market Overview – Factsheets

- The RES-Electricity market in BIH has seen significant development since the enactment of the FBIH Law on Use of RES and Efficient Cogeneration as well as the RS Law on RES and Efficient Cogeneration in 2013, (including various implementation bylaws adopted by the competent regulators);
- On 30 March 2016, the Council of Ministers of BiH adopted the BiH National Renewable Energy Action Plan ("**NREAP**") until 2020. NREAP was developed based on the action plans for RES in FBiH and RS. By adoption of NREAP, BIH moved a step forward to compliance with the requirements of Directive 2009/28 EC;
- NREAP set the overall goal for BiH of a 40% share of RES in the gross final energy consumption by 2020. Such a high share of RES in the gross final energy consumption was determined on the basis of the high RES share in 2009 as the baseline year. According to the Action Plan for Usage of RES in FBiH the goal is to reach a 41% share of RES and according to the Action Plan for Usage of RES in RS the goal is to reach a 48% share of RES by 2020;
- In November 2017, BiH as a party to the Energy Community Treaty, submitted to the Energy Community Secretariat its First Progress Report under the Directive 2009/28 EC. The obligation of submitting the progress reports on renewable energy to the Secretariat arises from Article 22 (1) of Directive 2009/28 EC;
- The RS Action Plan for Usage of RES was revised in 2018. The dynamic quotas for solar power plants were increased from 8 MW to 12.2 MW and dynamic quotas for biomass were decreased from 14.83 MW to 12.96 MW;
- The FBiH Action Plan for Usage of RES was also revised in 2018. The dynamic quotas for solar power plants were increased from 11 MW to 23 MW and dynamic quotas for biogas were set at the amount of 1.2 MW;
- At the beginning of 2018, a working group was formed in order to develop a concept for the reform of the RES Support Schemes in BiH ("**Working Group**"). The members of the Working Group are the Ministry of Foreign Trade and Economic Relations of BiH, the Federal Ministry of Energy Mining and Industry, the Ministry of Industry, Energetics and Mining of RS, DERK, FERC, RERS, and the RES Operators in FBIH and RS;

- In March 2018, the first large wind power plant ("**WPP**") in BiH commenced operation. The WPP generates 50 MW of installed capacity and its investor is a public enterprise Elektroprivreda HZ HB d.o.o. Mostar;
- In September 2018, the Working Group made a final report on a new concept for the reform of the RES Support Schemes in BiH, which proposed a feed-in premium for large installations (installed capacity exceeding 500 KW) and feed-in tariffs for smaller installations. In addition, certain tax relief mechanisms were proposed as part of the new concept for the RES Support Scheme;
- In April 2019, amendments to the RS Law on RES and Efficient Cogeneration were enacted by which generation of electricity from WPPs is excluded from the RES Support Scheme;
- In July 2019, BiH submitted the Third Progress Report under the Directive 2009/28 EC;
- On 29 August 2019, the Council of Ministers of BiH adopted the Framework Energy Strategy for BiH until 2035. The purpose of the Framework Energy Strategy is to identify key priorities required for the development of the energy sector in BiH.
- In the last two years, no significant progress has been recorded in the RES sector in FBiH. The institutions in FBiH have worked on reforming the RES Support Scheme with the support of international organisations, but to no avail. In respect of RS, the new RES Law was adopted in March of 2022.

3.2 RES Market Status, Permitting, Grid Connection, Licensing of RES-Electricity Facilities in Bosnia and Herzegovina

General Market Data	
RES Target 2020 provided by NREAP	The overall goal for BiH includes 40% target share of RES in the gross energy final consumption until 2020. In 2017 it was reported that 22.7% of the target had been achieved.[2]

2 Source: EUROSTAT and Agency for statistics of Bosnia and Herzegovina

Overall Installed General Capacity including RES (Overall Production)[3]	In 2021, the installed capacity of all production facilities in BiH was 4,608.26 MW whereas the overall electricity production was 17,055.44 GWh.
Installed capacity by technology[4]	Pumped Hydro – 420 MW Small Hydro – 180.18 MW Wind power – 135 MW Solar – 56,51 MW Biogas – 0.99 MW Biomass – 1.12 MW
RES Support Scheme	
Mandatory Repurchase of Electricity Produced in the RES-Electricity Facility at the Guaranteed Prices	In FBiH, a producer which obtains the status of privileged producer is entitled to a mandatory repurchase of electricity produced in the RES-Electricity facility for a period of twelve (12) years. The privileged producer concludes a standard model power purchase agreement ("**PPA**") with the RES Operator. In RS, the producer which fulfils the requirements for a mandatory repurchase can conclude a PPA with the Elektroprivreda RS acting as the RES operator for a duration of fifteen (15) years.
RES-Electricity Facilities Eligible for Mandatory Repurchase of the Electricity at the Guaranteed Prices	In FBiH the following RES-Electricity facilities are eligible for mandatory repurchase: ○ hydro power plants (**"HPPs"**) with an installed capacity of up to 10 MW; ○ WPPs regardless of the installed capacity; ○ solar power plants (**"PVs"**) up to and including 1 MW of installed capacity;

3, 4 Source: DERK's Annual Report for 2021

- geothermal power plants up to and including 10 MW of installed capacity;
- biomass power plants up to and including 10 MW of installed capacity;
- biogas power plants up to and including 1 MW of installed capacity;
- waste power plants up to and including 5 MW of installed capacity;
- efficient cogeneration facilities up to and including 5 MW of installed capacity.

In RS, the following RES-Electricity facilities are eligible for mandatory repurchase:

- HPPs with an installed capacity up to and including 150 KW;
- Wind power with an installed capacity up to and including 150 KW;
- Solar power on land with an installed capacity up to and including 150 KW;
- Solar power on objects:
  - with an installed capacity up to and including 50 KW;
  - with an installed capacity higher than 50 KW and up to and including 500 KW;
- Power from biomass and biogas, landfill gas and gas from wastewater treatment plants:
  - with an installed capacity up to and including 50 KW;
  - with an installed capacity higher than 50 KW up to and including 500 KW.

Other Incentives	In FBiH RES-Electricity facilities have advantages in terms of supply of electricity, i. e. advantages in dispatch as well as advantage in terms of allocation of rights of facilities with installed capacity of less than 150 KW, without reporting their daily schedule to the RES Operator. In RS, RES-Electricity facilities for small installation plants have benefits when connecting to the grid, in terms of time and in certain cases the cost for analysis of connection to the grid. Preferential access to the network (dispatching) to be mandatorily provided by the system operator to whose grid the generator is connected.

Grid Connection Specifics

Connection Documentation and Approvals	○ Based on the elaboration of the technical solution for connection to the transmission grid, the TSO will issue the Connection Conditions to the investor; ○ Based on the issued Connection Conditions and building permit, the investor can conclude the connection agreement with Transco in accordance with the Grid Code. The connection agreement regulates all technical, legal and economic conditions for connection of the RES-Electricity facility to the transmission grid; ○ Once the connection is constructed, Transco issues the approval for connection of the high voltage facility to the transmission grid; ○ The consent for operational start of the high voltage facility is issued by ISO based upon the approval for connection and request of the owner of the RES-Electricity facility; ○ The consent for the temporary operation of the facility is issued by ISO in order to conduct all functional and compliance tests in accordance with the Grid Code; ○ Once the functional and compliance tests are performed, ISO issues the consent for permanent work of the facility.

	All of the above-mentioned approvals, documents and steps are applicable only if the RES-Electricity facility is to be connected to the high voltage transmission grid. If the RES-Electricity facility is to be connected to the distribution grid, the approvals will be obtained, and agreements concluded with the operator of the distribution grid in accordance with the rules and procedures of the operators of distribution grids.
Costs	The producer bears the costs for preparing the elaboration of the technical solution for connection to the transmission grid. Also, the producer bears the costs for construction of the connection to the grid. The costs for the connection consist of a fixed and variable part. The producers from RES-Electricity facilities pay only 50 % of the fixed costs for the connection.
Licensing	
Licences	Once the RES-Electricity facility is constructed and the use permit is obtained, the producer can obtain the licence for generation of the electricity in the RES-Electricity facility. The licence in FBiH is issued by FERK. In RS the licence for generation is issued only for RES-Electricity facilities which have installed capacity in excess of 1MW. The licence is issued by RERS.
Duration of Administrative Procedure	Within sixty (60) days from the submission of the full documentation for all above-mentioned licences.
Licence's Validity	The licence for generation of RES-Electricity in FBiH and RS is issued for a duration of up to thirty (30) years.

4. Key Changes to the RES Support Scheme since 2016

Since 2016, the FBiH Law on Use of RES and Efficient Cogeneration has not been amended. In RS, on the other hand, a new RS Law on RES was adopted in 2021. The most significant change is the introduction of the concept of the electricity buyer-producer (*prozjumer*). This term refers to final customers operating within premises located in limited areas who (i) produce electricity for their own consumption, or (ii) can store or sell the electricity they produce from renewable energy sources to customers who do not fall within the category of households, where these activities do not represent their main commercial or professional activity. The buyer-producer uses the electricity thus produced for its own needs and injects the surplus into the distribution network. The buyer-producer relies on two-way meters that register how much electricity has been delivered and how much has been taken from the distribution network. Hence, the buyer-producer is paid or charged for electricity based on the difference between the quantities of electricity delivered and taken. The end customer has the right to build a power plant that uses renewable energy sources and to connect it to the internal electrical installations of its facility for its own consumption. The installed power of the power plant, where applying the net metering or net calculation scheme, may not exceed the approved connected power of the end customer's facility. The end customer acquires the status of buyer-producer by connecting the power plant to the internal electrical installations of its facility and by obtaining a production plant (power plant) certificate in accordance with this law. It also has rights and obligations under this law, and under the law governing electricity, to increase this power to 500 KW, which is one of the recommendations of the Energy Community.

Furthermore, the existing RES Support Scheme system, which included feed-in tariffs or guaranteed purchase prices, was retained for plants with small installations defined as such by law. Only those companies that have location requirements and environmental permits can apply for auctions, and it is possible to apply only for part of the installed power for which the construction is planned. A Renewable Energy Community or Energy Cooperative can also receive subsidies in the form of a premium if the installed power is less than 150 KW. The RES Support Scheme for plants with large installations is based on the market premium, which is variable and calculated as the difference between the auction sale price and the reference market price. The auction sale price remains unchanged for as long as the right to incentives endures, except where there is a change of more than 10 % in the BAM to EUR exchange rate in BiH.

4.1 Revision of the Maximum Capacity which can be Accepted by BiH Power System

At a session held on 3 September 2020, DERK adopted the Decision on Granting of Maximum Capacity of Acceptance from Unmanageable Electricity Sources, by which the maximum capacity of WPPs which can be accepted by the BiH power system was set at 840 MW (previously 460 MW) and at 825 MW for PVs (previously 400 MW). Due to the absence of the unique criteria for distribution of the maximum capacity from WPPs and PVs between FBiH and RS, DERK invited the competent authorities in FBiH and RS to agree on the established practice – i.e. that two thirds ($^{2}/_{3}^{rd}$) of the maximum capacity belongs to FBiH and one third ($^{1}/_{3}^{rd}$) to RS. Furthermore, according to the respective Decision, ISO is obliged to continuously perform the relevant analysis and to deliver to DERK a new proposal for the maximum capacity for acceptance by the BiH power system from unmanageable electricity sources.

4.2 The Rulebook on Obligatory Share and Offtake of Electricity Generated from RES

In December 2016, FERK adopted the Rulebook on Obligatory Share and Offtake of Electricity Generated from RES by which it determined for all suppliers to end-customers in FBiH as well as for qualified buyers who import electricity for their own needs, the following: (i) obligations and procedures for offtake of minimum quantities of electricity generated in RES-Electricity facilities at the annual level; (ii) obligations and procedures by which the fulfilment of the conditions set out in the Rulebook will be proven; and (iii) obligations for repurchase of the electricity from qualified producers at the reference price until the establishment of the RES market and fulfilment of the quotas related to the mandatory goals stipulated by the applicable law.

In accordance with the Rulebook, all suppliers and qualified buyers are obliged to offtake a certain portion of the electricity produced in the RES-Electricity facilities. The percentage of the obligatory offtake is determined in advance so that the suppliers and qualified buyers can allocate funds for purchase of their obligatory offtake. The percentage of this obligatory offtake is determined by FERK's decision to be made until 15 December of the respective year at the latest, for the following year. The RES Operator in FBiH concludes individual contracts with each supplier or qualified buyer by which all mutual rights and responsibilities regarding the offtake, metering and payments of the electricity between the parties will be regulated. The contracts also include the obligation of the RES Operator to issue to the supplier or qualified buyer the confirmation for off taken electricity generated from a RES-Electricity facility, as well as the obligation of the supplier or qualified buyer to provide a certain payment security.

In RS, the procedure for determining the obligatory share of RES-Electricity which must be off taken by suppliers and qualified buyers is provided in the Rules on Realisation of Incentive System in RS. The Rules were adopted in January 2012 by the RES Operator and taking into account that the new RES Law has been adopted, it is anticipated that new bylaws will soon be adopted.

4.3 Repurchase of the Electricity Generated from RES at the Referent Price

Besides the feed-in tariffs as part of RES Support Schemes in both entities, the producers of RES-Electricity are entitled to mandatorily repurchase the electricity at the reference price if their production is included in the obligatory quotas set by the entity's action plans for RES.

Although the producers do not receive the fixed price during a long-term period, the reference price can also be considered as a sort of incentive, since the value of the reference price is approximately 20 % higher than the current market price. The producers conclude power purchase agreements with the RES operators by which the RES operators assume the obligation to repurchase the entire quantity of the RES-Electricity at the reference price. Unlike the FiT, the reference price is not fixed and can be revised by the FERC or RERS usually at least once a year or more often if needed.

The mandatory repurchase of electricity at the reference price by the state-owned RES operators in BiH allows investors who intend to develop certain RES-Electricity projects to model these projects, especially for those technologies for which there are no available dynamic quotas, i. e. for which a PPA at the feed-in tariff level cannot be concluded.

One of the main shortcomings of the PPAs at the reference price is the fact that such PPAs may be concluded only once the RES-Electricity facility is fully operational. Hence a producer which intends to conclude a PPA at the reference price is not able to reserve the available quota by signing the pre-agreement until it completes the construction of the RES-Electricity facility. The latter could be problematic if the producer needs a lender to provide financing for the project. This is because lenders typically expect that a PPA is executed before the funds for the project are granted.

4.4 Guarantees of Origin for Electricity Produced from RES

The guarantees of origin for electricity produced from RES in RS have been regulated by the Rulebook on Issuance of Guarantees of Origin for Electricity. The Rulebook was adopted by RERS in 2013 and entered into force in 2014 and since then, it has not been amended. Taking into account that a new Law on RES has been adopted, it is anticipated that new bylaws will be adopted soon. In FBiH, the Rulebook on Procedure for Submitting Requests for Issuance of Guarantees of Origin for Electricity was adopted by the RES Operator in 2015 and entered into force in 2016. According to the FBiH Rulebook, the guarantee of origin can be issued only to a qualified producer whereas privileged producers are not entitled to submit a request for issuance of the guarantee of origin for electricity produced in their RES-Electricity facilities.

The FBiH Rulebook provides that the RES Operator must adopt a special regulation by which it will regulate the automatic transfer of the guarantees of origin for the electricity generated in the RES-Electricity facilities of privileged producers. Consequently, in 2018 the RES Operator in FBiH adopted the Rulebook on Transfer of Guarantees of Origin for Electricity Generated in a Privileged Producers' RES-Electricity Facility. This became applicable as of 1 January 2019. In accordance with this Rulebook, the guarantees of origin for electricity generated in privileged producers' RES-Electricity facilities will be automatically issued based on the data from the RES Operator database and transferred to the suppliers and qualified buyers which are obliged to repurchase a certain percentage of RES-Electricity. Once the guarantees are transferred to the suppliers and qualified buyers, they will be automatically cancelled since they cannot be further transferred or sold. The further transfer of such guarantee of origin is strictly prohibited. The RES Operator publishes the data on issued, transferred and cancelled guarantees on its website.

5. The Balancing of BiH Power System

Balancing responsibility requires market participants to harmonise their generation, consumption and purchase and sale of electricity during the period of imbalance. The balancing market is part of the wholesale market in BiH and also includes the obligation for electricity market participants to assume financial responsibility for imbalances.

According to the RS Law on RES and Efficient Cogeneration, producers of RES-Electricity from facilities where the installed capacity is less than 150 KW and which have exercised the right to an incentive for the production of electricity are not required to pay balancing costs. RES-Electricity producers where installed capacity exceeds 150 KW and which have exercised the right to an incentive for the production of electricity must bear all balancing costs. Producers of electricity with large installations and which have the right to a market premium price must also bear all balancing costs. The new bylaws regulating this matter should be soon adopted.

The FBiH Law on Using RES and Efficient Cogeneration provides that micro-producers of RES-Electricity (facilities with installed capacity ranges from 2 KW to 23 KW) are not obliged to bear the balancing costs. Privileged and qualified producers of RES-Electricity in facilities where the installed capacity does not exceed 150 KW are not obliged to pay the balancing costs. Otherwise privileged and qualified producers of RES-Electricity in facilities where the installed capacity exceeds 150 KW must pay the balancing costs in accordance with the Rulebook on Methodology for Distribution of the Balancing Costs for Privileged and Qualified Producers. This Rulebook should be adopted by the RES Operator and endorsed by the FERK and Federal Ministry on Energy, Mining and Industry. Although the RES Operator adopted the draft of the Rulebook and conducted public hearings, the Rulebook has not yet been officially adopted as of the date of publishing this guide (according to publicly available information, the last debate on the draft of this rulebook was held in December 2021). Accordingly, the matter of balancing responsibility for privileged and qualified producers in FBIH is still not completely regulated. Hence, the Rulebook should be adopted in the forthcoming period in order to allow potential and existing investors to allocate more precisely the future operating costs of their RES projects in FBiH.

6. Significant and/or Expected Changes as of 2022

6.1 A New Support System for RES-Electricity in BiH

In order to continue the development and support for generation of RES-Electricity, it is expected that in 2022 the competent authorities in FBiH will adopt a completely new RES Support Scheme for RES-Electricity facilities. RS adopted its new Law on RES and has yes to adopt the bylaws (which have not yet been adopted at the date of publishing this Guide).

The targets for 2020 have expired and it remains unclear if planned quotas were fulfilled due to the lack of transparency on those projects which received the support, since the project list has not been published by the responsible institutions.

Namely, the future RES Support Schemes in BiH need to be more economical and due to the complete liberalisation of the power sector in BiH, the future RES Support Scheme should be more market orientated and competitive. The new targets for the RES share of electricity until 2030 have not yet been adopted and it is expected that during 2020 the competent authorities from the energy sector will agree on these.

New RES Support Schemes in FBiH need to be introduced due to the following reasons, *inter alia*:

- The incentivising mechanisms for RES have drastically changed since the first RES Support Scheme in BiH was introduced;
- The use of RES-Electricity has significantly increased in the entire world and the prices for technologies for generation of RES-Electricity have decreased over the last decade. Therefore, the costs for RES project investments are lower;
- Many technical challenges appeared regarding the connection of RES-Electricity facilities to the transmission grids;
- The current RES Support Scheme in BiH is considered to be too expensive, so in the long run such a system is not sustainable or effective.

6.2 The Characteristics of the New RES Support Scheme in BiH

The Working Group for the final report on the concept for the reform of the RES Support Scheme in BiH proposed separate RES Support Schemes for large and small installations. EU regulations define a large installation as those facilities where the installed capacity exceeds 500 KW. However, the entities in BIH are entitled to establish different criteria for large installations in their legal frameworks. Accordingly, the competent authorities in RS have adopted the new Law on RES, which defines separate RES Support Schemes for large and small installations.

6.2.1 The RES Support Scheme for Large Installations

The Working Group in FBiH for large installations proposed a comprehensive replacement of the feed-in tariffs with feed-in premiums. Instead of the fixed price for electricity produced in RES-Electricity facilities, the producers must sell the electricity at the wholesale market price with an added premium. To determine the level of the incentives for large installations, auctions should be used under the condition that they relate to a limited variety of RES technologies. For certain RES technologies using biomass and biogas, the level of the incentives should be administratively determined.

The new Law on RES stipulates that large installations, which meets the conditions provided for by the Law, are entitled to a market premium for the electricity produced and sold on the market. The RES Support Scheme for large installations is based on the market premium, which is variable and calculated as the difference between the auction sale price and the reference market price.

6.2.2 The RES Support Scheme for Small Installations

The Working Group in FBiH proposed that small installations should still be incentivised by feed-in tariffs. The quotas for feed-in tariffs should be determined in a transparent manner for each RES technology. The feed-in tariff should be granted to producers under a first come – first served principle, i.e. the producer who first submitted an application will be granted the feed-in tariffs. Alternatively, PPAs at the reference price should still be an option for small installations.

For producers of RES-Electricity in facilities that use the produced electricity for their own needs and deliver the surpluses of the electricity to the grid (“**prosumers**”), net price billing should be introduced. The net price billing would provide that any surplus of electricity delivered to the grid can be used later in compensation for electricity costs incurred during the period when the local renewable production was not present or was not sufficient.

Feed-in tariffs, feed-in premiums and certain tax relief which are taken into consideration by the Working Group would entail direct incentives within the meaning of the new RES Support Schemes in BiH. Furthermore, indirect incentives would include the participation of the state authorities in the balancing costs, priority in dispatching, connection grid costs, etc.

All these characteristics of the new RES Support Schemes in BIH are currently just proposals. It is up to the competent authorities in BiH to decide whether they will completely accept the proposal of the Working Group or if they will enact a different concept for the RES Support Schemes than the one proposed.

The new RS Law on RES was adopted in March 2022. This new RS Law defines separate RES Support Schemes for large and small installations. Only those companies that have location requirements and environmental permits can apply for auctions, and it is possible to apply only for part of the installed power for which the construction is planned. A Renewable Energy Community or Energy Cooperative can also receive subsidies in the form of a premium if the installed power is less than 150 KW. The RES Support Scheme for plants with large facilities is based on the market premium, which is variable and calculated as the difference between the auction sale price and the reference market price. The auction sale price remains unchanged for as long as the right to incentives endures, except where there is a change of more than 10 % in the BAM to EUR exchange rate BiH.

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Generating Electricity from Renewable Sources in CEE & SEE

Projects, Infrastructure & Energy

Bulgaria

Country Chapter

Wolf Theiss

Country General Information

Capital: Sofia

Location: Bulgaria is situated in the centre of the Balkan Peninsula and is the most south eastern country of the European Union, sharing a border with Romania to the north, Serbia to the west, North Macedonia to the southwest, Greece to the south, Turkey to the southeast and the Black Sea to the east. Bulgaria lies between latitudes 43° and 44° N and longitudes 25° and 28° E.

Surface: 110,993 km^2

Population: 6,870,724 inhabitants

Climate: temperate and continental, with four (4) distinct seasons

Electricity Grid: The total length of the national electricity transmission network is over 1,500 km, of which 1,446 km are interconnection lines. The electricity distribution grid is over 152,000 km in length. The electricity system is comprised of overhead power lines with a nominal voltage of 400 kV, 220 kV, 110 kV and electrical stations having a higher voltage of 400 kV, 220 kV and 110 kV.

Electricity Transmission, Distribution and Supply: Electricity transmission is a licensed activity performed by a certified Independent System Operator – Electricity System Operator EAD. The electricity distribution activity is divided into four (4) licensed territories operated by four (4) licensed distribution companies. The electricity supply is provided under regulated prices by licensed end-supply companies to low voltage household customers and under freely negotiated prices by licensed electricity traders to business customers. The electricity is traded on the Bulgarian electricity exchange platforms operated by the power exchange operator Independent Bulgarian Energy Exchange EAD (IBEX). The full liberalisation of the Bulgarian electricity market is expected to be completed by 2025.

Official EU Language(s): Bulgarian

EU Member: since 1 January 2007

NATO Member: since 2004

United Nations Member: since 1955

Currency: Bulgarian lev (BGN). Bulgaria has a currency board with an exchange rate fixed to the euro at 1.95583 BGN/EUR.

Political System, Administrative Organisation and Economy: Bulgaria is a parliamentary republic with a separation of its legislative, executive and judicial powers. The government is headed by a Prime Minster. The President of the Republic is also the head of state and supreme army head. The country is divided into twenty-eight (28) counties and 265 municipalities.

1. Defined Terms for the Main Permits Required for RES-Electricity Generation Facilities

Building Permit	Administrative deed issued by the mayor or the municipal council of the local administrative unit where the RES-Electricity facility will be built.
Certificate for Change of Land Designation	Administrative deed approving a conversion in the designation of a land plot from agricultural land to land for construction purposes in accordance with the Bulgarian Act for the Preservation of the Agricultural Lands.
Contracts for Compensation with Premiums	Commercial contract concluded between a RES-Electricity producer and the FSES for payment of the Premiums .
Detailed Zoning Plan/ Parcelling Plan	Administrative deed in the form of an order of the mayor of the municipality for approval of a plan for regulation of streets, quarters and land plots assigned for construction or other purposes by prescribing the construction parameters of such land plots. Parcelling plans are developed for the electricity and communication connection infrastructure of a project.
Environmental Permit	Administrative deed in the form of an Ecological Assessment, Environmental Impact Assessment and/or Appropriate Assessment issued by the local Environmental Authority or the Ministry of Environment and Waters evidencing the compliance of the RES-Electricity facility with the environmental requirements as provided by law. For hydro power plants, a permit for water abstraction is required.
Grid Connection	Actions performed and commercial contracts concluded between a RES-Electricity generating facility owner and the respective grid operator to connect a new RES-Electricity generating capacity to the electricity transmission or distribution grid.

Guarantees for Origin	Administrative deed issued by the Sustainable Energy Development Agency to guarantee the produced electricity from a RES source from 1 MW of installed capacity.
Investment Design	Design developed for building of a RES project by eligible designer in accordance with the approved Detailed Zoning Plan or Parcelling Plan.
Forecasted Market Price	Annually calculated price by EWRC under a methodology considering the weighted average price for the previous 12-month period for electricity generated from solar, wind hydro (up to 10 MW), biomass and other RES-Electricity Producers. The FMP is used to provide a base for calculating the Premiums due to RES-Electricity Producers by FSES.
Fund Security of the Energy System (FSES)	Financial resource management fund created to meet expenses including the payment of premiums to RES production companies with an installed capacity above 500 KW.
Licence for Production of Electricity	Administrative deed issued by EWRC, for the performance of electricity generation by production facilities with an installed capacity above 5 MW.
Premiums	Fixed mark-up paid by FSES under CfCPs to RES-Electricity Producers to cover the difference between the Feed-in Tariffs applicable prior to 2018 for the respective RES technology and the annually set FMP. Premiums are calculated on an annual basis by EWRC.
Protocols During Construction	Administrative deeds issued by competent authorities in the course of the construction of a RES Project under the provisions of the Spatial Development Act and the related secondary legislation.

Property Deed	Administrative deed establishing right of ownership or superficial right of use for building over a land plot where a RES Project is to be built.
RES-Electricity	Electricity generated from RES sources such as: wind, solar energy, energy in the form of heat in the ambient air (aerothermal energy), energy stored in the form of heat beneath the solid earth surface (geothermal energy), hydrothermal energy stored in the form of heat in surface water (hydrothermal energy), ocean energy, hydropower, biomass, gas from renewable sources, landfill gas, and sewage treatment plant gas.
RES-Support Scheme	Support schemes provided under the AERS in the form of (i) Premiums for RES-Electricity Producers with installed capacity above 1 MW; or (ii) Feed-in Tariffs for RES- Electricity Producers with installed capacity up to 500 KW with a PPA concluded prior to 1 January 2016 or (iii) Feed-in Tariffs for rooftop or façade-mounted PV systems in urban territories or biomass with installed capacity below 30 KW.
Statement of Opinion of Technical Conditions for Connection to the Grid	Statement of opinion issued by the grid operator providing the technical conditions and parameters under which a RES project can be connected to the respective grid.
Use Permit	Administrative final deed permitting the exploitation of each component of a RES production project issued in compliance with Chapter XI of the Bulgaria Spatial Development Act.

2. Envisaged Need of Investments

According to the requirements of the Clean Energy Package[1], with an outlook towards 2030 Bulgaria has committed to new targets for RES energy production of 27.09% (the target for 2020 was sixteen percent (16%)) and energy efficiency savings of 27.89%. Further, as a Member State, Bulgaria is actively involved in ensuring that all available planning tools for the European Green Deal are coherently deployed. In addition, Bulgaria has elaborated and committed to CEP targets with its Integrated Plan for the Energy and Climate 2021 – 2030 EC with particular national general and specific targets related to Decarbonisation, Energy Efficiency, Energy Security, Internal Market and Research, Innovation and Competitiveness. Therefore, it is expected that Bulgaria will transpose the required legal provisions in its legislative framework for the necessary investments to accelerate the transition to clean energy.

According to the Bulgarian Integrated Plan for Energy and Climate 2021 – 2030 EC, the RES national targets for energy from renewable sources from the gross end consumption of energy by 2030 are separated into 3 main areas – namely (i) share of electricity from RES from the gross end consumption of electricity – 30.33%; (ii) share of heat energy and energy for cooling RES – 42.60%; and (iii) share of RES from end consumption of energy in the transport sector – 14.20%.

RES Production targets the following main measures:

- Market principles of investment and sale of produced energy for new projects;
- Tenders after 2025 if necessary;
- National plan for energy from forest biomass – 2018 – 2027;
- Development of energy communities and active consumers;
- Incentivising the production of energy for own consumption (prosumers); Development and modernisation of the capacity for energy storage and backup systems;
- Support to the decentralised distribution, adaptation of the transmission, increase of the electricity network adequacy); and
- Usage of RES energy for carbon storage.

1 The Clean Energy Package is comprised of 4 Directives and 4 Regulations – 1. Governance of the energy union and climate action (EU) Regulation 2018/1999; 2. Regulation on the internal market for electricity; 3. Regulation establishing a European Union Agency for the Cooperation of Energy Regulators; 4. Regulation on risk-preparedness in the electricity sector; 5. Energy Performance of Buildings Directive 2018/844; 6. The revised Renewable Energy Directive (EU) 2018/2001; 7. The revised Energy Efficiency Directive (EU) 2018/2002; 8. Directive on common rules for the internal market for electricity.

As regards the Decarbonisation target, Bulgaria is committed to increasing its energy from RES in the gross end-consumption and to reduce greenhouse gas emissions. Further to the instruction of the EC, Bulgaria has increased the level of its target as regards the share of RES in end consumption from 25 % to 27.09 % thus envisaging to reach the calculated target as per Annex II to Regulation EC 2018/1999. In support to this target, Bulgaria will implement additional production facilities with emphasis on wind and PV energy. Moreover, in order to achieve the target levels, it may consider opting out of tenders for additional capacities for energy from RES considering the market conditions after 2025.

The use of biomass is envisaged across all sectors: electricity energy, heating energy, cooling energy and transport. The envisaged measures for the transport sector will have significant effect on the development of energy from RES as well as the reduction of greenhouse gas emissions. Specifically, Bulgaria will incentivise the implementation and use of EV and hybrid vehicles in mass and private transport, and in the large cities it is envisaged to create low emission zones.

In all sectors of energy, heat, cooling and transport the Bulgarian integrated plan envisages EUR 2 billion of necessary investments in RES-related developments.

During the period 2020 – 2030 an increase of at least 2,645 MW of net installed capacity of electricity production facilities using renewable energy is expected. This increase will be achieved by increasing the net installed capacity of PV power plants by 2,174 MW and of wind power plants by 249 MW. The anticipated increase of these types of power plants is related to the quick development of the technologies and a decrease in the investment costs for their construction. An increase is also expected as regards biomass power plants by 222 MW.

The availability for new electricity production capacities in PV and wind should also replace the current ineffective and intensive carbon emission electricity generating facilities, which should be out of operation by 2025. This will be done in the context of achieving the objectives of energy security, competitiveness and decarbonisation of the energy sector.

Another target which Bulgaria has set in its national energy sector modernisation plan that will enable further opportunity for RES integration, is the level of interconnectivity with other Member States of the national electricity system. Based on its geographical position and its current system connectivity, further interconnectivity for Bulgaria – both in terms of the physical grid and also market measures like electricity day-ahead market and intraday market segments of IBEX functioning – is also expected. The achieved market coupling with Greece HEnEx and Romanian OPCOM and other European countries under the 4 MMC initiative is also contributing to the integration of Bulgaria into the wider European energy market.

As regards R&D and innovation, Bulgaria is planning to be actively involved in, among other things, the following projects:

- CROSSBOW – transboundary management of RES for storage of energy that will allow better flexibility of the energy system as regards renewable energy; and
- FLEXITRANSTORE – integrated platform for increase of the flexibility of data smart grids with facilities for storage of renewable energy, which will increase the flexibility of the system of the internal energy market.

3. Executive Summary-RES Market Status and Development of RES-Electricity Facilities

3.1 Market Overview – Factsheets

- The Bulgarian RES-Electricity market has developed since 2007 with the adoption of the first Act for the Alternative and Renewable Energy Sources and Biofuels ("**AERSB**") introducing the RES Support Scheme providing for Feed-in Tariffs, long-term power purchase agreements ("**PPAs**"), preferential connection to the grid and buy-out and merit order off-take;
- Further to the adoption of Directive 2009/28/EC on the promotion of the use of energy from renewable sources, Bulgaria has repealed ARAESB and has adopted the Act for Energy from Renewable Energy Sources ("**AERS**") which transposed the main provisions of the directive which keep the RES support scheme with a fixed Feed-in tariff, mandatory buy-out, long-term PPAs, preferential connection to the grid and merit order dispatch. The AERS also provided for issuance of guarantees of origin for the RES produced electricity;
- Based on the AERS, Bulgaria also adopted the National RES Plan 2010 – 2020 outlining the main measures and separation per renewable sources to be introduced in order to reach the threshold of 16% commitment under Directive 2009/28/EC;
- In 2011, AERS was amended and supplemented to reduce the duration of mandatory buy- out period under the PPAs from 15 to 12 years for wind power plants and from 25 to 20 years for PV and biomass RES-Electricity Producers. Nevertheless, Bulgaria has experienced a boom in the development, construction and commissioning of approximately 701 MW of wind, 1,047 MW of PV and 2,366 hydro RES projects (including those above 10 MW);

- In December 2013, under its second national RES achievement report, Bulgaria reported to the European Commission that it had reached sixteen percent (16%) of the total energy consumption from RES, which was the country target for 2020. AERS was amended in 2015, considering the Guidelines for State Aid in the area of environment and energy in the period 2014 – 2020 and Regulation No. 251/2014 EC as of 17 June 2014, announcing some measures as compatible with the internal market. Thus, the RES support scheme incentives related to mandatory buy-out under PPAs on a long-term basis were to be provided only for small energy objects connected to the electricity grid constructed on facades and roof tops in urbanised areas with an installed capacity of not more than 30 KW. Nevertheless, the RES-Electricity Producers with ensured PPAs continued to enjoy the 2011 RES support scheme;
- In 2016 as part of the liberalisation process, the organised electricity power exchange IBEX was introduced with its segments on day-ahead and centralised market on bilateral contracts;
- In 2018, 2019 and 2020, Bulgaria introduced amendments to the AERS and the Energy Act, by which it abolished the 2011 RES support scheme for projects with installed capacity above 500 KW and introduced a new support scheme. Under the new regime, all RES-Electricity produced by RES power plants with an installed capacity above 500 KW are subject to sale at the liberalised market through the IBEX segments. For the duration of the terminated PPAs, the RES-Electricity Producers are to be compensated for the difference between the abolished Feed-in tariffs and the achieved power exchange prices via mark-ups (premiums) paid under contracts for compensation with premiums to be concluded with the Fund for Security of the Energy System;
- Under the Integrated National Plan for Energy and Climate 2021 – 2030, Bulgaria has committed that by 2030 it will have twenty-seven point zero nine percent (27.09%) of RES-Electricity in the final energy consumption;
- Since November 2019, Bulgaria together with Croatia, Czech Republic, Hungary, Poland Romania and Slovenia have successfully linked intraday markets with fourteen (14) countries active in operational integrated electricity markets;
- Through several amendments to the Energy Act, Bulgaria has introduced several exemptions from the general legal framework for RES producers, namely: (i) RES-Electricity facilities (except for those with an installed capacity below 30 kV) which entered into operation after 1 January 2019 may sell the electricity they produce outside of IBEX (i.e. under OTC contracts with traders or end consumers); (ii) end consumers and traders that buy electricity under OTC contracts from RES producers (except for those with an installed

capacity below 30 kV) which have power plants that entered into operation after 1 October 2019 are not required to pay the so-called "obligations towards society price", which is set annually by the energy regulator EWRC, on the purchase of electricity; and (iii) RES-Electricity facilities (except for those with an installed capacity below 30 kV) which entered into operation after 1 January 2021 are not required to pay the FSES a 5% fee on the electricity they produce.

3.2 RES Market Status, Permitting, Grid Connection, Licensing of RES-Electricity Facilities

General Market Data	
RES Targets 2020 under AERS (Out of Final Consumption of Energy)	Sixteen percent (16%), reported achieved in 2013.
New Targets under Clean Energy Package and Integrated National Plan Energy and Climate 2021–2030	Twenty-seven point zero nine percent (27.09%)
Overall Installed General Capacity including RES (Overall Production)	In 2021, overall energy production was 12,493 MW (42 TWh).
RES Installed Capacity by Technology	Hydro including small – 1,399 MW Biomass – 76 MW Wind power – 701 MW PV – 1,106 MW

RES Incentives	
Beneficiaries of RES Support Scheme	○ RES-Electricity fannection to the grid prior to 2016 – Feed-in Tariff until the duration of the respective PPA; ○ RES-Electricity facilities with an installed capacity of up to 30 KW PV (roocilities with an installed capacity up to 1 MW and coftop or façade mounted systems in urban territories) or biomass – Feed in Tariff determined by EWRC.
Priority Dispatch under the Merit Order and Off-take	○ RES-Electricity facilities receive priority access to the grid and the sale of the amount of energy into the grid, up to the net specific generation amount of energy as set by EWRC in 2015 considering the specific technologies.
Other Incentives	○ RES-Electricity facilities with an installed capacity above 500 KW and connected to the grid prior to 2016 – compensation with premiums under contracts with FSES; ○ RES-Electricity facilities (except for those with an installed capacity below 30 kV) which entered into operation after 1 January 2019 may sell the electricity they produce outside of IBEX (i.e. under OTC contracts with traders or end consumers); ○ RES-Electricity facilities (except for those with an installed capacity below 30 kV) which entered into operation after 1 January 2021 are not required to pay the FSES a 5% fee on the electricity they produce; ○ Guarantees for origin of the energy – (still no market for trade though).
Other Conditions	○ Licence for commercial exploitation above 5 MW; ○ No installed capacity limit as long as the technical capacity of the grid allows; ○ Sale of RES-Electricity only via the IBEX platforms.

Grid Connection Specifics

Approvals

- Connection to the grid is subject to a reasoned statement of opinion on the connection conditions issued by the respective grid operator and depending on the installed capacity;
- Grid operator is responsible for issuing the reasoned statement of opinion and for further conclusion of preliminary and final connection contract with the applicant;
- TSO needs to include any new capacity in the 10-year grid development plan updated annually and approved by EWRC;
- DSOs need to coordinate the required connection capacity by the TSO prior to granting a positive reasoned statement of opinion on the connection conditions;
- RES-Electricity Producers need to obtain Guarantees for origin from the Sustainable Energy Development Agency.

Permitting

Timing:
depending on the installed capacity and connection to the grid, an investor may obtain the necessary approvals in approximately 2 years.

- Ecological Assessment, Environmental Impact Assessment and/or Appropriate Assessment;
- Elaboration and approval of detailed zoning plan(s) for the land plots where the RES-Electricity plant will be constructed; and parcelling plans for the power and communication lines necessary for the connection of the RES-Electricity plant to the respective electricity grid;
- Based on the zoning plan a change of land designation of the land plots where the project is to be constructed should be obtained by the agricultural land commission;
- Elaboration of design plan and investment design are required for obtaining a building permit for civil works and connection facilities to the grid;
- Preliminary and connection contract with the grid operator;
- RES-Electricity capacity and related connection works' testing, commissioning and entry into operation;
- Provision of access to the grid by the grid operator and conclusion of access to the grid contract.

Licensing		
Procedure	○	Licence issued by EWRC for generation of electricity activity from an RES-Electricity facility, to be granted prior to construction or upon construction for projects above 5 MW.
Duration of Administrative Procedure	Within four months from the submission of the full documentation.	
Licence's Validity	Thirty-five (35) years with a possibility for extension.	

4. Key Changes to the RES Support Scheme since 2015

Since 2015 the Bulgaria legal framework and the RES Support Scheme experienced several changes via bills for amendments and supplementations of the AERS and the Energy Act as follows:

4.1 Introduction of the Net Specific Generation of Electricity Threshold for Mandatory Buy-out

Prior to July 2015, the public provider National Electricity Company EAD ("**NEK**") and the end suppliers (Energo-Pro Sales AD, CEZ Electro AD and EVN Bulgaria Electricity distribution EAD, "**ES**") were obliged to purchase the entire RES-Electricity generated by RES-Electricity plants (except from hydro power plants with installed capacity above 10 MW). After July 2015, with the Bill for amendment and supplementation to the Energy Act and the AERS, the obligation for mandatory buy-out was limited to the amount of "net specific generation of electricity" ("**NSGE**") set out for the specific type of power plant. The NSGE is "the average annual electric power generation by 1 KW of installed capacity" in accordance with the EWRC decision fixing preferential prices after deduction of the RES-Electricity plant's own needs. The NSGE for existing power plants has been set out in Decision SP-1/31.07.2015 of the EWRC and was to apply until the end of the mandatory off-take period for those power plants. Once the NSGE is reached, RES-Electricity Producers may sell the remaining amounts of generated electricity either (i) on the liberalised market at freely negotiated prices; or (ii) respectively to NEK or the ES at the price for "surplus" paid on the balancing market.

4.2 Change in RES Support Scheme after November 2018 for RES-Electricity Producers with Installed Capacity above 500 KW

In 2018, the RES support scheme introduced by AERS in 2011 for mandatory buy-out under preferential prices (Feed-in-Tariffs) was abolished and a new support scheme was substituted for it. Under the new support scheme, the RES-Electricity Producers sell the produced electricity at the Bulgarian power exchange operated by IBEX at free market prices.

For the difference between the abolished, long-term mandatory Feed-in Tariff and the achieved market price at IBEX, the RES-Electricity Producers are compensated by way of premiums. The premiums are paid by the Fund for Security of the Energy System ("**FSES**") which substitutes for the old off-takers – the incumbent NEK and the licensed end-suppliers. FSES is not obliged to provide premiums if a RES Producer: (i) has failed to conclude contracts for any sale of electricity at IBEX at freely negotiated prices; or (ii) has not transferred the monthly guarantees for origin.

4.3 Conclusion of Contracts for Compensation with Premiums by RES Producers above 500 KW with FSES

Each RES Producer with an installed capacity above 500 KW should have signed Contracts for Compensation with Premium (CfCPs) with FSES and the existing PPAs with NEK and end-suppliers were terminated upon their conclusion. The duration of the CfCPs with FSES lasts until the term of the terminated PPAs, e.g. 12 or 15 years for wind RES Producers or 20 years for PV or biomass RES Producers.

For the electricity sold on the IBEX, the RES Producers have the right to claim from the FSES payment of an additional amount defined as a premium under the CfCPs from FSES. The payment of the premiums by FSES was conditional upon transfer of Guarantees for origin for the produced RES-Electricity issued by the Sustainable Energy Development Agency.

4.4 EWRC Determines Annually Premiums and Forecast Market Prices

In 2018, EWRC's powers were extended to adopt an Ordinance for determination of annual premiums for the FSES to pay to RES producers ≥ 500 KW and the Methodology for setting of forecasted market prices ("FMP").

The premiums are a fixed amount set by EWRC each year by 30 June and are calculated as the difference between FMPs for the respective group of RES-Electricity Producers and the applicable FiTs under the abolished 2011 RES scheme.

The FMPs are also set by the EWRC each year by 30 June, based upon its methodology as a weighted average price for the previous 12-month period for electricity generated from solar, wind hydro (up to 10 MW), biomass and other RES-Electricity Producers.

4.5 RES-Electricity Producers above 500 KW Sell Electricity at IBEX and Conclude CfCPs with FSES

RES-Electricity Producers with an installed capacity above 500 KW have also been excluded from the 2011 RES support scheme and have concluded CfCPs with FSES to be able to receive compensation with premiums for the produced electricity sold at IBEX. Accordingly, with the conclusion of CfCPs, their long-term PPAs were terminated.

4.6 Amendments Seeking to Promote RES without State Financial Support

Amendments to the energy legislation were also introduced to promote RES generation without any form of state financial support. Among others, the amendments concern the following:

- Smaller RES-Electricity Producers (under 30 KW of installed capacity) report to the FSES only once per year instead of each month as the rest of the RES Producers;
- RES-Electricity Producers not connected to the electricity transmission or distribution network, but using the generated electricity for own consumption do not pay the “obligations towards society price”;
- Opportunity for installation of smart metering devices replacing the existing commercial metering devices for clients with capacity of 10 KW and above, aiming to incentivise consumers to invest in their own PV plants, so as to be excluded from the obligation to pay the “obligations towards society price”.

5. Significant and/or expected changes in 2022

5.1 New RES-Electricity Share in Final Consumption

In order to achieve the new country targets for the RES-Electricity share in total consumption by 2030 as promoted under the Integrated National Plan for Energy and Climate 2021 – 2030, it is expected that in 2022, the Bulgarian authorities will adopt further changes to the primary and secondary legislation related to transposition of the Clean Energy Package Directives and in particular the Directive on common rules for the internal market for electricity.

5.2 National Energy Strategy 2020 – 2030

The Bulgarian energy strategy 2010 – 2020 has expired. Thus, Bulgaria must update its strategy also considering the Clean Energy Package and the commitments under the Integrated National Plan for Energy and Climate 2021 – 2030.

6. Overview of the Technical InNovations in Electricity Storage and Applicability in Bulgaria of such Storage Technologies

As more RES-Electricity will be supplied to the grids, the more the balancing of the system and flexibility to the demand-supply requirements will become a challenge for the grid operators. The use of modern technologies like smart grids, decentralised production, own production, demand response, active consumers, etc. offer practical solutions which will support grid operators. In addition, with the help of energy storage technologies and solutions, it is possible to address and solve many complex challenges related to generation, frequency regulation, grid balancing including secondary and tertiary reserve, optimisation of consumption profiles and portfolio etc. related to RES-Electricity. Thus, energy storage is increasingly seen as a key cornerstone and enabler of the transition to RES-Electricity worldwide.

Bulgaria has set its goal to progressively replace the regulatory and commercial obstacles for consumers to use, store, and sell to the market the energy produced by them and to participate in the market while providing flexibility to the system via energy storage and optimisation of consumption.

Bulgaria has planned to develop several projects for storage of electricity, aiming to (i) ensure balance and flexibility in the system; (ii) improve the Bulgarian status as an energy exporter; and (iii) ensure cross-border flexibility of the system. These projects will facilitate further development of the RES-Electricity projects and their integration into the national electricity system, considering the fluctuating production profiles of these RES sources. Therefore, Bulgaria anticipates the following projects:

- Increase of the operation capacity of PAHPP Chaira by construction of the Yadenica dam to optimise the structure of the generation capacities. Estimated project value is EUR 200 million;
- Investment in batteries for frequency regulation with estimated capacity of approximately 180 MW;
- Incentivising the use of new RES Facilities in combination with local storage facilities of electricity considering the appropriate technological solution for the respective project (in total approximately 200 MW). Estimated project value of EUR 200 million.

Accumulator-based energy storage systems are highly sought in Europe, as they provide utility companies with load balancing services on the power grid with an extremely fast response time.

In Bulgaria, the legal framework for the development of electricity storage is planned to be introduced through the provisions of the Electricity Market Rules to be adopted by EWRC. However, the provisions are sparse, as they only introduce a definition for electricity storage and do not provide further details as to the regulations of such facilities. Hence, further specific regulations are required to complete the regulatory framework for energy storage and to ensure its prompt and adequate implementation into the energy system.

7. Support Scheme for Cogeneration

High-efficiency cogeneration of heat and power ("**CHP**") systems which inject electricity into the national grid receive operating support provided that the electricity is produced from high-efficiency cogeneration, as defined in the Energy Act and the Community guidelines on state aid for environmental protection.

Bulgaria has abolished the support scheme for the promotion of high-efficiency cogeneration with an installed capacity above 500 KW and introduced a new support scheme, similar to that for RES production by way of compensation through premiums by FSES.

The high-efficiency cogeneration capacities that sell their produced electricity at IBEX receive compensation by premiums from FSES upon issuance of certificates of origin issued by EWRC and transferred to FSES. The highly efficient cogeneration capacities installed in Bulgaria amount to 1,690 MW.

The support scheme for compensation with premiums under CfCPs is applicable until the period of expiry of the terminated PPAs.

The level of the bonus received by the producers for each MWh produced from high efficiency cogeneration capacities and delivered in the grid is set annually by EWRC.

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Generating Electricity from Renewable Sources in CEE & SEE

Projects, Infrastructure & Energy

Croatia

Country Chapter

Wolf Theiss

Country General Information

Capital: Zagreb

Location: part of both Central and Southeast Europe, bordered by Hungary in the north, Slovenia to the west, Bosnia and Herzegovina and Serbia to the east, Montenegro and the Adriatic Sea to the south, Croatia lies mostly between latitudes 42° and 47° N and longitudes 13° and 20° E.

Surface Area: with territory spanning over 56,594 km^2 Croatia is a small but highly geographically diverse crescent-shaped country.

Population: 3,888,529 inhabitants

Climate: classified as moderately warm and rainy continental but can be divided into three (3) separate climate regions: continental, Alpine and Mediterranean. Croatia has four (4) distinct seasons.

Resources: natural resources found in the country in quantities significant enough for production include oil, coal, bauxite, low-grade iron ore, calcium, gypsum, natural asphalt, silica, mica, clays, salt, and hydropower. Karst topography makes up about half of Croatia and is especially prominent in the Dinaric Alps.

Electricity Grid: the total length of transmission electricity grid is 140,065 km, with 26,565 transformer substations. The system is networked with 4,519 km of lines at 35 (30) kV of voltage, 37,625 km of lines at 10 (20) kV of voltage, 62,083 km of lines at 0.4 kV of voltage.

Electricity Transmission, Distribution and Supply: Croatia has adopted the ITO market unbundling model, whereby the Croatian Transmission System Operator (HOPS) is separate from the Croatian Electric Power Company (HEP Group). HOPS owns the transmission network. The distribution of electricity is provided by the Croatian Distribution System Operator (HEP-DSO). The electricity supply is provided by seven (7) providers.

Official EU Language(s): Croatian

EU Member: since 1 July 2013

NATO Member: since 2009

United Nations Member: since 1992

Currency: Croatian Kuna (HRK). On 10 July 2020, Croatia joined the European Central Bank's Exchange Rate Mechanism II (ERM II). As announced by the Croatian Government and the Croatian National Bank, Croatia plans to adopt the euro on 1 January 2023. The actual date of Croatia's accession to the eurozone will be determined by a decision of the Council of the European Union that is expected to be adopted in June 2022.

Schengen: On 9 December 2021, the Council of the European Union concluded that Croatia had fulfilled the necessary conditions for the application of all parts of the Schengen *acquis*. This had been a precondition for the Council to be able to make a decision allowing for the lifting of internal border controls. However, European authorities have not yet given a specific date on which Croatia will officially become part of the Schengen zone.

Political System, Administrative Organisation and Economy: politics in Croatia are defined by a parliamentary, representative democratic republic framework, where the Prime Minister of Croatia is the head of government in a multi-party system. The Head of State is the President. Below the national level, Croatia is divided into twenty (20) administrative counties called *županije*. In addition to the capital city of Zagreb, which is considered separately. Croatia has an economy predominantly based on services, with tourism as one of the pillars of the service industry subsector.

1. Defined Terms for the Main Permits Required for RES-Electricity Generation Facilities

Building Permit	Administrative deed issued by the Ministry of Physical Planning, Construction and State Assets ("**MPCA**") or local authorities, depending on the type of RES Facility. The construction of a project may begin only after the Building Permit (*građevinska dozvola*) becomes final. As a partial exception, a Building Permit is not required for construction of solar power plants and photovoltaic modules on existing buildings installed solely for the purpose of producing electricity, without the possibility of a transfer to the power grid ("**Simple Power Plants**"). The Building Permit expires if the construction of the RES Facility does not commence within three (3) years from the date on which it became final. However, the validity may be extended for an additional three (3) year period if conditions for construction defined within the spatial plan and Location Permit remain unchanged.
CROPEX	Croatian Power Exchange Ltd.
Decision on the Status of an Eligible Producer	Prior to obtaining the Decision on the status of an eligible producer, the Preliminary decision on the status of an eligible producer should be obtained. Both deeds are issued by the Croatian Energy Regulatory Agency ("**HERA**"). Exceptionally, the Decision on the status of an eligible producer for Simple Power Plants will be issued automatically on the basis of evidence that the electricity producer has acquired the right to a permanent connection to the electricity grid for its facility (unless it will participate in the electricity Guarantees of Origin ("**GO**") scheme, in which case the decision must be obtained upon request). The Decision on the status of an eligible producer is considered as the final step in collecting permits.

Electricity Approval	Administrative deed issued by the Croatian Transmission System Operator ("**HOPS**") / Croatian Distribution System Operator ("**HEP-DSO**"). Electricity Approval (*elektroenergetska suglasnost*) sets out the technical requirements and financial obligations for the connection to the power grid and for its use. Electricity Approval is issued after the RES Facility is built and once it has been confirmed that the conditions for the temporary connection of the RES Facility for a trial run and for the issue of a Usage Permit are met.
Energy Permit	Administrative deed issued by the Ministry of Economy and Sustainable Development ("**MESD**"), representing the authorisation to build and run facilities using renewable energy or cogeneration. An Energy Permit (*energetsko odobrenje*) is required for construction of RES Facilities, except for Simple Power Plants. An Energy Permit is considered proof of a legal interest in obtaining a Location Permit and a Building Permit.
Environmental Impact Assessment	Assessment validated by MESD, seeking to minimise from the earliest phase of a project the negative effects to the environment and maximise the environmental quality. Either an Environmental Impact Assessment ("**EIA**") or an Assessment on the Need to conduct the EIA ("**Need Assessment**") must be carried out in the preparatory phase of an intended project and prior to issuance of the Location Permit. Performing an EIA is mandatory for facilities capable of generating more than 100 MW of electricity (more than 20 MW for wind power plants). For solar stand-alone, wind and hydro power plants capable of generating more than 10 MW, a Need Assessment is performed. A full EIA will then be performed only if the MESD decides that it is necessary.

Feed-in Tariff	A support mechanism available for RES Facilities under "old" regulations until the expiry of the originally contracted term. During such term, RES-Electricity Producers are not entitled to participate in the new system incentives under Guaranteed off-take price or Market Premium. There are two (2) concurrent Feed-in Tariffs (i) the tariff system applying to those power plants with off-take agreements in place on or before 31 December 2013; and (ii) the tariff system applying to those power plants with off-take contracts granted from 1 January 2014.
Grid Connection Agreement	Administrative deed issued by the grid operator to connect a new generating facility or to modify or replace the connection of an already generating facility to the grid.
Grid Usage Agreement	Administrative deed issued by the grid operator that defines when electricity will start entering the transmission system and the technical requirements for using the grid.
Guaranteed Off-Take Price	A support mechanism provided to eligible producers of RES-Electricity ("**RES-Electricity Producers**") with RES Facilities capacity of up to 500 KW and which have been selected as the best bidders in the tender process. The selected candidates are entitled to conclude the agreement at a guaranteed purchase price with the Croatian Energy Market Operator ("**HROTE**") for electricity produced in their RES Facilities.
Licence to Generate RES-Electricity	Administrative deed issued by HERA allowing its beneficiary to perform one of the following activities on the energy market: generation/transmission/distribution of electricity, organising the market of electricity, the supply/trade of electricity and/or the management of RES Facilities.

Location Permit	Administrative deed issued by the MPCA or the local authorities, depending on the type of RES Facility and the planned construction/ reconstruction location. To obtain a Location Permit (*lokacijska dozvola*), the applicant must provide to the competent authority a concept design, which should comply with the special requirements prescribed by technical and safety laws and other regulations. If an EIA is required for a power plant, it must be obtained prior to application for the issuance of the Location Permit.
Market Premium	A support mechanism pursuant to which RES-Electricity Producers receive premium support based on the market premium agreement concluded with HROTE. The amount of Market Premium is determined for a specific type of RES Facility, based on the difference between the market prices of electricity and the reference value of electricity offered in the public tender. Market Premium is available to all RES-Electricity Producers, regardless of the size of RES Facility (except those benefiting from the Feed-In Tariff).
RES Act 2021	Renewable Energy Sources and High-Efficiency Cogeneration Act (Official Gazette no. 138/2021)
RES-Electricity	Electricity obtained from renewable energy sources such as wind, solar, aerothermal, geothermal, hydrothermal and oceanic waves, hydraulic, biomass and biogas.
RES Facility	A generation facility using renewable energy sources such as wind, solar, aerothermal, geothermal, hydrothermal and oceanic waves, hydraulic, biomass and biogas to generate electricity.
RES Support Scheme	State-aid scheme aiming at supporting RES-Electricity based on either (i) Guaranteed off-take price; or (ii) Market Premium. However, (iii) Feed-in Tariff accredited until 31 December 2016 remains eligible for RES Facilities with agreements concluded under Feed-in Tariff until their expiry.

Usage Permit	Administrative deed issued by the MPCA or other authorised authority, depending on the capacity of a RES Facility. After finalising the construction of a RES Facility, the technical inspection will be carried out in order to examine if all the conditions set out in Building Permit are met. The MPCA or another competent authority will issue a Usage Permit only if it determines that the RES Facility is compliant with the Building Permit. With the Usage Permit, a RES Facility can legally commence its operations.

2. Envisaged Need of Investments in Croatia

On 23 December 2021, the RES Act 2021 entered into force. The existing bylaws adopted under the previously applicable RES Act 2016 continue to apply.

For the period until 2030, certain activities aimed at increasing the safety and flexibility of the electricity system are expected. These special efforts are anticipated to focus on the development of reversible hydropower plants and battery storage and on the organisation of market balance. These achievements will allow electricity to be accumulated when it is cheaper and then sold at a better price when needed. The energy storage should establish a better integration of variable and intermittent renewable energy sources into the grid. Also, further improvements in the software tools responsible for precise scheming of the electricity production should mitigate the risk of imbalances in the system caused by intermittency.

Also, better integration is planned with further investments in the design of the electricity market, in which intraday trading should ultimately be approximated to the real-time trading. Balancing the real-time production and consumption should bring significant stability to the variable nature of renewable energy, in which the levels of supply and demand are often not coherent.

Further steps in the RES system development are expected with the full implementation of the EU directives contained in the Clean Energy for all Europeans Package and the implementation of the EUR 783 million (HRK 6 billion) Market Premium programme approved by the European Commission on 9 December 2021. This programme is designated for the development of large power plants. The first tenders under the new market premium scheme are planned for Q3 2022 and should support Croatia's commitment to achieve the European climate targets and environmental objectives and to boost a further reduction in CO_2 and other greenhouse gas emissions.

3. Executive Summary-RES Market Status and Development of RES Facilities

3.1 Market Overview – Factsheets

3.1.1 Support Scheme

- In 2001, Croatia adopted a set of new energy-related laws and regulations, harmonising its energy market with the EU legislation. Amendments followed in 2004, with the implementation of the common rules for internal market of electricity;
- The Croatian RES-Electricity market developed in 2007, with the Governmental Tariff System for Generation of Electricity from Renewable Energy Sources and Cogeneration entering into force. The regulation provided incentivised prices of electricity paid to the eligible producers by HROTE. Feed-in Tariff unit prices were determined according to the type of power plant (initial distinctive capacity was 1MW) and the source used for generation, multiplied by the correction factor according to the statutory formula;
- The incentive prices obtained under the Feed-in Tariff were granted until the end of the contracted term, which was usually fourteen (14) years;
- In 2016, Croatia introduced a new RES-Electricity promotion scheme: (i) Guaranteed off-take price, initially available for RES-Electricity Producers with facilities having a capacity of up to 30 KW (extended in 2018 to 500 KW); and (ii) Market Premium, available for all RES-Electricity Producers. Existing power plants continued to receive incentives based upon the Feed-in Tariff;
- In 2019, a regulation providing for the selection of candidates for the RES-Support Scheme in public tenders entered into force. This regulation allowed: (i) RES-Electricity Producers with a capacity of up to 500 KW who win a tender to be awarded a Guaranteed off-take price with HROTE, whereby the entire output produced in a RES Facility will be purchased at the determined price; and (ii) RES-Electricity Producers with a larger capacity (however there is no limitation; small-capacity producers may also apply) to compete in a public tender to be awarded the Market Premium. The participants selected as having the best bids in the public tender are entitled to sell electricity on the open market and are awarded the allotted Market Premium to make up the difference between the tender price and the market price;

- By July 2020, Croatia had adopted the package of secondary legislation that was necessary to put the legislative scheme into practice: (i) Regulation on quotas to encourage the generation of electricity from renewable energy sources and high-efficiency cogeneration, (ii) Decision to amend the Decision on the fee for renewable energy sources and high-efficiency cogeneration, (iii) Regulation on the criteria for payment of the reduced fee for renewable energy sources and high-efficiency cogeneration, and (iv) Regulation on the amendments to the Regulation on the support of electricity from renewable energy sources and high-efficiency cogeneration;
- In September 2020, HROTE published the first auction to award the Guaranteed off-take price and the Market Premium incentive. The auction for the Guaranteed off-take price was offered to small solar power plants (aggregate quota of 50 MW), small hydropower plants (aggregate quota of 9 MW),small biogas power plants (aggregate quota of 7 MW) and small biomass power plants (aggregate quota of 6 MW). The Market Premium was offered exclusively to biomass and biogas power plants with an installed capacity of more than 500 KW and up to 2 MW (aggregate quota of 8 MW for each);
- On 8 December 2021, the Croatian parliament passed the new RES Act 2021, which entered into force on 23 December 2021. The RES Act 2021 sets Croatia's renewable energy target as a percentage of gross final energy consumption by 2030 36.6 %;
- On 9 December 2021, the European Commission approved the Croatian Market Premium programme to support the production of electricity from renewable energy sources. The programme will provide EUR 783 million (HRK 6 billion) in grants to the beneficiaries selected in the public tenders and will cover the period from 2021 to 2023. The first public tender under this programme is expected to be launched in the spring of 2022.

3.1.2 Market Developments

- In May 2014, HOPS and HROTE founded the Croatian Power Exchange (CROPEX). The launch of the day-ahead market followed in February 2016, providing for the first time a wholesale price of electricity in a transparent, liberalised and competitive trade environment. The intraday market of electricity was launched in April 2017;
- According to Eurostat data, in 2018 Croatia achieved the share of renewable energy in gross final energy consumption of 28.02 % and thus exceeded the target of 20 % share of RES-Electricity in gross final energy consumption by 2020;

- On 28 December 2018 Croatia notified its draft National Energy and Climate Plan for 2021 – 2030 ("**NECP**") to the European Commission. Under the NECP, Croatia committed to achieve the share of 36.4 % of renewable energy in gross final energy consumption by 2030, which was one of the most ambitious goals among EU countries. The NECP was adopted in December 2019;
- Further liberalisation to the RES-Electricity market followed in 2019 with the abandonment of former suppliers' obligations to take over from HROTE the total green electricity delivered by RES-Electricity Producers to the share of 70 % (while HROTE is allowed to offer the remaining 30 % on the open market);
- In the last quarter of 2019, the Register of renewable energy, high-efficiency cogeneration and eligible producers was established;
- In January 2022, the share of net electricity delivered by RES-Electricity Producers to HROTE that suppliers must take over from HROTE was reduced to 60 %. The remaining 40 % is offered on the open market.

3.2 RES Market Status, Permitting, Grid Connection, Licensing of RES Facilities

General Market Data	
RES Target 2020	28.02 %, reported achieved in 2018
RES Target 2030	36.4 %
Overall Installed General Capacity including RES (overall production)	In 2020, total primary energy production was 196.06 PJ.

Installed Capacity by Technology in 2021	Wind – 2,096.4 MW Hydro – 1,674.0 MW Biomass – 218.8 MW PV – 379.4 MW Biogas – 76.3 MW

RES Support Scheme	
Beneficiaries of RES Support Scheme	Guaranteed off-take price and Market Premium. The beneficiaries are divided in different groups according to the sources, technology used and installed capacity of RES Facilities. The Feed-in Tariff is received by those RES Facilities built prior to 31 December 2015.
Priority and Guaranteed Off- take into the Grid	RES-Electricity Producers that have obtained a Decision on the status of an eligible producer from HERA have priority access to the grid.
Other Incentives	○ Mandatory share of Net Electricity delivered by RES Facilities to HROTE to be purchased by the energy suppliers; ○ GOs provided for eligible producers not already participating in the Feed-in Tariff or the Guaranteed off-take price.
Other Conditions	○ For the construction of new generation and storage facilities (except for Simple Power Plants), MESD conducts a public tender to award an Energy Permit after having received an expression of interest from a potential investor;

- Public tenders to award an Energy Permit are not required for: (i) renovation and/or revitalisation of existing facilities, (ii) construction of geothermal where the investor plans to build a facility are resolved (i.e., there are no unresolved disputes and the ownership relations in practice correspond to what is registered in the land registry/cadastre);
- The criteria for selecting the best bidder are determined in the call for tender:
  - for the construction of facilities under 500 KW, this will be the best price offered for the Energy Permit as well as the best available technologies,
  - for the construction of the facilities over 500 KW, the criteria will be determined by weighting the price offered for the Energy Permit, the competitiveness of the facility, energy efficiency, the deadline for construction and the compensation to the local self-government unit and/or the possibility of local self-government unit participating and/or acquiring a shareholding);
- By obtaining an Energy Permit, the investor acquires the status of project holder and is entered in the Register of renewable energy, high-efficiency cogeneration and eligible producers. After entering into a Grid Connection Agreement with the TSO/DSO, the investor may apply for a Location Permit / Building Permit. Furthermore, if the RES Facility is to be located on public land, an easement right or building right must be established (once the Location Permit / Building Permit becomes final and binding);
- An Energy Licence (*dozvola za obavljanje energetske djelatnosti*) is mandatory (certain exceptions regarding capacity, trial runs and behind-the-meter facilities apply);
- No installed capacity limit as long as the grid allows this from a technical point of view.

Grid Connection Specifics	
Approvals	○ A new entrant to the electricity grid must conclude a Grid Connection Agreement and a Grid Usage Agreement with HOPS or HEP-DSO; ○ Prior to entering into a Grid Usage Agreement, the investor must hold an Electricity Approval (this is also necessary for a trial run of the facility); ○ The costs of grid connection and/or capacity upgrades, improvements or expansion of the grid are borne by the investor.
Permitting	○ Grid Connection Agreement should comply with the optimal technical solution study which is performed after the Location Permit has been issued; ○ The request for performing the optimal technical solution study is considered at the same time as the request to enter into the Grid Connection Agreement; ○ Depending on the technology deployed, on the installed capacity and on the connection to the grid, an investor can obtain the necessary approvals within approximately six (6) months to two (2) years.
Licensing	
Procedure	After the completion of the construction phase of the RES Facility, the following licences must be acquired: ○ Usage Permit, only after a successfully implemented trial run and after obtaining a Certificate for Permanent Operation; ○ Licence to generate RES-Electricity; ○ Decision on the status of an eligible producer.

Duration of Administrative Procedure	The procedure takes a minimum of two (2) months. The licensing procedures require frequent direct communication with HERA and the competent Ministry. However, it is not possible to provide any precise estimate on the time frame necessary for the issue of licences/authorisations.
Licence's Validity	Up to thirty (30) years. May be extended.

4. Key Changes to the RES Support Scheme since 2016

A new programme of incentives under Croatian law was introduced on 1 January 2016, with the entry into force of the now obsolete RES Act 2016. Amendments followed in 2016, 2017 and 2018, while in December 2021 the new RES Act 2021 entered into force. The new RES Act 2021 introduced certain changes to the RES system but has maintained the existing Guaranteed off-take price and the Market Premium incentive models.

4.1 Available Incentives

The key aspects of the existing support system, which replaced the Feed-in Tariff, are described below. Both incentives aim to encourage the construction of new RES Facilities until the quota set by the Croatian Government is met.

4.1.1 Guaranteed Off-Take Price

- Granted to eligible producers with RES Facilities capacity of up to 500 KW;
- The applicant selected as the best bidder in a public tender will conclude the agreement on guaranteed purchase price with HROTE and thus be allowed to sell electricity exclusively to HROTE (i.e. will not participate as an individual trader on electricity market);
- The agreement is concluded for the term of twelve (12) years, starting from the day of obtaining the status of an eligible producer;
- The amount of Guaranteed off-take price is determined in the tendering process. Prior to the tender, by using the methodology for estimating the market

conditions, HROTE should announce the amount of maximum guaranteed purchase price for each group of RES Facilities. The amount of purchase price offered by each bidder should not exceed the maximum guaranteed purchase price defined by HROTE for that type of RES Facility;

- The amount of Guaranteed off-take price determined in the agreement will remain unchanged during the entire contractual term, but the variable part of the price should be indexed every year in order to reflect inflation (by applying the indices of consumer prices published by the Croatian Bureau of Statistics).

4.1.2 Market Premium

- Offered to all eligible producers, regardless of the size of RES Facility;
- After concluding the Market Premium agreement with HROTE, the producers are not obliged to sell the produced electricity exclusively to HROTE. They are authorised to trade electricity on the open market with different producers, traders and suppliers of electricity, in accordance with the regulations governing the electricity market. However, if HROTE exercises its right of first refusal, producers must sell electricity to HROTE at the reference price (such right may be exercised by 30 October of the current year for the following year);
- A Market Premium agreement is concluded for a term of twelve (12) years, starting from the day of obtaining the status of an eligible producer;
- The amount of premium is a variable component and depends on the market prices of electricity. It is equal to the difference between the reference value of electricity offered by an eligible producer (determined in the Market Premium agreement) and the current market price of electricity. If the market prices are lower, the amount of premium goes up. In contrast, the premium is reduced if the market price of electricity goes up. If the market price of electricity exceeds the reference price of electricity determined in the Market Premium agreement, the eligible producer must return any attained difference in price to HROTE;
- In a public tender, HROTE will first publish the amount of the maximum reference value for electricity expressed in HRK/KWh for each group of RES Facilities. The maximum reference value is determined once a year pursuant to the statutory formula and is dependent on the current market conditions. For purposes of optimising the support toward a market-price system, it is expected that the applicants will aim to offer a reference value amount which is as close as possible to the actual market price of electricity.

4.2 Selecting Candidates in Public Tender

The process of granting support to RES-Electricity Producers through a public tender is defined in the Governmental Ordinance on Promotion of Electricity Production from Renewable Energy Sources and High-Efficiency Cogeneration. Although the regulation has been in force since January 2019, delays in adopting other necessary secondary legislation (primarily the regulation on quotas for individual groups of RES Facilities) have meant that only one call for tender has so far been published (in November 2020). In this public tender, support was offered to (i) solar, (ii) hydropower, (iii) biomass and (iv) biogas power plants under the Guaranteed off-take price model, and to (i) biomass and (ii) biogas power plants (capacity of up to 2 MW) under the Market Premium model.

The public tender is conducted by HROTE and is open to participants who acquire the status of an eligible producer from HERA. According to the RES Act 2021, HROTE should select candidates at least (i) once a year for the Guaranteed off-take price incentive and (ii) once every three years for the Market Premium incentive.

4.3 Register of Renewable Energy Sources, Cogeneration and Eligible Producers

This register was adopted in 2019 with the Ministerial Regulation on Register of Renewable Energy Sources, Cogeneration and Eligible producers.

Led by the MESD's RES department, the register represents a unique and accurate record of ongoing RES-Electricity projects in Croatia. For instance, it is where information on available quotas for incentives, conducted tenders, ongoing tenders and announced tenders may be found. The data kept in the register is used to generate the predefined reports for the Ministry and the general public.

The Register is publicly available via an online application[1] on the Ministry's webpage. The application also provides a graphical allocation[2] of the projects. As at February 2022, there were 3,826 solar power plants, 51 hydro power plants, 50 wind power plants, 120 biomass power plants, 2 geothermal power plants, 71 biogas power plants 6 landfill gas and wastewater treatment gas power plants, and 12 cogeneration plants registered in the register.

1 https://oie-aplikacije.mzoe.hr/pregledi/PopupIzvjestaj.aspx?ReportId=5b47346e-67aa-4df2-9603-fa83c47061e3

2 https://oie-aplikacije.mzoe.hr/pregledi/PopupIzvjestaj.aspx?ReportId=17ed7352-2f8d-416b-b2fb-cec912e96428

4.4 Suppliers' Obligation to Repurchase Net Electricity Delivered by Eligible Producers to HROTE

Since the entry into force of the latest Governmental Ordinance on the Share of Net Electricity Delivered by Eligible Producers which Electricity Suppliers Must Take Over from the Electricity Market Operator in January 2022, suppliers must take over from HROTE 60 % of the net electricity delivered by RES-Electricity Producers to HROTE. The remaining 40 % of net electricity delivered by RES-Electricity Producers to HROTE is offered on the electricity market.

4.5 Developments on the Market of GOs

The system of GOs is another support model for RES-Electricity offered on the Croatian market. It is reserved exclusively for eligible producers that are not already participating in a Feed-in Tariff or Guaranteed off-take price.

GO is an electronic deed which provides to the end customer the proportion or amount of RES-Electricity in total electricity mix of a supplier. The basic unit is 1 MWh. In the system of GOs, eligible producers can request that GOs be issued for the electricity produced at their RES Facility and may thereafter trade these GOs with suppliers of electricity.

The data on issuing, transferring and cancelling of GOs is collected in the Register of GOs operated by HROTE. In 2020, the Register of GOs reported 6 (six) suppliers and 20 (twenty) RES-Electricity Producers in total (hydropower plants Lešće, Varaždin, Orlovac, Dubrava, Čakovec, Vinodol, Rijeka, Dubrovnik, Gojak, Senj, Golubić, Zakučac, Miljacka, Peruća, Sklope, Roški slap, reversible hydropower plant Velebit and windpower plants Trtar-Krtolin, Ravna 1 and mTEO).

4.6 Launching the Day-Ahead and Intraday Market at the Croatian Electricity Exchange (CROPEX)

CROPEX is the central point for trading electricity in Croatia. All interested market participants willing to become CROPEX members shall sign the membership agreement and thus gain access to the training platform. CROPEX is jointly operated by HROTE and HOPS.

The day-ahead and intraday market on CROPEX have been operative for several years now. The intraday market provides users with a better flexibility in the system, where they can almost in real-time adjust their positions in accordance with potential deviations on the market.

In July 2018, the Croatian and Slovenian electricity markets merged as part of the Multi-regional Coupling project (MRC). The merger resulted in an exponentially larger volume of electricity trading (449,305 MWh in October 2018) that exceeded the total amount traded on CROPEX throughout the first two years of its existence.

Further developments are expected following the launch of the Core Flow-Based Market Coupling project that will connect the CROPEX and HUPX (Hungarian Power Exchange) day-ahead markets, which is announced for implementation by April 2022. With the project's implementation, the daily cross-border capacity at the Croatian-Hungarian border will no longer be allocated directly through the JAO platform but indirectly through the mechanism of connecting electricity exchanges. The first phase of joint regional testing (Full Integration Testing – FIT), focusing on the functionality between all systems involved in the FB MC process, was successfully finished on 13 January 2022. The next phase of testing (Simulation Integration Testing – SIT), which focuses on testing the joint operational procedures, commenced on 17 January 2022 and will run until the end of February 2022.

According to HERA's annual report for 2020, twenty-two (22) registered members bought electricity with a total capacity of 6,076 GWh on the single day-ahead market. On the intraday market, fourteen (14) registered members purchased electricity with a total capacity of 138.9 GWh from CROPEX.

4.7 ECO Balance Group

By entering the agreement under the Feed-in Tariff or the Guaranteed purchase price with HROTE, eligible producers of RES-Electricity automatically become the members of the ECO balance group. The ECO balance group started its operation on 1 January 2019.

In order to provide accurate production plans, producers should submit to HROTE precise information on the intended production at their RES-Facilities. The intention of the ECO balance group is to ensure the stability of the electricity system, by keeping the production and consumption of electricity always in balance. HROTE is financially responsible for any imbalances in the ECO balance group which may arise due to deviations in the realised hourly delivery of electricity compared to that preliminary estimated in the production plans.

Members of the ECO balance group with a connected capacity above 50 KW pay the monthly balancing compensation determined under the electricity balancing assessment. The compensation is calculated depending on the supplied power of electricity. Members of the ECO balance group shall submit to HROTE a non-transferable, irrevocable and unconditional bank guarantee in order to secure that the compensation is paid.

The total production plan of the ECO balance group for the day-ahead market in 2019 was 2,939,934 GWh, of which suppliers took over 2,040,255 GWh, with HROTE selling the remaining 899,311 GWh on the day-ahead market on CROPEX.

The total production plan of the ECO balance group for the day-ahead market in 2020 amounted to 3,227,605 GWh, of which suppliers took over 1,312,181 GWh (681,410 MWh were sold at auctions), with HROTE selling the remaining 1,235,023 GWh on the day-ahead market on CROPEX.

5. Significant and/or Expected Changes

5.1 RES-Electricity Share in Final Consumption Promoted by Croatia

Under the draft NECP for 2021–2030, Croatia has committed that by 2030 it will have 36.4% of renewable energy in final energy consumption. On 28 December 2018, Croatia introduced the draft programme to the European Commission.

On 18 June 2019, the European Commission addressed the level of ambitions set under the programme and brought recommendations to meet the objectives and targets introduced at EU level. Croatia has most notably been invited to (i) underpin the ambitious level of 36.4% share of renewable energy by 2030 with detailed and quantified policies and measures and to enable a timely and cost-effective achievement of this contribution; (ii) increase the level of ambition in the heating and cooling sector and transport; (iii) increase its ambition towards reducing both final and primary energy consumption in view of the need to reach the energy efficiency target level; (iv) define forward-looking objectives and measurable targets concerning market integration, in particular measures to develop liquid and competitive wholesale and retail markets; (v) further elaborate national objectives and funding targets for research, innovation and competitiveness; and (vi) continue its regional cooperation efforts on the national energy and climate plan in the context of the Central and South-Eastern Europe Energy Connectivity (CESEC) High-Level Group.

Achieving these objectives is strongly dependent on the realisation of scenarios considered under the groundwork documents for delivering the Energy Development Strategy until 2030 (see 5.2).

5.2 National Energy Development Strategy for Period until 2030 with Perspective to 2050

The Energy Development Strategy of the Republic of Croatia, adopted in February 2020, represents a step towards achieving the vision of a low-carbon energy economy and transitioning to a new era of energy policy that will provide an affordable, secure and quality energy supply, without an additional burden on the state budget through state aid and incentives.

The energy policy and strategy of the Republic of Croatia is focused on the EU goals of reducing greenhouse gas emissions, increasing the share of RES in the energy mix, energy efficiency, security and quality of supply. It also aims to develop the EU's internal energy supply market, energy infrastructure, and competitiveness. Two energy transition scenarios were established under the Energy Development Strategy – one moderate and one accelerated – which assume that the share of renewable energy in the final gross energy consumption will amount to approximately 37% by 2030. It is projected that, by 2030, total greenhouse gas emissions will have decreased by between 35.4% and 37.5% compared to 1990 levels.

5.3 Low-Carbon Development Strategy of the Republic of Croatia for the Period until 2030 with an Outlook to 2050

On 2 June 2021, the Croatian Parliament adopted the Low-carbon Development Strategy of the Republic of Croatia for the period until 2030 with an outlook to 2050. The core objectives of the strategy include achieving sustainable development and economic growth based on a low-carbon economy, resource efficiency, lower energy consumption and increased use of renewable energy sources. The strategy sets out 102 technical and organisational measures that will be implemented in all sectors of the economy, including energy, transport, industry, buildings, waste management, agriculture, tourism and services.

By 2050, the strategy aims to achieve an ambitious 80% reduction in emissions compared to 1990 levels. However, analysis shows that the investment and implementation of the measures set out in the strategy will lead to an increase in all core macroeconomic indicators. With the NU1 (gradual transition) and NU2 (strong transition) scenarios, Croatia should achieve a cut in emissions of between 33.5% and 36.7% by 2030 and a cut of between 56.8% and 73.1% by 2050, as compared to 1990 levels.

5.4 National Recovery and Resilience Plan 2021 – 2026

In July 2021 the European Commission gave the green light to Croatia's National Recovery and Resilience Plan 2021 – 2026. The plan is seen as a new tool for economic transformation, setting out reforms and areas of investment to achieve economic and social recovery and to address the impacts of the Covid-19 crisis. For the 146 investments and 76 reforms envisaged in the plan, Croatia is supported by EUR 6.3 billion in grants and EUR 3.6 billion in favourable loans. All reforms and investments that contribute to smart, sustainable and inclusive growth, job creation, economic productivity, competitiveness and a strengthening of economic, social and territorial cohesion must be implemented by August 2026.

Under the plan, 40 % of the allocation is foreseen for measures relating to climate goals, including the acceptance of renewable energy sources, energy efficiency, reconstruction of buildings after earthquakes and sustainable mobility. All steps envisaged in the plan should result in Croatia having an improved readiness to respond to challenges and should offer new opportunities in the country's green and digital market transitions. The plan assumes that RES-Electricity will make up 60 % of final electricity consumption by 2030.

The plan comprises six components worth a total of EUR 6.5 billion: (i) the economy, (ii) public administration, justice and state assets, (iii) education, science and research, (iv) the labour market and social welfare, (v) healthcare and (vi) renovation of buildings as part of post-earthquake reconstruction.

5.5 Storage

Croatia has started a new chapter of its energy policy – especially in terms of the competitiveness of new technologies in energy generation and storage – by adopting its National Energy Development Strategy for the period until 2030 with an outlook to 2050.

Common rules for energy storage are established in the new Electricity Market Act that entered into force on 22 October 2021. Under the Electricity Market Act, electricity may be stored in a facility by converting electricity into another form of energy, and includes reversible power plants, pumping power plants, electric boilers with tanks, heat pumps, battery tanks, electrolysers with hydrogen tanks and other devices in which electricity may be stored in some form and later transmitted to the transmission or distribution grid.

In general, to participate in the electricity market, the energy storage operator must hold an Energy Storage Licence (*dozvola za skladištenje energije*). However, exceptions apply in the following cases: (i) if the total installed power of the energy storage facility is below 500 KW; (ii) if the storage facility is conducting a trial run (or is between a trial run and acquiring a Licence to generate RES-Electricity); or (iii) when the storage is not considered an electricity activity (i. e. if the energy storage facility is behind the metering point of an "active purchaser", if it is used exclusively for personal needs whereby electricity is not transmitted to the grid, or if the TSO or DSO is using the storage facility to fulfil its obligations set out in the Electricity Market Act).

Energy storage operators at the metering point of facilities with an installed capacity exceeding 500 KmW may provide electricity on the wholesale market. The energy storage operator will be financially responsible for any deviations caused to the electricity system.

6. Support Scheme for Cogeneration

In Croatia, there is no specific legislation governing the system for the high-efficiency cogeneration of combined heat and power ("**CHP**"). The RES Act 2021 applies to both RES-Electricity and CHP, as does the general regulatory framework governing the energy sector, the regulation of energy activities, the electricity market, the gas market and the heat market.

According to the latest available data, the total installed capacity of CHPs in 2020 was 113.3 MW, with 6 (six) agreements in force.

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Generating Electricity from Renewable Sources in CEE & SEE

Projects, Infrastructure & Energy

Czech Republic
Country Chapter

Wolf Theiss

General Country Information

Capital: Prague

Location: Situated right in the heart of Europe, the Czech Republic is bordered by the Slovak Republic Austria, Germany and Poland. It lies mostly between latitudes 48°N and 51°N and longitudes 12°E and 19°E.

Surface Area: 78,866 km^2

Population: 10,682,029

Climate: Temperate continental-oceanic climate with four distinct seasons

Resources: The Czech Republic has abundant natural resources, thanks to its geographical diversity – from mountains surrounding the country, streams and rivers, to its geothermal areas, basins, forests, glacier lakes, ponds, etc. Natural resources include large reserves of coal, some natural gas and petroleum reserves, limestone, kaolin, limited deposits of metallic ores (lead, zinc, uranium, tin and graphite). Forestland covers a third of the country's surface area, making wood an important export. Large reserves of lithium were discovered in 2016 but uncertainty remains as to its extraction.

Electricity Grid: The Czech electricity grid is divided into two parts according to voltage: the transmission grid (400 kV and 220 kV) and the distribution grid (110 kV, 22 kV and 400 V). The transmission grid has a total length of 5,419 km and is part of the continental European grid system.

Electricity Transmission, Distribution and Supply: The Czech high-voltage transmission system (400 kV and 220 kV) is operated by ČEPS, a.s., a company whose sole shareholder is the Czech Ministry of Industry and Trade. The distribution system (110 kV and lower) is operated by three companies: PREdistribuce, a.s., EG. D, a.s. and ČEZ Distribuce, a.s.

Official EU Language(s): Czech

EU Member: since 1 May 2004

NATO Member: since 1999

United Nations Member: Czechoslovakia, the predecessor of the Czech Republic and the Slovak Republic, was one of the 51 founding countries. After the division of Czechoslovakia on 31 December 1992, the Czech Republic became a member of the UN on 19 January 1993.

Currency: Czech crown (CZK). The Czech Republic is committed to joining the eurozone once it meets all necessary conditions. However, the Czech Republic will itself decide when it enters the eurozone, a decision it has not yet taken.

Schengen: The Czech Republic is part of the Schengen area.

Political System, Administrative Organisation and Economy: The Czech Republic is a parliamentary republic with the prime minister as head of government and the president as head of state. The country is divided into 14 regions, one of which is the capital city of Prague. The Czech Republic has a developed, service-based economy with a focus also on industry, mainly in the area of transportation.

1. Defined Terms for the Main Permits Required for RES-Facilities

Authorisation for the Construction of a RES-Facility	Authorisation granted by the Czech Ministry of Industry and Trade. Any RES-Facility with a total installed capacity of above 1MW must obtain this authorisation before obtaining a Building Permit.
Building Permit	Administrative document permitting the construction of a RES-Facility, which is issued by the building authority of the administrative unit where the RES-Facility is to be built.
Connection Agreement	Agreement between the grid operator and the electricity producer, which states that all technical parameters have been met and connection to the public electrical grid will be granted.
Environmental Approval	Administrative document issued by the local Environmental Authority evidencing the compliance of the RES-Facility with the environmental requirements as provided by law. If an environmental approval is needed, it must be issued prior to the granting of a Building Permit.
Grid Connection	Actions performed by the grid operator to connect a new generating facility or to modify or replace the connection of a RES-Facility to the grid.
Liability for Grid Connection and/or Capacity Upgrades, Improvements or Expansion of Grid	The amount the producer/operator must pay as its share of the "costs associated with grid connection and ensuring the reserved capacity".
Licence of RES-Facilities	Administrative document issued by the ERO (**"Energy Regulatory Office"**) that is needed by any individual or legal entity that wishes to conduct business by trading electricity.

Priority Access to the Electric Grid Given to RES-Electricity	The statutory rule whereby grid operators must provide priority grid access for RES-Electricity.
RES-Facility	Electricity generation plant using renewable sources, secondary sources or high-efficiency combined heat and power.
RES-Electricity	Electricity obtained from RES such as wind, solar, aerothermal, geothermal, hydrothermal, hydraulic, biomass and biogas.
RES Support Scheme	State support provided to producers of RES-Electricity. In the Czech Republic, this support is provided to eligible producers in the form of green bonuses or feed-in tariffs.
Zoning Permit	An administrative document permitting the placement of a RES-Facility, which is issued by the building authority of the administrative unit where the RES-Facility is to be placed.

2. Envisaged Need of Investments

As the Czech Republic is a Member State of the European Union, it must work to ensure that the goals set by the EU are met. The Clean Energy for All Europeans package was passed in 2016. The package redesigns the EU electricity market to make it fit for the future and introduces an EU commitment for renewable energy to achieve 32 % of the EU's total energy consumption by 2030 at the latest. This package will be further updated by the new "Fit for 55" package. "Fit for 55" aims to help Europe achieve climate neutrality by cutting emissions by at least 55 % by 2030, compared to 1990 levels.

EU Member States are required to amend their legislation to reflect the renewable energy decision-making of the European Commission. The Czech Republic is required to enact specific measures to meet the EU's 32 % target. The Czech contribution to meeting this EU-wide goal is adjusted based on its geographical, climactic and economic conditions. The Czech Republic has set a target for RES-Energy to make up 22 % of total energy consumption. The latest data (from 2020) show that RES-Energy currently accounts for 17.46 % of consumption in the Czech Republic.

In order to meet the new goal under the Clean Energy for all Europeans package and to help the EU to reach its goal under the European Green Deal, investment in the Czech Republic is primarily needed in the following areas:

- investment to keep some of the existing RES-Facilities, mostly biomass and biogas facilities, in operation (once their support/promotion period ends), provided their operation is more effective than building a new RES-Facility;
- investment in research and development in the area of energy storage;
- investment in the hybridisation of energy systems;
- investment in the decentralisation of energy production;
- investment in the development of alternative green fuels;
- investment in the research and development of heating and cooling systems using RES-Energy;
- investment in lowering energy consumption by implementing energy efficient technologies;
- investment in green transportation (infrastructure, research and development);
- investment in strengthening the distribution grid in order to connect more low-voltage facilities;
- investment in research into the efficiency of RES-Facilities; and
- investment in research and development into facilities that utilise geothermal energy.

3. Executive Summary-RES Market Status and Development of RES Facilities

3.1 Market Overview – Factsheets

- The Czech Republic currently produces enough energy to be self-sufficient. In fact, around 13% of its total energy is produced for export;
- The Czech RES-Electricity market has developed since 2005, when the Czech Republic started to support RES-Facilities. This support was modified by its enactment of Act No.165/2012 Coll., on promoted energy sources (the "**Promotion Act**") which is still in force. The Czech Republic later pledged to

the EU that it would deliver 13% of its energy output from RES-Electricity. This 13 % goal for 2020 was met by the Czech Republic as early as 2013;

- In 2008 – 2010, the Czech Republic experienced a "solar boom" because the amount of state support (in the form of feed-in tariffs) was disproportionate and extremely beneficial for RES-Electricity producers. Numerous photovoltaic power plants were put into operation under these conditions and still benefit from the promotion today, as the feed-in tariffs were granted for 20 years;
- The solar boom led to the implementation of a "solar tax", which requires solar power plants commissioned between 1 January 2010 and 31 December 2010 to pay a monthly fee out of the state support provided. The solar tax was challenged in the Constitutional Court but was found not to breach the constitutional rights of the producers in question. Although the Promotion Act was not overturned by the Constitutional Court, the Promotion Act was subsequently amended and the solar tax reduced. Additionally, Act No. 458/2000 Coll, the Energy Act, as amended (the "**Energy Act 2000**") required RES-Facilities with a total installed capacity of over 1 MW to obtain an Authorisation for the Construction of a RES-Facility from the Ministry of Industry and Trade;
- In 2010, the total percentage of RES-Electricity within the supply energy mix was 10.52 %, while in 2013 that number increased to almost 15 %. Since 2013, when the support of new RES-Facilities was reduced, the percentage has been increasing at a slower rate;
- However, the "solar boom" significantly hurt the Czech RES market, as it undermined public confidence in RES (in particular, in relation to its financing and state support and their reflection in electricity prices). The installation of new solar power plants reached its peak in 2010 and the increase has slowed down since then;
- This loss of trust in turn led to a halt in the support of new RES-Facilities commissioned after 31 December 2013. Only wind, geothermal and biomass power plants were granted support until 31 December 2015. An exception was granted for new hydropower plants with a total installed capacity of up to 10 MW and for new cogeneration plants, which were still eligible for state support under the Promotion Act;
- In 2012, the Czech Republic joined the "trilateral coupling" mechanism between the Czech Republic, Hungary and the Slovak Republic, which was considered an intermediate step towards the single European day-ahead market. In 2014, Romania joined the system, now known as 4M MC;

- In 2017, the Czech Republic passed an amendment to the Fuel and Fuel Stations Act, which introduced the concept of "alternative green fuel";
- In 2018, the Czech government handed out support grants of almost EUR 2 billion.
- The majority of eligible RES-Facilities receive state support for twenty (20) years (i.e. most will end in around 2030 – 2033);
- A significant volume of the state support is distributed to individuals who wish to reduce their electricity consumption. State support is provided for energy-efficient renovations of buildings, for the construction of new energy-efficient houses, for the construction of energy-efficient apartment buildings and for RES-Facilities used for self-consumption. This state support programme is called "New Green Light for Savings" scheme and replaced the previous "Green Light for Savings" scheme;
- The Czech energy market still relies heavily on coal and nuclear energy. Coal consumption must be lowered and replaced by nuclear and RES-Energy (for details see Section 4.3 and 4.4). More state support is paid for the initial construction, rather than the operation, of RES-Facilities. The focus should also be on the research and development of energy storage, which is a vital prerequisite for efficient and long-term use of RES-Energy;
- On 1 January 2021, an amendment to Act No. 383/2012 Coll., on Greenhouse Gas Emission Allowance Trading Conditions was enacted. This amendment reflected the creation by the EU of the Modernisation Fund in its EU ETS Directive (Directive 2003/87/EC). In 2018, new Article 10 d was added to the Directive describing the Modernisation Fund, which aims to support investment to modernise energy systems and improve energy efficiency between 2021 and 2030. At least CZK 150 billion (approximately EUR 6.123 billion) should be available for the Czech Republic, representing 15.6 % of the total Modernisation Fund;
- On 1 January 2022, an amendment to the Promotion Act came into effect and established a new type of support scheme, known as the "auction bonus". Following extensive discussions, solar power projects were also included as eligible for future operating aid in the form of auction bonuses;
- This latest amendment to the Promotion Act also introduced a mechanism to tackle the issue of the overcompensation of RES-Facilities commissioned between 1 January 2006 and 31 December 2015. An internal rate of return

("**IRR**") interval of 8.4% – 10.6% for RES-Facilities was introduced, setting an appropriate level of support. At the same time, the solar tax was increased for solar plants commissioned in 2009 and 2010;

- On 13 July 2021, the new Building Act was enacted. The new Building Act comes into full force on 1 July 2023, but some provisions will come into force earlier, particularly the creation of the new state building administration. Currently, however, there is talk of the need to amend the new Building Act, with a bill being debated in the Parliament that may further delay the effectiveness of the Building Act and bring in some further amendments;
- To date, most of the support has gone towards solar power plants, with biogas and biomass facilities coming in second and third as the most promoted energy sources (despite all three of these sources generating around the same amount of electricity);
- Currently, work is underway on the New Energy Act (defined in Section 5).

3.2 RES Market Status, Permitting, Grid Connection, Licensing of RES-Facilities

General Market Data	
RES in 2020 (Out of Final Consumption)	17.46%
RES Target for 2030	22%
Overall installed General Capacity including RES (Overall Production of Electricity)	In 2020, the overall installed general capacity was 21,350.3 MW, with total overall energy production of 81,443.4 GWh gross and 76,126.2 GWh net

Installed Capacity by Technology	Total – 21,350.3 MW Nuclear – 4,290 MW Steam-electric – 10,058.3 MW Steam-gas – 1,363.5 MW Gas – 962.2 MW Hydro power – 1,093.9 MW Wind power – 339.4 MW Solar power – 2,071.3 MW Pumped storage Hydropower – 1,171.5 MW
RES Support Scheme	
Beneficiaries of the RES Support Scheme	The support scheme promotes: ○ existing RES-Facilities, under the rules applicable for the year commissioned (but solar power plants which are situated on class I or II protected agricultural land are not eligible for the new state support once the old state support expires); ○ RES-Facilities put into operation on or after 1 January 2022, although only the following are eligible for state support: (i) electricity generating plants whose production process units are not more than 5 years old on the date of commissioning; (ii) electricity generating plants whose production technology units are being replaced as part of modernisation and are not more than 5 years old on the date of registration of this support; (iii) power plants using water energy with an installed capacity of up to 10 MW; (iv) wind; (v) solar; (vi) landfill gas; and (vii) sludge gas; and ○ "High efficiency" cogeneration plants. Beneficiaries may usually choose between a feed-in tariff (only for RES-Facilities put into operation before 1 January 2022), green bonuses and auction bonuses.

Priority and Guaranteed Off-take into the grid	The Promotion Act adheres to the principle that, in connecting to the distribution grid, operators of the distribution grid within the area covered by their licence must give priority to RES-Facilities.
Other Conditions	○ Licence granted by the ERO for conducting electricity trading; ○ Authorisation for the Construction of a RES-Facility for the RES-Facilities with the total installed capacity over 1MW. ○ No installed capacity limits as long as the grid allows this from a technical point of view.

Grid Connection Specifics

Approvals by a Grid Operator	○ Connection to the grid is subject to the approval of the grid operator based on the location and installed capacity of the RES-Facility; ○ The grid operator may require a connection feasibility study from an energy producer if it is clear that the connection of the project will have an impact on the operation of the grid or if the applicant applies for connection to a high-voltage grid.
Permitting from Authorities Timing: depending on the installed capacity and connection to the grid, an investor could obtain the necessary approvals in approximately six (6) months to two (2) years.	○ Environmental Approval; ○ Zoning Permit for placement of the RES-Facility; ○ Authorisation for the Construction of a RES-Facility (above 1MW); ○ Building Permit followed by an approval for occupancy; ○ Licence; and ○ Connection agreement with the grid operator.

Licensing	
Procedure	A licence to trade in electricity is granted once the RES-Facility is built and functioning. Licences are granted by the ERO.
Duration of Administrative Procedure	Within sixty (60) days from submission of the complete documentation.
Licence's Duration	Maximum of twenty-five (25) years.

4. Key Changes to the RES Support Scheme since 2020

4.1 A New Support System for RES-Electricity

The Promotion Act was amended in response to the goals the Czech Republic has pledged to meet in order to fulfil the EU obligations set out in its environmental packages (Clean Energy for all Europeans and Fit for 55). The aim of this amendment is to meet, and ideally exceed, the goal of producing 22 % of total energy in the Czech Republic from RES-Facilities.

The most important change to the support scheme is the introduction of a new type of promotion in the form of auctions. The way this works is that the State will decide which new specific types of RES-Facilities should be built and will publish an auction. Whoever is able to build and operate this RES-Facility with the lowest promotion amount may win the auction and obtain the promotion. This system has been successfully trialled in Germany and Poland, where the auctions brought RES-Electricity prices down to the same price as electricity from other sources, since it ensures that support is awarded on a market-oriented basis. The priority in terms of solar energy rests with smaller rooftop solar facilities. Their construction is supported by the New Green Light for Savings (maximum state support is CZK 200,000 (approximately EUR 8,200)) or by the Modernisation Funds.

For more detail, see the part entitled "*Beneficiaries of the RES Support Scheme*" of the table in Section 3.2. The Promotion Act has also brought about an increase in the "solar tax". For solar power plants put into operation between 1 January 2009 and 31 December 2009, this tax is 10% for projects benefitting from feed-in tariffs and 11% for projects benefitting from green bonuses. For solar power plants put into operation between 1 January 2010 and 31 December 2010, the solar tax is 20% for projects benefitting from feed-in tariffs and 21% for projects benefitting from green bonuses. This rise came in reaction to the so-called "solar boom", so this "solar tax" does not apply to older or more recent solar power plants.

4.2 Support Scheme for Cogeneration

For many years, cogeneration has been a common tool to produce energy and heat in the Czech Republic. The heat produced by cogeneration covers more than half of the total heat produced, and electricity produced by cogeneration currently makes up 15% of all electricity in the Czech Republic. Additionally, the number of small cogeneration units has been growing rapidly in the last decade.

The promotion of cogeneration of energy and heat is regulated by the Promotion Act. Only "highly efficient" cogeneration plants are eligible for state support. "High-efficiency production" is defined as production that achieves a primary energy saving of at least 10%. The operation of cogeneration units has been supported by the state in the form of green bonuses. The ERO determines the value of "annual green bonuses for electricity generated in cogeneration plants" in its price decisions. To be eligible for the cogeneration green bonus, a certificate of origin of electricity from cogeneration issued by the Ministry of Industry and Trade is required. The Promotion Act includes cogeneration in the right to preferential connection to the grid system, provided that the technical access conditions are met.

4.3 Overcompensation and Internal Rate of Return on Investment (IRR)

In 2005, the Czech government passed a law that made it impossible to reduce feed-in tariffs for renewable energy by more than 5% per year. This significantly prevented the ERO from increasing the price of electricity more quickly, which proved to be a fatal mistake in the future. At the time, RES producers were guaranteed feed-in tariffs for up to 20 years.

In fact, in 2008 and 2009, the price of solar technologies went down very significantly, while the feed-in tariffs remained effectively unchanged. A number of investors took advantage of the favourable conditions to build solar power plants, while the costs of operating solar power plants were reflected in higher electricity prices for ordinary consumers and businesses. Due to the passivity of the then Czech government, this trend was only halted in 2010 by the adoption of a new law which no longer guaranteed feed-in tariffs for highly profitable sources (i.e. overcompensation). Later in the same year, a special solar tax was introduced.

This, together with fraudulent cases, has damaged the entire photovoltaic sector in the eyes of the Czech public.

Overcompensation in the Czech Republic is regulated by the Promotion Act. Overcompensation checks are used to monitor the adverse accumulation of financial support that disproportionately increases the profits of RES producers. These checks apply only to RES-Facilities put into operation between 1 January 2006 and 31 December 2015. The Promotion Act also sets out what constitutes adequate support – support for electricity is adequate if the internal rate of return ("**IRR**") on investment over the duration of the entitlement to support does not exceed between 8.4% and 10.6% depending on the type of the RES-Facility. The internal rates of return on investment for each type of RES will be set by the Czech government in a regulation. However, the government must stay within the range stipulated by the Promotion Act.

As a result of the October 2021 elections and the resulting change of government, no government regulation regarding the IRR has yet been passed. The new government is expected to issue this regulation in March 2022.

Checks will be conducted by the Ministry of Industry and Trade after ten (10) years have passed since each RES-Facility was put into operation and will be carried out as sector-by-sector investigations. In the event that Ministry of Industry and Trade identifies a risk of excessive state support for a given year, the owners of the electricity generating plants will be at risk of an the amount of their state support being adjusted under a general measure adopted by the Ministry of Industry and Trade or as a result of an individual inspection by the State Energy Inspectorate.

4.4 National Energy Strategy 2015 – 2040

The Czech National Energy Strategy was approved by the Czech government in 2015 and contains major strategies in the field of energy up to 2040. The Czech National Energy Strategy is a fundamental document in the field of energy. The general objectives contained therein are further developed in other documents (for example the National Plan (see below)).

The main goal of the document is to ensure a reliable, safe and environmentally friendly energy supply for the needs of the Czech population and economy, at competitive and affordable prices. It promotes lowering emissions, increasing energy efficiency, promoting private energy sources, diversifying energy sources, exporting energy and a downward trend of electricity consumption in private homes. An update of the National Energy Strategy is expected to be adopted by the Czech government in 2022.

4.5 National Energy and Climate Plan 2020 – 2030

This National Energy and Climate Plan 2020 – 2030 ("**National Plan**") stems from the Czech National Energy Strategy and sets out the most important measures to be taken by the Czech Republic in order to meet the goal for 2030, namely that RES should make up 22 % of all energy produced in the Czech Republic.

In the area of decarbonisation, the Czech Republic pledges to decrease carbon emissions by 30% (between 2005 and 2030). RES plays a large role in achieving this goal. The most important tool is the Promotion Act, which brings in a new type of state support (auction bonuses) for new RES-Facilities and for keeping existing RES-Facilities in operation.

In the area of energy efficiency, the Czech Republic sets goals for a decrease in total energy consumption, binding goals for public building efficiency and binding goals for a gradual decrease in total electricity consumption. The goal of the Czech Republic is to decrease total annual consumption by half.

The last area elaborated by the National Plan is research, innovation and competition. The plan sets no specific goals; however, there are other strategies and plans in place to ensure the development and public financing of research. Research into smart grids, infrastructure and storage technologies has been a focus of the Czech Republic.

5. New Energy Act

Preparations are currently underway to draft a new Energy Act (the "**New Energy Act**") to replace the Energy Act 2000. This also entails changes to many other sub-legislative regulations (e. g. Regulation No. 408/2015 Coll. on electricity market rules). The October 2021 general elections and the resulting change of the Czech government have delayed the work on the bill. Nevertheless, the current government also plans to enact the New Energy Act, although there could be some changes.

Since its enactment in 2000, the Energy Act 2000 has undergone many amendments, mainly as a result of the obligation to implement various EU legislation governing the operation of the energy sector. The relatively high number and scope of these individual amendments have made the Energy Act 2000 highly opaque, its provisions confusing and, in some cases, ambiguous, causing confusion as to its interpretation. This fact has long been reproached by the Government Legislative Council in examining each of these amendments to the Energy Act2000.

Although a definitive text of the bill is not yet available, the goals of the New Energy Act are known and include the following:

- Prepare the legal and regulatory framework for the new energy market model with an emphasis on meeting binding decarbonisation targets;
- Clearly define the rights and obligations of individual participants in the electricity and gas market and their interaction;
- Simplify, systematically link and clearly define the activities and other institutes to be covered and regulated by the new law;
- Resolve certain problematic situations (for example unjustified off take of electricity) and ensure the clarity and systematic nature of the energy law as a whole;
- Deal with the overlapping of the legal arrangements set out in the Promotion Act and the Energy Management Act (Act No 406/2000 Coll.);
- Increase the customer involvement in the electricity market through the institute of the "active customer" who will not only be entitled to take electricity but also supply electricity to the grid (today such customers need a licence granted by the ERO if they operate a source which exceeds 10 KW);

- Introduce three types of distribution systems in the electricity sector based on their different natures: regional, local and closed distribution systems; the rights and obligations of distribution system operators will be structured according to the type of distribution system operated;
- Transpose EU law.

5.1 Simplifying Access to a Business Licence

Whereas the current law applies only to businesses, the New Energy Act will apply to the activities of both individuals and legal persons (such as companies). It will therefore no longer matter whether a licence (or any other authorisation) is required to perform a given activity.

The bill introduces a business authorisation in the form of a licence. Licences are divided into three groups: a group of licences for infrastructure and market operator activities, a licence for commercial activities, and a licence for supply to the grid. The conditions for obtaining a business licence will be regulated differently for each type of licence. All business authorisations, regardless of the type of licence, will be of unlimited duration.

5.2 Energy Facilities Database and Energy Communities Database

The bill introduces a new database of energy facilities and the entities operating them, as well as a database of energy communities maintained by the ERO. Energy communities are a new feature that will be brought in by the New Energy Act. These energy communities will be able to: produce or purchase electricity for their members or associates; provide distribution services, aggregation services and services related to the operation of energy storage facilities; and operate charging stations.

It is proposed that a single application interface will provide unified access to the energy facilities database, the licences and energy communities database, and the load and transfer points database.

6. Overview of the Technical InNovations in Electricity Storage and Applicability in the Czech Republic of such Storage Technologies

Efficient energy storage is one of the key prerequisites for the successful use of RES-Energy. As renewable energy is dependent on the weather and/or time of day, electricity grids need to become more flexible in order to manage the changes in the amount of electricity supplied. Energy storage is a major component of the functionality of RES-Systems. For times when there is energy surplus, there is a need for technology and space to retain and store this excess energy.

The most common energy-storage system in the Czech Republic remains pumped-storage hydroelectricity. The Czech environment is ideal for these systems because of the abundance of water sources in mountainous areas (for most of the year). The Czech Republic has large water storage facilities that use cheap energy to transport water uphill and let the water stream downhill to produce energy in peak hours, when demand for electricity is at its highest.

Another common mode of energy storage in the Czech Republic is that used in rooftop solar panels, where the solar panel is connected to a lithium-ion battery that stores the excess energy. This stored energy may be used when sunlight is scarce.

However, in order to balance the entire grid, larger batteries with storage capacities of tens of MWh are needed. These can stabilise systems powered by RES-Electricity, protect the grid against blackouts, ease the transition to electromobility and ultimately save money for expensive electricity in peak hours. Some large-scale batteries have been installed but the area of energy storage is still underdeveloped, and legislature is lacking.

The concept of air compression systems is being researched but is not widely used in the Czech Republic at present.

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Generating Electricity from Renewable Sources in CEE & SEE

Projects, Infrastructure & Energy

Hungary

Country Chapter

Wolf Theiss

Country General Information

Capital: Budapest

Location: Hungary is situated in Central Europe in the Carpathian Basin and shares border with the Slovak Republic to the north, Ukraine to the north-east, Romania to the east and south-east, Serbia to the south, Croatia and Slovenia to the south-west, and Austria to the west.

Surface Area: Hungary is a mid-sized country with 93,030 km^2.

Population: Hungary has about 10 million inhabitants.

Climate: Hungary has a temperate seasonal climate with four distinct seasons.

Resources: Hungary's geography has traditionally been defined by its two main waterways, the Danube and Tisza rivers. The main natural resource of the country is the black soil of its farmlands. The alluvial soils of the Great Hungarian Plain are highly fertile. Soils in the northern highland river basins are also generally fertile. The main mineral resources are bauxite, coal, oil, natural gas, manganese, uranium, lignite and iron ore.

Electricity Grid: The total length of the transmission system network is 4,870 km, which is comprised of 750 kV, 400 kV, 220 kV and 132 kV overhead lines and 132 kV high voltage cables. The total route length of the network is 168,609 km.

Electricity Transmission, Distribution and Supply: The current structure of the Hungarian electricity market began to take shape around 1995, when the majority of the large power plants, the public utility suppliers and the distribution networks were privatised. Currently, domestic power plants sell the majority of their generated power output through agreements with the TSO or traders. A significant part of the purchases take place on the secondary trade market. The TSO has the exclusive right to operate and maintain the Hungarian transmission system network. The distribution systems are operated by six regional DSOs.

Official EU Language(s): Hungarian

EU Membership: since 2004

NATO Membership: since 1999

United Nations Membership: since 1955

Currency: Hungarian Forint (HUF)

Membership in the Schengen Area: since 2007

Political System, Administrative Organisation and Economy: Hungary is a parliamentary republic with a government led by the prime minister, exercising executive power, and a head of state (the president of the republic) whose primary responsibilities are related to security of the constitutional democracy, representation of the country and special orders of state. The country is divided into 19 counties plus the capital (Budapest) as an independent entity.

1. Defined Terms for the Main Permits Required for the RES-Electricity Generation Facilities

DSO	The distribution system operators authorised in Hungary. Currently, these are E.ON Dél-dunántúli Áramhálózati Zrt., E.ON Észak-dunántúli Áramhálózati Zrt., OPUS TITÁSZ Áramhálózati Zrt., ELMŰ Hálózati Kft., MVM Émász Áramhálózati Kft., and MVM Démász Áramhálózati Kft.
FiT	The feed-in tariff support scheme regulated mostly by Government Decree No. 389/2007. (XII. 23.), under which RES-Electricity is sold for a mandatory off-take price.
GoO	Guarantee of origin
HEPURA	The Hungarian Energy and Public Utility Regulatory Authority.
METÁR	The "premium support" scheme regulated by the METÁR Decree, under which RES-Electricity is sold for either a mandatory off-take price (in the case of small projects below 0.5 MW and demonstrative projects) or a market price with price correction (projects above 0.5 MW).
METÁR Decree	Government Decree No. 299/2017. (X. 17.) on the feed-in tariff for renewable electricity and the premium tariff.
PPA	Power purchase agreement.
RES	Renewable energy sources in general, such as wind, solar, aerothermal, geothermal, hydrothermal and oceanic waves, hydraulic, biomass and biogas.
RES-Electricity	Electricity generated from RES.
TSO	The transmission system operator in Hungary, namely MAVIR Zrt.

2. Envisaged Investments

2.1 National Energy Strategy of Hungary

According to the requirements of the EU, Hungary as a Member State must work to ensure that all available plans under the European Green Deal are coherently deployed. Therefore, it is required to adopt a national energy plan as well as to put in place the legal framework to attract the necessary investments to accelerate the transition to clean energy, such as:

- investments promoting the use of RES-Electricity for industrial purposes;
- investments in biogas and biomass power plants and other forms of geothermal energy;
- investments in the development of alternative green fuels;
- high value-added investments and investments in low energy consumption, energy storage or carbon capture and use;
- investments in the promotion of geothermal pumps for the heating and cooling of buildings;
- investments in the establishment of decentralised, gradually connected district heating islands;
- investments in appropriate agricultural techniques and organic (bio) farming, such as greenhouse cultivation based on sustainable geothermal energy use;
- investments in the „greening" of transportation including the establishment of electric charging stations; and
- investments in energy storage facilities.

The new National Energy Strategy published in January 2020 and the related action plans provide a vision for the future of the Hungarian climate and energy sector through 2030. The main objectives are to make the energy sector "clean, smart and affordable", focusing on the consumers, such as by strengthening the security of supply, making the energy sector climate-friendly, and promoting innovation and economic development. The National Energy Strategy envisages a progressively transformative electricity market dominated by solar and nuclear power, with fossil electricity generation contributing to only 10% of the total Hungarian energy mix.

Renewable energy is one of the main focus areas, with clear targets set for the electricity, thermal and transportation sectors. These targets are a 21.3% RES share in the electricity sector, a 28.7% RES share in the heating and cooling sector, and a 16.9% RES share in the transportation sector by 2030.

Achieving these targets will ensure a far more stable and balanced renewable energy mix. In view of the growing importance of weather-dependent, mainly photovoltaic generation capacity in RES-Electricity production, the strategy aims to increase solar capacity to nearly 6,500 MW by 2030 and to nearly 12,000 MW by 2040. It is also estimated that Hungary could increase its installed solar capacity by an additional 3.4 GW to around 6.4 GW by 2025 and could even reach the 2030 target earlier, given that Hungary is among the top ten EU Member States in terms of photovoltaic capacity growth per year.

With the increasing electricity load and demand on the system, it is crucial to improve and increase flexibility. Therefore, the classic and smart grid developments of the TSO and the DSOs is a must in order to integrate more solar energy without compromising security of supply.

"Greening" transportation is also an important aspect of fighting climate change, with particular emphasis on the development of railways, which are significantly more climate-friendly than internal combustion engine road transportation. The government has also launched a major green programme with a number of tenders for electric cars, buses and bicycles in recent years.

2.2 "Fit for 55" Package

In July 2021, the European Commission launched its "Fit for 55" initiative as part of the European Green Deal, proposing to make the EU's climate, energy, land use, transportation, taxation and buildings fit for reducing net greenhouse gas emissions by at least 55 % by 2030.

The "Fit for 55" package envisages, among other actions:

- a new emission trading system (EU ETS) for buildings, which is a carbon-intensive sector;
- a proposed review of the renewable energy directives in order to increase the current EU-level target of at least 32 % of RES in the overall energy mix to at least 40 % by 2030;
- a proposed review of the current energy efficiency directive by increasing the current EU-level target for energy efficiency from 32.5 % to 36 % for final, and 39 % for primary energy consumption.

Hungary was the first EU Member State to adopt a national legislative act aimed at achieving full climate neutrality by 2050. The path to this is determined by the National Clean Development Strategy. Hungary is starting from a favourable position, since it has been one of the few countries that has managed to increase its GDP while also reducing CO2 emissions and energy consumption since 2000.

2.3 Taxonomy Regulation

It is advantageous for Hungary that the European Commission expanded the EU Taxonomy Regulation to cover natural gas and nuclear activities, in line with the EU's climate and environmental objectives. Hungary's position in this respect is that there is no climate protection without nuclear energy. Therefore, maintaining and developing nuclear capacity guarantees a reduction in carbon dioxide emissions. Hungary aims to become fully self-sufficient in electricity with the expansion of the Paks nuclear power plant and the implementation of solar energy investments.

3. Executive Summary – RES Market Status and Development of the RES-Electricity Facilities

3.1 Market Overview – Factsheets

- Hungarian solar capacity reached 1,829 MW at the end of 2021. This is an increase of 422 MW compared to 2020. Large-scale industrial production was 2,423 GWh and small-scale domestic production was 1,370 GWh. Due to the growing number of participants in the METÁR System and the commissioning of earlier power plant developments under the FiT System, the total installed capacity of large solar power plants has increased significantly, and this trend is expected to continue in the coming years;
- Although the legal environment in Hungary has not allowed for newly built wind farms in the last decade, the electricity system has 323.3 MW of installed wind power capacity, which generated 638 GWh of electricity in 2020;
- Hydropower plants have a total installed capacity of 58 MW, capable of generating 238 GWh of electricity;
- The Paks nuclear power plant currently produces around half of the electricity generated in Hungary. The Government has also decided to build two new nuclear reactors with a total capacity of 2,400 MW;
- As a climate protection technology, the development of a hydrogen economy is noteworthy. As an example of greening hydrogen production, the surplus electricity generated at night at the Paks nuclear power plant or unused solar energy could be used;
- The share of RES-Electricity in gross final energy consumption was 10 % in 2019 and the share of renewable energy as a whole in gross final energy consumption increased to 13.9 % in 2020.

3.2 Support Schemes

Most of the RES-Electricity projects that have already reached the operational phase in Hungary are supported under the FiT System. The FiT System was replaced by the METÁR System on 1 January 2017 (i.e. applications can no longer be submitted, but the FiT entitlements already granted remain in force). Under the FiT System, the electricity generated is sold to the TSO at a fixed price, whereas under the new METAR system the electricity is sold mainly to traders or on the power exchange with price corrections.

The METAR system was originally designed for new projects (i.e. those that had not yet started to be implemented at the time of submitting an application for support). The system is intended to have five separate branches for different target audiences. In reality, however, only the so-called "green premium granted through tendering" system for installed capacities over 1MW is currently available.

HEPURA is the central agency for the FiT and METAR Systems. The FiT price, the supported quantity and the support period, as well as the margin of METÁR price correction, are all defined by HEPURA.

Due to the Covid-19 crisis, HEPURA actually extended the deadlines for project completion and the commencement of commercial operation under the FiT and METÁR projects. The new deadlines are as follows:

- 30 July 2022 for the commencement of projects that were initially supposed to commence commercial operations between 11 March 2020 and 30 June 2021;
- 31 December 2022 for the commencement of projects that were initially supposed to commence commercial operations between 1 July 2021 and 31 December 2021; and
- 30 June 2023 for the commencement of projects that were initially supposed to commence commercial operations between 1 January 2022 and 31 December 2022.

Last year's unforeseen energy market conditions – in particular, the dramatic increase in electricity prices – caused many producers to consider exiting the support schemes. Therefore, market-based power generation may become a reasonable possibility in Hungary in addition to the support schemes that have supported the market so far.

4. Key Changes to the RES Legislation since 2020

4.1 Experiences of the METÁR System

Up to the first quarter of 2022, HEPURA has launched five METÁR tenders for green investors, in order to encourage environmentally friendly RES-Electricity generation. While the conditions of the first three tenders were in line with each other, from the 4th tender onwards HEPURA introduced completely different parameters into the eligibility conditions. During the last round, applications may be submitted only for substantial (more than 50 % of the original investment value) renovation or upgrading of at least partially renewable (mixed-fuel) power plants that were commissioned for at least 20 years and have been in operation for at least 14 years of that 20-year period. However, this seems to be a one-off deviation from the general path towards RES-Electricity.

Announcement Date of the METAR Call for Tender	Power Plant Categories by Installed Capacity		Annual Support Limit*		Annual Amount of Subsidised Electricity		Highest Bid Price*	Availability for New Projects
	MW		EUR		GW/year		EUR/KWh	
	Small category	Large category	Small category	Large category	Small category	Large category		
Sept. 2019	0.3 – 0.99	1 – 20	935,025	1,872,858	66	134	0.07	Yes
July 2020	0.3 – 0.99	1 – 49,99	561,576	1,684,730	40	350	0.074	Yes
April 2021	0.3 – 0.99	1 – 20	561,576	701,971	50	250 r	0.076	Yes
Oct. 2021	HEPURA has withdrawn this METAR call for tender.							
Nov. 2021	5–20	20 – 50	1,684,730	46,049,306	30	Not limited	0.108	No

4.2 Significant Changes in Grid Connection Rules

Spring of 2021 brought a conceptual change regarding the allocation of grid connection capacities. New, competitive capacity allocation principles were introduced in the Hungarian Electricity Act, followed by more detailed provisions in September, which were adopted by the TSO and in January 2022 by the DSOs. Under this amendment, TSO/DSOs must on the

one hand make public, every six months, detailed information about free capacities (broken down by high-voltage and medium/high-voltage transformer stations) and the technical and foreseeable economic conditions of connection. On the other hand, grid connection applicants must pay financial guarantees for taking part in the capacity allocation, which is in response to the increasing difficulties of integrating solar power plants into the Hungarian electricity system.

Both the TSO and the DSOs decided to adopt their own rules in two phases. Transitional rules will apply for a short period of time with narrowly defined conditions. After this transitional period, it will be possible to initiate the connection procedure through a newly introduced competitive capacity allocation tender in the final systems to be subsequently adopted.

Under the transitional rules, applicants must:

- submit a binding declaration to the TSO or the competent DSO for its intended booking of the requested capacity (capacity booking declaration);
- pay a financial security (cash deposit) of HUF 900,000/MVA to guarantee those stipulated in the capacity booking declaration; and
- pay another financial security (cash deposit) of HUF 3,600,000/MVA as a guarantee for the conclusion of the grid connection contract.

These cash deposits will later be set off against the grid connection fee payable under the grid connection contract.

If an applicant fails to meet the deadlines, the grid connection procedure will be terminated. Furthermore, in case of failure to comply with the second payment, the first payment is forfeited by the investor as liquidated damages.

Applicants have the option to make their commitments in the capacity booking declaration conditional on their application being successful (at least in part) in any METÁR tender open until 31 December 2022.

The foregoing provisions will undoubtedly have a significant impact on domestic solar power developments. Investors had already invested substantial financial resources in many projects, and the above restrictions resulted in significant changes to their business models in the short term. Consequently, not all investors have been able to adapt to the new regulatory environment quickly enough. The increased financial costs and the reduced opportunity for being allocated grid connection capacities certainly narrows the range of potential investments. Many questions remain and the precise rules of the final system are unclear, leading to visible market uncertainty.

4.3 Special FDI Regime Related to Covid-19

The state of emergency in response to the Covid-19 pandemic also brought significant changes in the field of foreign direct investment (FDI) screening in Hungary. A temporary FDI regime came into force in May 2020, in addition to the already existing permanent FDI rules. Under the temporary regime, investments in strategic fields of industries (including the energy sector) are subject to prior review and acknowledgement by the competent Hungarian minister.

This two-fold FDI system means that Hungarian FDI rules now cover investors both from outside and from within the EU, the EEA and Switzerland. Moreover, in addition to the straightforward (direct or indirect) acquisition of shares, other deal structures such as acquisitions of convertibles or rights in usufruct or corporate transformation, asset acquisition, capital injunction and in-kind contributions are also all subject to the FDI clearance pertinent to the energy sector.

For more information on the current FDI system in Hungary, please visit our international comparative legal guide, accessible at https://www.wolftheiss.com/knowledge/detail/international-comparative-legal-guide-foreign-direct-investment-regimes-2022/.

4.4 Energy Communities and Aggregators

The implementation of the EU Clean Energy Package introduced new actors to the Hungarian electricity market, namely energy communities and independent aggregators, which are registered and supervised by HEPURA. This innovative, modern solution, together with the Modernisation Fund, will contribute to Hungary's renewable energy and greenhouse gas emission reduction targets.

Aggregation is the combination of power plants, user installations and electricity storage facilities connected to the electricity grid or to a private line for the purpose of sale, purchase or auction on the energy market. By combining the production and consumption of smaller, individually inefficient actors, the aggregator can create a larger portfolio through which these actors can access the power exchange or other electricity markets.

Energy communities are cooperative or non-profit legal entities whose main purpose is to provide environmental, economic and social benefits to their members within an area of operation by engaging in at least one of the activities of power generation, storage, consumption, provision of distribution flexibility services, electricity sharing and aggregation, provision of e-mobility services, or operation of e-charging facilities.

4.5 Guarantees of Origin

GoOs are tradable, electronic certificates proving to the final consumer that a certain quantity of the energy consumed has been produced from renewable energy sources. GoOs enjoy a privileged position: the amount of electricity from RES or from high-efficiency cogeneration can only be certified by GoOs in Hungary.

HEPURA operates the official registry of GoOs in its electronic management system. Since 1 February 2022, this management system is compatible with the European Energy Certificate System (EECS). Consequently, Hungarian GoOs can be transferred to foreign management systems and foreign GoOs can be adapted to the Hungarian management system more easily.

Due to the growing trend of GoO trading, the Hungarian power exchange (HUPX) intends to launch a GoO market platform from July 2022. According to HUPX, this GoO trading platform will be highly liquid and transparent, aiming to strengthen the role of GoOs in the region.

Given that most of the renewable energy in Hungary is produced in the FiT System, HUPX will first focus on auctions of FiT GoOs owned by the TSO. Later, HUPX plans to establish a market platform for non-FiT GoOs as well. The estimated market size for FiT GoOs, is around 1.9 TWh.

5. Significant and/or Expected Changes in 2022

5.1 Power Purchase Agreements

In line with EU trends, there is a growing interest in long-term PPAs in Hungary. PPAs allow stakeholders to mitigate the risks of electricity price increases and fluctuations on the market by ensuring long-term fixed prices. The scheme can provide additional benefits over traditional market solutions both for producers and for end-customers. For the producer, because normal market conditions might not allow it to make such a capital-intensive investment. For the user, because it will enable them to meet a significant part of their energy needs from renewable sources in line with increasing sustainability requirements. This is even more critical in the face of the electricity market prices, which have increased in parallel with the boom in natural gas prices in recent years.

Notwithstanding the benefits set out above, PPAs in Hungary are still in their infancy, and there is no experience-based, well-functioning domestic structure. Although PPAs and related investments are theoretically feasible in Hungary, there are currently several factors hindering the uptake of the scheme, on the part of producers, end-customers and regulators alike:

- When talking about renewables, there are legitimate concerns about security of supply, which are not only a barrier to the deployment of renewables in the country through PPAs, but also for renewables in general. Renewables are not capable of continuous baseload generation, which understandably makes users wary of them;
- Domestic consumers of Hungarian companies are not yet environmentally conscious enough to be willing to pay more for more sustainable products, and in PPAs, at least under normal circumstances, they typically pay a premium over market prices;
- Since PPAs are also financing schemes, the electricity producer takes on financing risk through the PPAs. Therefore, stable companies with a high credit rating are the most suitable partners for producers, which limits the potential range of Hungarian corporate users;
- At present, the domestic financial sector is not prepared to handle the relatively complex PPA contracts, but in the right circumstances they are unlikely to shy away from the new scheme.
- In the eyes of producers, a PPA also competes with the FiT and METÁR Systems, which offer better conditions for the producer, especially in terms of risk allocation and pricing, than are currently available with a PPA. The market therefore expects that CFD (contract for difference) clearing systems and contracts could be popular in Hungary, because they are physical PPAs and are similar in structure to METÁR, which increases their acceptance by banks and financiers;
- The 31% Robin Hood tax on pre-tax profits is a significant barrier to the domestic expansion of PPAs. The tax is also payable by renewable electricity producers, unless they participate in the KÁT or METÁR Systems.

The European Commission has recently launched a public consultation on facilitating PPA investments, and a public meeting has also been held in Hungary. So far, there has been no indication whether the government or the regulator plans to take specific measures to facilitate the uptake of these agreements, and no concrete information on the latest meeting has been provided to suggest that changes are likely. Conservative estimates therefore suggest that a total of 200 – 300 MW solar projects developed through PPAs are likely to be completed within 4 – 5 years, initially in the physical PPA sector.

5.2 Robin Hood Tax

There is an "unexpected" regulatory factor in the Hungarian legal system that could jeopardise ambitious investor and government targets for solar investments. Pursuant to the prevailing tax laws, energy suppliers (e.g. holders of a power generation license or electricity traders) are subject to the so-called Robin Hood tax, which is a special 31% income tax on the pre-tax profit of affected market players, adjusted by certain tax-base modifying items. An exception is made for those that participate in the KÁT or METÁR System and that have a capacity below 50 MW. This tax burden puts prospective solar developments that would take place without the above subsidies in a doubly difficult situation: in addition to not receiving the state support in question, they will also have to pay the special Robin Hood tax.

Financial simulations show that the estimated return is significantly worse if the project does not participate in the KÁT or METÁR System (i.e. the electricity produced is sold entirely at market prices). The difference is mainly due to the 31% Robin Hood tax payable outside the KÁT and METÁR Systems. In this case, the average annual return for the project is around 3 – 5% depending on the investment cost (for a new METÁR project, the average is 6 – 8%), which rarely provides a sufficient return for investors. By comparison, long-term Hungarian government bond yields are currently around 2.5 – 3%.

Overall, the current rules of the Robin Hood tax create a competitive disadvantage for small power plants not participating in the KÁT or METÁR System. These circumstances significantly reduce the return on investment of projects without subsidies and thus reduce the chances of a positive investor decision. Without a positive legislative turnaround, change in this area is unlikely. However, there is no information on whether the legislature plans to change its approach to the tax in the near or distant future.

6. Technical Innovations

6.1 Smart Metering

The current Hungarian electricity system has not yet adjusted to the growing need to integrate the large quantity of RES. The National Energy Strategy envisages the development of the DSOs' response capacity and flexibility mechanisms as crucial in parallel with the smartening and development of the transmission and distribution networks.

The strategy aims to encourage innovative technologies and modes of operation in order to improve the electricity systems while minimising the need for network development investments and maximising the integration of renewable, decentralised power generation.

The proposed programme focuses on the stimulation of energy storage, the strengthening of the capabilities/obligations of weather-dependent producers for system balancing, the fostering of adjustments by the demand side, and the rethinking of the competences of TSO/DSOs.

6.2 Electricity Storage

Market-based solutions for energy storage are desirable, but there is no significant domestic experience in the use of energy storage as a technology. According to Hungary's National Hydrogen Strategy, given the limited number of sites available for pumping reservoirs, a possible approach to seasonal energy storage could be hydrogen produced by the seasonal production of excess electricity through water decomposition. However, the production of green hydrogen requires a rather large energy investment and is significantly costly.

The development of energy storage as a stand-alone service will require the development of a market model that includes additional products (e.g. fast frequency response, inertia) and services (distribution level network voltage regulation) in line with the changes to the EU electricity market regulation.

The domestic battery sector can also play a key role in achieving the 2050 climate neutrality target. Accordingly, the government has set a clear goal for Hungary to become a leader in the battery industry. The plans include exploring and developing the potential for lithium extraction from the country's thermal water resources. Renewable energy capacity will grow at an unprecedented rate. Unfortunately, existing grids were not designed to meet these challenges when they were built. To overcome this challenge, smart technologies are needed to provide short-term resilience. Storage and the use of digital technology are the real blueprints for a sustainable energy future.

Partial support must be considered for the storage facilities of power plants that are no longer subsidised under the FiT System. In order to support the regulation, larger solar plants with auxiliary storage capacity submitting applications in the METAR System are likely to be preferred in the upcoming tenders.

6.3 Hydrogen

In line with European trends, hydrogen is garnering increased attention in Hungary. Hydrogen may become a widespread green energy source in the next decade. Accordingly, the Hungarian government adopted its National Hydrogen Strategy in July 2021. The main objectives are the production of large volumes of low-carbon and decentralised carbon-free

hydrogen, the decarbonisation of industrial consumption (using hydrogen), the development of hydrogen-based green transport and the development of green balancing energy infrastructure.

Hungary's target is to produce 36,000 tonnes/year of green or other carbon-free and low-carbon hydrogen (20,000 tonnes/year of low-carbon hydrogen and 16,000 tonnes/year of carbon-free hydrogen by 2030). The government intends to have 240 MW of electrolyser capacity in the next decade.

Regarding industrial decarbonisation, low-carbon hydrogen may be introduced to the petrochemical and chemical industries (i.e. ammonia production). This is concentrated on technical processes where decarbonisation is urgent for reasons of climate strategy compliance.

The government also intends to make traffic more environmentally friendly by increasing hydrogen usage. This may result in a parallel reduction in gas oil use, particularly in heavy-duty vehicle traffic (i. e. road transport and public transport). In 2021, the first hydrogen filling station was set up in Hungary.

Hydrogen could play a key role in electricity system balancing as green hydrogen-fired power plants could replace the currently operating gas-fired power plants. Hungary will need a stable and reliable balancing system due to the increasing volume of weather-dependent renewables.

After 2030, a further increase in the use of hydrogen is expected. The Hungarian parliament is committed to creating a suitable regulatory environment for hydrogen-related investments. In the coming decades, hydrogen will play an increasing role in industrial decarbonisation, transportation and the cooling-heating sector in Hungary.

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Generating Electricity from Renewable Sources in CEE & SEE

Projects, Infrastructure & Energy

Poland

Country Chapter

Wolf Theiss

Country General Information

Capital: Warsaw

Location: Situated in Central Europe, Poland's territory extends across several geographical regions, between latitudes 49° and 55° N, and longitudes 14° and 25° E. Poland is bordered to the north by the Baltic Sea, to the northeast by Russia and Lithuania, and to the east by Belarus and Ukraine. To the south the border follows the watershed of the Beskid (*Beskidy*), Carpathian (*Karpaty*), and Sudeten (*Sudety*) mountains, which separate Poland from the Slovak Republic and the Czech Republic, while to the west the Neisse (*Nysa Łużycka*) and Oder (*Odra*) rivers define the border with Germany.

Surface: 312,696 km^2

Population: 38,162,000 inhabitants

Climate: continental, with four (4) distinct seasons

Resources: Poland has substantial agricultural and mineral resources. It has the world's fifth (5^{th}) largest proven reserves of hard and brown coal, in addition to deposits of copper, sulphur, zinc, lead, silver, magnesium, and rock salt. There is natural gas and also potentially useful deposits of chalk, kaolin, clays, and potash.

Electricity Grid: Poland has over 280 lines with a voltage of 400 and 220 kV having a length of over 15,000 km, as well as several hundred kilometres of undersea cable connecting the Polish and Swedish power systems.

Electricity Transmission, Distribution and Supply: within the territory of the Republic of Poland there is one (1) transmission system operator for electricity – PSE S.A. with its seat in Konstancin-Jeziorna; one hundred percent (100%) of whose shares belong to the State Treasury. There are five (5) major distribution system operators: innogy Stoen Operator Sp. z o.o., ENERGA-Operator S.A., ENEA Operator Sp. z o.o., TAURON Dystrybucja S.A. and PGE Dystrybucja S.A. Electricity is provided by over a hundred (100) suppliers.

Official EU Language(s): Polish

EU Member Country: since 1 May 2004

NATO Member: since 12 March 1999

United Nations Member: since 24 October 1945

Currency: Polish złoty (PLN). Poland does not use the euro as its currency. However, under the terms of the Treaty of Accession with the European Union, all new Member States "shall participate in the Economic and Monetary Union from the date of accession as a Member State with a derogation", which means that Poland is obliged to eventually replace its currency, the złoty, with the euro.

Schengen: Poland is a member of the Schengen area.

Political System, Administrative Organisation and Economy: Poland is a multi-party democratic republic with a two (2) chamber parliament. The Head of State is the President, elected by a majority of votes for a five (5) year term. The upper parliamentary chamber is the Senate, with one hundred (100) senators; whereas the lower chamber is the Sejm, which has four hundred and sixty (460) seats. Parliament is chosen by a majority of the electorate for a four (4) year term. The state's internal and foreign policy is decided by the government, i.e. the Council of Ministers, whose activities are directed by the president of the Council of Ministers, i.e. the premier. The premier is chosen by the President. The executive officer for government administration and the government's representative in the voivodships is the voivode. Since 1 January 1999, the law of 24 July 1998 has been in place, which specifies a three (3) level division of the country›s territory. The entities of the three (3) level division of the state›s territory are separated into: gminas (municipalities), powiats (districts) (both local authorities) and voivodships (regional authorities). Since 1 January 1999, the country has been divided into sixteen (16) voivodships.

1. Defined Terms

Building Permit	Administrative deed issued by the head of the powiat (district) where the RES-Electricity facility will be built;
Feed-in Premium	A support mechanism under the Auction Based Scheme where the RES Facility receives an additional payment; being the difference between the auction price and the market price for electricity;
Feed-in Tariff	A support mechanism under the Auction Based Scheme where the RES Facility sells electricity for the auction price to a utility;
Grid Connection	Actions performed and administrative deeds issued by the grid operator to connect a new generating facility or to modify or replace the connection of a generating facility to the grid;
Licence	Administrative deed issued by the President of the URE, allowing for the generation of electricity in RES-Electricity facilities, which gives the right to operate the RES-Electricity facility and to sell RES-Electricity on the market;
Off-shore Act	Act promoting the generation of RES-Electricity from offshore wind farms and governing offshore wind farm investments in Poland;
President of the URE	President of the Energy Regulatory Office – the regulatory authority for the energy market in Poland;
RES Act	Renewable energy sources act setting out the RES Support Scheme in Poland;
RES-Electricity	Electricity obtained from renewable sources such as wind, solar, aerothermal, geothermal, hydrothermal, hydraulic, biomass and biogas;

RES Facility	A generation facility using renewables sources such as wind, solar, aerothermal, geothermal, hydrothermal, hydraulic, biomass and biogas to generate electricity;
RES Support Scheme	State-aid scheme notified and approved by the European Commission based either on (i) green certificates ("**GCs**") or (ii) auctions ("**Auction Based Support Scheme**") aiming at supporting RES-Electricity capacities.

2. Envisaged Need of Investments

Poland is currently undergoing a very intensive phase of investment in RES Facilities. There are several reasons for this. Firstly, the price of electricity has risen rapidly over the last several years, making investment in RES Facilities much easier to finance. This rise in prices is largely (but not solely) ascribed to the significant rise in the price of emission allowances. Secondly, there has been an increasing level of public acceptance of RES Facilities, in particular with respect to solar and offshore wind investments. Thirdly, the government has fully implemented the Auction Based Support Scheme, which provides additional stability for investors and banks.

It is noteworthy that the Polish energy sector is increasingly less reliant on the need for subsidies. The results of the auctions conducted in 2021 demonstrate that the business influence of the auction system has evolved. Specifically, starting in 2021, the auction support mechanism has become more of a long-term contract security (an issue important in financing a RES Facility). In the case of large solar and wind projects, financial support is no longer even necessary. As a result, these two technologies will become the most significant sources for future RES-Electricity production in the Polish system in the coming decades. There are also opportunities for corporate PPAs and trading companies offering innovative structures aimed at mitigating long-term risks using PPAs. Banks are also offering competitive financing based upon such conditions. In addition to the winning of projects from auctions, we will see further intensive growth in the market for prosumer solar installations and the start of construction of the first offshore wind farms.

Current RES investments in Poland are primarily focused on wind and solar projects. Other technologies have become comparatively far less attractive for investors. For example, following auctions conducted in June 2021, only 0.127 TWh of electricity was contracted for other technologies – mostly hydroelectric power plants. There is a view in the local market

that the Auction Based System should not be used to promote hydro and biogas investments given the specifics of these technologies. Instead, the belief is that other dedicated forms of support should be implemented to support hydro and biogas.

Offshore projects in Poland are also a hot topic these days. The adoption of the Offshore Act in February 2021 has provided a regulatory framework for the support, preparation and construction of offshore wind farms. The first administrative decisions to support 1st phase projects were issued in 2021. These decisions cover the seven most advanced offshore projects. In the coming years, support will be provided in the form of competitive auctions. The next auctions will be conducted in 2025 and 2027.

In February 2021 the Council of Ministers adopted "Poland's Energy Policy until 2040 – Strategy for the Development of the Fuel and Energy Sector" ("**PEP2040**"). The strategy assumes (among other things) that in 2030 the share of coal in electricity production will not exceed 56% of the total energy production in Poland. The share of renewable energy in gross final energy consumption will be at least 23% (not less than 32% in electricity, 28% in heating and 14% in transport – with a large contribution of electromobility). The installed capacity of offshore wind energy will reach approximately 5.9 GW in 2030 and up to 11 GW in 2040. As declared, by 2033 the first nuclear power plant unit will be commissioned with a production capacity of approximately 1 – 1.6 GW. To achieve these goals, the current existing and built capacity of RES Facilities will need to be at least doubled. A key factor in achieving this will be the offshore investments in Poland, but nevertheless the most significant contributor will remain solar and onshore wind. For onshore wind, amendments to the relevant Polish legislation will be necessary to realise its full potential.

3. Executive Summary – RES Market Status and Development of On-shore RES Facilities

3.1 Development of the Legal Framewok for the RES Support Scheme

- The Polish RES market has developed since 2005 with the implementation of the first provisions in the Energy Law introducing a RES Support Scheme based on GCs, available connection to the grid and guaranteed off-take by utilities;
- RES Facilities built before 31 July 2016 can enjoy the RES Support Scheme based on GCs, all those that were constructed after this date are no longer eligible to participate in this RES Support Scheme as it will be slowly phased out; GCs will only be issued for fifteen (15) years from the commissioning of a RES Facility:

- In 2015, a new RES Support Scheme was introduced – the Auction Based Scheme. This system did not fully emerge (at least on a large scale) until 2018. In November 2015, Polish authorities notified both support systems to the European Commission. After being amended, the Auction Based Support Scheme as well as the old RES Support Scheme were both accepted by the Commission on 31 December 2017.
- The main aim of the Auction Based Support Scheme was to make the support of RES more effective. It makes RES Facilities compete for support and it allows for the promotion of sources depending on technology and capacity by creating different technology baskets, imposing maximum prices and total maximum support value per auction. The bidder determines the price and the planned annual output. To determine the winning bids, the offers are sorted by price from the lowest to the highest until the planned auction volume is exhausted.
- The European Commission accepted on 31 October 2019 changes to the Auction Based Support Scheme introduced by the Act of 19 July 2019 amending the Act on Renewable Energy Sources, which, inter alia, extended the period of support and extended the deadline for the sale of RES-Electricity for the first time after winning the auction.
- In November 2021, The European Commission approved the prolongation of an existing Auction Based Support Scheme for the period 2022 – 2027. According to initial estimates, the extension of the auction system will enable the creation of approximately 9 GW of new RES-Electricity capacity. The maximum value of state support for the entire support period could amount to PLN 43.85 billion (approximately EUR 10 billion).

3.2 RES Market Status, Permitting, Grid Connection, Licensing of onshore RES Facilities in Poland

General Market Data	
RES Target 2020	15 % – already achieved (data provided by Poland is currently being verified by Eurostat)
RES Target 2033	21 – 23 %

Overall Installed General Capacity including RES (Overall Production)	In 2021, overall energy production was 173,58 TWh.
Installed Capacity by Technology	Wind (onshore only) – 7.1 GW Solar – 6.7 GW Hydro – 2.5 GW Biomass – 257 MW Biogas – 245 MW
RES Support Scheme	
Beneficiaries of RES Support Scheme	Auction Based Support Scheme is addressed to a number of technologies divided into baskets by technology and size.
Priority and Guaranteed Off-take into the Grid	The RES-Electricity Producers receive priority access to the grid.
Other Incentives	Mandatory annual GC quotas to be purchased by the energy suppliers.
Other Conditions	Licence for generation above 1 MW Entry in the register: 50 KW – 1 MW No installed capacity limit as long as the grid allows it from a technical point of view

Grid Connection Specifics

Approvals

There are no official data from grid operators regarding timing, but a few months' wait has become standard (and due to the technical limits of the grid this period is likely to become even longer).

Connection conditions issued by the grid operator based on (i) a grid study; and (ii) the advance payment for the connection payment. A zoning plan or decision must also be in place.

Connection agreement setting out the schedule of the connection as well as other rights and obligations of the parties.

Permitting

Timing: depending on the technology, installed capacity and connection to the grid, an investor could obtain the necessary approvals in approximately ten (10) months to two (2) years.

- Environmental decision setting out the environmental conditions of the RES Facility following an Environmental Impact Assessment (if necessary, depending on the area occupied by the investment);
- Zoning plan (or a zoning decision in its absence);
- Building permit for construction works and connection to the grid.

Licensing (above 1 MW)

Procedure	The licence for generation is issued after the construction and commissioning phases are finished.
Duration of administrative procedure	Within ten to sixty (10 – 60) days from the submission of the full documentation. It can be coordinated with the end of the commissioning phase.
Licence's validity	Up to fifty (50) years. Can be extended.

Entry in the Register (50 KW – 1 MW)

Procedure	Entry in the Register of Energy Producers for a Small Installation

Duration of Administrative Procedure	Up to 28 days from the date of receipt of a complete application

4. The (Onshore) RES Support Scheme – Full Implementation of the Auction Scheme

In February 2015 a new Renewables Act ("**RES Act**") was passed and a new RES Support Scheme created – the Auction Based Support Scheme. It did not fully emerge (at least on a large scale) until 2018. In November 2015, Polish authorities notified both the Auction Based Support Scheme as well as the RES Support Scheme based on GCs to the European Commission. After being amended, the Auction Based Support Scheme as well as the old RES Support Scheme were both accepted by the Commission on 31 December 2017. In November 2021, the European Commission approved the prolongation of an existing scheme for the period 2022 – 2027.

The Auction Based Support Scheme is based on the concept of contracts for difference granted in auctions. Support is awarded in auctions organised by the President of the URE for entities that will supply a given amount of RES-Electricity at the lowest price. Auctions are held electronically, via an internet platform. There is no minimum bidding price, but there is a maximum price for which 1 MWh can be offered in a given year, a so-called "reference price".

The reference price is determined, published by the Minister of State Assets and the volume of generated RES-Electricity that will be subject to that auction is also established. There are separate reference prices and volumes set for different renewable energy sources and also for different capacities of installations (technology baskets).

In order to participate in the auction, RES installations must prequalify. In order to pass prequalification, the RES project must achieve the ready-to-build stage (i. e. have obtained a final building permit) and have secured Grid Connection. The certificate of qualification is valid for twelve (12) months.

Bidders have a deadline to commence RES-Electricity generation. The RES-Electricity needs to be fed into the grid for the first time within a certain period, namely within 24 months (from the closing of the auction) for solar installations, within 33 months for onshore wind installations and within 42 months for other generation technologies (except for offshore wind, which is regulated by the Offshore Act). These periods may be extended by the

President of the URE (no more than 12 months) if the delay in starting power generation results from delays caused by the pandemic (i. e. delays in equipment deliveries).

RES Facilities above 500 KW will sell RES-Electricity on the market. They will be entitled to apply for a refund of the difference between the amount of RES-Electricity sold by them in the preceding month multiplied by the stock market price and the same amount of RES-Electricity multiplied by the price offered in the auction ("**Feed-in Premium**"). The authority responsible for settlements and support payments is a fully state-owned calculation agent, Zarządca Rozliczeń SA.

Settlements will take place on a monthly basis. Zarządca Rozliczeń is obliged to pay out the support amount within thirty (30) days from receiving the relevant data from the RES-Electricity producer. If the value of the RES-Electricity that is sold based on the market price is higher than its value based on the price offered at auction, no support will be paid, and the difference will be deducted from the amount of the support payment in the next settlement period. If, at the end of the entire support period, such a difference is not yet settled, the outstanding amount will be paid by the RES-Electricity producer to Zarządca Rozliczeń. The price of the selected bidders offered in the auction will be annually adjusted by the inflation rate.

The overall term of support for installations in the auction system is fifteen (15) years. However, the support may in no case last longer than until 30 June 2047.

The meeting of the obligation to produce the declared volume of RES-Electricity by a given producer must be verified by the President of URE at three (3) year intervals. Within this three (3) year settlement period, the producer is obliged to produce at least 85 % of the RES-Electricity volume declared at auction. Otherwise, it will be obliged to pay a fine, the amount of which will depend on the volume of the shortfall.

During the five years the auction system has been in operation (i. e. from 2016 to 2020), the President of the URE has granted total support covering more than 209 TWh of electricity, which corresponds to contracted electricity worth more than PLN 50 (approximately EUR 11 billion) paid to green energy generators for 15 years.

In June 2021, eight auctions were conducted but only three were successful. Under the RES Act, an auction can be decided if no less than three valid bids meeting the requirements set out in the Act are submitted. 37 TWh has been contracted for over PLN 8.5 billion. The most popular was the auction designed for new small (lower than 1 MW) solar and onshore wind projects. As part of this auction, a maximum of 14.7 TWh was anticipated to be allocated for no more than PLN 5.3 billion. A total of 432 producers entered the auction and 1,264 offers were submitted (out of which 1,016 won). The total amount of energy that will be subsidised is 11.9 TWh at an aggregate value of PLN 2.7 billion. The reference (maximum) price in this basket was PLN 340/MWh (EUR 73/MWh). The minimum price at which energy was sold

was PLN 207/MWh (approximately EUR 45/MWh). The energy volume that was awarded in the auction should translate into the construction of approximately 1GW of new capacity.

An auction was also conducted for large-scale wind and solar projects (with a capacity above 1MW). A total of 88 producers entered the auction and 111 offers were submitted. As part of this auction, a maximum of 38.7TWh was anticipated to be allocated for no more than PLN 10.7 billion. The total amount of energy that will be subsidised is 24.7TWh at an aggregate value of PLN 5.7 billion. The energy volume that was awarded in this auction should translate into the construction of approximately 1.2GW of new solar projects and 0,3GW of new wind projects. The reference price in this basket was PLN 320/MWh (EUR 69/MWh) for solar projects, and PLN 250/MWh (EUR 54/MWh) for wind projects. The minimum prices at which energy was sold were PLN 209/MWh (EUR 45.5/MWh) and PLN 179/MWh (EUR 39/MWh) respectively.

In December 2021 auctions were conducted for the following baskets:

- hybrid RES Facilities >1MW;
- hybrid RES Facilities ≤1MW;
- solar installations and onshore wind installations >1MW;
- solar installations and onshore wind installations ≤1MW;
- hydro installations (<0,5MW and ≥0,5 -≤1MW), geothermal installations, bio-liquid fuel installations.

All baskets in the Q4 2021 auctions were intended for new installations (to be commissioned under the Auction Based Support Scheme). The first dedicated auctions for hybrid RES installations were launched in Decembe 2021, but no offers were submitted.

IN those December 2021 auctions a total of 14TWh was contracted for over PLN 3.2 billion. As was the case in June, the most popular was the auction designed for new small (lower than 1MW) solar and (onshore) wind projects. A total of 182 (only PV) producers entered the auction and 401 offers were submitted. The reference price in this basket was PLN 340/MWh (EUR 73/MWh). The minimum price at which the energy was sold was PLN 219/MWh (ca EUR 48/MWh). The maximum price at which the energy was sold was PLN 278.9/MWh (EUR 60/MWh). The energy volume that was awarded in the auction should translate into the construction of approximately 300MW of new capacity.

An auction was also conducted for large-scale wind and solar projects (with a capacity above 1MW). A total of 66 producers entered the auction and 89 offers were submitted. As part of this auction, a maximum of 14.1TWh was anticipated to be allocated for no more than PLN 5 billion. The total amount of energy that will be subsidised is 11TWh at an aggregate value of PLN 2.5 billion. The energy volume that was awarded in this auction should translate into

the construction of approximately 570 MW of new solar projects and 460 MW of new wind projects. The reference (maximum) price in this basket was PLN 320/MWh (EUR 69/MWh) for solar projects, and PLN 250/MWh (EUR 54/MWh) for wind projects. The minimum prices at which energy was sold were PLN 139,64/MWh (EUR 30/MWh) and PLN 207.85/MWh (EUR 45/MWh) respectively.

5. PV Projects

Due to legal limitations on the location of onshore wind projects (the so-called "10 H proximity rule"), the solar PV industry is now booming in Poland. The installed capacity is gradually increasing and the growth rate (especially in the last two years) is high. The role of business prosumers is increasing significantly. The auction system allows for particularly intensive development of small projects (below 1 MW), so the competition between investors in this auction basket is strong.

A market analysis estimates that more than 30,000 people are employed in the solar industry in Poland. This means that the PV sector is becoming increasingly important for the national economy. In December 2021, the government and stakeholders in the solar energy sector in Poland signed an agreement to cooperate in the development of the photovoltaic sector. The agreement concerns the development of the domestic solar PV industry (local content in the supply chain) as well as cooperation on promotional and educational activities for the development of the photovoltaic sector. The government administration has committed (among other things) to creating a stable legal environment and consulting with other parties on changes to national law. This may influence further impressive growth of the solar PV sector (and the power installed).

6. Offshore Wind Projects

Offshore projects in Poland have been prepared by several companies interested in investments in the Baltic Sea. Due to the lack of a legal framework, these investments could not be launched until 2021.

A dedicated Offshore Act entered into force on 18 February 2021. This Offshore Act covers the rules and conditions for granting support for electricity generated by offshore wind farms as well as the rules and conditions for the preparation, erection/execution and liquidation of offshore wind farms.

The support will be provided for 25 years. The support system has been divided into two phases. The first phase was launched just after the Offshore Act entered into force. During this first phase, the President of the URE issued decisions granting support for offshore wind farms with a total installed capacity of up to 5.9 GW based on applications that had to be filed up to 31 March 2021. The second phase of the support will be based on competitive auctions (contracts for difference, based on negative balance settlements). The first auctions will be conducted in 2025 and 2027 and a total capacity of 2,5 GW may be sold during each of them. The auctions will be announced after the European Commission issues a decision declaring the state aid compatible with the internal market. The support system provided in both phases should lead to the construction of around 11 GW of installed capacity in offshore wind farms.

The framework for offshore investments is shaped not only by legal acts, but market players are also very active in creating favourable conditions for the development of the offshore business. In September 2021, the "Polish Offshore Wind Sector Deal" was signed between government administration and key representatives of the offshore wind energy sector. The purpose of the sector deal (as set forth in its preamble) is to undertake and implement those measures necessary for the development of the offshore wind sector in Poland. This is based on ensuring a maximum share of local Polish content in the supply chain in the process of the offshore wind farm construction. Seven (7) strategic objectives have been determined, including ensuring that local content makes up over 50 % of the total value in the preparatory, installation and operational stage of projects implemented after 2030. The government declared, among other things, that the planned changes to the strategies, legal regulations and programmes at the national and EU level that will affect the offshore wind sector will be made in consultation with industry stakeholders. The changes will also cover issues concerning the construction and reconstruction of Polish ports and of access infrastructure that will adapt them to offshore wind farms servicing by 2026.

Offshore wind projects are currently in a dynamic phase of development. The first offshore wind farms are anticipated to be erected in 2024 – 2026.

7. Corporate PPA

The Polish energy market is now open to corporate PPAs. There is a high level of interest in long-term contracts for the purchase of renewable energy in Poland. The first corporate PPA in the Polish renewable energy market was signed in 2018 between a wind power plant operator and an engine factory. The years 2019 – 2021 brought the conclusion of further agreements of this type, mainly in the form of virtual corporate PPAs. In January 2022, Wolf Theiss advised its client on concluding a PPA for around 300 GWh/year. The development prospects are therefore promising, and it seems that contracted energy volumes will

increase rapidly.

8. Energy Storage

In July 2021, an amendment to the (Polish) Energy Law entered into force, and regulations concerning energy storage have been implemented into the Polish legal system. New, uniform definitions of energy storage and storage facility have also been introduced into the Polish legal system. This new law also established rules for grid connection related to storage.

Obtaining a licence is not required to operate storage facilities of up to 10 MW, whereas storage facilities of between 50 KW and 10 MW must be registered in a newly implemented register (the data required and gathered in the register are addressed in the Ministry of Climate and Environment Regulation of 21 October 2021). The register itself is public.

The amendment to the Energy Law introduced a rule cancelling the double charging of distribution and transmission fees. If a storage facility is part of a generation unit, the settled amount is the difference between the electricity taken from the grid by the storage facility and the electricity injected into the grid by the storage facility in each settlement period. In addition, in order to sell stored energy to customers, there is no need to approve a tariff with the President of the URE.

Energy storage is dynamically evolving in Poland. The government plans to launch additional support programmes to stimulate the development of collective energy storage (for groups of prosumers). These programmes may provide additional impetus to this fast-growing market.

9. Hydrogen

Currently, Poland holds a leading position among European hydrogen producers with an annual production of approximately 1.3 million tonnes. However, this hydrogen is produced by processes that use fossil fuels. Because of the intensive development of RES projects in Poland, this may be an interesting location for green hydrogen investments. The potential for green hydrogen has been identified by both business and the government.

In November 2021, the Council of Ministers adopted “Polish Hydrogen Strategy until 2030 with an outlook until 2040” (“**PHS**”). PHS is a government strategy document that sets out the main objectives for developing a hydrogen economy in Poland and the actions needed

to achieve this. A hydrogen economy in the PHS is understood to refer to the technologies of production, storage, distribution and utilisation of hydrogen and derivatives in various sectors of the economy. Six objectives have been adopted in the strategy:

- implementation of hydrogen technologies in the power and heating sector;
- use of hydrogen as an alternative fuel for transport;
- support for the decarbonisation of industry;
- hydrogen production in new installations;
- efficient and safe hydrogen transmission, distribution and storage;
- creation of a stable regulatory environment.

To achieve these objectives, the government plans to undertake a number of activities, including creating a *Hydrogen Valley Ecosystem* as well as a *Hydrogen Technology Centre*.

It is commonly agreed that state support will be required to develop the green hydrogen market in Poland. At this point, such a support system has not yet been created. As declared in the PHS, in the next five years the government will support the research and development of low-emission processes and technologies for obtaining hydrogen, as well as launching such installations with a total power of minimum 50 MW. By 2030, the aim is to achieve an installed production capacity of 2 GW from low and zero-emission sources and processes.

In Q4 2021, a "Sectoral Agreement for the Development of the Hydrogen Economy in Poland" was also signed by 138 entities from government administration, business and science communities. The agreement aims to maximise the participation of Polish companies in the hydrogen economy procurement chain (establishing a local content indicator of not less than 50 % of the total value in 2030).

Interestingly, the Polish government declared in January 2022 that a "constitution for hydrogen" (a group of regulations) will be introduced into the Polish legal system. Since hydrogen technologies are of growing interest, the Polish legislative environment to promote hydrogen (particularly in relation to support systems) should be closely observed in the months and years ahead.

10. Support Scheme for Cogeneration

On 14 December 2018, Poland adopted a scheme to support high-efficiency cogeneration.

The scheme will support combined heat and power ("**CHP**") installations connected to district heating networks in Poland. On 15 April 2019 the European Commission has approved this scheme under EU State Aid rules. The aim of the Polish cogeneration scheme is to contribute to energy efficiency and lower levels of CO_2 emissions, in line with the EU environmental objectives and the EU climate change goals.

The scheme, with an annual budget of EUR 500 million, will run until 31 December 2028. The support may be granted to new and refurbished high-efficiency CHP installations, as well as to existing gas-fired highly efficient CHP installations. It will also be open to generators in other Member States.

The high-efficiency CHP installations benefitting from the scheme will receive support through a premium on top of the market price (cogeneration premium). The level of the cogeneration premium will be set either in a competitive bidding process or (in exceptional and clearly defined cases), determined administratively at a level covering the difference between the generation costs and the market price of electricity. The cogeneration premium will be granted until the full depreciation of the installations it supports, for a maximum period of fifteen (15) years.

In 2022, auctions for the cogeneration premium for the sale of electricity from high-efficiency CHP installations will be conducted in each quarter (in March, June, September and December). Each investor may submit more than one bid at each auction (provided that they are for different cogeneration units). The auction is won by the participants who bid for the lowest cogeneration premium (i.e. the subsidy for electricity sold from high-efficiency cogeneration) and whose bids in total do not exceed 100% of the value or quantity of the electricity specified in the auction announcement and 80 percent of the quantity of electricity covered by all submitted bids. In 2022, the maximum amount of electricity from high-efficiency cogeneration that may be sold under the cogeneration premium is 18 TWh.

For the purpose of conducting the auction, reference values are fixed. These values set the maximum amount of the cogeneration premium, in PLN per MWh, that an auction participant may bid for electricity produced from high-efficiency cogeneration, injected into the grid and sold.

In 2022, the reference value for a new cogeneration unit:

- fired with gas fuels, is PLN 320.27/MWh (approx. 70 EUR/MWh);
- fired with solid fuels is PLN 475.75 per MWh (approx. 104 EUR/MWh);
- those fired with biomass is PLN 272.03 per MWh (approx. 59 EUR/MWh);

- other than those specified in points 1 – 3, is PLN 202.18 per MWh (approx. 44 EUR/MWh).

11. Biocomponents / Biofuels

There is growing interest in using alternative fuels in Poland. The Act on Biocomponents and Liquid Biofuels (the "**Biocomponents Act**") sets the National Indicative Target ("**NIT**") – i.e. the obligation to introduce transport fuels from renewable sources (biocomponents/ biofuels) onto the market. The nominal NIT is 8.8% in 2022, 8.9% in 2023, and 9.1% in 2024.

In August 2021, the Biocomponents Act and was amended. The amendment aimed to introduce mechanisms intended to adapt legal regulations to the current situation of the fuel market following the entry into force of the so-called "fuel package", which is intended to facilitate the implementation of the NIT by entities from the fuel sector. The Biocomponents Act also provides for changes in regulations concerning the rules of production of biofuels by farmers for their own use, by enabling farmers to perform this activity without the need to possess a tax warehouse. They will be able to produce liquid biofuels for their own use outside of a tax warehouse. The new regulations of this Act also introduce a mechanism of the "obligatory blending" of bio-components in liquid fuels, whereby the entity implementing the NIT must, in any given quarter, ensure that a minimum share of bio-components is contained in liquid fuels.

In September 2021, The Court of Justice of the EU ruled that legislation requiring tax on intra-Community acquisitions of motor fuels to be paid within five days of their arrival in Poland is incompatible with the VAT Directive.

12. Significant and/or Expected Changes in 2022

12.1 New Auctions

As the European Commission approved the prolongation of the existing Auction Based Support System for the period 2022 – 2027, new auctions will be conducted. Therefore, the predictable environment for intensive development of RES Facilities will be maintained.

12.2 Changes to the Proximity Rule (Related to On-shore Wind Projects)

The Polish onshore wind energy market has effectively seen a "wipe-out" of projects that

have the necessary permits to start construction. The proximity rule (which forbids the construction of new wind farms that are closer to residential buildings than ten times the height of the turbine) in principle makes it impossible to develop any new projects. This has led to a shift in development and more and more solar projects (especially large scale) which are now being developed instead of onshore wind projects. Nevertheless, according to government officials, the proximity rule will be liberalised, which will allow Poland's onshore wind potential to once again be unlocked. According to information provided by the government, the draft amendment to the RES Act is to be submitted to the parliament in the first quarter of 2022.

12.3 Changes to the RES ACT

In February 2022, a new draft amendment to the RES Act was disclosed to the general public The draft in particular covers the modernisation of RES facilities, hybrid RES installations, biomethane, energy clusters as well as the transposition of the RED II Directive in relation to, among other things, guarantees of origin, PPA's and peer-to-peer energy trading. Further amendments to the Offshore Act are also planned.

12.4 Changes to Zoning Regulations Concerning RES

In 2022/2023, revolutionary changes are to be implemented into the Polish zoning regulatory framework. The preliminary draft of the new law disclosed to the general public indicates that the changes will also significantly affect the rules for RES development. The draft limits the possibility to locate a RES Facility only to those areas where the local zoning plan has been adopted and where this plan plainly and unambiguously allows a RES Facility to be located (over 500 KW, or 1 MW on poor quality agricultural land). Although the planning procedure is to be simplified and shortened, given the low zoning plan coverage in Poland the pool of land suitable for RES would thereby be significantly reduced (at least for the next few years, before the plans will be adopted or adjusted).

The draft mentioned above has not yet officially become a bill and the formal legislative process has not yet begun. Given the tendency to tighten spatial planning rules, it is to be expected that the rules will also be tightened with respect to RES. It is difficult to determine when the bill could come into force, but it is unlikely to happen in 2022.

12.5 New Regulations Concerning Biogas and Biomethane

On 23 November 2021, the government and stakeholders in the biogas and biomethane industry signed an "Agreement on cooperation for the development of the biogas and biomethane sectors". Its objective is to support the development of the biogas and

biomethane sectors in Poland. The signed document aims to help maximise “local content” (the share of Polish entrepreneurs and technologies in the supply chain for the construction and operation of domestic biogas and biomethane plants) as well as the development of the market and the widespread use of biogas and biomethane in the economy.

In 2022, changes to the RES Act are to be introduced. A register of biogas producers kept by the President of the URE will be launched. The new draft amendment to the RES Act will define biomethane, and agricultural biogas will be excluded from the definition of biogas.

12. 6 Changes to the Energy Law

Significant changes to the Energy Law are also planned. According to the draft amendment, this should create a legal framework for the operation of citizen energy communities. The goal is to enable electricity end-customers to participate directly in the generation, consumption, and sharing of electricity with other consumers. In addition, dynamically priced contracts are to be introduced into the Polish legal system. Only an end-customer with an installed remote reading meter will be able to take advantage of dynamic pricing offers, given the frequency of its metering compared to conventional meters. Electricity sellers that use dynamic-pricing contracts will be required to inform their end customers in a transparent and understandable manner about the costs and benefits as well as the risks associated with dynamic electricity pricing contracts.

The bill also introduces the concepts of an energy aggregator, defined as an entity engaged in aggregation and an independent aggregator (i.e. an aggregator who is not affiliated with the customer’s seller). Aggregation should be understood as an activity consisting of adding together the amount of power and electricity offered by customers, generators or holders of electricity storage facilities, taking into account the technical capacity of the network to which they are connected, for the purpose of selling or trading electricity. The bill allows aggregation services to be provided under an agreement for aggregation services between an end-customer, generator, or holder of electric energy storage and the aggregator. Aggregation is to be excluded from the obligation to prepare tariffs.

The bill also seeks to provide a legal basis for the operations of an active recipient – that is, a final customer or a group of final customers that have the ability to consume, store or sell the surplus of electricity generated on their own account and on their own territory.

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Generating Electricity from Renewable Sources in CEE & SEE

Projects, Infrastructure & Energy

Romania

Country Chapter

Wolf Theiss

Country General Information

Capital: Bucharest

Location: situated in the south-eastern part of Central Europe and sharing a border with Hungary to the northwest, Serbia to the southwest, Bulgaria to the south, the Black Sea to the southeast, Ukraine to the east and to the north and the Republic of Moldova to the east. Romania lies between latitudes 43° and 49° N and longitudes 20° and 30° E.

Surface: with 238,397 km² Romania is the largest country in South-eastern Europe and the twelfth (12^{th}) largest in Europe.

Population: 19,307,038 inhabitants.

Climate: temperate and continental, with four (4) distinct seasons.

Resources: Romania is blessed with an abundance of various natural resources, including rich farmland, water, wind, sun, biomass, geothermal potential, Black Sea access, Danube Delta, forests, fossil fuels, and deposits of a wide range of metallic ores, including iron, manganese, chrome, nickel, molybdenum, aluminium, zinc, copper, tin, titanium, vanadium, lead, gold, and silver, large deposits of pure salt, minerals, domestic raw materials to produce caustic soda, soda ash, chlorine, sulfuric and hydrochloric acid, and phosphate fertilisers, etc.

Electricity Grid: The total length of the national electricity grid is 8,834.4 km, of which 426.9 km are interconnection lines. The grid comprises overhead power lines with a nominal voltage of 750 kV, 400 kV, 220 kV, 110 kV and electrical stations having a higher voltage of 750 kV, 400 kV and 220 kV.

Electricity Transmission, Distribution, and Supply: Electricity transmission is a regulated natural monopoly and is provided by Transelectrica S.A. The electricity distribution market is divided into eight regions controlled by four distribution companies. The electricity supply is provided by more than forty 40 private providers. Electricity is traded on the Romanian electricity and gas exchange market platforms authorised by ANRE and outside the market platforms through direct negotiation between the parties.

Official EU language(s): Romanian

EU member: since 1 January 2007

NATO member: since 2004

United Nations member: since 1955

Currency: Romanian leu (RON). Romania has committed to the euro once it fulfils the necessary conditions.

Schengen: Romania is currently in the process of joining the Schengen area.

Political system, administrative organisation and economy: Romania is a semi-presidential republic with a head of government – the prime minister – and a head of state – the president of the republic. The country is divided into 41 counties and the municipality of Bucharest. Romania has an economy predominantly based on services and is a producer and net exporter of machines and electricity.

1. Defined Terms for the Main Permits required for RES-Electricity Generation Facilities

Accreditation	Administrative deed (decision) issued by ANRE, stating the right to benefit from the renewable energy sources ("**RES**") Support Scheme based on complying with all the legal requirements;
Building Permit	Administrative deed issued by the mayor of the local administrative unit where the RES-Electricity facility will be built, or by the president of the county council if the premises are located outside the city limits;
Connection Certificate	Administrative deed issued by the grid operator certifying that all technical parameters have been met and connection to the public electricity grid has been performed;
Environmental Approval	Administrative deed issued by the local Environmental Authority evidencing the compliance of the RES-Electricity facility with the environmental requirements as provided by law;
Grid Connection	Actions performed and administrative deeds issued by the grid operator to connect a new generating facility or to modify or replace the connection of a generating facility to the grid;
Guaranteed Access to the Electric Grid given to the RES-Electricity	Set of rules and technical and commercial conditions based on which RES-Electricity contracted on the electricity market shall be taken into the grid;

Liability and Responsibility for Grid Connection and/or Capacity Upgrades, Improvements or Expansion of Grid	The RES-Electricity Producers benefit from regulated access to the electricity grid of public interest. Access to the electricity grid of public interest is a regulated, obligatory service to be managed by the transport and system operator, grid operator and licence holders, as well as any person who owns an electrical distribution network located on the public domain. These entities must provide their services to all users of the electricity grid, in a non-discriminatory manner, ensuring access to the electricity grid in accordance with the law and with the grid capacity to take over the output. The expenses for modifying any grid installations are borne, according to legal requirements, based upon objective criteria. Certain categories of reinforcement work to the grid may be required (depending on the size of the RES-Electricity generating facilities) from the RES-Electricity Producers. The grid operator will refund to the RES-Electricity Producers the value of the expenses incurred for the reinforcement works upstream of the connection point, the method of compensation being agreed between the parties;
Licence of RES-Electricity Facilities	Administrative deed issued by ANRE, for the commercial exploitation of such RES-Electricity facilities, which gives a RES-Electricity Producer the right to operate the RES-Electricity facility and to sell the generated RES-Electricity on the market;
Priority Access to the Electricity Grid given to RES-Electricity	Set of rules and technical and commercial conditions, to have the possibility of taking over and selling the entire RES-Electricity output produced at a certain moment in time, depending on the capacity of the grid connection and the availability of the eligible units / resources (and as long as the national grid is not affected);
RES-Electricity	Electricity obtained from RES sources such as wind, solar, aerothermal, geothermal, hydrothermal and oceanic waves, hydraulic, biomass and biogas;

RES Support Scheme	State-aid measure notified and approved by the European Commission based on the green certificates ("**GCs**") support system applicable for all RES-Electricity capacities accredited until 31 December 2016. Under this support scheme, eligible producers of RES-Electricity ("**RES-Electricity Producers**") received a specific number of GCs, depending on the technology used, for each MW produced and delivered to the grid together with an obligation imposed on the electricity suppliers and certain producers ("**Entities**[1]") to purchase a mandatory quota of GCs. GCs can be traded on the GCs and RES-Electricity markets organised and administrated by OPCOM S.A. ("**OPCOM**"), the market's administrator and operator;
Setting-Up Permit	Establishment authorisation issued by the Romanian Energy Regulatory Body ("**ANRE**") required for creating a new RES-Electricity generation facility.

2. Envisaged need of investments in Romania

According to the new European requirements, as a Member State, Romania should work to ensure that all available planning tools for the European Green Deal are coherently deployed. Therefore, it is expected that Romania adopts a legal framework for the necessary investments to accelerate the transition to clean energy such as:

- Investments promoting the use of RES-Electricity for industrial purposes;
- Investments in development of alternative green fuels;
- High value-added investments and investments in low energy consumption, energy storage or carbon capture and use;
- Investments in the rehabilitation of the energy transportation system;
- Investments in promoting geothermal pumps for heating and cooling buildings;
- Investments in the technical configuration of gas transportation in infrastructure for transportation of biogas and green hydrogen;

1 Electricity suppliers and producers of (i) electricity purchased and used by suppliers for their final consumption as well as the electricity invoiced to end consumers; (ii) electricity used by a producer for their final end consumption, other than the electricity used for their technological consumption; and (iii) electricity used by a producer to power consumers connected through direct lines to the production facility.

- Investments in greening of transport fleets and equipping them with electrical charging stations;
- Investments to upgrade municipality heating systems;
- Investments in energy storage facilities;
- Investments in competitive electrolysis installations to obtain green hydrogen.

As per the provisions of Romania's National Plan in the field of Energy and Climate Change submitted with the European Commission, pursuant to the requirements of the Aarhus Convention, Romania proposes a clear plan to support further investments in RES-Electricity; mostly in wind and photovoltaic energy.

Romania will facilitate the funding of the following capacities to ensure a diversified and balanced energy mix with the purpose of securing energy supply by 2030:

Type of source	New production capacities (2021–2030)	Capacity (Production of electricity MWe/ Production of heat MWt)	SACET (MWe) (MWt)	Industrial clients (MWe) (MWt)
Nuclear energy	CANDU	675	-	-
Natural gas	CCGT	1600 / -	-	-
Natural gas	CHP	1,302/1,214	952 /914	350/200
Hydro (watercourse/ reservoir)	Units>10MW	1,088		
RES	Wind	2,302		
RES	Solar Photovoltaic	3,692		

Investments in the flexibility of the energy system are also necessary, in the form of operational and investment state aid. As part of these necessary investments into the flexibility of the energy system, the implementation of storage capacities for all RES-Electricity investments will also need another state aid support scheme.

The digitisation of the Romanian energy system, including the transport and distribution networks ("**smart grids**") also plays an important role in reducing own technological consumption (OTC) and increasing the production of RES-Electricity and in transforming the Romanian energy market into a "fit-for-RES" market and increasing integration of RES.

In Romania, it is estimated that in the coming years, photovoltaic capacities will be developed both in the form of medium-capacity solar parks, built on degraded or non-productive lands, and in the form of small capacities dispersed by the energy consumers who can make the transition to prosumer status.

It will also be necessary to replace electricity generating facilities that will be out of operation by 2030 with new, efficient and low emission and innovative investments in new capacities for electricity generation. To this end, the capacities anticipated from the repowering activity considered in the above-mentioned National Plan are:

- Wind energy – 3 GW installed capacity;
- Photovoltaic energy – 1.35 GW installed capacity.

This should be done in the context of achieving the objectives of energy security, competitiveness and decarbonisation of the energy sector.

The level of interconnectivity with other Member States of the national electricity system is expected to increase rapidly due to both the electricity day-ahead market and intraday market functioning in coupling modus with other European countries. This involves both domestic capacity-building investments and specific investments for transport interconnections. As a logical consequence, these will become national projects with regional impact, which will later transform into projects of common interest. They are supported by the EU and will become clusters with operational impact on energy security and commercial impact related to the single energy market:

- Black Sea Corridor cluster with direct impact on the energy system in Bulgaria and Romania; and
- The Mid Continental East Corridor cluster with direct impact on the energy system in Montenegro, Romania, Serbia and Italy.

3. Executive Summary-RES Market Status and Development of RES-Electricity Facilities

3.1 Market Overview – Factsheets

- The Romanian RES-Electricity market has developed since 2008 with the adoption of the first Renewable Energy Act ("**Law 220**") introducing the RES Support Scheme providing for GCs, long-term power purchase agreements ("**PPAs**"), available connection to the grid and merit order off-take;
- In 2011, the RES Support Scheme was approved by the European Commission and this led to a dynamic development of solar and wind projects resulting in 1,375.91 MW of solar and 3,015.93 MW of wind projects installed by 2019;
- The RES Support Scheme is applicable for those RES-Electricity Producers commissioned prior to 31 December 2016;
- RES-Electricity certified by a guarantee of origin is traded on the markets organised and administrated by OPCOM and sold to energy suppliers and/or to large intensive consumers and therefore consumed in the energy mix by both economic operators and residential consumers;
- In 2013, the government introduced measures such as support of RES annual quotas, obligation for energy agreements and GC agreements to be concluded on OPCOM, mandatory annual GC quotas to be purchased by the energy suppliers on the market and deferral from trading on the market of a number of GCs related to each RES technology. After 2014, few new projects were therefore developed on the local Romanian market;
- The development of electricity storage has developed since 2014, through the construction and operation of hydroelectric power stations with accumulation by pumping with installed power of more than 15 MW;
- Since 19 November 2014, the day-ahead market in Romania has been operating in a coupled way with the markets in the Czech Republic, Hungary and the Slovak Republic through the price coupling mechanism, known as 4M MC;
- Since 2014, based on a state aid measure approved by the European Commission, energy intensive users are exempted from fully supporting RES-Electricity and are paying at least fifteen percent (15%) of the number of GCs related to the mandatory GCs quota;
- In 2015, the RES Support Scheme was amended and reapproved by the European Commission;

- In 2016, Romania reported to the European Commission that it had reached twenty five percent (25%) of the total energy consumption from RES, exceeding the twenty four percent (24%) RES quota established as a country target for 2020 and provided no additional support scheme for new projects, except the sale of RES-Electricity on the specialised market;
- Since 2018, the Romanian government has regulated the use of RES-Electricity by prosumers, who own RES-Electricity facilities of at least 27 KW/consumption location and has given a strong signal that Romania encourages RES-Electricity consumption and energy efficiency;
- In November 2018, the Energy Minister drafted Romania's Energy Strategy 2019 – 2030 with perspectives set for 2050;
- In 2018 and 2019, the first electricity storage capacities were installed, which helps wind park and photovoltaic capacities to minimise energy losses during the charging process and adds new functionalities, including levelling of energy forecasts, recovery from power failures, as well as, capturing energy at law voltages or on cloudy days;
- Since November 2019, Romania together with Bulgaria, Croatia, Czech Republic, Hungary, Poland and Slovenia have successfully linked intraday markets with fourteen (14) countries active in operational work since June 2018.
- Under the draft of the National Plan for Energy and Climate Change for 2021-2030 with perspective 2050, at the beginning of 2020 Romania has committed that by 2030 it will have thirty-point seven percent (30.7%) of RES-Electricity in the final energy consumption.
- In 2020, ANRE approved the conditions for obtaining a licence for the commercial operation of energy storage facilities and the rules for licence holders regarding the commercial exploitation of new hydrogen production facilities. In the same year, the validity conditions for the Setting-Up Permit and licensing of new biogas/biomethane plants were also approved;
- On 1 February 2021, the following changes were introduced to the operation of the balancing market and the settlement of imbalances: (i) a 15-minute settlement time interval; (ii) a single imbalance price for settling imbalances of responsible parties; and (iii) a calculation method for dual imbalance prices (a single imbalance price for settlements between balancing parties (deficit and surplus price));
- In June 2021 the interim coupling project was launched by extending the 4M MC markets – i.e. the integration of the day-ahead electricity markets from the Czech Republic, the Slovak Republic, Hungary and Romania with those in Austria, Germany and Poland, as part of the pan-European SDAC project;

- In 2021, the Romanian government adopted amendments to the Energy and Gas Law 123/2012 to provide that wholesale electricity market transactions may also be concluded in the form of directly negotiated bilateral transactions (i.e. directly negotiated power purchase agreements (PPAs)), through bids on organised markets, including for balancing services, or import/export transactions;
- In October 2021, operations were completed for the coupling of the Romanian-Bulgarian border in the SDAC, which allowed for the integration of the Greek and Bulgarian day-ahead markets into the SDAC;
- In December 2021, the Romanian government presented its intentions to approve a new support scheme with contracts for difference ("CfD") as a means of promoting nuclear and renewable energy investments in Romania;
- On 21 December 2021, the European Commission approved an extension to the validity of the Romanian state aid scheme for a high-efficiency cogeneration bonus and related conditions;
- In March 2022, the Energy Ministry published for public debate an emergency ordinance draft prepared in relation to an institutional and financial framework to implement and manage the funds allocated to Romania through the Modernisation Fund to finance renewable energy projects.

3.2 RES Market Status, Permitting, Grid Connection, Licensing of RES-Electricity facilities in Romania

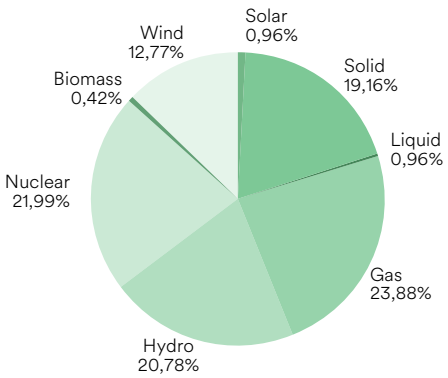
General Market Data	
RES Target by 2030	30.7 %
Net production	In 2021, overall energy production was 56.2 TWh.
Installed capacity by RES technology	Biogas – 10 MW Biomass – 109 MW Wind power – 3,015.93 MW Solar – 1,375.91 MW Small Hydro – 550.21 MW

RES Support Scheme	
Beneficiaries of RES Support Scheme	GCs are received by those RES-Electricity facilities accredited prior to 31 December 2016.
Priority and guaranteed off-take into the grid	The RES-Electricity Producers receive priority access to the grid and the sale of the entire amount of energy with the observance of the market rules.
Other incentives	○ Mandatory annual GC quotas to be purchased by the energy suppliers; ○ National annual RES quotas supported.
Other conditions	○ Licence for commercial exploitation above 1MW; ○ No installed capacity limit as long as the grid allows this from a technical point of view; ○ Sale of RES-Electricity and GCs only on the OPCOM market, excepting 3MW installed projects.
Grid connection specifics	
Approvals	○ connection to the grid is based on a solution study or solution sheet, depending on the installed capacity; ○ grid operator is responsible for drafting the solution study / sheet and for issuing the connection approval
Permitting Timing: depending on the installed capacity and connection to the grid, an investor may obtain the necessary approvals in approximately six (6) months to two (2) years.	○ building permit for civil works and connection works to the grid; ○ technical connection approval and connection agreement with the grid operator; ○ RES-Electricity capacity and related connection works' commissioning;

	○ Environmental approval and environmental authorisation; ○ Connection Certificate.
Licensing	
Procedure	○ Setting-Up Permit; ○ Accreditation; ○ Licence for commercial exploitation of the RES-Electricity facility.
Duration of administrative procedure	Within sixty (60) days from the submission of the full documentation.
Licence's validity	Twenty-five (25) years.

3.3 Generation structure of the National Power System by types of resources

Figure 1: Electricity structure by primary sources
(delivered by producers with dispatchable units)



Source: ANRE Monthly reports of producers – Electricity Market Monitoring Unit analysis

4. Key changes to the RES Support Scheme since 2016

In 2018 the RES Support Scheme experienced several amendments as per the provisions of Emergency Ordinance No. 24/2017, as approved by Law 184/2018, Emergency Ordinance No. 88/2011 and Law 360/2018:

4.1 Introduction of the concept of prosumer

A prosumer is a natural or legal person which not only consumes energy from the grid but is also a RES-Electricity Producer.

The prosumer can sell to the grid operator the RES-Electricity produced and delivered, based on a Connection Certificate obtained from the grid operator at the weighted average price recorded on the day-ahead market in the previous year, published on the OPCOM website.

4.2 Deferral of GCs generated by photovoltaic facilities

Two (2) GCs of photovoltaic facilities accredited prior to 31 December 2013 shall be deferred from being traded as of 1 April 2017 until 31 December 2020.

The above-mentioned GCs and the GCs deferred until 31 March 2017 shall be recovered starting from 1 January 2021, in equal monthly instalments until 31 December 2030.

4.3 Trade of the deferred GCs after the expiration date of the Accreditation and Licence of RES-Electricity Facilities

RES-Electricity Producers have the possibility to receive those GCs deferred from trading and to trade them after the Accreditation and Licence of RES-Electricity Facility will expire.

In all cases when the Accreditation or the Licence of a RES-Electricity Facility will expire, the RES-Electricity Producers are entitled:

- to obtain the GCs deferred from trading; and
- to trade until 31 March 2032 those GCs issued for their own production within the period of the Accreditation's validity.

4.4 GCs and electricity transactions between small RES-Electricity Producers and electricity suppliers

There is the possibility of concluding bilateral GC agreements and/or electricity agreements between small producers with an installed capacity of 3 MW and the electricity suppliers of the final consumers outside OPCOM markets.

4.5 All the GCs issued between 1 April 2017 and 31 March 2031, including all the deferred GCs will be guaranteed to be taken over on the market

This would eliminate the risk that RES-Electricity Producers will not make use of their GCs due to their expiration. The only condition is for the annual electricity consumption to not fall under the average value registered between 2017 – 2022.

4.6 The GCs may be traded only once between the RES-Electricity Producer and the electricity supplier

There is only one exception when the RES-Electricity Producer faces a shortfall of promised GCs for GC sale and in this case may buy the GC difference on the centralised markets.

4.7 Payment of EUR 70 by the electricity suppliers for non-fulfilment of annual mandatory GCs quota

Since 2018, RES-Electricity Producers and suppliers who do not fulfil the annual mandatory GC quota shall be required to pay the equivalent value of the non-purchased GCs to the Environmental Fund Administration at EUR 70 for each non-purchased GC, calculated in lei at the average exchange rate set by the National Bank of Romania for the previous year.

4.8 GCs will receive value in the account at the trading time

The GCs shall be registered in the RES-Electricity Producers' accounts only at the time of their trading on the markets and not at the issuing time. The change in registration will have direct impact on the profit tax related to GCs.

The measure is applicable only for GCs issued after 31 March 2017.

4.9 Limited financial impact of RES Support Scheme on the end-customer's electricity invoice

By law, the economic impact of the RES Support Scheme on electricity invoices of end-customers is limited through:

- a new calculation of the value of GCs to be used by electricity suppliers in the electricity invoice of end-customers;
- the maximum trading value for a GC is reduced to EUR 35/GC compared to EUR 55/GC;
- the financial support of end-customers will not exceed more than EUR 14.5/MWh in 2022.

Electricity suppliers shall need to calculate separately the GC value in the electricity invoice.

The value shall be calculated as the product of the GC mandatory quota, invoiced electricity quantity and the GC price.

The GCs price will be calculated as the weighted average price of the transactions on the spot GC market and, subsequently, at the time of the electricity invoice's settlement, at the weighted average price of GCs used by the electricity supplier to meet the mandatory GC quota for the previous year, which may not be higher than the weighted average price of GCs traded on the GC spot market in the previous year.

4.10 Electricity suppliers required to purchase fifty percent (50%) of the number of the GCs necessary for fulfilment of the GC quota

Companies with an obligation to purchase GCs on the market should purchase at least fifty percent (50%) of the GCs necessary for fulfilment of the GC quota from the GC centralised spot market.

5. Significant and/or expected changes in 2022

5.1 A new support system for RES-Electricity: contracts for difference

There is a Romanian government initiative to put to public debate by May 2022 a new support mechanism such as Contracts for Difference ("**CFDs**") to encourage investments in low-carbon technologies necessary for the Romanian energy sector. The Romanian authorities organised public debates in this respect in December 2021 and has collected views and position papers from the industry and non-governmental organisations.

The implementation of a CFD mechanism can provide additional benefits and an attractive and predictable environment for investors because it guarantees an agreement for a determined period, provides a reasonable degree of flexibility for project developers and protection against unforeseen changes and brings greater security and stability to revenues by eliminating exposure to volatile wholesale prices.

5.2 CfD overview

Two-way support payment, which will be the difference between the strike price and the market reference price:

- The CfD Counterparty pays the Generator when the market reference price is below the strike price;
- The Generator pays the CfD Counterparty when the market reference price is above the strike price.

The total revenue of generators per unit of electricity is given by:

Actual Sale Price + (Strike Price - Market Reference Price)

The key documents for implementing CfD are:

- The CfD Law:
  - sets out the legal basis for the implementation of the CfD scheme;
  - this is the primary law which will be supported by secondary instruments amending existing legislation.

- CfD Contracts:
  - are the bilateral, private-law contracts which will set out the detailed terms and conditions for the CfD
  - support between a generator and the CfD Counterparty
  - comprises 1) a “front end” contract agreement specifying generator and project details; and 2) standard terms and conditions as issued by the Ministry pursuant to the CfD Law.
- Auction Framework (issued via secondary legislation)
  - sets out the technical procedures which apply to CfD applications and auctions.

5.3 Overview of the auction process

5.3.1 Eligibility requirements:

Eligibility criteria	Requirement
Eligible technologies	Will vary by CfD auction; will include onshore wind and solar
Minimum capacity	No minimum specified
Grid Connection	Grid connection permit
Supply chain plan	Statement providing an overview of the supply chain for the Project
Bid bond	Payable by all bidders and refunded after closure of the auction and award of CfDs.

5.3.2 Review of bids and allocation of CfDs:

- Bidders submit a sealed bid specifying the technology, capacity and offer price;
- The CfD scheme operator ranks all bids from eligible bidders by offer price;
- If a bid violates a capacity constraint, several options exist for that marginal bidder (e.g. the bidder could be asked to accept a reduction in their capacity such that the exact allocation constraint is met);
- If there is a tie in the offer price of two marginal bidders, preference should be given to the bidder with the smaller offered capacity.

5.3.3 CfD offer and signature:

- CfD contracts will be offered to successful generators within five (5) working days from the auction closure;
- CfD contracts must be executed by the generator within ten (10) working days of their issue;
- Where a generator fails to execute its CfD contract within this period, the CfD will be revoked and the CfD scheme operator will draw on the bid bond.

The CfD scheme will be open only to new generation projects and will not be available for existing facilities.

It is expected that the Romanian government will launch normative documents regarding the CfD in the spring of 2022 for public debate and that the legislation will be adopted by the end of 2022.

5.4 New RES-Electricity share in final consumption promoted by Romania

Under the National Plan for Energy and Climate Change for 2021–2030, Romania has committed that by 2030, it will have thirty point seven percent (30.7%) of RES-Electricity in its final energy consumption, however the European Commission requested in June 2019 a higher RES-Electricity quota of thirty four percent (34%).

Other measures proposed to be adopted by Romania to reach the assumed RES-Electricity target and energy efficiency target as recommended by the European Union are (i) to include RES-Electricity in public transportation; (ii) to develop policies and measures that would lead to further energy savings by 2030; (iii) to specify measures to support the achievement of the objectives in the field of energy security, regarding the diversification of energy sources and

the reduction of the energy dependency; (iv) to develop liquid and competitive wholesale and retail markets, both by stimulating competition within the country and by removing barriers to cross-border trade, (including export restrictions); and (v) to enhance regional cooperation with neighbouring Member States with regard to natural gas and electricity infrastructure, RES-Electricity, energy efficiency and research, innovation and competitiveness.

5.5 National Energy Strategy 2020 – 2030

Given the pressure of the new targets imposed by the Green Deal Act, it is expected that the new national energy strategy will preserve and improve in terms of real measures: the generation of RES-Electricity based on low-carbon technologies, large scale energy storage, energy efficiency in buildings, the use of electric vehicles in public transportation, an increased share of RES-Electricity in heating and cooling, and necessary investments in the EU electricity interconnection infrastructure.

5.6 Amendments to the energy and gas law 123/2012 ("Law 123/2012")

A new draft law to amend and complete some of the most important provisions of Law 123/2012 is under review in the Romanian Parliament, awaiting approval from the speciality commissions of the Deputies Chamber.

Relevant for the promotion of RES-Electricity is one important amendment regarding long-term PPAs. As provided by the draft law, specific products may be designed for market participants which will be characterised by (i) an hourly power range over the quantity offered in the PPA within a maximum percentage set by ANRE; and (ii) updating the award price for a PPA based on a formula which contains clear terms and factors on the basis of updated public indicators.

6. Electricity Storage and Applicability in Romania of such Storage Technologies

The national electricity system ("**NES**") should maintain a balance between generation of electricity and demand uncertainty.

As more RES-Electricity will flow through grids, the more flexible these grids must become. This will be achievable only with the help of storage technologies.

Energy storage is increasingly being seen as a key cornerstone and enabler of the transition to RES-Electricity worldwide.

Law 155/2020 introduced specific provisions for new storage facilities and rules for their management. ANRE included references to storage capacities for energy producers in their recent provisions about licenses.

The NECP lists storage as an instrument to improve energy security. Transelectrica's system adequacy assessment study mentions a minimum 400 MW of needed storage capacity.

The first battery energy storage station in Romania was inaugurated in 2018 in Constanta by EDP Renewables S.A. The Cobadin 1 wind energy storage system with an installed capacity of 1 MW will help the wind park to level the energy forecast, and therefore the power generation fluctuations.

The second energy storage capacity in Romania was installed by the same company in December 2019. The battery energy storage system is connected to the solar photovoltaic installation near Băileşti in Dolj county.

EDP Renewables S.A. has installed an innovative energy conversion system that connects photovoltaic panels and uninterrupted current batteries with an alternative current transformer and a lithium-ion battery, as well as a system that monitors the entire process.

The storage system is remarkable mainly because of its direct connection installation, which minimises energy losses during the charging process and adds new functionalities, including recovery from power failures, as well as capturing energy at low voltages or on cloudy days.

It is expected that an increasing number of RES-Electricity Producers in Romania will adopt the solution of batteries in order to improve energy forecasts and to reduce load imbalances that could occur during operation of the RES-Electricity facilities.

7. Support scheme for cogeneration

Romania implemented a support scheme for the promotion of high-efficiency cogeneration, which was approved by the European Commission through Decision No. 437/2009.

The high-efficiency cogeneration capacities installed in Romania totalise 1,474.95 MW.

The high-efficiency cogeneration of heat and power ("**CHP**") systems injecting electricity into the national grid receive operating support provided that the electricity is produced from high-efficiency cogeneration, as defined in the Community guidelines on state aid for environmental protection.

The initial support scheme was applicable for the period 2010 – 2023, but the European Commission extended its application in its Decision no. 9774 dated 20 December 2021.

The amendments to the scheme concern: (i) the duration of the CHP support scheme for selected beneficiaries; (ii) an increase in the support scheme budget; and (iii) an amendment to the rules applicable to companies experiencing financial difficulty. The remaining elements of the existing aid scheme, as approved in the Commission decisions of 2009 and 2016, remain unaltered.

The level of the bonus received by the producers for each MWh produced in high efficiency cogeneration capacities and delivered in the grid is set annually by ANRE.

The bonus covers the difference between the production costs of electricity from high efficiency CHP and the market price of electricity, including a reasonable return on investment. The premium is calculated ex-ante separately for three types of CHP: (i) solid fuel-based CHP; (ii) CHP fuelled by gas supplied directly through the transmission network; and (iii) CHP fuelled by gas supplied through the distribution network.

The bonus value, the electricity and thermal energy prices are adjusted annually based on average annual fuel prices, the annual average CO2 certificate price, the average annual electricity trading price on the day-ahead market and inflation coefficient of variation, and if they lead to a variation of the bonus level, the prices of thermal or electrical energy by more than 2.5 %.

The bonus is calculated based on the following formula:

Bonus = (Total costs – Revenues el. – Revenues h) / Electricity

where:

Total costs = variable costs + fixed costs + return on capital

Revenues el. = income from the sale of the electricity delivered by a typical CHP plant at the electricity market price.

Revenues h = income from the sale of the heat produced in a typical CHP plant at the heat price.

Electricity = electricity delivered annually by the CHP plant.

8. Offshore Wind

There have been several initiatives by state-owned companies and private companies to explore the possibility of investing in offshore wind capacities in Romania.

A draft law for offshore wind energy was approved by the Romanian Senate at the end of 2020. The administrative process is currently ongoing to obtain approvals from specialist commissions in the Romanian Chamber of Deputies.

The draft law lays the ground-rules to build and commercially operate offshore wind parks. The Ministry of Energy plays an important part in this process, as it is tasked with issuing licenses and coordinating with other authorities for the full permitting process.

8.1 Subsidies for offshore wind capacities

Offshore wind parks set up through a competitive procedure benefit from subsidies under the CfD mechanism.

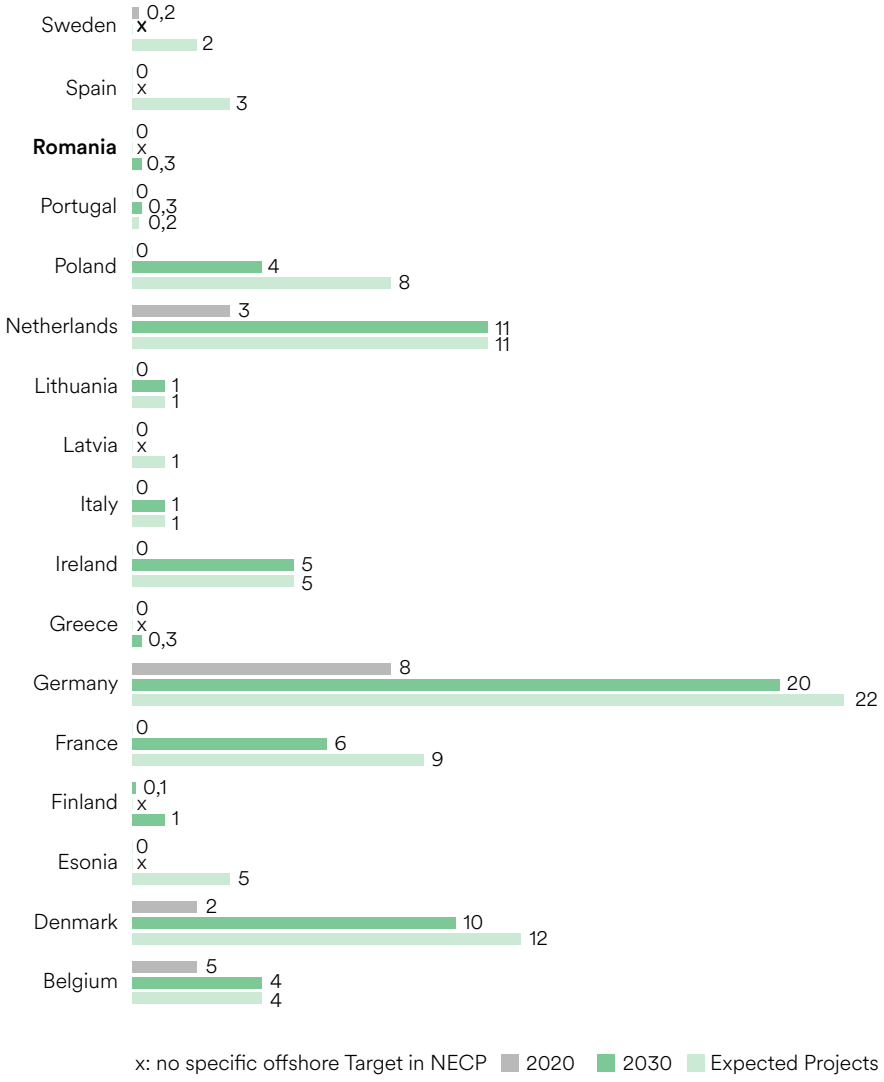
Offshore wind parks set up through an open procedure benefit from a premium of EUR 0.025/KWh added to the electricity market price. This subsidy is capped at EUR 0.060/KWh. If the electricity market price is above EUR 0.035/KWh, the premium is reduced accordingly. In addition to the premium, offshore wind parks can be compensated for balancing costs in the amount of EUR 0.020/KWh for 20 years commencing the grid connection date.

8.2 Building and exploitation licensing

There are two ways to obtain building and exploitation licenses, namely though competitive auction procedures and open procedures. The following four licences must be obtained:

- licence to conduct investigations, which is valid for one (1) year;
- licence for wind park construction, which is valid throughout the construction phase;
- licence for electricity generation, which is valid for twenty-five (25) years commencing the grid connection date; and
- authorisation for electricity generation (for installed capacities above 25 MW).

Figure 2: Offshore Wind Capacity
planned in the EU (GW)



Sources: JRC analysis of NECPs and future expected offshore wind projects (2021)

9. Green Hydrogen

In Romania, the Dobrogea region (near the Black Sea) meets the prerequisites to host a hydrogen technology cluster, as it has both exceptional capacity to produce clean hydrogen through wind and potentially significant hydrogen demand from existing refineries, the steel industry, district heating, urban public transport and decarbonising port activities, as well as naval transport in the port of Constanta.

Law 155/2020 aligned Romania with EU legislation by defining hydrogen producers and regulating its commercial exploitation.

In 2021, ANRE also introduced rules for Setting-Up Permits and commercial exploitation licences.

The licence gives investors the right to collect tariffs for services provided in connection with the operation of hydrogen installations, including hydrogen storage facilities.

Of particular importance for the authorities seems to be the establishment and maintenance of protection and safety areas associated with the normal operation of hydrogen production facilities.

9.1 Support scheme for green hydrogen

The Romanian Ministry of Energy has recently opened public consultation on the state aid scheme targeted at boosting investments in the construction of green hydrogen production capacity in electrolysis plants, which is financed through the National Recovery and Resilience Plan ("**NRRP**"). This draft state aid scheme aims to support the expansion of green hydrogen production capacity, reduce greenhouse gas emissions and increase the share of renewable energy sources in Romania's energy mix.

The projects eligible under this scheme are expected to enable the installation of at least 100 MW of green hydrogen production capacity in electrolysis plants and to produce at least 10,000 tons of hydrogen annually from renewable sources (wind, hydro or solar power) by 31 December 2025.

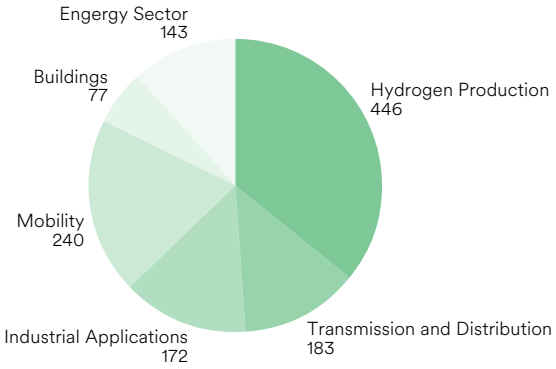
Moreover, as part of the green hydrogen technology process, storage capacity must be proportional to production capacity. However, during the project's implementation, storage capacity expenses of up to 20% of the cost of the production facility will be reimbursed.

As regards the amount of aid granted, the total estimated budget rises to the Romanian-leu equivalent of EUR 149.5 million, consisting of EUR 115 million in non-reimbursable European funds provided by the Recovery and Resilience Mechanism under the National Recovery and Resilience and EUR 34.5 million in national funds by applying an over-contracting percentage of 30 %.

The maximum aid that can be granted to any one company is EUR 50 million. The difference between this and the total value of the project must be met by the beneficiary. In addition, the state aid for investment granted under this scheme cannot be cumulated with any other state aid for the same investment, including de minimis aid, for the same beneficiary and the same eligible expenditure.

This state aid scheme for investments in the construction of green hydrogen production capacity in electrolysis plants will apply from the date of its entry into force until 30 June 2024.

Figure 3: Evolution of the hydrogen project pipeline in Europe (GWe)



Sources: Project pipeline of the European Clean Hydrogen Alliance, EU Commission

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Generating Electricity from Renewable Sources in CEE & SEE

Projects, Infrastructure & Energy

Serbia

Country Chapter

Wolf Theiss

Country General Information

Capital: Belgrade

Location: Serbia is a landlocked country situated at the crossroads between Central and South-Eastern Europe. It lies in the southern Pannonian Plain and the central Balkan Peninsula, which links Western and Central Europe with the Middle East, Asia and Africa. Serbia borders Hungary to the north, Romania to the northeast, Bulgaria to the east, Croatia and Bosnia and Herzegovina to the west, Montenegro to the southwest, and North Macedonia and Albania (through the disputed territory of Kosovo) to the south. It lies between latitudes 41° and 46° N and longitudes 18° and 23° E.

Surface: At 88,499 km^2 (77,589 km^2 excluding Kosovo), Serbia is a mid-sized European country. Belgrade, the capital of Serbia, is one of the largest cities in South-Eastern Europe.

Population: estimated at 6,899,126 (excluding Kosovo)

Climate: Temperate continental climate with gradual transitions between the four seasons of the year

Resources: Natural resources include rich and arable farmland, water (the river Danube, a variety of other rivers, lakes, underground natural and thermo-mineral water sources), wind, sun, forests, oil, gas, coal, iron ore, copper, zinc, antimony, chromite, gold, silver, magnesium, pyrite, limestone, marble and salt. The Serbian countryside is highly diverse in flora and fauna, making up a significant part of the richness and diversity of Europe's natural heritage. Serbia has an exceptionally varied terrain: rich fertile plains in the north, limestone ranges and basins in the east, and ancient mountains and hills in the southeast.

Electricity Grid: The total length of the national electricity grid comprising overhead lines is 10,914.01 km (9,861.78 km excluding Kosovo). The transmission system in Serbia consists of overhead power lines, cables, substations and switching stations with a nominal voltage of 400 kV, 220 kV and 110 kV, besides the 110/kV substations that form part of the distribution system. The transmission system is connected to production facilities on the one hand and to distribution system and customer facilities (industrial complexes and railway transformer stations). on the other. The transmission system is interconnected with all neighbouring countries.

Electricity Transmission, Distribution and Supply: Electricity transmission is operated by state-owned company Akcionarsko društvo Elektromreža Srbije Beograd (**EMS**). In December 2020, the electricity distribution network and system operator, Elektrodistribucija Srbije d.o.o. Beograd (**EDS**), was separated from Javno preduzeće Elektroprivreda Srbije (**EPS**). As a consequence, the electricity distribution system is now operated by EDS, which has branch offices in several cities, while public supply is carried out by EPS through its branch offices. EPS's branch office EPS Snabdevanje d.o.o. acts as a guaranteed supplier of households and small consumers and also supplies commercial customers. At 23 March 2022, there were also 61 other local company licensed to supply electricity and 69 local and foreign companies registered for the wholesale of electricity in the Serbian market.

Official EU Language(s): Serbian

EU Member Country: Candidate country to join the EU.

NATO Member: no

United Nations Member: A founding member of the United Nations as the legal successor to Yugoslavia. As Serbia, it has formally been a member since 2000.

Currency: Serbian Dinar (RSD)

Schengen: Serbia is not part of the Schengen area. However, since 30 October 2014 foreigners have been allowed to enter, transit and stay on Serbian territory under specified conditions without holding a Serbian visa if they have a valid Schengen visa.

Political System, Administrative Organisation and Economy: Serbia is a parliamentary republic with a political system divided into legislative, executive and judiciary branches. A unicameral national assembly represents the legislative body, the Prime Minister is the head of the government and the President of the Republic is the head of state. Serbia is a unitary state, with two autonomous provinces (Vojvodina province in the north and the Kosovo and Metohija province in the south), 29 administrative districts and 198 municipalities, cities and city municipalities. Serbia has an economy predominantly based on services and is an exporter of raspberries, steel, refined copper, automobiles, etc. Its strongest sectors are energy, manufacturing, automotive and mining.

1. Main Permits required for RES-Electricity Generation Facilities

Energy Permit	An Energy Permit (*енергетска дозвола*) is required to construct industrial plants that exploit natural resources or to conduct energy activities, except in PPP projects. Obtaining an Energy Permit is a precondition for obtaining a Construction Permit, where applicable.
Water Conditions; Water Consent	If the energy plant uses water from rivers, lakes or underground rivers, or releases water or other materials into them, a Construction Permit will be issued only after being granted Water Conditions (*водни услови*) and then Water Consent (*водна сагласност*).
Construction Permit	Depending on the capacity of the power plant, a Construction Permit (*грађевинска дозвола*) is issued by the local municipality, the Ministry of Construction, Transportation and Infrastructure, or the Autonomous Province of Vojvodina.
Environmental Impact Assessment; Consent	An Environmental Impact Assessment (**EIA**) may be required in some cases. The EIA and Consent thereto are mandatory for constructing an electricity or heat energy plant exceeding 50 MW.
Water Permit	If the energy plant uses water from rivers, lakes or underground rivers, or releases water or other materials into them, the Water Permit (*водна дозвола*) is the third step towards obtaining a Building Use Permit, coming after the first two steps of being granted the Water Conditions and Water Consent.
Building Use Permit	The Building Use Permit (*употребна дозвола*) certifies that the plant, as constructed, is in full conformity with the Construction Permit and other technical requirements. It is issued by the same authority that issued the Construction Permit.
Energy Licence	Electricity generation is subject to obtaining an Energy Licence from the Energy Agency. This Energy License can only be issued to a Serbian legal entity and is non-transferable.

2. RES Potential in Serbia

In the spring of 2021, Serbia entered a new chapter in RES by enacting the new Renewable Energy Sources Law (**RES Law**), which partially transposes EU Directive 2018/2001/EU (RED II). At the same time, amendments were made to the existing Energy Law, and a new Energy Efficiency Law and Climate Change Law were enacted.

The full transposition of RED II has not been completed and as at the publication date of this Guide the full suite of secondary legislation has not yet been enacted. Nonetheless, the new legal framework represents a significant step forward in green energy transition in Serbia and has already sparked interest for new investments.

The new RES Law introduced auctions for premiums and allowed citizens and companies to become prosumers.

Serbia has very ambitious targets for reducing CO_2 emissions. In its declaration on the EU Green Agenda for the Western Balkans it has made commitments to phase out coal and it has already met the opening energy benchmarks. However, more concrete steps are needed. The Serbian National Action Plan for RES, a strategic document adopted back in 2013, envisaged a 27% share of RES within the final energy consumption in Serbia by 2020. This target was not achieved. The data available for 2019 shows that RES accounted for only 21.44 % of gross final energy consumption – below even the interim target of 25.6% for that year.

The national energy strategy estimates that approximately EUR 200 million of investment is needed to reconstruct and modernise the district heating system and to achieve the shift from fossil fuels to RES (predominantly, biomass and natural gas). In this respect, the share of oil in comparison to 2010 (baseline year) should decrease from 28.7% to 14.6% by 2030 and the share of coal should decrease from 23% to 16.5%. By contrast, the share of natural gas should increase from 48.3% to 56.4% and biomass from 3.2% to 12.5% by 2030.

Serbia is also party to the Paris Agreement of 25 July 2017 and initially committed to a nationally determined contribution (**NDC**) of a 9.8% decrease in emissions by 2030 compared to its 1990 levels. Although it was announced that Serbia would increase its NDC to 33.3%, this revision was not accomplished by the time of the 2021 United Nations Climate Change Conference in Glasgow.

Reports on Serbia's progress towards EU membership also emphasise the need for investments particularly targeted at helping rural communities develop and diversify. RES potential in Serbia remains considerable, with biomass amounting to 60% of RES potential

and 30 % consisting of hydropower potential. By June 2021, total installed wind power capacity exceeded 400 MW, while the total capacity of other renewable sources (not including large hydropower plants) is about 140 MW. Based on the 2015 Energy Strategy of the Republic of Serbia, the available potential of RES in Serbia is estimated to be 5.65 million tons of oil equivalent.

Investments are no doubt needed and many projects are already in the pipeline. But these will require further development of the transmission and distribution grid to connect both new electricity generation plants and industrial and commercial prosumers. Balancing costs and responsibility are an area of particular focus at the time of publication of this Guide. There is also a high demand for intelligent transport systems in line with the EU's sustainable and smart mobility strategy. A key point on Serbia›s agenda is the modernisation and improved energy efficiency of large industrial complexes around the country, particularly those operated by state-owned enterprises as a legacy from the former Yugoslavia.

Serbia is already home to many established foreign investors in the energy sector, including Fintel Energia, RWE Inoggi, Itochu, MET Group, Taaleri, REV Canada, DEG, Secci, Enlight Renewable Energy, Elicio and others. The appetite of local Serbian investors, particularly for prosumer-related or energy efficiency projects, is increasing. RES and energy efficiency projects in Serbia are regularly financed by various lenders, from private equity funds and commercial banking syndicates, to international financial institutions such as the EBRD, IFC and the OEEB.

At present, many wind projects are in various phases of development around the country, with several large wind projects having become fully operational in the past few years. The current focus, however, is on solar, since this resource remains largely underutilised and underdeveloped. Biomass remains a significant energy potential with an estimated 3.448 million tons, or approximately 60 % of the total renewable energy potential of Serbia. Biomass is available throughout Serbia, mostly located in the rural areas of central Serbia and in Vojvodina province.

The total hydro energy potential in Serbia is about 25,000 GWh/year. Over 70 % of this potential is concentrated in several large rivers: the Danube, the Drina, the Velika Morava, the Lim and the Ibar. By some estimates there are more than 100 small-scale hydropower plants currently operating in Serbia while more than 700 are designed or in construction. However, due to active and widespread criticism of small-scale hydro power plants (given their limited benefits and the expected detriment to Serbian flora and fauna) few projects on smaller rivers are expected. Not only were only 25 MW of hydro capacities added in 2020, but many small-scale hydro projects are frequently put up for sale due to investors› difficulties in obtaining financing or meeting legal requirements.

After a very prolific period of investment (particularly for wind projects), the Covid-19 pandemic may have slowed down licensing, construction and procurement activities. Nonetheless, much is expected in the coming months from the development and application of the new RES Law and its secondary legislation. At the time of drafting this Guide, the market is waiting for its first auction, and the quota for wind projects is now set at 400 MW.

3. RES Market Status – Executive Summary

3.1 Market Over the Years

- The first Serbian Energy law was adopted in 2004 with the goal of reforming the energy sector and harmonising regulations with EU legislation. Subsequently, a new law was adopted in 2011, promoting electricity generation from renewable energy sources and advancing the development of the Serbian energy market in harmonisation with the EU market;
- In 2009, the feed-in tariff model was introduced for RES electricity generation. Since 2010, this has led to a continuous increase in the capacities for power generation from RES;
- In 2012, Serbia assumed an obligation towards the Energy Community to reach a 27% renewable energy share within gross final consumption of energy, as well as a 10% RES energy share within transport by 2020;
- In 2014, a renewed Energy Law transposing Directive 2003/54/EC concerning common rules for the internal market in electricity and Directive 2001/77/EC on the promotion of electricity produced from RES came into effect. This 2014 law provided for the implementation of all measures envisioned under the European Union's Third Energy Package (which is also Serbia's commitment under the Energy Community Treaty) ("**2014 Energy Law**");
- This 2014 Energy Law kept the feed-in tariff model, but introduced several novelties such as the possibility for RES producers to enter into a power purchase agreement ("**2014-Model PPA**") with the guaranteed public supplier at the moment they obtain the temporary status of privileged producer and to sell their entire electricity output to the guaranteed public supplier at the feed-in tariff locked in at the time of signing the PPA (with annual indexation) for a 12 year period;
- RES producers also became entitled to build the grid connection point themselves at their own expense and on behalf of the transmission system operator as the investor which facilitated construction;

- In 2015, Serbia adopted its Energy Strategy, which sets out targets and areas of special interest until 2025, with projections until 2030;
- In April 2016, Serbia signed the 2015 Paris Agreement, which was later ratified by parliament and came into force on 24 August 2017;
- During 2016 and 2017, under the feed-in tariff model, an additional 92.3 MW of RES plants were connected to the grid and by December 2018 another 222 facilities for generation of RES were built. In 2021 alone, a total of 1,847,657.74 MW/h of electricity were generated in Serbia from RES producers benefiting from these feed-in tariffs;
- The allocation of electricity generated under the feed-in tariff model during 2021 can be illustrated as follows:

Figure 1: Structure of electricity generated in the incentives system in 2021

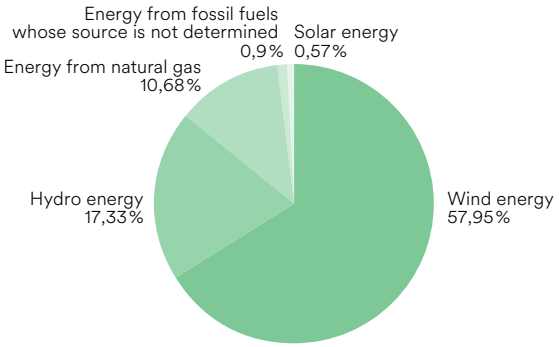
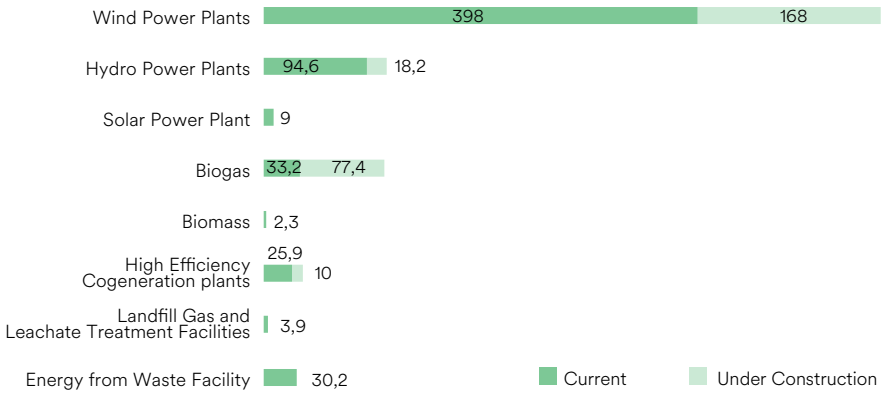


Figure 2: Capacity (MW)



- On 15 March 2020, a state of emergency was declared in Serbia due to the outbreak of Covid-19 and was in effect until 6 May 2020. During this time, EPS – the public supplier – notified all RES producers benefiting from feed-in tariffs that a *force majeure* event had occurred under the 2014-Model PPAs in view of the difficulties envisioned in the collection by EPS from end-customers. This led to much public debate among RES Producers (particularly, those using biomass) on the justification for this move;
- In November 2020, Serbia signed the Sofia Declaration on the Green Agenda for the Western Balkans, which forms part of the EU's initiative to include Western Balkan countries in the efforts to make Europe carbon neutral by 2050. Following this, Serbia also enacted its Law on Climate Change with the key goal of decarbonising the industry and reducing greenhouse gas emissions;
- On 30 April 2021, the long-awaited amendments to the Energy Law came into effect with the new and separate RES Law. The new RES Law partially transposes the EU RED II Directive 2018/2001/EU and regulates: (i) guarantees of origin of electricity; (ii) RES electricity generation for own consumption and possibility to achieve prosumer status; (iii) use of RES in heating and transportation; and (iv) international cooperation in the field of RES;
- The key change in the new RES Law is the introduction of market premiums awarded in a public auction process, compared to the previous feed-in tariff model. Feed-in tariffs are still available, but only for wind power plants of up to 3 MW, for other RES facilities of up to 500 KW, or for demonstration projects (i. e. non-commercial innovative projects demonstrating new technology).

3. 2 RES Market, Permitting and Grid Connection

Serbia is continuously improving its regulatory framework and instituting more and more e-government processes. The efficiency of these administrative processes has naturally increased over time as well. Focusing on construction, the average time for deciding on the 13,829 construction permit applications in the monitoring period between 1 January 2016 and 31 December 2018 was 10 calendar days. This is a clear indicator of the success of the online Unified Procedure portal of the Serbian Business Registers Agency compared to the previous arduous paperwork process which took months to complete with various authorities.

In our practice, we have seen a continuous increase in the number of services available electronically, but also in the preparedness of administrations and authorities to respond to electronic applications. In the past few years, the Serbian Energy Agency in particular has established a channel of communication for receiving electronically signed documents. Applicable rulebooks sometimes allow the Energy Agency or EMS – the Serbian transmission system operator – to receive uncertified copies or even documents in the English language.

The RES Law aims to complete the full digitalisation of all procedures with the Ministry of Mining and Energy.

Despite these positive developments, Serbia remains a very formalistic legal environment. Authorities still require documents that must strictly carry a paper notarisation and apostille. Hard-copy translations by certified translators into Serbian are almost always required. Most regulations still grant vast discretionary authority to request additional documents and information which often prolongs the licensing process. In its 2021 Report on Serbia, the European Commission noted that no further progress had been made to simplify administrative procedures in 2021, although an electronic system for issuing, transferring and cancelling of guarantees of electricity origin was functional.

Moving away from licensing, a key point for project development in Serbia, particularly for wind and solar projects, is ensuring that the required real property rights are in place. This is often problematic in practice due to unresolved ownership issues or numerous private individual owners, as is usually the case in rural areas where these projects are typically developed. Negotiations with the respective owners are often unpredictable and require a tailored approach on a case-by-case basis.

With regard to connection infrastructure, it should also be noted that the permits and real property rights required for its construction must be obtained in the name of the grid operator (i.e. transmission or distribution system operator). This requirement is eased by the legal possibility for the investor and future power producer to actually design and perform the construction works, even if the project is formally in the name and on behalf of the grid operator. Therefore, the coordination of activities with the grid operator in this process is of considerable importance. The contracts with grid operators for this purpose are concluded based on their standard templates and are generally not negotiable.

General Market Data	
RES Target 2020	27 % – not achieved.
Overall, Installed General Capacity Including RES (Overall Production)	In 2019, overall electricity production was 34.52 TWh

Installed Capacity by Technology	Wind – 566 MW Hydro – 113 MW Biogas – 111 MW Waste and landfill gas – 34.1 MW Solar – 9 MW Biomass – 2.3 MW
Key Authorities	Line ministry: Ministry of Mining and Energy Regulator: Serbian Energy Agency (**AERS**) Transmission System Operator: Elektromreža Srbije (**EMS**) Distribution System Operator: Elektrodistribucija Srbije (**EDS**) Public supplier: Elektroprivreda Srbije (**EPS**)
RES Support Schemes	
Feed-in Tariffs under 2014 Energy Law	Under the 2014 Energy Law, feed-in tariffs were available until the end of 2019 and were awarded to RES Producers. Many RES Producers in the market are still under the 12-year term of the 2014-Model PPA and benefit from these feed-in tariffs for the duration of those PPAs.
Feed-in Tariffs under Current RES Law	Currently available for: ○ wind power plants of up to 3 MW; ○ other RES facilities of up to 500 KW; and ○ demonstration projects.
Market Premium under Current RES Law	This is a support mechanism in the form of an addition to the market price of the electricity that the RES Producer delivers to the market, expressed in euro cents per KWh.

	Market premiums are awarded in an auction process based on the available quotas prescribed by the Serbian government. The premium can be obtained for all or part of the RES Facility's capacity and is paid monthly based on the RES-Electricity delivered to the grid.
Auction Process for Market Premium	The right to a market premium is acquired in an auction procedure conducted by the Ministry. Phases: qualification, bidding, and selection of best bidder. In the bidding phase, participants compete to offer the lowest market premium without exceeding the established maximum incentive purchase price. Participants are ranked from the lowest to the highest market premium (i.e. electricity purchase price) and are listed in that order until the quota for their type of facility is full. No auctions had yet been held prior to this Guide being published. The quota for wind projects was determined at 400 MW. The Serbian Energy Agency has published its methodology for determining maximum prices.
Market Premium Agreement	The model Market Premium Agreement is prescribed in a separate decree as a contract for difference. Unlike the 12-year 2014-Model PPA, the market premium agreement is entered into between EPS and the RES Producer for an incentive period of 15 years from the first market premium payment (or first negative premium).
Assumption of Balancing Responsibility	Unlike under the 2014 Energy Law, the balancing responsibility is now only assumed by the public supplier until a liquid intraday market is established in Serbia.
Other Incentives	Other incentives to RES Producers include: ○ Guarantees of origin for power produced from RES, issued by the transmission system operator at request ○ Right of priority access to the transmission/distribution/ closed distribution system

Grid Connection Specifics	
Specifics	○ The grid (distribution or transmission) operator is the owner of the connection infrastructure, and all permits and licences for the connection infrastructure are issued in the grid operator's name. ○ Access to the grid is granted by the grid operator EMS.
Stages of Grid Connection Process	○ Opinion by the (distribution or transmission) grid operator on the conditions and possibilities for connection; ○ Power plant connection study; ○ Contracts on preparing planning and technical documents and obtaining permits; ○ Contract on monitoring interconnection construction; ○ Contract on exploitation of the power plant; ○ Approval to connect the power plant (can be obtained only after acquiring the power plant construction permit). The duration of grid connection process varies in practice and is closely linked with the permitting and construction procedures.
Construction of a RES-Electricity Plant – Documents and Approvals	
EIA	○ Required for issuance of both the energy permit and the location conditions which are required for the Construction Permit. ○ Whether an EIA is required depends on whether the project meets certain minimum technical thresholds (please see next row).

	○	An EIA must be carried out (and approved) prior to the construction of an electrical energy or heat energy plant exceeding 50 MW. For a plant between 1 MW and 50 MW, the competent authority may request an EIA, except in the case of a hydroelectric plant, where the lower limit is 2 MW, and in the case of a wind energy project, where the lower limit is 10 MW (total capacity of the wind farm). For a plant below 1 MW and below the above-mentioned limits for wind and hydroelectric plants, no EIA is requested, regardless of the source of energy (with the exception of nuclear energy).
Energy Permit	○	An energy permit is issued by the Ministry of Mining and Energy in accordance with the Energy Law within 30 days of the date of application. An energy permit is issued for a period of three years and may be renewed for a further maximum one-year period. If an energy plant is constructed in accordance with the law regulating Public Private Partnerships and concessions, no energy permit is required.
Water Conditions and Water Consent	○	If the energy plant uses water from rivers, lakes or underground rivers or releases water or other material into them, a construction permit will be issued only after water conditions and water consent have been granted. Water conditions and water consent concern the construction and/or reconstruction of an energy plant.
Construction Permit	○	Issued by the local municipality – for energy plants below 10 MW capacity;
	○	Issued by the Ministry of Construction, Transportation and Infrastructure – for energy plants of 10 MW capacity or more; or
	○	Issued by the Autonomous Province of Vojvodina – energy plants of 10 MW or more, located entirely in the territory of the Autonomous Province.

	○ A construction permit should be formally issued within five days in the so-called unified procedure, which is conducted electronically. ○ To obtain a construction permit for a wind power plant, the approval of the Agency for Flight Control, confirming that the wind power plant does not endanger flight safety, is also required.
Water Approval	○ If the energy plant uses water from rivers, lakes or underground rivers or releases water or other material into them, a building use permit will be issued only after the water approval has been granted.
Building Use Permit	○ The building use permit (*употребна дозвола*) certifies that the plant, as constructed, is in full conformity with the construction permit and other technical requirements (issued by the same authority that issued the construction permit, within five days of receiving the Technical Inspection Commission's Report).
Add: Right (Concession) to Exploit Natural Resources	○ A concession can be granted for the purpose of enabling a concessionaire to use natural resources or public goods, or to conduct any activity of general interest. It may also be granted in the field of energy. ○ Serbian legislation foresees a tender procedure for granting the right (concession) to exploit natural resources. ○ The procedure may be initiated by: (i) the Government; (ii) an autonomous province or a municipality, if the subject of the concession is located within the territory of the autonomous province or municipality; (iii) a public company, if so allowed under a special law; or (iv) an unsolicited proposal of an interested private entity.

Add: Energy Licence for Power Generation Above 1 MW	An Energy Licence is necessary for the performance of energy activities, including energy generation. It can only be issued to a Serbian legal entity or entrepreneur. Exceptionally, a licence for the energy activity of wholesale trade of electricity can be issued to a foreign legal entity active in the EU energy market. The authority in charge of issuing Energy Licences is the Serbian Energy Agency. An Energy Licence is issued within 30 days of the date on which the complete application was submitted.

4. Key changes Introduced by the New RES Legislation

Although many legal instruments are still in development at the time of writing this Guide, we summarise below the key changes introduced in the Serbian laws to date compared to the former legal regime applicable under the 2014 Energy Law.

4.1 Market Premiums and New Quotas

Under the current RES Law, the following power plants are considered as RES electricity-generating facilities and their operators can benefit from RES Law incentives (**RES Producer(s)**):

- Hydro power plants with installed power up to 30 W (other than reversible power plants);
- Biomass power plants
- Biogas power plant
- Wind power plant
- Solar power plant
- Geothermal power plant
- Biodegradable waste power plant
- Landfill gas power plant
- Power plant using gas from urban wastewater treatment plants
- Power plant using other renewable energy sources

The new RES Law finally replaced the feed-in tariff model with auction-awarded market premiums, while only exceptionally leaving the option of awarding feed-in tariffs to smaller or demonstration projects.

For the first time, incentives for RES are being awarded at public tender.

4.2 Other Financial Incentives for RES-Electricity

RES Producers also have a right of priority for access to the grid and may enjoy certain other subsidies, tax, customs and other privileges.

4.3 Guarantees of Origin for RES-Electricity

The system of guarantees of origin in Serbia had already been introduced by the 2011 Energy Law. However, due to technical issues, this system was not implemented in practice for a long period of time.

A guarantee of origin is currently issued as an electronic document by EMS (the operator of the transmission system) upon the request of a RES Producer and it certifies the attributes of 1 MWh of electricity produced. Their purpose is to provide reliable information to electricity consumers on the origin of the electricity they purchase. Guarantees of origin have gained in popularity more recently as they allow commercial electricity consumers to meet relevant goals under their ESG policies.

Serbia also acknowledges guarantees of origin issued in other countries, but only under the condition of reciprocity. The decision to recognise is made by the transmission system operator. Exceptionally, if the transmission system operator is a member of any European association of issuing bodies, then the guarantees of origin will also be valid in accordance with the rules of that association. In that respect, EMS is a full member of the Electricity Scheme Group of the European Association of Issuing Bodies.

Guarantees of origin are transferable independently from the generated electricity they refer to.

4.4 Prosumers

Production of electricity from RES for own consumption is introduced through the institute of 'purchaser-producer' (*купац произвођач*) – i.e. the prosumer. The prosumer has the right to produce electricity and to store it for their own consumption, but also to deliver the

surplus produced electricity to the electricity system for sale. Prosumers are entitled to a reduction of their next month›s electricity bill or compensation from the electricity supplier for the sold surplus electricity.

This transposition of the RED II Directive has been a welcome addition in the Serbian market thus far and has already led to an increased interest from commercial customers and citizens alike. The ‹prosumer boom› is already underway. Many companies are already exploring the options available to produce energy for their own needs from RES (e.g. by installing rooftop solar panels), connecting to the grid and sell surplus electricity to the supplier. However, some practical concerns remain, including the impact on EMS capabilities to balance the system.

The Serbian Decree on Criteria, Conditions and Manner of Calculation of Receivables and Payables Between the Producer-Consumer and Supplier regulates this process in detail.

4.5 RES Communities

Continuing on the prosumer regulation, the RES Law allows individuals, legal entities and local government units to form a RES community in order to use RES to meet their energy needs in a way that is sustainable, environmentally conscious and economically and socially beneficial for its members.

5. Significant and/or expected changes in 2022

Currently, only the following secondary legislation has been enacted under the RES Law:

- Decree on Criteria, Conditions and Manner of Calculation of Receivables and Payables Between the Producer-Consumer and Supplier;
- Decree on Quotas for Wind Farms in the Market Premium System;
- Decree on Market Premium and Feed-In Tariff; and
- Decree on the Model of the Market Premium Agreement.

A regulation governing the balancing og responsibility (for all technologies and irrespective of whether the investor will participate in auctions) is much anticipated. The Decree on Terms of Delivery and Supply of Electric Energy also requires amendment.

Furthermore, market participants are already calling for the adjustment of the established maximum bidding prices in auctions considering that the current maximum prices do not take balancing costs into account.

Further clarifications and regulations are also necessary on the competences of the Serbian Energy Agency and EMS in this new market space.

In summary, it can be said that Serbia has laid the necessary legislative groundwork and it is expected that it will now focus on building on those foundations to create a functional and competitive market for RES-Electricity.

However, there still remains much to do in practical terms before Serbia can successfully hold its first auction, even though the software for electronic auctions has already been developed.

6. Necessity of Innovation in the Serbian Energy Sector

6.1 Environmental Protection

Serbia has undertaken obligations regarding environmental protection on its path to EU membership, many of which relate directly to the energy sector. This is most evident considering that almost 70 % of the generated electricity in Serbia still comes from coal-fired power plants.

On 28 October 2021, Belgrade was the most polluted city in the world according to IQAir. In the months surrounding that date, Serbia's capital often only switched places at the top of this chart with Delhi in India, Karachi in Pakistan and Wuhan in China. The unveiling of a study commissioned by Serbian public institute Batut and entitled "Improvement of Management of Contaminated Localities in Serbia" also contributed to the general public uproar by naming the most contaminated locations in Serbia – almost all of them mining-related.

For these reasons, the energy sector is frequently subject to public criticism and, more recently, public activism. Thousands of people took to the streets during 2021 to demand change. Members of the European Green Party also frequently visit sites associated with environmental devastation and draw media attention to companies or authorities believed to be responsible.

Therefore, Serbia is an attractive market for innovative, sustainable and environmentally conscious technologies.

6.2 Promoting RES in District Heating and Transportation

For years, the Energy Strategy of the Republic of Serbia (envisaging a shift from fossil fuels (coal and oil) to RES (biomass and natural gas) in the heating of public buildings and public transport) has been a dormant document. With the enactment of amendments to the Energy Law and the new RES Law, concrete steps are now contemplated to implement this strategy.

Local municipalities are required to enable the transparency of data on the share of RES in heating. Further secondary legislation is expected to regulate incentives and subsidies available to consumers utilising RES for heating. The switch to biomass in district heating systems in several municipalities is already underway with the commissioning of reconstructed biomass-fuelled boiler rooms.

Similarly, suppliers of fuel have a responsibility to ensure a share of RES that complies with the targets in the integrated national energy and climate plans. Significant investments may be expected in this field, as incentives are enabled for the producers of biofuels.

6.3 Focus on Hydrogen

The new RES Law places particular focus and opens the door more widely to improving the energy efficiency of public transport and the use of innovative technology. In particular, the new RES Law lays the groundwork and provides a legal basis for incentives in the development of clean fuels, such as green hydrogen.

A separate set of regulations on hydrogen in the Serbian energy sector is pending.

6.4 Electricity Storage

After years of stagnation, electricity storage projects have gained traction in Serbia. The Energy Law finally recognises and regulates the separate energy activity of electricity storage.

With ever increasing installed capacities, especially from wind power plants, it is expected that electricity storage projects initially based upon battery technology will start to increase and attract even more attention from investors.

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Generating Electricity from Renewable Sources in CEE & SEE

Projects, Infrastructure & Energy

Slovenia

Country Chapter

Wolf Theiss

Country General Information

Capital: Ljubljana

Location: situated in the southern part of Central Europe and sharing a border with Italy to the west, Austria to the north, Hungary to the northeast, Croatia to the southeast, and the Adriatic Sea to the southwest. Slovenia lies on the geographic coordinates 46°07 N and 19°49 E.

Surface: With 20,273 km^2, Slovenia is the thirty-ninth largest country in Europe.

Population: 2,108,708 inhabitants (2022 estimate)

Climate: Mediterranean climate on the coast, continental climate with mild to hot summers and cold winters in the plateaus and valleys to the east. Short coastal strip on the Adriatic, an alpine mountain region adjacent to Italy and Austria, mixed mountains and valleys with numerous rivers to the east.

Resources: Water (hydropower) and forests (about 66% of the total land area is forested) represent the predominant natural resources of Slovenia, with some deposits of lignite, lead, zinc and building stone.

Electricity Grid: The total length of the national electricity grid is 2,573 (3,720) km. The grid is comprised of overhead power lines with a nominal voltage of 400 kV (508 km), 220 kV (328 km), 110 kV (1,736 km). The Slovenian electricity grid system is connected to Austria (two 400 kV and one 220 kV power line), Italy (one 400 kV and one 220 kV power line), Croatia (three 400 kV, two 220 kV and three 110 kV power lines), while the connection to Hungary (two 400 kV power line) is still under construction.

Electricity Transmission, Distribution and Supply: The key market players in Slovenia are Elektro – Slovenija, d.o.o. ("**ELES, d.o.o.**") – transmission system operator, SODO, d.o.o. – distribution system operator, Borzen, d.o.o. – electricity market organiser, several owners of distribution networks, i.e. Elektro Ljubljana d.d., Elektro Primorska d.d., Elektro Maribor d.d., Elektro Celje d.d. and Elektro Gorenjska d.d. and several supply companies, i. e. Elektro Maribor Energija Plus d.o.o., Elektro Gorenjska Prodaja d.o.o, E 3 d.o.o., Elektro Celje Energija d.o.o., GEN-I, Petrol d.d., Petrol Energetika d.o.o., Elektro Energija d.o.o. (most of these are directly or indirectly state-controlled). However, there are also some newcomers such as SONCE energija d.o.o., a "new age" company which has a renewable energy trading platform based on blockchain technology and NGEN, energetske rešitve d.o.o., an energy system solutions provider, which uses the technology of pooling production, storage and consumption units used for auxiliary services.

The first pillar of the Slovenian wholesale electricity market consists of the holding company Holding Slovenske elektrarne, d.o.o., which operates the Drava Hydroelectric Power Plant, the Soča Hydroelectric Power Plant, the Lower Sava Hydroelectric Power Plant, the Šoštanj Thermoelectric Power Plant, and the Trbovlje Thermoelectric Power Plant. The second energy pillar is the group GEN energija, d.o.o., operating the Sava Hydroelectric Power Plant, Brestanica Thermoelectric Power Plant and Krško Nuclear Power plant.

Official EU Language(s): Slovenian. In addition, Italian and Hungarian are official languages in municipalities where Italian/Hungarian national communities reside.

EU Member: since 1 May 2004

NATO Member: since 2004

United Nations Member: since 1991

Currency: Euro (since 2007)

Schengen: since 2007

Political System, Administrative Organisation and Economy: The Republic of Slovenia is a parliamentary democracy with a multi-party system. The head of state is the president, who is elected by popular vote. The executive and administrative authority in Slovenia is held by the Government of Slovenia (*Vlada Republike Slovenije*), headed by the prime minister and the council of ministers or cabinet, who are elected by the National Assembly (*Državni zbor Republike Slovenije*). The legislative authority is held by the bicameral Parliament of Slovenia. The country is subdivided into 213 municipalities (11 of which have the status of urban municipalities). The municipalities are the only bodies of local autonomy in Slovenia. Slovenia has a developed economy and is per capita the richest of the Slavic countries by nominal GDP and the second richest by GDP (PPP) behind the Czech Republic. Almost two-thirds of the working population is employed in the services sector, and over one-third in industry and construction. Slovenia benefits from a well-educated workforce, well-developed infrastructure, and its location at the crossroads of major trade routes.

1. Defined Terms for the Main Permits Required for RES-Electricity Generation Facilities

Centre for RES/CHP	Centre organised within the company Borzen d.o.o., (which is the operator of the organised electrical power market).
CHP	Cogeneration or combined heat and power (CHP – *Soproizvodnja toplote in elektrike (SPTE)*) is the simultaneous conversion of fuel energy into heat and electricity. The main energy sources of such cogeneration are natural gas and wood biomass.
Electricity Supply Act	*Zakon o oskrbi z električno energijo* – Official Gazette of the Republic of Slovenia, No. 172/21, as subsequently amended
Energy Act	*Energetski zakon* – Official Gazette of the Republic of Slovenia No. 17/14, as subsequently amended; adopted in 2014 and last amended in 2019, which transposes several EC Directives into the Slovenian legal system, including Directive 2001/77/EC on the promotion of electricity produced from RES on the internal electricity market (now replaced by Directive 2009/28/EC).
Energy Agency	Slovenian Energy Agency (*Agencija za energijo*)
Energy Efficiency Act	*Zakon o učinkoviti rabi energije* – Official Gazette of the Republic of Slovenia, No. 158/20, as subsequently amended.
Gas Supply Act	*Zakon o oskrbi s plini* – Official Gazette of the Republic of Slovenia, No. 204/21
Slovenian Environment Agency	Slovenian Environment Agency (*ARSO – Agencija Republike Slovenije za okolje in proctor*)

Environmental Impact Assessment	Assessment of the long-term, short-term, direct or indirect impacts of the planned construction on human beings, land, water, air, biological diversity and valuable natural features, climate and landscape, as well as on buildings and cultural heritage, and their interrelationships.
Environmental Protection Consent	Consent issued by the Ministry of Environment and Spatial Planning pursuant to an Environmental impact assessment of the project.
Environmental Protection Permit	Permit issued for a period of ten (10) years, by the Ministry of Environment and Spatial Planning for the operation of any installation where an activity that might cause large-scale environmental pollution will be carried out. Additionally, the investor must obtain an environmental protection permit for the operation of any other installation if so prescribed by the regulations on (i) emissions of pollutants into the air, water or soil; (ii) activities that have a negative impact on the environment; or (iii) waste management.
Building Permit	Permit issued by the competent administrative unit (depending on the location of the facility) allowing the construction of a facility and which is generally needed in order to build an industrial plant (however a small plant within an existing installation may not require a Building permit).
Use Permit	Permit issued by the same administrative body which issues a facility`s Building permit and showing that the building work has been conducted in compliance with the Building permit and that the project has been completed.
Energy Permit	An energy permit issued by the Ministry of infrastructure must be obtained for the construction of electricity-generating installations with a capacity greater than 10 MW. It must be obtained before the Building permit can be issued.

Water Permit	Pursuant to Article 125 of the Water Act (*Zakon o vodah* - Official Gazette of the Republic of Slovenia, No. 67/02, as subsequently amended), a water permit must be obtained for the operation of hydroelectric power plants with an installed capacity of less than 10 MW. Pursuant to regulations on spatial planning and building construction, a water permit must be obtained before an Environmental protection permit may be granted. A water permit is issued by the Slovenian Environment Agency for a definite period of time.
Authorisation Under Energy Law/ Permit (Concession) to Exploit Natural Resources	A mandatory tender procedure for granting the concession to exploit natural resources in cases of hydro power plants with an installed capacity of 10 MW or more (if less than 10 MW, a concession is not required and only a Water permit must be obtained).
Guarantees of Origin	Guarantees of Origin issued by the Energy Agency constitute proof that a certain amount of electricity was produced in a certain power plant in a specified time period.
Renewable Energy Act	Act on the Promotion of the Use of Renewable Energy Sources *Zakon o spodbujanju rabe obnovljivih virov energije* – Official Gazette of the Republic of Slovenia, No. 121/21, as subsequently amended.
RES-Electricity	Electricity obtained from RES such as wind, solar, aerothermal, geothermal, hydrothermal and oceanic waves, hydraulic, biomass and biogas.

RES Support Scheme	A scheme providing funds for RES and cogeneration of electricity and heat production units, with two types of support: (i) guaranteed purchase of electricity by the Centre for RES/CHP support at regulated feed-in tariffs (generally applicable to facilities with less than 500 kW rated capacity); and (ii) financial support for operation, i.e. the difference between the reference costs of electricity production and the reference market price (this support is applicable to facilities with more than 500 kW rated capacity). RES-Electricity installations can benefit from one of these schemes for up to fifteen (15) years. The guaranteed purchase price is calculated on a case-by-case basis.
Rules on Support	Regulation on support for electricity generated from RES and from high-efficiency cogeneration, (*Uredba o podporah elektriki, proizvedeni iz obnovljivih virov energije in v soproizvodnji toplote in elektrike z visokim izkoristkom* – Official Gazette of the Republic of Slovenia, No. 74/16 – please note that the this regulation will remain valid until a new regulation is adopted under the new Renewable Energy Act).
Priority Access to the Electricity Grid Given to RES-Electricity	Set of rules pursuant to which the network operator must not reject the connection of the RES-Electricity installation to the electricity grid due to the fact that the connection would cause the network operator disproportionate costs.
Water Act	*Zakon o vodah* – Official Gazette of the Republic of Slovenia, No. 67/02, as subsequently amended.
Environmental Protection Act	*Zakon o varstvu okolja* – Official Gazette of the Republic of Slovenia, No. 39/06, as subsequently amended.

2. Envisaged Need of RES Investments

2.1 Solar Energy

Electricity production in solar power plants represents the largest environmentally acceptable potential for increasing RES-Electricity production in Slovenia. With respect to sustainable use of space, future development should prioritise integration of solar power plants into existing buildings. The capacity of existing solar power plants was 367.7 MW in 2020, producing 350.2 GWh of electricity. A key limitation, however, is the available land and the ability to integrate newly built solar power plants into the existing network systems. Specifically, upgrades of the existing electricity distribution network will be required.

To achieve RES-Electricity goals envisioned in the National Energy and Climate Plan (*Nacionalni energetski in podnebni načrt*), solar powered units with estimated capacity of up to 125 MW will have to be constructed annually. About 80 % of these would be medium and large facilities (i. e. 100 kW and 600 kW units and a smaller proportion of free-standing units of 1,000 kW build mostly in degraded or industrial sites), with the remaining 20 % representing smaller household units.

In accordance with the National Energy and Climate Plan, the various scenarios for solar energy production provide for different levels of solar energy development, which would increase electricity production between 0.6 and 1.9 TWh (492 – 1,650 MW) by 2030 and between 0.9 and 5.4 TWh (742 – 4,000 MW) by 2040. This would require an annual average installation of 20 – 125 MW of solar energy capacity, of which about 80 % would be medium and large solar power plants and the remaining would be solar power plants for domestic self-supply.

2.2 Wind Energy

There is currently some uncertainty regarding projects in Slovenia utilising wind energy, especially with respect to the placement of wind turbines. The placement of wind turbines is usually postponed due to environmental protection concerns. The primary concerns are the protection of endangered animal species and also the perceived “social unacceptability” of these projects. In general, there is only a limited number of locations with suitable wind conditions where the placement of wind turbines is allowed according to regulations.

The foreseen power potential of wind farms in Slovenia is therefore estimated at 415 MW. So far, no large projects have been realised and only a small number of individual wind turbines have been built. For the potential of this technology to be fully realised in Slovenia, new and advanced technologies with lower noise emissions and impact avoidance systems for birds and bats are required.

Moreover, further amendment of the regulations on noise pollution with respect to wind farms is contemplated by the new National Energy and Climate Plan. Limit values or the distance of wind farms to the closest protected buildings will also be amended in order to better determine those conditions and restrictions that should be considered when placing wind turbines.

The capacity of existing wind power plants was 3.3 MW in 2020, producing 6.2 GWh of electricity.

2.3 Hydro Energy

In order to minimise negative impacts on nature, the development of hydro power plants should be considered by maximising the production of existing hydro power plants, by use of new and more efficient technologies, and revitalisation of inactive smaller hydro power plants. For the construction of new hydro power plants, the locations should be limited to existing structures such as dams and bridges and no new barriers should be built on the waterways. It is therefore envisioned that existing capacities (155 MWe) may increase up to 159 MWe by 2030 and up to 177 MWe, by 2040.

2.4 Biomass and Biogases

Utilisation of sustainable wood biomass (preferably residues from the wood processing industry, logging residues, etc.) should focus primarily on the production of synthetic gas and hydrogen. The gas produced will then be sold back to the electricity network in order to minimise energy conversion and the potential energy loss of wood biomass, with electricity produced only as a by-product of excess heat. The potential to generate energy from forest biomass in Slovenia is estimated at 6,598 GWh of heat and 326 GWh of electricity (currently there is only 190 GWh heat and up to 50 GWh electricity produced by these means).

Due to the relatively well-developed livestock farming, livestock manure also has considerable potential for biogas production in Slovenia. The theoretical calculations show that up to 170 GWh by 2030 and 245 GWh of electricity by 2040 could be produced from the manure of cattle, pigs and poultry (127 GWh was produced from such biogas in 2017). Some feedstock is also used for the production of biogas, which can then substitute for natural gas. Furthermore, there is also potential for the production of bioethanol. The total biogas production potential is around 480 GWh by 2030 and up to 700 GWh by 2040 and includes biogas production from sewage treatment plants, waste treatment and landfill gas capture, as well as the production of agricultural gas. In 2020, the total electricity produced from biomass and biogas was 200 GWh (103.3 GWh from biomass power plants and 96.7 GWh from biogas power plants).

2.5 Transport

Transport is a sector that has significant influence on energy consumption in Slovenia and thereby on efforts to achieve the goals of energy and environmental policy, especially in achieving the goal of the share of RES in gross final energy use. Key investments in this sector should target electromobility, improving public transport, car-sharing opportunities, increasing freight traffic, developing rail transport, and adapting people's behaviour to new social and business models with respect to transport. Currently 10.9 % of the total energy consumption in the transport sector comes from RES.

3. Executive Summary-RES Market Status and Development of RES Electricity Facilities

3.1 Market Overview-Factsheet

- In 2009 a feed-in tariff support scheme providing funds for RES and cogeneration of electricity and of heat production units ("**CHP**") projects was established in Slovenia ("**RES Support Scheme**"). Under the RES Support Scheme, state aid is granted to producers of electricity produced from RES and in CHP units by offsetting the difference between the cost of generating electricity from RES and CHP units and the proceeds from the sale of the produced electricity on the market;
- In March 2014, the new Energy Act came into force. The new Energy Act substantially amended the previous law, as more than 100 provisions were amended. There were also changes to the RES Support Scheme, most notably, support can now only be granted in a public tender procedure. In this way, the RES Support Scheme has been harmonised with EU Guidelines on State aid for environmental protection and energy 2014 – 2020;
- Most of the principal EC Directives relating to RES have been implemented into the Slovenian legal system via the Slovenian Energy Act;
- Since 2014, and the adoption of the new Energy Act, a licence to generate RES-Electricity is no longer required;
- In 2016, new Rules on Support were adopted. Only units with rated power less than 10 MW are eligible for the RES Support Scheme, with the exception of wind energy production units for which a limit of 50 MW or less was set;

- At the end of 2018, more than 2,500 producers with a total of 3,859 installations were included in the RES Support Scheme. Most of the included installations are solar power plants (3,301 of the mentioned 3,859 in total);
- In 2018, a total of 617,424 MWh of RES-Electricity was produced from RES units included in the RES Support Scheme, which represents 34.5 % of all electricity produced in Slovenia;
- With public tenders published by the Energy Agency, a total of EUR 135.12 million has been paid out to investors pursuant to the RES Support Scheme;
- Apart from the production in large power plants, the Slovenian electricity system also includes some small-scale production units, mainly small hydroelectric power plants and industrial facilities for the cogeneration of heat and electricity. Since 2009, the number of small solar power plants has increased significantly, mainly due to lower prices of photovoltaic modules, relatively favourable purchase prices, and operating support for electricity produced from small solar power plants. Also, the number of facilities, producing RES-Electricity from other renewable sources (biomass, landfill gas), has increased;
- A goal of 25 % share of RES-Electricity by 2020 as set out in the 2009 Action plan on RES will most likely not be reached by 2020 (the official report is currently pending);
- Under the Integrated National Energy and Climate Plan, Slovenia has committed that by 2030, it will have a 27 % share of RES-Electricity in the final energy consumption, with climate neutrality achieved by 2050;
- Since November 2019, Slovenia together with Romania, Bulgaria, Croatia, Czech Republic, Hungary and Poland have successfully linked their intraday markets with fourteen (14) countries active in operational work since June 2018;
- In November 2020, the new Energy Efficiency Act, transposing Directive 2012/27 EU on energy efficiency, came into force. Additionally, in August 2021, the new Renewable Energy Act, transposing Directive 2018/2001/EU, came into force. Actual Slovenian electricity production in 2020 amounted to 13,315 GWh (see 3.2). Compared to 2019, production increased by 812 GWh (i. e. 6.5 %).

3.2 RES Market Status, Permitting, Grid Connection, Licensing of RES Electricity Facilities

General Market Data	
RES Target 2020 (out of Final Consumption)	25 %, (as of 2018, 21.14 % was achieved)
RES Target 2030 (out of Final Consumption)	at least 27 % of RES
Overall Installed General Capacity Including RES	3,666.1 MW (in 2020)
Overall Production Including RES	13,315.1 GWh (in 2020)
Installed Capacity by Technology (2020)	Nuclear – 348 MW (i.e. 50 % of the total installed capacity and production of the Krško Nuclear Power Plant) Hydro – 1,341.8 MW Thermo – 1,290 MW Biomass – 25.3 MW Photovoltaics – 367.6 MW Wind – 3.3 MW Biogas – 36.8 MW

RES Support Scheme

General overview

There are two types of support: (i) guaranteed purchase of electricity pursuant to the agreement concluded with the Centre for RES/CHP support at regulated feed-in tariffs (generally applicable to facilities with less than 500 kW rated capacity); and (ii) financial support for operation, i.e. the difference between the reference costs of electricity production and the reference market price (this support is applicable to facilities with more than 500 kW rated capacity which are new or refurbished). RES-Electricity installations can benefit from one of these schemes for up to fifteen (15) years. The guaranteed purchase price is calculated on a case-by-case basis.

The support is intended for RES generating installations that utilise the following sources:

- energy potential of watercourses (hydropower);
- wind energy used in onshore generating installations;
- solar energy used in photovoltaic production plants;
- geothermal energy;
- energy from biogas derived from biomass and biodegradable waste;
- energy generated from landfill gas;
- energy derived from gas from the sludge of wastewater treatment plants;
- energy derived from biodegradable waste; and
- RES production units which are based on the CHP technologies and achieve the prescribed efficiency for high efficiency cogeneration (excluding biofuel units).

Beneficiaries of RES Support Scheme

Beneficiaries are chosen via a public tender procedure, whereas only units with a rated power of less than 10 MW are eligible for the RES Support Scheme, (except for wind energy production units for which a limit of 50 MW or less is set).

Priority and Guaranteed Off-take into the Grid	Under the new Energy Act, the electricity network operators (i.e. operators of the distribution and transmission grid; the company ELES, d.o.o. as the operator of the transmission grid, and the company SODO d.o.o., as the operator of the distribution grid) may not reject a request for connection of a facility that produces RES-Electricity or a high utilisation cogeneration facility for the reason that the connection would cause the electricity network operator disproportionate costs.
Other Conditions	In the case of RES-Electricity, the owner or the investor bears the cost of connection to the grid. The costs of upgrades and network adjustments are borne by the network operators.
Special Allowance/ Tolerance for Intermittent Generation in Relation to Balancing Charges	No special allowance/tolerance
Permitting	
Environmental Impact Assessment and Environmental Protection Consent	Before an activity that is likely to have a significant impact on the environment may commence, an Environmental impact assessment of such activity must be carried out in most instances. Pursuant to the Environmental impact assessment, an environmental protection consent is issued by the Ministry of Environment and Spatial. The Ministry must render its decision on the environmental protection consent within three (3) months of receiving the completed application. The deadline for the issuance of the decision is suspended during the period of public consultation (thirty (30) days) and during any period agreed with any other EU Member State for which the planned activity could have a substantial environmental impact.

Environmental Protection Permit (if required)	Generally, an investor must obtain an Environmental protection permit for the operation of an installation where an activity which could cause large-scale environmental pollution will be carried out prior to the commencement of such construction. Additionally, the investor must obtain an Environmental protection permit for the operation of any other installation if so prescribed by the regulations on: (i) emissions of pollutants into the air, water or soil; (ii) activities that have a negative impact on the environment; or (iii) waste management. The Ministry of Environment and Spatial Planning must issue the Environmental protection permit within six (6) months from receiving the complete application. The application for the permit and draft decision on the Environmental protection permit must be made available to the public, and the public must be given an opportunity to express its opinion and comments thereon for a period of thirty (30) days. A Building permit may be issued only after the Environmental protection permit becomes final.
Building Permit	A Building permit is issued by the administrative unit competent for the area where the plant will be built. If the Building permit is issued pursuant to a short procedure, the Building permit must be issued within thirty (30) days from submission of a complete application. Otherwise, it must be issued within sixty (60) days. The administrative fee depends on the value of the investment. In the process of obtaining a Building permit, several approvals and authorisations are required, depending on the exact type and location of the installation. A Building permit may not be required for smaller/simpler projects.
Detailed Design (Projekt za izvedbo – PZI)	More detailed project of works based on the issued Building permit.

Use Permit	The investor must apply for a Use permit with the administrative body that issued the Building permit and must show that the building works have been conducted in compliance with the Building permit and that the project has been completed. Once the competent administrative body establishes that the application for the Use permit fulfils all the set conditions, it authorises the commission for technical inspection (*Komisija za tehnični pregled*) to examine the compliance of the construction with the Building permit, the building regulations, and other applicable regulations. After the inspection, a Use permit for the facility is issued.
Energy Permit	An Energy permit for production capacities must be obtained for facilities with rated capacity exceeding 10 MW that are connected to the public electricity power network. The Energy permit must be obtained before the Building permit can be issued or before the spatial plan can be prepared (if required). An Energy permit must also be obtained for any reconstruction of the above-mentioned facilities if the reconstruction changes energy parameters of the facility to the extent that it requires a subsequent Building permit. The Energy permit is issued by the Ministry of infrastructure within one (1) month of the receipt of the complete application.
Permit (Concession) to Exploit Natural Resources (or Alternatively a Water Permit) if required	According to the Water Act, the concession to exploit water assets for the production of electricity in a hydro power plant with an installed capacity of 10 MW or more shall be awarded only on the basis of a prior tender procedure. A concession is not required for hydro power plants with installed capacity of less than 10 MW – for these, a Water permit must be obtained. Furthermore, no tender procedure is required for the extension of the concession period or for the increase of scope of already awarded concessions. According to the Environmental Protection Act, the state or a municipality shall award a concession for the management, use or exploitation of a natural asset on the basis of a public tender provided that the conditions for environmental protection have been met.

	The competence of the state or a municipality depends on whether the natural asset is owned or managed by the state or the respective municipality. The basis for granting the concession is a deed of concession in the form of a Government or municipality regulation. Pursuant to the Water Act, the tender procedure may also be triggered by an unsolicited proposal of an interested private entity. In this respect, the unsolicited proposal shall contain all elements required for defining the content of the deed of concession, and in particular: its subject, scope, type and the concession term. Consequently, the Government shall notify the applicant within three (3) months upon receipt of the unsolicited proposal, as to whether it will initiate a procedure to adopt the deed of concession, which shall (if adopted) serve as a basis for the public tender for granting the concession.
Grid Connection Specifics	
Approvals	Approval issued by the owner of the distribution network for connection to the grid based on previously obtained documentation (needed for construction of the project). Declaration for the individual unit issued by the Energy Agency. This declaration is mandatory for receiving support from the RES Support Scheme.
Other	Registration of the production unit in the Energy Agency register. Guarantee of Origin obtained from the Energy Agency. Agreements on connection to the grid, on the supply of the electricity, and access to the distribution network concluded with the respective network distribution operator.
Licensing	
No Licence is required	

4. Key Changes to the RES Support Scheme since 2016

4.1 Derogation of the Rules on Support

The current Rules on Support for RES-Electricity and high-efficiency cogeneration were adopted in 2016. This regulation introduced a more detailed legal framework for the RES Support Scheme and governs the provision of state aid. The Rules on Support were derogated with the adoption of the Renewable Energy Act of 7 August 2021. However, they will continue to apply until a new regulation is issued under the Renewable Energy Act (regulating the same subject matter and replacing the existing Rules on Support). This new regulation is currently going through the legislative process in the Slovenian parliament.

4.2 Reduced Unit's Power Limit for Guaranteed Purchase of Electricity from RES Unit

The power limit for the guaranteed purchase of RES-Electricity was reduced from 1MW to 500kW or less of the rated capacity.

4.3 Obligatory RES Contribution

From 2017 onward, the end-customers of electricity, solid, liquid, gaseous fossil fuels, and district heat, are required to pay a contribution from which RES projects are financed.

4.4 Compensation for Users of Real Property on which the Energy Infrastructure is under Construction

Specific procedures have been developed with respect to compensation for users of real property on which the energy infrastructure is already under construction, but a decision on expropriation and easements in favour of public or other rights to build, has not yet been issued. The compensation is assessed by a court-certified appraiser and determined at the market value of the lease of such or comparable real property, taking into account the extent to which its actual use is for construction. This requirement was issued on the basis of a decision of the Constitutional Court of the Republic of Slovenia.

4.5 Higher Fines for Violation of Mandatory Share of RES Fuels in Sales

A higher fine has been set for fuel distributors if they violate rules with respect to mandatory shares of biofuels and RES in their sales. The fines are now set from EUR 50,000 up to 2% of annual sales from the sale of fuel to end-customers (for small size companies) or from EUR 150,000 up to 2% of annual sales from the sale of fuel to end-customers (for medium or large size companies).

4.6 Amendments to the Energy Act

Despite having recently been amended, the Ministry for Infrastructure on 21 November 2019 proposed certain further amendments to the Energy Act. The proposed changes will transpose into the Slovenian legal system the provisions of Directive (EU) 2019/692 amending Directive 2009/73/EC concerning common rules for the internal market in natural gas. Directive (EU) 2019/692 was published in May 2019 and the deadline for its implementation was 24 February 2020. However, the changes were not implemented on time. On 30 January 2020, the Slovenian Government submitted to the National Assembly its proposed amendment of the Energy Act, which came into force in May 2020. The provisions of this amendment have since been repealed with the adoption of the new Gas Supply Act, which came into force in January 2022.

4.7 New Acts on Energy Efficiency and Use of Renewable Energy Sources

In 2020 and 2021, two new acts repealing special chapters of the Energy Act entered into force:

In November 2020, the new Energy Efficiency Act came into force. This Act regulates energy efficiency, general measures to promote energy efficiency, measures to increase energy efficiency, energy efficiency requirements for products and ensuring the energy efficiency of buildings. It transposes Energy Efficiency Directive 2012/27/EU into the Slovenian legal system.

Additionally, in August 2021 the new Renewable Energy Act entered into force. This new Act: (i) transposes Directive (EU) 2018/2001; (ii) regulates the implementation of state and municipal policies on using renewable energy sources: and (iii) sets binding targets for the share of energy from renewable sources in the gross final consumption in Slovenia.

5. Significant and/or Expected Changes in 2022

5.1 Important Changes Intoduced by the New National Energy and Climate Plan

The New National Energy and Climate Plan was confirmed by the Government on 27 February 2020 and provides for the following regulatory changes in favour of RES projects:

- **Improvement of the feasibility of already notified projects** (mainly wind energy, SHPP and large SE above 1MWe) by removing administrative and regulative hurdles for realisation of approved / selected projects;
- **Preparation of a new RES Support Scheme** (foreseen for the period 2021 – 2023), with:
- new forms of incentives,
- simplified procedure for smaller production facilities,
- transition to non-refundable grant funds for RES technologies which are close to competitiveness at the end-customer price level,
- introduction of concession schemes for the revitalisation of degraded areas and their use for energy purposes;
- **Investment subsidies to encourage energy production from RES** in order to promote investments in promising but not yet economically viable RES projects – such as wind, solar, geothermal or water energy projects;
- **Promoting self-supply of RES-Electricity**, mainly by removing administrative obstacles and providing fiscal incentives for investments;
- **Promoting construction and reconstruction of large hydropower plants** by supplementing the regulations for more efficient (less burdensome) administrative procedures and procedures with respect to placement of facilities, accelerating the preparation of spatial plans for energy infrastructure of national importance, providing the possibility of further utilisation of hydropower in Slovenia in water management plans and harmonising the rules governing the prevailing public interest in protected areas;
- **Change of regulations on noise pollution with respect to wind farms**, by regulating the limit values or the distance of wind farms to the closest protected buildings and to better determine conditions and restrictions to be taken into account when placing wind turbines;

- **Update of technical criteria, procedures and tariffs for connection of RES units to the grid**, in particular:
- distribution operator should establish routing of potential investors to locations that do not require major investments in the networks (i. e. mapping of locations),
- simplification of procedures and shortening of the time required to complete the connection to the grid, and
- promoting appropriate integration of RES into the existing buildings, into space and into the energy system.

6. Overview of the Technical Innovations in Electricity Storage and Applicability in Slovenia of such Storage Technologies

One of the goals set out in the National Energy and Climate Plan is the development of energy storage technologies, infrastructure and services, which will improve the efficiency and safety of the electricity production and supply. New technologies are particularly important with respect to the available natural sources (i. e. wind and solar power).

It is envisioned that the demonstration and pilot projects for the centralised and decentralised electricity storage will be implemented by 2030. Those projects will include installation of battery storage solutions and other technologies for storing RES-Electricity, such as storing it in a solid state. In order to maximise the share of RES in gross final energy consumption, a sufficient number of energy storage facilities will have to be constructed by 2030.

Currently, battery packs are installed adjacent to smaller (households) which are used for the needs of individual owners of household solar power plants. Two larger electricity storage solutions have also been implemented in Slovenia, both owned and operated by NGEN d.o.o., with a total rated power of 30 MW.

New technical innovations in electricity storage solutions will be needed when the number of RES production units increases. The development and implementation of such solutions is foreseen in the National Energy and Climate Plan. Considering this, there are good opportunities for investors to enter the Slovenian energy market in this respect.

7. Support Scheme for Cogeneration

A support scheme – feed-in tariff (preferential prices) – is available for CHP units not exceeding 10 MW of rated power per facility and for wind energy production facilities not exceeding 50 MW. Individual support can be granted to high-efficiency cogeneration electricity production installations for up to ten (10) years and for installations producing RES-Electricity for up to fifteen (15) years (from the start of the facility's operation).

The following CHP units are eligible for the RES Support Scheme:

- combined cycle gas turbines with heat recovery;
- counter pressure steam turbines;
- extraction condensation steam turbines;
- gas turbines with heat recovery;
- internal combustion engines;
- microturbines;
- Stirling engines;
- fuel cells;
- steam engines;
- organic Rankin cycle turbines; and
- other types of technology or combinations thereof, used for the cogeneration of heat and electricity with high efficiency.

The Support scheme for cogeneration in Slovenia is the same as for other RES technologies. Therefore, investors investing in CHP units / facilities may apply for support in the form of either (i) guaranteed purchase of electricity by the Centre for RES/CHP support at regulated feed-in tariffs (generally applicable to facilities with less than 500 KW rated capacity); or (ii) financial support for the operation of the unit, i.e. the difference between the reference costs of electricity production and the reference market price (this support is applicable to facilities with more than 500 KW rated capacity).

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Generating Electricity from Renewable Sources in CEE & SEE

Projects, Infrastructure & Energy

Slovak Republic
Country Chapter

Wolf Theiss

Country General Information

Capital: Bratislava

Location: The Slovak Republic is a landlocked country in the eastern part of Central Europe. It is bordered by Poland to the north, Ukraine to the east, Hungary to the south, Austria to the southwest, and the Czech Republic to the northwest.

Surface Area: The Slovak Republic's territory covers about 49,000 km^2 and is mostly mountainous.

Population: 5,449,270 inhabitants

Climate: The Slovak climate falls within the temperate and continental climate zones with relatively warm summers and cold, cloudy and humid winters with four distinct seasons.

Resources: The Slovak Republic has been blessed with a wide variety of natural resources such as arable land, forests, and minerals. One of the Slovak Republic's most important natural resources is its arable land which make up roughly 28.75 % of the country's territory. In 2015, forests covered roughly 40.35 % of the Slovak Republic's territory. The Slovak Republic has several essential minerals such as iron, coal, and gold. One of the most critical minerals is coal. The coal mined in the Slovak Republic is mainly used locally to produce energy. The most common types of coal are lignite and brown coal. In 2017, the Slovak Republic ranked seventh globally in magnesite mining production (by gross weight), accounting for 1.5 % of the world's production. The country is otherwise not a significant global producer of mineral commodities. There are numerous mineral springs; according to estimates approximately two thousand (2,000) mineral water resources in the Slovak Republic. Furthermore, there are deposits of limestone, dolomite, cement, bentonite, basalt, travertine, salt, magnesite, perlite and zeolite.

Electricity Grid: The total length of the national electricity grid is 3,050.649 km. The grid comprises overhead power lines with a nominal voltage of 400 KW, 220 KW, 110 KW and electrical stations having a voltage of 400 KW, 220 KW and 110 KW.

Electricity Transmission, Distribution and Supply: Electricity transmission is a regulated natural monopoly and is provided by SEPS, a.s. The electricity distribution market is controlled by three (3) major distribution companies (ZSE, SSE and VSE), their total market share is more than 80 %. The electricity supply is provided by more than thirty (30) private providers. Electricity is traded, for example on the PXE (Power Exchange Central Europe) stock exchange, which was established in 2007 and allows trading in electricity with a place of delivery in the Czech Republic, Slovak Republic, Hungary, Poland and Romania.

Official EU Language(s): Slovak

EU Member: since 1 May 2004

NATO Member: since 2004

United Nations Member: since 1993

Currency: Euro

Schengen: since 2007

Political System, Administrative Organisation and Economy: The Slovak Republic is a parliamentary democratic republic with a multi-party system. The country is divided into eight (8) regions, each of which is named after its principal city. Regions have enjoyed a certain degree of autonomy since 2002. Their self-governing bodies are referred to as Self-governing (or autonomous) Regions or Upper-Tier Territorial Units. The regions are subdivided into many counties. The Slovak Republic currently has seventy-nine (79) counties. According to the Slovak Constitution, the economy is built on the principles of a socially and ecologically oriented market economy. In practice, it is a mixed market economy, with state interventions typical of Western-type economies. The Slovak government encourages foreign investment, since it is one of the driving forces of the economy. The Slovak Republic is an attractive country for foreign investors mainly because of its low wages, low tax rates, well-educated labour force, favourable geographic location in the heart of Central Europe, strong political stability and good international relations reinforced by the country's accession to the European Union. The main industry sectors are car manufacturing and electrical engineering.

RES-Electricity Target in the Next Ten (10) Years: the Slovak National Climate and Energy Plan for 2021 – 2030 set a target 19.2 % share of RES from the total consumption of energy no later than 2030.

Slovak Republic: Targets to Reach by 2030	
Greenhouse gas emissions (compared to 1990)	No national targets
Emissions in the ETS Sector (compared to 2005)	No national targets
NON-ETS Greenhouse gas emissions (compared to 2005)	-20 %
Total share of renewable energy sources	19.2 %
Share of renewable energy sources in transport	14 %
Energy efficiency	30.3 %
Interconnection of electricity systems	52 %

1. Defined Terms for the Main Permits required for RES-Electricity Generation Facilities

Accreditation	Licence to generate renewable energy sources ("**RES**") issued by the Regulatory Office for Network Industries ("**RONI**") on the basis of a written application in which the applicant states (i) the activity; (ii) the territory or part thereof in which the requested activity is to be performed; and (iii) the period for which the licence is requested.
Building Permit	The zoning permit approves the localisation of the building on the designated plot of land and confirms its compliance with the zoning requirements under urban plans. To obtain a zoning permit, the developer must submit several statements of approval from different authorities, bodies and public utilities, such as telecommunications and energy suppliers. The construction permit will be issued following the construction proceedings, within which the respective authorities issue their statements concerning the building. The participants in the construction proceedings may also submit their objections concerning the building. The construction permit is valid for two (2) years, during which period construction must be commenced. After completion of construction, but prior to occupation of the building, the applicant must receive an occupancy permit, which certifies that the building complies with the planning and construction permits and approves its use/operation for the designated purposes.
Connection Certificate	The connection of a new offtake or electricity generation facility shall be made based on a connection agreement to the system concluded with the owner of the offtake electricity or electricity facility after fulfilment of the technical conditions and business conditions of the system operator.

Environmental Approval	Administrative deed issued by the local Environmental Authority evidencing the compliance of the RES-Electricity facility with the environmental requirements as provided by law.
Grid Connection	Actions performed and administrative deeds issued by the grid operator to connect a new generating facility or to modify or replace the connection of a generating facility to the grid.
Liability and Responsibility for Grid Connection and/or Capacity Upgrades, Improvements or Expansion of Grid	The electricity producer's facility shall be connected to the distribution system if the distribution system is technically capable of being connected, is closest to where the electricity generating facility is located and the other system does not show a technically and economically better connection point. The costs of connection and the costs of extension of the distribution system shall be borne by the electricity producer and the grid operator. The operation order of the grid operator shall include the conditions for the extension of the distribution system.
Licence of RES-Electricity Facilities	Authorisation for construction of an energy facility granted by the Ministry of Economy. A power generating facility may only be built in the Slovak Republic with the prior approval of the Ministry of Economy, which examines the compliance of the applicant's investment plan with the nation's long-term energy policy. If the project complies with the energy policy, the Ministry issues a certificate approving the construction of the power plant. Approval is not required for a facility to produce solar power with a capacity which does not exceed 500 KW.
Priority Access to the Electricity Grid Given to RES-Electricity	Priority access shall be granted to any RES-Electricity producer, regardless of the installed capacity, (subject only to the preservation of the security, reliability and stability of the grid connection).
RES-Electricity	Electricity obtained from RES sources such as wind, solar, aerothermal, geothermal, hydrothermal, biomass and biogas, biomethane.

RES Support Scheme	**State aid scheme** to promote production of RES-Electricity, approved by the European Commission. This support is provided as an investment support for SMEs and major enterprises. The beneficiary shall be reimbursed for eligible expenses, to a maximum limit of EUR 15 million, based on a received payment request nd upon submission of accounting documents. This scheme is prepared in accordance with the Operational Programme Quality of Environment, which is financed by the European Regional Development Fund (ERDF) and the Ministry of the Environment. **Feed-in premium** (Green Bonus) – this support applies to electricity produced at the electricity producer's facilities with a total installed capacity of between 10 KW and 50 MW, including those selected by auctions. **Right to supplement** – high efficiency cogeneration installations with a total capacity not exceeding 1 MW (inclusive), of which at least 60 % of the heat produced is used to supply heat by centralised heat supply and the primary energy saving is at least 10 %. **The right to the off-take (Feed-in tariff)** of the electricity generated at a price equal to the sum of the off-take price and the supplement pertains to those installations the capacity of which is up to 250 KW. The off-take price is set by the RONI (Decree No. 18/2017 Coll.).
Setting Up Permit	Authorisation for construction of an energy facility granted by the Ministry of Economy. A power generating facility may only be built in the Slovak Republic with the prior approval of the Ministry of Economy, which examines the compliance of the applicant's investment plan with the nation's long-term energy policy. If the project complies with the energy policy, the Ministry issues a certificate approving the construction of the power plant. The undertaking must fulfil the following criteria: ○ compliance with the targets set in documents approved by the Government of the Slovak Republic; ○ compliance with the priorities of the long-term energy policy concept; ○ compliance with the priorities of the Slovak Republic's energy security strategy.

2. Envisaged Need of Investments

Member States of the EU are required to modify their legislation so that it reflects the decision-making of the European Commission regarding energy gains from renewables. The Slovak National Climate and Energy Plan for 2021 – 2030 set a target 19.2 % share of RES for the total consumption of energy, to be achieved no later than 2030.

The total investment cost for achieving the RES targets is estimated at EUR 4.3 billion. These investment costs include the electricity and heating sectors.

The Slovak Republic will strive to maximise the use of existing infrastructure in accordance with the rules adopted in the new and amended EU documents included in the "Clean Energy for All Europeans" package. In this context, the deployment of intelligent energy and electricity storage systems is particularly important.

- The principle stated in the Energy Policy of the Slovak Republic, which considered the principle of cost minimisation through an integrated approach to the use of RES and the reduction of greenhouse gas emissions, remains valid for the upcoming period. Maintaining this principle will mean that setting up support for RES will ensure that the objectives set are achieved in a cost-effective way and avoid significant negative effects on electricity prices. In order to achieve the RES objectives, it is essential to exploit all available options, one of the greatest potentials being in the development of waste recovery in the production of biomethane and energy recovery of waste that cannot be recycled and thus end up in landfill. In district heating systems, the energy potential of geothermal and solar energy, biomass and biomethane will be used.
- Investments promoting low-power equipment to produce electricity and heat in detached houses and apartments;
- Investments in development of biofuels II. generation;
- Investments promoting the production of RES-electricity;
- Investments into creating a promotion mechanism for increasing the share of RES in the heating sector and in district heating systems, also through the production from RES in high-efficiency cogeneration;
- Investments in promoting the production of biomethane and hydrogen;
- Investments in promoting RES facilities, energy distribution and storage facilities;
- Investments for exploitation of geothermal energy and promotion for the development of local heat supply systems;

- Investments in promotion of the transport infrastructure for charging electric vehicles and for refilling hydrogen into vehicles, as well as for the electrification of public transport;
- Investments in modernising and renovating the electricity distribution network.
- Investments in new wind electricity generation and a water-based electricity plant located on the Danube River.

In view of the high share of nuclear sources in electricity production and the high share of natural gas in the heating industry, the Slovak Republic has one of the lowest energy emission levels in the EU. Some possibilities for the decarbonisation of energy include the replacement of coal by low-emission sources, as well as sources for alternative fuel sources, energy efficiency measures and transport decarbonisation.

3. Executive Summary – RES Market Status and Development of RES Facilities

3.1 Market Overview – Factsheets

- The Slovak RES-Electricity market has developed since 2009 and is constantly developing; the Act on Promotion of RES (Act No. 309/2009 Coll., "**RES Act**") adopted in 2009 introduced FiT, long-term PPAs with mandatory purchase and preferential connection to the grid.
- In May 2012, the Slovak government adopted two main legislative acts governing energy law in the Slovak Republic (i) the Energy Act; and (ii) the Network Industries Regulation Act. Their principal aim was the implementation of the latest EU directives and regulations, above all the Third Energy Package ("**TEP**"). In relation to the RES regulatory framework, (particularly the RES Promotion Act), the implementation of the TEP did not result in significant changes. The only change was the mandatory installation of flow metering devices for electricity metering to solar energy generators. In January 2013, the RES Promotion Act was amended with effect from 1 March 2013 – only those solar energy generators operating facilities up to 30 KW (instead of the former 100 KW) of capacity, which are located on roof tops or facades of buildings, were eligible for the promotion in the form of a supplement. Promotion in the form of a supplement and off-take of the electricity does not apply to the equipment of energy producers using hydro power, with overall capacity above 5 MW, as an energy source.

- In November 2013, the RES Promotion Act was amended by Act No. 382/2013 Coll. The purported rationale behind this legislation was to ensure more effective functioning of support of RES-Electricity.
- In 2013, the Regulator adopted regulation No. 221/2013 Coll. which set out price regulation in the electro-energy sector. Currently, regulation No. 221/2013 Coll. has been replaced by regulation No. 18/2017 Coll which sets out price regulation;
- In October 2014, the National Council approved an act on energetic effectiveness, No. 321/2014 Coll. ("**Act on Energy Efficiency**"), which replaced the former Act No. 476/2008 Coll. This latter act represents a partial transposition of EU Directive No. 2012/2007/EU on energy efficiency.
- In 2014, Act No. 326/2005 Coll. on forests, that defined the establishment of energy stands and forest plantations and created conditions for the cultivation of reproductive material for these purposes, was amended. The energy stand is defined as a forest stand with a maximum production function, generally during the first fifteen (15) years, the benefits of which are mainly used for energy production.
- In 2015, the total percentage of RES-Electricity within the supply mix was above 12 %. Since 2015 the share of RES-Electricity has stagnated, the current status being 11.9 %.
- Since 1 January 2019 a system of green bonuses was adopted, which refers to electricity produced in an electricity generating plant with a total installed capacity of between 10 KW and 50 MW. The applicants may ask for green bonuses in auctions.
- In February 2019, the Slovak government adopted the Strategy of the Environmental Policy of the Slovak Republic until 2030 (**Greener Slovakia**) setting out the state policy in the field of environmental protection.
- Under the National Plan for Energy and Climate Change for 2021 – 2030 (with perspective until 2050), the Slovak Republic has committed to a target 19.2 % share of RES from total consumption of energy, by no later than 2030.
- Since 1 January 2020, the Slovak Republic has been a member of the Association of Issuing Bodies. The Issuing Body of the Slovak Republic is OKTE, a short-term electricity market operator based in Bratislava. The guarantees of origin issued after 1 January 2020 must be in accordance with AIB rules. OKTE is responsible for carrying out activities related to the issue, transfer, recognition, application and cancellation of guarantees of origin of electricity from RES (EECS® certificate).

- Since 1 March 2021, the Slovak Republic has implemented a new foreign direct investment (FDI) screening procedure into Act No. 45/2011 Coll. on critical infrastructure (the "**Critical Infrastructure Act**"). The FDI regime requires acquisitions of shares or businesses designated as elements of critical infrastructure under this act to be notified to the Ministry of Economy and approved by the Slovak government. Unofficial reports in the media suggest that only a couple dozen major companies in the sectors under the competence of the Ministry of Economy have been designated as elements of critical infrastructure, which would make those entities subject to FDI screening. New legislation establishing a more comprehensive FDI screening process, inspired by other EU jurisdictions, is currently going through the legislative process. A new law is expected to come into effect on 1 June 2022.

- In June 2021, the European Commission adopted a positive assessment of the Slovak Republics's recovery and resilience plan. This is an important step towards the EU disbursing € 6.3 billion in grants under the Recovery and Resilience Facility (RRF). The plan represents a comprehensive and adequately balanced response to the Slovak Republic's economic and social situation.

- In September 2021, the Slovak National Council adopted Act No. 371/2021 Coll. on major investments (the "**Major Investments Act**"). The main objective of this act is to redefine the conditions, procedures and control over the issuance of major investment certificates. These certificates may continue to be issued for investments in the field of industrial production, services, research and development or in the field of public services. The increased legal certainty stemming from the terms precisely defined under the Major Investments Act is expected to stimulate the construction of strategic parks, which would facilitate the influx of new investment, especially in less developed regions.

- Since October 2021, the Ministry of Economy has been preparing a comprehensive amendment to Slovak energy legislation. In December 2021, the Ministry gathered input from debates on the proposed changes. Currently, the Ministry is working on a new amendment bill aimed at aligning energy law with EU legislation and at implementing the directives from the Clean Energy for all Europeans Package ("**CEP**").

- In December 2021, the Slovak government began drafting new legislation regulating construction and land use planning. The new law aims to simplify and decrease the bureaucracy involved in the approval process. The law will shift the focus towards more methodical land use planning. It will no longer be possible to ratify any illegal constructions under the new regime. The legislation is expected to come into force on 1 January 2023.

3.2 RES Market Status, Permitting, Grid Connection, Licensing of RES-Electricity Facilities

General Market Data	
RES Target 2020 Provided by (out of Final Consumption)	14 %, in 2019 an achievement of 11.9 % was reported.
Overall Installed General Capacity Including RES (Overall Production)	In 2018, overall energy production was 7,728 MW (27,149 GWh).
Installed Capacity by Technology	Hydro – 2,542 MW PV – 530 MW Biomass – 234 MW Biogas – 100 MW Wind power – 3.14 MW Fossil – 2,352 MW Nuclear – 1,940 MW
RES Support Scheme	
Beneficiaries of RES Support Scheme	Feed in tariff (FiT): ○ promotion applies to the electricity generated in the electricity facility of a producer at a price equal to the sum of the off-take price and the supplement pertaining to those installations, the capacity of which is up to 250 KW.

	Surcharge: ○ in the facility of electricity producers with total installed capacity of up to 500 KW included for hydropower, geothermal, biogas, landfill gas or sewage treatment plant gas; ○ high-efficiency cogeneration in a cogeneration plant with a total installed capacity up to and including 1 MW, of which at least 60 % of the heat produced is used to supply heat by centralised heat supply and energy saving reaches at least 10 %. Feed in premium (Green Bonus): ○ applies to the electricity generated in the electricity facility of producers with a total installed capacity of between 10 KW and 50 MW, ○ by auctions.
Priority and Guaranteed Off-take into the Grid	Priority access shall be granted to any RES-Electricity producer, regardless of the installed capacity, subject only to the preservation of the security, reliability and stability of the grid connection.
Other Incentives	○ Guarantees of origin; ○ Special loans (1% interest) available from the Environmental Fund; ○ Deviation Assumption by the regional distributor for deviations from the injection schedules submitted by the producer.

Other Conditions	○ Authorisation for construction of an energy facility above 1MW granted by the Ministry of Economy except for facilities for the production of solar power which may not exceed 500 KW; ○ No installed capacity limit as long as the grid allows this from a technical point of view; ○ Licence granted by RONI for anyone who wishes to conduct business by trading with electricity.
Grid Connection Specifics	
Approvals	○ Access to the grid is allowed by the transmission system operator or by the distribution system operator upon conclusion of a contract on connection to the system, provided that the technical and business conditions for access and connection to the system are met, and after the payment of the price for connection to the distribution system. The distribution system operator is obliged to ensure priority connection of the facility of the electricity producer to the distribution system; ○ RES-Electricity producers are, under the RES Promotion Act, entitled to priority connection to the regional distribution network; ○ **The grid operator may refuse access to the transmission system due to lack of capacity of the grid;** ○ The grid operator is responsible for a connectivity study (functional test) within the period of thirty (30) days from the date of delivery of the request to the electricity producer and for issuing the connection approval.

Permitting Timing: depending on the installed capacity and connection to the grid, an investor could obtain the necessary approvals in approximately six (6) months to two (2) years.	○ environmental approval; ○ zoning permit for location of the building; ○ set-up authorisation (above 1MW); ○ building permit; ○ licence; ○ connection agreement with the grid operator
Licensing	
Procedure	○ Authorisation for construction of an energy facility granted by the Ministry of Economy; ○ Licence for energy business granted by RONI; ○ Registration of the authorised activity into the Commercial Register within a period of thirty (30) days.
Duration of Administrative Procedure	Within sixty (60) days from the submission of the full documentation; this period may be extended by thirty (30) days.
Licence's Validity	Fixed period or unlimited.

4. Key Changes to the RES Support Scheme since 2016

On 17 October 2018, the Slovak parliament adopted Act No. 309/2018 Coll. amending the **RES Act**. This amendment introduced some significant changes into the promotion of RES-Electricity.

4.1 Central Administration of the System of Promotion

The amendment responded to decentralisation between the three regional distribution system operators, which increases administrative costs as well as the costs of forecasting and subsequent management of imbalances. Due to this fact, the competence for administration of the system for promotion of RES-Electricity and high-efficiency cogeneration, namely support administration, data management and support financing, has been entrusted to short-term electricity market operator, OKTE, a.s.

4.2 Modification of the Promotion System to a More Market-Oriented Type of Promotion (Green Bonus)

The basic form of promotion for all new installations with an installed capacity exceeding 500 KW is by means of the so-called green bonus, granted by the operator of the short-term electricity market, whereby the producer is solely responsible for the sale of electricity to the trader on the basis of a voluntary bilateral agreement. The producer will also be responsible for the deviation itself, having the right to delegate the deviation responsibility to another electricity market participant, wh is the subject of the settlement by contract. The success of the tender is a prerequisite for the provision of promotion in the form of a green bonus for all new installations with an installed capacity exceeding 500 KW.

4.3 New Legal Framework for Provision of State Aid to Enterprises

State aid will be granted in the form of compensation, i. e. by reimbursing part of the fees related to the financing of promotion to produce electricity from renewable sources. The aid should be limited to sectors where the competitive position is at risk in relation to the costs arising from the financing of renewable energy promotion.

4.4 New Definitions Requiring the Transition to a New System of Promotion

Tariff for operating the system – this is a fixed price per unit of electricity linked to a technical unit, taking into account the proportion of the costs of producing electricity from renewable energy sources, including the correction of costs incurred in accounting promotion for the production of electricity from renewable energy sources.

Tariff for the production of electricity from renewable energy sources – this is a fixed price per unit of electricity linked to a technical unit, which takes into account the proportion of the costs of producing electricity from renewable energy sources and constitutes a component of the tariff for operating the system.

Tariff for system services – this is a fixed price per unit of electricity linked to a technical unit, considering the TSO's "eligible costs for the purchase of ancillary services and the TSO's other" allowed system services.

4.5 Access to System for Electricity Generating Producers

In order to avoid double payment, the price regulation of access for the electricity-generating producer will only apply to one of them.

4.6 Extended RES Support

The latest amendment to the RES Act came into effect in August 2021. The aim of this amendment is to reduce the annual financial costs associated with producing RES-Electricity by extending the support period and reducing the electricity price set for renewable energy producers at the beginning of their operation. These changes will apply following a decision made by the RONI following a request from the producer.

5. Significant and/or Expected Changes in 2022

5.1 Strategy of the Environmental Policy of the Slovak Republic until 2030

According to the Greener Slovakia strategy, in the next ten (10) years renewable energy production will be preferred, which by its nature does not burden the environment and contributes to the long-term sustainable development of the Slovak Republic.

This means that the impact of hydropower plants on the hydrology of river ecosystems will be mitigated by the removal of barriers on water courses, for example, by modifying release schedules with the release of appropriate flow rates and with regard to impacted habitats. Solar power stations will be, in the implementation of mitigating measures, mainly located on the roofs of buildings, car parks, brownfields or lower quality soil and not on high quality soil or habitats of national and European importance. Regarding geothermal energy, it is necessary to focus on the reinjection of water into the rock environment and to minimise outlets into surface streams. The setting of protection zones of geothermal sources, and subsequently their compliance with conditions of use by geothermal users will be determined by law. Sustainability criteria will not apply to projects that have already commenced.

5.2 The Slovak National Climate and Energy Plan for 2021 – 2030

Under the Slovak National Climate and Energy Plan, the Slovak Republic has committed that by 2030, it will have 19.2% of RES-Electricity in its final energy consumption.

Other measures set by this document are:

- Increase the share of RES in the area of heating and cooling – under this obligation it will be necessary to transpose the Directives EU Nos. 2018/2001 and 2018/2002, as well as certain regulatory measures. The aim will be to introduce incentive mechanisms for district heating and cooling system operators aimed at increasing the share of RES in the fuel mix. Moreover, centralised heat systems ("**CHS**") will be promoted also in the form of biomethane derived mainly from waste from plant and animal production, from the biodegradable fraction of municipal waste, biodegradable kitchen and restaurant waste and wastewater treatment plant waste. The development of geothermal energy will also be supported;
- Mandatory amount of RES in centralised heating systems;

- Mandatory connection to efficient CHS using RES;
- Promotion of prosumers – RES prosumers and RES energy producing communities will be entitled to install their own RES heating production facility, which will ensure the production of heat for their own consumption, enable the storage of heat produced from RES and the sale of overproduction. The intentions and form of national legislation with regard to ensuring the participation of consumers in the energy system and the benefits of their own electricity production and new technologies, including smart measures, arises, *inter alia*, from the transposition of EP and Council Directive (EU) No. 2019/944 into the Slovak Republic, by the transposition period until the end of 2020;
- Waste and waste heat recovery;
- Promotion of Clean mobility – fifteen (15) measures, which have the character of direct support for the use of low-emission vehicles and the possibilities of a financial mechanism to support the development of charging infrastructure, as well as incentive promotion. The current incentive to purchase vehicles is promoted by benefits such as distinctive vehicle identification, the possibility of using lanes reserved for public transport, allowing entry into low-emission zones or using parking lots for a restricted group of users;
- Promoting the energy efficiency of buildings.

It is assumed that after the construction of a new cross-border transmission line between the Slovak Republic and Hungary in 2021 there will be **no reasons for limited connection of sources in terms of safety and reliability of electricity system operation** and the Ministry of Economy will be able to determine higher outputs for local outputs and auctions.

5.3 New FDI Screening Procedure

Although the Slovak Republic remains open to foreign investment, the Slovak Republic implemented a new foreign direct investment (FDI) screening mechanism on 1 March 2021 based on EU framework regulation (EU) 2019/452). Under the new FDI regime, acquisitions of shares and businesses designated as critical infrastructure under the Critical Infrastructure Act must be notified to the Ministry of Economy. The consent of the Slovak government is required for any foreign investment into entities designated as elements of critical infrastructure under the new FDI regime.

Entities operating in the following sectors under the competence of the Ministry of Economy could be designated as elements of critical infrastructure: i) mining; ii) electric power engineering; iii) gas; iv) petroleum and petroleum products; v) pharmaceuticals; vi) metallurgical; or vii) chemical.

Despite this regime being understood as applying to foreign direct investment, the notification obligation also applies to acquisitions by any investors – not only foreign (EU or non-EU) but also domestic investors. Since the summer of 2021, the Ministry of Economy has been working on a new foreign investment screening mechanism under a specific legislative act. This law is currently going through the legislative process and is expected to come into effect by June 2022.

5.4 Comprehensive Changes in Slovak Energy Laws

The Ministry of Economy has presented the Slovak government with a bill to comprehensively amend the Energy Act, the RES Act and Network Industries Regulation Act by implementing the directives of the CEP proposed by the European Commission. In line with the goals of the CEP, this comprehensive amendment to Slovak energy legislation aims to improve energy efficiency, increase the market share of RES and promote fair conditions for consumers in the Slovak Republic.

Although the provisions of the bill are yet to be finalised, the amendment is expected to introduce new subjects as participants in the energy market, to increase support for new technologies, to enhance digitalisation and data gathering by the relevant institutions and, most notably, to introduce the deregulation of retail electricity and gas prices. The bill is still going through the legislative process and is expected to come into effect in the second half of 2022.

6. Overview of the Technical Innovations in Electricity Storage and Applicability in the Slovak Republic of such Storage Technologies

Under the Slovak National Climate and Energy Plan ("**NCEP**") for 2021 – 2030 the Slovak Republic considers the introduction of intelligent energy and electricity storage systems as being particularly important.

As noted, the Slovak Republic will transpose the EP and Council Directive (EU) No. 2019/944 into Slovakian legislation by the end of 2020. This should increase the flexibility of the Slovak electricity grid, including energy storage solutions.

Moreover, the Slovak Republic has the intention to set rules and create conditions for providing ancillary services, such as electricity storage services. Their target will be to enable providers of electricity storage systems to become regulatory service providers. The target is to ensure full and equal access to balancing markets for all technologies and providers, including RES.

The NCEP states that the integration of local energy storage in storage appliances, energy storage and electric vehicles or gas distribution networks with their storage capacities is therefore an important element of the smart grid. First, to maintain and promote the existing capacity and operation of pumped-storage power plants and, second if necessary, to assess the possible increase in storage capacity by building a new pumped-storage power plant.

In order to develop the electricity storage systems, one of the main cornerstones is for further research and innovation in the area of RES, the development of energy storage and energy conversion technologies (POWER to X) to interconnect sectors.

The most common energy-storage system in the Slovak Republic is still pumped-storage hydroelectricity.

Presently, the Slovak accelerator InoBat and the Czech energy company CEZ have agreed to jointly develop the technology for the saltwater and iron flow battery. They want to adapt its application to European conditions. The project will also be promoted by the Ministry of Economy of the Slovak Republic.

The Slovak company NAFTA, a.s., the main store of gas in the Slovak Republic, is anticipated to be a universal energy store in the future and sees the future in energy storage in the form of gas. They became a partner of the Underground Sun Storage project, created in accordance with the Power to Gas concept. Underground Sun Storage was a unique project to verify the possibility of storing energy from renewables in underground geological structures in the form of a natural gas and hydrogen mixture.

7. Support Scheme for Cogeneration

The support scheme for cogeneration is regulated by the RES Act. Specifics of cogeneration promotion are set in the Decree of RONI No. 490/2009 Coll. In 2017, the total installed capacity for high-efficiency cogeneration was 1,241.85 MW, representing 9 % of total electricity production in the Slovak Republic.

The incentive scheme is identical with the promotion of RES-Electricity and consists of:

- Priority access – shall be granted to any RES-Electricity producer, regardless of the installed capacity, subject only to the preservation of the security, reliability and stability of the grid connection;
- The right to the off-take of the electricity generated – at a price equal to the sum of the off-take price and the supplement pertain to those installations whose capacity is up to 250 KW;
- Right to supplement – high efficiency cogeneration installations with a total capacity not exceeding 1W, of which at least 60 % of the heat produced is used to supply heat by centralised heat supply and the primary energy saving is at least 10 %;
- Feed-in premium (Green Bonus) – the support applies to electricity produced at the electricity producer's facilities with a total installed capacity of between 10 KW and 50 MW, selected by tendering.

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Generating Electricity from Renewable Sources in CEE & SEE

Projects, Infrastructure & Energy

Ukraine

Country Chapter

Wolf Theiss

Country General Information

Capital: Kyiv

Location: Situated in the central part of Eastern Europe, Ukraine is the second largest country in the territory of Europe, with an area totalling 603,550 km^2. Ukraine borders the Russian Federation, Belarus, Poland, the Slovak Republic, Hungary, Romania and Moldova.

Surface: 603,550 km^2

Population: 41.3 million inhabitants

Climate: continental, with four distinct seasons

Resources: As of 2016, 70.8% of the territory of Ukraine was classified as agricultural land and 17.6% of the area was covered by forests. Ukraine has limited fossil-fuel energy reserves. The country is reliant on imports of oil, gas and coal. Nevertheless, the country has high potential for (i) wind power; (ii) expanded biomass use for energy purposes; and (iii) solar PV equipment that can be efficiently operated throughout the year (northern and southern regions).

Electricity Grid: In 2021, Ukraine generated 156,575 GWh of electricity, with state-owned enterprises accounting for most of that production. Currently, Ukrenergo has four regional power systems covering Ukraine: It operates high voltage equipment and manages more than 19,000 km of trunk and cross-border high voltage transmission lines. Each year, Ukrenergo transmits hundreds of thousands of GWh of electricity.

Electricity Transmission, Distribution and Supply: Supply and distribution is managed by either regional electricity supply and distribution companies, known as oblenergos (public and private ownership, including foreign-owned entities, with significant shares belonging to 5-7 individuals) or Distribution System Operators and Suppliers.

Official EU Language(s): Ukrainian

EU Member Country: N/A

NATO Member: N/A

United Nations Member: since 1945

Currency: Ukrainian Hryvnia (UAH)

Schengen: No – but has joined the Deep and Comprehensive Free Trade Area (DCFTA).

Political System, Administrative Organisation and Economy: Ukraine is a unitary state. State power in Ukraine is exercised on the principles of its division into legislative, executive and judicial power. The President of Ukraine is the Head of State and a guarantor of national sovereignty, territorial integrity and adherence to the Constitution. The only legislative body of Ukraine is the Parliament. Ukraine undertook decentralisation reforms in 2014 in order to create a capable institute in the form of local Governments. This reform created the basic level – communities - and the middle (sub-regional) level – districts - and thereby moved more power to these created institutes. The Ukrainian economy has started to show signs of stabilisation after years of political and economic tension. Certain reforms have been adopted to promote household consumption and to consolidate public finances with prudent fiscal and monetary policies. A flexible exchange rate regime has also helped to reduce budget and current account deficits. In recent years, the Ukrainian government has been investing heavily in the reconstruction of Ukrainian infrastructure, which had been lacking investment since the dissolution of the Soviet Union.

1. Defined Terms for the Main Permits Required for RES-Electricity Generation Facilities

Balancing Group Entry	Legal requirement for RES producers to enter into the balancing group of the SE "Guaranteed Buyer" in order to sell electricity on the new electricity market under a feed-in tariff or at auction price.
Construction Permit	Administrative deed issued by the local body of the state architectural and construction control ("**SACC**") (applicable to facilities qualified as SS2 or SS3 classes of harmful consequence facility).
Commissioning Certificate	Administrative deed issued by the local body of SACC in order to authorise the commissioning of the relevant RES Facility (applicable to facilities qualified as SS2 or SS3 classes of harmful consequence facility).
Construction Project Examination	Mandatory examination conducted by authorised expert organisations in case the relevant RES Facility qualifies as SS 2 or SS 3 classes of harmful consequence facility.
Environmental Approval	Administrative deed issued by the local Environmental Authority evidencing the compliance of the RES-Electricity facility with the environmental requirements as provided by law.
Grid Connection	Actions performed and administrative deeds issued by the grid operator to connect a new generating facility or to modify or replace the connection of an existing generating facility to the grid.

Guaranteed Purchase of Electricity Produced from RES Facilities	Set of rules and conditions based on which the State Enterprise "Guaranteed Buyer" is obliged to purchase all RES-Electricity within quotas acquired by the Producers at RES auctions.
Licence for Electricity Production	Administrative deed issued by the National Regulatory Commission on Energy and Utilities ("**NEURC**") for electricity production according to the licensing conditions for commercial electricity production, approved by Resolution of NEURC No. 1467 dated 27 December 2017. Under this Licence, the producer has the right to operate a RES-Electricity facility and to sell the generated RES-Electricity on the market.
NEURC	The National Energy and Utilities Regulatory Commission of Ukraine is the single authority for regulating gas and electricity in Ukraine. One of NEURC's main functions is to issue licences to business entities operating in the fields of energy and public utilities and to exercise control over their licensed operations.
RES-Electricity	Electricity obtained from RES sources such as solar, wind, aerothermal, geothermal, hydrothermal, wave, tidal, hydropower, biomass, landfill gas, sewage treatment gas and biogas.
RES Support Scheme	State-aid measures in two forms (i) feed-in-tariff (in other words green tariff) that was in force until 31 December 2019, however RES Procedures that concluded pre-PPA's with the SE "Guaranteed Buyer" until that date can still finish construction projects and fall within the green tariff regime until the end of 2029; (ii) RES auction mechanism introduced in 2019, aiming to replace the green tariff scheme. State support will be provided by means of guaranteed purchase through the SE "Guaranteed Buyer" of all electricity produced from RES Facilities within the quota acquired at the auction.

2. Envisaged Need of Investments in Ukraine

Ukraine has demonstrated significant commitment to reforming its energy sector in order to reach the sustainable growth targets set by numerous international obligations. The country joined the European Energy Community in February 2011 and in October 2014 set the goal of increasing its renewable energy share in the national power mix to 11% by 2020, while the Energy Strategy of Ukraine adopted in 2017 increased the target to 25% of renewable energy share by 2035. Therefore, renewable energy is expected to be the fastest growing source in terms of power generation in Ukraine in the foreseeable future.

Ukrainian cities are among the key players that are poised for changes in the sustainable growth of the country in the renewable energy field. The city of Zhytomyr (located in the northwest of Ukraine) approved a plan in 2018 to achieve one 100% renewable energy by 2050. This ambitious goal was also followed by the cities of *Kamianets-Podilskyi*, *Chortkiv* and *Lviv*. The State Agency of Ukraine on Exclusion Zone Management, that manages the Chernobyl zone, agreed that within the implementation of Ukraine's commitment under the Kyoto Protocol, a photovoltaic power station will be constructed in Chernobyl. Moreover, in 2018 the Government allocated seven (7) hectares of land for the construction of wind energy facilities within the zone's territory.

The official start of investments into RES Facilities was in 2008, when numerous (including foreign) players entered the market. Since then, RES projects (mostly solar and wind) have been mushrooming around the country. Such rapid development of the RES sector during 2008 – 2021 can be explained by the adoption of the green tariff in 2008, which essentially guaranteed prices until the end of 2029 and was the highest in Europe.

By the end of 2021, a total of 8.1 GW of RES capacity had been officially installed. The average price for RES-Electricity production under the green tariff in 2022 is approximately 13 – 15 euro cents per KWh. According to publicly available data, about EUR 1.2 billion was invested in RES capacities in Ukraine in 2019, which is significantly less than in 2019 (EUR 3.7 billion).

The Government has made significant efforts to stimulate and encourage the flow of foreign investments in RES projects (e.g. granted VAT exemptions on the import of certain RES equipment, simplified the process of land allocation, etc.).

Despite the development of the RES market over the years, Ukraine has faced problems regarding the attractiveness of RES incentives and the support scheme. In the last two years alone, over 3 GW of green capacity have been put into operation at an increased feed-in green tariff (mostly solar), at the highest tariff in Europe. According to the Ministry

of Ecology and Natural Resources of Ukraine, the energy system can no longer balance green generation capacities. There have been defaults on payments by the Government to investors in the RES sector.

Therefore, it appears inevitable that the legislation and regulations on the RES market are due to change significantly in the near future. The Government and the Parliament are in close communication with industry players in an effort to work out a solution that is acceptable to all parties and appear to appreciate that RES investments make up a large proportion of the total investments that have been made in Ukraine in recent years. The Government's priority is to not allow any unjustified increase in tariffs for end-customers, with the corresponding negative consequences for the economy of Ukraine and the inability to fulfil its obligations to investors in the RES sector.

Starting from 1 January 2020, investors or future RES producers may enter the Ukrainian renewable market in two ways: (i) by investing into existing RES projects that are entitled to operate under the green tariff regime; (ii) investing into RES projects operating under the new Auction Law.

3. Executive Summary – RES Market Status and Development of RES Facilities

3.1 Market Overview–Factsheets

- After the introduction of a special green tariff, tax and customs relief, as well as incentives for purchasing locally made equipment in 2008, the RES sector in Ukraine started to grow rapidly on an average of 31% annually;
- The Energy Strategy of Ukraine has been looking to increase the overall share of renewables to 12% by 2025, and to 25% by 2035, including for RES-Electricity generation;
- RES producers exploiting equipment of Ukrainian origin enjoy a higher green tariff (by up to 20%), provided the respective equipment is produced between 1 July 2015 and 31 December 2024;
- Import VAT on certain RES-related equipment and materials imported into Ukraine can be deferred interest free and paid in instalments over a 24-months period until 1 January 2025;

- In 2018, after a sharp fall in the cost of equipment for the construction of RES projects, the Government insisted on an urgent reduction of the green tariff from 1 July 2019;
- Ukraine's new electricity market model was introduced by the Law of Ukraine "On the Electricity Market" No. 2019-VIII, dated 13 April 2017, and was put into operation on 1 July 2019;
- In 2018, Ukraine became a member of IRENA. In 2019, Ukrainian law was amended to introduce state support auctions (instead of the green tariff) for RES-Electricity facilities commissioned after 1 January 2020;
- With these recent changes in the electricity market, Ukrenergo has become responsible for compensating the SE "Guaranteed Buyer" for the green tariff. Considering the difficulties with payments, the SE "Guaranteed Buyer" faced challenges in meeting its obligations to green energy producers and investors. In November 2021, the debt of SE "Guaranteed Buyer" to RES-Electricity producers stood at around USD 1 billion. A large part of that debt was repaid to RES-Electricity producers in late 2021 and early 2022. However, RES-Electricity producers are yet to receive full compensation of the purchase price for the electricity produced and purchased by SE "Guaranteed Buyer" in 2021;
- Ukraine plans to increase the share of RES-Electricity to 25% by 2035. Thus, it will require significant, and sustained investment into new RES capacity, storage and transmission networks. During 2018, installed solar power capacity increased by 87%, wind power by 15% and biofuel by 33% driven mainly by the "last chance" to fall within the green tariff regime until 2020;
- As of today, solar and wind projects constitute the vast majority of the RES projects in Ukraine;
- The installed capacity of RES-Electricity generating facilities in January 2022 stood at 8,199.30 MW nationwide. The largest increase in RES-Electricity generation during 2020 – 2021 was by solar power farms (67.8%), followed by wind farms (a 47.5% increase).

4. RES Market Status, Permitting, Grid Connection, Licensing of RES Facilities in Ukraine

General Market Data	
RES Target 2035	25 % by 2035 (reported to have achieved more than 14 % to date)
Overall Installed General Capacity including RES (Overall Production)	56,297 MW (generating capacity excluding the currently occupied territory of Crimea) 8,199 MW (RES capacity excluding the currently occupied territory of Crimea)
Installed Capacity by Technology	PV – 6,414 MW Hydro –6,318 MW Wind – 1,529 MW Biomass – 256 MW
RES Support Scheme	
Beneficiaries of RES Support Scheme	Business entities intending to generate RES-Electricity, regardless of the facility's installed capacity and the RES source (except for blast furnace and coke-oven gas, and in case of hydropower use with only micro, mini and small hydro plants).
Priority and Guaranteed Off-take into the Grid	RES-Electricity is not granted priority connection.

Other incentives	○ Guaranteed purchase of RES-Electricity; ○ Premium green tariff for the use of equipment manufactured in Ukraine (up to 20 %); ○ Exemption from import VAT on certain RES equipment; ○ Cancellation of the designated purpose land requirement; ○ Exemption from zoning requirements; ○ Exemption from the requirement for a construction permit for wind plants[1].
Other conditions	Green tariff rates decreased significantly in 2020 in an effort to relieve the burden on the state budget created by a large number of RES facilities going online within a short period of time to benefit from high green tariff rates.
Grid Connection Specifics	
Approvals	Electricity distribution and transmission system operators cannot deny access to their grids provided that the applicant meets the technical requirements.
Permitting	Construction permits for construction works, design documentation (including its examination) and connection to the grid.
Timing	Depending on capacity of the RES Facility, an investor may obtain the necessary connection approval within forty-five to sixty (45 – 60) days after the payment for connection has been made.

1 Construction of wind plants has been given SS1 class of harmful consequence facility, thus construction works may be undertaken without a specific construction permit.

Licensing	
Procedure	The Licence for electricity production is issued after the construction and commissioning phases (i.e. after obtaining the Commissioning Certificate) are finished. The RES producer applies for a Licence for electricity production by submitting a standard form application to NEURC and the supporting documents.
Duration of administrative procedure	Ten (10) working days following the submission of the application.
Licence's validity	N/A

5. Key Changes to the RES Support Scheme since 2016 – Implementation of the Auction Scheme

5.1 New Electricity Market Model

Ukraine's new electricity market model was introduced by the Law of Ukraine "On the Electricity Market" No. 2019-VIII ("**Law No. 2019-VIII**"), dated 13 April 2017, and was put into operation on 1 July 2019. The new model provides for direct (without intermediaries) and diversified electricity purchase arrangements between producers and power supply companies. It also contains such elements as intra-day, day-ahead and balancing markets.

Under Law No. 2019-VIII, the SE "Guaranteed Buyer" has been registered as an independent entity responsible for increasing the share of RES-Electricity by purchasing the produced electricity from RES Producers eligible for the green tariff or within the quota acquired at a RES auction. Additionally, Law No. 2019-VIII sets requirements for unbundling the functions of the distribution system operator. Law No. 2019-VIII also introduced responsibility for imbalances.

5.2 Introduction of RES Auctions

In 2019, Ukrainian law was amended to introduce state support auctions for RES-Electricity facilities commissioned after 1 January 2020 instead of the green tariff (however, certain planned projects where pre-PPAs were signed before 31 December 2019 will enjoy green tariffs also after 2020). Under the auction scheme, the Ukrainian state will purchase all electricity produced by the RES project within the limits of the quota purchased at auction at the established fixed tariff. The auctions will be mandatory for entities operating RES Facilities with a capacity of at least 1MW for solar facilities or 5MW for wind facilities. Operators of facilities under 1MW and other types of facilities may voluntarily participate in the auctions. RES facilities already working under a green tariff are not eligible for the auction support scheme.

The RES auctions will be conducted transparently through the Prozorro.Sales platform (Ukraine's public e-procurement system) within the annual auction support limits to be approved by the Ukrainian Cabinet of Ministers each year. SE "Guaranteed Buyer" is responsible for organising and holding the auctions and for establishing and documenting relations with the auction winners. In order to establish contractual relations with the SE "Guaranteed Buyer" after the auction, RES Producers will have to provide, among other things, evidence of title or lease rights to land and a grid connection agreement.

No RES auctions have yet been held, but the government plans to hold them in the near future. It is expected that the RES auction regime may be amended by the Feed-in Premium legislation that is due to be enacted sometime in 2022.

6. Significant and/or Expected Changes in 2022

6.1 Innovations in Electricity Storage and Applicability in Ukraine of such Storage Technologies

It is expected that the Ukrainian Parliament will soon adopt a special Law regulating energy storage systems. Early in February 2022, the Energy and Utilities Services Committee of the Ukrainian Parliament approved a draft Energy Storage Systems (ESS) Bill, which is expected to be voted on in Parliament soon.

According to the available text of the draft ESS Bill, an ESS operator is defined as an individual or legal entity which stores energy in order to sell it, and/or renders ancillary and/or balancing services. Energy storage activities are subject to licensing by the Regulator if they exceed certain thresholds or if they are conducted by electricity producers, including RES producers.

Generally, transmission system operators and distribution system operators cannot own and use an ESS, except when (i) such facilities are not used for balancing or regulating system restrictions, or (ii) the ESS owned by other operators in the market are insufficient for the relevant grid and such an ESS is necessary for the efficient, secure and safe operation of the relevant system.

ESS operators have rights and obligations similar to those of electricity producers and may participate in any electricity market. ESS operators must pay transmission, distribution and dispatching charges based on the difference between monthly output and billing.

RES producers that have been awarded a green tariff or have been allocated auction prices may own an ESS. This will not constitute grounds for having their green tariff or auction price reviewed.

Please note that some members of Parliament had considered adding provisions on virtual (financial) corporate PPAs to the draft ESS Bill. However, it was eventually decided to add those provisions to another appropriate draft bill.

6.2 Possible Changes in the Green Tariff Regime – Feed-in Premium Support

The Ukrainian government is currently developing a draft bill on feed-in premiums (FIP), which is expected to be laid before Parliament soon.

Under the draft bill, RES producers will be able to freely sell RES-Electricity on the electricity markets at market prices rather than being obliged to sell the electricity that they produce only to the Guaranteed Buyer under PPAs. As the market price may be lower than the guaranteed feed-in (green) tariff or the auction price, the state will top up the difference through the FIP support.

The FIP will apply to feed-in (green) tariff producers who have voluntarily decided to leave the balancing group of the Guaranteed Buyer and to all renewable energy auction winners.

Such RES producers will be able to sell RES-Electricity on the bilateral contracts market, the day-ahead market, the intraday market and the balancing market.

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