

Generating Electricity from Renewable Sources in CEE & SEE

Energy Industry Group

Serbia

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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 km² (77,589 km² 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 6,641,197 (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 10,914.01km (9,861.78km 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 the 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). Consequently, 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; it also supplies commercial customers. As at 27 March 2024, there were also 76 local companies licensed to supply electricity and 86 local and foreign companies registered for the wholesale of electricity in the Serbian market.

Official Language(s): Serbian

EU Member: 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 in 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. RES potential in Serbia

The Serbian National Action Plan for RES, which was adopted in 2013, envisaged a 27% share of RES within final energy consumption in Serbia by 2020. This target was not met by 2020 and has still not been achieved. Based on the most recent reports from the European Commission, Serbia has made moderate progress in harmonising its legislation, governance, and processes with the EU *acquis*, but Serbia's share of RES as a percentage of its gross final energy consumption has unfortunately decreased by 1% year-on-year and was at 25.28% in 2021.

Still, Serbia has set very ambitious targets for decarbonisation and increasing RES in its generation capabilities. Serbia committed to an unconditional emissions reduction target in August 2023 of 13.2% compared to 2010 levels, or 33.3% compared to 1990 levels, to be achieved by 2030.

Notwithstanding the above percentages, the total installed capacity of RES projects is steadily increasing in Serbia. The total installed capacity of RES used for electricity generation (not including wind and big hydropower plants) increased to 190 MW in 2023. The current 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). The share of electricity generation via oil in comparison to 2010 (baseline year) should decrease from 28.7% to 14.6% by 2030 and the share of generation via coal should decrease from 23% to 16.5%. By contrast, the share of generation via natural gas should increase from 48.3% to 56.4% and biomass from 3.2% to 12.5% by 2030.

The available potential of RES in Serbia is estimated to be 5.65 million tons of oil equivalent, with biomass amounting to 60% of the RES potential and 30% coming from hydropower. Total hydro energy potential in Serbia is approximately 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 to be developed.

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, including both large-scale



projects and industrial and household prosumers. Biomass remains a significant energy potential with an estimated 3.448 million tons, particularly in the rural areas of central Serbia and in the Vojvodina province.

One of the main obstacles to further RES development is the lack of human and technical resources in the Ministry of Mining and Energy's Department for Green Energy. Moreover, further development of the transmission and distribution grid requires considerable investment to connect new generation plants. Balancing costs and responsibility, as well as ancillary services, are an area of particular focus at the time of publication of this Guide.

The Serbian market can be described as very active with public and private project developments and project-driven M&A. Serbia is already home to many established foreign investors in the energy sector, including CWP, Fintel Energia, RWE Inoggi, Itochu, MET Group, Taaleri, REV Canada, DEG, Secci, Enlight Renewable Energy, Elicio and others. Appetite for it exists, particularly with regard to self-consumption and other energy efficiency projects. Such projects are regularly financed by a variety of lenders, from private equity funds and commercial banking syndicates, to international financial institutions such as the EBRD, IFC, KFW, and the OEEB.

2. RES Market

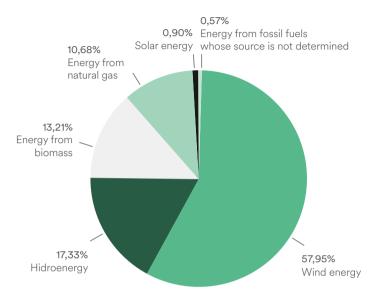
2.1 The Market Over the Years

- O The first Serbian Energy Law was adopted in 2004 and, after a few years, a new and improved version of this law was adopted in 2011. Both of these initial versions aimed to promote RES electricity generation through harmonisation of the local market with EU legislation.
- O In 2009, the feed-in tariff model was introduced for RES electricity generation.
- O 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.



- O 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").
- O 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 the signing of 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 that facilitated construction.
- O In 2015, Serbia adopted its current Energy Strategy, which sets out targets and areas of special interest until 2025, with projections until 2030.
- O In April 2016, Serbia signed the 2015 Paris Agreement, which was later ratified by parliament and came into force on 24 August 2017.
- O 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.
- O The allocation of electricity generated under the feed-in tariff model during 2021 can be illustrated as follows:

Structure of electricity generated in the incentives system in 2021



*Source: EPS

- O The capacity of wind power plants operated by RES producers with 2014-Model PPAs in place equals 398 MW, with another 168 MW of capacity still under construction (i.e. they hold the status of temporary privileged power producer). The total capacity of hydro power plants of the same type of RES producers is 94.6 MW, with 18.2 MW under construction. In comparison, the capacity of solar power plants of the same type of RES producers is only approximately 9 MW, total capacity of biogas is approximately 33.2 MW (with another 77.4 MW still under construction), and biomass capacity is only 2.3 MW. High efficiency cogeneration plants have a total capacity of approximately 25.9 MW (with another 10 MW under construction). The City of Belgrade PPP Project for Energy from Waste remained the sole beneficiary of the feed-in tariffs approved for its landfill gas facility and leachate treatment facility (installed capacity of 30.2 MW).
- O 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. Subsequently, 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 the possibility to achieve prosumer status; (iii) use of RES in heating and transportation; and (iv) international cooperation in the field of RES.
- O The key change in the new RES Law is the introduction of market premiums awarded in a public auction process in the form of a contract for difference, 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).
- O In June 2023, an auction plan for the period 2023 2025 with a total capacity of 1,300 MW was published. The first auctions for producers of electricity from renewable energy sources were then conducted in the summer of 2023. Out of the 400MW quota for wind projects, four projects filled the entire quota. On the other hand, out of the 50 MW quota for solar power, about half, or 25.2 MW, were awarded (some only after the appeals process).

2.2 Project Development in Serbia

Serbia is continuously instituting more and more e-government processes. It no longer takes months to obtain various documents from different authorities. Starting in 2023, companies can be incorporated through an entirely electronic process.

Focusing on construction, the online Unified Procedure Portal has significantly streamlined and simplified the process for investors compared to the arduous paperwork process which preceded it. In 2022, the average time for deciding on construction permit applications through the Unified Procedure portal was 10 calendar days. However, it should be noted that some cities and municipalities in Serbia work extremely efficiently and process such applications in a couple of days, whereas others can take several weeks to decide on permit issuance.

The number of services available electronically is also increasing along with the preparedness of administrations and authorities to respond to electronic applications.



EMS – the Serbian transmission system operator – uses its NERA platform to communicate with market participants and enter into contracts, such as balancing responsibility agreements. The Serbian Energy Agency has also established a channel of communication for receiving electronically signed documents. However, applications by foreign companies for electricity wholesale licenses must still be submitted by paper.

Despite positive examples, Serbia remains a very formalistic legal environment. Authorities still mainly require documents that 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.

A key first step for project development in Serbia, particularly for wind and solar projects, is ensuring that the required real property rights are in place. However, as is the case with most Western Balkans countries, this is often problematic in practice due to unresolved ownership issues or numerous private individual owners, particularly in rural areas where such 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	
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.
	The first auctions were held in July 2023.
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 upon 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 transmission system 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 the grid connection process varies in practice and is closely linked with permitting and construction procedures.

2.3 Main Permits required for RES-Electricity Generation Facilities

Environmental Impact Assessment; Consent

An Environmental Impact Assessment (EIA) may be required in some cases. In such cases, it is a pre-requirement for the issuance of both the energy permit and the location conditions which are required for the Construction Permit. 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 hydropower plant, where the lower limit is 2 MW, and in the case of a wind project, where the lower limit is 10 MW total capacity. 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 (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. A construction permit should formally be issued within five days during 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 Permit

If the energy plant uses water from rivers, lakes or underground rivers, or releases water or other materials into them, the Water Permit ($80\partial Ha \ \partial O38O Ja$) is the third step towards obtaining a Building Use Permit, following 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, within five days of receiving the Technical Inspection Commission's Report.
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.

3. 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 into Serbian legislation to date, compared to the former legal regime applicable under the 2014 Energy Law.

3.1 Market Premiums and New Quotas

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



- 1. Hydro power plants with an installed power of up to 30 W (other than reversible power plants);
- 2. Biomass power plants
- 3. Biogas power plant
- 4. Wind power plant
- 5. Solar power plant
- 6. Geothermal power plant
- 7. Biodegradable waste power plant
- 8. Landfill gas power plant
- 9. Power plant using gas from urban wastewater treatment plants
- 10. Power plant using other renewable energy sources

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

3.2 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. This guarantee 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 these guarantees 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.

3.3 Prosumers

Production of electricity from RES for own consumption is introduced through the institute of 'purchaser-producer' (*kynaų npouseoħaų*) – 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 monthly electricity bill or to compensation from the electricity supplier for the surplus electricity that was sold.

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 them in terms of producing energy for their own needs from RES (e.g. by installing rooftop solar panels), connecting to the grid and selling their surplus electricity to suppliers. 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.

3.4 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.



4. Significant and/or expected changes in 2024

4.1 Amendments to the Energy Law

Amendments to the existing Energy Law are expected. As one of the most anticipated changes, the market awaits the introduction of a concept of 'active customer', i.e. an end customer or a group of end customers who: (i) act together; (ii) use or store electricity produced within their facilities located within certain boundaries; or (iii) independently sell produced electricity or participate in flexibility services or energy efficiency measures, where these activities do not represent their basic commercial or professional activity.

These amendments, if enacted, will allow larger industrial facilities to install and connect large scale generation capacities which exceed the limitations currently imposed on prosumers. Such large commercial generators will most likely be required to fully regulate and take responsibility for load balancing with grid operators.

4.2 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 electricity generation via 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.



4.3 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.

4.4 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 begin to increase and attract even more attention from investors.

4.5 Power Purchase Agreement (PPA)

The rules and market standards for corporate PPAs are slowly falling into place in Serbia. While local regulations still do not allow on-site physical PPAs, financial PPAs have started becoming more common in the market. Generally, EPS as the guaranteed and main market supplier acts as a 'sleever' in most contractual arrangements. It is expected that market participants will become more familiar with the concepts and possibilities of PPAs with producers, particularly due to the extremely volatile market prices. The energy crisis has led to PPAs in Serbia being entered into for periods of 6 months to a year. At the time of this Guide, the price of electricity for industrial consumers towards EPS, as the main supplier in full supply contracts, is EUR 120 MWh (well over the European average) and this price will apply until end of April 2024.

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