

# Prospects for installation and utilization of rooftop solar photovoltaics in the CEE





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# General part

**The world is in turmoil. We are witnessing record-high fossil fuel prices as well as higher pollution levels than ever before. At the same time, encouraged by the COP26 summit and due to increased public awareness on the benefits of rapid energy transition, a number of countries have already committed to phase out coal-fired power generation and continue adding more renewables to their current energy mix.**

**Consequently, more and more individuals and organisations around the world are taking their first steps in assessing the best options for reducing their carbon footprint. These are supposed to secure the production of electricity at relatively predictable prices, enable less dependence on electricity produced from coal and other fossil fuels, and reduce the overall costs of doing business. Arguably, one potentially beneficial way of achieving these goals is the installation of rooftop solar panels (rooftop PVs) and net metering.**

## What is net metering?

Net metering is usually defined as a simple billing arrangement in which surplus energy produced from rooftop PVs is measured by an end-consumer's electricity provider and subtracted from its monthly electricity bill. When end-consumer's electricity production is higher than its electricity consumption, the excess generation is fed back into the grid.

## How does net metering work in practice?

Generally speaking, net metering is based on giving the end-consumer credit for feeding electricity produced from its rooftop PVs to the grid, as well as on offsetting the electricity it takes from the utility in the future. Thereby the end-consumer is given the full economic value of all the electricity its rooftop PVs has produced, which results in a reduction of its electricity costs. At the end of each billing period, the utility calculates the difference between how much electricity the end-consumer fed into the grid and how much electricity is actually delivered to the end-consumer from the grid, in order to determine its net consumption. Depending on regulations and local utility's policies, surplus electricity can be either fully credited, i.e., at a retail price for each kWh sent back to the grid, or credited at a lower rate, ranging from retail to the wholesale price of electricity paid on the relevant market.

## Why is net metering attractive?

### **Reduction of end-consumer's electricity costs**

With installed rooftop PVs and a net metering system in place, it is possible to reduce an end-consumer's annual electricity cost to zero. In order to do so, an end-consumer should aim to install appropriately sized rooftop solar PVs whose annual electricity production covers the end-consumer's annual electricity consumption, if possible.

### **Protecting the grid and reducing the strain on Distribution & Transmission Infrastructure**

Net metering policies lower the demand for electricity and allow utilities to better manage their peak electricity loads. In addition, by encouraging electricity production near the point of consumption, net metering reduces the strain on distribution systems and prevents losses in long-distance electricity transmission and distribution, which in some CEE countries amounts to up to 10% of total electricity produced.

### **Securing viable alternatives to electricity produced from fossil fuels at predictable prices**

The Report on Renewable Power Generation Costs prepared by the International Renewable Energy Agency clearly indicates that solar and wind power production is cheaper than fossil fuels. Importantly, while fossil-fuel electricity has become more expensive in recent months, the cost of electricity produced from wind and solar appears to be stable, which could indicate that an electricity system that is predominantly based on renewables is less subject to price volatility.

### **Reduction of environmental risks associated with production of electricity from fossil fuels**

By installing rooftop PVs and net metering, various societal benefits could be achieved, such as reduced air pollution and air quality control, which is a significant problem in several CEE countries, in particular during the winter season.

## What are potential drawbacks of the model?

On the other hand, the most significant drawbacks are the relatively high costs of installing solar PVs and the risk of overloading the D&T system during the summer peaks in production.

However, based on available statistics, costs associated with rooftop PV installation have fallen 82% since 2010, and, according to latest estimates, they are expected to decrease even further – approximately 59% by 2025 (source: International Renewable Energy Agency). In addition, most countries offer subsidies for the installation of rooftop PVs, as well as other benefits to end-consumers, making this technology even more cost-effective.

Finally, greater expansion of rooftop PVs could have negative effects on the D&T networks (including reverse power flow, voltage fluctuations, power losses, etc). Some of those negative effects could be mitigated by timely investments in the D&T infrastructure.

**The solar potential in many CEE countries is particularly high and more and more of them are beginning to use this potential. This brochure gives an overview of the prospects for installation and utilization of rooftop solar photovoltaics in selected CEE countries.**



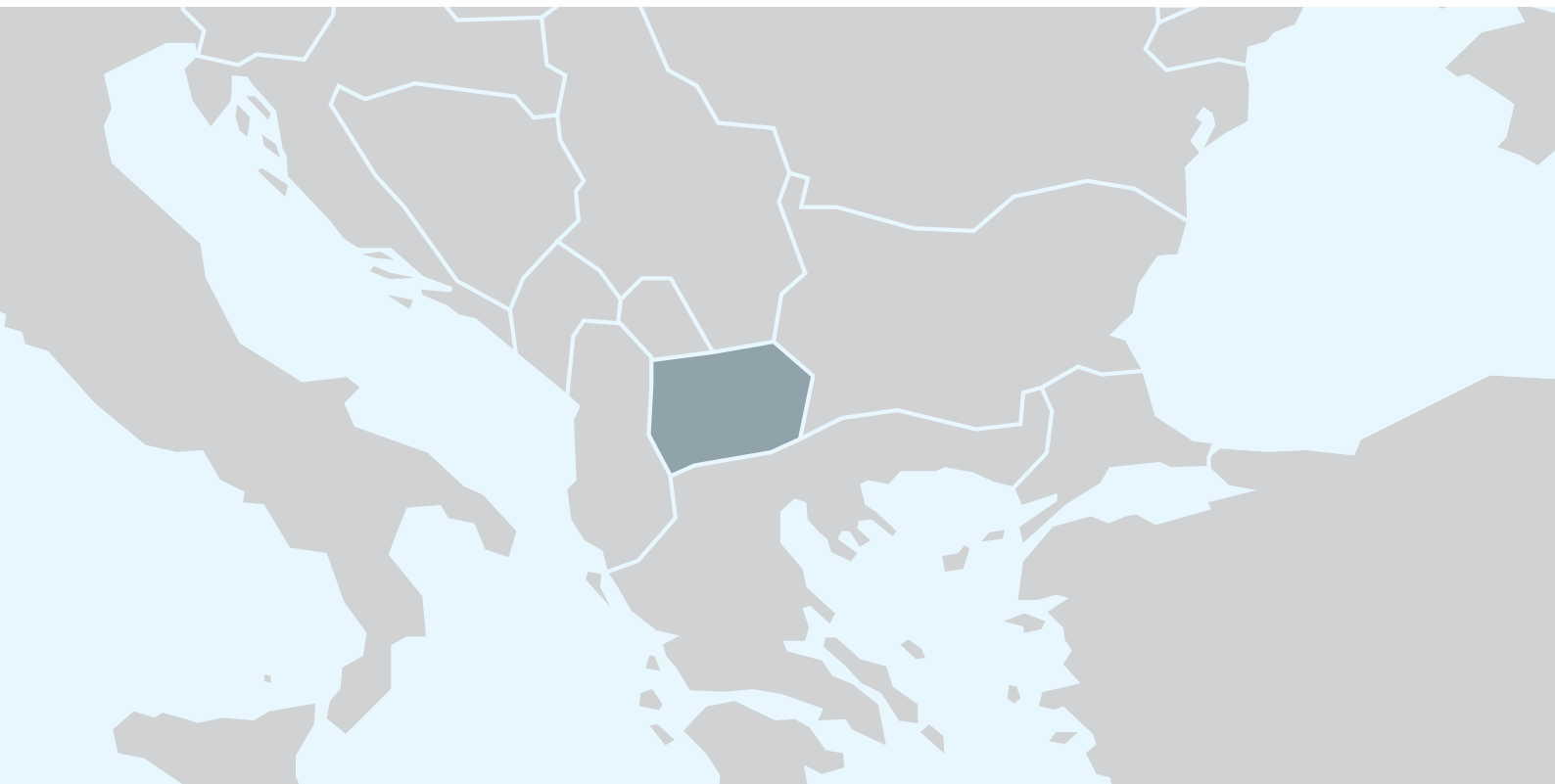
A close-up photograph of solar panels. The panels are dark blue or black with a fine grid of silver lines. A bright, circular reflection of the sun is visible in the lower right corner, creating a shimmering effect. The text is overlaid in the upper left quadrant.

**Is net metering the next  
big thing in the CEE region?**









# North Macedonia

## General remarks

Although North Macedonia has huge solar potential with 280 sunny days a year, it still relies on fossil fuels, mostly coal, and hydropower. In order to fulfil its Paris Agreement obligations and in accordance with the Energy Law, the Macedonian Government has adopted an Energy Development Strategy for the period from 2020 to 2040 ("Strategy"). One of the Strategy's goals is to fully phase out coal by 2025. This will grant North Macedonia the status of the first country in the Western Balkans to commit to eliminate coal before 2030. Additionally, the Strategy stipulates that by 2040, 45% of total energy production will come from renewable energy sources (RES), mainly solar and wind.

By **2040**  
**45%**  
of total energy production  
will come from  
**renewable  
energy  
sources.**

According to the Strategy, **solar power** plants are expected to be one of the **fastest-growing technologies** for electricity production in North Macedonia, with a theoretical potential of approx. 1.4 GW. At the moment, the share of solar energy in the total energy production mix is only 0.6%, and the installation of rooftop PVs is one of the ways of using the solar potential.

## Procedure for installing rooftop PVs

**The procedure for obtaining rooftop PV installation approval for the maximum installed capacity of 1MW in North Macedonia is straightforward and quick as construction permits are not required.**

As a rule, the installation is conducted based on a request for approval submitted by i) individuals ("households"), ii) companies ("small consumers") or iii) state entities that intend to install rooftop PVs (households, small consumers and state entities collectively referred to as "investors"). Based on the request for installation approval, the municipality where the PVs would



be installed makes a decision. As an exception, if the installation is financed by the state, a state-owned entity, the EU or some other international organization, the installation decision is made by the Ministry of Transport (and not by a municipality). In both cases the period in which an installation decision is made is short – 5 business days as of the submission of a complete request.

An investor should submit their request to install rooftop PVs, along with i) an excerpt from an urban plan or urban-planning documentation, a land certificate, or a legally binding decision for determining the legal status (for the building on which the PV would be placed), and ii) a revised basic project. However, in some cases, additional documents could also be needed, such as consent from the Civil Aviation Agency (for PVs higher than 15 meters).

In most cases, the investor would need to pay a relevant fee for installation before the installation decision is delivered .

As a rule, an investor can start the installation only after a legally binding installation decision.

## Acquiring prosumer status

A prosumer is a household, a small consumer (e.g. companies) and budget users (e.g. public bodies, municipalities, and other state entities) that own an object for electricity generation from renewable energy sources, which use the generated electrical energy for their own consumption and return the surplus electricity to the distribution grid. Prosumer status in North Macedonia can be acquired if the investor is not supplied by the universal energy supplier, installs rooftop PVs on buildings they own or use with an installed power of up to 4 kW (for households) or up to 20 kW (for small consumers), and transfers the electricity surplus to the same point of delivery of the supplier.

The prosumer should meet the technical-technological requirements and the requirements for connection to the electricity distribution network determined in accordance with the relevant Electricity Distribution Network Rules of the relevant North Macedonian system operator. In this manner, the produced and delivered electricity should be measured with metering devices that meet the requirements prescribed in the Network rules for electricity distribution and are owned by the distribution system operator.

The prosumer/distribution system operator relation is governed by both i) an agreement for electricity supply and transfer of the electricity surpluses in the electricity distribution network (regulated with the Electricity Supply Rules), and ii) the general conditions for access and use of the electricity distribution network. The distribution system operator must respond to a prosumer's request to sign an agreement for electricity supply and transfer within 30 days.

On a separate note, the prosumer/supplier agreement contains the standard mandatory energy supplier provisions in addition to the conditions for handing over the excess electricity, the data for the power generation facility of the prosumer, and the connection point and manner of measuring of the delivered electricity.

The method of determining the value of the electricity that the prosumer transfers to the supplier is specified in detail in the RES Rulebook. The billing period is four months. However, the supplier can also offer to the prosumer different price calculation methods and/or billing periods, but only if they are more favourable for the prosumer.





## Registration

PVs with an installed power of more than 1 kW should be registered in the RES plants Register carried by the Macedonian Energy Agency. For the registration procedure, prosumers are obliged to submit a connection agreement with the distribution system operator and a confirmation that the production plant is connected to the electricity distribution system. The Energy Agency is obliged to issue a decision for registration within 30 days. Upon registration in the Register of Power Plants, the PV plant is assigned a serial number.

## State subsidies

The Government of North Macedonia adopts yearly programmes to promote RES and energy efficiency for households. The planned total budget for 2021 was around EUR 850,000, with around EUR 130,000 of subsidies for prosumers. The state reimburses up to 30% of the costs of the purchase and installation of PVs with a capacity of up to 4 kW, and the individual subsidies are capped at EUR 1,000 (per applicant).

The procedure is conducted by the Ministry of Economy, according to the balanced regional development objectives set out in the Law on Balanced Regional Development. The “first come first served” principle (within each planning region) is applicable. One applicant can acquire this type of subsidy only once.

It is expected that at the beginning of 2022 a new yearly programme for the promotion of RES will also be adopted by the Government of North Macedonia, under similar rules.

## Conclusion

The procedures for installation, registration, and subsidizing rooftop PVs in North Macedonia are rather straightforward.

This article provides a brief presentation of the main steps that would take place, as well as the relevant information for acquiring prosumer status, registration and acquiring subsidies for the installation of rooftop PVs by prosumers. In the last couple of years, North Macedonia has done a lot to support RES initiatives (including solar), and there are numerous signs that this positive trend will continue.



## 5 steps of Installation of Rooftop PVs by Prosumers in North Macedonia

Step name (name of the document)	Issuer	Prerequisite	Approx. period for issuance
Right of ownership or use of a building	Real Estate Cadastre	– Ownership/usage deed	3 days
Installation decision (1MW-)	municipality / Ministry of Transport	– Ownership/usage deed (land certificate / excerpt from an urban plan / an urban-planning documentation / legally binding decision for determining the legal status) – Revised basic project (with phase-architecture, phase-construction, and phase-electricity) – Request (form)	5 business days
Decision for approval of connection to the distribution system	distribution system operator	– Ownership deed – Basic project – Installation decision (or Construction permit) – Request (form)	40 days
Agreement for connection with Operator of Distribution system	distribution system operator	– Technical-technological requirements – Request	30 days
Decision for registration in the Registry of RES producers (1kW+)	Energy Agency	– Agreement for connection with Operator of Distribution system – Supply agreement with supplier other than the universal supplier – Request (form)	30 days

## Legal framework

1. Energy Law, Official Gazette of North Macedonia, nos. 96/18 and 96/19;
2. Construction Law, Official Gazette of North Macedonia, nos. 130/09, 124/10, 18/11, 36/11, 54/11, 13/12, 144/12, 25/13, 79/13, 137/13, 163/13, 27/14, 28/14, 42/14, 115/14, 149/14, 187/14, 44/15, 129/15, 217/15, 226/15, 30/16, 31/16, 39/16, 71/16, 132/16, 35/18, 64/18, 168/18, 244/19, 18/20 and 279/20;
3. Rulebook on the Form and Content of the Request, the necessary documents, and the form of the installation decision for buildings that do not require a construction permit, Official Gazette of North Macedonia, nos.55/18, 188/20 and 55/21;
4. Rulebook for the degree of arrangement of construction land with facilities of communal infrastructure and the manner costs for arrangement are determined according to the arrangement degree, Official Gazette of North Macedonia, nos.193/16 and 72/18;
5. Rulebook for Renewable Energy Sources, Official Gazette of North Macedonia, nos. 112/19 and 240/19;
6. Rulebook for Licences, Official Gazette of North Macedonia, nos.51/19, 54/19, 214/19, 114/20, 246/20 and 44/21;
7. Electricity Distribution Network Rules, Official Gazette of North Macedonia, no.191/19;
8. Electricity Supply Rules, Official Gazette of North Macedonia, nos.172/18 and 138/19.



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# Serbia

## Introduction

Despite its great potential for solar energy and about 2,000 sunshine hours per year, Serbia is still primarily dependent on coal power. A new legal framework was recently introduced aimed at directing Serbia towards green energy and making good on the obligations it had committed to on its path to EU accession (such as reducing CO<sub>2</sub> emissions, etc.). Not only is the importance of climate-awareness stressed through many international arrangements but is also set forth in strategic documents of Serbia (such as one currently being drafted - Integrated National Energy and Climate Plan of the Republic of Serbia for the period until 2030 with the vision until 2050 and Energy Development Strategy of the Republic of Serbia for the period until 2040 with the vision until 2050). Moreover, poor air quality (resulting from the use of fossil fuels) is raising concerns and has been an increasingly common topic, drawing the attention of many citizens and NGOs.

The solar potential of Serbia is about 30% higher than that of certain central European countries such as Germany, but Germany is a leader in the production of electricity from PV systems. However, the use of solar power in residential buildings and individual houses is still developing and has not yet reached its peak. **A major step towards this goal was the change in the relevant legislation, especially, the country's recent adoption of four energy-related laws, first and foremost among them Serbian first renewable energy law in April 2021.** The Law on the Use of Renewable Energy Sources introduces the notion of prosumers (i.e., consumer-producers), establishing a long-awaited legal framework for end-consumers to produce energy for their own needs from RES by connecting to the grid and selling excess electricity to their supplier. For the surplus electricity fed into the grid, prosumers are entitled to a reduction in their next electricity bill

The  
**solar  
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certain CEE countries.

or compensation from the electricity supplier. This important advancement confirms that increasing the share of renewable energy sources in total energy production lies high on the government's agenda and that investments into these environment-friendly sources of energy (such as sunlight) are the future goal.

Driven by both rising electricity prices and lower solar technology costs, households and businesses in Serbia are starting to invest more in rooftop solar projects, not only for economic but also ecological reasons.

The recently implemented new net-metering scheme enables households and companies to become prosumers, one of the keystones of the future electric power system. On 27 August 2021, Serbia passed a Decree on self-consumption, envisaging a net-metering scheme (a method of calculating net electricity in which the surplus electricity produced per month reduces the amount of net electricity during the next billing period) for households or housing communities and a net-billing scheme for other self-consumers (a method of calculating net electricity in which the value of surplus electricity per month is calculated and charged based on a contract between the buyer - producer and supplier).

## Key steps on the road to acquiring the status of a prosumer in Serbia

The relevant procedure for obtaining the status of a consumer-producer (i.e., prosumer) has been simplified by the Decree on criteria, conditions and manner of calculation of receivables and liabilities between prosumers and suppliers adopted by the Government of the Republic of Serbia on 27 August 2021.

Setting up a one-step procedure for procuring of solar panels, foregoing the lengthy administrative procedures and permits (conveniently omitting location conditions, construction permit, installation permit and trial work from requirements burdening potential prosumers), the Decree makes the process more accessible.

A prosumer can be a: i) household; ii) housing community; iii) legal entity; iv) natural person or v) entrepreneur.

Pre-conditions for acquiring the status of a prosumer:

- purchase of electricity for one's own needs;
- concluding a contract on complete supply with net-metering or net-billing;
- the installed power of the production plant not exceeding the approved power at the end customer's plant connection;
- the production plant and measuring point meet all technical and safety requirements, as well as
- the end customer connects the production plant to his internal installation.

## Conditions that end-customers must fulfill

The end-customer is obliged to file a request to the supplier for the conclusion of a contract on complete supply with net-metering or net-billing. Before submitting a request to conclude a contract on complete supply with net-metering or net-billing, the end-customer is obliged to build a production plant and adjust the metering point to acquire the status of a prosumer. In







the process of connecting the production plant, the end customer is obliged to submit to the system operator the original statement of the contractor confirming that the devices, installations and measuring point are compliant and performed in accordance with regulations and standards.

### Conditions that the supplier must fulfill

The supplier must publish on its website the request form for concluding a complete supply contract and a model of a complete supply contract with net-metering or net-billing. The supplier delivers to the system operator a copy of the contract on complete supply concluded with the end-customer, immediately upon concluding the contract. A copy of the concluded contract on full supply with net-metering or net-billing with the end-customer, without commercial data or confirmation of the supplier on the concluded contract on complete supply the supplier delivers to the system operator to whose network the end-customer is connected, electronically, immediately upon concluding the contract.

### Conditions that the system operator must fulfill

The competent system operator must ensure the possibility of submitting documents electronically by opening a special e-mail address as well as publishing information on the method of delivery on its website. The distribution or closed distribution system operator is obliged to connect the end customer's prosumer plant to the system and issue an appropriate act of connection within 5 days of the date of receipt of the contract on full supply with net-metering or net-billing or confirmation of the contract submitted by the supplier. If the system operator during the connection procedure finds a malfunction in the device, installation, or measuring point, it is obliged not to connect the plant.

The end-customer who is a household, housing community, or other end-customer, acquires the status of a prosumer by entering the Register of Prosumers. The system operator is obliged to immediately, and no later than five days from the day of connection of the prosumer's plant to the electricity system, register the end-customer whose plant is connected to the system as a prosumer's plant with the Register.



The calculation period for settling receivables and liabilities between the consumer-producer and the supplier is one year (while the relevant period ends on April 1). If the prosumer handed over more energy to the supplier than it spent, the difference remains to the supplier free of charge, otherwise, prosumer must pay the difference to the supplier.

## Subsidies and other benefits available to prosumers

Although solar systems can significantly reduce the costs in the long run (the investment is believed to pay off in 7 to 10 years) the initial costs can be high. Regarding the state subsidies available to prosumers, the Ministry of Mining and Energy launched the first public call for the programme for subsidizing households to install solar panels and become self-consumers in September 2021.

According to the programme introduced by the Government of Serbia (primarily intended for increasing the use of renewable energy and improving energy efficiency), the subsidies of the state and a municipality will cover up to 50% of the costs for installing and deploying a PV system, whereas the remainder will be paid for by the household. For the time being, citizens in 37 Serbian municipalities will soon be able to apply for taking part in the programme for acquiring rooftop solar systems, in which Serbia is planning to invest approx. EUR 230 million in the next few years.

## Legal framework

1. Law on Use of Renewable Energy Sources ("Official Gazette of RS", No. 40/2021);
2. Decree on criteria, conditions and manner of calculation of receivables and liabilities between prosumers and suppliers ("Official Gazette of RS", No. 83/21)

## Conclusion

Following the adoption of relevant energy legislation in Serbia, newly implemented net-metering may facilitate further promotion of renewables in Serbia, in line with the country's objectives to achieve complete green transformation.



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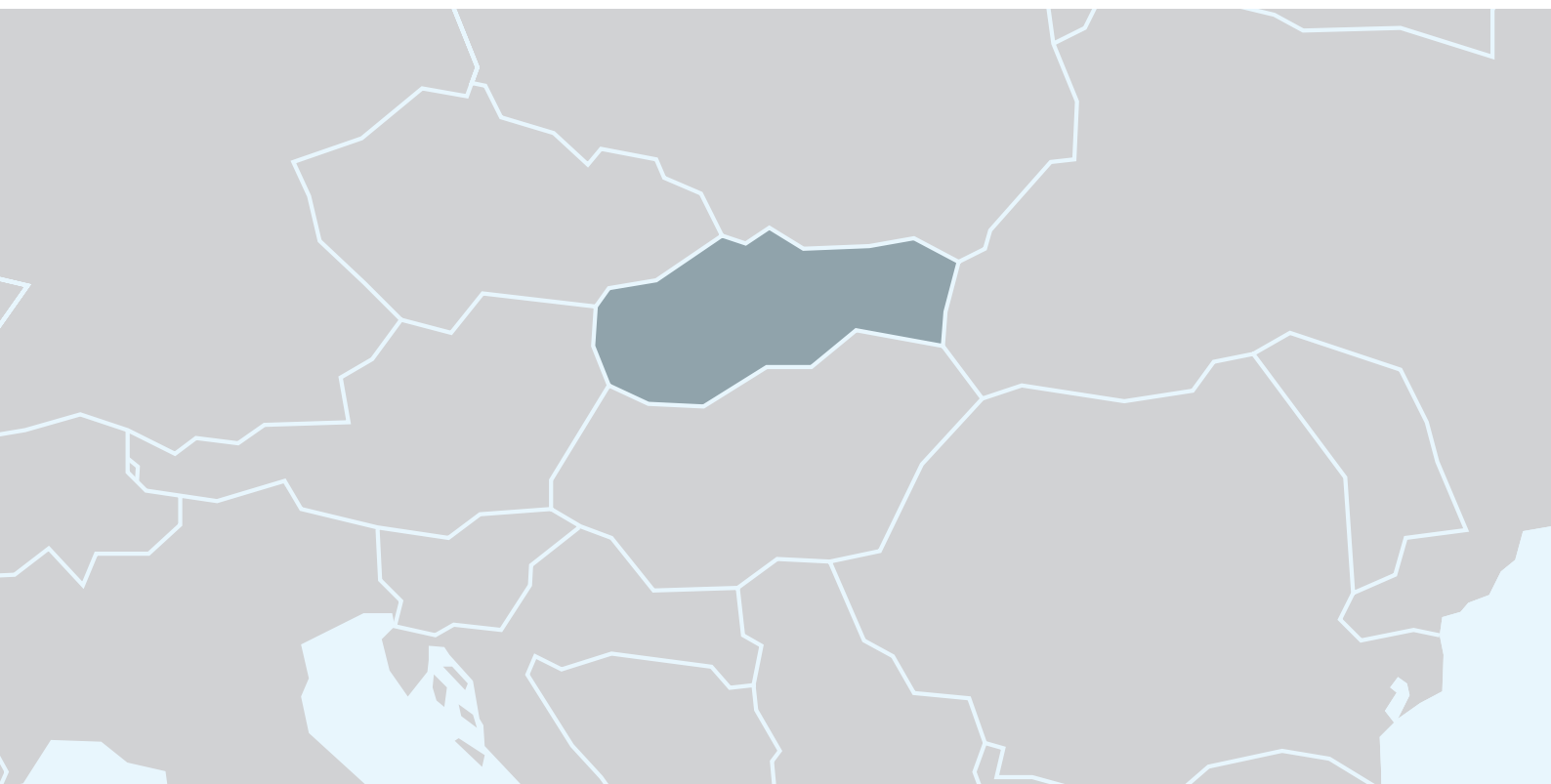
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# Slovakia

## Introduction

The Integrated National Energy and Climate Plan for the period 2021-2030 (the “National Plan”) – prepared in accordance with Regulation (EU) 2018/1999 of the EP and of the Council on the Governance of the Energy Union and Climate Action – develops a strategy for development in the energetics sector. The National Plan updates the existing energy policy and adds a decarbonisation dimension. Slovakia proposes to achieve 19.2% of its energy from renewable sources by 2030.

**Among other measures, The National Plan expands support for low-power devices for electricity and heat production in households and residential houses and extends support for the renewable electricity production, which includes the use of roof-top photovoltaic systems (PVs).**

On 1 November 2021, Slovakia signed the agreement on financing Slovakia's recovery and resilience plan (the “**Recovery Plan**”). The Recovery Plan outlines the initiatives that will be taken as part of the COVID-19 recovery. According to the Recovery Plan, inter alia, EUR 2,301 million from EU funds is allocated for the Green Economy in Slovakia, which covers renewable energy sources and energy infrastructure, building renovation, sustainable transport, decarbonisation of industry, and adaptation to climate change. The Recovery Plan envisages that solar photovoltaic and photothermal panels can be subsidized in the construction of new buildings and renovation or increase in the energy performance of existing buildings, amongst other things.

There is ongoing discussion about whether this is the right time for households or businesses to invest in PVs. Due to current legislative developments, it is likely that PVs will become the preferred progressive source of electricity in Slovakia.

### 2021

Slovakia signed the “**Recovery Plan**” according to which

**EUR 2,301 million** from EU funds is allocated for the **Green Economy** in Slovakia.

## Legal framework

The current Slovak legislation allows certain flows of electricity into the grid. PVs are regulated mainly by Act No. 251/2012 Coll. on Energy as amended (the “Energy Act”) and Act No. 309/2009 Coll. on the Promotion of Renewable Energy Sources and High-Efficiency Cogeneration, as amended (the “Act on the Promotion of Renewable Energy Sources”).

The list of actors on the energy market will be extended by an envisaged amendment to the Energy Act. It is expected to introduce changes that increase the use of roof-top PVs and net metering. At the time of writing, the amendment had not yet been adopted and remains in the early stages of the legislative process. The planned date of effectiveness is 1 October 2022; however, certain provisions will not take effect until 1 January 2023.

The amendment to the Energy Act will, amongst other things, deregulate the market, simplify administrative procedures for obtaining the permits required to supply and generate electricity, address storage and accumulation of electricity issues, and introduce smart grid and digitalization measures. The amendment is expected to introduce into Slovak law many new legal terms such as energy community, active consumer, aggregator, operator etc. For example, the energy community is a community that produces clean electricity for its own needs. If it provides electricity for consumers outside the community, the energy community needs to obtain a permit. The active consumer is a consumer who produces and consumes electricity at the same time. Apart from that, the consumer will be able to supply electricity to the grid. Active consumers will be exempt from the obligation to obtain licences and permits for the production and supply of clean electricity, provided that it will not be their main business activity. Another new legal term is aggregator, which is an entity authorised to supply electricity that carries out activities aimed to aggregate flexibility from several off-take and transmission points to offer and sell the aggregated flexibility on organised electricity or ancillary services markets.

It follows from these new definitions and the wording of the amendment that the Slovak energy market will change substantially. The energy business community impatiently waits for currently “blank spaces” to be regulated and is involved in open discussions about how to proceed with these topics in the future.

Regarding the principle of net metering, the current Act on the Promotion of Renewable Energy Sources allows local and small sources to feed electricity to the grid. Local and small sources are primarily used to cover the producer’s own electricity consumption and the moderate volume of unconsumed electricity should not threaten the spare capacity of the grid.





**Local sources** with a permit to sell electricity may supply unconsumed electricity to the grid, but only in a limited volume specified by law. The current Act on the Promotion of Renewable Energy Sources defines a local source as one that produces electricity exclusively for self-consumption and limits the maximum installed capacity of the source to 500 kW. The total installed capacity of the local source must not exceed the maximum reserved capacity of the electricity off-take point through which electricity flows. Entrepreneurs who have a permit to operate in the energy sector are legally entitled to sell surplus electricity from the local source. However, even in that case, they must not exceed the maximum reserved capacity of the local source – i.e. no more than 10% of its total installed capacity. If the permitted flows are exceeded and unauthorized electricity supplied to the grid, the producer risks being physically disconnected from the grid as a sanction.

**Small sources** that are allowed to feed electricity to the grid are typically unable to sell the electricity unless they fall within an exception provided by the Energy Act. However, if such a small source has received support from subsidy programmes financed from the state budget, it will not be able to sell the electricity. Small sources are usually the option for households since their maximum installed capacity is only 10kW.

## Subsidies and other benefits

Currently, the installation of PV is not subsidized sufficiently for consumers to consider this alternative as a cost-saving measure. In 2021, based on the subsidy project Green to Households II, households were subsidized up to EUR 1,500 of the cost of the PV system. It is again possible to apply for a financial contribution in 2022 for new projects. However, if the government co-finances the PV installation, households will not be able to sell the surplus energy back to the grid.

As regards suppliers, the production of electricity from renewable energy sources is promoted by a priority connection of their electricity generation facilities into the distribution system, by purchasing electricity for the price of electricity losses, by an additional payment and by assuming responsibility for a deviation by a regional distribution system operator. At the time of writing, subsidy programmes have not yet been published for 2022.

Since the Recovery Plan aims to enable the installation of new renewable sources alongside the repowering of already existing sources, it is expected that new subsidy schemes will be implemented.

## Conclusion

Net metering is not widespread in Slovakia. However, the legal regulation in the Slovakian energy sector is undergoing a massive overhaul. The planned amendment to the Energy Act will, among other things, support the ambition to connect a higher number of renewable sources to the grid. Given the targets in the National Plan to increase the share of renewable energy sources and the Recovery Plan prioritizing investment into renewables, it is expected that there will soon be a change that will encourage the use of roof-top PVs and net metering.



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# Slovenia

## Introduction

In July, the National Assembly of the Republic of Slovenia adopted the Resolution on Long-Term Climate Strategy until 2050. A clear goal of Slovenia's climate strategy is to transition to **net-zero emissions** and to become **climate neutral by 2050**. One of the main ways to achieve this goal is by reducing energy through boosting energy efficiency, the circular economy, and other sustainable practices such as solar power plants.

**Dispersed renewable electricity generation is an important pillar of future sustainable and self-sufficient electricity generation which will complement production in larger generation facilities on the transmission network.** The generation of electricity in solar power plants represents the greatest developmental and environmentally acceptable potential for increasing renewable electricity generation in Slovenia. In terms of the sustainable use of space, it is rational to steer future development towards the priority of integrating solar energy into buildings, where technical electricity generation potential regarding the available surface area is estimated at more than 20 TWh. Moreover, the construction of buildings should be prioritized in degraded areas and industrial sites, with the requirement that solar power units be installed on roofs where technically feasible.

A clear goal of Slovenia's  
**climate strategy**  
is to transition to  
**net-zero emissions**  
and to become  
**climate neutral** by  
**2050**.

## Legal framework

Slovenian legislation regulates the installation and use of solar power plants in several sectoral laws, supplemented by regulations and decrees. The installation of such plants is mainly regulated by the Construction Act and several Regulations, which specify the documentation and installation of the facilities.

The use is mainly regulated by:

1. Energy Act, Official Gazette of the Republic of Slovenia, No. 17/14 (EZ-1), adopted in March 2014;
2. Act on Energy Efficiency, Official Gazette of the Republic of Slovenia, No. 158/20 (ZURE), adopted in November 2020.
3. Act on the Promotion of the Use of Renewable Energy Sources, Official Gazette of the Republic of Slovenia, No. 121/21 (ZSROVE), adopted in July 2021;
4. Electricity Supply Act, Official Gazette of the Republic of Slovenia, No. 172/21 (ZOEE), adopted in November 2021;
5. Legal Act on the methodology for determining the regulatory framework and network charges for the electricity distribution system (adopted in November 2021).
6. Decree on the self-supply of electricity from renewable energy sources (adopted in May 2019).

## Key steps on the road to acquiring the status of a prosumer in Slovenia

- The investor must obtain all necessary permits and consents, namely environmental, concession and Heritage Conservation Authority approvals,
- For the construction of an electricity generation facility with a rated power greater than 1 MW to be connected to the public grid, the investor must also obtain an energy permit issued by the Minister responsible for energy and a building permit before starting construction.

## Subsidies and other benefits available to prosumers

- Direct subsidies – Eco Fund provides loans and subsidies for investors,
- Feed-in tariffs – In the Article 16 of Act on the Promotion of the Use of Renewable Energy Sources the Support Centre guarantees to buy the green electricity produced at a guaranteed feed-in price,
- Net metering – Article 23 of Electricity Supply Act,
- Tax deductions

## Conclusion

With the right incentives, it is possible to encourage customers to actively participate in the demand reduction process and thus contribute to reducing investment costs in extending the electricity network. In practice, the biggest barriers to further investment in solar power plants and becoming a prosumer are not technological or economic, but problematic regulations and a long administrative procedure for obtaining all the necessary permits.



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# Turkey

## Introduction

**Due to its geographical location, Turkey has enormous potential for solar energy generation.** However, according to data published by the Turkish Electricity Transmission Corporation ("TEIAS") and the Ministry of Energy and Natural Resources ("Ministry"), the share of electricity generated by solar energy currently stands at about only 4% of the total. Moreover, the Ministry predicts that within the next 10 years a level of 2,000 - 4,000 MW can be achieved through solar panel systems installed on the roofs of buildings. There are therefore good reasons to believe that solar power generation in Turkey is still a viable field ripe for greenfield investments.

Within the next

**10 years**

a level of

**2,000 - 4,000 MW**

can be achieved through  
**solar panel systems**

installed on the roofs of buildings.

## Legal framework

### 1. Electricity Market Law No. 6446 ("the Law")

According to Article 14 of the Law, a generation facility based on renewable energy sources that uses some of the energy generated and feeds the remainder into the transmission or distribution grid and whose generation and consumption are at the same metering point are exempted from the usual obligation to obtain a permit and establish a company.

### 2. Law on the Use of Renewable Energy Sources for Electricity Generation No. 5346 ("Renewable Energy Law")

According to Article 6/A of the Renewable Energy Law, natural or legal persons who generate electricity from renewable energy sources for their own consumption can benefit from special prices for feeding the surplus they generate into the transmission or distribution grid.

### 3. Regulation on the Unlicensed Electricity Production in the Electricity Market ("Regulation")

The Regulation regulates the principles of unlicensed electricity generation in Turkey in detail.



## Important steps

For prosumers who intend to install rooftop solar panels, Article 5/1-ç of the Regulation applies. The application procedure for the unlicensed generation of electricity from renewable energy sources is regulated in Article 10 of the Regulation, which requires an application to the competent grid operator.

- The applications from natural or legal persons who intend to install solar cells on roofs are examined by the commission formed by the utility companies.
- The evaluation of the documents will be completed within the first fifteen (15) days of the month following the application.
- A technical assessment will be carried out within the first fifteen (15) days of the month following the assessment on the basis of documentation.
- The costs for installing the system must be borne by the consumer.

According to the Ministry, the most important issue is the capacity of the distribution transformer in the area concerned. In this regard, all applications for the installation of solar panels are considered simultaneously by the distribution company in accordance with Article 14/3 of the Regulation. Finally, the total amount of electricity generated by the solar panels in the area concerned must not exceed 50% of the capacity of the distribution



transformer. In practice, the assessment procedure takes about one and a half (1.5) months.

## Subsidies and Other Benefits Available to Prosumers

- Net metering – According to Article 26 of the Regulation, the value of net generation/consumption in kWh is calculated by subtracting the generation and consumption for each monthly billing period. The surplus electrical energy generated from renewable energy sources is purchased by the electricity supply company.
- Exemption from income tax for electricity up to 25 kW for prosumers – Income Tax Law

## Conclusion

Turkey intends to increase energy efficiency measures in line with the Turkish Green Deal Action Plan. As mentioned above, the procedure for installing rooftop solar systems is not complicated. Even though this system is not yet widely used in Turkey, it could make an important contribution to the climate change campaign if the public were informed about it.



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# Ukraine

## Introduction

**Renewable energy generation is one of the key priorities the government has established for the Ukrainian energy sector.** On 18 September 2017, the Cabinet of Ministers of Ukraine (CMU) approved the Ukrainian Energy Strategy for the period up to 2035, "Safety, Energy Efficiency, and Competitiveness" (the Strategy). The Strategy provides for the continuous expansion of all types of renewable energy, which will be one of the means of ensuring Ukraine's energy security. In the short- to the medium-term (up to 2025), the Strategy projects that the share of renewable energy will increase to 12% of the general primary energy and to at least to 25% by 2035.

In November 2021, the Ministry of Energy of Ukraine released the forecast balance of electricity for 2022, according to which the share of renewables will reach 9.2%. This means that the renewable energy in Ukraine is **well on track** to reach the target of a 12% share of total energy consumption in 2025, as provided by the Strategy.

## Procedure for Construction of Rooftop PVs and Obtaining Feed-in Tariff

Under Ukrainian law, all construction objects are divided into three classes of consequences: CC1 – lower class of consequences, CC2 – medium class of consequences and CC3 – sizable class of consequences. Construction standards and regulations, as well as permits/licenses requirements, then vary depending on the class of consequences of a construction object. The construction of a rooftop PV installation with a maximum installed

The **renewable energy** in Ukraine is well on track to reach the target of a **12% share** of total **energy consumption** in **2025**.

capacity of up to 1MW (the Construction) falls typically under the lower (CC1) class of consequences. In this case, construction licences and permits are not required, and neither is the licence for electricity generation. Occasionally, however, the Construction may fall under the sizable CC2 class of consequences, in which case the Construction will be subject to the prior obtaining of construction permits. Moreover, construction works on an object which falls under a sizable CC2 class of consequences, may be executed only by a company with the relevant construction licence. Its project documentation will be subject to mandatory expert assessment in relation to its compliance with:

- sanitary and epidemiological safety standards;
- environmental, labour safety and energy-saving standards;
- fire, anthropogenic, nuclear or radiation safety standards;
- standards related to building sustainability, reliability, and durability and their operational safety and engineering support.

## Subsidies available for Rooftop PVs

- 1. Feed-in tariffs** (known as the “Green Tariff” in Ukraine) is currently the primary state support mechanism for renewable power producers. However, the feed-in tariff is only available for solar power plants with a capacity below 1MW.
- 2. Quota auction support scheme for renewable power producers.** Under the quota auction support scheme for renewable power producers, the state will provide 20-year support from the date of commissioning the renewable project, through the guaranteed offtake of electricity within the quota and at the tariff determined by auction. The solar power plants with a total capacity exceeding 1 MW may apply only for this support scheme. Electricity producers with a capacity below 1MW may participate in auctions voluntarily in addition to enjoying the feed-in tariff. As of now, no auctions have been held by the state.
- 3. The premium for localization.** Renewable power producers that will be put into operation by 31 December 2024 may also receive between 5% and 20% premium on top of the feed-in tariffs or quota auction tariff for using Ukrainian equipment (i.e. transforming sub-station or steel structures for PV modules manufactured in Ukraine). The Ukrainian origin certificate for equipment must be obtained from the Ukrainian Chamber of Commerce and Industry for this purpose.

Moreover the government currently contemplates the implementation of the net metering and/or additional feed-in-premium support scheme for renewable projects.

## Conclusion

The procedures for the construction of Rooftop PVs and obtaining feed-in tariffs in Ukraine are relatively straightforward.

A summary of the required main steps for construction of Rooftop PVs and obtaining feed-in tariff has been prepared based on the assumptions that (i) the maximum installed rooftop PVs capacity will be up to 1MW in Ukraine and (ii) rooftop PVs installation projects will fall under the lower (CC1) class of consequences.





The main stages of the Construction process are as follows:

Step name (name of the document)	Issuer	Prerequisite	Approx. period for issuance
Obtaining the ownership right or right to use a building or its rooftop (if not yet secured)	Real Estate Cadastre		
Obtaining the Urban Development Conditions and Restrictions	Local council or local public administration	– Ownership deed or lease agreement (step 1)	10 (ten) working days
Obtaining Technical Specifications for connection to the grid	Distribution system operator	– Ownership deed or lease agreement (step 1)	10 (ten) working days
Development of the Project Documentation	Engineering, procurement and construction contractor	– Urban Development Conditions and Restrictions (step 2); – Technical Specifications for connection to the grid (step 3)	No more than 30 (thirty) calendar days
Registration of a Notification on Commencing Works	State Inspectorate for Architecture and Urban Planning of Ukraine	– Urban Development Conditions and Restrictions (step 2); – Technical Specifications for connection to the grid (step 3); – Development of the Project Documentation (step 4)	No more than 5 (five) working days
Registration of the declaration of readiness for operation	State Inspectorate for Architecture and Urban Planning of Ukraine	– Completion of the construction	Up to 10 (ten) working days
Obtaining a certificate of origin for rooftop PV equipment	Ukrainian Chamber of Commerce and Industry		Up to 7 (seven) working days
Approval of the feed-in tariff	The National Commission for State Regulation of Energy and Public Utilities	– Ownership deeds or lease agreement (step 1); – Registered declaration of readiness for operation (step 6); – Certificate of origin (if Ukrainian equipment is used in power plant) (step 7)	Up to 30 (thirty) calendar days
Signing agreement for connection to the grid	Distribution system operator	– Ownership deed or lease agreement (step 1); – Consent of the building owner for connection to the grid (if the rooftop PV owner is not the building owner)	Up to 3 (three) working days
Registration as a participant in the electricity market	Transmission system operator	– Before the registration as the electricity market participant, numerous agreements need to be executed with the transmission system operator and the distributor system operator	The registration itself takes up to 2 (two) days, but signing of required agreements may take up to 1 month
Signing Power Purchase Agreements	State Enterprise "Guaranteed Buyer"	– Available technical documentation (e.g. billing device layout and distribution point passports) and registration as the participant of the electricity market (step 10)	Up to 18 (eighteen) working days

## Legal framework

Ukrainian legislation regulates the installation and operation of solar power plants in several sectoral laws, supplemented by regulations. The Law on the Regulation of Urban Development Activities is the major legislative act regulating the installation of solar power plants.

The operation of solar power plants is mainly regulated by:

4. Law on the Regulation of Urban Development Activities No. 3038-VI dated 17 February 2011;
5. Law of Ukraine on Electricity Market No. 2019-VIII dated 13 April 2017;
6. Law of Ukraine on Alternative Energy Sources No. 555-IV dated 20 February 2003;
7. Transmission System Code adopted by Resolution of the NEURC No. 309 dated 14 March 2018;
8. Distribution Systems Code adopted by Resolution of the NEURC No. 310 dated 14 March 2018;
9. Market Rules adopted by Resolution of the NEURC No. 307 dated 14 March 2018;
10. Code of Commercial Metering of Electricity adopted by Resolution of the NEURC No. 311 dated 14 March 2018;
11. Resolution of the NEURC No. 641 "On Approval of the Regulations Governing the Guaranteed Buyer and the Purchase of Electricity at the Feed-in Tariff and at the Auction Price" dated 26 April 2019;
12. Day-Ahead Market Rules and the Intraday Market Rules adopted by Resolution of the NEURC No. 308 dated 14 March 2018;
13. Retail Electricity Market Rules adopted by Resolution of the NEURC No. 312 dated 14 March 2018;
14. Resolution of the NEURC "On Approval of the Procedure for Establishing, Revising and Terminating the "Green" Tariff for Electricity for Business Entities, Electricity Consumers, including Energy Cooperatives, and Private Households whose Generating Plants Produce Electricity from Alternative Energy Sources" No. 1817 dated 30 August 1817; and
15. Resolution of the NEURC "On Approval of the Licensing Conditions for the Performance of Business Activities on the Generation of Electricity" No. 1467 dated 27 December 2017 establishing a list of documents to be submitted for obtaining a licence for the performance of electricity generation activities and determining a list of requirements, conditions and rules that are binding during the performance of these activities.



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