Kosovo

Scaling-up Distributed Solar PV in Kosovo: Market Analysis and Policy Recommendations

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KOSOVO COUNTRY PROFILE — KEY COUNTRY DATA	
Population (2018)	1.845.300[1]
GDP per capita (2018)	4.302 USD per capita[2]
Electricity consumption per capita (2018)	3.157 kWh/year[3]
Solar resource quality (insolation)	1,400 – 1,500 kWh/m^2/year
Range of current installed costs (reported)	EUR 1.000 – 1.200/kW
Total annual power consumption (2018)	5.67 TWh
Average electricity tariffs	Households: EUR 73/MWh + taxes Businesses: EUR 90/MWh + taxes

This research was supported by the European Climate Foundation (ECF).

[1] https://data.worldbank.org/country/kosovo
[2] Ibid
[3] Energy Regulatory Office (2019), Annual Report for 2018, available at https://www.ero-ks.org/w/shqip/publikimet-mainmenu-110/raportet-vjetore-mainmenu-111

1. Introduction

Kosovo is at an early stage in the European integration process. In 2015, Kosovo ratified a Stabilisation and Association Agreement with the European Union and is currently implementing this agreement. As part of this, Kosovo benefits from the European Union's Instrument for Pre-accession Assistance, which aims to give the country a boost in the integration process. On the other hand, Kosovo is part of the Energy Community Treaty, which aims to harmonise policies in the energy sector with those of the European Union, ultimately aiming at integrating Kosovo's electricity market with that of the region.

The EU's long term climate ambition will require complete decarbonisation of the electricity sector before 2050, and Kosovo will need to follow suit. These policy changes are expected to result in a significant shift towards renewables in Kosovo's power sector. According to the current Kosovo Energy Strategy 2017-2026, a complete decarbonisation of the energy sector in Kosovo is expected to occur by 2060. However, various analyses have shown that this commitment is not ambitious enough and that the current policy landscape needs to change in order to accelerate decarbonisation.[4]

Since small scale solar competes with end user electricity prices instead of wholesale electricity prices, solar PV can be an attractive investment for certain consumers already, depending on their electricity rate category. These potential investors may be staying away from solar investment due to regulatory and technical barriers to solar PV investment in Kosovo.

This report therefore contains a number of recommendations on how the current framework can be improved to incentivise investment in rooftop solar. While the report is aimed mainly at policy makers, it may also contain valuable insights for developers as well as potential investors in rooftop solar PV projects in Kosovo.

2. Kosovo's electricity sector

Market liberalisation

Kosovo's electricity sector has undergone significant changes in the past decade towards a liberalised market, in line with requirements under the Energy Community Treaty. Starting in 2004, Kosovo's electricity system has undergone changes from a vertically integrated system to an unbundled system. The reform process has continued with the unbundling from the vertically integrated KEK Company into a distribution system operator (which is now private), a transmission system operator (KOSTT, which remains publicly owned and now operates as a separate transmission and market entity) as well as nine different utility companies responsible

[4] INDEP (2017), Review of the Energy Strategy of Kosovo, Pristina, available at https://indep.info/wp-content/uploads/2017/12/Strategjia-e-Energjise-2017-2026_INDEP-dhe-KOSID_RISHIKIM-1.pdf

[5] Energy Regulatory Office, (2015), Annual Report for 2014, available at https://www.ero-ks.org/w/shqip/publikimet-mainmenu-110/raportet-vjetore-mainmenu-111 (accessed in October, 2019)

for serving customers.[5] Despite the fact that nine different operating licenses have been issued by the Government to different companies, only one of these operating licenses is active, that of the legacy supplier KEK.

As part of Kosovo's unbundling process, the country has established an Energy Regulatory Office. The Energy Regulatory Office is an independent body tasked with regulating activities in the energy sector in Kosovo, including electricity, district heating and gas.[6]

Electricity supply and consumption

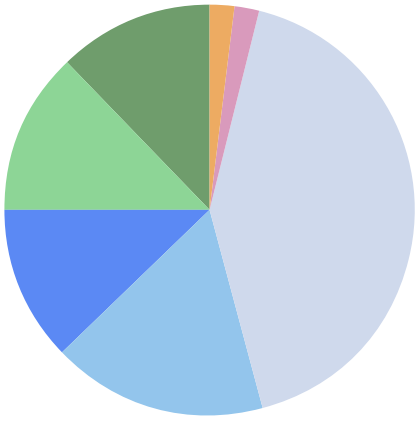
Kosovo's electricity mix remains heavily dominated by coal, with approximately 97% of the total electricity mix in the country being generated in coal-fired power plants. **This singular fact makes Kosovo one of the countries with the highest share of coal-fired generation in its electricity mix in the world.** In addition to coal-fired generation, the country has a little hydro power, a small wind power project, an estimated 6.6 MW of solar PV, and a small share of biomass-fired generation as well.

Another important feature of the electricity mix is that the residential sector (i.e. households) represent a substantial share of overall electricity consumption in the country, at approximately 42%.

FIGURE 1: ELECTRICITY CONSUMPTION BY CUSTOMER TYPE, IN GWH (2018)

Households	2374	42%
Commercial	944	17%
Industrial	704	12%
Commercial Losses	755	13%
Technical Losses	674	12%
Transmission Losses	111	2%
Utility Own-Consumption	107	2%
Total	**5669**	**100%**

Source: Energy Regulatory Office (ERO)

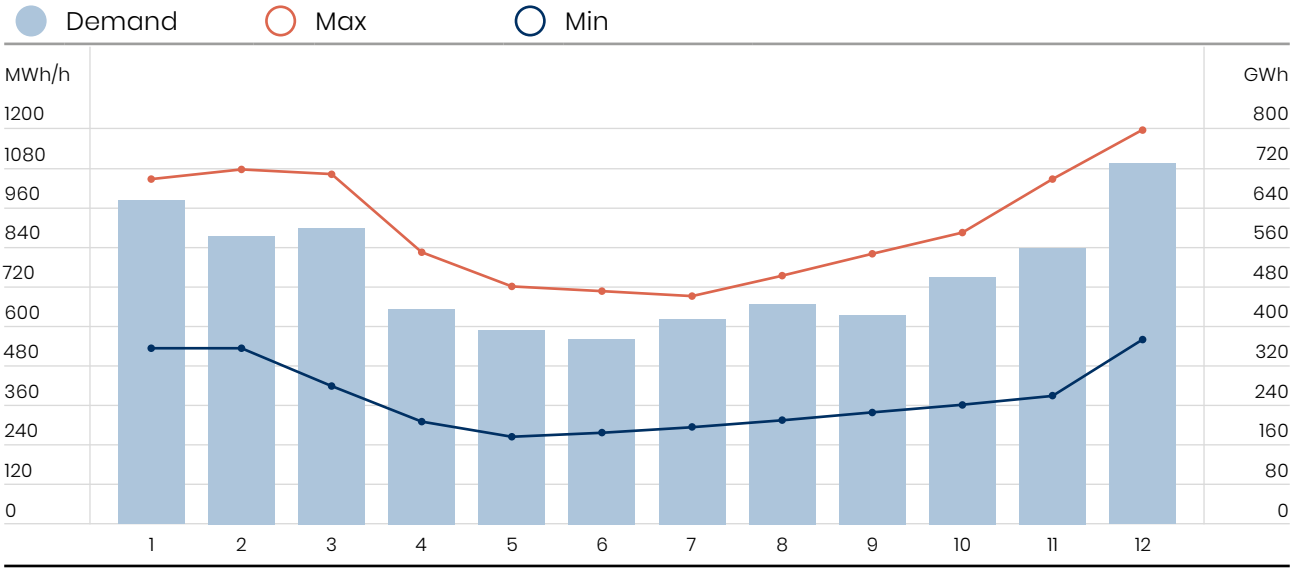


In addition, demand fluctuates considerably on a seasonal basis, with demand peaking in the winter months (October through March), and declining in the period between April and August. Partly as a result, Kosovo is able to fully cover the energy demand during the summer months while resorting partly to imports in order to cover national demand during the winter months. In 2018, 14.55% of energy demand was covered by imports mainly from neighbouring countries, including Serbia, Montenegro, Albania and Macedonia.[7]

[6] This Treaty is signed by the European Union and nine partners from South East Europe in Athens in October 2005 on the creation of the legal framework for an integrated energy market. Energy Regulatory Office, (2019), Official Webpage, About ERO, Pristina, available at https://ero-ks.org/w/shqip/pzrre-extra-menu-75

[7] Energy Regulatory Office of Kosovo, (2019), Annual Report of 2018, Pristina, available at https://www.ero-ks.org/w/shqip/publikimet-mainmenu-110/raportet-vjetore-mainmenu-111

FIGURE 2: AVERAGE MONTHLY ELECTRICITY DEMAND IN 2018, INCLUDING MAX AND MIN



The figure above shows the minimums and maximums of electricity demand for daily loads in the country on a monthly basis.

National renewable energy targets and plans

Kosovo is a contracting party of the Treaty establishing the Energy Community. To support the use of renewable energy technologies in Kosovo, the Ministry of Economic Development (MED) drafts long-term and mid-term renewable energy plans in accordance with obligations deriving from the Energy Community Treaty. The Ministry is also responsible for setting up renewable energy targets, for monitoring of implementation and annual reporting on achievement of targets as well as for the measures undertaken to achieve the targets. In addition, the Ministry may adopt secondary legislation containing measures for promoting renewable energy technologies.

TABLE 1: OVERVIEW OF KOSOVO'S RENEWABLE ENERGY TARGETS

	Mandatory	Voluntary
Target for energy from renewable sources in gross final consumption of energy for 2020 (%)	25%	29.47%
Expected total adjusted energy consumption (ktoe)	1729.82	1729.82
Expected amount of energy from renewable sources corresponding to the 2020 target (ktoe)	432.46	509.70

The Government of Kosovo has adopted targets for its gross final energy consumption (which includes electricity, heating, cooling and transport-related sources) as shown in Table 1 above.

[8] Ministry of Economic Development (2013), National Renewable Energy Action Plan - NREAP 2011-2020, Pristina: MED.

In order to successfully fulfil these targets, Kosovo has designed a range of measures and policies including a Feed-in Tariff (FIT) policy, priority dispatch, a policy framework governing self-consumption as well direct public investments, often in partnership with international donors.

Currently, the primary sources of renewable electricity in the country are hydropower, with some additional wind, biomass, and solar PV. Renewable energy projects that are below certain size thresholds are eligible for the country's Feed-in Tariff policy, which offers long-term offtake prices for the electricity generated from eligible sources (see Section 3 below for more details).

3. The market for distributed solar PV

Solar power

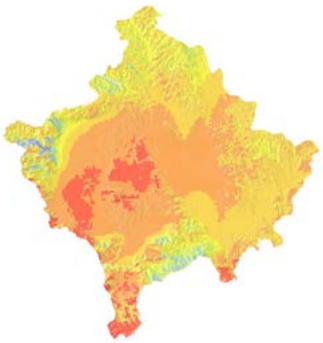
The total installed solar PV capacity in Kosovo is currently estimated at 6.6 MW. In addition, there are a further 3.4 MW of solar PV projects under construction, and 60 MW of projects with preliminary authorisations pending. Insolation is between 1,400 – 1,500 kWh/m2/year, which is higher than in most EU countries. IRENA (2017) estimates that cost-competitive solar potential could reach close to 600 MW in 2030 in Kosovo.

FIGURE 3: SOLAR RESOURCE MAP

Long-term average of PVOUT, period 1994–2018

Daily totals	3.0	3.2	3.4	3.6	3.8
Yearly totals	1095	1168	1241	1314	1387

Source: World Bank ESMAP program[9] kWh/kWp



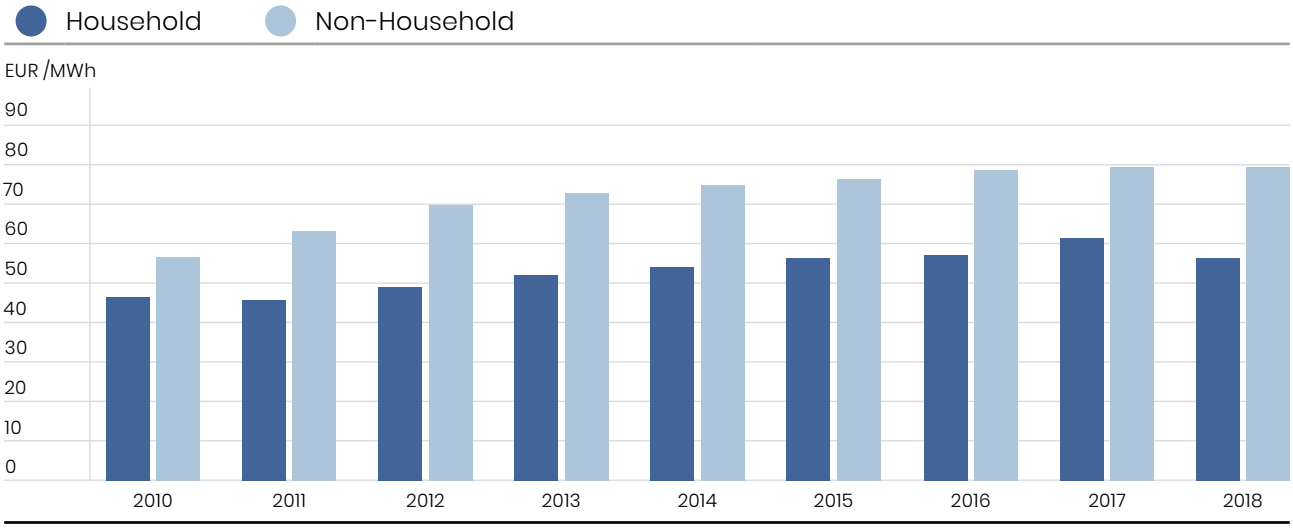
Given the fact that the household sector represents a substantial share (42%) of Kosovo's electricity consumption, distributed PV could play a significant role in decreasing the electricity demand from this category of consumers, and in so doing, in increasing Kosovo's renewable energy share.[10] In addition, the industrial and commercial sector also has great potential for distributed PV and some commercial and industrial customers have started to demonstrate an interest in investing in onsite solar PV systems.

End user electricity prices

The average prices for electricity for both households and non-households have increased over time.[11] The figure below, however, shows that this increase has been fairly moderate with electricity prices only increasing by approximately 7% over the last five years. This increasing trend in end user prices, combined with the decreasing cost of solar, will result in solar becoming an increasingly attractive investment option, especially for consumers paying higher rates (i.e. businesses).

9 Global Solar Map, Worldbank and Solargis, available at https://solargis.com/maps-and-gis-data/download/kosovo
10 Ibid
11 Energy Regulatory Office, (2019), Annual Reports for 2010-2018, Pristina: ERO.

FIGURE 4: AVERAGE PRICES OF ELECTRICITY FOR HOUSEHOLD AND NON-HOUSEHOLD CONSUMERS (IN EUR/MWH)



TEXT BOX 1: IMPACT OF RETAIL RATE ON SOLAR PROSUMERS

Both the structure and the level of the retail electricity price have a significant impact on the attractiveness of customer-sited solar PV projects.

The higher the retail price, the more attractive investments in self-generation technologies like solar PV are. Given that the levelised cost of rooftop solar PV investments is now below EUR 100/MWh in most markets around the world, including in countries like Kosovo, retail prices in this range and above are typically considered sufficient to drive investments. In fact, recent analysis of different states across the U.S. show that retail prices are more important than solar resource quality in determining where investments in customer-sited solar take place.[1]

In addition to retail prices, however, it is important to consider retail price structure: for example, inclining block rates (where each additional kWh consumed becomes more expensive) tend to make self-consumption investments more attractive, as it is the higher consumption thresholds that are erased first, thereby enabling higher returns. Similarly, the presence of demand charges (which are typically levied on a per-kW basis according to the maximum electrical demand a given customer reaches over a particular billing cycle) can also make solar PV projects more attractive, particularly when coupled with storage, as storage can guarantee that certain demand thresholds are never reached.

Additionally, factors such as fixed bill charges, taxes, or special subsidy charges, can also make self-consumption more attractive, as they push retail prices up.

[1] https://energyathaas.wordpress.com/2020/02/03/putting-solar-in-all-the-wrong-places/

Kosovo's electricity tariff structure underwent a series of changes in 2017. With the tariff changes, the country's inclining block tariffs have been eliminated. Prior to 2017, customers spending less than 200 kWh per month paid a lower tariff compared to those consuming between 200-600 kWh and over 600 kWh. Now all customers pay flat tariffs irrespective of how much electricity they consume in a given month.

The Energy Regulatory Office justified the decision to introduce flat tariffs by stating that doing so will help simplify customers' power bill and support the process of market liberalisation and price deregulation. However, several of Kosovo's civil society organisations opposed such changes, arguing that the change will increase consumption, discourage energy savings and increase energy poverty. In addition, removing the inclining tariff structure can have direct impacts on how attractive investments in customer-sited solar PV are in the country, as inclining block rates make it more attractive for households and businesses with higher electricity consumption to invest in onsite supply. While the inclining block rates have been abandoned, the revised electricity tariffs retain a differentiation according to the time of day. The current structure of energy prices for different categories is shown in Table 2.

TABLE 2: OVERVIEW OF ELECTRICITY PRICING IN KOSOVO BY CUSTOMER TYPE AND TIME OF DAY

Voltage Level	Unit	Time of day	Price (EUR/MWh)
35kV	EUR/MWh	Night	31.6
		Day	49.2
10 kV	EUR/MWh	Night	36.9
		Day	57.3
0.4 kV (Category I - Consumers with reactive energy)	EUR/MWh	Night	49.6
		Day	66.9
0.4 kV (Category II)	EUR/MWh	Night	53
		Day	107.1
0.4 kV 2-tariff meter (household)	EUR/MWh	Night	28.9
		Day	67.5
0.4 kV 1-tarif meter (household)	EUR/kWh	Night	17.4
		Day	53.2
0.4 kV households without time-of-use meters	EUR/kWh	Fixed	67.5

* The lower night tariff is applicable from 22:00 to 7:00.

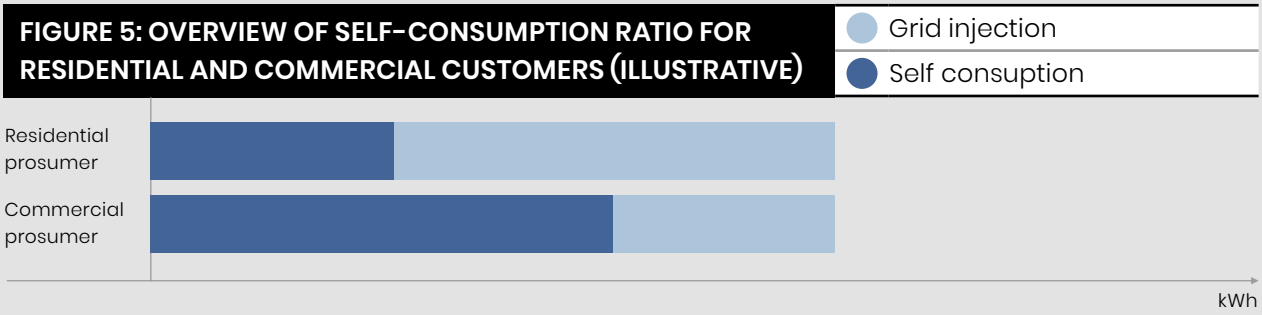
TEXT BOX 2: UNDERSTANDING PROSUMERS' SELF-CONSUMPTION RATIO

The self-consumption ratio refers to the share of a prosumer's total onsite solar PV generation that it is able, on average, to consume in "real time" in a given month or year. Residential customers that invest in their own solar PV system typically have self-consumption ratios between 20-40%.[1] By contrast, the self-consumption ratio for commercial customers tends to be somewhat higher, between 50-70%, depending on the commercial customer's load profile and the size of the PV system that is installed.[2]

[1] https://www.sma.de/en/partners/knowledgebase/the-self-consumption-bonus.html
[2] https://www.sma.de/en/partners/knowledgebase/commercial-self-consumption-of-solar-power.html

[12] INDEP, (2017), Analysis of the New Tariff Structure, available at (ALB version) https://indep.info/wp-content/uploads/2017/03/Analiza-për-strukturen-tarifore-te-ZRRE.pdf (accessed in December, 2019)

FIGURE 5: OVERVIEW OF SELF-CONSUMPTION RATIO FOR RESIDENTIAL AND COMMERCIAL CUSTOMERS (ILLUSTRATIVE)



In fact, any prosumer can achieve a 100% self-consumption profile simply by installing a smaller solar PV array, thereby ensuring that all (or most) of the real-time power generation can be consumed directly by the building, or facility. This is the case if the size of the PV installation is such that it produces electricity equivalent to the daytime minimum load of the household.

For example, analyses conducted on various commercial customers indicate that a dairy farm with annual electricity demand of 50,000 kWh and a PV system of 30 kW can achieve a self-consumption ratio of roughly 55%. By contrast, for a manufacturing business operating mainly during the daytime with a requirement of 1,000,000 kWh and a PV system of 200 kW, the attainable ratio is approximately 85 percent.[2]

Differences in the self-consumption ratio of different prosumers can have a significant impact on the attractiveness of solar PV investments. For instance, in jurisdictions with relatively high retail prices and weak (or no) policies governing net excess generation, many prosumers simply opt to size their PV systems according to their minimum daytime load. In this way, they can avoid having significant net excess generation. In jurisdictions with more attractive conditions for exporting the power, customers may choose to make greater use of their available roof space and install larger PV systems, exporting more surplus generation to the grid, thereby achieving a lower overall self-consumption ratio.

Currently, given the presence of the Feed-in Tariff for solar projects in Kosovo, it is likely that many potential prosumers would opt for the FIT (i.e. for injecting 100% of their self-generated electricity to the grid, rather than self-consuming a portion of it), as was the case in Germany until roughly 2012–2013 , as the FIT for solar PV, at 136.4 EUR/MWh, is higher than retail prices for most consumers. However, as retail prices in Kosovo continue to rise, and the availability of the FIT becomes more limited, a growing number of customers are likely to start finding self-consumption attractive, particularly as solar PV prices continue to decline.

Current policies of solar PV

Renewable electricity production is subsidised by a Feed-in Tariff. Currently, the Feed-in Tariffs are differentiated by technology as follows:

- small hydro power plants: 67.3 EUR/MWh
- wind power plants: 85 EUR/MWh
- biomass power plants: 71.3 EUR/MWh
- Solar PV: 136.4 EUR/MWh[13]

[13] Republic of Kosovo, (2017), Energy Strategy of the Republic of Kosovo 2017-2026, Pristina: Official Gazette

The FITs provide guaranteed payment over a 12-year period for solar PV projects. In addition, under the current regulations in Kosovo, the transmission and distribution system operators are required to give **priority dispatch** to generation from renewable energy sources in accordance with the limits specified in the country's Grid Code. In turn, the system operator is allowed to establish and publish rules regarding who will bear the costs for any technical adaptations and grid-level investments necessary to facilitate the integration of renewable energy sources into the system, though such rules have to be approved by Energy Regulatory Office (ERO).

The Energy Regulatory Office ensures that transmission and distribution charges for renewable energy producers are non-discriminatory. The ERO is also the body designated for issuing guarantees of origin for electricity produced from renewable energy sources.[14]

In addition to its FIT policy, Kosovo has introduced **Net Metering**. Under this framework, the policy provides a bill credit for each kWh of surplus electricity injected into the grid, allowing the customer to carry that kWh over to subsequent billing cycles. As such, any positive imbalance is credited with electricity via per-kWh bill credits, rather than a cash payment (see **Text Box 3** below for more information). In order to be eligible to participate, customers have to be connected to the grid at 0.4kV voltage levels, restricting the programme mainly to households and very small companies.

TEXT BOX 3: OPTIONS FOR THE PRICING AND SALE OF NET EXCESS GENERATION

Broadly speaking, there are three different pricing methodologies used to determine the compensation for prosumers' net excess generation:

1. **Compensation in terms of bill credits (i.e. in kWh)** that can be carried over to offset, on a kWh-to-kWh basis, one's electricity consumption in future billing cycles (Net Metering)
2. **Compensation in terms of monetary credits (e.g. 1 kWh = EUR 0.06)** that can be carried over to reduce one's electricity bill in future billing cycles (Net Billing)
3. **Compensation in terms of monetary payment (i.e. EUR cents/kWh)**, resulting in the prosumer receiving both a cheque and a bill at the end of each billing cycle (Net-FIT)

In addition, there is the important issue of how these rates are set. For Net Metering, this is simple: each kWh exported to the grid generates one kWh credit that can be used to offset future consumption. However, **for both Net Billing and Net-FITs, there are additional considerations that need to be taken into account**; in these cases, there are five basic options for determining the price offered for the net excess generation:

1. **linked to the market in real time** (though this would require time-of-use meters for all customers, and is likely to pose an additional barrier for residential and small commercial customers);
2. **linked to the market**, but based on daily, monthly or annual averages;
3. **linked to the energy component of the retail rate**, minus a small fee, or percentage, to cover transaction costs and the supplier's margin (e.g. 10-15%);
4. **Based on some other rate**, such as the supplier's avoided energy costs, that is revised and updated over time;
5. **Based on another formula**, such as the value of solar to the distribution grid, after taking into account time-of-day, the reduction of line losses, the energy and capacity value, etc.

[14] Ibid

Each of these different options has important implications both for electricity suppliers (i.e. buyers), as well as for prosumers.

Another important consideration for policymakers and regulators is whether different rules, and payment conditions apply for projects of different sizes, for residential vs. commercial customers, for customers connected at different voltage levels, or for customers in different rate categories.

In the U.S., which has the widest variety of Net Metering policies, Net Metering is typically reserved for smaller project sizes under 1 -2 MW.[1] By contrast, Brazil has recently lifted the project size cap on Net Metering projects up to 5 MW.[2] In some cases, different payment arrangements are available for projects of different sizes.

In general, the larger the embedded generation projects become, the more likely it is for such projects to receive some form of **monetary payment** for their net excess generation (i.e. a Net-FIT), in contrast to smaller rooftop systems, which continue to operate predominantly on the basis of **bill credits** (as under Net Metering), or **monetary credits** (e.g. as under Net Billing).

In the interests of keeping self-consumption policies simple and easy to understand both for prosumers and for suppliers, some jurisdictions choose to apply the same compensation rules for all prosumers, regardless of project size or customer rate category.

[1] https://programs.dsireusa.org/system/program
[2] https://www.pv-magazine.com/2018/01/24/brazil-surpasses-175-mw-of-solar-under-net-metering/

More specifically, Chapter V of the Rule No. 10/2017 on the Support Scheme for Renewable Energy Sources Generators establishes a scheme for supporting Self-Consumption Generators (prosumers). The policy framework governing self-consumption in Kosovo envisages that:

- Suppliers offtake all electricity produced and deliver all electricity consumed by prosumers within a billing period (i.e. one month);
- Suppliers account for the prosumer balance of the billing period, based on which the monthly invoice is prepared;
- If the prosumer balance is positive then the prosumer is credited in energy (in kWh) in the next billing period;
- Any outstanding positive balance on the last billing period of a calendar year is reset to zero without compensation from the supplier;
- If the prosumer balance is negative, then the supplier invoices the prosumer for the value of the prosumer balance.[15]

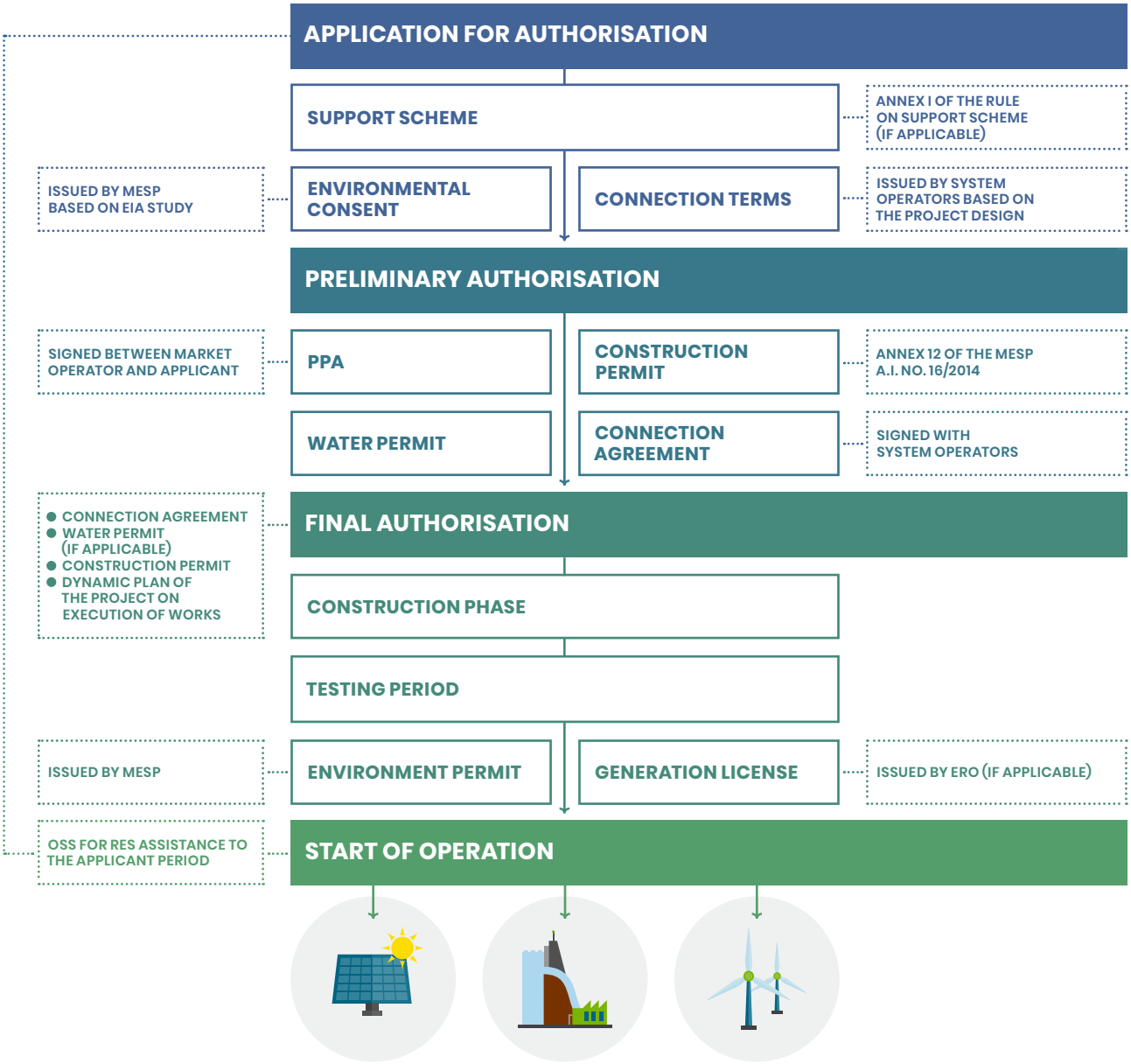
Since this Regulation is in place, **from 2017 until the beginning of 2020, an estimated 20 permits to construct solar PV projects configured for self-consumption were issued**.

Any electricity customer connected to the low voltage distribution grid (0.4 kV) may apply to their supplier for obtaining the status of **generating customer**. There are three main steps for

[15] Energy Regulatory Office, (2011), Rule No. 10/2017 on the Support Scheme for Renewable Energy Sources Generators, Chapter V, available at http://www.ero-ks.org/2017/Rregullat/Rule%20on%20Support%20Scheme_2017.pdf (accessed on October, 2019)

renewable electricity generators to obtain the requisite licenses and permissions: preliminary authorisation, final authorisation and connection to the grid. The figure below provides an overview of this permitting process:

FIGURE 6: STEPS TO OBTAIN AUTHORISATIONS FOR A RENEWABLE ENERGY PROJECT IN KOSOVO



Source: Ministry of Economic Development Kosovo

In addition, there has been uncertainty in recent years relating to the treatment of Value Added Tax (VAT), and whether VAT should be added onto the electricity injected into the grid. In October 2019, the Ministry of Finance sought to provide clarity to prosumers in Kosovo on this matter: the guidance now requires that prosumers issue an invoice for the electricity they feed into the system that includes the calculation of VAT (currently set at 16%). This is a rather symbolic gesture at the moment considering the fact that according to the Law No. 05/L-037 on Value-Added Tax the VAT can be reimbursed by the end of the year. Given the low threshold to participate in the Net Metering policy (for customers connected at 0.4kV voltage level), the VAT sums at stake would be small (see Text Box 4 on the treatment of VAT below).

TEXT BOX 4: PROSUMERS AND THE TREATMENT OF VAT

Broadly speaking, there are four main forms of taxation that are relevant to the taxation authorities, and that should be taken into account:

1. **VAT charged on the equipment** (panels, inverters, wiring, etc.): this continues to be collected unless special exemptions are put in place by the responsible tax authorities, and provides direct tax revenues to the government in year 0.
2. **VAT charged on the operations, maintenance, and insurance costs**: for all service-related aspects, including maintenance, insurance, etc., the government will continue to collect VAT, as applicable, over the life of the asset.
3. **VAT on the exported electricity**: When the prosumer exports electricity, this is typically treated as a "good or service", and is therefore subject to VAT. When the net excess generation is sold to a utility, as a business, the latter are typically able to recover the VAT. If the prosumer is a household, they are typically not eligible to collect VAT, unless they are registered as a VAT-registered legal entity.
4. **VAT charged on the imported (purchased) electricity**: Any taxes that the prosumer pays on their electricity purchases are typically reduced volumetrically by self-consumption. Since taxes are typically levied on the "net" consumption in a given month, or billing cycle, a reduction of purchases from the grid will result in a reduction of the total VAT being paid. This can result in a loss of VAT for the government, particularly over the lifetime of the asset.

From the list above, it is the fourth category of VAT taxation that is arguably the most problematic. However, analysis conducted by the International Energy Agency has indicated that under most cases modelled, the net loss of VAT-related tax revenue is real, but small.[2]

Additionally, if the revenues derived from exporting net excess generation to the grid result in a financial benefit, or profit, then the relevant tax authorities are liable to charge income tax on the associated profit.

[1] https://www.energy-community.org/dam/jcr:b73594c1-0e30-48bc-aac1-e8b7ce1478d7/WSEL052017_Muratovi%C4%87_recommendations.pdf

[2] https://nachhaltigwirtschaften.at/resources/iea_pdf/reports/iea_pvps_task1_review_and_analysis_of_pv_self_consumption_policies_2016.pdf

The sale of electricity from non-utility generators in Kosovo is covered by a Power Purchase Agreement (PPA); this PPA needs to be concluded between the RES Generating Facility and the Market Operator. In Kosovo, the electricity produced by the RES generators enjoys priority dispatch. The Market Operator is obliged to sign a PPA agreement to buy the electricity either at the government-set Feed-in Tariff rates, or at some other reference price; in the latter case, the price is set annually by Energy Regulatory Office.[16] As of mid-June 2020, a decision to set the reference price for 2020 has not yet been made.

In addition, small and large renewable energy projects that are not part of the support scheme may sell their electricity output under either the regulated framework or under market-based conditions.[17] Under market-based conditions, they can sell to willing buyers depending on the market conditions and prices while still enjoying priority dispatch.

[16] Ibid, article 15.

[17] Ibid

Table 3 below provides an overview of the main policies and regulations available for solar PV projects in Kosovo.

TABLE 3: OVERVIEW OF KOSOVO'S RENEWABLE ENERGY TARGETS

	Within Supporting Scheme	Outside Supporting Scheme (Regulated Framework)	Outside Supporting Scheme (Market-Based Conditions)
Priority Dispatch	Yes	Yes	Yes
Liability for Imbalance Cost	25%	Yes except for generation entities with a capacity under 500 kW	Yes except for generation entities with a capacity under 500 kW
Selling the electricity through a Power Purchase Agreement (PPA)	Yes the PPA should be 12 years.	Yes the PPA should be at least 1 year[18]	Yes the PPA should be at least 1 year
Feed-in Tariff	Yes	No, the price referent is set annually by ERO.	NO, prices are determined by the market rules.

4. Barriers to Solar PV in Kosovo

There are several obstacles to developing distributed solar PV projects in Kosovo. The barriers are broken into four categories: 1) Policy and Regulation, 2) Metering and Billing, 3) Balancing Responsibilities, and 4) Financing.

Policy and regulation

Long administrative and permitting delays: Some of the major obstacles relate to the fact that the period from the preliminary authorisation to the final authorisation is very long and can last up to three years. Some companies that apply for the support scheme and receive an allocation of generation capacity are unable to meet their initially proposed implementation timeline. This leads to gaps between the preliminary authorisation and actual investments on the ground. The ERO is currently trying to address this issue by proposing shorter implementation periods. Proponents who fail to build their projects within this new implementation period could thereby have their capacity allocation withdrawn.

Arbitrary limitations imposed on prosumers: Currently, in order to participate in the policy and regulatory framework offered for prosumers, customers must be connected to the grid at 0.4 kV voltage levels. This severely constrains the potential market for customer-sited solar PV projects and for self-consumption in particular, as many of the customers for whom such projects are most attractive are commercial and industrial customers. Lifting the voltage threshold limit up to 35 kV would enable a wider range of customers to participate.

[18] Energy Regulatory Office, (2011), Rule No. 10/2017 on the Support Scheme for Renewable Energy Sources Generators, available at http://www.ero-ks.org/2017/Rregullat/Rule%20on%20Support%20Scheme_2017.pdf (accessed on October, 2019)

Special requirements for municipal consent to develop solar PV projects: Municipalities in Kosovo are required to provide consent forms for distributed solar projects. These are formal documents in which the municipality declares that the respective project does not impede the implementation of any municipal development plans or urban plans and that the project does not endanger any construction structure. The document is required for projects implemented in any part of the territory of the municipality regardless of whether it is an urban area or a rural one. For municipalities, this document is completely new and as such, they are not very familiar with it, in particular with how it applies to solar projects. This causes unnecessary delays for investors who want to invest in distributed PV as well as consumers who may be interested in becoming prosumers.

At times dysfunctional institutional and regulatory environment: Political and party affiliated appointees have dominated the Energy Regulatory Office. According to the current legislation, it is the Government that proposes members of the Board of the Energy Regulatory Office and the Kosovo Assembly approves them. Moreover, the appointment is made in block for all the vacant positions. This has led to the ruling parties choosing candidates who were members of or closely affiliated with the ruling political parties. Since the Government coalition occasionally consists of up to five political parties, there are often disagreements on the names proposed, which leads to delays. In extreme cases, this can render the ERO non-functional due to the expiration of the mandate of the board members.[19] A more merit-based system in which professional criteria are emphasized and in which appointees are voted in individually, with a rotation based on terms of different durations, is one of the solutions proposed by civil society groups in the country. Under such an approach, every year, one out of five members of the ERO would need to be appointed through a competitive and transparent process, along with strict professional criteria to ensure ERO's independence, effectiveness, and professionalism.

Lack of skilled labour: Broadly speaking, Kosovo has not done enough to design training programs for solar panel installers, maintenance and quality assurance. Kosovo has a highly functioning vocational training system that could easily adopt such training programs in order to create the skilled labour needed.

Metering and billing

In order to track progress toward Kosovo's renewable energy targets, accurate data are needed. In particular, this includes data on gross PV system output. If the net excess generation is all that is metered, this fails to capture the solar generation that is produced and consumed onsite. It is important for Kosovo to ensure that prosumers have the appropriate metering infrastructure in order to monitor domestic renewable energy development toward the achievement of national energy and climate targets. At the same time, however, utilities need to be able to meter bidirectional power flows (see Text Box 5 below for more information).

Broadly speaking, there are two options: **1) the regulations can require all prosumers with customer-sited PV systems to install meters that allow both the metering of bi-directional power flows and the metering of gross solar PV system output**, or **2) the regulations can impose**

[19] European Comission, (2019), Kosovo Report, Existence of a functioning market economy, page 41, available at https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/20180417-kosovo-report.pdf (accessed in December, 2019)

the obligation on utilities instead, requiring them to adopt metering infrastructure that allows both the metering of bi-directional power flows and the metering of gross output. However, since this additional metering infrastructure adds an additional cost, either for the prosumer or for the utility, a clear cost-sharing formula or arrangement is needed.

Depending on the pricing arrangements agreed-upon for prosumers, time-of-use meters may be required.

TEXT BOX 5: ADDITIONAL METERING CONSIDERATIONS

The metering arrangements available (or prescribed by utilities) in a given jurisdiction can have direct impacts on the attractiveness of self-consumption:

- **In the absence of two-way meters and of clear compensation for the net excess generation**, then PV systems will tend to be dimensioned to cover customers' own consumption at the lowest load level during the day. This may result in relatively small PV systems being installed on large commercial rooftops, and a failure to harness the available rooftop potential.
- **In situations where two-way meters are used, but no cash compensation is offered, only bill credits** (i.e. under Net Metering), prosumers may choose to maximize their PV system size, particularly if they are paying above-average retail prices. This may lead to significant amounts of net excess generation, above and beyond what utilities expect from individual prosumers.
- **If there is a two-way meter and prosumers can sell electricity in real time** (i.e. under Net Billing) then prosumers are likely to choose their system size more carefully, aware that their self-consumption ratio and the anticipated export rate will have significant impacts on their profitability; however, the low price at which electricity can be sold may be a barrier and may still result in prosumers opting for smaller system sizes, so that they can avoid having large amounts of net excess generation.

Ultimately, a decision needs to be made on whether Kosovo wants to encourage further solar investment and to what extent. In any case, it is clear that even without support there is scope for additional investment among groups paying a high price and with high self-consumption rates.

Balancing responsibilities

According to article 22 of Law No. 05 / L-085 on Electricity in Kosovo, the Transmission System Operator is specifically responsible for the organisation and development of the market of balancing electricity.[20] As part of maintaining the real-time balance in the system, market participants are required to provide the necessary information to the TSO.

At the EU level, the current regulations regarding balancing responsibilities currently set an exemption for projects below 400kW. This threshold is projected to decline to 200kW for projects connected to the grid after 2026.[21] In the meantime, prosumers with onsite renewable energy projects under 400kW do not face separate balancing responsibilities.

[20] Republic of Kosovo, (2016), Law No. 05/L-085 on Electric Energy, Article 3, available at https://gzk.rks-gov.net/ActDocumentDetail.aspx?ActID=12744

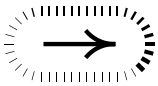
[21] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019R0943&from=EN

Financing environment

In general, businesses face a difficult financial environment if they wish to invest in distributed PV. High interest rates and lack of investment loans are among the main financial obstacles. Local banks provide only some 30-35% of the necessary investment cost in the form of loans, with a payback period of up to 10 years and with an interest rate of at least 5% - and the majority of investors finance their projects through their own equity.[22] In response to that, in 2016 Kosovo adopted the Law no. 05/l -057 on the Establishment of the Kosovo Credit Guarantee Fund. The Kosovo Credit Guarantee Fund is created to help meet the need for increased access to finance for micro, small and medium enterprises in Kosovo in order to create jobs, increase local production and value added services, improve the trade balance, and enhance financing opportunities for small and medium enterprises.[23] Some of the main banks in Kosovo have issued special green loans. ProCredit Bank offers "Loans for Eco Investments" including investments for distributed PV. TEB Bank in cooperation with EBRD offers "Green Loans" for investments including investments for distributed PV.

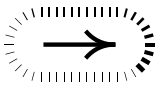
5. Synthesis and recommendations

In order to increase the level of investment in solar PV, to increase its efficiency and to maintain a decentralisation of the energy system by promoting small-scale renewable energy, including solar PV, a number of measures need to be taken.



The Government of Kosovo must commit to a full and accelerated energy transition within a specific timeframe.

Kosovo's Energy Strategy 2017-2026 makes no mention of the energy transition as either an objective or a goal to be achieved. In light of the EU's long term decarbonisation goals, and considering that coal and lignite fired electricity generation will no longer be financially viable once Kosovo joins the EU, the Energy Strategy needs to be amended to include clear policies for supporting renewable solar PV with a clear energy transition objective. The strategy should also include prosumers and specific measures to support them. The lack of a comprehensive strategy has resulted in policies focusing only on building new coal capacity and not on the energy transition.



In order to encourage prosumer investments, a Net-FIT approach should be favoured over Kosovo's current Net Metering policy.

According to stakeholders present at the workshop, some commercial and industrial customers are already investing in onsite solar PV systems for self-consumption. This strongly suggests that

[22] Govori, Zana, (2019), Renewable Energy in the Republic of Kosovo: Regulatory and Financial Obstacles to RES Penetration and Deployment in the Market, Thessaloniki: International Hellenic University

[23] Republic of Kosovo, (2016), Law No. 05/L-057 on the Establishment of the Kosovo Credit Guarantee Fund, Pristina: GZRKS.

investing in rooftop solar projects is already attractive for customers in certain electricity rate categories in the country.

Experience in a growing number of countries around the world signals a move away from classic Net Metering and toward other self-consumption policies such as **Net Billing** (where a monetary credit is allowed and can be carried over to offset future consumption) as well as **Net-FITs** (where net excess generation is paid for, either at the end of each billing cycle, or at the end of the year).

Net Metering credits all net excess electricity on a one-to-one basis on customers' electricity bill: the transaction is therefore settled in kWh, not in monetary terms. In addition, Net Metering ignores grid and transaction-related costs, making it costlier to utilities, and to other rate payers.

In terms of mobilizing traditional bank financing (i.e. loans), Net Metering poses a number of challenges, as the compensation received for the project's net excess generation is in the form of kWh credits. As a result, banks cannot be certain that the project will be paid off, particularly if the business that made the original solar investment goes out of business. The lack of clarity around what happens to a customer-sited solar PV system after bankruptcy makes the issuance of loans under such conditions riskier. The presence of clear market access for the excess generation provided to the grid provides a "worst case scenario" for the bank, and thus, helps de-risk such investments.

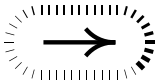
As such, in terms of encouraging prosumers in Kosovo, a Net-FIT approach should be favoured over the country's current Net Metering policy: a Net-FIT allows prosumers to be paid for the net excess generation at the end of each billing cycle, or calendar year, at a specific rate. In a growing number of cases, this rate is lower than the full kWh rate paid by customers.

Regarding the compensation rates, there are five basic possibilities. The price for net excess generation can be:

1. **Linked to the market in real time** (though this would require time-of-use meters for all customers, and is likely to be pose an additional barrier for residential and small commercial customers);
2. **Linked to the market, but based on daily, monthly or annual averages**;
3. **Linked to the energy component of the retail rate**, minus a small fee, or percentage, to cover transaction costs and the supplier's margin (e.g. 10-15%);
4. **Based on some other rate, such as the supplier's avoided energy costs**, that is revised and updated over time;
5. **Based on another formula, such as the value of solar** to the distribution grid, after taking into account time-of-day, the reduction of line losses, the energy and capacity value, etc.

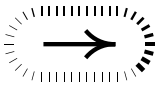
Each of these different options has important implications both for utilities (i.e. the buyers), as well as for prosumers.

As highlighted above, a pricing formula that allows customers to be paid for their net excess generation (rather than simply receiving a bill credit), even if it is established at a relatively low rate such as the market price, can be critical to help mobilise financing.



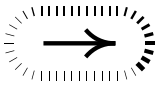
A fundamental reform of the permits and licenses system is necessary.

The Government of Kosovo should establish a one-stop-shop system of licenses and permitting. This system of permits and licenses should ensure that investors are informed about the services, conditions and all responsible institutions. The Ministry of Economic Development, the Ministry of Environment and Spatial Planning, municipalities and other agencies need to work jointly to create a one-stop-shop for all permitting.



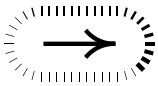
The current limit of 100 kW for prosumers should be reconsidered.

One model to consider is that of Albania where the limit is 500 kW and is based on the consumption patterns of the prosumers. Amending this limit would contribute to an increase in investment, especially by consumers paying higher tariffs, resulting in more decentralised production.



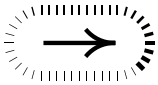
No specific balancing obligations should be imposed on individual prosumers.

Given that most solar PV projects configured for self-consumption are likely to remain relatively small in Kosovo (less than 500kW), there is currently no need to impose individual balancing responsibilities on each prosumer. These balancing responsibilities can be transferred to a Balancing Responsible Party in order to maintain system stability for the foreseeable future.



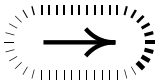
Training is needed for municipal officials on renewable energy in general and specifically for solar PV projects.

These trainings should focus not only on issuing municipal approval documents necessary to obtain a license for building projects, but also on how to integrate solar PV projects into municipal development strategies and municipal regulatory plans.



Human capacity within responsible institutions, especially in the Energy Regulatory Office and in municipalities, needs to be increased.

There is currently a lack of staff to deal with renewable energy projects. Adding staff to these institutions would help accelerate project implementation and improve the quality of services for the investors.



The Government and Assembly of Kosovo must ensure that the country has stable, independent and functioning institutions.

The manner in which members of the Board of Regulators are elected needs to be changed so that the Regulator does not remain non-functional due to the absence of a mandate of the majority of its members. Most importantly, the criteria for appointing these members should change in favour of increasing professionalism instead of being based on party affiliation and politicisation.