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**Republika Kosova - Republic of Kosovo**

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REGULATORNI URED ZA ENERGIJU  
ENERGY REGULATORY OFFICE



## Consultation Paper

**RES Targets Support Mechanism  
(20 MW solar photovoltaic)**

### DISCLAIMER

This document has been prepared by ERO for consultation with stakeholders and should not be considered as a decision of ERO.

Comments from the interested parties must be submitted with the title:

“Feed-in Tariff for additional RES Targets” by:

16 May 2019

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## 1 Summary

The technologies for generation of electricity from renewable energy sources have developed greatly over the last decade and their development trend will continue to be positive in the future as well. Various developed and developing countries have played an important role in supporting projects for Renewable Energy Sources (RES). The means of state support for RES projects include many aspects, ranging from financial support to technical aspects of energy dispatching priority or facilitating the balancing responsibilities in the system.

Kosovo has so far relied the whole financial support mechanism on the Energy Regulatory Office (ERO) , which has established mechanisms of the RES Support Scheme based on targets set by the Government of Kosovo for fulfilling the legal obligations set by the European Commission. So, Kosovo has a mandatory target to reach 25% of domestic consumption by 2020 from RES. Consequently, ERO has carefully handled this obligation by creating appropriate and predictable mechanisms which are suitable for Kosovo's socio-economic circumstances. The mechanisms established by ERO for support of RES have proved to be very efficient, stimulating great interest in investments and from time to time, these mechanisms have been adapted to legal changes and the conditions of doing business in Kosovo and the region. We can say that the energy sector, especially renewable energy, remains one of the most attractive investment areas in Kosovo, owing to the above-mentioned mechanisms.

Despite the mandatory target of 25%, the Government of the Republic of Kosovo has also expressed readiness for voluntary targets for RES, which leads it to over 29%. Moreover, in 2017, the Ministry of Economic Development has added to the Administrative Instruction on Renewable Energy Sources (UA 05/2017) an additional target of 20 MW for solar photovoltaic energy, as well as 6% for biomass. This has created ambiguity and uncertainty in state policies regarding energy sector. ERO, with the support of USAID-funded consultancy Repower, has carried out a study on the impact of increased RES voluntary targets, which has resulted in the impact of about 2% on final customers' tariffs.

Kosovo must follow the trends of general developments in the energy sector and adapt its policies to sensitive transformations in the electricity market taking place in the region and beyond. One of the most important transformations is certainly the development of RES technologies, in particular solar and wind, thus affecting the huge decrease of the cost of investments in this sector, and by increasing the efficiency of using the technologies in question. As a result of all technological developments, we have reached a stage where the support of renewable energy investments will be less required compared to few years ago. In many European and regional countries, Feed-in Tariffs, as a dominant means until 2016, are now excluded from Support Schemes, replacing them with new models that align RES energy prices with market prices. All the technology development and ongoing subsidies that have been made in this sector have had the major goal of finding alternative solutions of energy generation from clean sources, at a cost close to conventional ones. From current practices and trends, it can be seen that, in some cases, the energy generated by RES enters the market at a lower price than average market prices and energy from conventional generation methods.



Consequently, the development of technology definitely has an impact on Kosovo's policies in terms of RES support, orientating them at an acceptable level toward the energy market and allowing the market to determine what prices would be reasonable for the energy generated from RES. The market should be the right mechanism that determines investment costs and energy prices, through competitive ways of equal investment opportunities to all potential investors. Kosovo can greatly benefit from the experience of other similar countries, especially neighbouring countries, and develop competitive models for development of RES Sector.

According to Eurostat, Kosovo has reached the level of RES participation of 24.6% in the total energy consumption. This data has also been validated by the Energy Community Secretariat. Starting from this fact and from authorizations for construction of new generation capacities from RES, issued by ERO, it results that by 2020, the 25% target is easily accessible.

This Consultation Paper takes into account the development of technologies for generation of energy from RES, the publication of Eurostat on their share in total energy consumption in one hand and the affordability of electricity tariffs by household and commercial customers on the other hand. ERO has also carefully addressed the issue of adding 20MW solar to the Support Scheme. The Feed-in Tariff was also proposed on this Report, taking into account sufficient incentives to develop projects for additional target of 20MW for solar energy. It should be mentioned that the Feed-in Tariff as a support mechanism covers all investment costs and does not support the costs that are secured by grants or any other form of subsidy.



## 2 Introduction

The Energy Regulatory Office (ERO), in line with the powers and obligations defined in the Law on Energy Regulator, the Law on Energy and the Law on Electricity, as well as the secondary legislation governing the Renewable Energy Sector, has prepared the Report on Public Consultation on the support mechanism of additional targets of 20 MW for solar photovoltaic energy. This has come as a result of the review of the Administrative Instruction on RES targets by the Government of the Republic of Kosovo through the Ministry of Economic Development. The latest amendments to the Administrative Instruction are presented in the table below.

*Table 1 - RES Targets in Kosovo -2020*

| Technology  | Administrative Instruction<br>01/2013 | Administrative Instruction<br>05/2017 |
|-------------|---------------------------------------|---------------------------------------|
| Wind        | 150                                   | 150                                   |
| Solar       | 10                                    | 30                                    |
| Water       | 240                                   | 240                                   |
| Biomass/Gas | 14                                    | 20                                    |

It is worth mentioning that the public consultation is a legal obligation for all processes that will impact the tariffs of final costumers and the energy market in Kosovo.

In this document, ERO has presented the Feed-in tariff as a mechanism to support the development of additional capacity of 20 MW.



### 3 Feed-in Tariff

Feed-in Tariffs have been one of the major incentives for investments in renewable energy generation for a long time, being applied in many EU countries, the United States and beyond. This means of support is applied by ERO and continues to be applied for development of additional capacities of 20 MW. The calculation of the Feed-in Tariff is presented in this Consultation Paper, which guarantees to the potential investors that the amount of energy generated from PV sources will be purchased from the Market Operator at a price which enables the return of investments and operation costs. Moreover, ERO has proposed in this document that the purchase of RES energy that is regulated through the Power Purchase Agreement for 12 years shall remain unchanged.

#### 3.1 The Principle for Determination and Calculation of Feed-in Tariff

Following ERO's detailed analysis of the internationally used methods/principles for setting the Feed-in Tariff, ERO has decided to adopt the method of setting it based on the energy levelled cost. According to this method, ERO has analyzed the main factors that affect the cost of producing electricity from solar PV sources, which include:

- Investments for generators;
- Operational and Maintenance Costs (O&M), including the imbalance costs;
- Funding costs ( weighted average cost of capital);
- Other costs related to the project

Determination of the Feed-in Tariff means the evaluation of the level of money that a company has to circulate within a specified period in order to cover the return of invested capital, the reasonable cost of energy production, including the cost of other services and costs of connection to distribution or transmission network.

The following formula is used for defining the levelled cost of energy (LCOE):

$$LCOE=(WACC \times CAPEX + OPEX)/(CF \times 8,760 \text{ hours/yr})+VOM$$

Where:

|        |   |
|--------|---|
| WACC:  | - Weighted Average Cost of Capital (Allowed Return) |
| CAPEX: | - Capital Investments                               |
| OPEX:  | - Operational and Maintenance Costs                 |
| CF:    | -Capacity factor                                    |
| VOM:   | -Variable cost                                      |

ERO sets WACC in accordance with the applicable legislation, expressed in real terms after tax. The formula for WACC is as follows:



$$WACC = a \times C_E + (1 - a) \times C_D \times (1 - t)$$

ku,

$C_E$  - is the cost of capital

$C_D$  - is the cost of debt

$a$  - is the ratio of the capital over the total of assets

$t$  - is the corporate profit tax

### 3.2 Capital Expenditures (Capex)

Owing to the huge support provided to the solar energy sector by the governments of the respective countries, the development of this sector has undergone huge development steps. This growth has led to the evolution of technology, as well as a significant cost reduction. If we look at solar technology pricing trends, we can conclude that prices will continue to fall steadily in the coming years. The following figure shows the evolution of this sector by showing the decrease of the cost of investment per unit:

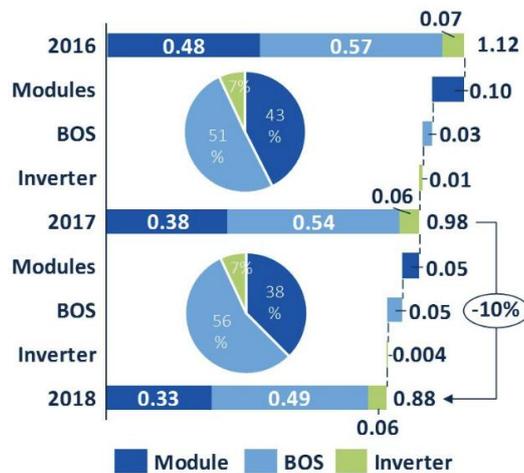


Chart 3.1.1<sup>1</sup> –the trend of technology prices for solar energy system -PV

ERO has collected the data and analyzed them very carefully in order to come up with a summary of capital costs for solar energy investment. More specifically, the following costs are analyzed and reviewed:

- Equipment cost: electromechanical equipment is often purchased from a supplier and are amongst the major expenditures for such a project.
  - PV Panels
  - Preparation of the site and installation- road access and network connection.

<sup>1</sup> Source: "What cost for photovoltaic modules 2020? – Working paper 13-ME-03"



- Elements required for fitting and construction of the system;
- Distribution Panel and various other electrical equipment;
- Inventor;
- Costs of land purchase or renting;
- Unpredictable: this position should always be included to cover unpredicted expenditures.

Capital expenditures are the main factor determining Feed-in Tariffs for energy generated from solar systems. Their value for capacity installation according to ERO's evaluations, taking into account various studies in the region and beyond, as well as various feasibility studies by project developers in the country, came up with the result that the investment cost will be somewhere between € 0.75 million to € 0.90 million per MW. Depending on the installed capacity, unit costs may change, decreasing upon the increase of installed capacity.

### 3.3 Operational expenditures (OPEX) and other expenditures

Unlike capital expenditures that are constantly falling in solar energy investments, operational costs and other periodic expenses depend on other parameters and cannot be said to have a downward trend. Some of the most important elements of operational and maintenance are described below:

- Maintenance: cleaning, supervision of the power generation system, etc.
- Other costs

**Other costs  $OC_n$** , are evaluated costs that may include the imbalance costs or other expenditures.

ERO, following the analysis and all the data and economic parameters of Kosovo, and using various studies, has managed to determine operational costs and other periodic expenditures of system operation, which are typically around 2 -3% per year, compared to the investment cost.

The inflation will only be allowed for the purpose of indexing the Feed-in Tariffs. According to the legislation in force, ERO defines the inflation rate based on the Harmonized Index of Customer Price (HICP) - All units for Eurozone, published by Eurostat.

### 3.4 The value of parameters and the proposal for Feed-in Tariff

Taking into consideration all of the above mentioned parameters, the required level of investments for one MW solar energy capacity in Kosovo ranges from 0.75-0.90 million Euro, while operational and maintenance costs are about 2-3% of the investment level. In addition to the value of investments and operational and maintenance costs, ERO has considered the following values as the determinant of the Solar Energy Feed-in Tariff:

- Load Factor: 1,370 hours in a year
- Beta equity: 1
- Real WACC ( Weighted Average Cost of Capital): 8.3%;
- Power Purchase Agreement: 12 years

Based on the given technical, financial and economical parameters, the following results of modelling for solar photovoltaic energy Feed-in Tariff are calculated according to ERO's eligibility criteria (up to 3MW of installed capacity). It should be noted that unit cost decreases upon the increase of installed capacity.



Table 2 - FIT calculated for solar photovoltaic energy

| Feed-in Tariff      | Installed Capacity | Calculated FIT [€/MWh] |
|---------------------|--------------------|------------------------|
| Photovoltaic energy | ≤ 3 MW             | 90.4                   |