Pursuant Article 21, paragraph (1) point 12) and Article 22 point 11) of Law on Electricity in the Federation of Bosnia and Herzegovina (Official Gazette of the Federation of BiH, 66/13), Article 25 paragraph (1) and paragraph (2) Law on Usage of Renewable Energy Sources and Efficient Cogeneration (Official Gazette of the Federation of BiH, 70/13 and 5/14), Article 10. paragraph (1) point l), Article 11, paragraph (1) point k) and Article 23, paragraphs (1) and (2) of Statute of Regulatory Commission for Energy in the Federation of Bosnia and Herzegovina (Official Gazette of the Federation of BiH, 24/14) and Article 32, paragraph (1) of Rules of Procedure of Regulatory Commission for Energy in the Federation of Bosnia and Herzegovina (Official Gazette of the Federation of BiH, 29/14), Regulatory Commission for Energy in the Federation of Bosnia and Herzegovina - FERK on its 9th regular session, held in Mostar on 6 June 2014 has adopted

RULEBOOK
on Methodology to Determine Feed-in Prices for Electricity Purchased from Plants Using Renewable Energy Sources and Efficient Cogeneration

PART ONE  GENERAL PROVISIONS

Article 1
(Subject-matter)

With Rulebook on Methodology to Determine Feed-in Prices for Electricity Purchased from Plants Using Renewable Energy Sources and Efficient cogeneration (hereinafter called the Rulebook) Regulatory Commission for Energy in the Federation of Bosnia and Herzegovina (hereinafter called FERK) prescribes methodology to determine feed-in prices for electricity purchased from plants of eligible producers that have obtained privileged producer status, for each type and group of plants for usage of renewable energy sources (hereinafter called RES) and efficient cogeneration (hereinafter called CoGen), as well as criteria for changes in the determined feed-in price.

Article 2
(Objectives)

The objectives for adopting this Rulebook are design of methodology on determination of feed-in prices for electricity generated in the plants using RES and CoGen (hereinafter called the Methodology) in accordance with Law on Electricity in the Federation of Bosnia and Herzegovina (Official Gazette of the Federation of BiH, 66/13) and Law on Usage of Renewable Energy Sources and Efficient Cogeneration (Official Gazette of the Federation of BiH, 70/13 and 5/14) that give guidelines for simple and understandable manner of calculating feed-in prices based on the known parameters that are easily enforceable in practice.
Article 3
(Definitions)

Terms used in this Rulebook have meanings provided within the Law on Electricity of the Federation of Bosnia and Herzegovina, Law on Usage of Renewable Energy Sources and Efficient Cogeneration and FERK’s secondary legislation designed based on those laws.

PART TWO    CLASSIFICATION OF PLANTS USING RES AND COGEN

Article 4
(Types of RES and CoGen Based on Installed Capacity)

Plants using RES and CoGen (hereinafter called RES and CoGen plants) depending on installed capacities are as follows:

a) micro-plants: from 2 kW up to and including 23 kW,
b) mini plants: from 23 kW up to and including 150 kW,
c) small plants: from 150 kW up to and including 1 MW,
d) medium plants: from 1 MW up to and including 10 MW and
e) big plants: over 10 MW.

Article 5
(Groups of RES and CoGen Plants Depending on Primary Energy/Technology Source)

Depending on type of primary energy/technology source used for power generation or power and heat, plants from Article 4 may be grouped as follows:

a) hydropower plant,
b) wind power plant,
c) solar power plant,
d) geothermal power plant,
e) biomass power plant,
f) biogas power plant,
g) power plant using sea energy,
h) power plant on communal waste and
i) efficient cogeneration plant.
PART THREE  METHODOLOGY ON DETERMINING FEED-IN PRICES FOR ELECTRICITY PURCHASED FROM THE PLANTS USING RES AND COGEN

CHAPTER I  BASIS OF METHODOLOGY

Article 6  
(Subject-matter of the Methodology)

Methodology subject matter is to prescribe how to calculate feed-in prices for purchased electricity, and is based on the Federation of BiH legislation.

Article 7  
(Determination of Purchase Feed-in Price)

(1) Purchase feed-in price \( G_c \) is the value result from multiplication of referent electricity price \( R_c \) and related tariff coefficient \( C \) determined for the type of RES and CoGen.

\[
G_c = R_c \times C
\]  

where is:

\( G_c \) – is feed-in price for purchase of electricity \( (BAM/kWh) \)

\( R_c \) – referent electricity price \( (BAM/kWh) \)

\( C \) – tariff coefficient

(2) Referent electricity price \( R_c \) means purchase price from the plants using renewable sources and cogeneration and for which generation is not incentivized and is used to determine fee paid for RES and this is determined by FERK.

(3) Tariff coefficient \( C \) is numerical value assigned to each type and group of plants for power generation from RES that is reconciled once in 18 months, prescribed by the law.

(4) Input data for calculation of tariff coefficient and feed-in price for purchased electricity have been given in Attachment 1 of this Rulebook.

(5) Feed-in electricity price determined in accordance with the methodology for privileged producer that has signed contract with Operator for RES and CoGen stays the same during whole contracting term.
CHAPTER II  

CALCULATION OF TARIFF COEFFICIENT

Article 8

(Tariff Coefficient)

(1) Tariff coefficient (C) that is assigned to each type and group of plants and is used to determine feed-in purchase prices is determined depending on the type of RES respecting specific characteristics of individual technologies and installed capacity of the plant.

(2) Tariff coefficient from the paragraph (1) of this Article is calculated in accordance with the equation:

\[ C = \frac{TP_c}{R_c} \]

where is:
- \( TP_c \) – generation costs calculation per unit of electricity (KM/kWh)
- \( R_c \) – referent electricity price (BAM/KWh)
- \( C \) – tariff coefficient

(3) Calculation of tariff coefficient from paragraph (2) of this Article is based on the calculation of total annual costs of generating plants that are using RES, using annuity method of investments valuation, where this calculation is based on previously defined technical and economic parameters.

(4) Economic parameters on which tariff coefficient calculation is based are as follows: price of capital (%), period for return on investment (years), investment costs (KM/kW), operating and maintenance costs (KM/kW) and fuel costs (KM/kWh).

(5) Technical parameters on which tariff coefficient calculation is based are as follows: installed capacity (kW) and annual working hours (h/year) of the generating plant.

(6) Tariff coefficient calculation form this Rulebook is based on two economic presumptions, that are the same for all generating plants no matter which energy source they are using:
   1) Price of capital, as weighted average cost of capital on own capital and loans
   2) Period of return on investments of 12 years.

(7) Calculation of generation costs per unit of electricity for RES plant consists for calculation of fixed and variable costs in accordance with the following equation:

\[ TP_c = T_{inv} + T_{rko} + T_{gorivo} \]
where is:

\[ TP_{c} \] - generation costs per unit of electricity (BAM/kWh)

\[ T_{inv} \] - investment costs per electricity unit (BAM/kWh)

\[ T_{rd,o} \] - operation and maintenance costs per electricity unit (BAM/kWh)

\[ T_{gorivo} \] - fuel costs (BAM/kWh)

\[ T_{inv} = \frac{T_{INV} \times F_{z,n}}{H} \quad [4] \]

where is:

\[ T_{inv} \] - investment cost per electricity unit (BAM/kWh)

\[ T_{INV} \] - unit value of investment per unit of installed capacity (BAM/kW)

\[ F_{z,n} \] - invested capital compensation factor (annuity factor) (%)

\[ H \] - full load hours in a year (h/year)

and

\[ T_{rd,o} = \frac{T_{R&O}}{H} \quad [5] \]

where is:

\[ T_{rd,o} \] - operating and maintenance costs per electricity unit (BAM/kWh)

\[ T_{R&O} \] - unit labour and maintenance costs per unit of installed capacity (BAM/kW)

\[ H \] - full load hours in a year (h/year)

Equation [3], with including equations [4] and [5], may be shown also as follows:

\[ TP_{c} = \frac{T_{R&O}}{H} + \frac{T_{INV} \times F_{z,n}}{H} + T_{gorivo} \quad [6] \]

where is:

\[ (8) \] Calculation of generation costs per electricity unit for plants of CoGen consists of calculation of fixed and variable costs in accordance with the equation:

\[ TP_{c} = T_{var} + \frac{T_{fiksni}}{Q_{el}} \quad [7] \]

where is:

\[ TP_{c} \] - generation costs per unit of electricity for CoGen plant (BAM/kWh)

\[ T_{var} \] - variable costs of power generation (BAM/kWh)

\[ T_{fiksni} \] - fixed costs of power generation (BAM)

\[ Q_{el} \] - annual power generation (kWh).

Further it follows that it is:
\[ TP_c = (T_{g\text{oriva}} - P_{\text{toploata}}) + T_{\text{inv}} + T_{r&ko} \]  

where is:
- \( TP_c \) - generation costs per unit of electricity for CoGen plant (BAM/kWh)
- \( T_{\text{inv}} \) - investment cost per electricity unit (BAM/kWhel)
- \( T_{r&ko} \) - operation and maintenance costs per electricity unit (BAM/kWhel)
- \( T_{g\text{oriva}} \) - fuel costs (BAM/kWhel)
- \( P_{\text{toploata}} \) - revenues of heat sales (BAM/kWhel)

\[ T_{\text{inv}} = \frac{T_{\text{INV}} \times F_{z,n}}{H} \]  

where is:
- \( T_{\text{inv}} \) - investment cost per electricity unit (BAM/kWhel)
- \( T_{\text{INV}} \) - unit value of investment per unit of installed capacity (BAM/kW)
- \( F_{z,n} \) - invested capital compensation factor (annuity factor) (%)
- \( H \) - full load hours in a year (h/year)

and

\[ T_{r&ko} = \frac{T_{R&O}}{H} \]  

where is:
- \( T_{r&ko} \) - operation and maintenance costs per electricity unit (BAM/kWhel)
- \( T_{R&O} \) - unit value of investment per unit of installed capacity (BAM/kW)
- \( H \) - full load hours in a year (h/year)

Equation [8], with including equations [9] and [10], may be shown also as follows:

\[ TP_c = (T_{g\text{oriva}} - P_{\text{toploata}}) + \frac{T_{\text{INV}} \times F_{z,n}}{H} + \frac{T_{R&O}}{H} \]  

(9) Fuel costs \( T_{g\text{oriva}} \), as variable cost is significant in calculation of costs for electricity generated in plants using biomass as fuel and in plants generating electricity in CoGen, and using natural gas and coal as fuel. In cogeneration plants that are using gas as basic fuel, gas price is determined, for the purpose of determining feed-in price, based on the wholesale gas price in the Federation BiH market. In cogeneration plants that are using coal as basic fuel, coal price is determined, for the purpose of determining feed-in price, based on the wholesale coal price in the Federation BiH market. In cogeneration plants that are using
biomass as basic fuel, biomass price ids determined, for the purpose of determining feed-in price, based on the biomass price in Bosnia and Herzegovina market.

(10) The level of fixed cost is determined by the level of investment and operation and maintenance costs.

(11) The level of investment per unit of installed capacity (KM/kW) is determined based on information from available literature, respecting specific features of different RES and installed capacity, and taking into account progress in development of technology and experience in usage. In determination of investment cost level, costs of design, land, civil engineering works and electric equipment and connection on network are used.

(12) Adding up unit value of investment on annual amount is done through annuity method using invested capital compensation factor (Fz,n), where:

\[
F_{z,n} = \frac{z \times (1 + z)^n}{(1 + z)^n - 1}
\]

where is:

\( F_{z,n} \) - invested capital compensation factor (annuity factor) (%)
\( z \) - weighted average cost of capital (WACC) (%)
\( n \) - period of return on investment (12 years)

(13) FERK calculates rate of return on total capital as weighted average cost of capital on own capital (profit rate) and on loans (interest rate) in accordance with the following equation:

\[
z = WACC = (w_{wws} \times k_{wvs}) + (w_{wps} \times k_{bps})
\]

where is:

\( z \) - weighted average cost of capital (own and loans) (%)
\( w_{wws} \) - own assets share (%)
\( k_{wvs} \) - profit rate on own assets (%)
\( w_{wps} \) - loan assets share (%)
\( k_{bps} \) - interested rate on loan assets (%)

Rate of return on total capital, calculated in this way, is a single value no matter what type of RES is considered.

(14) Period of return on investment is the period of 12 years in which developer is able to return invested funds in the incentives system through feed-in purchase electricity price and it is single value no matter what type of RES is considered.

(15) Operating and maintenance costs consist of: maintenance and operation, costs of salaries, insurance, rents and fees. Unit amount of these costs per unit of installed capacity (TR&O) is determined as percentage of investment respecting specific
features of individual technologies. The amount of salaries is calculated based on data on average number of staff for individual plants and level of average gross salary in power sector in the Federation of BiH.

(16) Starting with available data on average efficiency of different types of RES, for every single technology annual full load hours are determined, based on available information and analysis relevant to the Federation of BiH. During determination of this parameter FERK takes into account that priority is to incentive investment into plants on locations with the highest rate of efficiency taking into account guidelines provided within Action Plan on Usage of Renewable Energy Sources in the Federation of BiH.

**Article 9**

(Criterion for Changes of Determined Feed-in Price)

Once in every 18 months FERK shall review input data necessary for calculation of tariff coefficients and depending their modifications, as well as changes in referent price, shall determine feed-in prices and submits it to Ministry of Energy, Mining and Industry of the Federation of BiH for further procedure.

**Article 10**

(Giving Consent on Feed-in Price for Purchased Electricity)

The consent on feed-in prices for purchased electricity (Gc) prepared by FERK, shall be given by the Government of the Federation of BiH on the proposal of Ministry of Energy, Mining and Industry of the Federation of BiH.

**PART FOUR TRANSITIONAL AND CLOSING PROVISIONS**

**Article 11**

(Amendments to the Rulebook)

(1) FERK has the right and obligation to amend this Rulebook, in compliance with the amendments of laws and secondary legislation

(2) FERK follows and analyses the effects of the implementation of this Rulebook adjusts its provisions according to the changed conditions and market developments, population numbers, electricity market prices, interest rates, technological development, energy potentials, level of investment costs by technology type, costs of maintenance and labour, etc.
Article 12
(Interpretation of the Rulebook)

(1) Interpretation of the provisions of this Rulebook is made by FERK.
(2) Amendments to this Rulebook are administered through the same procedures applicable to its adoption.

Article 13
(Entry into Force)

This Rulebook enters into force on the eighth day following its publication in the Official Gazette of the Federation of BiH.

Ref. No. 01-07-487-08/14
Mostar, 6 June 2014
FERK PRESIDENT
Risto Mandrapa
## ATTACHMENT 1

<table>
<thead>
<tr>
<th>Plant type based on primary energy source</th>
<th>Capacity (kW)</th>
<th>Operating hours (h/year)</th>
<th>Unit investment value (Tiov) BAM/kW</th>
<th>Operating and maintenance costs (Tmao) BAM/kWh</th>
<th>Fuel costs (Tgo(m) BAM/kWh)</th>
<th>Invested capital compensation factor (Fz,n)</th>
<th>Generation costs by electricity unit (TFc) BAM/kWh</th>
<th>Referent price (Rc)</th>
<th>Tariff coefficient (C)</th>
<th>Feed-in price (Gc) BAM/kWh</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydropower plant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) micro</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) mini</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) small</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) medium</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e) big</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wind power plant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) micro</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) mini</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) small</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) medium</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e) big</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solar power plant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) micro</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) mini</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) small</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) medium</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e) big</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Geothermal power plant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) micro</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) mini</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) small</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) medium</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e) big</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power plant on biomass</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) micro</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) mini</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) small</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) medium</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Ref: 10
<table>
<thead>
<tr>
<th>Power Plant on Biogas</th>
<th>a) micro</th>
<th>b) mini</th>
<th>c) small</th>
<th>d) medium</th>
<th>e) big</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Plant using sea power</td>
<td>a) micro</td>
<td>b) mini</td>
<td>c) small</td>
<td>d) medium</td>
<td>e) big</td>
</tr>
<tr>
<td>Power Plant using communal waste</td>
<td>a) micro</td>
<td>b) mini</td>
<td>c) small</td>
<td>d) medium</td>
<td>e) big</td>
</tr>
<tr>
<td>Efficient cogeneration plant</td>
<td>a) micro</td>
<td>b) mini</td>
<td>c) small</td>
<td>d) medium</td>
<td>e) big</td>
</tr>
</tbody>
</table>