

Terms of Reference

to carry out a study and evaluation of the implementation of activities and measures of TPP Maritsa East 2 EAD to achieve emission limit levels applying the BAT conclusions published in 2017

By Implementing Decision (EU) 2017/1442 of 31 July 2017 (published on 17.08.2017), under Directive 2010/75/EU of the European Parliament, the European Commission adopted the established conclusions for the best available techniques (BATC) for the large combustion plants (LCP).

Emission limit values to be achieved by applying BAT for air emissions shown in the current conclusions are expressed in mass of emitted substance per volume of flue gas under the following standard conditions:

- Dry gas at temperature 273.15 K and pressure 101.3 kPa, expressed in mg/Nm³, µg/Nm³ or ng I-TEQ/Nm³.
- Reference oxygen level O^{ref} = 6 % by volume.

Yearly average and daily average values of emission limit levels for TPP Maritsa East 2 EAD applying BAT are shown in Table 1 under the following conditions:

- Lignite combustion;
- Total rated thermal input exceeding 300 MW_{th};
- Commissioned not later than 7 January 2014.

Table 1 Emission limit values of TPP Maritsa East 2 EAD in accordance with the BAT conclusions published in 2017.

Pollutant	Value	
	Yearly average	Daily average
Nitrogen oxides - NO _x	175 mg/Nm ³	220 mg/Nm ³
Sulphur oxides - SO _x	≥97% efficiency of FGD plant, but not more than 320 mg/Nm ³	nil
Carbon monoxide - CO	100 mg/Nm ³	100 mg/Nm ³
Dust	8 mg/Nm ³	14 mg/Nm ³
Mercury - Hg	7 µg/Nm ³	nil

I. Activities and measures to achieve emission limit levels applying BAT for nitrogen oxides – NO_x. (BAT 20):

1. Assessment of the emissions of nitrogen oxides generated by the power boilers of TPP Maritsa East 2 EAD based on real data from the continuous monitoring system and own measurements.
2. Analysis of the possibility of achieving emission limit levels in accordance with Table 1, only and solely by applying of “primary measures”. These emission limits have to be fulfilled in all normal operating conditions of the power boilers of the plant.
3. Assessment of the possibility of further reduction of NO_x emissions by applying secondary measures to reduce them. (selective non-catalytic reduction).
4. Assessment of capital and operating expenses necessary to be made by TPP Maritsa East 2 EAD according to the activities proposed under item 2 and item 3 above.
5. All proposed measures to reduce nitrogen oxides (under item 2 and item 3 above) shall be in compliance with the following restraining factors:
 - i. The carbon monoxide (CO) emission values shall meet the emission limit levels according to Table 1;
 - ii. The efficiency of the power boilers shall be maintained at their current levels;
 - iii. Do not allow slagging of:
 - a. Transfer surface of combustion chamber;
 - b. Gas-intake ducts of boilers;
 - c. Convection heated primary superheaters.
 - iv. Metal corrosion in power boilers shall not be allowed.

II. Activities and measures to achieve emission limit levels applying BAT for sulphur oxides – SO_x. (BAT 21);

1. Analysis of SO_x emissions downstream FGD plants of TPP Maritsa East 2 EAD based on real data from the continuous monitoring system.
2. Assessment of the level of cleaning of flue gas from sulphur oxides by FGD plants operated at TPP Maritsa East 2 EAD.
3. Identification of implementing measures by TPP Maritsa East 2 EAD for each FGD plant to achieve a level of cleaning of flue gas from SO_x ≥ 97 %;
 - i. Assessment of capital expenses to achieve a level of cleaning of flue gas from SO_x of 97 % for each FGD plant;
 - ii. Assessment of operating expenses to achieve a level of cleaning of flue gas from SO_x of 97 % for each FGD plant;
4. Identification of implementing measures by TPP Maritsa East 2 EAD for each FGD plant to achieve emissions of not more than 320 mg/Nm³

at $O_2^{\text{ref}}=6\%$. When choosing the necessary measures under this item, the following assessments shall also be made:

- i. Assessment of the estimated content of sulphur (S) in lignite supplied by Mini Maritza East EAD in the next 10 years;
 - ii. Assessment of capital expenses to achieve SO_x emissions ≤ 320 mg/Nm³ at $O_2^{\text{ref}}=6\%$ for each FGD plant;
 - iii. Assessment of operating expenses to achieve SO_x emissions ≤ 320 mg/Nm³ at $O_2^{\text{ref}}=6\%$ for each FGD plant;
5. All identified measures for SO_x emission reduction, defined in item 3 and item 4 above, shall not lead to deterioration of the values of other pollutants which are subject to continuous monitoring.

III. Activities and measures to achieve emission limit levels applying BAT for dust (BAT 22):

1. Analysis of the dust emissions generated by the power boilers at TPP Maritza East 2 EAD based on real data from the continuous monitoring system.
2. Identification of measures to be implemented by TPP Maritza East 2 EAD to meet the new emission limit values in accordance with BREF as shown in Table 1.
3. Assessment of capital and operating expenses necessary to be made by TPP Maritza East 2 EAD according to the values proposed under item 2.
4. All identified measures for dust emission reduction, defined in item 2 above, shall not lead to deterioration of the values of other pollutants which are subject to continuous monitoring.

IV. Activities and measures to achieve emission limit levels applying BAT for mercury - Hg (BAT 23):

1. Preparation of material balance analysis for mercury (Hg) for TPP Maritza East 2 EAD. For its preparation, the content of Hg shall be analyzed in:
 - i. Lignite;
 - ii. Ash from:
 - a. Wet hopper;
 - b. Outdoor air preheater;
 - c. Electrostatic precipitator (ESP);
 - iii. Flue gases downstream FGD;
 - iv. Limestone;
 - v. FGD gypsum;
 - a. Water;
 - b. Soil;
 - c. Fuel oil;
 - d. and others.

2. Assessment of the estimated content of mercury (Hg) in lignite supplied by Mini Maritsa East EAD in the next 10 years.
 3. Identification of measures to be implemented by TPP Maritza East 2 EAD to meet the emission limit values for mercury in accordance with BREF as shown in Table 1. According to the data obtained for the material balance for mercury under item 1 and estimated values of mercury content in coal to be supplied for firing at TPP Maritza East 2 EAD, the following alternatives shall be developed:
 - i. Realistic scenario – involves maintaining the mercury content in coal as it is now;
 - ii. Pessimistic scenario – involves increasing the mercury content in coal supplied.
 4. Assessment of capital and operating expenses necessary to be made by TPP Maritza East 2 EAD according to the values proposed under item 3.
 5. All identified measures for mercury emission reduction, defined in item 3 above, shall not lead to deterioration of the values of other pollutants which are subject to continuous monitoring.
- V. Assessment of the increase in the cost of electricity produced as a result of the application of each of the measures for implementation of the BAT conclusions published in 2017.