

Environment Management Award Scheme for Coal based Thermal Power Stations

1.0 PREAMBLE

Under the present Comprehensive Award Scheme for improving the overall performance of the Power Sector, National awards are given away by the Ministry of Power every year in recognition of meritorious performance in Thermal, Hydro and Nuclear power generation, Transmission and Distribution as well as early completion of Thermal, Hydro and Transmission Projects. Recognizing the need to promote environment protection, it has been proposed to introduce a new category of award w.e.f. the year 2008-09 to be given to best performing coal/lignite based thermal power stations (TPSs) for Environment Management. The Environment Management Award Scheme for TPSs is intended to award thermal power station which has shown improvements in its key environmental parameters such as CO₂ emissions, Particulate Matter emissions, disposal and utilization of Ash, etc through effective environment management.

2.0 OBJECTIVE

The scheme is intended to encourage, motivate, recognize and reward Thermal Power Station which has shown high commitment towards environmental protection and management.

3.0 NUMBER OF AWARD

(i) One (1) number, the highest ranking Coal/lignite based thermal power station will be awarded in recognition of its level of commitment towards environment management.

(ii) *The criteria for gold/silver/bronze shield shall be:*

Gold Shield - For Thermal Power Stations scoring marks more than 90%

Silver Shield - For Thermal Power Stations scoring minimum marks of 80% and above

Bronze Shield - For Thermal Power Stations scoring minimum marks of 70% and above

4.0 ELIGIBILITY

(i) The scheme shall cover coal/lignite based thermal power stations only having all the units with reheat of capacity 100 MW and above of Central, State and Private sector (excluding captive power plants)

(ii) *All units of station shall be based on coal/lignite.*

(iii) *The station PLF (annual average) shall be equal to or more than national average PLF of coal/lignite power plants.*

5.0 EVALUATION CRITERIA

The parameters to be evaluated have been listed in the enclosed **Annexure – ‘A’**. The weightage assigned to each of these parameters have been given therein. The criteria for assigning marks are given in enclosed **Annexure – ‘B’**.

Data received from all stations shall be processed and marks assigned as per above marking criteria. Total marks shall be considered for ranking. All coal/lignite based thermal stations of Central, State and Private Sectors shall be considered at par.

6.0 DATA REQUIREMENT

The Chief Executives of all coal/lignite thermal power stations shall be required to furnish complete data in the **prescribed format (Annexure – ‘C’)** to the Nodal Officer of CEA as specified hereunder:

7.0 TIME SCHEDULE FOR SUBMISSION OF DATA

All Thermal stations shall send the above data pertaining to FY 2017-18 to CEA latest by **31st January, 2019**.

8.0 NODAL OFFICER

Chief Engineer (TPE&CC)
Central Electricity Authority
Sewa Bhawan, R.K.Puram,
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PARAMETERS FOR ENVIORNMENT MANAGEMENT AWARD AND THEIR WEIGHTAGE

SNo	Parameter			Marks Weightage
1	Specific CO₂ emission in kg CO₂/ kwh			15
2	Suspended Particulate Matter (SPM) emission at Stack (in mg/Nm³)			
a)	Based on % Deviation from notified norm			15
b)	Based on actual value			10
3	% of ash utilization			
a)	% fly ash utilization			20
b)	% bottom ash Utilization			5
4	Effluent Discharge			6
5	Measures taken to conserve water in the power station			10
6	ISO 14001 certification			5
7	Measures taken outside plant area for better environment			5
8	House Keeping	Green Belt	5	9
		Keeping	4	
	TOTAL			100

CRITERIA FOR ASSIGNING MARKS**Annexure-`B`**

Parameter	Criteria for Coal/lignite based stations		Remarks
1. Specific CO₂ emission	Minimum Deviation from Design specific CO ₂ emission	15	Marks on pro-rata basis for values in between 0 to +6.5 %
	Deviation of more than 6.5% over and above the Design specific CO ₂ emission	0	
2.Suspended Particulate Matter emission (at Stack)			
a) Based on % Deviation from notified norm	Maximum negative % deviation (improvement)	15	The negative % deviation (improvement) from notified limit would be calculated for each unit. The average of these deviations would be taken as deviation for the station as a whole. The highest negative % deviation (improvement) from the notified norm would be given maximum marks and others would be given marks on pro-rata basis.
	Even one unit exceeding the notified limit in any month	0	
b) Based on actual value	Minimum SPM level	10	The minimum SPM level (in absolute terms) will be awarded maximum marks and others would be given marks on pro rata basis
	Above notified norm	0	
3. % of ash utilization			
a) Fly Ash	Maximum fly Utilization %	20	Marks on pro-rata basis for values between National average and Highest value. In case the station is using coal with weighted average ash content of 25% or below, Full Marks would be allocated only if ash utilization is 100% and zero marks shall be given if ash utilization is less than 100%.
	Below National Average	0	
b) Bottom Ash	Maximum bottom Ash Utilization %	5	Marks on pro-rata basis for values between maximum and minimum value.
	Zero utilization	0	

4. Effluent Discharge	Meeting the notified Limit	6 (2 marks for each parameter)	
	Not meeting the notified limits in any month	0	
5. Measures taken for water conservation		10	2 (two) marks would be given for each measure taken as listed at S.No.5. Expert committee shall decide on marking if any measure other than listed has been taken by the station
6. Valid ISO 14001 certification	Yes.	5	
	No,	0	
7. Measures taken outside plant area for better environment during the year		5	CEA team shall allot the marks based on the details provided by the station.
8. House Keeping	Green Belt	5	CEA team shall visit the selected stations (based on total marks scored in the parameters SNo 1 to 7) and decide the marks to be allotted.
	Keeping	4	

FORMAT FOR FURNISHING DATA FOR ENVIRONMENT MANAGEMENT
AWARD – 2017-18

PART-A. GENERAL INFORMATION

1. Name and Address of the Power Station:
2. Installed Capacity:
(Please indicate no. of units and size and commissioning date of each unit)
3. Name, designation, Tel. No., Fax No. and Email Address of the contact person:

PART-B. INFORMATION RELATING TO ENVIRONMENT MANAGEMENT

1. Specific CO₂ emission in kg CO₂/ kWh

Unit No	Unit Size in MW	Gross Generation in MU during the year	Design Gross Heat Rate in kcal/kWh	Actual Gross Heat Rate^{\$} in kcal/kWh during the year	Station Average Annual PLF (%)
1					
2					
....					
Weighted Average Gross Heat Rate in kcal/kWh			*	*	

* The Design weighted average Gross heat rate should be calculated w.r.t. capacity and the Actual weighted average Gross heat rate should be calculated w.r.t. actual generation of the units.

\$ Actual Gross heat rate should be calculated by the following formula:

Average GCV of Coal/Lignite in kcal/kg * Specific Coal Consumption in kg/kWh + Average GCV of oil in kcal/litre * (Specific oil Consumption in ml/kWh /1000)

CO₂ emission expected at design heat rate in kg CO₂/ kWh	Current year Specific CO₂ emission based on actual Gross heat rate in kg CO₂/ kWh	% deviation w.r.t. to DESIGN during the year	Remarks
Not to be filled by the station			

- Design and Actual CO₂ emission will be calculated by CEA by following formula using design and actual Gross heat rate respectively.

- Formula to be used for calculating specific CO₂ Emission is

$$\text{Specific CO}_2 \text{ Emission (in kg/kWh)} = \frac{4.187 * \text{Station Gross Heat Rate}^{\$} \text{ in kcal/kWh} * \text{Emission Factor} * \text{oxidation factor}}{\text{Emission Factor}^{++}}$$

Where

Emission Factor⁺⁺ = 92.5 gCO₂/MJ for coal (on GCV basis)
= 102.5 gCO₂/MJ for lignite (On GCV Basis)

Oxidation factor = 0.98 , 1 Calorie = 4.187Joules

\$ - Station Gross heat rate is the weighted average gross heat rate of all the units at the station.

⁺⁺ Emission factor given by Initial National Communication of Ministry of Environment and Forest.

2. Suspended Particulate Matter (SPM) emission at Stack

Unit No	Size in MW	Pollution control Equipment installed	Limits notified by MOEF/CPCB /SPCB for SPM emission (mg/Nm ³)	Month wise Maximum measured value of SPM during the year (mg/Nm ³)												Yearly Average*	Reasons, if any for deviation w.r.t. notified limits	
				A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R			

* Simple average of monthly values

3. a) % of ash utilization

Total Generation during the year in GWh	Qty of domestic coal consumed in tonnes	Weighted Average Ash content in Domestic coal in %	Qty of imported coal consumed in tonnes	Weighted average Ash content in Imported coal in %	Weighted average Ash content in (Domestic+ Imported) coal consumed in % (6)	Qty of Fly ash generated during the year in tonnes	Qty of fly ash Utilized during the year in tones	% fly ash utilization
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)

Qty of bottom generated during the year in tonnes (10)	Qty of bottom ash Utilized during the year in tonnes (11)	% bottom ash utilization (12)

b) Details of manner of Utilization of fly ash

4. a) Effluent Discharge (Drain from Central Monitoring Basin or ash pond effluent pond in old plants)

SNo	Parameter	Notified limit	Month wise Maximum measured value												Annual average
			A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	
1	pH														
2	Oil and Grease (mg/L)														
3	Total Suspended Solids (mg/L)														

b) Reasons for deviation w.r.t to notified limit

5. Measures taken for water conservation

SNo	Measure	(Yes/No)
1	100% dry fly ash handling system	
2	Ash Water recirculation system	
3	Zero water discharge system	
4	High concentration slurry system for ash disposal	
5	Any other measure (Attach list)	

6. ISO 14001 certification (Yes/No)

if yes, mention (i) Date of issue of certificate:
and (ii) Valid up to:
(Attach a copy of the certificate with validity)

7. Measures taken outside plant area for better environment during the year

SNo	Measures	Details
1	Plantation outside the plant area	
2	Environment Awareness programmes inside and outside Plant area	
3	Adoption of wildlife sanctuary/Parks etc	
4	Preservation and Development of flora and fauna	
5	Any other innovative idea	

8. House Keeping – Describe the measures taken for general upkeep of the station.