

**CENTRAL ELECTRICITY REGULATORY COMMISSION
(NEW DELHI)**

Petition No. 04/SM/2021 (Suo-Motu)

**Coram
Shri P.K.Pujari, Chairperson
Shri I.S.Jha, Member
Shri Arun Goyal, Member
Shri P.K.Singh, Member**

Date of Order: 12th April, 2021

DRAFT ORDER

In the matter of

A mechanism to determine Compensation on account of installation of Emission Control System by the generating companies in compliance with the Revised Emission Standards issued by Ministry of Environment, Forest & Climate Change (MoEFCC), Government of India, vide Environment (Protection) Amendment Rules, 2015 on 7th December, 2015 in respect of the Thermal Power Generating stations whose tariff is determined through competitive bidding under Section 63 of the Electricity Act, 2003.

The Central Electricity Regulatory Commission (hereinafter referred to as 'the Commission') has recognized the need for a mechanism to determine the compensation on account of installation of Emission Control system by the generating companies in compliance of Revised Emission Standards notified by Ministry of Environment, Forest & Climate Change, Government of India (MoEFCC) vide Environment (Protection) Amendment Rules, 2015 on 7th December, 2015 and further amended vide MoEFCC's Notification dated 19.10.2020 and 01.04.2021 in respect of the Thermal Power Generating stations, whose tariff is determined through competitive bidding under Section 63 of the Electricity Act, 2003 (hereinafter "the Act").



BACKGROUND

2. On 19th January, 2005, vide notification No.23/11/2004-R&R (Vol.II), the Ministry of Power, Government of India, in exercise of the powers conferred under Section 63 of the Act, has notified the “Guidelines for Determination of Tariff by Bidding Process for Procurement of Power by Distribution Licensees” (hereinafter referred to as “the Guidelines”) along with Standard Bidding Documents (as amended from time to time). These Guidelines recognize two different cases for bidding, namely Case-1 and Case-2 bidding depending on project characteristics. Subsequently, on 21st September, 2013, the Ministry of Power repealed the Guidelines for Case-2 bidding and notified the "Guidelines for Procurement of Electricity from Thermal Power Stations set up on Design, Build, Finance, Operate and Transfer (DBFOT) basis". On 9th November, 2014, Guidelines for Case-1 bidding was repealed and notified as "Guidelines for Procurement of Electricity from Thermal Power Stations set up on Design, Build, Finance, Own and Operate (DBFOO) basis". The Commission has noted that about 53,660 MW of power generation capacity was installed under the private sector in the 12th plan period during 2012-17, for which the distribution licensees have entered into power purchase agreements with generating companies for procurement of electricity. Supply of electricity has commenced after commercial operation of the generating station(s) in accordance with the provisions of the power purchase agreements.

3. The generating stations were developed after compliance with the laws in force including the environmental laws. Subsequently, Ministry of Environment, Forest & Climate Change Government of India (MoEFCC) has notified the Environment (Protection) Amendment Rules, 2015 on 7th December, 2015 (hereinafter referred as



“the 2015 Rules”) amending the Environment (Protection) Rules, 1986 specifying revised emission standards and water consumption limit for coal and lignite based thermal generating stations. Revised emission standards include the emission limit of Particulate Matters, Sulphur Dioxide (SO₂), Oxides of Nitrogen (NO_x) and Mercury (Hg) as notified in the 2015 Rules, substituting serial number 25 in Schedule-I of the Environment (Protection) Rules, 1986. Further, MoEFCC vide Notification dated 19.10.2020 (“the 2020 notification”) amended the NO_x emission standards and Notification dated 01.04.2021 (“the 2021 notification”) amended the timelines for complying with the emission norms. Several coal and lignite based thermal generating stations, are required to install or upgrade Emission Control Systems (hereinafter referred to as “the ECS” or “the emission control system”) in respect of coal and lignite based generating stations to meet the revised emission standards.

4. Consequently, due to additional capital expenditure required for installing or upgrading such emission control system, the agreed tariff under the respective power purchase agreements (PPAs) of the generating companies are impacted. The generating companies are invoking the provisions of change-in-law of power purchase agreements to recover such additional impact of cost arising on account of installation or up-gradation and operation of the emission control system.

5. Along with invocation of change in law, the parties to the contract are also seeking approval of capital cost on *ex-ante* basis, based on the chosen technology. The approved capital expenditure coupled with allowed operational expenses would determine the compensation to be recovered from the procurers, who have contracted to procure electricity from the generating companies. While acknowledging the 2015



Rules as a “Change in Law” event under the PPA and approving provisional cost for installation of flue-gas desulfurization (FGD) system in few cases, the Commission has taken cognizance of the concerns of the parties regarding the compensation mechanism. The Commission, vide order dated 23rd April, 2020 in Petition No. 446/MP/2019 and order dated 18th May, 2020 in Petition No. 210/MP/2019, directed the staff of the Commission to float a staff paper on the issue of compensation mechanism and tariff implications on account of the 2015 Notification in case of thermal power plants under Section 63 of the Act, where the PPA does not have explicit provision for compensation mechanism during the operation period and the PPA requires the Commission to devise such a mechanism.

6. The Staff Paper of September 2020 on the subject was aimed at soliciting views and suggestions of the stakeholders on compensation mechanism and different aspects of determining such compensation. The public notice was issued on 5th September, 2020 inviting comments/ suggestions from stakeholders. Various stakeholders, including generating companies, distribution licensees, non-government organizations, associations, consumer groups and individual experts have submitted their views and comments on the Staff Paper. All responses have been published on website of the Central Electricity Regulatory Commission. The Commission has taken into consideration all the responses, comments and suggestions received from the stakeholders in developing the proposed mechanism for compensation due to installation of emission control system by the generating company in compliance of revised emission standards in case of concluded power purchase agreement under Section 63 of the Act.



LEGAL FRAMEWORK AND JURISDICTION

7. It is appropriate to discuss first the legal framework and jurisdictional issues. Government of India, Ministry of Power vide its notification No. 23/11/2004-R&R dated 19.1.2005 issued Guidelines for Determination of Tariff by Bidding Process for Procurement of Power by Distribution Licensees (“the guidelines”) provides as under:

“4.7 Any change in law impacting cost or revenue from the business of selling electricity to the procurer with respect to the law applicable on the date which is 7 days before the last date for RFP bid submission shall be adjusted separately. In case of any dispute regarding the impact of any change in law, the decision of the Appropriate Commission shall apply.”(Emphasis supplied)

8. Clause 10.3.1 of the Model Power Purchase Agreement under Case-1 bidding deals with relief during construction period whereas Clause 10.3.2 of the model PPA deals with relief during operation period for any Change in Law event. These clauses are extracted as under:

“10.3 Relief for Change in Law

10.3.1 During Construction Period

As a result of any Change in Law, the impact of increase/decrease of Capital Cost of the Power Station in the Tariff shall be governed by the formula given below:

For every cumulative increase/ decrease of each Rupees [Insert amount] in the Capital Cost during the Construction Period, the increase/ decrease in Non Escalable Capacity Charges shall be an amount equal to[Insert amount] of the Non Escalable Capacity Charges. In case of Dispute, Article 14 shall apply.

It is clarified that the abovementioned compensation shall be payable to either Party, only with effect from the date on which the total increase/ decrease exceeds amount of Rs. [Insert Amount].

10.3.2 During Operating Period

The compensation for any decrease in revenue or increase in expenses to the Seller shall be payable only if the decrease in revenue or increase in expenses



of the Seller is in excess of an amount equivalent to 1% of the value of the Letter of Credit in aggregate for the relevant Contract Year.

10.3.3 For any claims made under Articles 10.3.1 and 10.3.2 above, the Seller shall provide to the Procurer(s) and the Appropriate Commission documentary proof of such increase/ decrease in cost of the Power Station or revenue/ expense for establishing the impact of such Change in Law.

10.3.4 The decision of the Appropriate Commission, with regards to the determination of the compensation mentioned above in Articles 10.3.1 and 10.3.2, and the date from which such compensation shall become effective, shall be final and binding on both the Parties subject to right of appeal provided under applicable Law.”

9. Clause 13.2 of the Model Power Purchase Agreement under Case-2 provides as under:

“13.2 Application and Principles for computing impact of Change in Law

While determining the consequence of Change in Law under this Article 13, the Parties shall have due regard to the principle that the purpose of compensating the Party affected by such Change in Law, is to restore through Monthly Tariff Payments, to the extent contemplated in this Article 13, the affected Party to the same economic position as if such Change in Law has not occurred.

a) Construction Period

As a result of any Change in Law, the impact of increase/decrease of Capital Cost of the Project in the Tariff shall be governed by the formula given below:

For every cumulative increase / decrease of each Rupees [Insert amount] in the Capital Cost over the term of this Agreement, the increase/decrease in Non Escalable Capacity Charges shall be an amount equal to [Insert amount] of the Non Escalable Capacity Charges. Provided that the Seller provides to the Procurers documentary proof of such increase/ decrease in Capital Cost for establishing the impact of such Change in Law. In case of Dispute, Article 17 shall apply.

It is clarified that the above mentioned compensation shall be payable to either Party, only with effect from the date on which the total increase/decrease exceeds amount of Rs. [Insert amount].

(b) Operation Period

As a result of Change in Law, the compensation for any increase/decrease in revenues or cost to the Seller shall be determined and effective from such date,



as decided by the Central Electricity Regulatory Commission whose decision shall be final and binding on both the Parties, subject to rights of appeal provided under applicable Law.

Provided that the above mentioned compensation shall be payable only if and for increase/ decrease in revenues or cost to the Seller is in excess of an amount equivalent to 1% of Letter of Credit in aggregate for a Contract Year.”

10. For Case-1 bidding document under DBFOO model, Clauses 34.1, 34.2, 34.3, 34.4, 34.5 and 36.4 of the model PPA deal with relief for any Change in Law event.

Relevant clauses are extracted as under:

“34.1 Increase in costs

If as a result of Change in Law, the Supplier suffers an increase in costs or reduction in net after-tax return or other financial burden for and in respect of Contracted Capacity, the aggregate financial effect of which exceeds the higher of Rs. 1 crore (Rupees one crore) and 0.1% (zero point one per cent) of the Capacity Charge in any Accounting Year, the Supplier may so notify the Utility and propose amendments to this Agreement so as to place the Supplier in the same financial position as it would have enjoyed had there been no such Change in Law resulting in the cost increase, reduction in return or other financial burden as aforesaid. Upon notice by the Supplier, the parties shall meet, as soon as reasonably practicable, but no later than 30 (thirty) days from the date of notice, and either agree on amendments to this Agreement or on any other mutually agreed arrangement:

Provided that if no agreement is reached within 90 (ninety) days of the aforesaid notice, the Supplier may by notice require the Utility to pay an amount that would place the Supplier in the same financial position that it would have enjoyed had there been no Change in Law, and within 15 (fifteen) days of receipt of such notice, along with particulars thereof, the Utility shall pay the amount specified therein; provided that if the Utility shall dispute such claim of the Supplier, the same shall be settled in accordance with the Dispute Resolution Procedure. For the avoidance of doubt, it is agreed that this clause 34.1 shall be restricted to changes in law directly affecting the Supplier’s costs of performing its obligations under this Agreement

34.2 Reduction in costs

If as a result of Change in Law, the Supplier benefits from the reduction in costs or increase in net after-tax return or other financial gains for and in respect of Contracted Capacity, the aggregate financial effect of which exceeds the higher of Rs. 1 crore ((Rupees one crore) and 0.1% (zero point one per cent) of the Capacity Charge in any Accounting Year, the Utility may so notify the Supplier



and propose amendments to this Agreement so as to place the Supplier in the same financial position as it would have enjoyed had there been no such Change in Law resulting in the decrease cost, reduction in return or other financial gains as aforesaid. Upon notice by the Supplier, the parties shall meet, as soon as reasonably practicable, but not later than 30 (thirty) days from the date of notice, and either agree on such amendments to this Agreement or on any other mutually agreed arrangement:

Provided that if no agreement is reached within 90 (ninety) days of the aforesaid notice, the Utility may by notice require the Supplier to pay an amount that would place the Supplier in the same financial position that it would have enjoyed had there been no Change in Law, and within 15 (fifteen) days of receipt of such notice, along with particulars thereof, the Supplier shall pay the amount specified therein; provided that if the Supplier shall dispute such claim of the Utility, the same shall be settled in accordance with the Dispute Resolution Procedure. For the avoidance of doubt, it is agreed that this clause 34.1 shall be restricted to changes in law directly affecting the Supplier's costs of performing its obligations under this Agreement.

34.3 Protection of NPV

Pursuant to the provision of Clauses 34.1 and 34.2 and for the purpose of placing the Supplier in the Supplier in the same financial position as it would have enjoyed had there been no Change in Law affecting the costs, returns or other financial burden or gains, the parties shall rely on the Financial Model to establish a net present value (the " NPV") of the net cash flow and make necessary adjustment in costs, revenues, compensation or other relevant parameters, as the case may be, to procure that the NPV of the net cash flow is the same as it would have been if no Change in Law had occurred.

34.4 Restriction on cash compensation

The Parties acknowledge and agree that the demand for cash compensation under this Article 34 shall be restricted to the effect of Change in Law during the respective Accounting Year and shall be made at any time after commencement of such year, but no later than one year from the close of such Accounting Year. Any demand for cash compensation payable for and in respect of any subsequent Accounting Year shall be made after the commencement of the Accounting Year to which the demand pertains, but no later than 2 (two) years from the close of such Accounting Year.

34.5 No claim in the event of recovery from Buyers

Notwithstanding anything to the contrary contained in this Agreement, the Utility shall not in any manner be liable to reimburse to the Supplier any sums on account of a Change in Law if the same are recoverable from the Buyers."

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36.4 Adjudication by the Commission

36.4.1 In the event a Dispute is required under Applicable Laws to be adjudicated upon by the Commission, such Dispute shall, instead of reference to arbitration under Clause 36.3, be submitted for adjudication by the Commission in accordance with Applicable Laws and all references to Dispute Resolution Procedure shall be construed accordingly. For the avoidance of doubt, the Parties hereto agree that the adjudication hereunder shall not be final and binding until an appeal, if any, against such adjudication has been decided by the appellate tribunal or no such appeal has been preferred within the time specified in the Applicable Law.

36.4.2 Where any dispute is referred by the Commission to be settled through arbitration, the procedure specified in Clause 36.3 shall be followed to the extent applicable.”

11. The provisions of the Competitive Bidding Guidelines, the Model PPA under Case-1 and DBFOO model are analysed as under:

- a) The Competitive Bidding Guidelines clearly provide that any change in law impacting cost or revenue from the business of selling electricity to the procurer after the cut-off date (which is 7 days before the last date for RFP bid submission) shall be adjusted separately. In case of dispute regarding impact of change in law, the decision of the Appropriate Commission shall be final.
- b) Model PPA under Case-1 provides that while deciding the consequences of Change in Law, the Parties shall have due regard to the principle that the purpose of compensating the Party affected by such Change in Law, is to restore the affected Party to the same economic position as if such Change in Law has not occurred.
- c) In the Model PPA under Case-1, there is a specific formula for Change in Law during the construction period. However, for Change in Law event during the operation period, no specific formula has been provided. The determination of



the compensation for any increase/decrease in revenue or cost to the Seller on account of change in law during operation period including its effective date has been left to be decided by the Commission. It further provides that the decision of the Commission shall be final and binding on both the Parties. In other words, the model PPA under Case-1 vests unfettered jurisdiction on the Commission to determine the impact of change in law on cost or revenue during the operation period and the effective date from which it is to be implemented.

- d) For increase in cost under the DBFAOO model, it has been provided that the Supplier may so notify the Utility and propose amendments to the Agreement so as to place the Supplier in the same financial position as it would have enjoyed had there been no such Change in Law resulting in the cost increase, reduction in return or other financial burden as aforesaid. Upon notice by the Supplier, the parties shall either agree on amendments to the Agreement or on any other mutually agreed arrangement. In case of disputes, matter is to be referred to the Commission for adjudication.

12. Thus, the parties to the power purchase agreements have agreed to the compensation to be determined by the Commission to reconstitute the affected party to the same economic position as if the change in law event has not occurred. Further, unfettered jurisdiction has been conferred on the Commission to determine the impact of change in law on the cost or revenue during the operation period. Implementation of ECS to meet the revised emission standards results in increase in cost inter alia on account of additional capital expenditure, additional Operation and Maintenance Expenses, Interest on Working Capital and Consumption of Reagent. Moreover, it



results in decrease in revenue on account of additional auxiliary energy consumption. Therefore, the mechanism for compensation proposed to be specified through this order is within the four corners of the power purchase agreements between the parties. The proposed mechanism neither intends to override the provisions of the PPAs where the parties have already agreed to a mechanism for compensation for change in law nor does it prevent parties to mutually agree to an alternative mechanism for compensation through any supplementary agreements. Thus, for compensation for change in law on account of implementation of the revised emission standards, the parties may either agree to the mechanism proposed by the Commission or may work out a mechanism through mutual agreement and approach the Commission for amendment of the Power Purchase Agreements. In such cases, the Commission's role would be to adjudicate upon disputes, if any, regarding claim of compensation or to approve the supplementary agreement, as the case may be.

13. In the light of the above discussion, the Commission is of the view that the Commission in exercise of its power under Section 63 read with subsection (1) of Section 79 and as per provisions of the Competitive Bidding Guidelines and Standard PPA has not only the power to adopt the tariff but also has the power to implement the tariff so adopted including devising appropriate mechanism to determine the impact of change in law on cost or revenue during the operation period. If the parties to the PPAs mutually agree to a mechanism and approach the Commission for amendment to the PPA, the Commission has the power to approve such amendment in order to give effect to the mechanism mutually agreed. In case of dispute between the parties, the Commission has the power to adjudicate the disputes under clause (f) of subsection



(1) of Section 79 of the PPA. Therefore, devising a compensation mechanism for allowing the increase in cost or decrease in revenue during the operation period on account of change in law consequent to the implementation of ECS for complying with the revised emission standards in case of power purchase agreements under Section 63 of the Act is squarely within the jurisdiction of the Commission.

PRINCIPLES OF COMPENSATION

Economic Restitution

14. The proposed mechanism provides for the methodology for computation of compensation during the operating period on account of Change in Law events for installation of emission control systems. The standard bidding documents issued by the Central Government under Section 63 of the Act do not provide any specific formulation for computation of compensation during the operating period, but contain the principle of restitution to restore the affected party to the same economic position as if the change in Law event has not occurred. It is left to the Commission to determine the compensation that will be admissible on account of change in law during the operation period, which shall be binding on the parties. The Commission is of the view that a suitable compensation mechanism can be devised by the Commission to compensate the affected party during the operation period by invoking the principle of restitution contained in the PPA.

Carrying Cost

15. The issue of “carrying cost” arises on account of time lag between the occurrence of Change in Law event and actual payment for the Change in Law in the absence of any specific formula to that effect in the Power Purchase Agreements. The Appellate



Tribunal for Electricity has interpreted the provision of restitution in the Power Purchase Agreements to encompass the carrying cost in its judgement dated 13.4.2018 in Appeal No. 210 of 2017. It has held as under:

“x. Further, the provisions of Article 13.2 i.e. restoring the Appellant to the same economic position as if Change in Law has not occurred is in consonance with the principle of ‘restitution’ i.e. restoration of some specific thing to its rightful status. Hence, in view of the provisions of the PPA, the principle of restitution and judgment of the Hon’ble Supreme Court in case of Indian Council for Enviro-Legal Action vs. Union of India &Ors., we are of the considered opinion that the Appellant is eligible for Carrying Cost arising out of approval of the Change in Law events from the effective date of Change in Law till the approval of the said event by appropriate authority. It is also observed that the Gujarat Bid-01 PPA have no provision for restoration to the same economic position as if Change in Law has not occurred. Accordingly, this decision of allowing Carrying Cost will not be applicable to the Gujarat Bid-01 PPA.”

16. The Hon’ble Supreme Court has upheld the above judgment of APTEL and observed as under:

“10. A reading of Article 13 as a whole, therefore, leads to the position that subject to restitutionary principles contained in Article 13.2, the adjustment in monthly tariff payment, in the facts of the present case, has to be from the date of the withdrawal of exemption which was done by administrative orders dated 06.04.2015 and 16.02.2016. The present case, therefore, falls within Article 13.4.1(i). This being the case, it is clear that the adjustment in monthly tariff payment has to be effected from the date on which the exemptions given were withdrawn. This being the case, monthly invoices to be raised by the seller after such change in tariff are to appropriately reflect the changed tariff. On the facts of the present case, it is clear that the respondents were entitled to adjustment in their monthly tariff payment from the date on which the exemption notifications became effective. This being the case, the restitutionary principle contained in Article 13.2 would kick in for the simple reason that it is only after the order dated 04.05.2017 that the CERC held that the respondents were entitled to claim added costs on account of change in law w.e.f. 01.04.2015. This being the case, it would be fallacious to say that the respondents would be claiming this restitutionary amount on some general principle of equity outside the PPA. Since it is clear that this amount of carrying cost is only relatable to Article 13 of the PPA, we find no reason to interfere with the judgment of the Appellate Tribunal.” (Emphasis supplied)



17. Hence, as per the judgment of the APTEL and Hon'ble Supreme Court, even in the absence of specific provision in the PPA to grant relief for carrying cost, the same can be allowed by invoking the principle of restitution contained in the PPA.

APPLICABILITY OF THE PROPOSED COMPENSATION MECHANISM

18. We agree with the suggestions of the stakeholders that there needs to be clarity regarding applicability of the mechanism for compensation. The Commission is of the view that the proposed Compensation Mechanism shall be applicable as per the following principles:

- (a) The Compensation Mechanism shall be applicable to generating stations which have valid PPA(s) with the procurer(s), having provisions of restitutionary relief under Change in Law or having specific provision which vests power in the Commission to determine the impact of change in law during operation period;
- (b) The Compensation Mechanism shall not be applicable in cases where the power purchase agreements entered into by the parties already have a mechanism for compensation on account of change in Law for the expenditure incurred during the Operation Period;
- (c) In cases where the power purchase agreements do not provide for a mechanism for compensation but the parties to the power purchase agreements have agreed mutually to a compensation mechanism, the compensation worked out by this proposed Compensation Mechanism shall be the ceiling compensation;



- (d) The applicability of the proposed Compensation Mechanism shall be subject to the admissibility of the 2015 Rules read with the 2020 and 2021 notifications as change in law event in terms of the respective power purchase agreements.

19. Some stakeholders have commented that it is against the principles of Section 63 of the Act to go into individual tariff components, unlike in the case of Section 62 based projects. However, we have observed that Para 10.3.2 of the Case-1 PPA provides that the compensation is to be worked out based on increase in cost or decrease in revenue. The same is extracted below:

“10.3.2 During Operating Period

The compensation for any decrease in revenue or increase in expenses to the Seller shall be payable only if the decrease in revenue or increase in expenses of the Seller is in excess of an amount equivalent to 1% of the value of the Letter of Credit in aggregate for the relevant Contract Year.”

20. Due to installation or augmentation of emission control system, there would be additional capital expenditure and increase in expenses. The additional capital cost would be on account of capital expenditure towards plant and machinery for installation of ECS. There would be increase in expenses on recurring basis due to higher Operation & Maintenance Expenditure, Interest on Working Capital and operational expenses because of consumption of reagent. There would also be increase in expenses due to servicing of additional capital expenditure. Whereas any increase in Operation & Maintenance expenses, Interest on Working Capital and operational expenses because of consumption of reagent can be assessed directly, the increase in expenses due to servicing of additional capital expenditure cannot be



assessed directly. The increase in expenses for servicing additional capital expenditure needs to be assessed based on cost components such as depreciation and cost of capital employed.

21. Due to installation or augmentation of emission control system, there would also be decrease in revenue due to additional auxiliary energy consumption. The quoted capacity charges and energy charges were based on the auxiliary energy consumption without emission control system. After installation of emission control system, there would be additional auxiliary energy consumption and the net electricity delivered from generating station would get reduced. As a result, there would be decrease in revenue based on quoted capacity charges and quoted energy charges. These components are also required to be assessed. Therefore, there is a need to assess the components impacting the increase in expenses or decrease in revenue, which is consistent with the provisions as given at Clause 10.3.2 of the Model PPA.

22. Some stakeholders have suggested that there should be separate methodology of reimbursement for PPAs under Case-1 bidding and Case-2 bidding. We have perused the provisions of the PPAs and bidding guidelines under Case-1 bidding and Case-2 bidding and acknowledge that the Model PPA under Case-1 bidding and that under Case-2 bidding are different due to several distinguishable features. Therefore, we are of the view that the proposed mechanism of compensation will be made applicable on case to case basis, consistent with the provisions of the respective PPA.

Capital cost

23. In response to the Staff Paper, several suggestions have been received regarding additional capital expenditure on emission control system on account of incidental



expenditure during construction, financing charges, insurance charges, interest during construction, un-discharged liabilities, gain or loss on foreign exchange rate variations, initial spares etc. The proposed Compensation Mechanism deals with the methodology to work out the compensation based on capital cost admitted by the Commission. The Commission expects that the hard cost of emission control system would be discovered through a process of transparent competitive bidding. An inclusion or exclusion of any other expenditure shall be decided on case to case basis. Once the capital cost is determined, the compensation mechanism can be made applicable to work out the compensation.

STRUCTURE OF COMPENSATION

24. Clause 4 of the Guidelines for Determination of Tariff by Bidding Process for Procurement of Power by Distribution Licensees issued by the Central Government under Section 63 of the Act dated 19th January, 2005 and subsequent amendments thereof provide for the tariff structure for bidding. It provides that capacity charges and energy charges can be quoted separately or combined.

25. Where capacity charges and energy charges are quoted separately, the revenue streams would consist of two components. Clause 4.7 of the same Guidelines provides that the compensation is to be assessed based on impact on cost or revenue. The installation of emission control system would increase the expenses due to (i) servicing of additional capital expenditure; (ii) additional operation and maintenance expenses; (iii) servicing of additional working capital; and (iv) additional expenses towards consumption of reagents. At the same time, there would be decrease in revenues on



account of increased auxiliary energy consumption impacting quoted capacity charges and energy charges.

26. The standard bidding guidelines and model power purchase agreements generally provide for a two-part tariff structure, consisting of capacity charges and energy charges. However, the standard bidding guidelines and model power purchase agreement also recognise consolidated tariff in case of medium-term procurement.

Relevant provisions of the bidding guidelines are extracted below:

“4. Tariff Structure

4.1 *For procurement of electricity under these guidelines, tariff shall be paid and settled for each payment period (not exceeding one month). A multi-part tariff structure featuring separate capacity and energy components of tariff shall ordinarily form the basis for bidding. However, for medium term procurement, the procurer may, at his option, permit bids on a single part basis, and the same shall be clearly specified in the Request for Qualification (RFQ)/ Request for Proposal (RFP).*

Procurement under case-2 where procurer offers a captive fuel source (such as captive coal mine) for concurrent development and use for power production covered under the procurement query would also have a multi-part tariff structure featuring separate capacity and energy components of tariff.

4.2 (emphasis supplied)”

27. The Model Power Purchase Agreement issued by the Central Government as part of Standard Bidding Guidelines provides the mechanism for payment of compensation of Change in Law as under:

“13.4.2 The payment for Changes in Law shall be through Supplementary Bill as mentioned in Article 11.8. However, in case of any change in Tariff by reason of Change in Law, as determined in accordance with this Agreement, the Monthly Invoice to be raised by the Seller after such change in Tariff shall appropriately reflect the changed Tariff.”



28. Therefore, in case of two-part tariff structure, the recovery of compensation would be through supplementary capacity charges and supplementary energy charges. In case of consolidated tariff, the recovery of compensation shall be through supplementary tariff. The structure of compensation shall be in line with tariff structure in the Power Purchase Agreements, as supplementary capacity charges and supplementary energy charges or supplementary tariff, as the case may be.

29. Thus, the structure of compensation would as under:

(1) The Supplementary Capacity Charge (**SFC**) shall consist of:

1.1. Servicing of Additional Capital Expenditure:

(a) Depreciation (**DEPe**); and

(b) Cost of Additional Capital Expenditure (**COCe**);

1.2. Additional Operation and Maintenance Expenses(**O&Me**);

1.3. Additional Interest on Working Capital (**IWCe**); and

1.4. Additional Capacity Charges due to additional Auxiliary Energy Consumption (**ACCe**).

(2) The supplementary Energy Charge (**SEC**) shall consist of:

2.1 Expenses towards consumption of reagent (**CORe**); and

2.2 Additional Energy Charges due to additional Auxiliary Energy Consumption (**AECe**).

(3) In case of consolidated tariff, the supplementary tariff shall be calculated on case to case basis by considering components of supplementary capacity charges and supplementary energy charges.



SUPPLEMENTARY CAPACITY CHARGE (SFC)

30. The compensation on account of additional capital expenditure would be through following components:

- (a) Depreciation (DEPe); and
- (b) Cost of Additional Capital Expenditure (COCe).

Depreciation (DEPe)

31. The staff paper had suggested as under:

“4.9. Based on the above, life of 25 years has been considered for ECS. Accordingly, 90% (considering salvage value of 10%) of additional capital expenditure on account of installation of ECS is proposed to be recovered by the generating company in 25 years as depreciation {straight line method @3.6% (90%/25) per year} starting from ODe of ECS.”

32. The stakeholders have responded mainly on two issues - period over which depreciation is to be recovered and the rate of depreciation. Some of the stakeholders have suggested that the recovery should be over the balance useful life or balance extended life of the generating station or the balance tenure of the long term PPA, whichever is lower. The useful life of the emission control system should be considered as the remaining useful life of the power plant and depreciation for the initial 12 years of operation may be considered at a rate of 7% to 7.5% to service the debt repayment and the remaining depreciation should be on Straight Line method basis till the end of life of the power plant. Some stakeholders have pointed out that the standardized recovery of depreciation @ 3.6% per annum is premised on the erroneous assumption that all the generating projects shall continue to operate efficiently for 25 years post



installation of the emission control system, irrespective of their actual years in operation, at the time of installing the emission control system.

33. Per contra, some of the stakeholders have justified the approach on the ground that almost all the generating stations under competitive bidding have been commissioned during the last fifteen years and since their useful life is considered as forty years, the consideration of 25 years for recovery of depreciation is logical.

34. We are of the view that the useful life of the generating station is to be considered 40 years in line with the Companies Act, 2013. The Commission has considered the useful life of the generating station based on life cycle of major equipment of thermal generating station. The life of emission control system has been considered as 25 years in line with the other major equipment of generating station. The Commission observes that as on today, there are no generation projects with competitively bid tariff which have completed more than 15 years of life. Therefore, based on 40 years of life of generating stations, in all cases 25 years of life of emission control system would be available for recovery of depreciation. Thus, the proposed approach for recovery of depreciation in 25 years balances the interest of the generating companies and procurers.

35. Accordingly, in all cases irrespective of balance useful life of the generating plant, 90% of additional capital expenditure on account of installation of ECS (considering salvage value of 10%) shall be recovered by the generating company in 25 years as depreciation (straight line method @3.6% per year). The depreciation shall be computed from the date of putting the emission control system into use after meeting



all applicable technical and environmental standards, certified through the Management Certificate duly signed by an authorised person. The value base for the purpose of depreciation shall be the additional capital expenditure of the emission control system as admitted by the Commission. In case of gradual installation of emission control system for different emission standards or for multiple units, weighted average life shall be considered to work out depreciation. The computation of depreciation during each year of the contract period shall be worked out by the parties directly based on admitted capital cost and the depreciation rate as follows:

$$DEPe = (0.036) \times ACEe$$

Where,

ACEe is the gross capital cost (in Rupees) of emission control system as admitted by the Commission ;

DEPe is annual depreciation in Rupees.

Cost of Additional Capital Expenditure (COCe)

36. In the staff paper, the suggested approach of servicing of cost of capital employed was in line with industry practice unlike the servicing of debt and equity separately as followed for generating stations under Section 62 of the Act. Relevant extract is as under:

“4.10. The cost of capital employed also known as the cost of fund infused represents the weighted average cost of debt fund and equity fund deployed in the project. Considering the fact that any compensation mechanism needs to be based on the principle of restitution, there can be no expectation of profit in any component of tariff.

4.11. Accordingly, additional capital expenditure on installation of emission control system is proposed to be serviced on Net Fixed Assets (NFA) basis (value of fixed assets reducing each year by the depreciation value) @ weighted average rate of interest of loans raised by the generator or at the rate



of Marginal Cost of Lending Rate of State Bank of India (for one year tenor) plus 350 basis points, as on 1st April of the year in which emission control system is put into operation, whichever is lower.”

37. Some of the stakeholders have suggested to adopt the notional debt to equity ratio of 70:30 with consideration of actual debt in case of higher debt. Some stakeholders have also suggested to service equity at the rate of 15.5% post tax with gross up of tax rate and servicing of debt at the rate lower of actual rate or SBI MCLR+3.5%. Further, they have also suggested that the capital base be worked out based on Gross Fixed Assets (GFA), to provide a level playing field for generating stations under Sections 62 and 63 of the Act for compliance of installation of Emission Control System.

38. Per contra, other stakeholders have supported the approach suggested in the staff paper as it is revenue neutral since no parties would gain or lose and therefore, would be consistent with principle of restitution. A number of stakeholders have submitted that as most of the IPPs are stressed financially due to various reasons not attributable to them and their net worth already eroded, they would find financial closure very difficult. Therefore, servicing of debt may be allowed on actual basis without any capping and servicing of equity should be based on principle of reasonable RoE.

39. We have considered the suggestions of the stakeholders. The Commission notes that the approach of net fixed assets and cost of capital employed suggested in the staff paper satisfies the principle of economic restitution. The Commission is aware of the concerns and financial position of the generating companies. However, any compensation for change in law cannot be a mechanism to improve their financial



position. Accordingly, we hold that the suggested approach of servicing investment through cost of capital employed approach is appropriate, being consistent with the principle of economic restitution.

40. The servicing of capital employed during each year of the contract period shall be worked out based on net fixed asset (derived by adjusting cumulative depreciation of emission control system) and interest rate of fund. The interest rate will be weighted average rate of interest on loans of the generating station including ECS or at the rate of Marginal Cost of Lending Rate of State Bank of India (for one year tenor) as on 1st April of the year under consideration plus 350 basis points, whichever is lower. The generating companies shall workout the applicable interest rate for the cost of capital employed towards emission control system for the year under consideration. The cost of capital employed during the year shall be worked out as follows:

$$\text{COCe}_{(n)} = \text{NFA}_{(n)} \times \text{WAROI}_{(n)} / 100$$

$$\text{Where } \text{NFA}_{(n)} = \text{ACEe} - [(n-1) \times (\text{DEPe})]$$

Where,

COCe	Servicing cost of Additional Capital Expenditure in Rupees per annum;
NFA _(n)	is the net fixed asset of the of the year “n”;
WAROI _(n)	is the weighted average rate of interest (in %) worked out based on weighted average rate of interest on loans of the generating station including ECS or at the rate of Marginal Cost of Funds based Lending Rate (MCLR) of State Bank of India (for one year tenor) as on 1 st April of the year plus 350 basis points, whichever is lower.
n	represents the year starting from the date of operation of emission control system.



Additional Operation & Maintenance Expenses (O&Me)

41. The installation of emission control system would result in additional operation & maintenance expenses due to repair and maintenance, human resource deployment, reagent consumption, additional working capital expenses etc. The staff paper had suggested method to arrive at operation & maintenance expenses based on percentage of capital cost. It was suggested that additional O&M expenses (O&Me) for first year may be allowed @2% of additional capital expenditure for installation of ECS (excluding IDC and FERV) as admitted by the Commission after prudence check. For subsequent years, the first year O&M expenses may be escalated @3.5% or any other escalation rate as may be specified by the Commission. The above O&M expenses may subsequently be reviewed based on actual O&M expenses of ECS installed at various generating stations.

42. Some of the stakeholders have opposed the approach of linking O&M expenses with capital expenditure on the ground that capital investment depends on market condition and financial position. Further, there is difficulty in separating out additional expenses on account of emission control system. Some stakeholders have suggested to increase the percentage to about 5% on the grounds of high cost likely to be incurred towards consumable, stores, spares, repair & maintenance expenses, personnel and contractual manpower expenses, administrative and operating cost, exposure of the emission control system to highly corrosive environment, additional gypsum disposal cost and increase in water consumption of the plant. Suggestions have also been received to consider the suggested approach only for first few years, till norms are developed. One stakeholder has suggested that O&M expenses may be



fixed at the rate of 2.5% of the capital expenditure in the interim period till norms are developed and escalation rate may be fixed at the rate of 4.77% in line with the prevailing tariff regulations with addition of 0.5% for coal plants.

43. We have considered suggestions of the stakeholders. The stakeholders have generally recognized the difficulty of availability of data due to lack of such facilities in operation and there is a general agreement amongst stakeholders that O & M norms are required to be developed based on more data and separate studies.

44. Accordingly, we propose that the additional revenue expenses for operation and maintenance (**O&Me**) for the first two years of operation (including part financial year), shall be based on 2% of the additional capital expenditure (ACEe) for installation of ECS (excluding IDC and FERV) as admitted by the Commission, to be escalated at the rate of 3.5% per annum for the second year. The O&M expenses from the third year onward shall be as per norms and escalation rate determined separately by the Commission. The additional O&M expenses (**O&Me**) shall be worked out as follows:

First Year: 2% of ACEe excluding IDC and FERV

Second Year: 2% of ACEe escalated at the rate of 3.5%.

Third Year onward: As per norms to be specified by the Commission.

Additional Interest on Working Capital (IWCe)

45. Any framework for working capital will have two components - working capital requirement and interest rate at which the working capital is to be serviced. Stakeholders have suggested to increase the stock in period of lime stone to 30 days



and to consider the landed cost of previous three months taking into account purity of limestone etc. Suggestions have also been received to consider receivables based on actual plant load factor or actual availability factor, whichever is higher. Suggestion has also been received to consider the interest rate at only 150 basis points above the Marginal Cost of Lending Rate of State Bank of India (for one-year tenor).

46. We are of the view that the working capital requirement suggested in the staff paper is appropriate. Accordingly, it is proposed that interest on working capital shall be interest rate of Marginal Cost of Lending Rate of State Bank of India (for one year tenor) plus 350 basis points, as on 1st April of the year for which compensation is to be determined.

47. The Working Capital (WCe) shall include following components:

- (i) Cost of lime stone or reagent for stock of 20 days corresponding to the normative annual plant availability factor;
- (ii) Advance payment for 30 days towards cost of lime stone or reagent for generation corresponding to the normative annual plant availability factor;
- (iii) Operation and maintenance expenses in respect of emission control system for one month;
- (iv) Maintenance spares @20% of operation and maintenance expenses in respect of emission control system; and
- (v) Receivables equivalent to 45 days of supplementary capacity charge and supplementary energy charge for sale of electricity calculated on the normative annual plant availability factor.



48. Accordingly, the Additional Interest on Working Capital (IWCE) shall be worked out as under:

$$IWCE_{(n)} = WCE_{(n)} \times WCIR_{(n)}/100.$$

Where,

$WCE_{(n)}$ is the Working Capital of the year for which compensation is to be determined (Refer Paragraph 47 above)

$WCIR_{(n)}$ is Working Capital Interest rate (in %) which is Marginal Cost of Lending Rate of State Bank of India (for one year tenor) plus 350 basis points as on 1st April of the year for which compensation is to be determined.

Additional Capacity Charges due to additional Auxiliary Energy Consumption

(ACCe)

49. The bidding guidelines issued by the Central Government provide for quoting escalable and non-escalable capacity charges based on normative availability factor. However, the availability factor gets reduced after installation of the Emission Control System, due to additional auxiliary energy consumption. Hence, appropriate adjustment will be required to be made in the capacity charges to compensate for additional auxiliary energy consumption.

50. In the Staff Paper, a framework for addressing the impact of additional auxiliary consumption on quoted escalable capacity charges and non-escalable capacity charges had been suggested. The comments and suggestions of stakeholders received on the same are summarized as under:



- a) There could be multiple units in a generating station and if entire installed capacity of certain units have been contracted under PPA, the formulae suggested will not work;
- b) For Section 63 projects, the actual auxiliary consumption has no relevance. Hence, Original Auxiliary Energy Consumption and Auxiliary Energy Consumption of ECS may be fixed;
- c) The Original Auxiliary Consumption (AUXo) would make the contracted capacity dynamic, as the actual auxiliary consumption would vary from period to period.

51. Stakeholders have generally agreed to the use the normative Auxiliary Consumption for ECS as proposed by CEA. However, certain suggestions have been received on norms specified by CEA, which are as under:

- a) It does not consider plant specific requirements. Proposed auxiliary consumption of 1% for wet limestone FGD system irrespective of the size of the generating unit may not be appropriate.
- b) Auxiliary consumption may be specified for different sizes of generating unit. Additional Auxiliary Consumption recommended by CEA can be considered as the ceiling.
- c) The Commission may allow AUXe @1.2% of gross generation at full load, with an additional AUXe of 0.5% for unit size of 210/250/300 MW or lower.

52. Some stakeholders have commented that the Contracted Capacity in all the Case-1 long-term contracts are at Interconnection Point of the Generator with the inter-State transmission system (Net Contracted Capacity) and any reduction in the net



contracted capacity may require modification in the power purchase agreements adopted by the respective State Commissions of the procuring Utility. It has also been suggested that gross contracted capacity can be revised by using the inverse of the factor $(1 - AUX_t)/(1 - AUX_o)$ as suggested in the Staff Paper.

53. We have considered the suggestions and comments of the stakeholders. Accordingly, it is proposed that the additional capacity charges due to emission control system (ACCe) shall be arrived at based on Quoted Capacity Charges by applying the following formulae:

Additional Capacity Charges due to increase in auxiliary Consumption (ACCe)
(in Rs/KWh)

$$= \text{Quoted Capacity Charge} \times \left\{ \left(\frac{(1 - AUX_o)}{(1 - AUX_t)} \right) - 1 \right\}$$

Where,

Quoted Capacity Charge is sum of Quoted Escalable and Non- Escalable Capacity Charges in the contract year in accordance with the PPA;

AUX_t is the Total Auxiliary energy consumption and is equal to $(AUX_o + AUX_e)$

AUX_o is the original Auxiliary energy consumption as agreed under the definition of Power Station's Net Capacity or otherwise; and

AUX_e is the Additional energy consumption due to emission control System as specified by the Central Electricity Authority and admitted by the Commission from time to time.

54. The Auxiliary Original Energy Consumption (AUX_o) shall be worked out based on the definition of Power Station's Net Capacity. Standard Power Purchase Agreement provides for the definition of Power Station's Net Capacity. Relevant paragraph of the Model PPA for Case-1 bidding is extracted below:



“Power Station’s Net Capacity shall mean [.....] MW, being Installed Capacity of the Power Station measured at the bus-bar, reduced by the normative auxiliary power consumption as prescribed by CERC from time to time:

In case of a dedicated transmission line connecting the bus-bar and the Interconnection Point, the Power Station’s Net Capacity shall beMW, being the Installed Capacity of the Power Station measured at the Interconnection Point and reduced by the normative auxiliary power consumption and losses, if any, of such dedicated transmission line” (Emphasis supplied)

55. Accordingly, it is proposed that AUXo shall be considered based on normative auxiliary power consumption as prescribed by the Tariff Regulations of the Commission applicable as on seven days prior to the bid deadline or difference between installed capacity and power station’s net capacity indicated in the respective PPA, whichever is lower. Where dedicated transmission line is connecting bus bar and interconnection point, the AUXo shall be worked out by considering auxiliary energy consumption and losses of dedicated transmission line as per agreement or difference between installed capacity specified under PPA and power station’s net capacity as mentioned in PPA, whichever is lower.

56. In case of the Model PPA for Case-2 bidding, the installed capacity and contracted capacity (including merchant capacity, if any) arrived based on rated net capacity, both are mentioned upfront at the time of bidding. Accordingly, it is proposed that the AUXo shall be worked out based on difference between installed capacity and contracted capacity (including merchant capacity, if any) recognized under the Case-2 PPA.

57. Some stakeholders have suggested that there are Case-1 PPAs where the gross contracted capacity can be revised by using the inverse of the factor $(1 - \text{AUXt}) / (1 - \text{AUXo})$ as suggested in the Staff Paper. The Commission observes that the provision



of Case-1 PPA defines power station's net capacity by adjusting auxiliary energy consumption as specified by CERC from time to time or as agreed by the parties. Therefore, if the additional auxiliary energy consumption of emission control system is allowed to be adjusted against any surplus capacity, it would be beneficial for the procurers as the contracted capacity remains unchanged. However, it would mean redefining the Power Station's Net Capacity agreed under the contract. Therefore, it is for the concerned parties to agree to redefine the Power Station's contracted capacity through supplementary agreement if they intend to adjust the additional auxiliary energy consumption of emission control system against any surplus capacity or in case the actual auxiliary energy consumption is less than what is agreed under the PPA.

SUPPLEMENTARY ENERGY CHARGES (SEC)

Expenses towards consumption of reagents (COrE)

58. The emission control system will consume reagent based on technology selected by the generating company. If the cost of reagent is factored in as part of operation and maintenance expenses, it may increase the capacity charges to be recovered based on availability. As the consumption of reagent would be commensurate with the actual generation, we are of the view that it would be appropriate to recover the cost of reagent in the same manner as the fuel cost is recovered i.e. recover separately from operation & maintenance cost.

59. In the staff paper, it had been suggested to recover the cost of reagent based on specific reagent consumption and the weighted average landed price of specific



reagent in accordance with the scheduled energy. The summary of suggestions received from the stakeholders is as under:

- a) Normative values may be arrived at after 5 years of operation of the Emission Control System by the generators and during that period the actual consumption of limestone reagent need to be considered;
- b) NOx control system is still at the pilot stage and as such fixing guidelines for specific consumptions of reagent at this stage would be premature;
- c) Ceiling of limestone purity at a minimum of 85% may not be pragmatic in view of large requirement of limestone for Emission Control Systems in India and therefore, the cap may be removed;
- d) Commission may devise a mechanism similar to that of variable or transportation escalation index of coal, so as to properly compensate both positive side or negative side variations in reagent cost;
- e) There should be provisions/guidelines for signing reagent supply agreements on the lines of Fuel Supply Agreements, with standard clauses such as indexation to ensure common practices across industry;
- f) The formula appears to calculate limestone consumption based on stoichiometry ratio. However, actual limestone consumption in the ECS system depends upon many other factors. Ageing will degrade the efficiency of the Emission control system and hence, degradation factor should be factored in the formula.

60. The suggestion to arrive at normative value based on five years data would be appropriate and same can be considered once sufficient data is available. The



suggestion to devise a mechanism based on escalation index is a welcome one as it would obviate need for determination and verification of reagent bills and at the same time would capture variations in reagent cost. Accordingly, we propose that the cost of reagent per unit of electricity generated for the month shall be calculated based on the specific reagent consumption (grams/KWh) and landed price (in Rs.) of the reagent at the generating station as follows:

$$\text{COR}_e \text{ (Rs/KWh) } = \left(\frac{(\text{SRC}_e) \times (\text{LPR}_e)}{1000} \right)$$

Where,

COR_e is expenses towards consumption of reagents in Rs/KWh

SRC_e is the specific reagent consumption on account of emission control system (in grams/KWh) for a unit generated at generator terminal. This shall be normative number recommended by CEA for different variants of the ECS;

LPR_e is the weighted average landed price of reagents for ECS (in Rs/Kg) during the month.

61. The reagent expenses for a month shall be calculated on month to month basis based on actual landed price. The landed price of reagent shall be worked out based on actual payment made by the generating company backed by the documentary proof.

Additional Energy Charges due to additional Auxiliary Energy Consumption (AEC_e)

62. The standard bidding guidelines issued by the Central Government provide for Quoted energy charges i.e. sum of Escalable Energy Charges and Non-Escalable



Energy Charges. The energy charges are payable on scheduled energy on ex-bus level by the generating company. Because of emission control system, there would be additional auxiliary energy consumption, resulting in decrease in revenue, which would have to be compensated.

63. Suggestions of stakeholders have been received mainly on computation. The need for additional energy charges due to impact of additional auxiliary energy consumption has been accepted by all the stakeholders. Accordingly, we are of the view that additional energy charges (AECe), due to additional auxiliary energy consumption of emission control system, shall be arrived at based on Quoted Energy Charges by applying the following formulae:

$$\begin{aligned} &\text{Additional Energy Charges (AECe)} \\ &= \text{Quoted Energy Charges} \times \left\{ \left(\frac{(1-AUX_0)}{(1-AUX_1)} \right) - 1 \right\} \end{aligned}$$

Where,

Quoted Energy Charges is sum of Escalable and non-Escalable Energy Charges in Rs/KWh.

64. In case of standard bidding documents issued by the Central Government on 21st September, 2013 and 9th November, 2014 (DBFOT & DBFOO model), the capacity charges and fuel charges for a year are to be calculated from the base capacity and fuel charge are to be worked out as per the procedure mentioned in the PSA. The Additional Capacity Charges and Additional Energy Charges would be paid as per the formulation in paragraphs above. This will restore the generating company to the same



economic position with respect to additional auxiliary energy consumption after installation of ECS.

RECOVERY OF COMPENSATION

65. Various suggestions have been received from the stakeholders regarding recovery mechanism of compensation. A summary of the suggestions received are as follows:

- a) Only actual energy generated instead of scheduled energy should be considered as the additional variable cost incurred would relate to actual generation and not scheduled generation. Therefore, Supplementary Annual Capacity Charges should be calculated at actual generation.
- b) Supplementary Energy Charges should also include cost of additional water required for emission control system, water treatment cost, waste water disposal cost and by-product disposal cost.
- c) Late Payment Surcharge should be levied for late payment of Supplementary Tariff for emission control system.
- d) The compensation should be payable only if the revised emission norms are met and not merely on the basis of installation of the ECS. Therefore, the ECS related supplementary capacity and energy charge should be paid to the generating station only if the said station produces a certificate issued by the appropriate Pollution Control Board confirming that the environmental norms are being complied with.



66. The model power purchase agreements issued by the Central Government as part of standard bidding guidelines provides the mechanism for payment of compensation of change in Law as under:

“13.4.2 The payment for Changes in Law shall be through Supplementary Bill as mentioned in Article 11.8. However, in case of any change in Tariff by reason of Change in Law, as determined in accordance with this Agreement, the Monthly Invoice to be raised by the Seller after such change in Tariff shall appropriately reflect the changed Tariff.”

67. In line with the same philosophy, it is proposed that the compensation for capacity charges shall be recovered on monthly basis in the form of Supplementary Capacity Charges and the compensation for energy charges shall be recovered in the form of Supplementary Energy Charges.

Recovery of Supplementary Capacity Charge ($SFC_{(m)}$)

68. The supplementary capacity charges ($SFC_{(m)}$) would consist of two components:

- a) Compensation for additional fixed Charges due to additional capital expenditure, O&M and IWC (AFEe) (in Rs per KWh); and
- b) Compensation for Capacity Charges due to additional Auxiliary Consumption = ACCe (in Rs per KWh)

69. Per unit Supplementary Capacity Charge ($SFC_{(m)}$) on account of installation of the Emission control system shall be computed with respect to the installed capacity of unit or generating station, as the case may be, and shall be recovered with reference to the contracted capacity under each power purchase agreement. The compensation for additional fixed expenditure due to ECS shall be computed by applying following formulae:



$$AFEE = \left(\frac{\sum[DEPe, COCe, O\&Me, IWCe]}{(IC \times 1000 \times NA \times (1 - AUX_t) \times h)} \right) \text{ (in Rupees per KWh)}$$

Where,

IC is Installed Capacity (in MW);

NA is Normative Availability of the generating station expressed in decimal; and

h is Total number of hours in the year;

70. Accordingly, per unit supplementary capacity charges shall be worked out as under:

$$SFC_{(m)} = AFEE + ACCe \quad \text{(in Rupees per KWh)}$$

By applying the above value of the Supplementary Capacity Charge rate (Rs/KWh), the generating company shall recover the supplementary capacity charges on monthly basis under each PPA depending upon the cumulative availability achieved till the end of each month. No supplementary incentive shall be allowed to the generating company for declaring the availability beyond the normative availability. The availability and payment of supplementary capacity charges shall be reconciled on annual basis. Irrespective of the availability declaration by the generating station, if the generating company has operated the generating station without operation of the ECS for any period of time, the supplementary capacity charges shall be payable corresponding to the availability achieved by ECS only. If the contract period as per PPA is less than the useful life of the emission control system, the obligation of the procurer shall be limited to its contract period and contracted capacity



Recovery of Supplementary Energy Charge (SEC_(m))

71. Per unit Supplementary Energy Charges on account of installation of the emission control system shall be computed on the basis reagent consumption and additional quoted energy charges. Monthly Supplementary Energy Charges (SEC_(m)) shall be computed as follows:

$$(\text{SEC}_{(m)}) = \text{AEO}_{(m)} \times [\text{CORe}/(1 - \text{AUXt}) + \text{AECe}]$$

Where,

- AEO_(m) is scheduled energy during the month 'm' (in kWh);
- CORe is additional operational expense due to specific reagent consumption on account of emission control system (Rs. per kWh)
- AUXt is Total Auxiliary Energy consumption
- AECe is Additional Energy Charge due to additional Auxiliary Energy Consumption (Rs. per kWh)

Availability Calculation

72. In competitive bidding based projects, auxiliary energy consumption is not a bidding parameter but has impact on tariff as the contracted capacity is net of auxiliary energy consumption. Installation of emission control system alters the auxiliary energy consumption assumed at the time of arriving at the contracted capacity. The additional auxiliary energy consumption impacts the contracted capacity (CC), thereby impacting the computation of availability factor. Since contracted capacity under the power purchase agreement has been revised to give effect of additional auxiliary energy consumption, the availability factor shall also be calculated based on revised contracted capacity. Accordingly, the Commission proposes that the computation of



Availability factor on account of impact on contracted capacity due to additional auxiliary energy consumption of the emission control system shall be as under:

$$\text{Availability (\%)} = (\text{Availability declared in MW} \times 100) / (\text{CC}_{(\text{Revised})})$$

Where,

$$\text{AUXt} = \text{AUXo} + \text{AUXe}$$

$$\text{CC}_{(\text{Revised})} = \text{CCo} \times (1 - \text{AUXt}) / (1 - \text{AUXo});$$

CCo is Original Contracted Ex-Bus capacity of unit or generating station, as the case may be;

MISCELLANEOUS ISSUES

Shutdown Period

73. The installation of emission control system involves shutdown of the generating plant at the time of interconnection with existing plant and machinery under operation. Several suggestions have been received from the stakeholders regarding the treatment of the shutdown period. Some stakeholders have suggested that generating companies should be entitled for Deemed Capacity Charges for the shutdown period. Suggestions have also been received for complete defrayment of fixed charges during the shutdown period.

74. Suggestions have also been received on the modalities for compensating for the shutdown period. One such suggestion is that the period of shutdown and stabilization post commissioning of the emission control system should be excluded from the calculation of Annual Plant Availability Factor ("PAF") for recovery of fixed costs. For projects with captive coal mines, suggestions have been received that the



compensation during the shutdown period may also include loss of contribution margin (total tariff without any change in law per unit – coal cost per unit) on average PLF in the previous 2 financial years, namely, FY 2018-19 and FY 2019-20. Suggestions have also been received to include recovery of LTA charges, penalty under PPA and additional charges for short / non- lifting of coal. Suggestions have also been received to specify the period over which the recovery would be allowed, may be on a case to case basis, subject to prudence check by the Commission.

75. We have examined the suggestions. As regards the normative availability factors in annual shutdown period, the parties to the PPAs shall coordinate and plan the interconnection of emission control system with main plant by synchronizing it with the annual overhaul. The Commission is of the view that if the period of shut down exceeds beyond annual shutdown period factored in the normative availability under PPA, either on account of delay in timely completion of activities for interconnecting emission control system or lack of coordination, the consequential cost for the same cannot not be passed on to the consumers.

Open Capacity

76. A suggestion has been received for consideration of compensation mechanism for open capacity to provide all the generating stations, with and without emission control systems a level playing field. We are of the view that the risk associated with open capacity needs to be addressed by the concerned market player and therefore, we do not find need for any regulatory intervention for open capacity at this stage.



Suggestions/Comments from Stakeholders

77. Before we issue the final order on the proposed mechanism to determine compensation on account of installation of emission control system, we intend to give an opportunity to all stakeholders to submit their views, comments and suggestions, if any. Accordingly, Secretary, Central Electricity Regulatory Commission is directed to undertake publication of the Draft Order and invite comments and suggestions of the stakeholders. The Commission may schedule a public hearing for oral submission, if required.

(P.K. Singh)
Member

(Arun Goyal)
Member

(I. S. Jha)
Member

(P. K. Pujari)
Chairperson



Abbreviations Used

Abbreviation	Unit	Description
ACEe	Rupees	Gross capital cost of Additional Capital Expenditure on emission control system as admitted by the Commission
ACCe	Rupees	Additional Capacity Charges due to additional Auxiliary Energy Consumption
AECe	Rupees	Additional Energy Charges due to additional Auxiliary Energy Consumption
AFEe	Rupees	Compensation for additional fixed Charges due to additional capital expenditure, O&M and IWC
AUX _t	Percentage (%)	Total Auxiliary Energy consumption
AUXe	Percentage expressed in decimals	Additional Auxiliary energy consumption due to emission control System as specified by the Central Electricity Authority and admitted by the Commission
AUXo	Percentage expressed in decimals	Original Auxiliary energy consumption as agreed under the definition of Net Power contracted capacity or otherwise
AEO _(m)	KWh	Scheduled energy during the month 'm'
CC	MW	Ex-Bus Contracted Capacity
CC _{Revised}	MW	Ex-Bus Contracted Capacity revised due to increase in Auxiliary consumption of Emission Control system
COCe	Rupees	Cost of Additional Capital Expenditure
CORe	Rs/KWh	Expenses towards Consumption of Reagent
DEPe	Rupees	Depreciation
GFA	Rupees	Gross Fixed asset



Abbreviation	Unit	Description
IWCe	Rupees	Interest on Working Capital
LPR	Rs/Kg	Landed Price of Reagent used for emission control system
NFA	Rupees	Net Fixed asset
MCLR	Percentage (%)	Marginal Cost of fund based Lending Rate
NA	Percentage (%)	Normative Availability as specified in the PPA
O&Me	Rupees	Operation and Maintenance Expenses
SEC	Rs/KWh	Supplementary Energy Charges due to Emission control system
SFC	Rupees	Supplementary Capacity Charge (also known as Supplementary Fixed Charges)
SRC	gm/KWh	Specific Reagent Consumption
WAROI	Percentage (%)	Weighted Average Rate of Interest
WCIR	Percentage (%)	Working Capital Interest rate

