APP Comments on CERC Staff Paper on Mechanism for Compensation for Competitively Bid Thermal Generating Stations for Change in Law on account of compliance of revised Emission Standards of MoEFCC

We commend the efforts made by CERC in formulating this Staff Paper, which details out many important aspects pertaining to the compensation mechanism for the 'Change in Law' impact of FGD installation on competitively bid generating projects during the operation phase.

Unfortunately, some of the provisions appear to have overlooked the principle of restitution upheld in the judgement of the Hon'ble Supreme Court in the Energy Watchdog (EWD) Judgment dated 11.04.2017. To quote from the judgement, the Hon'ble Supreme Court held that – *'…the PPA read with these documents provides in clause 13.2 that while determining the consequences of change in law, 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, the affected party to* ***the economic position as if such change in law has not occurred.****' (bold supplied for emphasis).*

Any deviation from the above position would thus be against the legal position laid down by the Hon'ble Supreme Court and subject to legal challenge – a situation which all would like to avoid.

We have based our suggestions on the above premise and concept of restitution. We have also dwelt on the certainty of cash flow, which is a crucial aspect as acknowledged by the Hon'ble Commission in its own judgement dated 23.04.2020 in 446/MP/2019 (Sasan Power Ltd). **Our suggestions have been framed with the intent to ensure that operating and financing norms to be used for compensation towards implementation of ECS are workable; acceptable from the point of view of technology providers and bankable from the point of view of providers of debt and equity capital.** To briefly summarize, the main concerns with the Staff Paper are:

- **Inadequate compensation of cost of equity or the cost of borrowing** - The return on equity has been merged in the cost of capital (to be calculated as lower of SBI MCLR + 3.5%, which works out to be 10.5% based on present SBI MCLR, or actual RoI of loan,). **This does not even cover minimum cost of equity even for a no profit scenario and fails to take into consideration the fact that equity component has a much higher risk and hence opportunity cost for any generating company.** Apart from the equity component, **developers even face under-recovery of their cost of borrowing as a sizeable number of existing projects have weighted average rate of interest more than 12% owing to their credit ratings/financial metrics/risk profile of beneficiary Discom, etc.**

  Such a 'one size fits all' approach is inappropriate when sources of debt funding and equity funding are both scarce & distinct, have distinct risk appetite and have distinct

return expectations. Therefore, **we have suggested that RoE should be allowed on the equity component @ 15.5% post-tax on the lower of actual or normative equity. For recovery of cost of borrowing, we have suggested that rate of interest for debt should be considered as the weighted average rate of interest of actual loan portfolio of the emission control system or in the absence of actual loan portfolio, the weighted average rate of interest of the generating company as a whole should be considered.**

- **Under-recovery of CAPEX due to faulty assumptions on 'useful life'** - Under-recovery has been inherently built into the provisions for depreciation. The Staff Paper has standardized the useful life of the associated ECS as 25 Years for all the generating projects and has accordingly proposed recovery of Depreciation towards ECS CAPEX @ 3.6 % per annum. This standardization is premised on the erroneous assumption that all the generating projects shall continue to operate efficiently for 25 years post installation of ECS, irrespective of their actual years of operation at the time of start of operation of the ECS. Most of the competitively bid plants are already operational for more than 5-10 years and their balance life is significantly less than 25 years. **Therefore, the loans against the ECS would need to be recovered during the remaining remunerative period of the plant (balance useful life or balance tenure of long term PPA, whichever is lower).** Failing this, not only would the generators be exposed to under-recovery but financial closure of the ECS loans itself would get affected as the lenders are already significantly risk averse.

- **Very tight operating norms have been prescribed, adding to risk of under-recovery** - ECS equipment are being implemented on such a huge scale in India for the first time and many of the operational difficulties and costs are not even properly known to us at this stage. We have requested for some relaxation of the operating norms pertaining to auxiliary energy consumption, O&M expenses, consumption norms for reagents etc., with a suggestion to revisit them after some years of operation so that more realistic and practical norms can then be laid down.

- **Compensation towards loss of revenue during the period of project shutdown for ECS installation** - The Staff Paper is silent on this aspect and has left the same to be decided by the Hon'ble Commission on case-to-case basis after installation of ECS. While it is understandable that the period of shutdown would vary from plant to plant and would have to be approved by the Hon'ble Commission, the Staff Paper should certainly have provided explicit comfort on the complete defrayment of fixed charges/opportunity costs incurred by the generating station during the shutdown period as this would be in line with the Principle of Restitution upheld by the Hon'ble APTEL and the Hon'ble Supreme Court.

- **Time lag between commencement of debt servicing obligations and start of compensation cashflows** - No enabling provision has been kept for grant of projected Compensation for the period between Date of Operation of the ECS till the date of determination of Compensation thereof by the Hon'ble Commission. Lack of such projected Compensation affects the certainty of cash flow streams as the process of Compensation determination, being an exhaustive process, may span across 6-12 months while the debt servicing obligations of the generation company to its lenders would start immediately after the start of operations of the ECS. This is again likely to affect the financial closure of the ECS project.

The above issues clearly indicate the high possibility of inadequacy of cash flows to meet the debt servicing and operating expenditures. Bankability of the compensation mechanism is contingent on both certainty and adequacy of cash flows, especially in the current scenario where all lenders are looking to reduce their exposure to the power sector. It may be kept in mind that the reluctance of bankers to fund the FGD installations has been the primary cause of delays in the process of implementation of emission control equipment. Accordingly, our suggestions have been formulated in a manner to create an enabling environment for attracting funding rather than developing regulations which will make it difficult to implement the environment technologies to meet the new Environmental norms. Towards this end, it is important to have a model which gives appropriate Return on Equity (@15.5% on post-tax basis) and compensates the developers for their actual cost of borrowing. Similarly, the Hon'ble Commission may ensure that the plants are allowed to recover the capex over the remaining useful life of the project/balance tenure of long term PPA and that the plants are fully compensated towards loss of revenue and any penalties arising out of shutdown period due to installation of the ECS.

Considering that such installations are being carried out on a mass scale for the first time in India and that data pertaining to operation and maintenance expenses and reagent/chemical consumption, handling costs etc., are not readily available, it is also important to allow flexibility in operating norms instead of prescribing stringent parameters. For example, restricting O&M expenses to 2% of additional capital expenditure and auxiliary consumption due to ECS at 1% of gross generation – these are unnecessarily stringent requirements which are not even in line with the specifications offered by the OEMs. The Hon'ble Commission may consider allowing the ECS equipment to operate for a couple of years on more relaxed norms. Thereafter, the norms may be revisited on the basis of the operational data. The intent is to avoid stringent norms at the outset which would further reduce the bankability of the entire process.

Our detailed comments on the Staff Paper are covered in the following pages. We would once again like to reiterate that we fully appreciate the efforts and intent of the Hon'ble Commission and its staff in preparing this Staff Paper, and we are confident that our concerns will be addressed appropriately.

1. **Compensation on account of loss of revenue due to shut down of an operating project during installation of ECS**

Provision as per Staff Paper: *Not covered*

APP's Suggestions:

It is suggested that the principles/ mechanism for working out the compensation on account of loss of revenue suffered by a generating company during the period of project shutdown for integration of ECS with the operating generating project should be addressed by the Hon'ble Commission at this juncture itself.

It is further suggested that the plant/unit should be considered as "Deemed Available" during the extent of actual number of days of shutdown (subject to prudence check by the Hon'ble Commission), during which the plant/unit would be compensated for the following:

- Complete defrayment of Fixed Capacity Charges
- Recovery of LTOA Charges
- Waiver/reimbursement of penalty under PPA, if any, for lower availability
- Waiver/reimbursement of any additional charges for short / non- lifting of coal under the FSA with coal companies.

This will be in consonance with the Principle of Restitution upheld by the Hon'ble Supreme Court, which has also been duly acknowledged by this Hon'ble Commission in the present Staff Paper

Rationale:

The Staff Paper has not proposed any mechanism for computation of compensation towards loss of revenue during the period of project shutdown for integration of ECS with the operating generating project and has left the same to be decided by the Hon'ble Commission on case-to-case basis after installation of ECS.

However, we suggest that a clear methodology may be put in place at this stage itself, for recovery of fixed charges and other incidental costs for shutdown period. It may be appreciated that loss of revenue during the period of project shutdown for integration of ECS with the operating generating project is an import aspect having a significant tariff implication and thus should be clarified at this stage in order to remove uncertainty and align the proposed compensation mechanism with the Principle of Restitution upheld by the Hon'ble APTEL and the Hon'ble Supreme Court.

It may further be appreciated that the basic purpose of the Staff Paper is to give predictability to the generating companies, lenders and the procurers under PPAs about the potential impact

of installation of ECS in terms of additional compensation to the generating companies. While it is understandable that the period of shutdown would vary from plant to plant and would have to be approved by the Hon'ble Commission, we request that provisions for complete defrayment of fixed charges/opportunity costs incurred by the generating station during the shutdown period **for integration of ECS with the operating generating project should be provided at this juncture itself.**

2. Timelines for Determination of Compensation

Provision as per Staff Paper: *Not covered*

APP's Suggestions:

a. Based on the estimated/ projected CAPEX to be incurred towards installation of ECS, the Hon'ble Commission may kindly grant Projected Compensation (@ say 90% of the estimated Compensation on the basis of benchmark costs approved by CEA) 2-3 months before ODe of the ECS which may subsequently be trued up on the basis of actual ECS CAPEX.

OR

The petition for determination of tariff may be allowed to be filed six months prior to scheduled commissioning of ECS so that the additional tariff is paid from the month in which ECS is commissioned.

b. For the purpose of Projected Compensation, norms for IDC / Pre-ops expenses / Contingency / Taxes etc., may be specified for calculating the project capex on a normative basis.

Rationale:

The Staff Paper provides for determination of Compensation (in terms of Supplementary Tariff only after installation of Emission Control Systems ("ECS") and no enabling provision has been kept for grant of projected Compensation for the period between Date of Operation ("ODe") of the ECS till the date of determination of Compensation thereof by the Hon'ble Commission.

Such Compensation determination, being an exhaustive process, may span across 6-12 months after ODe of the ECS. Hence, in absence of any projected Compensation, the generating company would not be able to secure any revenue during this intervening period of 6-12 months. However, the debt servicing obligations of the generation company to its lenders would start immediately after ODe of the ECS. In absence of any projected Compensation, it would be extremely difficult for a generating company to discharge its debt-servicing obligations during this intervening period, which would severely affect its cash flows.

Further, in the current challenging scenario, the lenders are increasingly looking for certainty of timelines for recovery of compensation as a pre-requisite for lending, in absence of which, it would be extremely difficult for a generating company to achieve timely financial closure. Such a delay in achieving financial closure, would eventually lead to breach of permissible

timelines prescribed by MoEF, GoI for installation of ECS, for absolutely no fault of generating companies.

It may be further noted that the Expert Committee under Shri K.V. Kamath, as constituted by RBI, for the Resolution Framework for COVID-19 related stress, has recommended threshold values for certain financial parameters which are to be considered while preparation of Resolution Plan for a borrower in a specific sector. For the power sector, a ratio of Total Debt/EBITDA ≤ 6.00 has been specified. While this is reasonable during normal course of business, this ratio will be impacted significantly due to the increase in debt due to loan taken for FGD installation. In the absence of immediate commencement of cash flows after ODe of ECS, the resolution process for borrowers who have been hit hard by the COVID-19 pandemic, which includes all the IPPs, can get derailed.

Hence, grant of projected Compensation (@ say 90% of the estimated Compensation) 2-3 months before ODe of the ECS, which may subsequently be trued up on the basis of actual ECS CAPEX, will be a win-win proposition for the all stake holders viz. the lending institutions, generating companies, Discoms etc. as:

- This would enable the generating companies to secure the return on investment made by them towards ECS, right from the first day of its operation, thereby facilitating them to honor their debt-servicing obligations on timely basis.

- Further, this will also prevent accumulation of substantial arrears of the Discoms/ Beneficiaries in terms of Supplementary Tariff and Carrying Cost during such intervening period of 6-12 months, which would otherwise impair their cash-flows on account of a substantial accrued liability.

Currently CEA/CERC is approving only hard cost without the components like taxes/IDC/Pre-ops/contingency etc. To arrive at Projected Compensation/Tariff payable by the procurer from the date of starting of operation of ECS, norms for the above components would require to be finalized by CEA/CERC, which will be subject to true up at actuals during the compensation determination process by the Hon'ble Commission.

3. Depreciation and Useful Life *(Para 4.3 to 4.9)*

Provision as per Staff Paper:

- Total depreciation allowed: 90%
- Useful life of ECS: 25 years
- Rate of Depreciation: 3.6% (= 90% / 25 yrs)

APP's Suggestions:

It is suggested that the recoverable depreciation of the emission control system (to be computed at 90% of the capital cost from its date of operation) **should be fully recovered in the balance useful life or balance extended life of the generating station or the balance long term PPA tenure, whichever is lower.**

Further, in case the beneficiary terminates the PPA before the existing PPA tenure is completed or does not extend the PPA tenure up to the useful life of FGD system, or terminates the extended PPA prior to completion of useful life of FGD, as the case may be, **the beneficiary shall fully compensate the generator towards the un-recovered cost of installation of such FGD system.**

Rationale:

Recovery of Depreciation has been standardized @ 3.6% per annum irrespective of the balance useful life of the associated generating project post installation of ECS. This standardization is premised on the erroneous assumption that all the generating projects shall continue to operate efficiently for 25 years post installation of ECS, irrespective of their actual years in operation at the time of ODe of associated ECS. As such, the Staff Paper considers the following generating projects at par for the purpose of recovery of Depreciation towards ECS CAPEX:

i. A new generating project in which ECS is being installed along with project construction and both project & ECS have a balance life of 25 Years post project COD.

ii. An existing generating Project which has been under operations for 5 years at the time of ODe of the associated ECS.

iii. An existing generating Project which has been in service for 15 years at the time of ODe of the associated ECS.

To add on to the woes of the generating companies, the Staff Paper has restricted recovery of Depreciation (@ 3.6% per annum) only over the balance life of the PPA, irrespective of the balance life of the generating project/ ECS.

Such skewed approach to standardize recovery of Depreciation of ECS CAPEX for all the generating projects irrespective of their remaining useful life is not only against the basic principles of recovery of depreciation, but also undermines the Principle of Restitution upheld by the Hon'ble Supreme Court and the Hon'ble APTEL, which has also been duly acknowledged by this Hon'ble Commission in the present Staff Paper. The flaws with this approach are:

- For generating plants which have already been operating for around 10 years, it has been assumed that after the expiry of useful life of 25 years, they will operate efficiently for another 10 to 15 years by incurring marginal expenditure towards Renovation & Modernization. It may be noted that any extension of period beyond expiry date of PPA is on mutual agreement between Buyer & Seller. However, under present circumstances where the market has noticeably and firmly moved away from long term contracts, the continuation of PPAs would be highly unlikely. This would leave the generators at a severe financial disadvantage, as they would neither be able to contract new PPAs (the markets have already noticeably shifted away from long term PPAs) nor recover the actual CAPEX incurred towards installation of ECS.

- Since most of the competitively bid plants are already operational for more than 5-10 years and balance life is significantly less, Lenders shall expect the loan against emission control systems to be recovered during the remunerative period of the plant. It must be kept in mind that with renewable tariffs coming down significantly, there is a lack of debt funding for coal-fired plants, even in domestic financing markets / banks. Lenders, including PSU Banks, are looking to reduce their exposure to power sector, especially coal-based power generation sector. In fact, left to the banks, they will be most happy if no further debt funding exposure is required to be taken on a given IPP considering pre-existing challenges of stretched debt service coverage levels, absence of DSRA, cost under-recoveries, etc. There is hardly any international equity or debt available either for coal-fired power sector investments.

Thus, the proposed formulation fails from the point of view of both bankability and restitution. Even if lenders agree to extend debt to the ECS project, the maximum loan tenure extended would be around 12 years while the depreciation period has been set as 25 years - a deep chasm of under-recovery and additional stress seems to be the outcome from this proposition.

In order to ensure that loan repaying ability of the generators shall not be affected and funding will not be a constraint for installing such emission control system, it is important that recoverable depreciation is fully recovered during the balance useful life/PPA term.

Therefore, recovery of Depreciation of ECS CAPEX cannot be standardized across the board and has to be linked to and recovered over the balance useful life or balance extended life of the generating station or the balance long term PPA tenure, whichever is lower, in order to ensure that the Compensation on account of this "Change in Law" event adequately restores the affected generating company to the same economic position if such "Change in Law" had not occurred.

Further, in case the beneficiary terminates the PPA before the existing PPA tenure is completed or does not extend the PPA tenure up to the useful life of FGD system, or terminates the extended PPA prior to completion of useful life of FGD, as the case may be, the beneficiary shall fully compensate the generator towards the un-recovered cost of installation of such FGD system so that the generating company is restored to the same economic position if such 'Change in Law' event had not occurred.

4. Supplementary Capacity Charges *(Para 4.2 and 4.15)*

Provision as per Staff Paper:

> *"The four components, namely, ACE_{Dep}, ACE_{COC}, $ARE_{O\&M}$ and ARE_{IWC} shall be calculated in Rs. lakh on annual basis for the **useful life of ECS** i.e. 25 years starting from ODe of the ECS. The sum of these is termed as Supplementary Annual Capacity Charges (SACC). The recovery of Supplementary Annual Capacity Charges by way of monthly billing shall be in line with the recovery and payment of quoted capacity charges for generating stations in accordance with the PPA."*

APP's Suggestions:

a. Competitively bid plants should also be allowed to recover the cost of funds under separate heads of "Return on Equity" and "Interest on loan capital" as allowed to plants where tariff is determined by CERC U/S 62.

b. Useful life of ECS must be considered as the balance useful life or balance extended life of the generating station or the balance long term PPA tenure, whichever is lower.

Rationale:

As far as ECS is considered the cost recovery and additional tariff determination principle is same for all plants, irrespective of tariff determination methodology of the power plant. The guiding principle to be followed is recovery of all costs while none of the plants are allowed and expected to make profits though installation of ECS. Projects having tariff determined under Section 62 are allowed to recover the cost of funds under separate heads of "Return on Equity" and "Interest on loan capital" as a part of supplementary capacity charges. However, these separate heads have not been made available to competitively bid projects. Having different approach depending upon the tariff methodology is not justified for cost recovery on capital employed and competitively bid plants should also be allowed to recover the cost of funds under separate heads of "Return on Equity" and "Interest on loan capital".

Regarding useful life of ECS, as explained in the preceding comments on Depreciation, most of the competitively bid plants are already operational for more than 5-10 years and balance life is significantly less, Lenders shall expect the loan against emission control systems to be recovered during the remunerative period of the plant. The assumption that after the expiry of useful life of 25 years, well maintained generating stations will operate efficiently for another 10 to 15 years by incurring marginal expenditure towards Renovation &

Modernization is inherently flawed and erroneous. It may be noted that any extension of period beyond expiry date of PPA is on mutual agreement between Buyer & Seller. However, under present circumstances where the market has noticeably and firmly moved away from long term contracts, the continuation of PPAs would be highly unlikely.

Further, competitively bid generation projects face various challenges with respect to operating beyond 25 years, such as availability of coal (FSA is executed for only 20 years), PPA, water, efficiency of technology, etc. In fact, there is an emerging trend where plants have been retired before 25 years life on account of technology and performance issues to allow other efficient plants to operate. There is a situation of excess supply / lack of demand, especially for coal-based power. CERC may like to take up these issues appropriately with the concerned Ministries.

In order to ensure that loan repaying ability of the generators shall not be affected and that funding will not be a constraint for installing such emission control system, it is important that the useful life of the ECS has to be considered as the **balance useful life or balance extended life of the generating station or the balance long term PPA tenure, whichever is lower.** Therefore, the recovery of components of Supplementary Capacity Charge needs to be calculated in Rs Lakhs on annual basis for the useful life as mentioned above.

5. Cost of Capital Employed and Return on Equity *(Para 4.11)*

Provision as per Staff Paper:

It has been proposed that the cost of capital would be estimated based on Net Fixed Assets (NFA) value of fixed assets reducing each year by depreciation value. The cost of such NFA would be at Lower of SBI MCLR + 3.5% or Actual rate of interest on loan. No separate provision for Return on Equity.

APP's Suggestions:

a. Instead of cost of capital, a notional Debt to Equity ratio of 70:30 should be used. However, if the generator is able to arrange higher debt funding for ECS Capex, such higher level of debt funding can be considered.

b. RoE should be allowed on the equity component @ 15.5% post-tax on the lower of actual or normative equity.

c. If however, the RoE is still proposed to be restricted to the rate of interest of loans, the said rate of interest should be the higher of the actual weighted average rate of interest or the SBI PLR plus 350 basis points.

d. **Rate of interest for debt to be the weighted average rate of interest of actual loan portfolio** of the emission control system or in the absence of actual loan portfolio, the weighted average rate of interest of the generating company as a whole should be considered.

Rationale:

Return of Equity

- The Return on Equity ("RoE") has been merged in the cost of capital, where the cost of capital is proposed to be considered as lower of SBI MCLR+3.5% or actual RoI of loan. The SBI MCLR + 3.5% as on date works out to 10.5% - such rate of return on equity investments is very low and does not even provide for minimum cost of equity for a no profit scenario. This rate is even lower than the actual cost of taking on fresh debt. This is a significant deviation from the existing principles of supplementary tariff computation and fails to take into consideration the fact that Equity component has a much higher risk and hence opportunity cost for any generating company. This is especially true during the current scenario of severe financial stress where many of the generators have already eroded their networth.

- Unlike routine additional capex, FGD implementation involves significant capex which would not be completely funded by debt financing from Banks/other Financial Institutions and would require promoters/equity holders to inject additional equity capital. It will be impossible to attract this additional capital unless broad sector rate of return is provided. This is especially true when the sources of debt funding and equity funding are both scarce & distinct, have distinct risk appetite and have distinct return expectations. Even where equity is funded by internal accruals, the proposed provision would mean that the return to the existing equity investors will be less than the cost of such equity capital.

- The PPA provides for "Restitutionary Principle" which says that in the event of Change in Law the affected party should be compensated such as to bring the affected party to the same economic position as if no change in law has occurred. This principle has been upheld by Supreme Court in Energy Watchdog (EWD) Judgment dated 11.04.2017. As submitted above, the expenditure cannot be entirely debt funded and equity **has** to be infused. Therefore, if RoE on the investment is not allowed to the generator then it would not lead to complete restitution and the principle set out in the EWD judgment will not be implemented.

- Regulatory certainty is of utmost importance for stakeholders and the cost recovery structure proposed in the Staff Paper essentially means that it will be impossible to finance with 70:30 debt equity ratio as proposed equity return will not enable requisite DSCRs required for achieving financial closure for ECS Projects on a standalone basis.

- Coal-fired power plants are already not able to attract international investors for environmental reasons. If they become unattractive for even domestic investors, then power companies will find it exceedingly difficult to raise the equity required for FGD implementation, thereby delaying the ECS implementation.

- In view of the above, it is suggested that:

    - **Instead of cost of capital, a notional Debt to Equity ratio of 70:30 should be used. However, if the generator is able to arrange higher debt funding for ECS Capex, such higher level of debt funding can be considered.**

    - **RoE should be allowed on the equity component @ 15.5% post-tax on the lower of actual or normative equity.**

    - **If however, the RoE is proposed to be restricted to the rate of interest of loans, the said rate of interest should be the higher of the actual weighted average rate of interest or the SBI PLR plus 350 basis points.**

Rate of interest for debt

- The Staff Paper proposes to restrict Weighted Average Rate Of Interest ("WAROI") on Debt/ Loan at SBI MCLR (for one year tenor) plus 350 basis points. This assumption fails to take into consideration the fact that Lenders charge different interest rates to different projects/companies depending on many factors including their previous exposure/financial health of the power procurers/credit rating/liquidity position etc and there are a sizeable number of existing generating projects where the actual WAROI is substantially higher than SBI MCLR (for one year tenor) plus 350 basis points owing to their credit rating / financial metrics. It may be noted here that credit rating for many of the competitively bid projects have been influenced by the negative view that rating agencies have on the counter-parties (distribution utilities) as well as the overall negative outlook for coal-fired power plants emerging from number of bankruptcy cases.

- In the absence of any caps being applied by the Banks/Financial Institutions on the interest rate, it would not be appropriate to Cap the rate of interest to one year MCLR+350 basis points as this will create an inbuilt mechanism for under-recovery of financing costs, a scenario wherein lenders will not want to sanction any loan.

- **Accordingly, it is requested that WAROI on the Debt component be allowed on actual basis without any capping/ linking it to SBI MCLR. Therefore, Rate of interest for debt should be the weighted average rate of interest of actual loan portfolio of the emission control system or in the absence of actual loan portfolio, the weighted average rate of interest of the generating company as a whole should be considered.**

- Further, despite the above rationale, if the Hon'ble Commission still wants to go ahead with MCLR regime, then **1 yr MCLR should be taken as on 1st April of every year instead of the year when ECS is commissioned.** MCLR is floating in nature and it certainly cannot be the intent of the Commission to keep it as a fixed rate for the entire period. **Further, MCLR should be considered as average MCLR notified by all the banks.**

6. Additional O&M Expenses *(Para 4.13)*

Provision as per Staff Paper:

"it is proposed that additional O&M expenses (AREo&m) for first year may be allowed @2% of additional capital expenditure (ACEECS) for installation of ECS (excluding IDC and FERV), admitted by the Commission after prudence check. For subsequent years, the first year O&M expenses (AREo&m) 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."

APP's Suggestions:

a. Additional O&M expenses should be allowed at 5% of ECS capitalization (excluding IDC and FERV) for first year. For subsequent years, annual escalation of 5% may be considered.

b. The provision of review of O&M expenses based on actuals may be deleted.

c. Normative handling, storage and disposal charges of Gypsum (say Rs 150/tonne) may be allowed to the generating companies.

Rationale:

- Estimation of O&M expenses on account of ECS is presently a difficult exercise due to the lack of available data and experience. However, most of our members feel that the proposed norm of 2% of admitted capital expenditure (excluding IDC & FERV), appears to be on the lower side, on the basis of limited data that is presently available. This is especially because O&M expenses of emission control system on a stand-alone basis, may require additional cost involvement over the power plant due to following:
    - Thermal power plants predominantly have electromechanical devices (though there are several small chemical facilities) whereas Wet Limestone FGD is primarily a large chemical based plant with higher wear and tear entailing higher operation and maintenance cost.
    - The FGD System is exposed to highly corrosive environment created by the low pH & high chlorides. This results in very high maintenance and high consumption of spares & consumables. The spare holding, storage and maintaining cost is thus also higher.

- Quite a few components, such as the ones mentioned below, have a much shorter life due to the corrosive environment in which they operate.
    - Booster Fan – The problem of erosion and corrosion of fan blades leading to high vibration, frequent replacement of Oil hoses & filters and damage to fan casing rubber lining are experienced. This gives rise to high cost of material and services used.
    - GGH Baskets - Corrosion and erosion of GGH elements will require changing of baskets.
    - Scrubber – There are frequent replacement of Nozzles & Packing's, failure of mist eliminator pump, failure of bellows due to acidic nature of the ash which historically results in high material and Maintenance services cost.
    - Dampers & Ducts – Some failure/damage to duct supports occur thereby necessitating replacement and damage to anti-corrosive coating due to erosion by ash, again resulting in higher cost of material and services.
- Higher maintenance cost as a sizeable number of equipment installed for the emission control system is likely to be imported and imported spares are sensitive to forex fluctuations.
- Implementation of emission control system at existing plants setup may require additional infrastructural support to facilitate smooth operation (for example installation of a dedicated road and gate for trucks carrying gypsum - similar to separate dedicated gates with security personnel that have to be maintained in power plants for ash movement.).
- Recurring annual insurance costs of ECS which is almost of the order of 0.5% of ECS CAPEX
- Moreover, annual increase in minimum wages by several states goes way beyond 5%. In addition to the above, cost of spares, consumables & associated services have increased by more than 10% per annum. Hence, keeping the above facts in mind, **it is suggested that additional O&M expenses should be allowed at 5% of ECS capitalization (excluding IDC and FERV) for first year. For subsequent years, annual escalation of 5% may be considered.** As any increase in O&M will be paid only after prudence check, keeping the limit of the O&M expenses on the lower side will deny the admissibility of the claim permanently.

- Further it has been proposed that the O&M cost would be reviewed based on actuals. It is submitted that once commissioned the ECS becomes an integral part of the plant and would be difficult to identify O&M cost for it from the overall O&M cost of the plant. **Any such reconciliation exercise may become a contentious issue leading to disputes and therefore, the provision for review based on actuals may be removed.**

- Commissioning of many limestone based ECS by such a large number of generating plants would pose a challenge for disposal of Gypsum, which is a by-product of ECS. As it is, gypsum has low demand in the market and with high availability of Gypsum post commissioning of sizeable ECS capacity from 2022 onwards, there would be limited takers of Gypsum. Thus, Gypsum, which is a hazardous material, would necessitate environmentally safe measures for its storage and disposal thereby entailing significant expenses. **Therefore, it is requested that a normative charge for handling, storage, transportation and disposal of Gypsum (say Rs 150/tonne) may be allowed to the generating plants.**

7. Additional Interest on Working Capital *(Para 4.14)*

Provision as per Staff Paper:

It has been proposed to include following in the Working capital:

- Cost of limestone/reagent towards stock for 20 days
- Advance payment for 30 days for generation corresponding to NAPAF
- O&M expense of 1 month of ECS
- Maintenance spares @20% of O&M Expense
- Receivables of 45 days of supplementary capacity & variable charges

APP's Suggestions:

a. For avoidance of any doubt, normative Rate on Interest on Working Capital may be specifically mentioned and kept in line with the Rate of Interest on Working Capital mandated under CERC Tariff Regulations, 2019, which is 1 year MCLR of SBI + 350 basis points

b. Cost of limestone or reagent should be the landed price inclusive of transportation and handling charges, transit and handling losses and charges for limestone sampling, testing and analysis.

c. 30 days stock of limestone/reagent should be considered.

Rationale:

- The Staff Paper has listed the components of Working Capital, however the normative Rate of Interest on Working Capital has not been mentioned. Accordingly, it is suggested that for avoidance of any doubts, normative Rate on Interest on Working Capital may be duly mentioned and kept in line with the Rate of Interest on Working Capital mandated under CERC Tariff Regulations, 2019.
- In order to avoid under-recovery of cost, it may be specified that cost of limestone/reagent would be the landed price inclusive of transportation and handling charges, transit and handling losses and charges for limestone sampling, testing and analysis.

- Currently, there is uncertainty about the availability, quality and location of limestone. There are also constraints in transportation/ logistics since the limestone is essentially transported by road. In order to meet the availability commitments, the generator will have to keep stock of limestone/reagent to last at least for a month to protect against supply disruptions, quality issues etc. Therefore, 30 days stock of limestone/reagent should be considered.

8. Components of Additional Capital Expenditure *(Para 4.2)*

Provision as per Staff Paper:

It has been proposed that the Additional Capital would include:

- Base cost of ECS
- Taxes & duties
- IDC

APP's Suggestions:

a. Methodology for allowing IDC may be specified as actual interest on loan during the construction period. IDC to be allowed on actual loan if equity is less than 30% or IDC to be allowed on actual loan + normative loan equal to amount in excess to 30% fund deployment.

b. It is suggested that in addition to the cost components considered; following costs should also be included in additional capital:

- **Initial spares** – may be considered as percentage of Plant and Machinery cost with a ceiling of 4%
- **Undischarged liabilities** - may be allowed for competitively bid plants as additional capital expenditure during the year it is discharged, subject to prudence check.
- **Incidental Expenditure During Construction (IEDC)**
- **Gain/Loss on FERV**

Rationale:

- The proposed mechanism does mention that the IDC would be considered as part of additional capital. However, there is no specific mention of methodology for estimation of the same. For the sake of clarity, it may be provided that IDC may be allowed on actual loan if equity is less than 30% or IDC to be allowed on actual loan + normative loan equal to amount in excess to 30% fund deployment.
- The components of additional capital expenditure should include all the capital expenditure heads with a prudence check. It is noted that Initial spares and Undischarged liabilities have been allowed for plants where tariff is determined by Hon'ble

Commission under Section 62. However, these cost components have not been allowed/specified for competitively bid projects. There is no difference in the capital cost of ECS between Section 62 and Section 63 projects and hence the cost treatment should be the same.

9. Additional Auxiliary Energy Consumption *(Para 4.18, 4.19)*

Provision as per Staff Paper:

"4.18. The ex-bus energy charges quoted by the generating company will undergo change due to additional auxiliary energy consumption on account of installation of ECS. This is explained using the illustration given below.

…..

4.19. The Revised Contracted Capacity after installation of the ECS can be arrived at as follows:

$CC_{Revised} = CC_{Org} \times (1-AUX_{Total})/(1-AUX_{Org})$

where $AUX_{Total} = AUX_{Org} + AUX_{ECS}$.

The Original Auxiliary Energy Consumption (AUXOrg) shall be the minimum of actual auxiliary energy consumption and values arrived at by applying one of the following methodologies….."

APP's Suggestions:

a. The original Auxiliary Consumption AUX_{org} proposed under para 4.19 would make the contracted capacity dynamic as the actual auxiliary consumption would vary from period to period. Further, in case of Section 63 projects, the actual auxiliary consumption has no relevance. Hence, in order to avoid unnecessary complications, **it is proposed that the Original Aux Energy Consumption and the Aux consumption of ECS may be fixed and the reference to actual auxiliary energy consumption may be removed.**

b. There are some generating stations with multiple units where the entire installed capacity of certain units is contracted under PPA by meeting the auxiliary power requirement from other units of the power stations. Taking such cases into account, **it may be clarified that Installed Capacity of the entire power station and aggregate contracted capacity of all PPAs would be considered for deriving the Auxiliary Power Consumption.**

10. Monthly Supplementary Charges *(Para 5.3)*

Provision as per Staff Paper:

The Monthly Supplementary Energy Charges only consist of the reagent consumption on account of emission control system.

APP's Suggestions:

Supplementary Energy charge should also include the following

a. **Cost of additional water required for emission control system**
b. **Water treatment cost and waste water disposal cost**
c. **Product disposal cost**

Rationale:

CEA has also recommended above additional O&M expenses in respect of wet limestone based FGD emission control system which is mentioned in the order by the Hon'ble Commission, dated 11th November 2019 in the petition no 152/MP/2019 (Maithon Power Limited). This appears to have been missed out in the Staff Paper and may be included appropriately.

11. Norms for Additional Auxiliary Energy Consumption (ΔAUX) – For reduction of emission of Sulphur Dioxide *(Annexure-I)*

Provision as per Staff Paper:

Name of Technology	ΔAUX (as % of gross generation)
(1) For reduction of emission of Sulphur Dioxide:	
a) Wet Limestone based FGD system (without Gas to Gas heater)	1.0%
b) Lime Spray Dryer or Semi dry FGD System	1.0%
c) Dry Sorbent Injection System (using Sodium bicarbonate)	NIL
d) For CFBC Power plant (furnace injection)	NIL
e) Sea Water based FGD system (without Gas to Gas heater)	0.7%

APP's Suggestions:

a. We suggest that the Hon'ble Commission may allow ΔAUX upto 2% of gross generation, with an additional 0.5% ΔAUX for unit size of 210/250/300 MW or lower.

Rationale:

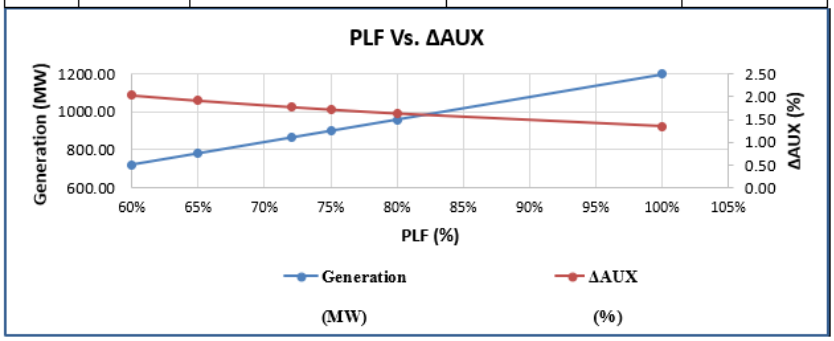
The Additional Auxiliary Energy Consumption (ΔAUX) for wet limestone based FGD system has been considered as 1% of gross generation, which in our view, appears to be low. These norms are on benchmark basis and do not consider plant specific requirements. Further, the power consumption of the desulfurization system is closely related to the parameters such as the amount of flue gas, the concentration of sulfur dioxide, the purity of limestone and the desulfurization efficiency, each unit is different and the prescribed limit of 1% of gross generation would fail to cover all these cases. Moreover, majority of wet limestone based FGD suppliers are quoting minimum auxiliary consumption of 1.2% at full load for unit size of 660 MW and even higher for for unit size of 300 MW and below.

Further, as per technical bids submitted by various OEMs for installation of Wet Limestone based FGD System, the Auxiliary Energy Consumption due to installation/ operation of Wet Limestone based FGD System has a negative/ inverse correlation with the flow of Flue Gas (i.e. Boiler Load, essentially PLF of the generating project) which shall be fed to the FGD system for removal of SO2.

For a typical 1200 MW coal based thermal generation project, Flue Gas flow has been derived with respect to the PLF as per design calculations of the Boiler OEM and a graph has been

plotted for PLF (%), Generation (MW) and ΔAUX (%) as shown below, which clearly demonstrates an inverse correlation between ΔAUX and PLF and that ΔAUX shall vary in the range of 1.35% to 2% corresponding to the respective PLF range of 100% to 60%.

PLF (%)	Generation (MW)	Using Trendline Equation of Load Vs Gas Flow Graph	Using Trendline Equation of Gas Flow Vs ΔAUX Graph	(ΔAUX) x 100 (1000 x MW)
		Flue Gas Flow (kNm3/h)	**ΔAUX (kwh/h)**	**ΔAUX (%)**
100%	1200.00	1995	16226	1.35
80%	960.00	1668	15642	1.63
75%	900.00	1580	15427	1.71
72%	864.00	1526	15282	1.77
65%	780.00	1397	14898	1.91
60%	720.00	1302	14580	2.03



The above table and graph make it clear that the inverse correlation between AUX and PLF of TPPs should be factored in while framing the AUX norms. Considering the quotes provided by the equipment suppliers and the fact that average PLF of coal based thermal power plants are unlikely to rise significantly beyond 60%-65%, **we suggest that the Hon'ble Commission may allow ΔAUX upto 2% of gross generation, with an additional 0.5% ΔAUX for unit size of 210/250/300 MW or lower.**

12. Norms for Additional Auxiliary Energy Consumption (ΔAUX) – For reduction of emission of oxide of Nitrogen *(Annexure-I)*

Provision as per Staff Paper:

(2) For reduction of emission of oxide of nitrogen:	
a) Selective Non-Catalytic Reduction system	NIL
b) Selective Catalytic Reduction system	0.2%

APP's Suggestions:

There is no experience in the country regarding SNCR and hence instead of notifying norms for auxiliary consumption without having the actual feedback, it would be prudent if actual additional auxiliary consumption due to SNCR is monitored and allowed as pass through cost for initial period of 3-4 years and based on the data collected, norms for the same can be notified subsequently.

Rationale:

- SNCR requires additional equipments to be installed which inter alia include Ammonia storage and handling system
    a) Ammonia vaporization system
    b) Ammonia Dilution system
    c) Ammonia injection system
    d) Waste ammonia dilution system
    e) Steam and condensate system
    f) Air Blowing System
    g) Nitrogen purging system
    h) Electricals
    i) Control & Instrumentation
- These equipments would consume electrical power and hence additional auxiliary power consumption would be present if SNCR in installed.

13. Norms of Operation – Degradation of Gross Station Heat Rate due to ECS operation *(Annexure-I)*

Provision as per Staff Paper:

None

APP's Suggestions:

1% increase in the existing normative GSHR on account of installation of De-NOx System may be allowed.

Rationale:

The Staff Paper has failed to address an important aspect related to degradation of Gross Station Heat Rate ("GSHR") of a generating project due to installation of De-NOx System, which is an essential component of ECS.

As per the OEMs, due to installation of De-NOx System, the combustion pattern of Boiler will change which will invariably result in increase in combustibles in the fly ash as well as bottom ash. Such an increase in unburnt combustibles shall consequently reduce the Boiler Efficiency thereby increasing the existing GSHR of the thermal generation projects by more than 1%.

As such, not allowing any normative increase in GSHR due to installation of De-NOx System shall lead to substantial under recovery by the generating companies. Accordingly, it is sincerely requested that 1% increase in the existing normative GSHR on account of installation of De-NOx System be allowed.

14. Norms for consumption of reagent – For reduction of emission of sulphur dioxide *(Annexure-I, 2(1))*

Provision as per Staff Paper:

"(a) For Wet Limestone based Flue Gas Desulphurisation (FGD) system: *The specific limestone consumption (g/kWh) shall be worked out by following formula:*

= [0.85 x K x SHR (kCal/kWh) x S (%)]/[GCV (kCal/kg) x LP (%)]

Where,

S = Sulphur content in percentage,

LP = Limestone Purity in percentage;

Provided that value of K shall be equivalent to (35.2 x Design SO2 Removal Efficiency/96%) for units to comply with SO2 emission norm of 100/200 mg/Nm3or (26.8xDesign SO2 Removal Efficiency/73%) for units to comply with SO2 emission norm of 600 mg/Nm3;

Provided further that the limestone purity shall not be less than 85%."

APP's Suggestions:

a. Due to dearth of data, normative values for consumption of reagents may have to be arrived at after 5 years of operation and during that period the actual consumption values may be considered.

b. Condition of minimum purity of 85% of limestone may be removed at least for the initial years till the limestone market stabilizes.

Rationale:

- There is a dearth of reagent consumption data for FGDs, specifically for Indian conditions. Further, the specific reagent consumption would vary with many factors such as particular FGD technology, normative station heat rate, GCV of coal, Sulphur content of coal, purity of reagent, design SO2 removal efficiency of the ECS, stoichiometric molar ratio of reagent consumption etc. Further, the consumption of reagent using the specified formula in the Staff Paper comes to 25% to 30% lower as compared to the guaranteed reagent consumption offered by majority of vendors of wet limestone based FGD. **Therefore, we feel that normative values may have to be**

arrived at after 5 years of operation and during that period the actual consumption values need to be considered.

- Limestone purity depends on the source of limestone over which generating company has absolutely no control. Further limestone with 85% purity would not be available all the time, especially when there will be sudden increase in demand with significant FGD installations. As such, it is requested that no normative limestone purity be mandated under the Staff Paper at this juncture and the same may be reviewed at a later stage.

15. Norms for consumption of reagent – For reduction of emission of oxide of nitrogen *(Annexure-I, 2(2))*

Provision as per Staff Paper:

"(a) For Selective Non-Catalytic Reduction (SNCR) System: The specific urea Consumption of SNCR system shall be 1.2 gm per kWh at 100% purity of urea."

APP's Suggestions:

There is no experience in the country regarding SNCR/SCR and hence instead of notifying norms for reagent consumption without having the actual feedback, it would be prudent if actual consumption of reagent due to SNCR/SCR is monitored and allowed as pass through cost for initial period of 5 years and based on the actual data, norms for the same can be notified subsequently.

16. Additional Submissions:

a. Various State Electricity Regulatory Commissions are yet to issue such guidelines related to implementation of ECS for Sec 62 and Sec 63 projects. **Hon'ble Commission may provide guidance to SERCs for implementation of the same.**

b. It is suggested that a common guideline/ policy on merit order scheduling be considered which can be followed by thermal plants across the country without having the possibility of being backed down on account of having higher ECR due to emission control system expense initially as long as most of the generators have implemented the same for their Generating Station.

Further, such policy/provision in the Regulations will be in-line with the proposed recommendations regarding incentives to Thermal Power Plants for early installation of Pollution Control Equipment given by the Central Electricity Authority vide letter dated 26.09.2018 and Ministry of Power (MoP) direction dated 30.7.2019, issued u/s 107 of the Act to Hon'ble Commission to address similar concern. Key excerpts of the direction u/s 107 of the Act is reproduced below for ready reference:

"3. The Phasing of the implementation of the new environmental norms has been reviewed. Accordingly, it is directed that the impact of operating costs incurred in the implementation of new Environmental Norms shall not be considered for Merit Order Despatch of Coal Based Thermal Power Stations till 31.12.2022. For this purpose, CERC shall advise a methodology of supplementary tariff determination separately from normal tariff so that installation of FGD/other ECS has no bearing on the merit order dispatch till 31.12.2022."

c. Cost recovery may be provided for Lime stone / reagent consumption during an estimated 3 month trial operation of emission control systems prior to declaration of date of commissioning.

d. Currently IPPs with untied capacity earn revenue from such untied capacity through sale of electricity on Power Exchanges. However, this opportunity would be lost during the installation period of ECS which will have a severe impact on debt servicing. Hon'ble Commission is requested to take this into account. Possible solution is to advise the Banks to reduce their debt servicing demand during the ECS installation period to the extent of revenue lost because of sale of power from open market and treat the unserviced component as ECS project loan. After commencement of ECS operation, this component of additional loan shall be repaid from open market revenues and the duration of loan should be same as ECS Loan but at on cost of funds basis.