



A Centre for Science and Environment survey report

INVESTING IN POLLUTION CONTROL

Review of ERC Policies and Procedures



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Acknowledgement: Centre for Science and Environment is thankful to all the officials of State Electricity Regulatory Commissions of—Chhattisgarh, Gujarat, Haryana, Madhya Pradesh, Maharashtra, Punjab, Rajasthan, and Uttar Pradesh, along with the Central Electricity Regulatory Commission (CERC) for participating in survey activity and giving their valuable responses. We would also like to extend our gratitude to **Mr. Palaniappan Meyyapan**, Director, ABPS Infrastructure Advisory Pvt. Ltd. for giving the insights on the regulatory process which is adopted by the various commissions for the cost approval and **Mr. Umesh Bapat**, Tata Power for his inputs on the questionnaire of the survey. Special thanks to **Mr. S.K. Jha**, Secretary, Forum of Regulators (FOR) for sharing his thoughts and giving the crucial inputs which has been used in this report.

An initiative supported by



CSE is grateful to Shakti Sustainable Energy Foundation for their support. Shakti Sustainable Energy Foundation works to strengthen the energy security of the country by aiding the design and implementation of policies that encourage energy efficiency, renewable energy and sustainable transport solutions, with an emphasis on sub sectors with the most energy saving potential. Working together with policy makers, civil society, academia, industry and other partners, The Foundation takes concerted action to help chart out a sustainable energy future for India (www.shaktifoundation.in).



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Citation: Priyavrat Bhati, Rohit Pathania, Pranav Phadke, Siddhesh Hande and Soundaram Ramanathan 2019, *Investing in Pollution Control: Review of ERC Policies and Procedures*, Centre for Science and Environment, New Delhi, January

Published by

Centre for Science and Environment

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Printed at Multi Colour Services

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1. Background

In 2015, India, which has the world's fourth-highest coal-based power capacity, revised its emission norms for the sector.¹ This was done to curb the sharp increase in pollution load from the sector given a massive rise in coal-based capacity in the past ten to 15 years. The new standards for coal-based plants are expected to cut down emissions of particulate matter (PM) by 35 per cent, sulphur dioxide (SO₂) by 80 per cent and nitrogen oxides (NO_x) by 42 per cent over the next decade compared to a business-as-usual scenario (if the norms had not been implemented).

To comply with these norms, additional investments are required to be incurred by power stations to install and operate pollution control equipment. These additional investments will increase the cost of generation and, eventually, result in a tariff hike.

Tariff hikes are approved in India by the electricity regulatory commissions (ERCs). These are Central and state level agencies to which petitions for approval of investments and tariff hikes are made by generation companies (GENCOS).

However, ambiguities exist amongst the ERCs on the provisions under which these additional capital investments for installation of emission control technologies and subsequent tariff revision can be allowed. Additionally, there are variations in the procedures adopted at various ERCs which further complicates the process.

Accordingly, the Central Electricity Regulatory Commission (CERC) and state ERCs sought guidance from the Central government (Ministry of Power) on this matter. In May 2018, the ministry issued directions to the CERC under Section 107 of the Electricity Act, 2003 that the new environmental norms of 2015 qualify as a "change in law" event² - This means that investments in pollution control technologies to meet the 2015 norms will be covered by tariff increase.

This has removed some confusion among the ERCs as well as power plants. After this clarification had been made, it was expected that more tariff revision petitions would be filed by coal-based power plants and will quickly get approved. Filing of more petitions would also provide data on the status of implementation of the pollution norms—more the petitions, more progress towards compliance.

On the ground, however, there seems to be little movement in this direction. Only a few petitions, for capacity totalling about 27 GW (less than 15 per cent of the total installed capacity) were submitted at the Central and state levels. Of these petitions, many have been deferred or rejected. For instance, plants with a cumulative capacity of 13 GW have been directed to get clearance for pollution control technologies from the Central Electricity Authority (CEA).

This highlights the need to understand issues behind delays in filing and approval of petitions and suggest policy improvements or best practices to address them.

In this regard, Centre for Science and Environment (CSE) decided to conduct a survey of ERCs across India. The following were the objectives of the survey:

- To determine the present status of petitions
- Identify the petition process followed by various ERCs to approve emission control technology costs
- Understand the ERCs role in the process of implementation of the norms—cost approvals, monitoring, pushing for meeting timelines, etc.
- Understand the challenges faced by the ERCs in dealing with the subject
- Identify policy and procedural gaps, and suggest corrective steps

2. Methodology

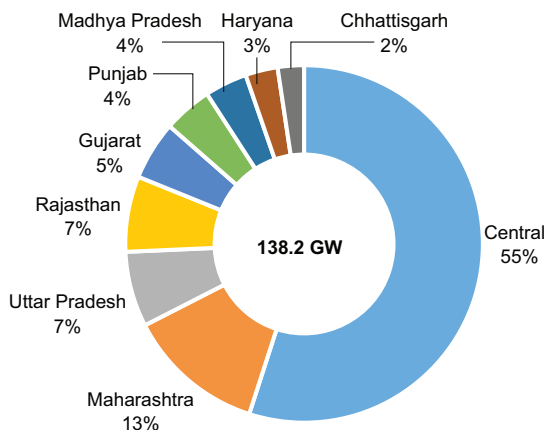
CSE prepared a survey questionnaire in consultation with several industry and regulatory experts. This questionnaire was designed to capture relevant information such as—capacity under governance, procedures followed by the commissions in dealing with additional capitalization and change in law petitions, cost benchmarks used (if any), and the challenges ERCs face while scrutinizing and approving such petitions.

CSE then shortlisted states for the survey across a wide range of total installed capacities. The eight state ERCs finalized for the survey include Chhattisgarh, Gujarat, Haryana, Madhya Pradesh, Maharashtra, Punjab, Rajasthan and Uttar Pradesh—along with the CERC. CSE also sought inputs from the Forum of Regulators (FoR) and the CERC to develop a detailed picture.

As a result, about 138 GW or over two-thirds of the country's installed coal-power capacity was covered under the survey (see Graph 1: *Capacity under jurisdiction of the surveyed ERCs*). We note that a large number of power stations in our sample are inter-state generating stations (ISGS), i.e., they supply power to more than one state and, therefore, come under the jurisdiction of the CERC. In addition, the CERC governs tariffs for Central government-owned generating stations. Moreover, the actions and decisions taken by the CERC often become the guidelines by which state ERCs abide.

We shared our questionnaire with the selected ERCs in advance, and held discussions with top ERC officials—members, secretaries and in-charge directors. CSE developed an understanding of the legal provisions under which petitions are being filed and the regulatory approval processes followed by different ERCs. We also identified the best practices (that could be replicated) and the concerns of the ERCs that need immediate redress.

Graph 1: Capacity under jurisdiction of the surveyed ERCs
CERC has a dominant share



Source: Centre for Science and Environment, 2018

In addition to the questionnaire and meetings, we also collected information from secondary sources such as orders, petitions, detailed project reports, etc. These documents were assessed for:

- Costs estimates in the tariff petitions or orders
- Targeted pollution cuts and specifications of the technology being considered
- The rationale behind decisions (approval/ reserved/ rejection) taken by ERCs

3. Key findings

VARYING PROCEDURES

The meetings with various ERC, revealed that adequate provisions exist under which power companies can file tariff petitions related to the costs of the pollution control technologies. However, different ERCs approach this issue differently; while some ERCs have allowed “in-principle” approval for capital costs as part of capital expenditure or power purchase agreements (PPAs), others cite the absence of the same in their respective tariff regulations and ask plants to first incur expenditure and then approach the commission.^{3,4&5}

While minor variations exist, the approaches adopted by most ERCs can be classified under two broad categories:

a. In-principle approval

In-principle approvals are granted on the basis of the estimated costs provided by the power plants. A power plant approaches the relevant ERC with a petition and supporting documents (detailed project reports, a broad cost-benefit analysis, letter of support from financial institutions for the proposed project etc.) asking for approval of costs and an assurance of tariff increase. The commission may ask for more supporting documents and support from consultants, if deemed necessary. Comments are also sought from distribution companies (DISCOMS), often the primary respondents to the process. The petition may or may not be put out for public comments prior to a hearing by the ERCs. In cases where public comments are invited, they are addressed along with the respondent’s arguments during the hearing.

Plants seek in-principle approval based on two distinct approaches:

1. By citing “change in law” through an additional capitalization clause in the ERCs regulations
2. By invoking the appropriate “change in law” article in their PPAs

In some states, such as Maharashtra, in-principle approvals are explicitly defined in the tariff regulations. Such states also have clearly laid out processes to be adopted in filing the petitions. On the other hand, in states where such explicit clauses are missing from tariff regulations, there are clauses in the PPAs which allow tariff revisions under “change in law”. However, ambiguities exist among ERCs, DISCOMS and GENCOS about what will constitute change in law. This was clarified only in May 2018, when the MoP issued clarification, clearly identifying the 2015 environmental norms as an event qualifying as “change in law”.⁶

In-principle approvals need not result in an immediate tariff hike. States typically will ask power stations to come back after the expense is incurred with all the necessary support documents for final approval (also called “true-up”). At the true-up stage, the commission examines the claims of the companies and then takes a decision on the exact amount. Only one state among those surveyed, Gujarat, allows tariff recovery with immediate effect, starting from the quarter following the one in which the tariff hike was approved. If a difference arises between the initially approved cost and the final capital cost incurred by the power station, the ERC may choose to order capital recovery.

Further, the validity period of in-principle approvals vary across states. In Maharashtra, the validity period has been fixed at one year to put pressure on the power plants to quickly make

progress for project implementation. The approval lapses in case no progress is reported to the Maharashtra ERC, after which the power company has to seek a fresh approval. In states like Chhattisgarh, in-principle approval does not have any time-bound validity. Instead, the ERC seeks an explanation for the delay in project execution.

Out of the nine ERCs that were surveyed, five ERCs used the in-principle approach. They suggested that without regulatory certainty, it would not be possible for petitioners to raise funds required for installation of emission control technologies.

b. Post-facto approval

In the post-facto scenario, the petitioner approaches the commission after incurring the expenditure. The merits of the expenses, provided in a detailed break-up and supported with documentation, are examined through a public hearing. If deemed necessary, more support documentation can be requested by the commission and, with the support of consultants, are scrutinized before the final order is passed. In general, the process of post-facto approvals is followed by all ERCs for relatively small expenditures. However, till now, such additional capital investments have involved only minor upgradations.

Officials from four out of the nine ERCs surveyed stated that they were comfortable with this process. They reasoned that this process forces power plants to be prudent about their expenditures, and they try to install and maintain pollution control equipment at the lowest cost possible. However, they do acknowledge that this process could potentially stall implementation. The officials of these ERCs claim that there is no provision for an in-principle approval in their tariff regulations. In fact, some DISCOMS have opposed petitions for “in-principle” approval on the grounds that the tariff regulations do not allow such approvals.^{7,8&9}

The post-facto approval process is perceived to work well in case of government-owned power stations. Officials of the ERCs in almost all states expressed no reservation in approving the costs for state and central GENCOS under a post-facto approach. However, our discussions with private power companies have revealed their discomfort with this approach. Securing finance is a challenge, as the companies as well as banks are unsure of the amount, or even whether, ERCs will approve the investment. A shortfall can reduce the profitability of the project and poses risk for the banks.

FEW PETITIONS HAVE BEEN FILED

Since December 2015, when the norms were announced, only 27 GW out of the 138.2 GW capacity governed by the surveyed ERCs have petitioned for approval of desulphurization technology system costs, which forms the biggest chunk of the expected control costs (see Graph 2: *Status and timeline of petitions at the surveyed ERCs*). Given the significant investments involved and the impending deadlines, we expected many more power plants would have approached the ERCs. However, few petitions have been filed even after MoP ruling in May 2018 clarified that these costs can be recovered under “change in law” provisions.¹⁰ A majority of the petitions were filed in 2017—very close to the implementation deadline.

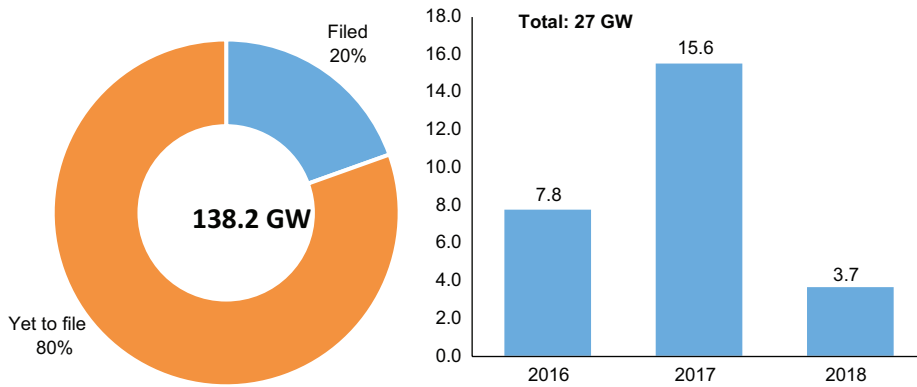
CENTRAL AND STATE GENCOS ADOPTING THE POST-FACTO APPROACH

A significant proportion of installed capacity is owned by public sector companies; very few of these have filed petitions for in-principle approvals with the respective commissions (see Graph 3: *Sector-wise share of in-principle approval petitions filed*).

Many Government-owned power stations, both at the Centre and state owned, are moving ahead with tendering and installation of emission control technologies and will approach commissions for final approvals (true-up) after incurring expenditure. For example, the

Graph 2: Status and timeline of petitions at the surveyed ERCs

Majority of petitions were filed in 2017, very close to the deadline



Source: Centre for Science and Environment, 2018

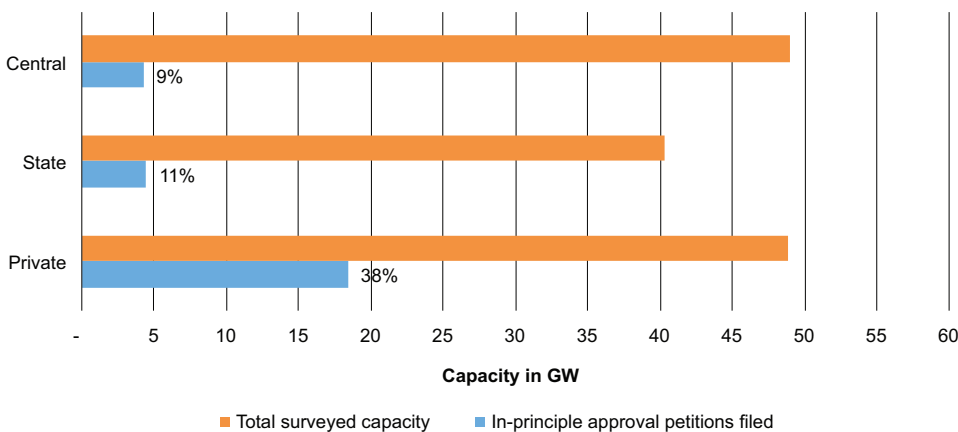
tender for a flue-gas desulphurization (FGD) system was in process at the Anpara power plant of Uttar Pradesh Rajya Vidyut Utpadan Nigam Limited (UPRVUNL), but the company had not filed a petition with Uttar Pradesh ERC. NTPC had approached CERC with petitions for its Singrauli and Sipat power stations; however, it decided to award tenders and sign contracts without prior approvals for some of its power stations, including Dadri and Aravalli power stations in Delhi-NCR. According to power plant officials, such steps are being taken to avoid delays. They say ERCs can be approached later for true-up, as was done by NTPC, Vindhyachal. So far, only state GENCOS of Maharashtra and Haryana have approached their respective commissions to even inform them about FGD costs.

MOST PETITIONS HAVE NOT BEEN CLEARED

Almost all petitions filed from 2016 onwards have been stalled (see Table 1: *Status of filed petitions*). ERC officials said that the reason for this is the absence of a cost benchmark. In some cases, capital costs submitted by the power plants were deemed too high by the

Graph 3: Sector-wise share of petitions filed

In general, state and centre-owned plants have not filed advance petitions



Source: Centre for Science and Environment, 2018

commissions. In a majority of such cases, the petitioning power plants were redirected by ERCs to the CEA for technical clearance, delaying the entire process. While private sector power stations have experienced delays and rejections, even state and central sector power stations have been asked to obtain technical approval of the CEA. NTPC’s petition on Singrauli and Sipat has been directed to the CEA for approval.

However, it is pertinent to note that petitions have been approved by ERCs in the past where an FGD system was installed at a power station before the norms were announced. Most of these plants—NTPC, Vindhyaachal; CLP, Jhajjar; Tata, Trombay, etc.—carried out the installation of FGD system alongside the commissioning of the plant. Moreover, ERCs do have experience and processes in place to assess FGD costs—CERC’s 2013 guidance document on the development of capital cost benchmarks mentions the cost of installation of an FGD system, even proposing a formula for its inclusion in the overall costs.¹¹ This provision can be potentially extended, with suitable modifications, to retrofit plants as well. Nevertheless, as of now, no clearances have been granted to petitions asking for cost approvals for retrofits in existing power stations.

However, the delays are not just due to the requirement of CEA’s technical clearances but also because of bureaucratic processes including demands for additional documents. For instance, several power plant officials have pointed out that there have been delays of more than a year in clearing of petitions filed under the provision of “change in law”.

EMERGING BENCHMARKS

Over the last few years ERCs have approved costs for FGD technology in the range of Rs 20–40 lakh per MW (see Graph 4: Emerging benchmarks for FGD technology). These cost approvals include power stations that had installed the technology (limestone or seawater FGD) even before the 2015 norms were announced. However, most of these plants installed FGD technology as part of greenfield projects, where the costs were accounted for under capital costs.

Most private power stations have quoted relatively high FGD cost estimates. Perhaps, as a result, these plants have been asked by ERCs to obtain approval from the CEA. However,

Table 1: Status of filed petitions

Almost all filed petitions lie stalled

Category	Description	Cumulative capacity (GW)
Approved	These are newly commissioned projects established with an FGD system	2.2
CEA clearance required	These plants have been redirected by ERCs to the CEA for obtaining technology clearance	12.8
Additional documentation required	These plants have been asked to file more documentation (e.g. emissions data, clarifications, etc.)	9.7
Under scrutiny	In the case of these plants, the relevant commission is reviewing the petition and supporting documents	2.3
Total		27

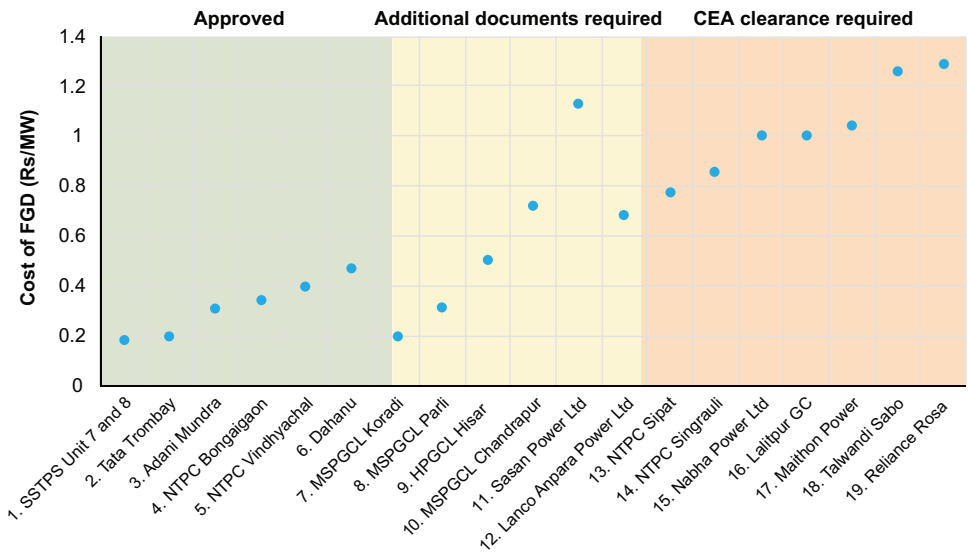
Source: Centre for Science and Environment, 2018

even that has not ensured that the project receive an in-principle approval. It is to be noted that the chances of delays with the ERCs increase when the cost quoted by petitioners crosses 0.5 crore/MW.

The third category of plants are ones that have been asked by ERCs to submit additional documents. These quoted moderate cost estimates in their petitions. Most of these plants are state owned.

Graph 4: Emerging benchmarks for FGD technology

Private power stations have given relatively high FGD cost estimates



Source: Centre for Science and Environment, 2018

4. Challenges identified by ERCs

Cost benchmarking: Officials of a majority of the surveyed ERCs acknowledge that costs would differ significantly between one power plant and another. Despite that, benchmark costs are considered highly desirable. ERC officials reason that guiding costs give them confidence to scrutinize petitions.

This is a flawed idea. Each project's technology requirements will inevitably be unique. This will lead to significant variations in cost estimates across projects. Thus, benchmarks will set hurdles in the process of clearances—variations may well complicate the clearance process. Higher costs compared to a benchmark, even if justifiable, may be rejected.

Technology assessment: Officials of all the ERCs have expressed a lack of understanding of the technologies themselves, and cited this as another reason for the requirement of technical clearance by the CEA. This has also led to ERCs asking for additional documentation, leading to further delays in the implementation process at the power stations.

In the absence of a benchmark cost, CEA's approval of technology is considered an appropriate step by almost all ERCs. This approach could lead to significant delays in implementation since the technical approval process may drag on for years. To provide technical clearance for every project, CEA will require huge manpower which it doesn't have.

Conflicting consumer interests: ERCs believe that their main goal, which stems from political and public pressure, is keeping the consumer tariffs low. They are therefore reluctant to approve additional investments which will result in higher tariffs. ERC officials do concede that air quality affects consumers, however they believe that consumers don't support tariff increase to install pollution control technologies. ERCs should not be delving into the rationale for pollution control or if consumers want it. Instead, they need to ensure that the investment, which is required by law, is of the right amount.

Officials also believe that the cost estimates submitted in petitions are very high compared to possible numbers. For the same reason, DISCOMS are opposing the petitions of power companies in many states. In fact, in all stalled cases, DISCOMS have opposed additional capitalization, reasoning that the responsibility of bearing the cost lies solely with the power generating company.¹² Differences of opinion on this subject have come up during regional power committee meetings as well.¹³

Assurance on operation of equipment: Officials of three of the surveyed ERCs raised concerns around the operation of the pollution control equipment, post commissioning. These officials would like to have some kind of assurance on the operation of equipment

from power plants, in terms of cuts in emissions as stated in tariff applications. This stems from the concern that consumers should not end up paying for equipment that is not even operated, defeating the very purpose of the exercise.

Role of ERCs: Officials of almost all ERCs say that their role is limited to ensuring that tariffs are kept reasonable. They do not see any role for themselves in the implementation of the norms, but consider it, as the responsibility of state pollution control boards and environment departments. While this is true, indifference on the part of ERCs towards timely approval of tariff petitions for installation of pollution control technologies is leading to delays in implementation. ERC officials need to be more proactive in granting approvals and pass-through tariffs at later stages swiftly to ensure that thermal power stations are compliant with environmental standards in a timely manner.

5. The way forward

CSE's survey has revealed that even as companies are yet to file petitions for cost approvals, ERCs are also adopting a wait-and-watch approach due to the various reasons enumerated in the previous sections. This will inevitably lead to significant delays in the implementation process. A series of steps are needed to get things moving:

- **In-principle approvals should be accorded:** The officials of the CERC and several ERCs maintain that there is no provision of in-principle approval for additional capitalization in their present tariff regulations. However, some states, such as Maharashtra, Rajasthan and Gujarat, already have in-principle approval processes in place to deal with this matter. This can be a template for the CERC and other state ERCs to consider for their new tariff regulations for the period 2019–24.

One of the regulatory pathways available for consideration to the power companies is the invocation of provisions of “change in law” under the Electricity Act alongside the relevant clause (article 13) within their PPAs to obtain in-principle approval. Now that MoP has issued a clarification on it, in-principle approvals can be granted through this pathway. This pathway was also adopted by the CERC while granting tariff increments on pollution control technology costs for Adani, Mundra power station, though it was not the case earlier. However, some states, notably Uttar Pradesh, have not given approvals under such a PPA approach, and have asked power stations to adopt a post-facto approach instead.

It is only natural to expect that power stations, especially privately owned or managed ones, would want an assurance on recovery before investing significant amounts. Government-owned power stations may follow a different path, but in the case of private power stations, banks and other financial institutions, require some assurance of repayment, at the very least.

- **A separate clause for approval of emission control technology costs should be incorporated in tariff regulations:** To avoid ambiguity in the process going forward, a separate clause for emission control technology costs should be incorporated in tariff regulations of the CERC and ERCs. Several ERCs are already in the process of developing tariff regulations for the new control period (2019–2024), and such provisions should be included in the regulations. This can help achieve greater clarity within the regulatory process. In fact, draft tariff regulations released by the CERC for 2019–2024 discusses a need for developing a tariff mechanism for pollution control technologies.¹⁴ Also, if stricter standards are introduced in the future, the confusion over the applicability of the appropriate provision of law would arise again.

A precedent to establish a separate clause on a specific issue was established when a renovation and modernization clause was introduced in the CERC regulations for the period 2009–14, and was subsequently adopted in all state ERC tariff regulations.

- **Avoid the bottleneck of technical clearances by involving relevant stakeholders:** A major concern is the delay in the final approvals due to the technical clearance being sought from the CEA in some cases. Thermal plants with a cumulative capacity of about 13 GW have been redirected towards the CEA by the CERC and state ERCs. This number will increase as more plants start to file petitions, given that regulatory commissions seem

AUTOMATIC ADJUSTMENT CLAUSE

In United States, environmental compliance costs are covered under the automatic adjustment clause (AAC), as these investments are considered to be beyond the discretion of the GENCO in question. Under Section 115 of Public Utility Regulatory Policies Act of 1978, the AAC is defined as:

A provision of a rate schedule which provides for increases or decreases (or both), without prior hearing, in rates reflecting increases or decreases (or both) in costs incurred by an electric utility. Such a term does not include any rate which takes effect subject to refund and subject to a later determination of the appropriate amount of such rate.

This clause has helped power companies to move away from the practice of filing for approval for the frequently changing costs (or those beyond their control), especially the costs incurred in implementing approved environmental compliance plans. Eleven states allow rate adjustment for environmental costs under this provision. The process of true-up takes place regularly without any approvals. The utility is subject to after-the-fact auditing at a later stage.

The Act also restricts the usage of this clause by the state regulatory authority to once in four years to provide incentives for efficient use of resources, or once in two years to ensure maximum economies in operation of the utility and purchase of equipment.

A good example of this clause's utilization can be seen in the state of Alabama. The Alabama Power Company, an integrated utility, used the AAC provision in 2016 for its five year environmental compliance plan, providing yearly projected costs for operation and maintenance activities to comply with the plan. This was accepted by the Alabama Public Service Commission.

to prefer this solution. The CEA should not necessarily be the focal point for clearances or benchmarks as this could lead to significant delay in implementation.

Ideally, the ERCs should be undertaking such assessments in-house, with the help of consultants and follow similar processes that they are currently adopting for ESP upgradations. For instance, in majority of ERCs the cost proposal submitted for ESP upgradation by the petitioners is weighed on its own merits and subsequently adjudicated. The process involves submission of the technical and financial proposals.

It is pertinent to note here that ERCs have approved costs of FGDs in the past too, especially in the case of newly commissioned units (see Graph 6: Emerging benchmarks – FGD). CERC also had created tools for accounting FGD costs back in 2013¹⁵. It therefore is reasonable to ask the ERCs to adopt similar processes for approval of these technologies.

Additionally, ERCs can involve other relevant stakeholders in the matter to verify costs:

- a. DISCOMs and independent consumer interest organizations should be brought onboard to thoroughly examine the documentation. This is usually done in several states for tariff petitions, and the procedure can be extended in these cases too. DISCOMs are already respondents in tariff petitions while comments from consumer interest organizations are anyway sought on tariff petitions in several states, and so it will merely be an expansion of both their roles. Moreover, both these groups would want tariffs to be least impacted and so it is in their vested interest to ensure prudent expenditure.
- b. ERCs should also consult State Pollution Control Boards (SPCBs) to obtain and understand plant emissions data. This can be used to establish a cost benefit analysis and appropriateness of technology. For instance, Punjab ERC asked the Punjab PCB for support in understanding emissions data submitted by petitioners.

PCB officials can also regularly update ERCs about plants emission levels. This can enable ERCs to verify if the pollution control equipment's are being operated or not when accounting for a plant's operation and maintenance costs during true-up.

- **Set deadlines for submission of tariff petitions and penalize delays in their filing:** Deadlines for implementation of the norms have been set by the Central Pollution Control Board (CPCB). However, about 76 per cent of the surveyed capacity has still not approached ERCs to file petitions for approval of emissions control technology costs. Therefore, deadlines should be set for intimation of costs to regulators or filling of cost approval petitions by power stations, and these should be aligned with the CPCB implementation timeline. In this manner, pressure can be put on power stations to approach ERCs at the earliest.

Officials of all surveyed ERCs stated that power plants should ideally consult regulators and intimate them about costs. This helps to get greater buy-in with the ERCs, improving transparency. ERCs can ask plants to file petitions as per a fixed schedule (see Table 2: *Schedule for intimating regulators*) or intimate them about costs. Failure on the part of power companies to file petitions within time should certainly be penalized in some manner by asking them to file post-facto petitions at a later stage. Another strategy to push power companies to act quickly can be to tie an in-principle approval's validity period with implementation action, as is the case in Maharashtra. In such cases, failure to take any action within a period of one year should lead to the lapse of the in-principle approval.

- **Safeguarding consumer interests:** While tariff hikes are unavoidable due to the implementation of emissions control technologies, information about the health and environment benefits arising due to these technologies must be widely disseminated. This will help the sector get buy-in for the tariff hike.
- **Capacity building:** Since many ERCs have expressed lack of understanding regarding the technologies themselves, capacity building of ERC officials on the nature of these technologies and the associated costs is extremely important. There is an urgent need to address the lack of information surrounding the costs of pollution control technologies, their impact on tariff and the overall benefits of these technologies.

Table 2: Schedule for intimating regulators

Implementation deadline	Petition submission (FGD)
Prior to June 2021	Should have already intimated costs to ERCs
September 2021	January 2019
December 2021	April 2019
March 2022	July 2019
June 2022	October 2019
September 2022	January 2020
December 2022	April 2020

Note: FGD documentation and procurement process takes eight months while actual construction takes 24 months
Source: CSE

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