**Comments on the Second Project Design Document and Application for Validation after Rejection of Registration by CDM Executive Board**

***GHG Emission Reductions through grid connected high efficiency power generation, Coastal Gujarat Power Ltd., India***

**July 12, 2011**

CDM Watch and the Sierra Club respectfully submit the following comments on the *Project Design Document (PDD)* for *GHG Emission Reductions through grid connected high efficiency power generation.* We thank the CDM Executive Board and Designated Operating Entity (DOE), Bureau Veritas Certification Holding SAS, for recognizing the integral role of transparency in the CDM validation process, and for taking this comment into consideration.

This project is not appropriate for validation for three reasons. First, the project will generate at least 22 million tons of carbon dioxide pollution per year, and is likely to be the largest single source of emissions in India.[1] CDM support for such a high-polluting project is contrary to the overarching objectives of the CDM. Second, it is plainly non-additional and ineligible for support under CDM rules. Quite simply, this project will be completed using supercritical technology regardless of whether the CDM provides support. Third, the Executive Board has previously rejected this project for registration, and the PDD presents no compelling evidence for the validator to disregard the Executive Board's original conclusion and issue a positive validation this time around.

If approved, this Project would lead to the issuance of 41,486,710 excess Certified Emissions Reductions (CERs) that do not represent additional emissions reductions, and would give the project participant an undeserved windfall on the order of € 500 million (based on current CER prices). Validation of such a high-emitting project that has already been rejected for registration by the CDM Board, and that manifestly fails to meet CDM additionality and other eligibility requirements, would seriously undermine the credibility of both the validator and CDM process more generally.

We are confident that after a rigorous examination of the *PDD* and other project documents, you will agree with the Executive Board's original rejection and will decline to validate this project. However, should you afford the project proponent the opportunity to provide clarifications or corrective action, we respectfully request that stakeholders be given the

[1] $CO_2$ Scorecard, *Tata Mundra: Potentially among the Top $CO_2$ Emitters in India*, 9 June 2011, *available at* http://www.co2scorecard.org/home/researchitem/20 .

opportunity to comment on any further submissions.[2] Otherwise, the project proponent would benefit from filing an inadequate PDD by avoiding public scrutiny of key elements of its proposal.

## SUMMARY OF COMMENTS

The project activity, as presented in the PDD, is not eligible for validation under ACM0013 ver.4, the *Additionality Tool*, and other CDM tools and guidelines, for the reasons outlined below:

### Additionality

1. CDM support will not catalyze additional emissions reductions because the Government of India has required the project to use supercritical technology.

2. The Executive Board has already refused to register this project because the project proponent failed to evaluate alternative tariff structures that would allow the project to achieve adequate returns without CDM support. The new PDD does not fix this problem.

3. The Executive Board has previously refused to register this project because all of its financing is already in place and does not depend on CDM support.

4. The project proponent has demonstrated by nearly completing the project after it was rejected for registration that it does not need CDM support to proceed, and has not informed its shareholders that the failure to secure registration would pose any material financial risks to the project.

5. The PDD does not adequately demonstrate that the use of supercritical technology will lead to additional $CO_2$ reductions.

### Baseline assessment

6. Supercritical technology has become the technology of choice for new large-scale coal-fired power plants in India, and therefore is a more appropriate baseline than subcritical coal technology.

7. The PDD fails to adequately assess other "realistic and credible" baseline scenarios.

[2] *CDM Validation and Verification Manual, Ver. 1.2, EB 55 report, Annex 1,* at 9, para. 42.

## Investment analysis

8. The investment analysis is incomplete and fails to provide the data and assumptions necessary for a reader to reproduce the results.

9. The sensitivity analysis improperly advantages inefficient subcritical technology by using an unrealistically narrow range of fuel price variation.

## CER calculation

10. The project proponent has artificially inflated the number of CERs it is seeking by misapplying the formula prescribed by ACM0013. This was corrected by the DOE in the original submission and is now the second time this error has been made.

## COMMENTS

## Additionality

1. **CDM support will not catalyze additional emissions reductions because the Government of India has required the project to use supercritical technology.**

### Applicable rules

A project cannot be additional if it is "the only alternative amongst the ones considered by the project participants that is in compliance with mandatory regulations…"[3]

### Discussion of non-compliance

The Government of India has mandated that all Ultra-Mega Power Projects (UMPPs) use supercritical technology.[4] This stipulation is *not* contingent upon the receipt of CDM credits.[5]

[3] *Tool for the demonstration and assessment of additionality, Ver. 5.2, Annex: Guidance on the Assessment of Investment Analysis*, at 5.
[4] Government of India, Ministry of Power, *Ultra Mega Power Projects*, at 1. *available at* http://www.powermin.nic.in/whats_new/pdf/ultra%20mega%20project.pdf ; *see also*, TÜV Rheinland, 2011. *Validation Report for the CDM Project Activity: Greenhouse Gas Emission Reductions Through Super Critical Technology - Jharkhand Integrated Power Ltd. (Validation Report)*, at 41, 72 ("the project developer is required to implement the project with super critical technology only.")
[5] *Id.*

The requirement that UMPPs use supercritical technology was recognized in the original *Validation Report.*[6] Under the terms of the Request for Proposal and the transfer of the Special Purpose Vehicle, then, the project proponent is contractually obligated to use supercritical technology. Given that the project proponent must use supercritical technology, the use of that technology cannot be said to generate additional emissions reductions.

**Conclusion**

Because supercritical technology is "the only alternative…that is in compliance with mandatory regulations…",[7] the project activity is not additional and not eligible for validation under CDM rules.

2. **The Executive Board has already refused to register this project because the project proponent failed to evaluate alternative tariff structures that would allow the project to achieve adequate returns without CDM support. The new PDD does not fix this problem.**

**Applicable rules**

The *Additionality Tool* requires the project sponsor to fully consider the "project without CDM support" alternative.[8] Applying this rule, the CDM Executive Board previously refused to register this project, concluding that the project sponsor had not demonstrated additionality because it "had not considered a tariff that would enable it to achieve its ROE benchmark and implement the project activity without considering CDM revenues…."[9]

**Discussion of non-compliance**

[6] Det Norske Veritas, 2008. *Validation Report: GHG Emission Reductions through grid connected high efficiency power generation in India*, at 14.
[7] *Tool for the demonstration and assessment of additionality, Ver. 5.2, Annex: Guidance on the Assessment of Investment Analysis*, at 5.
[8] *Tool for the demonstration and assessment of additionality, Ver. 5.2, Annex: Guidance on the Assessment of Investment Analysis*, at 5.
[9] http://cdm.unfccc.int/Projects/DB/DNV-CUK1254830678.73/Rejection/IWNNWJIB1G6WAG6F9RW59N3AOLQEXP , See also, *Final Ruling Regarding the Request for Registration of Rincon Verde LFGTE Project (3432)* ("The DOE (TUEV Rheinland) has failed to substantiate additionality of the project activity, in particular, the suitability of … the electricity tariff assumed in the PDD… The (insufficiently justified) tariff is a significant component in determining the additionality of the project activity, and with a 10% increase in the electricity tariff, the IRR for the project activity crosses the benchmark ….")

The second PDD does not rectify the shortcomings of the original PDD. The project proponent continues to decline to evaluate alternative tariff structures, contending that its tariff "was optimized by the PP so as to increase its chances of winning the project after factoring the CDM."[10] Thus, the project proponent concedes that it has used the possibility of CDM support to subsidize its proposed tariff rate so it could outbid its competitors, and not to catalyze additional emissions reductions.[11] This is not an appropriate use of CDM support. There is no mandate for CDM credits to be used for one project bidder to gain competitive advantage over another, and the CDM should be indifferent as to which qualified bidder wins any given project. Rather, the relevant question from the CDM's perspective is whether another bidder could have come forward with a bid that earned reasonable returns without CDM support. If so, the "project without CDM support" alternative is viable, and the project should not be registered.

**Conclusion**

By failing to consider alternative tariff structures that would improve the project's returns without the use of CDM revenue, the project sponsor still fails to meet its obligation to evaluate the "project without CDM support" alternative.

**3. The Executive Board has previously refused to register this project because all of its financing is already in place and does not depend on CDM support.**

**Applicable rules**

In its rejection of this project's previous request for registration, the Executive Board concluded that Coastal Gujarat and the DOE had failed to substantiate barriers to investment, because the project had secured financing after the project's start date, but did not "clearly indicate that the lenders have taken into account the CDM registration of the project activity."[12] This decision is in accordance with previous decisions by the Executive Board that have found that the availability of CDM credits must actually influence the decision to proceed in order for a project activity to be considered additional. In particular, the Executive Board has refused to

[10] *PDD*, at 34.
[11] *Id.*
[12] *Review of Project Activity: GHG Emission Reductions through grid connected high efficiency power generation* (3020), *available at* http://cdm.unfccc.int/Projects/DB/DNV-CUK1254830678.73/Rejection/IWNNWJIB1G6WAG6F9RW59N3AOLQEXP

register a project where the project proponent failed to substantiate that support from the CDM was a "necessary element" of the decision to invest.[13]

**Discussion of non-compliance**

The new PDD offers no evidence to support a different decision this time around. The project still has all the necessary financing and is proceeding apace without CDM support. The Coastal Gujarat project achieved financial closure in April 2008,[14] and Tata Power has subsequently assured its investors that "[t]he Company has completed all pre-disbursement conditions in the financing agreements and has been receiving loan disbursements from the lenders as per the funding plan."[15] The new PDD makes no claim that this financing has now somehow been made contingent upon the registration of the project after its initial rejection.[16]

Moreover, given that Coastal Gujarat is a special purpose company and that its creditors have limited recourse, the fact that the creditors did not condition disbursement upon the receipt of CDM support, or add any contingencies in the event such support was not forthcoming, is compelling evidence that they did not believe that CDM credits were a "necessary element" of the financial package,[17] or that the failure to gain credits would threaten the viability of the project. Their understanding of the non-additionality of CDM support creates a high burden on the part of Coastal Gujarat to demonstrate that CDM support really was essential. The PDD is entirely devoid of such evidence.

**Conclusion**

[13] *Review of Project Activity: Hot air generation using renewable biomass fuel for spray drying application at H. & R. Johnson (India) Ltd, Kunigal* (1545), *available at* http://cdm.unfccc.int/Projects/DB/TUEV-SUED1200568517.44/Rejection/DYSTHYWLL9HIB9ELS1BBWMTPUZIEPE; *see also Review of Project Activity: Optimization of steam consumption in the process by installation of free flow falling film finisher evaporator and retrofit to the chemical recovery boiler in Cachar Paper Mill of Hindustan Paper Corporation Limited* (1475), *available at* http://cdm.unfccc.int/Projects/DB/DNV-UK1197870388.18/Rejection/MAXJNK4XZBW732JI3W56I249GFEQE3; *Review of Project Activity: Koppal Green Power Limited Biomass Power Project* (1383), *available at* http://cdm.unfccc.int/Projects/DB/TUEV-RHEIN1192092174.11/Rejection/GTIP8G67K2EUKEQVRK61J17A5GXR0U

[14] Tata Power, 2008. *Annual Report 2007-2008*, at 30.

[15] Tata Power, 2009. *Annual Report 2008-2009*, at 18.

[16] *PDD*, at 34.

[17] See, *Review of Project Activity: Hot air generation using renewable biomass fuel for spray drying application at H. & R. Johnson (India) Ltd, Kunigal* (1545), *available at http://cdm.unfccc.int/Projects/DB/TUEV-SUED1200568517.44/Rejection/DYSTHYWLL9HIB9ELS1BBWMTPUZIEPE (project proponent must show that the benefits of the CDM were a "necessary element" of the decision to invest in order to prove additionality).*

As with the first request for registration, the fact that financing for the project does not depend on CDM support should be fatal to the claim of additionality. The Executive Board's original decision should stand.

**4. The project proponent has demonstrated by nearly completing the project after it was rejected for registration that it does not need CDM support to proceed, and has not informed its shareholders that the failure to secure registration would pose any material financial risks to the project.**

**Applicable Rules**

The Executive Board that found that the availability of CDM credits must actually influence the decision to proceed in order for a project activity to be considered additional. In particular, it has refused to register projects where the project proponent did not substantiate that support from the CDM was a "necessary element" of the decision to invest.[18]

**Discussion on non-compliance**

***By nearly completing the project after it was rejected for registration, the project sponsor has proven that it does not need CDM support to proceed.*** For most projects that seek CDM registration, the assessment of additionality is challenging because it requires close consideration of the counterfactual scenario. The DOE and Executive Board must determine whether the emissions reductions would be realized in the absence of CDM support. Here, however, that is not the case. We know exactly what would happen to the project if CDM credits were not available, because the Executive Board has already rejected the project proponent's first request for registration. If CDM support really was essential to the implementation of the project, the rejection would have been a serious setback for the project, or would have derailed it entirely.

In fact, the project has moved forward without a hitch. No funding was cancelled, no contracts were terminated, and no delays of any kind were recorded. During the year in which the proponent had no expectation of receiving CDM credits, about a quarter of the project was constructed,[19] and it is now about 83 percent completed.[20] The first unit is slated to come online

[18] *Review of Project Activity: Hot air generation using renewable biomass fuel for spray drying application at H. & R. Johnson (India) Ltd, Kunigal* (1545), *available at* http://cdm.unfccc.int/Projects/DB/TUEV-SUED1200568517.44/Rejection/DYSTHYWLL9HIB9ELS1BBWMTPUZIEPE;
[19] Tata Power, 2010. *Annual Report 2009-2010*, at 22.

in September, a year ahead of schedule.[21] Key tests of two other units have already been completed, and all units are proceeding on schedule. The entire facility is expected to be operational in 2013.[22] The fact that the project has come so close to completion after registration was rejected is irrefutable evidence that it will be completed using supercritical technology, regardless of whether or not the project is eligible to receive CERs. Accordingly, it is not additional and should not be eligible for registration.

***The project sponsor has never informed its shareholders that the failure to earn CDM credits would be a material financial risk to the project.*** Tata Power, the owner of Coastal Gujarat, has consistently told its shareholders that all financing for the project is in place, and has never warned them that the failure to have the project registered would pose any material financial risk to the project.[23] Even after the original request for registration was denied, the sponsor did not inform shareholders of any adverse impact on the project.[24] For example, in a May 2011 statement, the Chairman of Tata Power alerted shareholders to issues that could affect "the recoverability of the carrying amount of the Project," but did not mention the Project's failure to gain CDM registration, and concluded that "no provision for diminution in value is considered necessary in respect of the Company's long-term investment in CGPL."[25] Surely, if CDM support really were critical to the success of the project, Tata Power and its auditors would have recognized that the failure to have the project registered was a material risk and disclosed it to their shareholders.

## Conclusion

The project sponsor's demonstrated commitment to completing the project after its request for registration was rejected, coupled with its failure to warn shareholders that CDM support was integral to the project, make clear that this project does not depend on CDM support and is non-additional.

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[20] Tata Power, 2011. *Investor Presentation July 2011*, at 16, *available at* http://www.tatapower.com/investor-relations/pdf/investor-presentation-july-2011.pdf

[21] *Id.*; Tata Power, 2008. *Annual Report 2007-2008*, at 18.

[22] Tata Power, 2011. *Investor Presentation July 2011*, at 16, *available at* http://www.tatapower.com/investor-relations/pdf/investor-presentation-july-2011.pdf Tata Power, 2008. *Annual Report 2007-2008*, at 18.

[23] See Tata Power, 2010. *Annual Report 2009-2010*, at 22, 40; Tata Power, 2009. *Annual Report 2008-2009*, at 18.

[24] Tata Power, 2010. *Audited Financial Results for the Quarter/Half Year Ended 30 September 2010, available at* http://www.tatapower.com/investor-relations/pdf/fy11-Q2-financial-results-30th-sep-2010.pdf; Tata Power, 2010. *Audited Financial Results for the Quarter/Nine Months Ended 31 December 2010, available at* http://www.tatapower.com/investor-relations/pdf/fy11-Q3-financial-results-31st-dec-2010.pdf; Tata Power, 2011. *Audited Financial Results for the Year Ended 31 March 2011, available at* http://www.tatapower.com/investor-relations/pdf/annual-results-31-march-11.pdf .

[25] Tata Power, 2011. *Audited Financial Results for the Year Ended 31 March 2011*, at 3, *available at* http://www.tatapower.com/investor-relations/pdf/annual-results-31-march-11.pdf .

5. **The PDD does not adequately demonstrate that the use of supercritical technology will lead to additional $CO_2$ reductions.**

**Applicable rules**

In order to demonstrate that the project activity will deliver real, additional emissions reductions, the PDD must show that it "uses a more efficient power generation technology than what would otherwise be used with the given fossil fuel category."[26] If the PDD cannot demonstrate that the project activity will have an emission rate below the selected baseline scenario, the project activity should not be considered to produce emission reductions.[27]

**Discussion of non-compliance**

The amount of $CO_2$ emissions that will be released from a given coal-fired unit can vary widely depending on a number of site-specific factors. These include coal quality, heating value, site conditions, condenser pressure, plant design, and the addition of pollution control equipment such as FGD or SCR.[28] Of these factors, variability in the coal used poses a particular challenge in predicting the $CO_2$ emissions factor of an individual coal plant. Coal can vary in quality and characteristics even for coal of the same category.[29] This makes it impossible to predict an exact amount of $CO_2$ emissions for supercritical technology unless the project was mine mouth or pithead utilizing coal from the exact same source year after year.[30] For example, an individual unit can fluctuate anywhere between 0.86 tons $CO_2$/MWh to 1.01 tons $CO_2$/MWh depending upon a variety of factors including coal quality.[31]

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[26] *ACM0013, Ver. 4.0*, at 2.
[27] *Id.*, at 4.
[28] US EPA, *Available and Emerging Technologies for Reducing Greenhouse Gas Emissions from Coal Fired Electric Generating Units*. *available at*: http://www.epa.gov/nsr/ghgdocs/electricgeneration.pdf; Chikkatur and Sagar, 2007. *Cleaner Power in India: Towards a Clean-Coal-Technology Roadmap*, at 192.
[29] Jahar Roy et al., 2008. *Predictive equations for $CO_2$ emission factors for coal combustion, their applicability in a thermal power plant and subsequent assessment of uncertainty in $CO_2$ estimation*.
[30] *Id.*
[31] $CO_2$ Scorecard. *The World Bank's Coal Electricity Headache*. *available at* http://www.co2scorecard.org/home/researchitem/19#_ftn2

Other site-specific factors are also important determinants of unit efficiency. For instance, higher water temperatures used for cooling purposes in countries like India can reduce efficiencies by as much as 3 percent.[32] This efficiency reduction can make a significant difference in overall efficiency and therefore $CO_2$ output.[33]

Taken together, these factors can cause supercritical units to operate far below predicted levels, and can even eliminate the operational efficiency advantages of supercritical over subcritical technologies. For instance, Sipat, the first supercritical unit in operation in India, only delivered an efficiency of 33.8 percent-- marginally lower than the best sub-critical plants. More importantly, it had a *higher* $CO_2$ output (96kg/kwh) than the best subcritical plant.[34] Similar findings have emerged from the longer track record of supercritical plants in the United States.[35] Despite using far higher quality coals, many US supercritical plants operate at efficiencies far worse than the PDD's stated benchmark of .944 tons of C02/GWh[36].

**Conclusion**

While supercritical combustion is, on average, a more efficient technology, it does not always outperform subcritical alternatives. Whether or not the project activity will actually deliver reduced emissions will depend on a variety of site-specific factors. Accordingly, the PDD's claim that the project activity will achieve quantifiable emissions reductions over sub critical technology cannot be substantiated without fine-grained, site-specific data, which the PDD is decidedly lacking.

**Baseline Assessment**

**6. Supercritical technology has become the technology of choice for new large-scale coal-fired power plants in India, and therefore is a more appropriate baseline than subcritical technology.**

**Applicable rules**

[32] Chikkatur and Sagar, 2007. *Cleaner Power in India: Towards a Clean-Coal-Technology Roadmap*.
[33] *Id.*
[34] Center for Science and Environment, 2010. *The Challenge of the New Balance*, at 35.
[35] $CO_2$ Scorecard. *The World Bank's Coal Electricity Headache. available at* http://co2scorecard.org/home/researchitem/19
[36] http://www.alstom.com/power/resources/brochure/iatan-us-920mw-advanced-supercritical-boiler/

In order to identify alternative baseline scenarios under *ACM0013*, the PDD must analyze "all possible realistic and credible alternatives" including "the proposed project activity without CDM benefits."[37] As part of this analysis, the PDD must "[e]nsure that all relevant power plant technologies that have recently been constructed or are under construction or are being planned (e.g. documented in official power expansion plans) are included as plausible alternatives."[38] If the PDD proposes a baseline scenario that is different from the power plant technologies that have recently been constructed or are under construction or are being planned, it must justify this apparent discrepancy.[39]

**Discussion of non-compliance**

The Baseline Assessment in the PDD does not adequately assess whether the use of supercritical technology without CDM benefits is a "realistic and credible alternative." As a threshold matter, while the PDD implies that supercritical combustion is risky and unproven,[40] it is actually a quite mature and well-established technology. Supercritical processes have been in commercial use since the 1960s and have achieved broad and deep global penetration. There are now over 500 supercritical units in operation worldwide,[41] representing more than 20 percent of installed units.[42]

More importantly, the Baseline Assessment fails to consider the extent to which supercritical plants have "recently been constructed or are under construction or are being planned" in India. A proper review of the deployment of supercritical technology in India would have shown that (1) India is already rapidly adopting supercritical technology, with about 40 supercritical projects that are operational or in various stages of development; and (2) supercritical technology will continue to rapidly gain market share without CDM support due to operational advantages, economic and sectoral drivers and government policies. The Baseline Assessment makes no effort to discuss these trends, or to explain the discrepancy between the proposed subcritical baseline and the stream of supercritical projects under development as required under *ACM0013*.[43]

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[37] *ACM0013, Ver. 4.0*, at 3.
[38] *Id*.
[39] *Id.*, at 4.
[40] *PDD*, at 5.
[41] Qingshan Zhu, 2005. *Clean coal technology– Gasification vs. (pulverized coal) combustion*, at 4. *available at* http://www.interacademycouncil.net/Object.File/Draft/10/338/0.pdf
[42] World Bank, 2008. *Clean Coal Power Technology Review: Worldwide Experience and Implications for India*, at 2. *available at* http://moef.nic.in/downloads/public-information/LCGIndiaCCTjune2008.pdf
[43] PDD, at 17.

***India is turning away from subcritical technology and is already rapidly deploying supercritical units.*** As the original DOE noted, since the partial deregulation of the power sector in 2003, the private sector has only invested in 1120 MW of subcritical coal generation in all of India.[44] By contrast, as of 2010, India had 37 supercritical units between 660 MW and 800 MW under construction, with a combined generating capacity of 26 GW.[45] (see Appendix I). At least two units have come online in the last 6 months, and at least 8 more with a capacity of 5280 MW are slated to begin operations in the next year.[46] The Government of India has also mandated supercritical technology for the "ultra-mega power projects" (UMPPs), a series of 14 projects (including Coastal Gujarat) that each have a minimum capacity of 4 GW. So far, four of the planned UMPPs are in various stages of development.[47] Going forward, about 60 percent of the 75 GW of thermal power contemplated in the 12th Five-Year Plan is expected to be supercritical,[48] as well as 100 percent of new coal-fired plants in the 13th Five-Year Plan.[49] Supercritical units are likely to contribute up to 50 GW by 2020.[50]

Other power plant operators in India such as the National Thermal Power Corporation (NTPC) and CPL are rapidly embracing supercritical technology. CPL entirely renounced subcritical technology in 2009. At that time, its Managing Director stated that "We will not build subcritical coal-fired power plants, and believe no one else should. We should move towards supercritical and, in due course, ultra-supercritical (USC) technology, to reduce the carbon intensity of generation."[51]

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[44] Det Norske Veritas, 2010. *Response to request for review "GHG Emission Reductions through grid connected high efficiency power generation"*, at 12-13.

[45] International Energy Agency, 2011: *Technology Development Prospects for the Indian Power Sector*, at 46. *available at* http://www.iea.org/papers/2011/technology_development_india.pdf

[46] "Media Release: Adani Power Synchronizes Country's First supercritical 660 MW unit at Mundra", December 23, 2010, *available at* http://www.adanipower.com/Data/APLMediaReleasefirst660Unit.pdf; "Barh 1 and II, 3,300MW Coal-Powered Plant Barh, India," http://www.power-technology.com/projects/barh-coal/ ; "NTPC's first supercritical tech unit commissioned," *iGovernment*, February 24, 2011, *available at* http://www.igovernment.in/site/ntpc%E2%80%98s-first-supercritical-tech-unit-commissioned-39347

[47] International Energy Agency, 2011: *Technology Development Prospects for the Indian Power Sector*, at 47. *available at* http://www.iea.org/papers/2011/technology_development_india.pdf

[48] Planning Commission, 2011. *Interim Report of the Expert Group on Low Carbon Strategies for Inclusive Growth at 37..available at* http://moef.nic.in/downloads/public-information/Interim%20Report%20of%20the%20Expert%20Group.pdf

[49] International Energy Agency, 2011: *Technology Development Prospects for the Indian Power Sector*, at 47. *available at* http://www.iea.org/papers/2011/technology_development_india.pdf; Central Electricity Authority, *Letter of 2 February 2010, available at* http://www.cea.nic.in/more_upload/advisory_mop_sourcing_domestic_mfrs.pdf

[50] *Id*.

[51] "Large utilities to get priority on coal supplies," *Livemint.com*, Dec. 23, 2009, *available at* http://www.livemint.com/2009/12/23234919/Large-utilities-to-get-priorit.html (quote from a CLP

NTPC's experience may be even more illustrative. NTPC is the largest state-owned power generating company in India. It operates nearly 27 GW of coal-fired capacity[52]—almost 29 percent of India's total.[53] As early as 2008, it had already adopted supercritical technology for units over 500 MW, and was moving towards even higher steam parameters (ultra-supercritical) for upcoming projects.[54] At that time, NTPC already had six 660 MW units of supercritical technology in advanced stages of construction, and orders placed for two more.[55] It also had seven other 660 MW units and sixteen 800 MW units "upcoming."[56]

***Supercritical technology will continue to rapidly gain market share without CDM support due to operational advantages, market forces and government policies.*** Supercritical technology offers considerable advantages over subcritical. According to NTPC's Chief Design Engineer, NTPC switched to supercritical technology for its larger boilers due to improved plant efficiency and fuel tolerance; reduced coal consumption, ash production and pollutant emissions; and better operational performance than subcritical technology.[57] At the same time, NTPC has concluded that the downsides are minimal or non-existent. Supercritical boilers are a "mature and established" technology that use materials that are "proven and already in use" and equally as available as sub-critical.[58] Moreover, it also has concluded that project implementation and operations and maintenance are "essentially [the] same as sub-critical."[59]

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managing director).

[52] http://www.ntpc.co.in/index.php?option=com_content&view=article&id=96&Itemid=175&lang=en

[53] *Ministry of Power, Government of India*. *available at* http://www.powermin.nic.in/

[54] *Supercritical Technology in NTPC India-A Brief Overview*, presentation by Pankaj Gupta, Chief Design Engineer, NTPC to APEC Energy Working Group's Cleaner Coal Workshop, Ha Long City, Vietnam August 19-21, 2008, at 16, 24. *available at* http://www.egcfe.ewg.apec.org/publications/proceedings/CleanerCoal/HaLong_2008/Day%202%20Session%203A%20%20Pankaj%20Gupta%20Supercritical%20Technology%20in%20.pdf

[55] Sipat-I (3x660MW) and Barh-I (3x660MW) were in advanced stages of construction, while orders had been placed for Barh-II (2x660MW). *Supercritical Technology in NTPC India-A Brief Overview*, presentation by Pankaj Gupta, Chief Design Engineer, NTPC to APEC Energy Working Group's Cleaner Coal Workshop, Ha Long City, Vietnam August 19-21, 2008, at 16, 24. *available at* http://www.egcfe.ewg.apec.org/publications/proceedings/CleanerCoal/HaLong_2008/Day%202%20Session%203A%20%20Pankaj%20Gupta%20Supercritical%20Technology%20in%20.pdf

[56] North Karanpura (3x660MW), Tanda-II (2x660MW), Meja (2x660MW), Darlipali,(4x800MW), Lara (5x800MW), Cheyyur (3x800MW), Marakanam (4x800MW). *Supercritical Technology in NTPC India-A Brief Overview*, presentation by Pankaj Gupta, Chief Design Engineer, NTPC to APEC Energy Working Group's Cleaner Coal Workshop, Ha Long City, Vietnam August 19-21, 2008, at 16. *available at* http://www.egcfe.ewg.apec.org/publications/proceedings/CleanerCoal/HaLong_2008/Day%202%20Session%203A%20%20Pankaj%20Gupta%20Supercritical%20Technology%20in%20.pdf

[57] *Id.*, at 10.

[58] *Id.*, at 13.

[59] *Id.*

In addition to the operational benefits of supercritical boilers identified by NTPC, other non-CDM related factors are driving this technological shift. Rising coal prices and severe domestic shortages have provided a strong impetus for operators to install more efficient generating technology.[60] Over the last five years, persistent coal shortages have inhibited the ability of generators to produce and sell electricity to the grid,[61] and have forced both plant operators,[62] and the country's main coal producer[63]-- Coal India -- to look abroad for supplies. As a result, Indian coal imports grew by 36 percent between 2007 and 2009, reaching 16.5 percent of total consumption in 2009.[64]

This imported coal is considerably more expensive than domestic coal, since state-run Coal India subsidizes domestic consumers by discounting its output by as much as 50 percent below global prices.[65] As of 2008, coal prices were 633 percent higher in Germany and 490 percent higher in Chinese Taipei than in India (see charts below). This situation is unsustainable, and Coal India has expressed its intent to more closely align its prices with world markets.[66] Coal

[60] *See, e.g.*, David Victor, "He protests too much; India is already going green," *Newsweek*, Aug. 17, 2009 ("Shortages in coal, which supplies about three quarters of India's electricity, are forcing India to accelerate this trend to higher efficiency.") (LexisNexis Academic)

[61] *See, e.g.*, "Thermal plants' coal shortage worsening, *Business Line*," Apr. 4, 2005, *available at* http://www.thehindubusinessline.com/2005/04/04/stories/2005040401750500.htm ; "Thermal plants face acute coal shortage (coal stock at 8,689 million tonnes against normal replacement of 22 million tonnes)," *India Business Insight*, Apr. 2, 2008 (LexisNexis Academic); "Coal situation worsens at thermal stations (several stations super critical with stocks for less than 4 days)," *India Business Insight*, May 9, 2008, *available at* http://www.thehindubusinessline.com/2008/05/09/stories/2008050952240100.htm ; "Corporate power crisis looms large as key thermal stations starve for coal," *Business Line*, Aug. 9, 2008, *available at* http://www.thehindubusinessline.com/2008/08/09/stories/2008080950460300.htm ; "Inadequate coal linkages hit power stations," *The Press Trust of India*, Jan. 26, 2009, *available at* http://www.highbeam.com/doc/1G1-192610842.html ; "Govt revises coal import target upwards to 35 MT in FY'10," *The Press Trust of India*, Mar. 20, 2009 (LexisNexis Academic); "Thermal stations continue to battle coal shortages," *Business Line*, Apr. 16, 2009, *available at* http://www.thehindubusinessline.com/2009/04/16/stories/2009041651511500.htm; "Shortage of coal, gas to hit power sector," *Financial Express*, Nov. 2, 2009 (LexisNexis Academic); "Indian market ready for plants, but needs steady supply of coal," *Platts Coal Outlook*, Nov. 16, 2009 (LexisNexis Academic); "India's NTPC shuts two coal plants on coal shortages," *Platts International Coal Report*, Nov. 23, 2009 (LexisNexis Academic).

[62] "Adani to invest $1.6 billion in Indonesian project," *Reuters, available at* http://in.reuters.com/article/2010/08/25/idINIndia-51045420100825

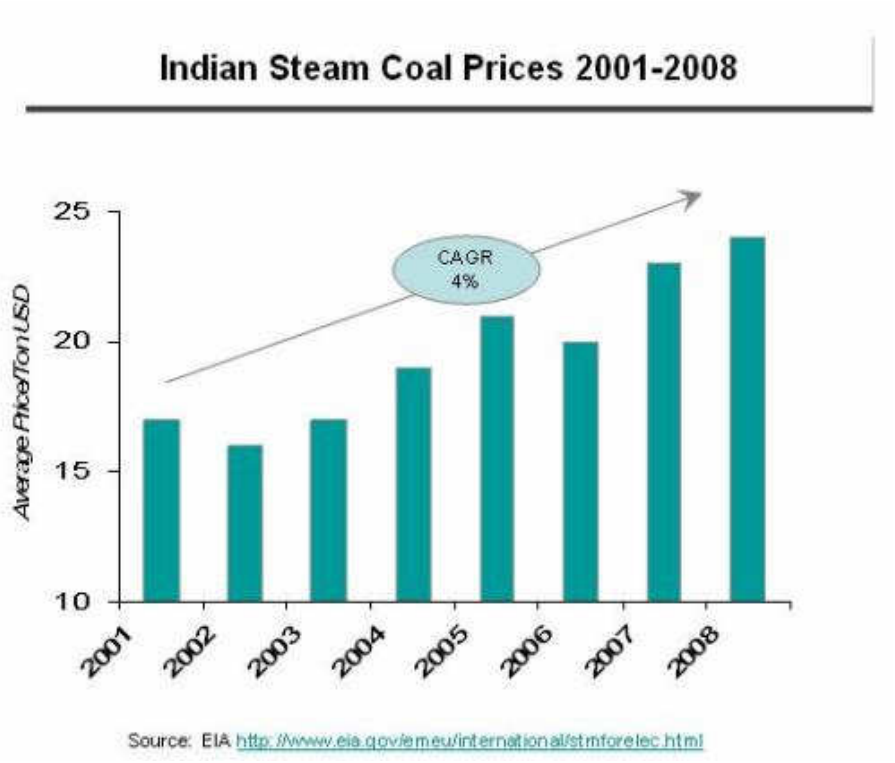
[63] "CIL readies war chest for acquiring overseas mines," *The Asian Age*, *available at* http://www.asianage.com/business/cil-readies-war-chest-acquiring-overseas-mines-082

[64] IEA Coal Statistics, 2010.

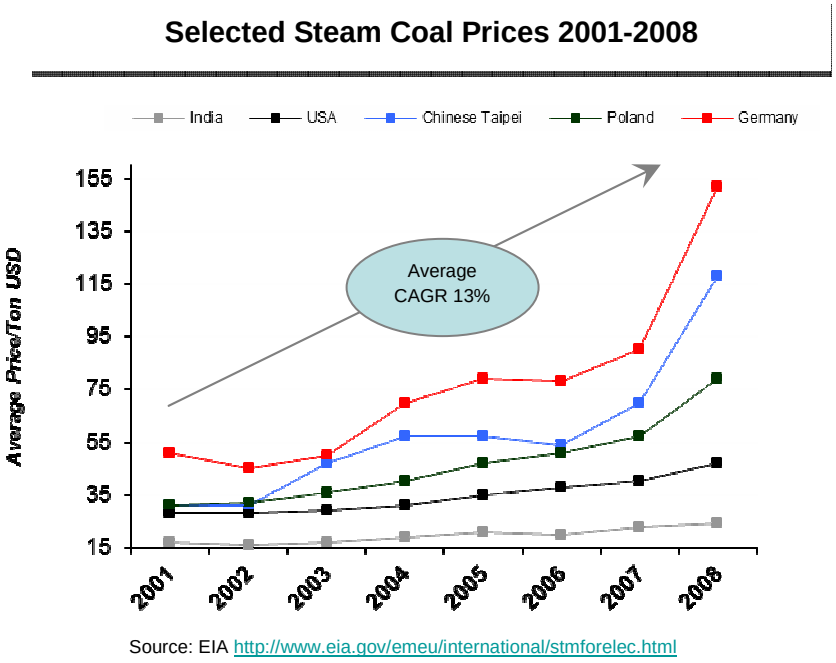
[65] "CIL to hike coal prices by 15 pc from tonight," *Times of India*, February 26, 2011, *available at* http://articles.timesofindia.indiatimes.com/2011-02-26/india-business/28636394_1_coking-coal-coal-production-cil

[66] *Id.*

India raised prices by 12 percent in February, 2011. While it excluded the power sector,[67] future price hikes are expected to cover all sectors.[68]




[67] http://articles.economictimes.indiatimes.com/2011-03-16/news/28697785_1_price-hike-salary-hike-cil
[68] *Id.*




Source: EIA http://www.eia.gov/emeu/international/stmforelec.html

Sector analysts have warned that Asian coal markets, including India, are increasingly subject to greater price volatility due to surging demand and a high correlation with oil prices.[69] Rising and volatile coal prices will squeeze plant operator profit margins. The cost of fuel inputs can account for 40-60 percent of the total cost of generation.[70] Variable costs in Maharashtra, for example, are as high as 2.2 cents/kwh.[71]

When the costs of coal are considered, supercritical boilers are now cost-competitive or cheaper than subcritical ones. Modern supercritical plants cost only 2 percent more to install than subcritical plants,[72] and the small incremental difference in capital costs can be offset by greatly reduced variable fuel costs over the life of the project.[73] Thus, in its 2006 *Integrated Energy Policy*, the Planning Commission concluded that "[i]t should be possible to get gross efficiency

[69] UBS, 2011. *Global Utilities Outlook 2011*, at 10.
[70] Chikkatur and Sagar, 2007. *Cleaner Power in India: Towards a Clean-Coal-Technology Roadmap*, at 50.
[71] http://www.prayaspune.org/peg/publications/item/140-transition-from-mou-to-competitive-bidding-good-tech-off-but-turbulence-ahead-review-of-thermal-capacity-addition-through-competitive-bidding-in-india.html
[72] Boben Anto, M.M. Hasan, undated. *Analysis of Supercritical technology in Indian Environment and Utilizing Indian coal*, at 113.
[73] *Id.*; "Fire without smoke making the switch (supercritical technology considerably lowers the costs of coal based power generation)," *India Business Insight*, Aug. 29, 2007.

of 38-40% *at an economically attractive cost* for all new coal-based plants."[74] (emphasis added). Other studies have similarly found that supercritical technologies entail no additional costs over subcritical,[75] and that supercritical units can actually deliver a lower cost of energy over their operating lifetime.[76] Indeed, the planned "Ultra-Mega Power Plants" (like Coastal Gujarat) are expected to produce power at tariff rates well below those that are economically feasible from subcritical plants, due to their operational efficiency and economies of scale.[77]

Caught between persistent coal shortages, rising prices and the need to address massive power supply deficits, the Government of India ("Government") has placed a "very high priority [on]… developing or obtaining the technology for coal-based plants of high efficiency."[78] Towards this end, it is adopting policies to encourage power generators to move to supercritical or even ultra-supercritical technology. The Government has mandated that all of the "Ultra-Mega Power Plants", including Coastal Gujarat, use supercritical technology.[79] It has adopted a "mega power project policy" that waives import duties on equipment purchases and provides income tax incentives for new coal-fired power plants of 1000 MW and larger. It is also considering whether to explicitly restrict "mega power project" benefits to supercritical plants.[80] In 2009, the Power Ministry and the Coal Ministry decided to use only supercritical technology for new capacity additions wherever possible.[81] Finally, the Government is considering new policies that would give supercritical generators priority access to scarce coal supplies,[82] and may even ban subcritical plants altogether.[83]

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[74] Planning Commission, 2006. *Integrated Energy Policy: Report of the Expert Committee*, at 49.
[75] Center for Science and Environment, 2010. *The Challenge of the New Balance*, at 35.
[76] MIT, 2007. *The Future of Coal*, at 19.
[77] *See, e.g.*, "Rs 1.19 per unit tariff feasible: Shahi," *The Press Trust of India*, Dec. 19, 2006 ("Government today said the Rs 1.19 per unit tariff proposed by Lanco Infratech for the 4,000 MW Sasan Ultra mega power project is feasible . . . "Super critical system gives you an advantage of fuel input and cost of power which has helped lowering the tariff," he said.") (LexisNexis Academic).
[78] http://planningcommission.nic.in/reports/genrep/rep_intengy.pdf
[79] International Energy Agency, 2011. *Technology Development Prospects for the Indian Power Sector*, at 47. *available at* http://www.iea.org/papers/2011/technology_development_india.pdf
[80] "India: Power firms likely to be told to tread green path," *Daily the Pak Banker*, Jan. 4, 2010 (LexisNexis Academic).
[81] International Coal Report, March 23, 2009, *Platts*, at 10. *available at* http://china.platts.com/IM.Platts.Content/ProductsServices/Products/intlcoalreport.pdf
[82] "Large utilities to get priority on coal supplies," *Livemint.com*, Dec. 23, 2009, *available at* http://www.livemint.com/2009/12/23234919/Large-utilities-to-get-priorit.html (quote from a CLP managing director).
[83] "Sub-660 MW plants face denial," *Financial Express*, Jan. 5, 2010.

**Conclusion**

To address both market and policy risks, generators now have a strong, non-CDM-related incentive to install supercritical technology. Given these trends, and the large set of supercritical units already in operation or in the project pipeline, it is clear that supercritical technology is the coal technology of choice in India going forward. Coastal Gujarat seeks to be compensated for using a technology that the Government of India has required on this project and is encouraging throughout the sector, and that other market participants have concluded is a mature and widely available technology.

**7. The PDD fails to adequately assess other "realistic and credible" baseline scenarios.**

**Applicable rules**

In addition to assessing the project activity without CDM benefits, the PDD must also analyze all other "possible realistic and credible alternatives that provide outputs or services comparable with the proposed CDM project activity."[84] *ACM0013* makes clear that (1) "[t]hese alternatives need not consist solely of power plants of the same capacity, load factor and operational characteristics"; [85] (2) the alternatives "may not be available to project participants, but could be available to other stakeholders within the grid boundary…."; and (3) "realistic combinations of [facilities, technologies, outputs or services] should be considered as possible alternative scenarios to the proposed project activity."[86] The decision to exclude scenarios must be supported by "appropriate explanations and documentation."[87]

The PDD must include "all relevant power plant technologies that have recently been constructed or are under construction or are being planned (e.g. documented in official power expansion plans)" as plausible alternatives, and should include a "clear description of each baseline scenario alternative, including information on the technology, such as the efficiency and technical lifetime."[88] If the type of power plant identified as the baseline scenario differs from those that have recently been constructed or are under construction or are being planned, the project participants shall explain this discrepancy.[89]

[84] *ACM0013, Ver. 4.0*, at 3.
[85] *Id.*
[86] *Id.*, at 4.
[87] *Id.*
[88] *Id.*
[89] *Id.*, at 4.

**Discussion of non-compliance**

The PDD fails to adequately consider all realistic and credible alternatives to the proposed baseline, or to fully assess all options that are currently being implemented. It also entirely fails to explore ways that plausible alternatives can be realistically combined to produce an alternative baseline scenario. Alternatives that do not receive the kind of analysis required under *ACM0013*, alone or in combination, include low- or zero-carbon alternatives such as:

***Energy efficiency and demand side management:*** Energy efficiency and demand side management should be considered on par with expanded supply in delivering energy services. As the Government's Commission's *Integrated Energy Policy* notes, "lowering energy intensity through higher efficiency is equivalent to creating a virtual source of untapped domestic energy….[a] unit of energy saved by a user is greater than a unit produced, as it saves on production losses as well as transport, transmission and distribution losses."[90] Accordingly, the Planning Commission found that "[s]everal [energy efficiency] options are less expensive than coal or gas-based generation, and therefore, *should be the "first resource" considered for fulfilling demand*."[91] (emphasis added). Towards this end, "efficiency power plants"-- i.e., bundled sets of energy efficiency programs that can deliver the energy and capacity equivalent of a large conventional power plant-- should have been considered on the same basis as supply alternatives in the baseline scenario analysis.[92] The Government of India has recognized the critical importance of energy efficiency in closing India's chronic 8-10 percent supply deficit. Recent studies have found that end-use efficiency improvements could reduce effective demand by more than 20 percent,[93] and add approximately $500 billion to India's economy between 2009 and 2017.[94]

***Reduction of transmission and distribution losses:*** The PDD entirely omits any analysis of the potential for improvements in transmission and distribution efficiency, despite the fact that loss rates in the states that will purchase power from Coastal Gujarat range from 26 to 46

[90] Planning Commission, 2006. *Integrated Energy Policy: Report of the Expert Committee*, at xx.
[91] Planning Commission, 2011. *Interim Report of the Expert Group on Low-Carbon Strategies for Inclusive Growth*, at 31.
[92] See, e.g., the World Bank's recent support for mass distribution of compact flourescent light bulbs in Bangladesh. http://siteresources.worldbank.org/EXTENERGY2/Resources/ELIB_Presentation.pdf. Meg Gottstein, Planning, Financing and Building Efficiency Power Plants: Regulatory Practices in California and Other States, The Regulatory Assistance Project (2008), available at www.raponline.org; David Moskovits, Meeting China's Energy Efficiency Goals Means China Needs to Start Building Efficiency Power Plants (EPP), The Regulatory Assistance Project (2005), available at www.raponline.org.
[93] Greenpeace India. 2009. *Still Waiting*, at 14. available at http://www.greenpeace.org/india/Global/india/report/2009/11/stillwaiting.pdf
[94] Shakti Foundation, 2011. *The Hundred Billion Dollar Bonus: Global Energy Efficiency Lessons from India.*

percent.[95] Reducing transmission and distribution losses is a top government priority,[96] as the extraordinarily high current loss rates place a huge strain on the economy and threaten the viability of energy sector.[97] Simply raising Indian transmission and distribution efficiencies to international best practices (less than 10 percent losses)[98] could eliminate the need for as much as 30 GW worth of additional capacity.[99]

***Solar thermal:*** The PDD discusses only photovoltaic sources, and summarily dismisses them as variable and incapable of producing base load power.[100] It entirely overlooks solar thermal power (or "concentrated solar power"), which can provide baseload power and has the potential to deliver 3 to 4 times the amount of power as India's coal reserves.[101] As both the fuel and construction costs of coal-fired power plants have rapidly escalated, the price differential between coal and solar thermal power has been dramatically narrowed.[102] Furthermore, India already has a solar power manufacturing sector to rely on for increased growth in this area.[103]

***Strengthened grid connections:*** The PDD does reference the use of connected grids to import electricity, but dismisses this alternative because of the transmission deficit. However, this quick dismissal ignores the fact that the deficit is primarily a result of the focus on building new power plants, rather than investing in grid improvements and end-use efficiency.[104]

***Wind and Biomass:*** The PDD dismisses power from wind and biomass without meaningful analysis. However, India has an enormous potential of 46 GW of wind[105] and 27 GW

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[95] Asian Development Bank, 2008. *Proposed Loan: India: Mundra Ultra Mega Power Project*, at 16.
[96] *International Energy Agency*; *Technology Development Prospects for the Indian Power Sector*, at 69. *available at* http://www.iea.org/papers/2011/technology_development_india.pdf
[97] Planning Commission, 2006. *Integrated Energy Policy: Report of the Expert Committee*, at 4.
[98] Greenpeace India. 2009. *Still Waiting*, at 14. *available at* http://www.greenpeace.org/india/Global/india/report/2009/11/stillwaiting.pdf
[99] Shankar Sharma, 2011. *Indian Power Scenario: Huge scope for low carbon energy pathway*.
[100] *PDD, at 25.*
[101] Ummel, Kevin. Center for Global Development Working Paper. *Concentrating Solar Power in China and India: A Spatial Analysis of Technical Potential and the Cost of Deployment*.
[102] David Wheeler, 2008. *Tata Ultra Mega Mistake: The IFC Should Not Get Burned by Coal, available at* http://blogs.cgdev.org/globaldevelopment/2008/03/tata-ultra-mega-mistake-the-if.php
[103] *An Overview of Renewable Energy in India*, at 11. *available at* http://www.geni.org/globalenergy/library/energytrends/currentusage/renewable/Renewable%20Energy%20Potential%20for%20India%5B2%5D_%5B1%5D-1_.pdf
[104] http://blog.cleantech.com/sector-insights/energy-efficiency/india-loses-45-of-the-electricity-it-produces-expect-surge-in-energy-efficiency-investment/
[105] *An Overview of Renewable Energy in India*, at 14. *available at* http://www.geni.org/globalenergy/library/energytrends/currentusage/renewable/Renewable%20Energy%20Potential%20for%20India%5B2%5D_%5B1%5D-1_.pdf

for biomass.[106] These options should have been more rigorously evaluated both alone and in combination with other options.

**Conclusion**

Each of these potential alternatives is already being implemented in India, and some, such as end use efficiency, reducing transmission losses, and solar thermal, are a matter of national priority. Yet contrary to the requirements of *ACM0013*, the PDD makes no effort to explain the discrepancy between such actions and the baseline scenario. The PDD also makes no effort to assess how these alternatives can be combined in ways that would produce a more attractive baseline than subcritical technology. In particular, given the Planning Commission's determination that energy efficiency should be the "first resource" in meeting demand, it is difficult to see how the PDD could not consider it as a potential baseline, either alone or in combination with other alternative scenarios.

Despite the methodology's requirement that exclusions be supported by "appropriate explanations and documentation", the PDD offers no evidence other than conclusive statements about the various risks associated with each alternative. Under *ACM0013*, the PDD must clearly justify the conclusion that these and other alternatives are not plausible options. It has not met this test.

## Investment Analysis

**8. The investment analysis is incomplete and fails to provide the data and assumptions necessary for a reader to reproduce the results.**

**Applicable Rules**

*ACM0013* and the *Additionality Tool* both require a comprehensive investment analysis to determine the baseline scenario and whether "the project activity would be financially viable without the incentive of the CDM."[107] The investment analysis must be "presented in a transparent manner and all the relevant assumptions should be provided in the PDD, so that a reader can reproduce the analysis and obtain the same results." [108] All investment analysis should

[106] "Powering India with Rice Husks? An Interview with Ratnesh Yadav from Husk Power Systems," *available at* http://sierraclub.typepad.com/compass/2011/01/powering-india-with-rice-husks-an-interview-with-ratnesh-yadav-from-husk-power-systems.html

[107] *Tool for the demonstration and assessment of additionality, Ver. 5.2, Annex: Guidance on the Assessment of Investment Analysis*, at 12.

[108] *ACM0013, Ver. 4.0*, at 4; *Tool for the demonstration and assessment of additionality, Ver. 5.2*, at 7.

be provided in spreadsheet format, with all formulas readable and relevant cells viewable and unprotected.[109] The analysis must clearly present all "[c]ritical techno-economic parameters and assumptions (such as … fuel price projections, lifetimes, the load factor of the power plant and discount rate or cost of capital)…," and must justify those assumptions "in a manner that can be validated by the DOE." [110] It should "[i]nclude all relevant costs (including, for example, the investment cost, fuel costs and operation and maintenance costs), and revenues (including subsidies/fiscal incentives, ODA, etc. where applicable), and, as appropriate, non-market cost and benefits in the case of public investors."[111] The analysis must present a clear comparison of the financial indicators for all scenario alternatives.[112] Assumptions and input data should be consistent across the project activity and its alternatives, unless differences can be well substantiated.[113]

**Discussion of non-compliance**

The investment analysis is deficient with respect to virtually all of the requirements set forth in *ACM0013* and the *Additionality Tool*. It barely resembles the kind of rigorous and comprehensive analysis that would actually be required to determine if the project activity requires CDM support to be the preferred alternative. The investment analysis relies on a comparison of the levelized cost of energy (LCOE) for each alternative to justify its claim that subcritical technology would be the preferred option without CDM support,[114] but fails to:

- Show the calculations it used to generate the LCOEs, or present them in spreadsheet form so they could be replicated;
- Show any of the calculations it used to generate values for other key variables or to reach its conclusions, or present them in spreadsheet form so they could be replicated;

[109] *Tool for the demonstration and assessment of additionality, Ver. 5.2, Annex: Guidance on the Assessment of Investment Analysis*, at 13. The Guidance is clear that this requirement cannot be avoided on grounds of business confidentiality:

> "In cases where the project participant does not wish to make such a spreadsheet available to the public an exact read-only or PDF copy shall be provided for general publication. In case the PP wishes to black-out certain elements of the publicly available version, a clear justification for this shall be provided to the UNFCCC secretariat by the DOE when requesting registration."

[110] *ACM0013, Ver. 4.0*, at 4; *Tool for the demonstration and assessment of additionality, Ver. 5.2*, at 7.
[111] *Id.*
[112] *ACM0013, Ver. 4.0*, at 4.
[113] *Tool for the demonstration and assessment of additionality, Ver. 5.2*, at 7; *ACM0013, Ver. 4.0*, at 4.
[114] *PDD*, at 24, 31.

- Demonstrate how revenue from the CDM would affect the financial viability of the project activity, and cause supercritical technology to become the preferred option;
- Offer credible fuel price projections and explain the methodology and assumptions used to generate them;
- Assess how the risk of regulatory changes, such as increased pollution control requirements or a carbon tax or cap and trade regime, might affect the LCOE of each alternative;
- Consider the costs of other resource inputs such as labor and water, and how they might differentially affect the LCOE for each option.

**Conclusion**

The investment analysis fails to assess the importance of the CDM to the project's financial viability. It asserts that subcritical technology would have the lowest LCOE, but fails to demonstrate how it reached that conclusion. By providing its data only in chart form, without showing the relevant calculations and assumptions, the PDD makes it impossible for the reader to "reproduce the analysis and achieve the same results." The Executive Board has rejected previous proposals based on these same deficiencies,[115] and they provide a sufficient basis for the DOE to refuse to validate this project activity.

The failure to include this required material is a transparent attempt to evade public scrutiny. The proper response to such manipulation of the process is to refuse to validate the project. However, if Bureau Veritas allows Coastal Gujarat to amend the PDD to include this material, the public must also be afforded an opportunity to comment.

[115] *See e.g., Review of Project Activity*: *Sichuan Liangtan Hydropower Station Second Phase Project (2410), available at* http://cdm.unfccc.int/Projects/DB/DNVCUK1197870388.18/Rejection/MAXJNK4XZBW732JI3W56I249GFEQE3 *Review of Project Activity: 10 MW Somasila Hydro Power Project for a grid system by Balaji Energy Pvt. Ltd. (1201), available at:* http://cdm.unfccc.int/Projects/DB/DNV-CUK1182338073.37/Rejection/OO2TQ0VFWPHDSIUDDMF7KXQ7SN81MN;*Review of Project Activity: BHL Palia Kalan Project (1184), available at* http://cdm.unfccc.int/Projects/DB/DNVCUK1182235542.94/Rejection/ED7ZTMB2J3G28EMMVW1C3AOS9Z6EBP

**9. The sensitivity analysis improperly advantages inefficient subcritical technology by using an unrealistically narrow range of fuel price variation.**

**Applicable rules**

*ACM0013* and the *Additionality Tool* require the PDD to include a "sensitivity analysis" for all alternatives, to ensure that conclusions regarding the financial attractiveness of the project are robust with regard to reasonable variations in the critical assumptions (e.g. fuel prices, load factor, etc.). Guidance for the Additionality Tool requires DOEs to closely assess whether the range of variations is reasonable in the context of the project. Past trends should be a guide for determining a reasonable range, but generally variations "should at least cover a range of +10% and –10%, unless this is not appropriate in the context of the specific project circumstances."[116] Moreover, "where a scenario will result in the project activity passing the benchmark or becoming the most financially attractive alternative the DOE shall provide an assessment of the probability of the occurrence of this scenario in comparison to the likelihood of the assumptions in the presented investment analysis…."[117]

The sensitivity analysis can provide a valid basis for selecting the baseline scenario or alternative "only if it consistently supports (for a realistic range of assumptions) the conclusion that the pre-selected baseline scenario [or alternative] is likely to remain the most economically and/or financially attractive."[118] Where the sensitivity analysis clearly reaffirms the result, the most economically attractive alternative should be considered the most plausible baseline scenario. However, where the sensitivity analysis is not fully conclusive, the alternative with the lowest emission rate among those that are the most financially and/or economically attractive should be selected as the baseline scenario.[119]

**Discussion of non-compliance**

The PDD's sensitivity analysis is not robust to reasonable variations in critical in the price of coal, because it only varies coal prices by +/- 10 percent.[120] In fact, prices have fluctuated by as much as 100 percent in recent years in the Indian market, and much more in the international markets. (see previous price graphs). Coastal Gujarat will use imported coal, most

[116] *Tool for the demonstration and assessment of additionality, Ver. 5.2, Annex: Guidance on the Assessment of Investment Analysis*, at 15.
[117] *Id.*
[118] *ACM0013, Ver. 4.0*, at 4; *Tool for the demonstration and assessment of additionality, Ver. 5.2*, at 7.
[119] *ACM0013*, Ver. 4.0, at 4.
[120] *PDD*, at 33.

of which will come from Indonesia.[121] The Government of Indonesia recently issued an order harmonizing the price of exported coal with international rates.[122] This order will apply retroactively to all contracts, and will likely increase the price of imported coal for Coastal Gujarat and other coastal Indian coal plants by $30/ton.[123] This change alone would represent a 60 percent rise over the base case assumed in the PDD.[124] Moreover, Asian coal markets generally are increasingly subject to greater price volatility due to surging demand and a high correlation with oil prices.[125] In the face of these trends, it is fanciful to assume that coal prices will only fluctuate 10 percent from the base case over the ten year project period.

While modern supercritical plants cost about 2 percent more to install than subcritical plants,[126] they can deliver energy at the same or lower costs over their operating life due to their reduced fuel costs.[127] That being the case, a rigorous sensitivity analysis should have shown that at a certain coal price, supercritical technology will surpass subcritical as the most financially or economically attractive alternative. The Additionality Tool requires that the sensitivity analysis determine if the "switching price" will occur within a "realistic range of assumptions." [128] It further requires the DOE to independently assess "the probability of the occurrence of this scenario in comparison to the likelihood of the assumptions in the presented investment analysis…."[129]

**Conclusion**

By narrowly limiting the range of price variation considered in the sensitivity analysis, the PDD implies that there is no "switching price" between the technologies. This suggestion is plainly unsupportable, and it is incumbent upon the DOE to independently determine this inflection point and the likelihood that it will occur, and to reassess financial attractiveness of the options on that basis.

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[121] Tata Power, 2011. *Investor Presentation July 2011*, at 16, *available at* http://www.tatapower.com/investor-relations/pdf/investor-presentation-july-2011.pdf
[122] http://www.dnaindia.com/money/report_indonesian-nightmare-for-tata-adani-jsw-lanco_1554313
[123] *Id.*
[124] *PDD*, at 33.
[125] UBS, 2011. *Global Utilities Outlook 2011*, at 10.
[126] Boben Anto, M.M. Hasan, *Analysis of Supercritical Technology in Indian Environment and Utilizing Indian Coal*, at 113.
[127] MIT, 2007. *The Future of Coal*, at 19; Center for Science and Environment, 2010. *The Challenge of the New Balance*, at 35.
[128] ACM0013, Ver. 4.0, at 4; *Tool for the demonstration and assessment of additionality*, Ver. 5.2, at 7.
[129] *Tool for the demonstration and assessment of additionality, Ver. 5.2, Annex: Guidance on the Assessment of Investment Analysis*, at 15.

## CER calculation

**11. The project proponent has artificially inflated the number of CERs it is seeking by misapplying the formula prescribed by ACM0013. This was corrected by the DOE in the original submission and is now the second time this error has been made.**

### Applicable rules

According to the ACM0013, the project proponent must "[e]nsure that $EG_{PJ,y}$ is the net electricity generation (the gross generation by the project plant minus *all auxiliary electricity consumption of the plant*)" (emphasis added). Failing to exclude auxiliary electricity consumption can artificially inflate emissions reductions calculations.

### Discussion of non-compliance

In its original PDD supporting its first registration request, the project proponent failed to follow this rule, including the auxiliary consumption in its calculations. The original DOE corrected this error and reduced the CER calculations from 4,267,604 $tCO_2e$ annually to 2 2,651,753 $tCO_2e$. [130].

However, in the current proposal, the project has again failed to deduct auxiliary consumption, as it uses the exact same electricity production figure – 29,784 GWh – that the first validator found erroneous. As a result, the project proponent now seeks credits for emissions reductions of 4,148,671 $tCO_2e$.

### Applicable rules

According to ACM0013,"[T]his methodology allows to claim emission reductions from using fossil fuels more efficiently for power generation, *but does not account for any emission reductions from using less carbon intensive fuels*. Given that the $CO_2$ emission factor and amount of any start-up/auxiliary fuels *may differ between the project and the baseline*, the

[130] Validation REPORT NO. 2008-0362, Revision No 5.

*crediting of emission reductions is limited to the electricity generated from the main fossil fuel only*[131]" (emphasis added).

**Discussion of non-compliance**

The project assumes that sub-bituminous coal with a higher emissions factor will be used in the baseline scenario whereas bituminous coal, with a lower emissions factor, will be used in the project activity.[132] However, the ACM0013 clearly prohibits using less carbon intensive fuels to secure emissions reductions. Therefore, the use of less carbon intensive fuels in the project activity compared to the baseline is inadmissible. The project must therefore recalculate emissions reductions using the same category of coal for both the baseline and project activity.

In addition, the PDD contains other errors in the calculation of the baseline and project emissions. The PDD improperly:

1) Uses a lower plant efficiency factor for the baseline in the current PDD - 35.06%[133] - than was used in the previous version - 35.1%[134] without explanation.

2) Uses a smaller subset of plants in the new PDD to determine the top 15% performers, which results in a higher baseline emissions factor (.944)[135] than the government calculation of (.941)[136] that was used in the previously rejected PDD.

3) Uses the lower bound[137] of emissions factors for the coal category "other bituminous" in place of the default emissions factor, which results in a difference between the baseline factor and the project factor that is twice as large (.928, .895) as the difference that results from using the default factors (.961, .946).

4) Inexplicably drops the years 2011 and 2012 from the current proposal despite including them in the previously rejected PDD. These two years had lower emissions

[131] Approved consolidated baseline and monitoring methodology ACM0013, Version 4, available at 5.
[132] PDD Version 03 available at, 39-40
[133] PROJECT DESIGN DOCUMENT FORM (CDM PDD) - Version 03 13, June, 2011 available at, 37
[134] PROJECT DESIGN DOCUMENT FORM (CDM PDD) - Version 03.1 4, January, 2010 available at 3
[135] PROJECT DESIGN DOCUMENT FORM (CDM PDD) - Version 03 13, June, 2011 available at, 39
[136] PROJECT DESIGN DOCUMENT FORM (CDM PDD) - Version 03.1 4, January, 2010 available at 54
[137] Table 1.4 of Chapter1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories

reductions than the remaining 8 years of the crediting period and were replaced with years 2021 and 2022 which had higher calculated values.

At a bare minimum these errors/ unexplained calculations must be addressed prior to requesting formal registration. Failing to do so will alter the appropriate calculations of emissions for the project activity as well as baseline.

## CONCLUSION

The role of the CDM within the Kyoto framework is to assist developing countries in achieving sustainable development and allow developed countries to meet their emission reduction obligations, with the ultimate objective of reducing overall global emissions and averting dangerous interference with the climate system. Unless a project is additional and contributes to sustainable development—not only in terms of technical compliance with methodologies, but in fact—it cannot contribute towards these fundamental goals.

This PDD is riddled with fundamental flaws, and fails to demonstrate that the project activity will produce additional emissions reductions as a result of CDM support. On a purely technical basis, the PDD fails to comply with several important provisions of the *ACM0013*, the *Additionality Tool*, and other CDM tools and guidelines. But even if the project proponents were to correct the PDD's technical deficiencies, the project activity would not be additional. India is already rapidly adopting supercritical technology due to a variety of operational, market, and regulatory factors. Moreover, the PDD provides scant evidence that this project needs CDM support to be financially viable. Indeed, the project proponent has already secured the necessary financing and is nearing completion of the construction of the project.

Thus, approving CDM benefits for new supercritical projects in India would lead to excess issuance of CERs, beyond any actual emissions reductions, and undermine the objectives of both the Kyoto Protocol and the UNFCCC.

Based on these concerns, we call on Bureau Veritas Certification Holding SAS not to validate the proposed Project. Should the DOE afford the project proponent the opportunity to provide clarifications or corrective action, we respectfully request that stakeholders be given the opportunity to comment on any further submissions.

Respectfully submitted,

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## APPENDIX 1: SUPERCRITICAL PROJECTS IN INDIA[138]

### Ultra Mega Power Projects

| No. | Name/Location of Thermal Power Station | No. of Units | Unit capacity (in MW) | Utility |
|---|---|---|---|---|
| 1 | UMPP, Mundra | 5 | 800 | M/s. Tata Power Ltd. |
| 2 | UMPP, Sasan | 6 | 660 | M/s. Reliance Power Ltd. |
| 3 | UMPP, Krishnapatnam | 5 | 800 | M/s. Reliance Power Ltd. |
| 4 | UMPP, Tilaiya | 5 | 800 | M/s. Reliance Power Ltd. |
| 5 | Orissa, UMPP | 5 | 800 | - |
| 6 | Chhatisgarh, UMPP | 5 | 800 | - |
| 7 | UMPP, Tamil Nadu | 5 | 800 | - |

### Supercritical Thermal Power Stations Completed or Under Construction

| No. | Name/Location of Thermal Power Station | No. of units | Unit capacity (in MW) | Utility |
|---|---|---|---|---|
| 1 | Hissar | 2 | 660 | M/s. HPGCL |
| 2 | Jhajjar | 2 | 660 | M/s. HPGCL |
| 3 | Talwandi Sabo | 2 | 660 | M/s. PSEB |
| 4 | Mundra, Kutch | 2 | 660 | M/s. Adani Power Ltd. |
| 5 | Meja IV, Uttar Pradesh | 2 | 660 | M/s. NTPC Joint Venture |
| 6 | Sipat-I, Bilaspur | 3 | 660 | M/s. NTPC Limited |
| 7 | New Nabinagar, Bihar | 3 | 660 | M/s. NTPC Joint venture |
| 8 | Krishnapatnam | 3 | 800 | M/s. APGENCO |
| 9 | Sholapur Thermal Power plant, Maharashtra | 2 | 660 | M/s. NTPC |
| 10 | Barh Super Thermal Power Station | 3 | 660 | M/s. NTPC Ltd. |
| 11 | Raghunathpur-II, West Bengal | 2 | 660 | M/s. DVC |
| 12 | Gidderbaha Station-I, Punjab | 2 | 660 | M/s. PSEB |
| 13 | Sahapur Thermal Power Company Limited | 2 | 660 | M/s. STPCL |
| 14 | Jewargi Power Company of Karnataka Limited | 2 | 660 | M/s. Power Company of Karnataka Company Ltd. |

[138] Boben Anto, M.M. Hasan, undated. *Analysis of Supercritical technology in Indian Environment and Utilizing Indian coal*, at 113.



**Proposed Supercritical Power Stations**

| No. | Name/Location of Thermal Power Station | No. of Units | Unit capacity (in MW) | Utility |
|---|---|---|---|---|
| 1 | Dhenknal, Orissa | 2 | 660 | M/s. Lanco Infratech Ltd. |
| 2 | Pussurar Region, Raigarh, Chhatisgarh | 3 | 660 | M/s. Infrastructure Leasing & Financial Services Ltd. |
| 3 | Chutru region of Jharkhand | 3 | 660 | M/s. Infrastructure Leasing & financial Services Ltd. |
| 4 | Chandil region of Jharkhand | 3 | 660 | M/s. Infrastructure Leasing & financial Services Ltd. |
| 5 | Bade Dumarpali, Raigarh, Chhatisgarh | 2 | 660 | M/s. Athena Chattisgarh Power Private Ltd. |
| 6 | Gondia, Maharashtra | 3 | 660 | M/s. Adani Power Maharashtra Private Ltd. |
| 7 | East Godavari, Kakinda | 2 | 660 | M/s. Spectrum Power Generation Ltd. |
| 8 | Sinnar, Nasik, Maharashtra | 2 | 660 | M/s. Fama Power Co. Ltd. |
| 9 | Nagapattinam, Tamil Nadu | 2 | 660 | M/s. PEL Power Ltd. |
| 10 | Nandgaon pet, Amravati, Maharashtra | 4 | 660 | M/s. Sophia Power Co. Ltd. |
| 11 | Tamnar Raigarh, Chhatisgarh | 2 | 660 | M/s. Opelina Finance and Investment Ltd. |
| 12 | Tamnar Raigarh, Chhatisgarh | 2 | 660 | M/s. Jindal Power Ltd. |
| 13 | Lathur, Maharashtra | 2 | 660 | M/s. Amravati Thermal Power Ltd. |
| 14 | Machillipatnam, Andhra Pradesh | 2 | 660 | M/s. Thermal Powertech Corporation (I) Ltd. |
| 15 | Gopuvanipalem, Krishna, Andhra Pradesh | 3 | 660 | M/s. Nagarjuna Construction Company Ltd. |
| 16 | Simar Thermal Power Plant, Junagarh, Gujarat | 2 | 800 | M/s. JSW Energy Ltd. |
| 17 | Salaboni Thermal Power Plant, Paschim Midnapore. | 2 | 800 | M/s. JSW Energy Ltd. |
| 18 | Manappad, Tuticorin, Tamil Nadu | 2 | 660 | M/s. Ind-Bharat Power (Madras) Ltd. |
| 19 | Mundra, Kutch, Gujarat | 3 | 660 | M/s. Adani Power Ltd. |
| 20 | Sompeta, Drikakulam, Andhra Pradesh | 3 | 660 | M/s. Nagarjuna Construction Company Ltd. |
| 21 | Central India Power, Phase-II, Maharashtra | 1 | 668 | M/s. Central India Power Company Private Ltd. |
| 22 | Tanda Expansion, Uttar | 2 | 660 | M/s. NTPC Ltd. |

| No. | Name/Location of Thermal Power Station | No. of Units | Unit capacity (in MW) | Utility |
|---|---|---|---|---|
| | Pradesh | | | |
| 23 | Katwa, West Bengal | 2 | 660 | M/s. WBPDCL |
| 24 | Bakreshwar, Extension Project | 1 | 660 | M/s. WBPDCL |
| 25 | Koradi Extension Project, Maharashtra | 2 | 660 | M/s. Mahagenco |
| 26 | East Coast, Andhra Pradesh | 2 | 660 | M/s. East Coast Energy |
| 27 | NSL Power, Tamil Nadu | 2 | 660 | M/s. NSL Power Private Limited |
| 28 | Marakanam, Tamil Nadu | 4 | 800 | M/s. NTPC Ltd. |
| 29 | Darlipali, Orissa | 4 | 800 | M/s. NTPC Ltd. |
| 30 | Lara, Chhatisgarh | 5 | 800 | M/s. NTPC Ltd. |
| 31 | Kudgi, Karnataka | 3 | 660 | M/s. NTPC Ltd. JV with M/s. PCKL |