Comments on the Project Design Document and Application for Validation

Energy efficient power generation in Raigarh, Chhattisgarh, India

17 September 2011

CDM Watch and the Sierra Club respectfully submit the following comments on the *Project Design Document (PDD)* for *Energy efficient power generation in Raigarh, Chhattisgarh, India*. We thank the CDM Executive Board and Designated Operating Entity (DOE), SGS United Kingdom Limited, for recognizing the integral role of transparency in the CDM validation process, and for taking this comment into consideration.

According to our research, this project should not receive a positive validation because it is not additional nor did it apply the correct baseline scenario. Quite simply, this project will use supercritical technology regardless of whether the CDM provides support.

This is a very large and expensive project that if approved, could receive 4,779,000 CERs that do not represent additional emissions reductions. Despite the large number of CERs Visa Power is seeking, the impact of CDM support on project costs is relatively small. For this reason, the additionality determination is highly sensitive to the initial assumptions. With a large number of CERs at issue and a small margin of error, this project activity demands close scrutiny. SGS's effectiveness in ensuring the accuracy, credibility and completeness of claims by Visa Power using conservative assumptions, and in testing those assumptions against objective evidence from sources other than Visa, is particularly important in this context.[1]

We are confident that after a rigorous examination of the PDD, project documents, and other relevant sources, you will agree that this project should not be eligible for registration and decline to validate it. However, should you 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 before a validation decision is made.[2] The PDD, as submitted, omits assumptions and calculations that are required to be disclosed under CDM rules and that are integral to a rigorous review of the project. If the project is validated without further opportunity for public comment, the project proponent would improperly benefit from filing an inadequate PDD by avoiding public scrutiny of key elements of its proposal.

[1] CDM, *Validation and Verification Manual, Ver. 1.2, EB 55 report, Annex 1*, at 5, 7.
[2] *CDM Validation and Verification Manual, Ver. 1.2, EB 55 report, Annex 1*, at 9.

SUMMARY OF COMMENTS

According to our research, the project activity, as presented in the PDD, is not eligible for validation under ACM0013, the *Additionality Tool*, and other CDM rules, for the following reasons:

<u>Additionality</u>

1. The project does not depend on CDM support to proceed using supercritical technology, as it has already achieved financial closure. The Executive Board has previously refused to register an Indian supercritical plant on these grounds (3020).

2. The project sponsor failed to evaluate alternative tariff structures that would enable the project to achieve a target rate of return without CDM support. The CDM Executive Board has already refused to register one Indian supercritical plant on these grounds, and requested review of two others.

<u>Baseline Assessment</u>

3. 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.

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

5. The PDD fails to apply the E+ guidelines in determining the baseline scenario.

<u>Investment Analysis</u>

6. The PDD uses an unreasonably high estimate of supercritical project costs, and an unreasonably low estimate of project costs for the subcritical alternative.

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

8. The sensitivity analysis improperly advantages inefficient subcritical technology by employing a baseline assumption for the price of coal that is far too low, and using an unrealistically narrow range of price variations.

COMMENTS

Additionality

1. The project does not depend on CDM support to proceed using supercritical technology, as it has already achieved financial closure. The Executive Board has previously refused to register an Indian supercritical plant on these grounds.

Applicable rules

Previous Executive Board decisions 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. Project proponents must therefore substantiate that support from the CDM is a "necessary element" of the decision to invest.[3] Where finance is available that does not depend on CDM support, CDM support cannot be a necessary element. Thus, in its rejection of the "*GHG Emission Reductions through grid connected high efficiency power generation (3020)*" request for registration, the Executive Board concluded that the project proponent 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."[4]

Discussion of non-compliance

Visa Power already has all the financing to proceed with this project in place.[5] It makes no claim that this financing is contingent upon the registration of the project. As such, it cannot show that the CDM support is essential for the project to move forward using supercritical technology.[6]

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[3] *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

[4] *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

[5] NBMCW, *Visa Power gets Rs. 500cr infusion*, 5 August 2011, *available at* http://www.nbmcw.com/news/25021-visa-power-gets-rs-500cr-infusion.html

[6] 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-*

Conclusion

The Executive Board has already refused to register another Indian supercritical project in very similar circumstances. The fact that financing for the project does not depend on CDM support should be fatal to the claim of additionality.

2. The project sponsor failed to evaluate alternative tariff structures that would enable the project to achieve a target rate of return without CDM support. The Executive Board has already refused to register one Indian supercritical plant on these grounds, and requested review of two others.

Applicable rules

The *Additionality Tool* requires the project sponsor to fully consider the "project without CDM support" alternative.[7] This includes consideration of alternative tariff structures that would obviate the need for CDM support. Applying this rule in its *Review of the Project Activity (3020): GHG Emission Reductions through grid connected high efficiency power generation*, the Executive Board declined to register the proposal by another Indian supercritical project on the grounds the project proponent 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…."[8] The Executive Board also has recently initiated reviews of two other requests for registration by Indian supercritical projects, in part because they did not consider alternative tariffs or provide a sensitivity analysis of the proposed tariff.[9]

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).

[7] *Tool for the demonstration and assessment of additionality, Ver. 5.2, Annex: Guidance on the Assessment of Investment Analysis,* at 5.

[8] 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 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 ….")

[9] Registration Request for Review: Greenhouse Gas Emission Reductions Through Super Critical Technology - Jharkhand Integrated Power Ltd. (4629), *available at* http://cdm.unfccc.int/Projects/DB/TUEV-RHEIN1301452084.68/Review/QHZKRH4KHWRXTR5711DV4J3PE9PFBV/display; registration Request for Review: Project: 4807 Energy Efficient Power Generation by Nabha Power Limited, *available at* http://cdm.unfccc.int/Projects/DB/RWTUV1305574742.42/history

Discussion of non-compliance

Visa Power makes no claim that the existing tariff structure does not allow it to "achieve its ROE benchmark and implement the project activity without considering CDM revenues…."[10] Moreover, the PDD contains no discussion of alternative tariff structures that would enable the project to meet its ROE benchmark and proceed without CDM support. Indeed, Visa Power has not provided any evidence or market analysis to show that it needs CDM support to produce power at a rate that would enable it to compete in the market.[11]

Conclusion

By failing to consider alternative tariff structures that would improve the project's returns without the use of CDM revenue, Visa Power has failed to meet its obligation to fully consider the "project without CDM support" as required by the *Additionality Tool*.[12]

Baseline Assessment

3. 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

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."[13] 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."[14] If the PDD proposes a baseline scenario that is different from the power plant technologies that

[10] 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)*

[11] The proposed project is an independent power project that proposes to sell its output to the national grid, where there is currently a shortage of supply and its competitors do not receive CDM support.

[12] *Tool for the demonstration and assessment of additionality, Ver. 5.2, Annex: Guidance on the Assessment of Investment Analysis*, at 5.

[13] *ACM0013, Ver. 4.0*, at 3.

[14] *Id*.

have recently been constructed or are under construction or are being planned, it must justify this apparent discrepancy.[15]

Discussion of non-compliance

The Baseline Assessment in the PDD fails to adequately assess whether the use of supercritical technology without CDM benefits is a "realistic and credible alternative." It seeks to portray supercritical technology as novel and unproven, when in fact it is a quite mature and well-established technology. Supercritical processes have been in commercial use since the 1960s and have achieved broad global penetration. There are now over 500 supercritical units in operation worldwide,[16] representing more than 20 percent of installed units.[17]

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 (see Appendix I); 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*.[18]

India is turning away from subcritical technology and is rapidly deploying supercritical units. Since the partial deregulation of the power sector in 2003, private sector actors have only invested in 1,120 MW of subcritical coal generation in all of India, and have not undertaken any such projects in the last 3 years.[19] 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

[15] *Id.*, at 4.
[16] 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*
[17] 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
[18] PDD, at 13.
[19] Det Norske Veritas, 2010. *Response to request for review"GHG Emission Reductions through grid connected high efficiency power generation"*, at 12-13, available at http://cdm.unfccc.int/filestorage/5/L/8/5L8JTCSFON1WHYZ4KG2DPU3BE6Q0A7/3020%20RfR%20response%20DNV.pdf?t=NkV8MTMxMTE4ODIxNS43OQ==|Aat17nr3_GfKZU4WhGv-2M_yMjQ= .

GW.[20] (See Appendix I). At least two other units have come online in the last 6 months, and at least 8 more with a total capacity of 5280 MW are slated to begin operations in the next year.[21]

The Government of Madhya Pradesh has required the use of supercritical or ultra-super critical technology for all large units, and the Government of India has also mandated supercritical technology for the "ultra-mega power projects" (UMPPs), a series of 14 projects that each have a minimum capacity of 4 GW. So far, four of the planned UMPPs are in various stages of development.[22] Going forward, about 60 percent of the 75 GW of thermal power contemplated in the 12th Five-Year Plan (2012-2017) is expected to be supercritical. The 13th Five-Year Plan (2017-2022) states that 100 percent of new coal-fired plants in shall be supercritical.[23] Supercritical units are likely to contribute up to 50 GW by 2020.[24]

Other power plant operators in India such as Reliance, CPL and the National Thermal Power Corporation (NTPC) are rapidly embracing supercritical technology. In October 2010, Reliance placed a US $ 10 billion order for 42 supercritical boiler, turbine and generator (BTG) packages totaling about 30,000 MW.[25] 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."[26]

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[27]—almost 29 percent of India's total.[28] 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)

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[20] 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

[21] "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

[22] 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

[23] 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

[24] *Id*.

[25] http://www.bseindia.com/xml-data/corpfiling/AttachHis/Reliance_Power_Ltd_281010.pdf

[26] "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).

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

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

for upcoming projects.[29] At that time, NTPC already had six 660 MW units of supercritical technology in advanced stages of construction, and orders placed for two more.[30] It also had seven other 660 MW units and sixteen 800 MW units "upcoming."[31]

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 superior operational performance.[32] 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.[33] Moreover, it also has concluded that project implementation and operations and maintenance are "essentially [the] same as sub-critical."[34]

In addition to the operational benefits of supercritical systems identified by NTPC, other non-CDM related factors are driving this technological shift. Rising coal prices and severe domestic coal shortages have provided a strong incentive for operators to install more efficient generating technology.[35] Over the last five years, persistent coal shortages have lead to reduced electricity production,[36] and have forced both plant operators,[37] and the country's main coal

[29] *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

[30] 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

[31] 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

[32] *Id.*, at 10.

[33] *Id.*, at 13.

[34] *Id.*

[35] *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)

[36] *See, e.g.*, "Thermal plants' coal shortage worsening, *Business Line*," Apr. 4, 2005, *available at* ; "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

producer[38]-- Coal India -- to increase coal imports. As a result, Indian coal imports grew by 36 percent between 2007 and 2009, reaching 16.5 percent of total consumption in 2009.[39]

Imported coal is considerably more expensive than domestic coal, since state-run *Coal India* subsidizes domestic coal by as much as 50 percent below global prices.[40] 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.[41] Coal India raised prices by 12 percent in February, 2011. While this price hike excluded the power sector,[42] future price hikes are expected to cover all sectors.[43]

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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).

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

38 "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

39 IEA Coal Statistics, 2010.

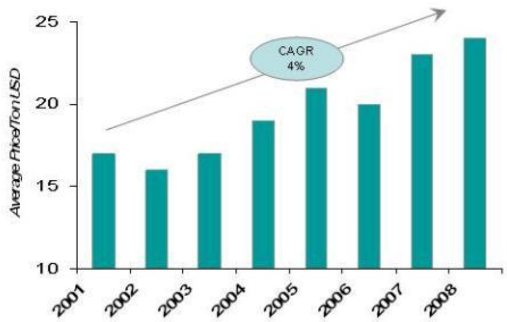
40 "CIL to hike coal prices by 15 pc from tonight," *Times of India*, February 26, 2011, *available at* http://articles.timesofindia.indiatimes.com/2011-02-26/india-business/28636394_1_coking-coal-coal-production-cil

41 *Id.*

42 http://articles.economictimes.indiatimes.com/2011-03-16/news/28697785_1_price-hike-salary-hike-cil

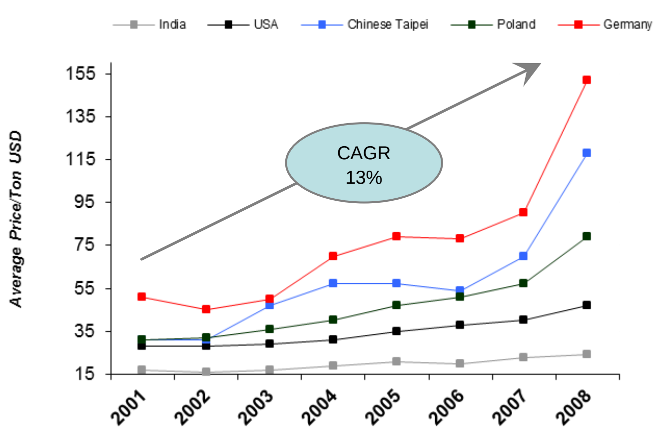
43 *Id.*

Indian Steam Coal Prices 2001-2008



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

Selected Steam Coal Prices 2001-2008



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

In addition, 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.[44] Rising and volatile coal prices will squeeze plant operator profit margins, as the cost of fuel inputs can account for 40-60 percent of the total cost of generation.[45] Indeed, rising costs of imported coal has already forced several companies to halt construction on projects under development.[46]

[44] UBS, 2011. *Global Utilities Outlook 2011*, at 10.

[45] Chikkatur and Sagar, 2007. *Cleaner Power in India: Towards a Clean-Coal-Technology Roadmap*, at 50.

[46] The Hindu Business Line, "RPower halts work on mega AP project citing costlier imported coal", July 8, 2011, *available at* http://www.thehindubusinessline.com/industry-and-economy/banking/article2211624.ece ; Business Standard, "Power plants in pause mode, lenders press panic button", August 3, 2011, *available at*

When the costs of coal are considered, supercritical technology is now cost-competitive or cheaper than subcritical. Modern supercritical plants cost only 2 percent more to install than subcritical plants,[47] and the small incremental difference in capital costs can be offset by greatly reduced variable fuel costs over the life of the project.[48] Thus, in its 2006 *Integrated Energy Policy*, the Planning Commission concluded that "[i]t should be possible to get gross efficiency of 38-40% *at an economically attractive cost* for all new coal-based plants."[49] (emphasis added). Other studies have similarly found that supercritical technologies entail no additional costs over subcritical,[50] and that supercritical units can actually deliver a lower cost of energy over their operating lifetime.[51] Indeed, the planned "Ultra-Mega Power Plants" 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.[52]

Given 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."[53] 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" use supercritical technology.[54] In 2009, the Power Ministry and the Coal Ministry decided to use only supercritical technology for new capacity additions wherever possible.[55] Finally, the Government is considering new policies that would give supercritical generators priority access to scarce coal supplies,[56] and may even ban subcritical plants altogether.[57]

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http://www.business-standard.com/india/news/power-plants-in-pause-mode-lenders-press-panic-button/444689/ ; Bloomberg, "Tata Power Said to Seek Government Help to Curb Plant Losses as Coal Soars", August 10, 2011, *available at* http://www.bloomberg.com/news/2011-08-09/tata-power-said-to-seek-government-help-to-curb-losses-at-plant.html

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

[48] *Id.*; "Fire without smoke making the switch (supercritical technology considerably lowers the costs of coal based power generation)," *India Business Insight*, Aug. 29, 2007.

[49] Planning Commission, 2006. *Integrated Energy Policy: Report of the Expert Committee*, at 49.

[50] Center for Science and Environment, 2010. *The Challenge of the New Balance*, at 35.

[51] MIT, 2007. *The Future of Coal*, at 19.

[52] *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).

[53] http://planningcommission.nic.in/reports/genrep/rep_intengy.pdf

[54] 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

[55] International Coal Report, March 23, 2009, *Platts*, at 10. *available at* http://china.platts.com/IM.Platts.Content/ProductsServices/Products/intlcoalreport.pdf

[56] "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).

Conclusion

To address both market and policy risks, power plant operators 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 planning, it is clear that supercritical technology is the coal technology of choice in India. Visa Power seeks to register a project in the CDM for using a technology that is already heavily promoted by Government of India policies, widely adopted, increasingly compelled by market conditions, and cost effective. The project is therefore clearly non-additional.

4. The PDD fails to adequately assess all "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."[58] *ACM0013* makes clear that (1) "[t]hese alternatives need not consist solely of power plants of the same capacity, load factor and operational characteristics";[59] (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."[60] The decision to exclude scenarios must be supported by "appropriate explanations and documentation."[61]

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."[62] 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.[63]

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

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57 "Sub-660 MW plants face denial," *Financial Express*, Jan. 5, 2010.
58 *ACM0013, Ver. 4.0*, at 3.
59 *Id.*
60 *Id.*, at 4.
61 *Id.*
62 *Id.*
63 *Id.*, at 4.

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:

Energy efficiency and demand side management: It is the policy of the Government of India to consider energy efficiency and demand side management on the same basis as expanded supply in delivering energy services. The Planning 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."[64] 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*."[65] (emphasis added). Moreover, 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 eliminate the supply deficit by 2013,[66] reduce effective demand by over 20 percent,[67] add approximately $500 billion to India's economy by 2017,[68] and reduce the India's cumulative CO_2 emissions by 65 Mt.[69] 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.[70]

Reduction of transmission and distribution losses: Projects that reduce transmission and distribution losses can earn CDM credits under AMS IIA and AM0067. Projects that reduce transmission and distribution losses can earn CDM credits under AMS IIA and AM0067. The PDD entirely omits any analysis of the potential for improvements in transmission and distribution efficiency, despite the fact that Chhattisgarh suffers from loss rates of 42.55

[64] Planning Commission, 2006. *Integrated Energy Policy: Report of the Expert Committee*, at xx.
[65] Planning Commission, 2011. *Interim Report of the Expert Group on Low-Carbon Strategies for Inclusive Growth*, at 31.
[66] Jayant Sathaye and Arjun P. Gupta, 2010. *Electricity Deficit through Energy Efficiency in India: An Evaluation of Aggregate Economic and Carbon Benefits* (Lawrence Berkeley National Laboratory).
[67] Greenpeace India. 2009. *Still Waiting*, at 14. available at http://www.greenpeace.org/india/Global/india/report/2009/11/stillwaiting.pdf
[68] Shakti Foundation, 2011. *The Hundred Billion Dollar Bonus: Global Energy Efficiency Lessons from India.*
[69] Jayant Sathaye and Arjun P. Gupta, 2010. *Electricity Deficit through Energy Efficiency in India: An Evaluation of Aggregate Economic and Carbon Benefits* (Lawrence Berkeley National Laboratory).
[70] 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.

percent.[71] Nationally, reducing transmission and distribution losses is already a top government priority,[72] as the extraordinarily high loss rates place a huge strain on the economy and threaten the viability of energy sector.[73] Simply raising Indian transmission and distribution efficiencies to international best practices (less than 10 percent losses)[74] could eliminate the need for as much as 30 GW worth of additional capacity.[75]

Natural gas: The PDD dismisses natural gas as a credible alternative, because there is a supply shortfall in the Indian market.[76] This is entirely inadequate. If this standard were applied consistently, all coal projects would have to be excluded as well, given the severe coal shortages and tumultuous market conditions described above. Had this option been subjected to a full investment and sensitivity analysis, it likely would have been shown to be a more attractive option than subcritical coal. A new combined cycle natural gas facility typically costs about 35 percent what a new coal plant would cost,[77] and has substantially lower CO_2 emissions.

Solar thermal: The PDD summarily dismisses renewable sources as variable and incapable of producing base load power.[78] 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.[79] The Government of India has identified capturing the "low hanging options" in solar thermal as a national priority in the first phase of the national solar mission.[80] 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

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71 Indian Power Ministry, 2004. *State-wise T&D Losses. Available at* https://docs.google.com/viewer?a=v&q=cache:7AyFfev8XBMJ:www.powermin.nic.in/distribution/apdrp/projects/pdf/Presentation_on_AT%26C_Losses.ppt+india+state+by+state+t%26D+losses&hl=en&gl=us&pid=bl&srcid=ADGEESgmDE4_xQ2xlrILB9A2j46cR8MovfSKpP5IturalNHv2UYvrHIPt-GjO9TIR_nqgK4JDU_KgiPDHQg2BnAI6d46dzDETDcmR2hfQM3awd3UCik-366OlMpwoIpM-wwquoltUxjk&sig=AHIEtbRGhfj6JoxpkmbDgp4nOLyM-RheGA

72 *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

73 Planning Commission, 2006. *Integrated Energy Policy: Report of the Expert Committee*, at 4.

74 Greenpeace India. 2009. *Still Waiting*, at 14. *available at* http://www.greenpeace.org/india/Global/india/report/2009/11/stillwaiting.pdf

75 Shankar Sharma, 2011. *Indian Power Scenario: Huge scope for low carbon energy pathway*.

76 *PDD*, at 14.

77 See, National Energy Technology Laboratory, U.S. Department of Energy, *Cost and Performance Baseline for Fossil Energy Plants; Volume 1. Bituminous Coal and Natural Gas to Electiricity,* Rev. 2, November , 2010, ES-5, ES-7 http://www.netl.doe.gov/energy-analyses/pubs/BitBase_FinRep_Rev2.pdf

78 PDD, at 15.

79 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*.

80 Jawaharlal Nehru National Solar Mission: Towards Building SOLAR INDIA, at 3, *available at* http://india.gov.in/allimpfrms/alldocs/15657.pdf .

been dramatically narrowed.[81] Furthermore, India already has a solar power manufacturing sector to rely on for increased growth in this area.[82]

Wind and Biomass: The PDD similarly dismisses power from wind and biomass without meaningful analysis.[83] However, India has an enormous potential of 46 GW of wind[84] and 27 GW for biomass.[85] While wind power does not, by itself, serve as baseload generation, it can be integrated with demand-side management, transmission system upgrades, hydropower and existing fossil-fired generation to reduce or eliminate the need for additional coal-fired plants. These options should have been more rigorously evaluated both alone and in combination with other options.

Strengthened grid connections: The PDD references the use of connected grids to import electricity, but dismisses this alternative because neighboring grids are in shortage.[86] 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.[87]

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.

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[81] 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

[82] *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

[83] PDD, at 15.

[84] *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

[85] "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

[86] PDD, at 15.

[87] http://blog.cleantech.com/sector-insights/energy-efficiency/india-loses-45-of-the-electricity-it-produces-expect-surge-in-energy-efficiency-investment/

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.

5. PDD fails to apply the E+ guidelines in determining the baseline scenario.

Applicable Rules

E+ guidelines require that national or sectoral policies that give comparative advantage to more emissions intensive technologies or fuels can only be accounted for in establishing the baseline scenario to the extent that they existed prior to the adoption of the Kyoto Protocol. Where such policies are in place, the baseline scenario should refer to a hypothetical situation without the national and/or sectoral policies or regulations.[88]

Discussion of non-compliance

The Government of India has a longstanding policy of subsidizing the consumption of coal for power production by having its state-owned coal enterprises sell coal to power producers at prices that are well below market rates.[89] While this subsidy was in place before 1997, it has dramatically increased since then. In 1997 coal prices on international markets were 350 percent above domestic prices; by 2008 (the most recent year for which data was available), they were 700 percent above domestic prices.[90] The difference between the prices charged by these state-owned enterprises and prevailing international market prices represents a subsidy that gives a comparative advantage to coal-fired power plants over cleaner modes of energy production, and to inefficient coal-fired power over more efficient ones. Accordingly, under the E+ guidelines, alternative baseline scenarios should have been evaluated as if the level of coal subsidy that existed on December 11, 1997 were still in place.

Conclusion

Under the E+ guidelines, the baseline scenario should have been assessed under the hypothetical situation in which subsidies as they existed on December 11, 1997 were still in place. By conducting the analyses using the much higher current subsidy rates, the PDD improperly privileges less efficient subcritical coal.

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[88] EB 22, Annex 3, paragraph 7(a)

[89] http://www.coal.nic.in/chap10102.pdf

[90] Data gathered from EIA: http://www.eia.gov/emeu/international/coalprice.html , Indian Coal Ministry Annual Reports: http://www.coal.nic.in/welcome.html , BP 2011 statistical review: http://www.bp.com/sectionbodycopy.do?categoryId=7500&contentId=7068481 , and IEA Coal Statistics 2010

Investment Analysis

6. The PDD uses an unreasonably high estimate of supercritical project costs, and an unreasonably low estimate of project costs for the subcritical alternative.

Applicable Rules

Data and assumptions presented in the investment analysis must be accurate, conservative, credible, reliable, and complete.[91] They must stand up to objective analysis when compared with other sources of information.[92]

Discussion of non-compliance

The PDD bases its claim of additionality on the purported difference in costs between energy that will be produced by this project without CDM support, and energy produced from a subcritical project. Supercritical plants typically cost about 2 percent more to install than subcritical plants,[93] but the project proponent estimates that it the supercritical plant will cost over 100 percent more.

The PDD estimates that the super critical plant would have a total project cost of 44,537.2 million INR (€ 682.57 million).[94] This works out to approximately € 1034/KW, which is far higher than what would be expected from the literature.[95]

Conversely, the PDD grossly underestimates the alternative subcritical project costs. The PDD estimates a total project cost of 22,112.7 million INR (€338.75 million)—less than half the estimated cost of the supercritical plant.[96] This works out to approximately € 513/KW, which is far lower than what would be expected from the literature.[97] These costs typically average €827/KW.[98]

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[91] CDM, *Validation and Verification Manual, Ver. 1.2*, *EB 55 report, Annex 1*, at 5, 7.
[92] *Id.*, at 7.
[93] Boben Anto, M.M. Hasan, undated. *Analysis of Supercritical technology in Indian Environment and Utilizing Indian coal*, at 113.
[94] PDD, at 17.
[95] See, U.S. Environmental Protection Agency, *Available and Emerging Technologies for Reducing Greenhouse Gas Emissions from Coal Fired Power Plants, Exhibit 3-2* October , 2010, http://www.epa.gov/nsr/ghgdocs/electricgeneration.pdf; see also http://www.deq.state.mi.us/aps/downloads/permits/PubNotice/341-07/AlternativesAnalysis.pdf ; National Energy Technology Laboratory, U.S. Department of Energy, 2010. *Cost and Performance Baseline for Fossil Energy Plants; Volume 1. Bituminous Coal and Natural Gas to Electiricity,* Rev. 2, ES-5, ES-7 http://www.netl.doe.gov/energy-analyses/pubs/BitBase_FinRep_Rev2.pdf
[96] PDD, at 18.
[97] See, U.S. Environmental Protection Agency, *Available and Emerging Technologies for Reducing Greenhouse Gas Emissions from Coal Fired Power Plants, Exhibit 3-2* October , 2010,

Conclusion

The PDD uses an unreasonably high estimate of project costs and an unreasonably low estimate of subcritical project costs. These are substantial outliers when compared to credible estimates of similar projects by independent parties. Had more reasonable assumptions been used, there is good reason to believe that supercritical would have emerged as a lower cost option than subcritical, given high and rising coal prices.

7. The investment analysis 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."[99] 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." [100] All investment analysis should be provided in spreadsheet format, with all formulas readable and relevant cells viewable and unprotected.[101] 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." [102] 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."[103] The analysis must present a clear comparison of

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http://www.epa.gov/nsr/ghgdocs/electricgeneration.pdf; see also http://www.deq.state.mi.us/aps/downloads/permits/PubNotice/341-07/AlternativesAnalysis.pdf ; National Energy Technology Laboratory, U.S. Department of Energy, 2010. *Cost and Performance Baseline for Fossil Energy Plants; Volume 1. Bituminous Coal and Natural Gas to Electiricity,* Rev. 2, ES-5, ES-7 http://www.netl.doe.gov/energy-analyses/pubs/BitBase_FinRep_Rev2.pdf

98 *Id*.

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

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

101 *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."

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

103 *Id.*

the financial indicators for all scenario alternatives.[104] Assumptions and input data should be consistent across the project activity and its alternatives, unless differences can be well substantiated.[105]

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 is not 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,[106] but fails to:

- Provide project cost data for alternatives other than subcritical;
- Show the calculations it used to generate the LCOEs, or present them in spreadsheet form so they could be replicated;
- Show the assumptions or 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;
- Show or calculate sensitivity analyses for O&M costs as well as Fuel transportation costs
- Demonstrate how revenue from the CDM would affect the financial viability of the project activity, and cause supercritical technology to become the preferred option;
- Provide estimated fuel prices or credible 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 provide key data, assumptions and calculations to support that conclusion. By providing its data only in chart form, without showing the relevant calculations the PDD makes it impossible for the reader to "reproduce the analysis and achieve the same results." The Executive Board has

[104] *ACM0013, Ver. 4.0*, at 4.
[105] *Tool for the demonstration and assessment of additionality, Ver. 5.2*, at 7; *ACM0013, Ver. 4.0*, at 4.
[106] *PDD*, at 30.

rejected previous proposals based on these same deficiencies,[107] and the proper response to such a woefully inadequate PDD is for the DOE to refuse to validate this project activity. However, if SGS Certification Services allows the project sponsor to amend the PDD to include this material, it must also afford the public an opportunity to comment on the supplementary material. Otherwise, the project sponsor would evade public scrutiny of its investment analysis by submitting an inadequate PDD.

8. *The sensitivity analysis improperly advantages inefficient subcritical technology by employing a baseline assumption for the price of coal that is far too low, and using an unrealistically narrow range of price variations.*

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."[108] 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…."[109]

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."[110] 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

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[107] *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

[108] *Tool for the demonstration and assessment of additionality, Ver. 5.2, Annex: Guidance on the Assessment of Investment Analysis*, at 15.

[109] *Id.*

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

lowest emission rate among those that are the most financially and/or economically attractive should be selected as the baseline scenario.[111]

Discussion of non-compliance

The sensitivity analysis must consider future coal prices within a "realistic range of assumptions," as determined by project circumstances and past trends.[112] However, the PDD assumes a baseline cost of coal for the project of 736 Rs/tonne,[113] only about a third of Coal India's average price of 2,245 Rs/tonne.[114]

In addition to starting from an unrealistically low baseline, the PDD uses an unrealistically narrow price variation of +/-10% in the sensitivity analysis. As discussed in section 5, India is currently experiencing severe coal shortages and there is strong upwards pressure on coal prices. Coal prices in Indian markets rose an average of 15.9 percent *annually* between 1994 and 2008,[115] and have risen 25 percent in the last quarter alone.[116] These shortages have constrained electricity production,[117] and have forced plant operators[118] and Coal India[119] to

[111] *ACM0013*, Ver. 4.0, at 4.
[112] *ACM0013*, Ver. 4.0, at 4; *Tool for the demonstration and assessment of additionality*, Ver. 5.2, at 7, 15.
[113] *PDD*, at 17.
[114] The Economic Times, *Coal India: Coal price, other income to drive future growth*, 21 August 2011, *available at* http://articles.economictimes.indiatimes.com/2011-08-22/news/29915012_1_coal-india-e-auction-coal-production
[115] Data gathered from EIA: http://www.eia.gov/emeu/international/coalprice.html , Indian Coal Ministry Annual Reports: http://www.coal.nic.in/welcome.html , BP 2011 statistical review: http://www.bp.com/sectionbodycopy.do?categoryId=7500&contentId=7068481 , and IEA Coal Statistics 2010
[116] Moneycontrol, Rise in power tariffs may further fuel inflation, says RBI, *available at* http://www.moneycontrol.com/news/economy/risepower-tariffs-may-further-fuel-inflation-says-rbi-_568856.html
[117] *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).
[118] "Adani to invest $1.6 billion in Indonesian project," *Reuters*, *available at* http://in.reuters.com/article/2010/08/25/idINIndia-51045420100825
[119] "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

increasingly source coal from more expensive international markets.[120] Analysts expect this situation to worsen, as the shortage is likely to grow to 250 to 350 million tons over the next 3-4 years.[121] The Indian Power ministry predicts that the shortage will leave up to 42,000 MW of new generation capacity unable to generate electricity.[122] Moreover, while Coal India has historically subsidized domestic consumers by selling its coal at well below international rates, these subsidies are proving to be unsustainable, and Coal India has stated that it will allow its prices to rise to better reflect global markets.[123] That is why Coal India raised prices by 12 percent in February, 2011, and further price hikes are anticipated.[124]

The Indian Government is also considering a Mines and Minerals bill that would significantly raise the costs for coal mining companies.[125] New mines would be required to provide 26 percent of their profits to local residents, while royalty dues to the government would likely double.[126] With domestic coal prices heavily discounted in comparison with international prices, market analysts believe Coal India can raise prices without adversely affecting profits–a likely move considering the affect the bill is already having on Coal India's stock price.[127]

Given these trends, it is unrealistic to assume that coal prices will only fluctuate 10 percent from the base case over the ten-year project period. A sensitivity analysis that more accurately reflected the current volatility in the Indian coal market would almost certainly show that supercritical coal is the more financially or economically attractive baseline under certain reasonably likely market conditions. While modern supercritical plants typically cost about 2 percent more to install than subcritical plants,[128] they can deliver energy at the same or lower costs over their operating life due to their reduced fuel costs.[129] That being the case, a rigorous sensitivity analysis would have shown that at a certain coal price, supercritical technology will surpass subcritical as the most financially or economically attractive alternative. The

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[120] IEA Coal Statistics, 2010.

[121] Sharma, Ravi. Coal shortage to rise between 250 mn to 350 mn tonne in next 3-4 yrs: Adani Power. http://articles.economictimes.indiatimes.com/2011-07-20/news/29795017_1_growmore-trade-coal-shortage-power-rates

[122] Sasi, Anil. Coal shortage may trip 42,000 MW of new projects. http://www.thehindubusinessline.com/industry-and-economy/article1991364.ece?homepage=true

[123] *Id.*

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

[125] *Share your profits mining bill will raise costs all around* http://www.firstpost.com/politics/share-your-profits-mining-bill-will-raise-costs-all-around-38372.html

[126] *Id*.

[127] Coal India slips over 12 pc since June; mining bill weighs http://articles.economictimes.indiatimes.com/2011-07-11/news/29761308_1_mining-bill-nc-jha-mmdr-bill

[128] Boben Anto, M.M. Hasan, *Analysis of Supercritical Technology in Indian Environment and Utilizing Indian Coal*, at 113.

[129] MIT, 2007. *The Future of Coal*, at 19; Center for Science and Environment, 2010. *The Challenge of the New Balance*, at 35.

Additionality Tool requires that the sensitivity analysis determine if this "switching price" will occur within a "realistic range of assumptions."[130] 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…."[131]

Conclusion

An adequate sensitivity analysis must employ a range of price variability that accurately reflects recent market trends. This must be far higher than the +/- 10 percent minimum allowed under CDM rules.[132] By way of example, one recent independent sensitivity analysis of the stock price of GPIL, assumed coal price variations up to + 30 percent per year.[133]

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 "switching price" and the likelihood that it will occur, and to reassess financial attractiveness of the options on that basis.

CONCLUSION

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. For this reason, we call on SGS United Kingdom not to validate the proposed Project. However, should SGS 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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[130] ACM0013, Ver. 4.0, at 4; *Tool for the demonstration and assessment of additionality*, Ver. 5.2, at 7.
[131] *Tool for the demonstration and assessment of additionality, Ver. 5.2, Annex: Guidance on the Assessment of Investment Analysis*, at 15.
[132] *Tool for the demonstration and assessment of additionality, Ver. 5.2, Annex: Guidance on the Assessment of Investment Analysis*, at 15.
[133] ULJK Financial, Institutional Research: Godawari Power and Ispat Limited, at 7. March 31, 2011, *available at* http://www.harshadgandhi.com/images/gpil%20uljk.pdf .

APPENDIX 1: SUPERCRITICAL PROJECTS IN INDIA[134]

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.

[134] 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 Pradesh	2	660	M/s. NTPC Ltd.
23	Katwa, West Bengal	2	660	M/s. WBPDCL
24	Bakreshwar, Extension	1	660	M/s. WBPDCL

No.	Name/Location of Thermal Power Station	No. of Units	Unit capacity (in MW)	Utility
	Project			
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