Carbon Resource Management

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CDM Executive Board

DNV

25 July 2007

Ref. CRM/UNFCCC/1109

Response to the request for review for 1109 M/S. Kothari Sugars and Chemicals Ltd (KSCL)'s Bagasse Based Co-generation Project, at Perambalur district, Tamil Nadu, India

Dear Sir, Madam,

We would like to clarify each of the issues raised in the request for review for our bagasse CHP project reference 1109.

The first issue raised in the request for review is:

The guidelines for completing section B.5 of the PDD requires, "If the starting date of the project activity is before the date of validation, provide evidence that the incentive from the CDM was seriously considered in the decision to proceed with the project activity. This evidence shall be based on (preferably official, legal and/or other corporate) documentation that was available at, or prior to, the start of the project activity." This requirement has not been satisfied.

Response to the first issue:

The evidence – the minutes of the board meeting approving the investment in the plant as a CDM project (Annex 1) – was provided to the DOE and validated as part of the validation process prior to the request for registration. The minutes from the Board of KSCL are attached for your information.

The start date of the project activity is 22 September 2005. A copy of the boiler contract as an evidence of start date of the project activity was provided to DOE for validation. The minutes of board meeting, dated 15 September 2005, clearly shows

that KSCL had seriously considered incentives from the CDM in decision making process prior to the start of the project.

The delay between the Board decision, the initial submission of the PDD to the DOE, and the final validation was caused among others by the careful selection procedure for the CDM consultant, changes to the PDD format just before the initial stakeholder period, as well as changes to the methodology and the changes required due to the approval of the CEA emission factor values by the Government of India just before requesting registration.

The second issue raised in the request for review is:

- *The list of alternatives does not include the possibility of a low pressure cogeneration system designed to meet the captive needs of the sugar plant.*

Response to the issue:

Step 3 of the analysis of additionality in section B.5 of the PDD shows that a low pressure cogeneration scenario faces a variety of barriers that prevent the implementation of such a plant as well as showing that any cogeneration unit can not be considered common practice. The DOE confirmed the findings in the validation report.

The barrier analysis in the PDD shows several barriers which are applicable to both low and high pressure cogeneration systems in India, preventing the implementation of such a system, including:

- The cost of setting up a cogeneration plant is equivalent or more than setting up a sugar plant. Presently, the high interest cost of capital from both banking and non-banking financial institutions makes the co-generation less attractive for sugar mills[1]. KSCL has faced investment barriers from high upfront cost and great difficulty to reach financial closure for the project.

- Banks and financial institutions require a power purchase agreement (PPA) to be signed before approving a loan. However, the signing of a PPA takes a long time and may not be finalised in the initial stages when loans are sought and negotiated. In addition, they request an escrow agreement in place to safeguard payment from the counterparty to the PPA. But TNEB (the PPA counterparty) does not provide an escrow account facility and its financial condition is vulnerable – TNEB had accumulated losses of Rs. 35.11 billion as on March,

[1] Commission for agricultural costs and prices report on price policy for sugarcane for the 2004-05 season (point No. 25) http://dacnet.nic.in/cacp/sugar-final.htm.

2005[2] – a and the agreed PPA could be at risk. However, the envisaged additional revenues from the project due to CDM registration will improve the financial viability of the project and also will have positive effect on the return on investment.

- To operate the power plant in the off-season period a large amount of biomass fuel is required. This is an additional significant barrier to the project activity as bagasse during off-season is not readily available from the cane crushing operation of the plant, as during the season and most of this fuel requirement will have to be met from outside sources, mostly from many small suppliers scattered over a large area. Even though the Tanjavur District where the project is located, is a prominent agricultural belt in Tamil Nadu, mobilising the required quantity of biomass is challenging, as there is no organised biomass fuel market.

- The latest data available on bagasse-based cogeneration from the Sugar Technologists' Association of India[3] lists only 22 mills with bagasse cogeneration of similar or larger capacity in India. Some of these projects are also considering CDM benefits. Considering that there are 517 sugar mills in India the uptake of bagasse cogeneration on a similar scale, represents only 4%. Therefore it must be considered that similar activities to the proposed project activity are not common practise and hence the project is additional. All three new bagasse cogeneration plants of similar capacity in Tamil Nadu are being proposed as a CDM projects.

Due to these barriers a cogeneration system not implemented as a CDM project is not considered as a realistic alternative. Instead, therefore, in the baseline scenario, as a conservative alternative (i) KSCL would use bagasse for generation of process heat, (ii) no power would be generated on site, and (iii) power would be drawn from the grid for meeting the needs of the sugar mill. Thus, the project would offset grid emissions for electricity generation, but not offset emissions for heat generation from biomass, and neither would the project claim reductions from decay from biomass.

The fourth issue raised in the request for review is linked to the previous (second) issue raised:

- *More information should be provided to confirm that scenario 4 of the approved methodology is not more applicable to this greenfield project than scenario 3.*

[2] http://powermin.nic.in/indian_electricity_scenario/Final_Report_Rating.pdf, page no: 85.
[3] "List of Cane Sugar Factories and Distilleries in India", Published by The Sugar Technologists Association of India season 2005-06.

Response to the issue:

Scenario 3 (P4, B1 or B2 or B3 and B4, H4) describes a situation where the project baseline is heat generation from the same biomass (B4, H4) – or less conservatively dumping of the biomass without energy recovery (B1 or B2 or B3) – and electricity from the grid (P4).

Scenario 4 (P2 and P4, B4, H2) describes the situation where the project baseline would be heat and power generation using the same biomass resources (P2, B4, H2), but at a lower efficiency than the proposed project activity; some additional electricity may be imported from the grid (P4).

The alternatives P2/H2 (low pressure cogeneration) – the difference between these two scenarios – are discussed in the PDD. However, in Step 3 of the analysis of additionality in section B.5 of the PDD, and described in detail in our response to the second issue above, a low efficiency cogeneration system not implemented as a CDM project is not considered as a realistic alternative. Scenario 4 therefore is not considered realistic. Instead, scenario 3 is taken as a conservative baseline alternative: (i) KSCL would use bagasse for generation of process heat, (ii) no power would be generated on site, and (iii) power would be drawn from the grid for meeting the needs of the sugar mill. Thus, the project would only offset grid emissions for electricity generation, but not offset emissions for heat generation from biomass. The DOE confirmed these findings in the validation report.

The main reasons why alternatives P2 and H2 are not realistic are presented in the barrier analysis, including the cost of setting up a cogeneration plant and the high cost of capital making co-generation less attractive for sugar mills[4], and common practice with only approximately 4% of the 517 sugar mills[5] having a similar bagasse cogeneration plant, some of which are requesting CDM registration. Additionally, all three new bagasse cogeneration plants of similar capacity in Tamil Nadu are being proposed as a CDM projects.

Scenario 4, therefore, is not applicable as KSCL would not have considered installation of a cogeneration plant in absence of CDM due to the barriers (which are similar for low and high pressure cogeneration) associated with the biomass prices, difficulties of the agreement of the PPA and financial closure of such project. Instead, without the CHP plant, it had planned to consume bagasse in a conventional boiler for meeting the

[4] Commission for agricultural costs and prices report on price policy for sugarcane for the 2004-05 season (point No. 25) http://dacnet.nic.in/cacp/sugar-final.htm.

[5] "List of Cane Sugar Factories and Distilleries in India", Published by The Sugar Technologists Association of India season 2005-06.

process heat requirements of the sugar plant and import electricity from TNEB grid. Reasons for not considering cogeneration plant in baseline scenario are:

a. KSCL is not required by law to establish a cogeneration unit in its sugar mill.

b. No mandate from Central Pollution Control Board for disposal of bagasse to the cogeneration plant.[6]

c. The cost of setting up a cogeneration plant is equivalent or more than setting up a sugar plant.[7] The high interest cost of capital from both banking and non-banking financial institutions have discouraged KSCL management from considering cogeneration at the sugar mill. KSCL management agreed to install the cogeneration plant only after considering the CDM benefits.

d. Sugar cogeneration is not a common practice in Tamil Nadu which has 38 sugar factories out of which 16 have cogeneration plants.[8] Among these cogen plants, at least 6 plants have opted for using lignite.[9] At national level, with bagasse based cogeneration potential of 5000 MW only 300 MW is installed.[10]

e. Institutional policy of TNEB is not encouraging for establishing cogeneration plants in sugar mills. TNEB has history of revising the prices unilaterally on power purchased from bagasse based cogeneration plants. With establishment of regulatory commission the unit prices of power is now fixed at Rs 3.15 without escalation for 3 years.[11] However, the increase in the raw material and operational costs has made the cogeneration projects vulnerable. Considering the financial situation of TNEB[12], the sanctity of tariff rate under PPA agreement with TNEB is also questionable.

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[6] Central Pollution Control Board:
http://www.cpcb.nic.in/Environmental%20Standards/Effluent/standard56.html;
http://www.cpcb.nic.in/Environmental%20Standards/Emission/standard4.html;
http://www.cpcb.nic.in/Environmental%20Standards/Emission/standard32.html.

[7] Commission for agricultural costs and prices report on price policy for sugarcane for the 2004-05 season (point No. 25) http://dacnet.nic.in/cacp/sugar-final.htm.

[8] "List of Cane Sugar Factories and Distilleries, Season 2005-06", Published by The Sugar Technologists Association of India.

[9] Industries Department, Policy Note – 2003 – 2004, Demand No. 26, Page no.8, para no.2, www.tn.gov.in/policynotes/archives/policy2003-04/industries.pdf.

[10] Energy and Water for Sustainable Living, The Office of Policy & International Affairs, US Department of Energy, http://www.pi.energy.gov/documents/EWSLindia.pdf.

[11] Tamil Nadu Electricity Regulatory Commission, Order No. 3 date: 15/5/2006.

[12] http://powermin.nic.in/indian_electricity_scenario/Final_Report_Rating.pdf - page no: 85.

f. No organized biomass residue market in the region as a result cogeneration project is susceptible to inflation on biomass residues prices.

g. Non availability of skilled man power in the region resulting in training cost.

The additionality section of PDD provides a more detailed analysis of the above mentioned barriers.

Due to these barrier the KSCL board is convinced that establishing a cogeneration plant, in absence of CDM benefits, is not profitable. Consequently, in the absence of CDM, KSCL would have used bagasse for producing steam and importing grid electricity to meet sugar plant requirements. The excess would be dumped at the sugar plant (since there is no law which regulate open dumping of baggase and at the same time it is not economical to transport to nearest use).

Considering the above mentioned points scenario 3 is the most relevant and a conservative alternative to the proposed KSCL bagasse based cogeneration project, as validated by DNV prior to requesting registration.

The third issue raised in the request for review is:

Further evidence is requested to confirm that the barriers presented prevent the implementation of the project activity. If barriers only affect the financial viability of the project it should be confirmed that the project is not financially viable with these constraints.

Response to the third issue:

The PDD and our responses above clearly discuss the various barriers and shows that these barriers prevent the implementation of the alternatives: the investment barriers identified prevent the project proponent from setting up the project, as well as from obtaining loans; the institutional barriers show that the risks associated with the project activity and in particular those related to the feed in tariff make the project more risky and less attractive; without an organised biofuel market it will be difficult to operate the plant during the off-season when no bagasse is available; and finally the common practice analysis shows that these types of projects are not common practice and that similar projects are also requesting CDM registration.

The evidences presented are:

- Commission for agricultural costs and prices report on price policy for sugarcane for the 2004-05 season (point No. 25) http://dacnet.nic.in/cacp/sugar-final.htm.

- Tamil Nadu Electricity Regulatory Commission, Order No. 3 date: 15/5/2006.
- http://powermin.nic.in/indian_electricity_scenario/Final_Report_Rating.pdf, page no: 85.
- Letter issued from Indian Bank for the Term Loan mentioning Interest Rate.
- "List of Cane Sugar Factories and Distilleries in India", Published by The Sugar Technologists Association of India season 2005-06.
- Industries Department, Policy Note – 2003 – 2004, Demand No. 26, Page no.8, para no.2, www.tn.gov.in/policynotes/archives/policy2003-04/industries.pdf.

While some of the barriers impact the financial viability of the project, other barriers exist and prevent the implementation of the alternatives in other ways. Neither the PDD nor the validation report claims that the barriers only affect the financial viability of the project. However, the promise of additional income from CER sales lifts the financial returns of the project making it financially attractive to the developer to implement the project.

The barrier discussion shows that the relatively high cost of establishing a cogeneration system caused difficulties for financial closure, as well as higher costs. It also shows the risks associated with the power purchase agreement and the low tariffs paid in Tamil Nadu. The technical and common practice barriers discussion shows that there is little experience with any cogeneration plant in the sector which are not implemented as CDM projects. The final barrier discussed is the lack of an organised biofuel market. However, for completeness we have attached an IRR analysis (Annex 2) for the project without CER revenue, showing the IRR just 8.13%. This return is not sufficiently high to reward the investor for the risks taken. Based on a weighted average cost of capital calculation, the return would need to be 9.42%. With CER revenues, the IRR would be increased to 15.27%, thus making the project financially attractive.

The assumptions of the financial analysis are (see Annex 2):

- Total investment costs is INR 877,500,000 (Annex 3).
- The project is a stand alone project, so that all units have an opportunity cost equal to the market price or cost of generation. The cost of bagasse is priced according to the tariff calculations of TNEB for the project's own bagasse (Rs. 575 per tonne)[13] and the cost for purchasing biomass on the market (Annex 5)

[13] Fuel price - Tariff Document of TERC. Please refer to Page No. 81 for fuel price http://tnerc.tn.nic.in/orders/nces%20order%20-approved%20order%20host%20copy.pdf.

as certified by a Chartered Accountant (Annex 3). The escalation in biomass price is taken as 5%[14]. The electricity price is equal to the feed in tariff (the captive consumption by the sugar plant is during the crushing season and therefore equal to the higher price) (the PPA is attached as Annex 7, an invoice as Annex 8,). The cost of steam is priced according to the tariff calculations of TNEB (Rs. 260 per tonne)[15]. Both the electricity and steam tariffs are increased by 5% after each 5 years although the TNERC has not yet decided to escalate the tariff[16]. This is considered to be conservative.

- The weighted average cost of capital (WACC) is calculated to be 9.46%, which is below the prime lending rate of the Indian Bank (12.5%[17]), and therefore is used as more conservative. The WACC is calculated from the expected return on equity used by the Tamil Nadu Electricity Regulatory Commission (16%[18]), the actual loan rate from the Indian Bank (10%, see Annex 4) and the preferential rate loan form the Sugar Development Fund (only 4%, see Annex 9).

- The O&M costs, which are high due to the technology used, have been certified by a qualified Charted Accountant (Annex3). An annual escalation of O&M costs of 5% is used as decided by TNERC[19].

The final issue raised in the request for review is:

Section B7 of the PDD must contain information on how all parameters required by the methodology, including fossil fuel consumption and electrical output, will be monitored.

Response to the final issue:

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[14] Fuel price escalation - Tariff Document of TERC. Please refer to Page No. 81 fuel price escalation http://tnerc.tn.nic.in/orders/nces%20order%20-approved%20order%20host%20copy.pdf.

[15] See Annex 6.

[16] Escalation in tariff -Tariff Document of TERC. Please refer to page No. for 36 http://tnerc.tn.nic.in/orders/nces%20order%20-approved%20order%20host%20copy.pdf Also refer PPA document.

[17] http://www.indianbank.in/interest.htm#plr.

[18] Return on Equity - Tariff Document of TERC. Please refer to Page No. 90 for the ROE figure (16%). http://tnerc.tn.nic.in/orders/nces%20order%20-approved%20order%20host%20copy.pdf.

[19] Escalation in O&M -Tariff Document of TERC. Please refer to page No. 78 - O&M for biomass cogen plants. http://tnerc.tn.nic.in/orders/nces%20order%20-approved%20order%20host%20copy.pdf.

The table with data and parameters monitored covering electricity generation from the project was accidentally missed out in B.7.1 and only included in B.6.2. However, Annex 4 of the PDD which describes the monitoring plan in more detail clearly states that the net electricity generation will be monitored using electricity meters at the substation. The table is included in the attached PDD v3.1.

Data / Parameter:	EG_y
Data unit:	MWh
Description:	Net quantity of electricity generated in the project plant during year y
Source of data to be used:	TNEB & KSCL electricity meters
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Net supplied power is expected to be 139,000 MWh/year once fully operational
Description of measurement methods and procedures to be applied:	The data will be based on TNEB meter readings at the sub-station and the KSCL meter for internal electricity use (not including parasitic losses). EG is net of parasitic losses and includes internal electricity use and electricity exported to the grid.
QA/QC procedures to be applied:	The meters will be maintained according to the appropriate industry standards. They will be calibrated and checked annually for accuracy. TNEB meter readings at the substation will be cross-checked with sales receipts.
Any comment:	

Information with regards to monitoring fossil fuel use is included fully in the PDD. The table shows that fossil fuel use will be monitored at the boiler inlet. The fossil fuel consumption is monitored with low uncertainty levels and any use will be cross checked against fuel purchases.

Conclusion

In conclusion, we believe that sufficient evidence has been provided that the KSCL bagasse project (1109) is additional. It is our sincere hope that the EB will accept these clarifications and explanations, and will approve this project for registration without further delay.

Annexes

1. Board Meeting Minutes
2. IRR calculation spreadsheet
3. Chartered Accountant certificate
4. Indian Bank loan note
5. Bagasse supply quotes
6. Steam invoice
7. PPA
8. Electricity invoice
9. Sugar Development Fund loan note