

Mr. Hans Jürgen Stehr Chair, CDM Executive Board **UNFCCC Secretariat** CDMinfo@unfccc.int

January 4th, 2008

Request for review of the request for registration for the CDM project activity "Enercon Wind Farms in Re: Karnataka Bundled Project – 33 MW" (UNFCCC No. 1299)

Dear Mr. Stehr,

SGS has been informed that the request for registration for the CDM project activity "Enercon Wind Farms in Karnataka Bundled Project – 33 MW" (UNFCCC No. 1299) is under consideration for review because three requests for review have been received from members of the Board.

The requests for review are based on the reasons outlined below. SGS would like to provide a response to the issues raised:

Request 1, 2 and 3:

1. It is required to provide calculations of a project IRR, which should be confirmed to a suitable benchmark following sub-step 2b of the additionality tool.

SGS Response:

SGS recognises that in carrying out the benchmark analysis as mentioned in version 3 of the additionality tool; calculation of the Project IRR and comparison a with benchmark return corresponding to the project IRR returns (for greenfield project IRR) for the power/wind power generation projects. Acknowledging that the benchmark value should be transparent, conservative and a publicly available one, SGS has accepted the Equity IRR approach because post tax equity return benchmark is publicly available as it is set by the electricity regulatory commissions for tariff determination (of Independent Power Plants (IPP) in India) provides a transparent, credible and conservative benchmark for returns from investment in power generation projects in India.

Further, an investor looks at the equity IRR when making an investment decision in the project. It also stands to reason that firms that can avail of debt financing (project financing) will attempt to optimize the debt financing in order to enhance their equity returns. The very objective of having a sectoral benchmark that is free from project or firm related aspects will get defeated if it is not widely and publicly available.

Accordingly, project proponent had calculated the Equity IRR for the project and compared it with the benchmark of post tax equity return for IPPs in India.

It is also important to note that investors look at maximising the return on their investments (Equity) and therefore base their investment decisions on the equity IRR of the project. If a typical project were to be



considered, not withstanding the project IRR that is generated in a business as usual case, the equity investor will never invest in the project unless the project provides sufficient returns (equity IRR) to the investor. Therefore, investment decisions are as much dependent on project characteristics as on financing structure and it would not be appropriate to ignore the financing structure aspect.

Using the project IRR approach has the potential of allowing otherwise profitable projects to get through. To explain this point SGS has considered following examples¹ which is the case with project activity as well. Suppose there are two firms and each undertakes investment in identical projects (Investment of 100, project lifetime of 15 years) and their project returns are 10%. Firm A has weak financials and no track record in implementing such projects and therefore is forced to use a 100% equity financing for its project because it is not able to avail of debt financing. Firm B which is financially very strong and has a strong track record in implementing such projects uses a 90:10 debt:equity financing structure. Further, Firm B is able to avail long tenure debt (say 15 years) and at very competitive interest rates (say at 8%), given its strong negotiation position. As both have invested in identical projects, the project IRR of both the projects would be same but the equity IRR of firm B is likely to be very high (approx. 25.5%) as compared to Firm A (10%).

	Project	Debt cash	Equity cash flows = (Project
	cash flows	flows	cash flows - debt cash flows)
Year 0	-100	-90	-10
Year 1	13.15	10.515	2.635
Year 2	13.15	10.515	2.635
Year 3	13.15	10.515	2.635
Year 4	13.15	10.515	2.635
Year 5	13.15	10.515	2.635
Year 6	13.15	10.515	2.635
Year 7	13.15	10.515	2.635
Year 8	13.15	10.515	2.635
Year 9	13.15	10.515	2.635
Year 10	13.15	10.515	2.635
Year 11	13.15	10.515	2.635
Year 12	13.15	10.515	2.635
Year 13	13.15	10.515	2.635
Year 14	13.15	10.515	2.635
Year 15	13.15	10.515	2.635
IRR	10.0%	8.0%	25.5%

If an equity IRR approach is used, Firm A's project would pass the additionality test while Firm B's project would not pass the test. This is the desired outcome. On the other hand, if a project IRR approach is used, it would not distinguish between Firm A and Firm B's projects – either both would pass or both would fail (depending on if the sectoral benchmark works out to above 10% or below 10%).

To summarize, investment decisions are as much dependent on project characteristics as on financing structure and it would not be appropriate to ignore the financing structure aspect. Further, the very objective of having a sectoral benchmark that is free from project or firm related aspects will get defeated if it is not widely and publicly available. The benchmark for equity IRR is widely and publicly available and it makes sense to consider equity IRR because this approach is able to discriminate between additional and non-additional projects more effectively.

¹ See the excel sheet attached as Annex 1 for calculations.



CERC's discussion paper of June 2003² on page 20/53 stated that the preferred approach for the benchmark for conventional power generating companies would be cost of equity approach. It further stated on page 21/53 that it would retain the 16% post tax return on equity benchmark and any revision in future will not revise it downward from 16%.

SGS would therefore request the Executive Board to reconsider the approach set out in Benchmark Analysis (sub-step 2b) and allow the equity IRR to be used wherever there is a publicly available benchmark of equity IRR.

2. <u>Further clarification and validation are required on the decrease in the electricity tariff after 10 years of operation.</u>

SGS Response:

The applicable tariff for sale of electricity from the project activity has been determined by the Karnataka Electricity Regulatory Commission (KERC) and enforced through the Power Purchase Agreement (PPA) entered between the project proponent and the off-taker i.e. Bangalore Electricity Supply Company Limited (BESCOM). The PPA³ tenure is for 10 years, there is no commitment from the BESCOM to continue to buy electricity from the project. The alternative available in such a case would be to sale to a third party under open access. However such an arrangement would not be possible as the infirm nature of wind electricity generation does not allow the project activity to commit to a dispatch schedule in advance.

KERC while coming out with a 10 year tariff schedule (for the PPA period) has considered normative values relating to capital cost, financing pattern, depreciation rate, working capital, PLF etc to arrive at the cost plus tariff number that ensures full investment recovery and a 16% post tax equity return for the wind energy investors. The statute of Electricity Act mandates regulatory commissions to determine tariff in a manner that assumes commercial principles, encourages competition, efficiency and economical usage of resources, ensures reasonable recovery of cost of generation and rewards efficiency in performance and safeguards interests of the consumers. Hence, even if the PPA were to be renewed, it stands to reason that the tariff beyond the 10th year period can not be the same as the first 10 year tariff as the regulatory commission can not allow the same cost to be passed on to the consumer twice. PPA section 4.3 states that "From 11th year onwards, from the date of signing of the agreement the corporation (BESCOM is referred as corporation) shall pay to the company for the energy delivered at the metering point at a rate based on operating costs and incentives to be agreed upon by mutual negotiations. In case the Parties do not arrive at a mutual agreement on the tariff, the company shall be permitted to sell energy to third parties and enter into wheeling agreement with corporation to sell power through the corporation grid for which it shall pay wheeling charges to corporation at the rates applicable from time to time in addition to the banking charges at the rates applicable from time to time as approved by the commission, based on the month and end balance of the energy banked" In fact the PPA clearly mentions that the tariff beyond 10 years would be determined on a cost plus basis.

Earlier, KERC, while inviting comments on the draft KERC (Power Procurement from Renewable Sources by Distribution Licensee) Regulations 2004, had issued a discussion paper titled "Consultation Paper on Back ground Issues on treatment of Renewable Energy Projects in the light of EA, 2003" which presented detailed discussions on the tariff issues and normative values proposed by KERC for determining the tariff for non conventional energy projects (including wind).

² http://www.cercind.gov.in/Terms_Condition_of_Tariff.pdf

³ Pls. refer to copy of PPA submitted while submitting PDD for request for registration. http://cdm.unfccc.int/Projects/DB/SGS-UKL1187708460.15/view



In the order before KERC⁴ In the matter of determination of tariff in respect of Renewable sources of Energy, dated 18 January 2005 page 8/31, the commission states "Considering the debt repayment obligations, the Commission opines that differential tariff should be applicable for the project that have completed 10 years"

Accordingly, the tariff for beyond the 10th year period has been determined using the tariff principles followed by KERC in its tariff order.

3. <u>Further justification and validation of the essential distinctions between the project activity and the other projects are required following sub-step 4b of the additionality tool.</u>

SGS Response:

Installed capacity of wind in India is about 15% of its potential. In Karnataka against an assessed wind potential of 7023 MW, the state currently has installed wind capacity of 853 MW as of 31 March 2007, which is about 12% of its potential (Refer Table⁵ below). In 2004, when the project activity was started, the installed capacity of wind in Karnataka was 208 MW, barely 3% of its potential. The table below provides details of wind capacity additions in Karnataka since the promotional policy for wind was first introduced in 1994-95.

SL.NO	Financial year	Capacity allocated in MW	Capacity commissioned in MW
1	1994-95	0.55	0.55
2	1995-96	4.00	1.35
3	1996-97	14.56	3.95
4	1997-98	32.50	12.04
5	1998-99	45.60	1.25
6	1999-00	394.16	18.09
7	2000-01	125.60	3.75
8	2001-02	358.30	28.80
9	2002-03	806.05	55.46
10	2003-04	409.10	83.17
11	2004-05	555.40	204.55
12	2005-06	1,575.10	174.63
13	2006-07	2,397.20	265.95
14	2007-08	305.00	-
	Total	7,023.12	853.54

More than 75% of Karnataka's wind capacity has been added in the last three years. It is interesting to note that during this period the regulatory framework for wind investments in Karnataka have reduced the tariff benefits to wind projects. We analyze the tariff that would be applicable to the project under the

⁵ http://www.kredl.kar.nic.in/docs/Yearwise_allotment_and_commissioned_wind_power_projects.xls

⁴ http://www.kerc.org/order2005/Order%20on%20NCE%20Tariff%20(FINAL).doc



different regulatory policy regimes that have come up for wind power projects in Karnataka over the years.

Electricity tariff (Rs/kWh)	2006- 07	2007- 08	2008- 09	2009- 10	2010- 11	2011- 12	2012- 13	2013- 14	2014- 15	2015- 16	Average
MNES Policy ⁶	3.60	3.72	3.83	3.94	4.05	4.17	4.28	4.39	4.50	4.62	4.11
KERC Order 2003 ⁷	3.29	3.35	3.41	3.47	3.53	3.60	3.66	3.72	3.78	3.84	3.57
KERC Order 2005 ⁸	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40

Since 2003-04, close to 720 MW of wind projects have come up in Karnataka. Out of the projects that are currently available on the UNFCCC website, 190 MW of registered wind projects are from Karnataka, close to 269 MW of wind projects are under the validation and registration process and another 150 MW of wind is currently in project development stage which will enter the CDM pipeline soon. Out of the 720 MW that has come up, 609 MW of capacity or close to 85% are already in the CDM pipeline and more are expected to follow⁹.

A more relevant common practice test is the amount of wind power generation as compared to the overall electricity generation availability for Karnataka. In 2004–05, wind electricity generation in Karnataka was 489.53 GWh¹⁰ and the total electricity availability at bus-bar in the state of Karnataka was 33,523.92 GWh¹¹. This works out to 1.45%, showing that wind energy power generation is insignificant as compared to other power project generation sources in Karnataka. Please note that this wind generation is for all wind projects (including CDM projects). If one were to remove the CDM wind generation from the above data, the percentage would be still lower. Thus it was demonstrated that the present project activity is not a common practice in the sector.

Clearly, wind power project development in Karnataka is insignificant when compared to the power sector of Karnataka. Thus the present project activity is not a common practice.

4. <u>Further clarification is required regarding the determination and appropriateness of the benchmark and how it was verified and validated by the DOE.</u>

SGS Response:

The various publicly available documents, which explicitly state the appropriate benchmark for power generation projects for determination of tariffs available at the start date of the Project are stated below:

⁶ MNES came out with its tariff guidelines for NCE projects on 13.09.1993. The policy states that tariff would be Rs.2.25 for 1994-95 and 5% annual escalation thereafter, http://mnes.nic.in/wp4.htm

⁷ Rs.3.10 for 2003-04 and 2% annual escalation thereafter, http://www.kerc.org/orders2003/Void%20PPAs-2.doc

⁸ Rs.3.40 for 2005-06, fixed for next 10 years, http://www.kerc.org/order2005/Order%20on%20NCE%20Tariff%20(FINAL).doc

⁹ www.cd4cdm.org

¹⁰ Table 3.4 titled "Gross Electrical Energy Generation (Utilities Only) Primemoverwise, Regionwise / Statewise During 2004-05" in chapter 3 of the CEA general review 2006 available at http://www.cea.nic.in/power_sec_reports/general_review/index_general_Review.html

¹¹ Table 5.3 titled "Statewise System Losses During 2004-05" in chapter 5 of the CEA General review 2006 available at http://www.cea.nic.in/power_sec_reports/general_review/index_general_Review.html



A) Government notification

Government of India notification of 1992¹² first set out the benchmark returns for thermal and hydro power generation projects in India. Section 1.5 (e) states that return on equity shall be 16 percent and Section 1.5 (d) provides for reimbursement of taxes. This set the benchmark as 16% post tax return on equity.

B) Central Electricity Regulatory Commission Orders

- (a) Central Electricity Regulatory Commission (CERC) carried out an assessment of the required rate of return and its advisor came up with a report in April 2000¹³. Page 38/54 of the report summarizes the cost of equity under various approaches for central government owned power generating units. This ranged from 16% 20%.
- (b) CERC's tariff notification of 26th March 2001¹⁴ on page 10/54 stated that the required equity rate of return for conventional power generating companies shall be 16%. Tax would be over and above this. Refer page 15/54 for tax on income.
- (c) CERC's discussion paper of June 2003¹⁵ on page 20/53 stated that the preferred approach for the benchmark for conventional power generating companies would be cost of equity approach. It further stated on page 21/53 that it would retain the 16% post tax return on equity benchmark and any revision in future will not revise it downward from 16%.
- (d) CERC's order¹⁶ discussing the determination of terms and conditions of tariff applicable from 1st April 2004 also mentions 16% as rate of return on equity.

It is important to note that for conventional power generation companies, a two part tariff structure is followed where fixed charges are payable based on availability and therefore, investors of conventional power projects are protected from dispatch risk or unavailability of transmission facilities, etc. Thermal and hydro projects in India are provided incentives when their generation exceeds a target PLF. Thermal power projects are given an incentive of 25 paise per kWh for generation in excess of 80% PLF and if the generation of a storage type hydro station exceeds 85% capacity index then an incentive of 65% of the annual fixed charge is given to the project. There are no such generation linked incentives in case of wind. Further, for conventional projects the tariff is set on a case to case basis depending on actual costs. Any additional expenses on account of foreign exchange are allowed to pass through in the tariff. This is clearly not the case with wind projects.

C) State Electricity Regulatory Commission's Orders

Karnataka Electricity Regulatory Commission set the generation tariffs for renewable energy projects in <u>January 2005¹⁷</u>. Page 4/31 and 5/31 of its order sets out 16% post tax return on equity as the

¹² http://powermin.nic.in/acts_notification/tariffnotification_generatingcompanies.htm

¹³ http://www.cercind.gov.in/rep1304.pdf

¹⁴ http://www.cercind.gov.in/Tariiff/Notification.pdf

¹⁵ http://www.cercind.gov.in/Terms Condition_of_Tariff.pdf

¹⁶ http://cercind.gov.in/08022007/Final-Order-Terms.pdf

¹⁷ http://www.kerc.org/order2005/Order%20on%20NCE%20Tariff%20(FINAL).doc



appropriate benchmark for tariff determination of wind power generation projects. This Order continues to be in force.

D) Tariff setting process

While setting the generation tariffs for wind power projects, a state electricity regulatory commission goes through a transparent and detailed process for determining each of the parameters that impact the tariff and obtains relevant data in relation to each parameter from the various stakeholders. The regulatory commission goes through this extensive public process and using the various cost parameters, the key operating parameters and the required rate of return (post tax equity return), it establishes the tariff for wind energy generation by aggregating the costs (including required rate of returns) and dividing by the expected generation from the wind projects. The regulatory commission also carries out its mandate as striking a balance between the consumers' interests and generator's interests. Clearly, the regulatory commission cannot allow any generator to make excess profits at the expense of the consumers and as the tariff is set *ex ante* based on various parameters, the parameters themselves are chosen on a conservative basis (lower benchmark rate of return for equity, higher benchmark for plant load factor/expected generation, etc.) so as to lead to a conservative per unit generation tariff.

Conclusion

The Option III - Benchmark analysis tool allows for equity returns as the appropriate benchmark. To quote from the text of version 3 of the additionality tool; "Identify the relevant benchmark value, such as the required rate of return (RRR) on equity. The benchmark is to represent standard returns in the market, considering the specific risk of the project type, but not linked to the subjective profitability expectation or risk profile of a particular project developer."

This fits in well with the choice of equity rate of return that was chosen for this project, based on above mentioned evidences. DOE believe that since the regulatory commission/government notifications provide a very sound, rigorous and transparent basis for the benchmark returns and this has been in use in India for a very long time for tariff determination which has a significantly large impact on the economics of the power plant as well as the consumer tariffs, this must be accepted as the appropriate benchmark for the project activity.

The obvious question therefore would be why the equity IRR of the project is lower than the benchmark when the same value is being used for determining the tariff for the project. It is hence important to clarify that:

- This benchmark rate of return when applied for determining tariff of thermal and hydro power stations is set on a project-by-project basis using a cost-plus approach.
- Tariff for wind electricity generation projects are determined using the same cost-plus approach as that for conventional thermal and hydro power projects with an essential difference. In case of thermal and hydro projects, tariff is determined for each project using project specific parameters. In case of wind energy tariff, a single tariff is made applicable for all the wind power projects implemented over a period of years. As the tariff line is fixed ex ante based on conservative assumptions relating to a typical wind power plant, any incidents of variations (vis a vis the assumed values) in capital costs, financing costs and structures, operating costs, etc. are borne by the individual wind power projects. Therefore even though this benchmark rate of return is considered in setting this single wind energy generation tariff, the expected return of equity of the individual wind projects would obviously differ from the benchmark equity rate of return.

This has been clearly shown through the investment analysis where this tariff when applied on wind power project, specific parameters results in equity returns being lower than the benchmark.



5. As the land for the wind mills was allotted in 2000 and the wind mills were ordered from January 2003, four years before submission as a CDM project, the need for the CDM incentive requires further substantiation and clarification.

SGS Response:

DOE agrees that the lands for windmills were allotted in 2000. The decision to proceed with investing in the project activity is dependant on several factors, the key determinant being the ability to sell the generated electricity and the ensuring revenues. In other words, if there are no off-takers of electricity, the investment in the project is worthless. The Power Purchase Agreement entered between the project proponent and the distribution utility provides the assurance in the form of off-take commitment and applicable tariff that are necessary for making the investment decision. Clause 3.1 (in the point VI) of the Power Purchase Agreement entered with the electricity utility (KPTCL) clearly mentions the CDM benefits "The benefits accruing on account of carbon credit shall be shared between the company and the corporation". The PPA has already been uploaded as part of the registration documents and is available on UNFCCC website¹⁸. This was also mentioned in the validation report submitted for request for registration.

To explain the reasons for delay, it is important to note that the proposed CDM project activity is bundle of several small wind farms. The transaction costs associated with going through the CDM process prohibit these projects to pursue CDM development independently. At the same time, bringing such large number of diverse investors under one umbrella is also a difficult task, the process is time consuming, resulting in the delay in the project activity entering the CDM process.

In regard of CDM consideration by the project proponent DOE has verified PPA for the project activity which was submitted with PDD during request for registration. Further in this regard, the state nodal agency i.e. Karnataka Renewable Energy Development Agency (KREDL) had issued guidance to owners of small wind farms in Karnataka informing about the structure of bundling of multiple wind farms as a single CDM project activity. A sample copy of one of such letter to Deffree Engineering Pvt Ltd; one of the wind farm owners mentioned in the PDD has been attached as Annex 1 with this reply.

6. The plant load factors assumed for this project activity are unrealistically low. Sensitivity analysis should include the values achieved by similar wind farms in the Chitradurga region, as e.g. the Reliance wind farm with a PLF of over 35%. Further clarification is required.

SGS Response:

Sensitivity analysis should consider a range of parameters that are reasonably expected to be achieved over the entire term of the project, i.e., 20 years, for the proposed CDM project activity. In this regard, we do not believe the Reliance wind farm PLF to be considered in the range of reasonable expectation because; The Jogimatti wind zone in Chitradurga region, where the project is located, spans across a 90 square kilometers of geographic area and includes several possible sites for wind turbine installation. The wind density and wind speed at different sites (within the wind zone) is not uniform, given that electricity generation is dependant on wind density and speed, the expected PLF of the wind farms within a particular wind zone can not be uniform. So the plant load factor will vary from site to site depending on the terrain and the wind regime in a specific site in the Jogimatti wind zone. The proposed CDM project and the quoted Reliance wind farm are located 25 kilometers apart from each other and the wind regime for both the sites is different.

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http://cdm.unfccc.int/Projects/DB/SGS-UKL1187708460.15/view



Reliance has a 1.8 MW wind farm which is at the same location and employs similar capacity and make of turbines (600 kW and Enercon) as that of the candidate CDM project activity. Therefore, if at all any comparisons were to be drawn, the performance of this wind farm can be considered as a better representative for the project activity than the 7.59 MW project that is located 25 km away and that employs different capacity turbines. The PLF achieved by the Reliance 1.8 MW wind farm is as follows:

Year	PLF			
2003-04	25%			
2004-05	28%			
2005-06	26%			

(Source: Generation data for the last three year provided by Enercon (O&M contractor for the Reliance wind farm)¹⁹

This data was available with Enercon India Ltd since Enercon is the O and M contractor for this plant.

7. The answers in the stakeholder consultation twice refer to wind turbines of 0.8 MW, whereas the rest of the PDD refers to 0.6 MW. Further clarification is required on which turbine size has really been used in the project activity.

SGS Response:

The project activity involves installation of 600 kW machines as mentioned in section A.4.3 of the PDD and not 800 kW. In the stakeholder consultation meeting for the project activity, the local stakeholders were communicated that the wind turbines that are installed as part of the project activity are of 600kW capacity. The Minutes of Meeting was initially prepared in the vernacular language and the error occurred while translating the same into English. This signed document (in vernacular) clearly mentions that the capacity of machines is 600kW. This document was also provided to the DOE during validation and is attached for your reference as Annex 2 herewith.

The confusion was created due to a typographical error while translating the vernacular minutes into English. We regret the confusion and PP has corrected the stakeholder consultation summary in the PDD to reflect the correct capacity. The revised PDD is attached herewith as Annex 3.

8. <u>The DOE shall further clarify how they have cross checked and validated the assumptions regarding the investment analysis.</u>

SGS Response:

The project activity involves 15 independent project participants and Enercon India Ltd. is co-ordinating the project activity for CDM. The financial analysis shown in the excel sheet includes the details regarding the project finance from individual project participant. The IRR for each of the project participant was calculated based on the information like loan amount, equity participation, rate of interest for the loan and loan repayment period. The same information was validated during the site visit through a project finance details available with the project proponent i.e. Enercon India Ltd. The parameters used for IRR calculation were also used for Sensitivity Analysis and thus it was validated and verified. Because of the large number of project participants, project proponent has considered example of single project developer i.e. Shreyalaxmi Properties.; as the same project proponent is having the highest IRR compared to the other project participants. As mentioned in the validation report submitted for RfR the sensitivity analysis and financial analysis was verified through the verification of the assumptions and

¹⁹ Attached as Annex 2



calculations for IRR values of all the sub-bundles. The IRR value in the excel sheet was checked with those mentioned in Appendix 3 of the PDD and thus it is validated.

We hope that above explanations have answered the queries raised by the CDM-EB.

Vikrant Badve (+91 9860365556) will be the contact person for the request for review process and is available to address questions from the Board during the consideration of the request for review in case the Executive Board wishes.

Yours sincerely,

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Annexes:

Annex 1: Excel spreadsheet Annex 2: REL wind farm data

Annex 3: Letter from KREDL reg. CDM consideration to Deffree Engineering Pvt Ltd Annex 4: Local stakeholder consultation document collected during validation site visit

Annex 5: Revised PDD version 5 in highlighted mode