24th October 2008

To
The Chairman
UNFCCC CDM Executive Board

Sub: Response to request for review for the project "Wind power project by HZL in Karnataka"

Dear Sir/Madam

Bureau Veritas Certification has performed a validation of the "Wind power project by HZL in Karnataka" project of M/s. Hindustan Zinc Limited (hereafter called "the project") located in located in 2 villages namely Kurthkoti and Mallasamudra of District Gadag, Karnataka, India. The request for registration was made in April 2008 and was under review from 11/08/2008 to 09/10/2008. Subsequently, there have been 4 (three) requests for review, which were received on 10/10/2008. Since all the requests are identical, we are providing common responses to the issues that have been raised.

We thank the CDM executive board and the secretariat for giving us the opportunity to clarify about our considerations in validating the said project.

The project participant and our responses are explained below along with the relevant Annexures as evidences.

Review Point No. 1
As the use of the 16% return on equity based on the KERC is no longer acceptable as per guidance issued at EB 40, paragraph 40, further validation opinion is required on (a) the choice of the benchmark and (b) whether 16% return on equity is applicable for renewable energy and/or non-renewable energy projects or not. The PP/DOE is further requested to provide the spreadsheet with the formulae readable to enable replication of the investment and sensitivity analyses.

Project Proponent's Response
The proposed project activity was submitted for request for registration to the CDM Executive Board on 23/04/2008 and the confirmation for the processing of registration fee was received on 02/05/2008. The EB 40 was held on 15/06/2008 till 17/06/2008. Further the project was webhosted under request for registration on 13/08/2008 till 09/10/2008.

Thus, the proposed CDM project activity was submitted to the CDM EB before the EB guidance against the acceptability of the CERC based benchmark of 16% came into place (EB 40). Till then, there was no guidance regarding the consideration of this benchmark. However, in view of the EB's guidance, the PP has provided justification with regards to the following

a) Justification as to how does the KERC benchmark fit in accordance with the considerations to be made while using the benchmark as provided in the Guidance on investment analysis and also the Additionality tool
b) Justification on the appropriateness of the benchmark inspite of it being applicable for both CDM and non CDM project
c) Comparison of the equity IRR with other benchmarks.

Choice of Benchmark

The following is an extract from the para 40 of the EB 40 meeting report,
"The Board noted that many proposed CDM project activities in the energy sector in India seek to demonstrate additionality by means of investment analysis applying a benchmark of 16%, which is based on tariff orders published in accordance with the Central Electricity Regulation Commission. The Board is concerned with the use of this value as a benchmark for proposed CDM project activities, as this value is used in tariff determination for CDM projects and for non-CDM projects. Therefore the Board is of the view that this value is not a suitable benchmark"

In context of the above EB guidance, the EB is of the view that the Return on Equity of 16% as set by the **Central Electricity Regulatory Commission (CERC)** is not a suitable benchmark. However, in the present proposed CDM project, the benchmark used is as set by the **State Electricity Regulatory Commission of Karnataka i.e. KERC** in its tariff order formulated exclusively for non-conventional sources of power (and specifically for wind power) dated 18th January 2005.

HZL is vertically integrated enterprise with its operations being limited to exploration, mining, ore processing to smelting of non-ferrous metals. The proposed project activity is a diversification of mainstream business of HZL into wind power sector economics. This is a part of the first project activity being undertaken by HZL with the intention of diversification into wind power exporting the generated electricity from its wind farm to the regional electricity system.

EB Guidance on selection of Benchmarks
The project activity is such that it could have been developed by any entity other than the project participant as well. As per the guidance on the investment analysis issued by the EB, for such project activities, a benchmark determined by relevant national authorities should be used and

should also be such that it can be validated by a DOE. The excerpts from the guidance on the assessment of investment analysis are reproduced below:

"In the cases of projects which could be developed by an entity other than the project participant the benchmark should be based on publicly available data sources which can be clearly validated by the DOE. Such data sources may include local lending and borrowing rates, equity indices, or benchmarks determined by relevant national authorities."

This guidance, however, does not detail the considerations for setting up the benchmark and hence the additionality tool has been used as the reference for further guidance. The additionality tool states that benchmark used should represent standard returns in the market, considering specific risk of the project type, but should not be linked to the subjective profitability expectation or risk profile of a particular project developer.

In India, activities in the electricity sector such as generation, distribution, transmission and trading of power come under the purview of a comprehensive legislation called the Electricity Act 2003 (EA 2003)[1]. As per the EA 2003, the power to determine the tariff relating to generation, transmission and distribution of electricity is vested with the Electricity Regulatory Commissions. One of the provisions laid down by the Electricity Act for tariff determination under section 61(d) is "*safeguarding of consumers' interest and at the same time, recovery of the cost of electricity in a reasonable manner*". Apart from this the act under section 61 (c) also requires that the commissions take into account "*the factors which would encourage competition, efficiency, economical use of the resources, good performance and optimum investments*".

The EA 2003 required the Government of India to prepare a national electricity policy and a national tariff policy which was to act as guidance for the state electricity regulatory authorities for framing of tariffs for their respective states. In compliance with EA 2003, the government of India issued the National electricity policy in the year 2005[2]. The policy required offering investors a rate of return on investment based on a clear understanding and evaluation of the risks and opportunities involved in the sector in order to attract investment in the sector (refer section 5.8.4 of the policy). At the same time, the policy also requires maintenance of an appropriate balance between the interests of the consumers and the need for investment while choosing the appropriate return on investment (section 5.8.4). The National Tariff policy, issued subsequently in the year 2006, also stated similar requirements for consideration while calculating tariffs.

The discussion in the above two paragraphs shows that the tariff setting is done on the basis of a rate of return on investment that is conservative (safeguard's the interest of consumers) and at the same time is specific for investment in the sector considering the risks and opportunities involved in the sector.

It should be kept in mind that the applicable tariff for the wind power project has been set by the State Electricity Regulatory Commission (KERC). The project proponents have therefore looked at the approach adopted by KERC while determining the appropriate benchmark for the project.

Tariff setting process of KERC
The KERC undergoes a thorough, transparent and detailed process of consultation with the public known as the public hearing process while setting the generation tariffs for wind power projects. This public hearing process takes into account the views of all the stakeholders of the wind power projects representing the interest of the IPPs, the consumers and the government. KERC sets the tariff for wind energy projects on a cost plus return on equity basis.

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[1] http://www.cercind.gov.in/08022007/Act-with-amendment.pdf

[2] http://powermin.nic.in/indian_electricity_scenario/national_electricity_policy.htm

Each of the parameters that impact the tariff (i.e. all the costs and the return on equity) is discussed in this consultation and relevant data in relation to each parameter is obtained 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 while choosing the appropriate values for different parameters 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 reasonable 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.

From the above discussion it is evident that:
a) the benchmark has been set by a relevant and authorized national authority (KERC), and has also been validated by a DOE,
b) it represents the standard returns in the market taking into account the risks and opportunities in the power sector (by the help of the consultative process for choosing various parameters) and;
c) is not linked to the subjective profitability expectation or risk profile of the project developer (as the KERC determines the benchmark keeping in view that consumers interest).

Keeping in mind the above discussion and that the benchmark applied meets the requirements of the guidelines issued by the EB for benchmark analysis; the same was chosen as the appropriate benchmark for the project activity.

Applicability of the benchmarks for both CDM as well as non CDM projects:
As explained in the additionality tool the benchmark should be based on the standard returns in the market taking into account the characteristics of the project type. The standard returns in the market for a project type will be a value that would be applicable to the project type (in this case wind energy projects), which includes both CDM as well as non CDM. Hence, although the benchmark is applicable for CDM as well as non CDM projects, the benchmark still can be deemed appropriate as per the EB's guidelines and the additionality tool.

The national authority does not make a distinction between CDM and non CDM projects. The benchmark considered is applicable for both CDM as well as non CDM projects and the tariff is designed to provide the investors with the required rate of return. However, there is an essential distinction between CDM and non CDM projects which has been explained in the subsequent paragraphs.

The tariff determined for wind power projects is based on cost plus approach wherein, the tariff is not set on a project to project basis. A single tariff is made applicable for all the wind power projects implemented over a period of years. While determining tariff, multiple assumptions with respect to the incurrence of the operational and implementation cost for the project activity are made by the state electricity regulatory commission. Assumptions on the different parameters including capital cost, operating cost, means of finance, plant load factor, etc. are made, to arrive at the tariff that would provide a costs plus post-tax equity return. The commission in an attempt to not allow any generator to make excess profits at the expense of the consumers sets the tariff based on the various parameters, which are chosen on a conservative basis (lower capital costs, higher plant load factor/expected generation, etc.) so as to lead to a conservative per unit generation tariff.

The above discussion shows that the tariff for all wind projects is fixed ex ante based on conservative assumptions made by the KERC relating to a typical wind power plant, any incidents of variations (as compared to the KERC assumed values) in capital costs, financing

costs and structures, operating costs, etc. are borne by the individual wind power projects. An investor would get the desired rate of return only if all the project parameters are exactly same as the assumptions made by the KERC or if positive assumptions exactly offset the negative ones. 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. In this project the values of various parameters such as capital costs, means of finance etc, vary considerably as compared to the commission's assumptions and hence the equity return is not equal to the benchmark return.

The commission's assumptions can be referred in the KERC tariff order dated *18 January 2005, In the matter of Determination of Tariff in respect of Renewable Sources of Energy*. When we compare the parameters taken by KERC for computation of tariff (fixed tariff of INR 3.40 per unit with no escalation set at 16% ROE) and the actual project parameters, it is seen that KERC assumes the capital cost for wind projects to be INR 4.25 crores per MW whereas for the project under consideration, the capital cost is INR 4.88 Crores per MW.

As can be seen, the per MW capital cost assumption taken by KERC is extremely conservative and the actual cost per MW of the project activity is much higher than the KERC assumption. For the development of such project activities (like HZL's), which have higher costs than the KERC's assumptions, CDM funds would need to be considered by the project developers as an additional source of revenue, for the project to attain the benchmark returns. On the other hand, if a project had parameters exactly similar to the assumptions made by KERC, the tariff set would have given them the benchmark returns even without CDM revenue.

Thus, though the benchmark for a CDM and a non CDM project would be the same. However non CDM projects may be able to generate the desired rate of return through the sale of electricity alone while CDM projects need to generate additional source of revenue by sale of CERs to make the project financially feasible. The benchmark set by the National Authorities does not make any distinction between CDM and non-CDM projects. However, projects which are unable to meet the benchmark with sale of electricity alone can proceed ahead with the setting up of the project considering CDM funds.

Applicability of the benchmark for Renewable sources

The benchmark considered for the project activity is the 16% ROE set by the KERC in its order specifically issued for renewable energy projects. The order is titled "In the matter of Determination of Tariff in respect of Renewable Sources of Energy". After taking into account the views of various stakeholders of renewable energy projects, the order states that "to promote investments in projects of renewable sources of energy, the Commission decides that the ROE shall be 16%". This is the return on investment that has been taken for setting tariff for wind and other renewable energy generation sources. It is in the context of this order (which is exclusive for renewable energy projects) that the benchmark ROE number was set and hence the KERC benchmark taken for this project is applicable to renewable energy projects.

Further substantiation of the required return on equity:
Return recommended by ENVIS Centre of Renewable Energy and Environment - TERI
The Energy Resources Institute of India (TERI), a Government of India ENVIS (Environmental Information System) Centre for Energy and Environment in the year 2005-06 issued a report "Wind Energy Information" which discussed extensively about the basics of wind energy, the processes involved in setting up of a wind project, the advantages with respect to sustainability, global status of renewable energy, wind energy development in India and various other aspects. As a part of its extensive study on wind energy generation in India, TERI has also studied the

cost of wind power and has recommended a rate of return higher than the 16%[3] that was being offered by the government of India.

The extract from the publication is reproduced verbatim '*As per Govt. of India guidelines for Private Sector participation it (return on equity) should be minimum 16% though a higher return may be justified in view of uncertainties involved in wind flow pattern*.'

ENVIS[4] program was started by the Government of India to provide environmental information to decision makers, policy planners, scientists and engineers, research workers, etc. all over the country and has specific centres that are responsible for research on different sectors. TERI is the regional ENVIS centre for Renewable Energy and Development. The benchmark recommended by TERI can be validated by the DOE and does not represent the subjective expectations of private investors as well.

The above account substantiates the choice of 16% benchmark as stipulated by the KERC against comparison with the equity IRR of the project activity under consideration.

However, we have also assessed the additionality of the project using other benchmarks available with the project proponent in accordance with the Additionality Tool Version 04. These are:

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[3] Wind Energy Information 2005/2006 by TERI- ENVIS centre on Renewable Energy and Environment (Annexure-1)

[4] ENVIS due to its comprehensive network has been designed as the National Focal Point (NFP) for INFOTERRA, a global environmental information network of the United Nations Environment Programme (UNEP). In order to strengthen the information activities of the NFP, ENVIS was designated as the Regional Service Centre (RSC) of INFOTERRA of UNEP in 1985 for the South Asia Sub-Region countries.

Benchmark 1
The benchmark has been determined in accordance with para 6(a) sub step 2b of the Additionality tool i.e. *Government bond rates increased by a suitable risk premium to reflect private investment and / or project type*.

The required rate of return on equity for the project has been calculated using the Capital Asset Pricing Model (CAPM). As per CAPM, the required return on equity investment is the return of a risk-free security plus beta times the difference between the market return and the risk-free return. The Government Securities have been taken to represent the risk free return. Stock index has been used to represent the market return.

While considering a new project, CAPM can provide the required rate of return that the project needs to yield, taking into account the volatility (risk) of the stock relative to the market (Beta). This required return on equity represents the cost of equity benchmark for the project.

The formula of CAPM is as follows:
$R_i = R_f + \beta (R_m - R_f)$ where:

Ri	=	Rate of return on equity;
Rf	=	Risk-free rate of return;
B	=	Beta or systematic risk for this type of equity investment coefficient reflecting the volatility (risk) of the stock relative to the market,;
Rm	=	Expected market returns
Rm – Rf	=	Market risk premium;

Risk free rate:
At the time of start of the project the data available for the average Government bond rate was that of the year 2005-06, which was 7.34% (source: Reserve Bank of India, web-link: http://rbidocs.rbi.org.in/rdocs/Publications/PDFs/80303.pdf).

The β in the CAPM equation helps to account for the systematic risk by quantifying the sensitivity of the stocks of the companies representing a particular project type/sector with the market returns. Thus, it incorporates the risk of a specific sector in the calculation of the cost of equity. The Beta value taken for this analysis is based on the beta values of the listed private companies engaged in similar business as the project activity (i.e. the power sector) at the start of the project activity estimated by regressing weekly returns on stock against local index, using 10 years of data if available otherwise the data since incorporation of the company has been used. The beta values have been taken from Bloomberg[5].

Company Name	Beta
Tata Power	0.885
Reliance Infra	0.867
Jaiprakash Hydro	1.009
BF Utilities	1.326
Average Beta	**1.02**

The guidance on investment analysis requires the use of benchmark which represents standard market returns. These returns are assumed to reflect the risk free rate of return plus a market premium. The capital asset pricing model requires the adjustment of the market premium with the factor 'beta' which represents the volatility of a stock relative to a well diversified market portfolio.

Wind power is the not core business of HZL and hence the beta factor of HZL cannot be used for the calculation of the risk premium. Also, in order to understand the standard market returns, it is essential to consider a wider range of companies. Hence an attempt to study the beta values of

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[5] Annexure – 2 - Screenshots from Bloomberg terminal have been submitted.

private sector companies with relatively significant investment in wind power was made. BF Utilities was the only one company identified with mainstream wind power business, listed on the Indian bourses and actively traded with a historic beta value of 1.326 since the incorporation of the company in August 2001. Hence, the portfolio of the companies considered for the study was widened to include the companies with significant investment in the power sector including in renewable and non renewable energy.

Conventional (Thermal and Large Hydro) power projects are a more attractive investment option as compared to non conventional (renewable energy power projects) projects, primarily because of the lower risks that such project activities face as compared to renewable energy projects and in particular wind power projects. Conventional power plants supply firm power, operate on higher Plant Load Factor (PLF) and are not subject to the vagaries of nature as wind power plants. Wind power projects on the other hand operate at much lower PLF (22-28%) and have much higher capital costs. Thus, from the perspective of a private investor, investments in thermal power plants are a safer option. A study of the baseline scenario, indicating that over 55% of the power generation in the country is from thermal sources[6], also reinforces the fact that generation from thermal sources provides a more attractive and assured source of return as compared to investments in renewable energy sources like wind power.

Hence it is assumed that such private companies with significant investments in non renewable energy projects face lower risk as compared to the wind power project and hence the value of beta for such companies should also be lower. Thus, as the use of the beta value for companies with significant investment in non renewable power projects is representative of the returns generated in the baseline scenario and is also conservative, the same has been considered appropriate for the analysis. The average beta has been estimated as **1.02** and the same has been chosen for further analysis.

Rm – Rf (Market Risk Premium): The market risk premium is the return that an investor expects over and above the risk free return available in the market. The market risk premium has been estimated using historical approach. This can be defined as the historical differential return of the market and the risk-free rate. The most common method of calculating this is the difference between historical return of the stock market index and the historical return of the risk free rate. The differential can be calculated as arithmetic or geometric average. The geometric average[7] usually is a more accurate representation of the risk premium, accordingly we have calculated market risk premium as the historical geometric mean return on the stocks (using the BSE Sensex[8] Index since it start in 1979) minus the historical geometric mean return on government securities. This would give the incremental returns over and above the risk free rate.

Market Rate of Return (Rm) = [{(BSE index at the time of start of project) / (BSE index at its start in 1979)} ^ (1/no. of years from 1979 till start of project)]-1

= [(14,090/100) ^ (1/27.83)]-1
= 19.46%
Average risk free rate (Rf) = The average risk free rate represents the historical risk free rate and is calculated as the geometric mean of the compounded annual return.

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[6] http://cea.nic.in/power_sec_reports/Executive_Summary/2008_07/27-33.pdf

[7] The compounded return is computed by taking the value of the investment at the start of the period

(Value$_0$) and the value at the end (Value$_N$), and then computing the following:

$$\text{Geometric Average} = \left(\frac{\text{Value}_N}{\text{Value}_0}\right)^{1/N} - 1$$

[8] http://www.bseindia.com/histdata/hindices.asp

Geometric mean of compounded return for the year 2005-06 = [{(Compounded return for year 2005-06)/ Return for the year 1979-80)} ^ (1/number of years from 1979-80 to 2005-06)]-1
= [(1281/100) ^ (1/26)]-1
= 10.31%
Please refer to the excel sheet of calculations for further details.
[Source for risk free rate is Reserve Bank of India]

Market Risk Premium = 19.46% - 10.31% = 9.15%

Rate of return on equity or cost of equity benchmark is Ri= Rf + β (Rm-Rf)
= 7.34% + 1.02 x 9.15%
= 16.69%

Hence the benchmark for equity IRR of the project is the Cost of equity of companies engaged in similar business as that of the project which is calculated as **16.69%.**
Please refer excel sheet Annexure 3.

Benchmark 2

Deposit Rates increased by Market Risk Premium
In accordance with the guidance provided by EB to the request for review of Project activity number 1856 which is also HZL's project, Benchmark has also been estimated using the Government **Deposit Rates** applicable at the time of start of the project activity. The average RBI deposit rate applicable in the year 2005-06 was **6.625%.**
(Source: - http://rbidocs.rbi.org.in/rdocs/Publications/PDFs/87456.pdf)

Market returns and beta are the same as estimated in Benchmark 1.

Average risk free deposit rate (Rf) = The average risk free rate is calculated as the geometric mean of the compounded annual return.
Geometric mean of compounded return for the year 2005-06 = [{(Compounded return for year 2005-06)/ Return for the year 1979-80)} ^ (1/number of years from 1979-80 to 2005-06)]-1
= [(1204.18/100) ^ (1/26)]-1
=10.04%
Refer the excel sheet of calculations for further details.
[Source for risk free rate is Reserve Bank of India]

Market Risk Premium = 19.46% - 10.04% = 9.41%

The benchmark i.e. deposit rate increased by Market Risk Premium is:
Ri= Rf + β (Rm-Rf)

= (6.625+9.41*1.02) %
= 16.24 %

Hence the benchmark for equity IRR of the project is the Deposit Rates increased by Market Risk Premium adjusted to incorporate risk of companies engaged in similar business as that of the project which is calculated as **16.24%.**
Please refer excel sheet Annexure 3.

Benchmark 3
According to the tool for demonstration and assessment of additionality, the benchmark can also be derived from *estimates of the cost of financing and required return on capital for the country and type of project activity concerned), based on bankers views on comparable projects.*

One of India's largest private banking institution ICICI Bank Limited which has been financing private sector wind energy projects (**type of project activity concerned**) over the past few years has stated that, an Internal Rate of Return of over 16% for the capital employed in their view is desirable to ensure economic viability and adequate cash flows of a high risk wind power project. This return was also applicable during the start date of the project activity as clarified by the bank in a subsequent letter. According to the financial institution, this desired IRR is also expected to ensure adequate coverage to service debt. The letters from ICICI Bank are attached as Annexure 4a and 4b.

Hence in accordance with the additionality tool, this Bankers view is a suitable benchmark for comparison against the Project IRR.

It can be seen from the above discussion that whichever benchmark rate is applied, the returns from the project activity are less than the benchmark. Hence, the project proponent would not have gone ahead with the project activity without CDM benefits under any circumstances.

The investment analysis sheets are being resubmitted to ensure readability of formulas and replication. The sensitivity analysis sheets are also being submitted separately for more clarity (Annexure – 5a: IRR analysis without CDM, Annexure -5b: IRR analysis with CDM, Annexure – 5c – Sensitivity Analysis sheets).

Response by Bureau Veritas Certification to Review Point no. 1
Referring to decision from EB-40, benchmark of 16% as per CERC order is now not considered as benchmark for investment in the project activity. Project participant, in his response, has provided the background on why it was considered as benchmark previously. However, now Project participant has considered three other benchmarks for investment analysis. In the response from project participant, elaborate explanation on each of these is provided. Validation comments for all these benchmarks are as follows:

Benchmark 1: Government bond rates increased by a suitable risk premium to reflect private investment and / or project type.

The required rate of return on equity for the project has been calculated using the Capital Asset Pricing Model (CAPM). As per CAPM, the required return on equity investment is the return of a risk-free security plus beta times the difference between the market return and the risk-free return. The Government Securities have been taken to represent the risk free return. Stock index has been used to represent the market return.

Average government bond rate has been considered to be 7.34% as prevailing in year 2005-06. This has been taken from Reserve Bank of India.

Beta value in the calculation represents systematic risk by quantifying the sensitivity of the stocks of the companies representing a particular project type/sector with the market returns. The Project Participant in this case has considered private power sector companies in India that have either partial or complete investment in renewable power sector. The beta value thus arrived at relates to the type of the project activity. The beta values have been taken from Bloomberg. Project participant has provided screenshots from Bloomberg terminal. These screen shots for all the investors in the list has been provided. The Beta value taken for this analysis is based on the

beta values of the listed private companies engaged in similar business as the project activity (i.e. the power sector) at the start of the project activity estimated by regressing weekly returns on stock against local index, using 10 years of data if available. Otherwise the data available since the listing of the company on the stock exchange has been used. Based on this information, average beta value is 1.02.

Market risk premium has been calculated as the historical geometric mean return on the stocks (using the BSE Sensex Index with 1979 as the base year) minus the historical geometric mean return on government securities. This would give the incremental returns over and above the risk free rate. This figure is arrived to be 19.46%.

The average risk free rate is calculated as the geometric mean of the compounded annual return & this is 10.31%, which is also sourced from Reserve Bank of India and considering a historical risk free rate is deemed to be a conservative approach.

Considering these both viz. market rate of return and Average risk free rate, Market Risk Premium comes to 9.15 %. With government bond rate of 7.34%, Rate of return on equity or cost of equity benchmark comes to 16.69% based on beta value of 1.02.

The validation team hereby confirms that it has assessed the information provided. The validation team notes that the above approach is in line with the requirement of clause 6(a) of the 'Tool for demonstration and assessment of additionality, Version 04'. The validation team therefore accepts the above method of calculation of benchmark.

Benchmark 2: Deposit Rates increased by Market Risk Premium.

Benchmark has also been estimated using the Government Deposit Rates applicable at the time of start of the project activity. The average deposit rate as published by Reserve Bank of India and applicable in the year 2005-06 was 6.625%.

The average risk free rate is calculated as the geometric mean of the compounded annual return. Geometric mean of compounded return for the year 2005-06, comes out to be 10.04%.

This data is available at Reserve Bank of India's web-link. Accordingly the market risk premium arrives at 9.41 % and subsequently the benchmark i.e. deposit rate increased by Market Risk Premium comes to 16.24% using the beta value of 1.02 as calculated for Benchmark 1.

The validation team hereby confirms that it has assessed the information provided. The validation team notes that the above approach is in line with the requirement of clause 6(a) of the 'Tool for demonstration and assessment of additionality, Version 04'. The validation team therefore accepts the above method of calculation of benchmark.

Benchmark 3: Estimates of the cost of financing and required return on capital for the country and type of project activity concerned), based on bankers views on comparable projects.

ICICI Bank Limited, which is one of the biggest private sector banks in India and has been financing private sector wind energy projects (type of project activity concerned) over the past few years, in its letter dated 17/10/2008 addressed to M/s. Hindustan Zinc Limited has confirmed that an Internal Rate of Return of over 16% for the capital employed is desirable to ensure economic viability and adequate cash flows of a high risk wind power project. Subsequently the bank vide letter dated 23/10/2008 has also clarified that this rate of return as 16% has been the same for last three years. Hence DOE is of the opinion that the same rate of return is applicable as benchmark to proposed project activity, which was conceptualized in November 2006 and is therefore in conformity with the banker's expectations. [Within 3 years of these letters by ICICI bank].

The above stated IRR is inclusive of cost of financing and the required rate of return as expressed by an expert. It therefore is in line with clause 6(b) of the tool for demonstration and assessment of additionality, version 04. The validation team therefore accepts this as an alternative benchmark.

Evaluating all the alternate benchmarks presented, it can be seen that 16% rate of return considered by ICICI bank is most conservative & hence can be considered as benchmark for the subject project activity. With this benchmark, investment analysis shows that investment in the proposed project activity is prohibitive without CDM Revenues and hence can be considered to be additional.

The validation team therefore hereby confirms that 16% is accepted as the benchmark for the project activity for the purpose of benchmark analysis under investment analysis.

Project proponent is resubmitting all the IRR spreadsheets with the formulae readable to enable replication of the investment and sensitivity analyses (Annexure 5a, 5b and Sensitivity analysis sheets).

Review Point no. 2
Further clarification is required on how the DOE has validated the common practice analysis, in particular, similar projects should be described and the essential distinction between them and the project activity should be clearly indicated.

Project Proponents Response:
According to the additionality tool *Sub-step 4a requires to analyze other activities similar to the proposed project activity:*

Wind potential and installations in India
The all India generating capacity (including the captive connected to grid) as on March 2007 is 146965.21MW[9], whereas the installed capacity of wind till that time is only 7114.6 MW[10]. Thus just 4.8% of the total generating capacity in India is through wind generation sources. Given that the gross potential for wind power in India is 45195 MW[11], installed capacity of wind in India is only about 15% of its potential. Hence it can be seen that both as a proportion of total installed capacity of the country and as a percentage of the potential of wind power, wind energy penetration in the country is very low.

Wind potential and installations in Karnataka
Specifically analyzing the situation in the state of Karnataka, it is seen that against an assessed wind potential of 7023 MW, the state has installed wind capacity of 853 MW as of 31 March 2007 (Source: KREDL data given below in the table). This shows that until March 2007, the installed capacity of wind energy in Karnataka was only about 12% of its potential.

Wind capacity additions over the years and proportion of CDM projects in the capacity additions
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 (MW)	Capacity commissioned

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[9] http://www.cea.nic.in/power_sec_reports/Executive_Summary/2007_03/6.pdf

[10] Source - Ministry of New and Renewable Energy of India http://www.windpowerindia.com/statstate.html

[11] Source – MNRE http://www.windpowerindia.com/statest.html

			(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**

Source: Karnataka Renewable Energy Development Limited[12]

Wind Electricity generation in Karnataka
Another 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 GWh[13] and the total electricity availability at bus-bar in the state of Karnataka was 33,523.92 GWh[14]. This works out to 1.45%, showing that wind energy generation is insignificant as compared to other power 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.

Wind projects of similar scale
According to additionality tool version 04, similar project activities are those that rely on a broadly similar technology, are of a similar scale, and take place in a comparable environment with respect to regulatory framework, investment climate, access to technology, access to financing etc. The project activity under consideration is a large scale project activity with installed capacity 34.4 MW. Similar project activity has been defined as any large scale project activity with size above 15MW and set up by a single project proponent within a particular time frame in the state of Karnataka. Small scale wind power project activities bundled together from a large scale CDM project have not been considered for the analysis as the scale of these projects and the scale of investment is not comparable to the project activity under consideration.

The wind projects of similar scale commissioned in state of Karnataka at the time of investment in the project activity i.e. as on 31st December 2006 (prior to the start date of HZL's wind project) were analysed from the list of projects commissioned provided by the state energy development agency KREDL.

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[12] http://www.kredl.kar.nic.in/docs/Yearwise_allotment_and_commissioned_wind_power_projects.xls

[13] Table 3.4 titled "Gross Electrical Energy Generation (Utilities Only) Prime mover-wise, Region-wise / State-wise 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

[14] 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

An analysis of the data indicate that there were only 5 projects of similar scale in the state of Karnataka and all the 5 projects have been setup considering CDM funds. Thus if we were to exclude CDM project activities from the list of projects commissioned from further analysis, **there are no other large scale project activities implemented in the state of Karnataka without CDM**. (Excel Sheet of the Analysis attached as Annexure 6).

The identified project activities of similar scale are tabulated below:

Name of Investor	Project size (MW)	Project Size under CDM (MW)	UNFCCC Reference
VSLMining Company (P) Ltd.,	28.7	27.5	VSL Wind power project - http://cdm.unfccc.int/UserManagement/FileStorage/1V5DW5ZJNU9BGYUL8N04SIF0NERRP4
Ramgad Minerals & MiningPvt.Ltd,	41.4	38.75 + 2.65 = **41.4**	0315 - 125 MW wind power project in Karnataka http://cdm.unfccc.int/Projects/DB/DNV-CUK1142448670.58/view 8.35 MW wind power project at Guddarangavana Halli, Chitradurga, Karnataka in India - http://www.sgsqualitynetwork.com/tradeassurance/ccp/projects/434/Revised%20Final%20CDM_4_Kar_PDD.pdf
Nuziveedu Seeds Ltd.	32.65	27.65	0998 - NSL 27.65 MW Wind Power Project in Karnataka, India - http://cdm.unfccc.int/Projects/DB/DNV-CUK1173772302.89/view
MSPL	89.65	78.9 + 4.75 + 6.0 = **89.65**	0315 - 125 MW wind power project in Karnataka - http://cdm.unfccc.int/Projects/DB/DNV-CUK1142448670.58/view 8.35 MW wind power project at Guddarangavana Halli, Chitradurga, Karnataka in India - http://www.sgsqualitynetwork.com/tradeassurance/ccp/projects/434/Revised%20Final%20CDM_4_Kar_PDD.pdf Emission free electricity generation at Harihar, Karnataka - http://cdm.unfccc.int/UserManagement/FileStorage/Q7FCFG27XNUZ6IB32EM7CTVC7KZG6R
Enercon India Limited	127.6	125.20	1259 - Enercon Wind Farm (Hindustan) Ltd in Karnataka - http://cdm.unfccc.int/Projects/DB/DNV-CUK1185356859.49/view 1291 - Enercon Wind Farms in Karnataka Bundled Project- 30.40

			MW - http://cdm.unfccc.int/Projects/DB/SGS-UKL1187092432.51/view 1299 - Enercon Wind Farms in Karnataka Bundled Project- 33 MW - http://cdm.unfccc.int/Projects/DB/SGS-UKL1187708460.15/view 1286 - Enercon Wind Farms in Karnataka Bundled Project- 73.6 MW - http://cdm.unfccc.int/Projects/DB/SGS-UKL1186566570.26/view 0276 - Bundled wind power project in Chitradurga (Karnataka in India) managed by Enercon (India) Ltd. (16,8 MW) - http://cdm.unfccc.int/Projects/DB/DNV-CUK1140782658.34/view

It was noted that few of the project owners from above like Nuzivedu Seeds Ltd., Enercon India Limited and VSL & Sons have some other small scale installations in Karnataka are not under the CDM. However, since these installations were implemented in a different time frame at different location and not as a single project activity having size less than 15 MW, these were deemed to be incomparable to the HZL project activity.

Thus, after exclusion of the above project activities which are under CDM as stipulated by the guidance for conducting common practice analysis provided by the additionality tool, **it was found that there were no similar scale project activities under operation in the state of Karnataka.**

It is thus even more evident that the development of similar wind power projects has been heavily dependent on CDM funds.

From the above discussions the following can be concluded:
- ✓ Installed capacity of wind in India is about **15%** of its potential.
- ✓ Until March 2007, the installed capacity of wind energy in Karnataka is only about **12%** of its potential.
- ✓ Even after including CDM projects only **1.45%** of the total electricity generation in Karnataka is through wind energy sources.
- ✓ All the similar wind farm projects in Karnataka of 15 MW or more capacity undertaken by private investors **are CDM projects** indicating that implementation of wind power projects in the state of Karnataka without CDM do not exist.

The above analysis shows that:
- ✓ Wind power project development is insignificant when compared to the total installed generating capacity of the power sector as well as in terms of realisation of the total wind potential.
- ✓ Further it also shows that wind power project development is substantially dependent on CDM and non CDM wind energy generation is not widely observed and hence is not common practice.

The additionality tool states in Sub-step 4b that *"If similar activities are widely observed and commonly carried out, it calls into question the claim that the proposed project activity is financially unattractive (as contended in Step 2) or faces barriers (as contended in Step 3)."*

On the basis of the conclusions of the analysis in Sub-step 4a, it is seen that:
- ✓ Similar activities i.e. non CDM wind projects **are not widely observed**
- ✓ Further to this **non CDM wind farm projects of project size greater than 15 MW are not present** in the state of Karnataka.

Hence as per additionality tool Version 04 further analysis of step 4 (b) is not required.

Further the additionality tool also states that "*If Sub-steps 4a and 4b are satisfied, i.e.*
- i. *Similar activities cannot be observed*

OR
- ii. *Similar activities are observed, but essential distinctions between the project activity and similar activities can reasonably be explained, then the proposed project activity is additional".*

The above common practice analysis satisfies the sub steps 4a and 4b through point (i) that similar activities are not widely observed and hence wind electricity generation is not a common practice.

Response by Bureau Veritas Certification

Project participant has provided the list of wind power installations in the region (Karnataka state). This list is available from Karnataka Renewable Energy Development Limited. (KREDL). According to this publicly available data, two aspects can be concluded:

According to additionality tool, Projects are considered similar if they are in the same country/region and/or rely on a broadly similar technology, are of a similar scale, and take place in a comparable environment with respect to regulatory framework, investment climate, access to technology, access to financing, etc. The Tool also mentions that other CDM project activities are not to be included in this analysis.

Accordingly only large scale projects i.e. capacities above 15 MW setup by a single private investor have been considered for common practice analysis. As seen from data available from KREDL, it is seen that there are 5 single investors who have investments in wind mills of capacity 15 MW or more before the project activity. It was noted that all 5 of these investments are implemented with CDM project consideration. Project participant has provided evidence for the same in his response. In case of M/s Nuzivedu Seeds Ltd., M/s Enercon India Limited and M/s VSL & Sons a few of the windmills are not covered under the respective CDM project activities. However, it is seen that the capacity that is not covered in the CDM project is installed in a different time frame at different location and ranged between 1.2 to 5 MW (i.e. <15MW). Thus this capacity is not comparable in scale to the project activity and is equivalent to an independent small scale project.

Thus project participant has demonstrated that similar projects in the same region are all implemented only with due consideration of CDM and hence there are no similar project activities for comparison in the common practice analysis.

Information on other issues regarding penetration of wind energy in the country and the region has been provided by the PP and we concur with the same. All data and information provided has been verified with publicly available data provided in the weblinks mentioned in the PP's reply.

Considering all the available information, DOE is of the opinion that installations of similar scale are not a common practice in the region and that that wind power project development is substantially dependent on CDM. We observe that this response and the information by the PP are in line with the interactions that we had with the project participants subsequent to request for review. We therefore endorse the response given by the participants.

We hope that the clarification provided above are satisfactory and request the EB to register the project as CDM project activity

Yours truly,

H.B.Muralidhar
Local Product Manager-CDM
Bureau Veritas Certification Limited