1. The DOE is requested to explain the suitability of the 16% benchmark set by the (KERC), given the EB guidance (EB 40 report, para. 40) that this is not a suitable benchmark for investment analysis for CDM projects in India.

In reference to the above question, the PP would like to give the following chronology of events:

Submission to EB	9th April 2008
EB 40 held	15th -17th June 2008
Webhosting of the project	7th of July – 8th of August

The proposed CDM project activity was submitted to the CDM EB before the EB guidance against the suitability of the 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 would like to justify the appropriateness of the benchmark considered in this project.

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[1] in its tariff order formulated exclusively for non-conventional sources of power (including wind) dated 18th January 2005.

The KERC tariff order is based the cost plus approach. As per this approach, the tariff by the utility is set such that the revenue from tariff should be able to cover the cost of the investment and in addition be able to give a minimum return at the rate set by the respective utility. In doing so, the regulatory commission of the state is guided by several policies related to electricity. The following paragraph gives an extract from one such policy i.e. the National Electricity Policy of India[2] :

"Private sector will have multiple options for investments. Return on investment will; therefore, need to be provided in a manner that the sector is able to attract adequate investments at par with, if not in preference to, investment opportunities in other sectors. This would obviously be

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[1] (http://www.kerc.org/)
[2] http://www.powermin.nic.in/indian_electricity_scenario/national_electricity_policy.htm

based on a clear understanding and evaluation of opportunities and risks. An appropriate balance will have to be maintained between the interests of consumers and the need for investments."

As mentioned in the paragraph above, the return on investment that is to be provided to the Independent Power Producers (IPPs) by the utilities or the government thus represents the amount of return that is expected by these private investors for investing into power sector. This return on investment is calculated in terms of the Return on Equity (ROE) set by the Electricity Regulatory Commission (ERC) in their tariff orders. Thus, any project under a particular tariff order is expected to yield a minimum return that is equivalent to the ROE set by the ERC. In the tariff order of 18th January 2008, KERC has considered a return on equity of 16% for all renewable sources of power.

Further, the parameters used to calculate the tariff for non- conventional power projects as given in the above mentioned tariff order has been determined through a public hearing procedure. This procedure involves stakeholders representing all sectors of renewable energy and gives them a platform to present their views. Thus, parameters for setting the tariff order are determined as per the prevailing market trends. Keeping the above arguments into consideration, 16% was considered an appropriate benchmark.

Since the project is a small scale project (below 15 MW), additionality for the was proved as per the *Attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM project activities*. No concrete guidance has been given in regard to benchmark for the small scale CDM projects. During time of the validation the only guidance available in regard to benchmark was the **Tool for the demonstration and assessment of additionality, version 04** which defined benchmark as per the following:

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.

As per the above the use of 16% benchmark was found to appropriate on following accounts:

- Represents the standard returns in the market – As KERC determines all the parameters (including ROE of 16%) for the calculation of tariff with the help of a public hearing process. This process ensures that parameters are set as per market standards.
- Considering the specific risk to the project type – Since the tariff order specifies the tariff for only non- conventional sources of energy, it ensures that parameters that are set represent the values of this sector.
- Not linked to the subjective profitability expectation or risk profile of a particular project developer – The basic principle of a tariff order is to maintain the balance between the consumer and the supplier. Moreover, the value of 16% is a generic value applicable to all projects. Thus, the benchmark cannot represent the subjective profitability of only one project developer.

Moreover, the Indian power sector does not provide any other (apart from ROE of 16% considered in tariff) publicly available benchmark on the basis of which investors can make a concrete decision. Thus, most power sector investors resort to the above

mentioned benchmark. Only few studies have been conducted to record any such estimation of the required rate of return to Indian power sector projects. One of these is a study conducted by the World Bank Group in 2003 that reveals that as per a survey of the International Investors, a large percent of the investors sought a return of more than 16% on their equity invested[3] in developing countries. Given the volatility of power sector of developing countries, return of more than 16% is quite valid. However, for Indian investors a conservative value for 16% can be considered appropriate.

In addition to this, in December 2006, the technical consultants of the PP, M/S Power and Energy Consultants (PEC) had submitted a feasibility report[4] for the present project activity after a change in the original location of the project took place. The report consists of a detailed analysis of the financial calculations of the project and also discusses about the most suitable benchmark that should be used for comparing the returns to the project. The report discusses three separate benchmarks that are used in Indian Power sector:

- 16% Return on equity – as per the KERC tariff order for non-conventional power projects dated 18th January 2005
- Cost of Equity for Central Sector Utilities- Calculated by the CRISIL Advisory Services (CAS) for CERC[5] – 19.52%
- Cost of Equity (calculated for this project) - 16.88%

It was found that the 16% ROE given by KERC was the most conservative of all the other available benchmarks and therefore was considered as the appropriate benchmark for the project.

However, in accordance with the EB 40 guidance, the PP would like to revisit the earlier benchmark considered for the project and would now like to consider Cost of equity calculated for this particular project type as the appropriate benchmark.

The Cost of Equity basically represents the cost of financing a project. Thus, for a project to be viable, the returns should at least be equivalent to its cost of financing, if not more. The PEC has developed the method of Cost of Equity in a way similar to CRISIL's report submitted to the CERC.

It uses the Capital Asset Pricing Model (CAPM) to calculate the Cost of Equity. The CAPM model propagates a linear relationship between risk and return and is based on the portfolio theory of finance. The model involves adjusting of the equity risk premium of the market to the riskiness of a particular sector to reflect the true risk premium of that sector. To this, the risk free rate of the country is added for calculating the Cost of Equity.

The following formula will be help in comprehending things better:

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[3] Annexure 1-1 World Bank Discussion Paper by Lamech and Saeed, 2003.
[4] Annexure 1-2 Report by PEC
[5] Annexure 1-3 CERC 2000 Tariff order (detailed discussions have been carried out in the order itself)

$$Er_j = r_f + \left(Er_m - r_f\right)\beta_j$$

Where:

$E(r_j)$ is the expected rate of return on equity (cost of equity)

r_f is the risk-free rate of return (e.g. return on government bonds)

$E(r_m)$ is the expected rate of return of the market as a whole

β_j is the coefficient reflecting the volatility (risk) of the stock relative to the market, which measures the systematic risk of the stock.

Risk free rate (r_f):

The Government of India securities are considered as the best representative of risk free rates in the market. Weighted average yield of such securities for the year 2005-06 has been taken as the Risk free rate of India.

Beta (β_j):.

One of the most important features of CAPM method is that it differentiates between the following:

- Systematic risk- Also known as the non-diversifiable risk applicable to the market as a whole at macroeconomic level, such as inflation, tax rises, interest rates, etc.
- Unsystematic risk- Also known as diversifiable risk unique to an individual firm or small group of companies that form a subset of the market

The β in the CAPM equation helps account for the systematic risk by quantifying the sensitivity of the stock of a listed company 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 PEC has considered M/S BF Utilities as the representative for the project activity under consideration. This is because BF Utilities, till 2006, was the only listed company at the Bombay Stock Exchange that solely dealt with wind power generation. Thus, the calculated Beta of 1.11 can be considered to be the risk co-efficient of wind power sector.

Market risk premium {E (r_m) – r_f}

The market risk premium is the return that an investor expects over and above the risk free return available in the market. There are various methods to calculate the risk premium in the country. However, the PEC has derived its risk premium from the study titled A First Cut Estimate of the Equity Risk Premium in India by Jayanth.R. Varma and Samir.K. Barua[6] (an IIM Ahmadabad publication), which has calculated the risk premium in India to be 8.58%.

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[6]Annexure 1-4 IIMA working Paper

With the help of the above figures, the Cost of Equity for the project has been calculated to be 16.88%.

The Cost of Equity was found to be a little above the previous benchmark of 16%. Therefore, even if the new benchmark is considered, the present project activity still remains additional.