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CDM Executive Board

RESPONSE TO REQUEST FOR REVIEW

"Bii Stinu Wind Energy Project" (1581)

AENOR had performed the validation of "Bii Stinu Wind Energy Project" No. 1586 located in Mexico. The request for registration was made on 22/01/2008.

Three requests for review have been issued, which are identical to each other. The communication of this request for review was received on 04/08/2008.

We thank the CDM Executive Board and the Secretariat for giving us the opportunity to clarify about our considerations in validating the project mentioned.

Please find below AENOR response to the issues raised by the request for review.

Request for review:

"The DOE shall describe how it has validated that the project is additional based on generic investment cost comparison between wind and natural gas power generation, the IRR calculation without a benchmark and generic barriers to wind energy development."

In order to provide and extend details about the validation of the issues mentioned on the request for review, AENOR has prepared the following clarifications.

The validation team of AENOR arrived at the opinion that the "Bii Stinu wind energy project" is additional, and "not a business as usual case", by means of the barrier analysis. It has been determined that all of the identified barriers specifically apply to "Bii Stinu wind energy project". Furthermore an investment analysis was assessed and considered to reinforce the conclusion achieved with the barrier analysis.

Thus the barrier analysis and the investment analysis demonstrate that the project activity would not likely be developed without the support from the CDM.

Validation was carried out according to the CDM UNFCCC requirements and the "Tool for the demonstration and assessment of additionality" version 03, and was based on the conclusions obtained from the application of different means of validation and the assessment of the project specific evidences and sources of information, relying on the local knowledge of the Validation team designated with a Mexican member of AENOR.

Three different questions have been included in the request for review:

a) "The project is additional based on generic investment cost comparison between wind and natural gas power generation"

AENOR has validated that the alternative baseline scenario for Bii Stinu wind energy project in Mexico is a combined cycle generation plant. An investment cost comparison has been carried out for the project and validated for both levelized cost and investment cost indicators. Based on that, it is demonstrated that Bii Stinu project is less attractive than the alternative. Further details are provided below.

- According to an official document published by the Mexican government[1], there are two possible technologies that can be considered as realistic alternatives to a 164 MW wind farm. These options are fuel oil plants and natural gas combined cycle generation plants (hereinafter CC). Of these two options, CC plants are expected to dramatically increase their share of the national electricity mix in the coming years, while the share of fuel oil plants is expected to drop.

  Based on data provided by SENER (Mexican Ministry of Energy), the continuation of the current situation will be natural gas-fired CCGT construction. The latest planning document issued by SENER[1] shows that 60,6% of the 7 GW of "fixed" planned capacity will be based on combined cycle power plants. Therefore, the BAU alternative would most likely be gas-fired power generation sponsored by CFE (see Annex III). Hence, although CC plants are generally somewhat larger in terms of installed capacity than the Bii Stinu wind energy project, CC plants are viewed as the most appropriate baseline technology for the investment cost comparison.

- The analysis between these technologies has been carried out according to both the levelized cost concept[2] and the investment cost comparison.
  - *Levelized cost*:
    - The levelized cost for the Bii Stinu project has been calculated to be 89.56 US$/MWh (see Annex I). The sensitivity analysis carried out for this calculation that varies both construction costs and the discount rate yields a range of levelized costs from 83.14 $/MWh to 134.89 $/MWh. AENOR has validated this information through i) revision of an Excel spreadsheet (see the attached Annex 0) which has been developed using with Bii Stinu Project inputs, ii) analysis of the methodology and computation of the Levelized Cost according to

[1] "Prospectiva del Sector Eléctrico 2006-2015"(Electric Sector Forecast 2006-2015).SENER.

[2] Levelized energy cost (LEC) is a cost of generating energy (usually electricity) for a particular system. It is an economic assessment of the cost of the energy-generating system including all the costs over its lifetime: initial investment, operations and maintenance, cost of fuel, cost of capital. A net present value calculation is performed and solved in such a way that for the value of the LEC chosen, the project's net present value becomes zero.

industry practice standards, and iii) verification of original back-up documentation that gives support for investment costs and expenses in the operating phase of the project.

- According to official sources (see Annex II), the levelized costs for combined cycle generation plants in Mexico range between 38 and 58 US$/MWh. Thus the levelized cost for the project activity is much higher than for the baseline technology. AENOR has validated this information through the revision of the official documents referenced in Annex II.

- *Investment cost*:
  - The investment cost for the Bii Stinu project has been calculated to be 2,238 US$/kW per installed kW[3]. This cost is very similar to investment costs calculated for other wind energy projects in the country[4]. AENOR has validated this information through the revision of the original back-up documentation in which the investment costs for the project are shown.
  - The official investment cost for natural gas power plants in Mexico is 432 US$/kW[5]. AENOR has validated this information through the revision of the official documents referenced :

    http://www.cfe.gob.mx/es/LaEmpresa/generacionelectricidad/

    http://www.las-ans.org.br/Papers%202007/pdfs/Paper065.pdf

Conclusion

As stated above, it is considered that both the investment cost comparison and levelized cost comparison demonstrate that the Bii Stinu wind energy project is far less economically attractive than the baseline technology, a CC natural gas plant.

b) "The IRR calculation without a benchmark"

Due to the fact that wind energy is the only business of Eoliatec del Istmo S.A.P.I de C.V. (PP) an internal benchmark has not been considered in the analysis.

AENOR reviewed the benchmark analysis carried out by the Project Participant and validated both the sensitivity analysis as well as the benchmark value provided. The main parameters are shown in the adjoining table.

[3] This includes external grid connection costs, corresponding to a 140 kms of high voltage lines and improvement of CFE existing substations. In particular, Wind Turbine Generators (WTG) accounts for 70% of the investment cost (1,615 US$/kW)

[4] "Energías Renovables para el Desarrollo Sustentable en Mexico" (Renewable Energies for Sustainable Development in Mexico). 2006. SENER.

[5] Source: CFE, Federal Commission of Electricity and Universidad Anáuhac del Norte (Mexico).

	IRR Benchmark	
	Project IRR without CER´s revenue	Rate of return - Benchmark
Base Case values	7.34 %	14 %
Electricity price sensitivity (-10%; +10%)	(6.16%; 8.47%)	
Investment sensitivity (-10%; +10%)	(8.27% , 6.52%)	

A benchmark value of 14% has been determined and subsequently validated[6]. This value includes the consideration of the rates for Treasury Certificates in Mexico and a risk premium corresponding to country risk and technology risk factors as follows:

- The Bank of Mexico indicates that the rate of 28 day Mexico Treasury Certificates ("Certificados de Tesorería de la Federación a 28 días") was 7.04%[7].

- The risk premium was determined considering both the country risk and the technology risk

    - *Country risk*: According to database from Bloomberg, an acknowledged specialist in providing financial data and investment information, the country risk for Mexico was 7.14%[8] (see Annex V). Although this figure reflects the country risk as of the date of this response, it is not likely that this rate has changed during the investment phase of the project given the relatively stable state of Mexico's economy with respect to the risk[9]. In fact, over the past few years, risk rates have hardly been reduced (see Annex V), which implies that the current value used in this analysis is on the conservative side as for IRR benchmark purposes is concerned.
    - *Technology risk*: a reliable risk premium related to wind energy projects could not be identified due to a lack of public information in this sector. However, this risk has not been considered in the benchmark value, as a conservative approach, due to the fact that wind energy is the only business of Eoliatec del Istmo S.A.

For purposes of being conservative, the PP selected a benchmark of 14 percent. Since the project IRR is calculated to be 7.34% without CER income and it is substantially below this benchmark[10], AENOR validated it and considered it appropriate for the

[6] It is also worth mentioning that due to the fact that wind energy is the only business of Eoliatec del Istmo S.A. an internal benchmark has not been considered in the analysis.

[7] January 2007. See historical values in Annex V so as to verify conservative value selected.

[8] Data provided from Bloomberg is delivered on a daily basis and no historical records are kept in Bloomberg database. AENOR validated the data at the moment of the validation.

[9] http://www.secmca.org/Docs/informe_RP/InformeRiesgoPaisRegionSeptiembre2007.pdf

[10] It is also worth mentioning that equity IRR is also lower than such this 14% benchmark.

financial additionality analysis of Bii Stinu wind energy project. Even with the sensitivity analysis the project IRR does not go above 8.47% and thus is still below this benchmark.

Conclusion:

AENOR has validated that the alternative baseline scenario for a wind energy project in Mexico like Bii Stinu is a combined cycle generation plant. A cost analysis has been validated for both the levelized cost and investment cost indicators. Furthermore, a benchmark analysis has been carried out and an appropriate benchmark justified.

All of the above have demonstrated the additionality of the project activity.

c) "Generic barriers to wind energy development"

It has been assessed that all of the barriers identified specifically apply to Bii Stinu wind energy project. AENOR confirmed and validated the barrier analysis after analysing information provided by the Project Participant and reviewing the published documentation as well as in the interviews held during the on-site visit. In this sense, AENOR conducted a thorough validation of the barriers presented for the Project.
Specifically, key activities/tasks as well as sources of information are as follows:

- Review of Energy Production Legal Framework – Federal Laws, Public Service Laws and Energy Commission Acts;
- Analysis of Investment Costs based on information supported by equipment suppliers, technologist, general contractors and references from other projects.
- Understanding of Market development and presence of key players in the Mexican Market in industry and market intelligence publication focused on wind energy (e.g. "Wind Power").
- Interviews with key stakeholders in the project.
- Analysis of technical and Information Barriers – Data obtained from Wind resource and energy assessment report.
- Land ownership structure in the Region – understanding of land ownership in the region as well as its implications.

Although some issues included in the identified barriers could have an impact on the profitability of the project, the barrier analysis performed demonstrates that the implementation of Bii Stinu project activity is prevented specifically by those barriers. A summary of the key barriers is provided in the table below.

Barrier	Brief description of the barrier	Attributable specifically to the Bii Stinu wind energy project	Prevents the business as usual alternative (CC)	Conclusion	Data and sources of information at validation
Institutional, legal, and policy frameworks.	Lack of regulation No premium in Mexico for wind energy projects	YES	NO	Argument justified. Barrier attributable to other wind farms registered as CDM project activities in Mexico.	CFE, Federal Commission of Electricity CRE, Energy Regulation Commission http://www.cfe.gob.mx/es/LaEmpresa/marconormativo/leyes/leyspee/ http://www.cre.gob.mx/pagina_a.aspx?id=23
Economic and financial barrier.	Significant lower investment cost in the BAU (CCGT) than in wind farm in Mexico	YES	NO	Argument justified. 432 USD/kW for CCGT versus 1,370 USD/kW at wind farm project in Mexico as a general reference and 2,238 USD/kW as investment cost calculated for the Bii Stinu project.	- Anahuac Norte University Mexico - CFE - International Energy Agency - La Venta II wind farm CDM project - Financial model of Bii Stinu wind energy project and back up documents http://www.cfe.gob.mx/es/LaEmpresa/generacionelectricidad/ http://www.las-ans.org.br/Papers%202007/pdfs/Paper065.pdf

Barrier	Brief description of the barrier	Attributable specifically to the Bii Stinu wind energy project	Prevents the business as usual alternative (CC)	Conclusion	Data and sources of information at validation
Market structure and human resources.	The lack of qualified personal in the area of the project compromises and hinders O&M works. Wind turbines must be imported.	YES	NO	Argument justified. During the onsite assessment the need to improve a strong capacity building program was verified. There are no production facilities of wind turbines in Mexico.	- CFE - Personal interviews during the onsite assessment on July 2007 with a group of land owners and Ms. Angélica Gonzalez (legal onsite working team of Eoliatec del Istmo S.A.)
Technical and information barriers.	Limited information about wind resources in Mexico and in the wind farm area; specific research is necessary.	YES	NO	Argument justified. Adequately substantiated according to the specific study performed by the project participant.	"Wind resource and energy assessment, Bii Stinu Wind Farm" report. (Alatec June 2007).
Other barriers: Access to land	Lack of legal land titles for the land owners to support its possessions. A strong effort from the project participant is necessary to work with the local community to provide them with the land property legal titles.	YES	NO	Argument justified. During the onsite assessment, it was verified both the situation of land owners and the work of the project proponent with a specialized legal team that was working in the area including local specialists.	Personal interviews during the onsite assessment on July 2007 with a group of land owners and Ms. Angélica Gonzalez (legal onsite working team of Eoliatec del Istmo S.A.)

Further details of these demonstrated barriers are provided in the Annex VI.

Conclusion

This barrier analysis was considered exhaustive and sufficiently supported to demonstrate the additionality of the Bii Stinu project activity. The barriers presented prevent the project activity and do not affect to the business as usual scenario, natural gas fired CC.

ANNEXES

Annex 0: “Levelized cost Istmo.xls” (Excel file attached).

Annex I: Levelized Cost – Bii Stinu Project: Sensitivity Analysis.

Annex II: Levelized Cost for combined cycle plants

Annex III: Official Forecast of generation mix in Mexico.

Annex IV: Regulatory importance for wind energy development.

Annex V: Country Risk.

Annex VI: Further details considered to validate the barriers.