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Mr. Hans Jürgen Stehr
Chair, CDM Executive Board
UNFCCC

Response to the request for review for the CDM project activity "Shandong Wudi Biomass Generation Project" (Ref. no. 1263)

2007-11-10

Dear Mr. Stehr,

Regarding to your request for review on request for registration related to 1263 - Shandong Wudi Biomass Generation Project, we would like to make the following explanation to the issues that you requested for review.

Issue 1 raised:

The PP shall clarify their understanding in the PDD that "The estimated emission reduction will be 117,520 CERs per year".

PP Reply:
It is a typo mistake, which should be "tCO2e per year" not "CERs per year". The revised sentence is that "The estimated emission reduction of the proposed project will be 113,433[1] tCO2e per year.". It is revised in the updated PDD.

Issue 2 raised:

Further substantiation of additionality is required.

PP Reply:
Shandong Wudi Biomass Generation Project is one of the first biomass combustion generation projects in China, and it is obviously to be first-of-this-kind in China. Therefore the proposed project is not a common practice in China, obvious investment barrier and technology barrier will be expected as stated in the PDD. The innovative technology applied by the proposed project implies higher development and operational risks, which are ultimately translated into a higher financial risk for the proposed project, resulting in investment hurdle to the investment.

[1] The amount of the emission reduction is changed due to recalculation of the ER for the reply to Issue 9 of the Request for Review.

Furthermore, the IRR of the proposed project is only 6.46% (6.36% in the revised PDD following the request for review by EB), which is much lower than the benchmark (8%). For this reason, in the financial analysis in the Feasibility Study of the proposed project approved by Shandong Provincial Development and Reform Commission, it states that *The proposed project meets eligibilities of CDM, and the proposed project will become feasible with revenue from CO_2 emission reduction transactions*[2].

During the investment consideration process of the proposed project, barriers were disclosed and the project developer decided to seek additional support from CDM. The project owner issued a tender on inviting CDM development entities on the official website hosted by Chinese DNA – "Clean Development Mechanism in China" (http://cdm.ccchina.gov.cn/) on August 15, 2006[3]. The proposed project started construction in Jan 2007 after the CDM development company was selected. It demonstrated that CDM revenue has been seriously considered in the project decision making.

Therefore, without CDM, the proposed project would not be developed. Therefore, Shandong Wudi Biomass Generation Project is additional.

Issue 3 raised:

Further clarification is required regarding the benchmark analysis applied. The DOE shall further clarify how they have assessed and validated the values of the parameters utilized and the IRR calculation, including detailed explanation of, inter alia, the following issues:

a) ***Reduction of 42% in the Power Price in year 18 of the financial projections.***

PP Reply:
According to *Interim Regulation for Tariff of Renewable Energy Power Generation and Appointment of Expenses* under *Chinese Renewable Energy Law*[4], the tariff for biomass generation project in the first 15 years is the guided tariff approved by government, and the tariff after the first 15 years is the same as the tariff of coal fired power plants in the province. Regarding with the proposed project, the first 2 years are the construction years and the first 15 years of operation are considered from Year 3 to Year 17(the tariff is RMB 0.595/kWh in Shandong Province), and the tariff after the first 15 years is RMB 0.345/kWh which is tariff of coal fired power plants in Shandong Province. For this reason, the power price of the proposed project reduced by 42% from Year 18 onwards.

b) ***Whether the IRR calculation is before or after taxes. The calculation seems to be after taxes while the Excel sheet indicates differently.***

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[2] Sourced from Page 93, 12.2.10 Sensitive Analysis of Feasibility Study in May 2006. Refer to Annex 2
[3] Refer to Annex 1
[4] http://www.china.com.cn/chinese/2006/Feb/1118762.htm

PP Reply:
The IRR calculation is after taxes. There is a typo mistake in the excel attached, in sheet ("Cash Flow after FS'), the "IRR(before tax)" should be "IRR(after tax)". It is revised in the updated excel table.

c) *Treatment of depreciation and amortization, as non tax charges.*

PP Reply:
According to the financial analysis rules (*Interim Rules on Economic Assessment of Electric Engineering Retrofit Projects*) applied in the Feasibility Study, the depreciation and amortization are calculated as part of the total cost, together with operation cost and interest. The depreciation period is 15 years. The project participant realized the depreciation period in the IRR calculation is 20 years, and has corrected this mistake. The amortization is 7% of the fixed asset investment, and the period of amortization is 5 years[5]. The formula in profit calculation is that "profit = inflow - total cost - city and education added cost". The profit is charged 33% of income tax. Therefore, the depreciation and amortization are charged by income tax as part of the costs.

d) *Income tax calculation, Education Tax" rates and "Public Welfare Fund rate, and the treatment of past losses (in China it is accepted to include the five last years in the consolidation of losses).*

PP Reply:
According to the financial analysis rules (*Interim Rules on Economic Assessment of Electric Engineering Retrofit Projects*) applied in the Feasibility Study, the total cost is the sum of depreciation, amortization operation cost and interest. The inflow minus total cost and city and education added cost is the profit. The profit is charged 33% of income tax. The rate of education (the full name is as "city and education added tax") is 3%, and the rate of public welfare fund is 5%[6]. The public welfare is 5% of the profit after tax. Regarding with the losses of public welfare, it is a model bug, which doesn't avoid the negative value of public welfare in some years. The bug is that even though the profit of a given year is negative, the public welfare must be paid and results a negative welfare fund value. But the welfare should be paid in positive. However, this negative welfare paid makes the IRR higher than the actual value.

Regarding the treatment of past losses, the project participant didn't consider it in the previous financial model. The project participant agrees with the consolidation of losses according to the *Interim Regulation of Enterprises Income Tax*[7], and consolidates the losses of the Year 3, 4 and 5 into the profits of the Year 6, 7 and 8 (less than five years) in the revised financial model. The approach is that after 3 years losses (Year 3, 4 and 5), the afterward years profits will be deducted by the 3 years losses first. Only when the losses are recovered, the net profit will be charged by income tax. The proposed project receives profit since Year 8 when the

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[5] Data source: Page 90, 12.2 Financial Analysis, Feasibility Study. Refer to Annex 2
[6] Data source: Page 91 12.2 Financial Analysis, Feasibility Study. Refer to Annex 2
[7] Issued by People's Congress in 1993

accumulated past losses are recovered. The financial model of the proposed project for IRR follows the rules applied in the Feasibility Study, hence, it applies well when the project return is positive, but it doesn't apply well when project return is negative. The project participant just realized it has a few bugs in detailed calculation for only negative scenario, but the impact to IRR is very slim and wouldn't result doubt to additionality of the project. Reflecting the impacts from revisions of Public Welfare and past losses calculation, the recalculated IRR of the proposed project is 6.36%, which is very similar with the IRR in the last version PDD (6.46%).

e) *Projected energy prices which are considered fixed, while the Chinese economy shows an inter-annual increase in producer prices of approximately 3%.*

PP Reply:

The increasing of Chinese economy will not only have impact of the producer prices, such as electricity, but also have impact on the producer costs, such as straw price, etc. Economy development is considered to be a dynamic trends and hard to be considered as concrete in decision making.

For electricity tariff:

In China, the electricity tariff of the project is negotiated between the project owner and the grid company, and approved by government according to relevant laws and requirements[8]. The grid company is the only counter party that the project could sell electricity to, so the grid company is strong and the project owner is weak in negotiation, and it is always a difficult mission for the project owner. When the electricity tariff is approved, it is always not changed in the whole project life time. Even the electricity tariff is considered to be too low in the future, it would be very difficult for the project owner to re-negotiate with the grid company. The increasing of energy price is not stated in any public documents or regulations by Chinese government or related entities, however, it is also disclosed through media that the electricity tariff is decreased from some coal power plants in the same province recently[9]. Without any proven evidence that the tariff will increase in the future from official source, the project participant can not take it into consideration when making decision and project revenue projection.

For straw price:

As one of the energy price related with the proposed project, the straw price has a trend of increasing at this moment and in the future. The experience of the first biomass with coal generation demonstration project shows the straw price kept increasing[10]. However, the cost of straw is one of the costs of the proposed project, hence the increasing of straw cost will even

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[8] According to *Interim Regulation for Tariff of Renewable Energy Power Generation and Appointment of Expenses* under *Chinese Renewable Energy Law*, the tariff for biomass generation project in the first 15 years is the guided tariff approved by government, and the tariff after the first 15 years is the same as the tariff of coal fired power plants in the province. This is stated as regulations under law. The Feasibility Study of the proposed project calculates income of the proposed project with the energy price fixed as guided by the Interim Regulation.

[9] Source: Notice on decreasing the electricity tariff of some coal power plants by Shandong Provincial Price Bureau in Sept 2007. http://www.sdwj.gov.cn/qf_qtxw/qtxw.asp?qt-key=200711104

[10] http://www.sdpc.gov.cn/zdxm/t20051229_55135.htm

lower the IRR and prove the additionality of the project. The project participant uses the fixed straw price is conservative.

Issue 4 raised:

The DOE shall further clarify how they have assessed and validated the sensitivity analysis and the range of fluctuations for the key parameters, in particular those related to tariffs, inputs and investment costs. All the cost variables in the sensitivity analysis as practiced are tied to the same projection basis, precluding an analysis of the whole set of cost items and their individual trends.

PP Reply:
Although the issue is raised to the DOE, the project participant would like to raise its own clarification on this issue. The financial sensitivity analysis and the range of fluctuations of the proposed project in the PDD is implemented according to the financial analysis rules (*Interim Rules on Economic Assessment of Electric Engineering Retrofit Projects*) applied in the Feasibility Study that was approved by Shandong Provincial Development and Reform Commission. The range of fluctuations (10% above or below) for the key parameters has covered the likely scenarios that might happen in the future time and it is accepted by the project owner. Four parameters are analysed by the project. The tariff is not possible to be changed as discussed in PP's reply to Issue 3 e). The straw price is in the trend of increasing as discussed in PP's reply to Issue 3 e). Facing the high uncertainty of the new boiler applied by the project, the Operation & Maintenance will face an increasing trend as well, which is also the parameter has least impact on IRR. The total investment of the project is increasing at this moment, resulting from the main materials in construction have increased 4% in Sept 2007 against the same month of last year[11]. In conclusion, the approach of financial sensitivity analysis follows the common practice in China.

Issue 5 raised:

The DOE shall clarify how they have validated the financial benchmark adopted by project proponents.

PP Reply:
Although the issue is raised to the DOE, the project participant would like to raise its own clarification on this issue. The financial benchmark of the proposed project is 8%, which is widely applied in the power generation projects in China, following the analysis rule - *Interim Rules on Economic Assessment of Electric Engineering Retrofit Projects*. The benchmark of 8% for power project is the common practice in China as well as the benchmark for Guodian Technology & Environment Group Co., Ltd. when making investment.

Issue 6 raised:

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[11] Published by National Development and Reform Commission in Oct 2007
http://finance.sina.com.cn/g/20071025/02064096857.shtml

The PP/DOE shall further demonstrate the conclusions of the barrier analysis. The investment barriers should be further substantiated as they are generic; i.e. the statement in the PDD that "Despite the fact that China possesses rich biomass residues and is facing high demand for electricity, biomass generation power is not considered to be an attractive power generation technology in China comparing to dominated coal fired power generation".

PP Reply:

The area around the proposed project has rich biomass residues resource, however, these biomass residues was unused and left or uncontrolled burned. The reason of these biomass was not used is because there was no available biomass utilization technology in China. Shandong Wudi Biomass Generation Project is one of the first biomass combustion generation projects in China. The innovative technology applied by the proposed project implies higher development and operational risks, which are ultimately translated into a higher financial risk for the proposed project to become a hurdle to the investment. Furthermore, the IRR of the proposed project is only 6.46% (6.36% in the revised PDD following the request for review by EB), which is much lower than the benchmark (8%) as well. Therefore, in the financial analysis in the Feasibility Study of the proposed project approved by Shandong Provincial Development and Reform Commission, it states that *The proposed project meets eligibilities of CDM, the proposed project will become feasible with revenue from CO_2 emission reduction transactions*[12]. It is also concluded by renewable energy policy expert that biomass generation project is hard to attract investor without effective policy and financial support in China[13].The project investor understood this as an investment barrier against the proposed project and sought CDM revenue support to develop the project.

Issue 7 raised:

The PP shall further clarify the reference to technology risks in investment barriers that seems to be contradictory to the statement in the PDD that "The boiler is the key part project adopts the biomass technology of Taishan Group Co. Ltd, which is advanced domestically manufacturer" ... and "Taishan Group Co. Ltd. has experiences in manufacturing traditional fossil fuel combustion boilers and could well control the risk of safety issues".

PP Reply:

Due to high causticity content of the gas from biomass combustion, the biomass combustion boiler becomes the core technology in biomass combustion cycle. In China, the bottleneck of the technology has not been tackled, hence, baffling the development of Chinese biomass generation projects. As an innovative technology, biomass combustion generation technology has high risks in boiler operation and maintenance, etc as well as safety issues. No domestic boiler manufacturer has had biomass combustion boiler development and operation

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[12] Page 93, 12.2.10 Sensitive Analysis of Feasibility Study in May 2006. Refer to Annex 2

[13] Remarked by Mr. Han Weike, Vice Chief of Energy Research Institute, National Development and Reform Commission. Source: http://www.neoman.cn/neoman/29548/g.htm

experience[14] when the project developers were seeking boiler supplier. Therefore, it is very necessary for the project investor to select a boiler manufacturer who has experience in traditional boilers and has capacity in innovating and developing new biomass boiler. Taishan Group Co. Ltd was selected as the boiler supplier to the proposed project, because they have relatively strong capacity in overcoming the technology barrier. Therefore, the technology risks in investment barriers are not contradictory to the statement of the experience of Taishan Group Co. Ltd in traditional boilers.

Issue 8 raised:

The technology risks referred to should be further substantiated. Technology development of the boiler is not part of the project and biomass collection is a management issue rather than technology related.

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PP Reply:

Technology development of the boiler is not part of the project, however, applying an innovative technology is a big technology risk to the proposed project. Chinese boiler manufacturers don't have biomass combustion boiler development and manufacturing experience, but the boiler acts as a core part of the whole project, so their products for the proposed project will have considerable technology risks during project operation and maintenance, which is a significant technology barrier. The fuel of the proposed project is biomass straw, which is quite different in content, weight and format, etc compared with traditional coal fuel. The fuel feed in system and boiler combustion and control system is very different from traditional coal boilers. Since biomass generation project is new in China, there is no trained operation and management staffs for this kind projects. The project developer needs to conduct training to the power plant operators. The risk for management of biomass collection is directly associated to the new biomass generation technology applied by the proposed project. It is mainly because the biomass suppliers of the proposed project are the thousands of individual farmers, which is quite different from the biomass project in other countries[15]. The project investor doesn't have any experienced management staffs to ensure the well management of straw collection work. Hence, it is why stated as part of the technology barrier, which is because *skilled and/or properly trained labour to operate and maintain the technology is not available.*

Issue 9 raised:

Clarification regarding the calculation of the baseline emission factor for the biomass, in particular whether the values used in table B.6.3.1 have been validated in accordance with the approved methodology.

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[14] Source: Biomass Generation Equipment Needs Domestic Manufacturing, reported by Mr.. Lu Yanchang, member of the Chinese People's Political Consultative Conference, on March 2007, http://epaper.rmzxb.com.cn/2007/20070313/t20070313_126623.htm

[15] Source: Biomass Generation Equipment Needs Domestic Manufacturing, reported by Mr.. Lu Yanchang, member of the Chinese People's Political Consultative Conference, on March 2007, http://epaper.rmzxb.com.cn/2007/20070313/t20070313_126623.htm

PP Reply:

In the ACM006 Version 4, regarding with the EF of biomass, it says "To determine the CH_4 emission factor, project participants may undertake measurements or use referenced default values. In the absence of more accurate information, it is recommended to use 0.0027 t CH_4 per ton of biomass as default value for the product of NCV_k and $EF_{burning,CH4,k,y}$."

The project participant applies the measurement on the NCV[16] of biomass k and multiple the IPCC default value of Methane Emission Factor[17] in agriculture or forestry to calculate the EF of biomass. The project participant thought this is a more accurate EF since it is based on the measurements on the biomass used in the proposed project. The EF calculated in this method is 0.0044 t CH_4 per ton of biomass. However, being requested review on this approach, the project participant agrees to apply the recommended EF as a more conservative manner. The emission reduction calculation in the whole PDD is revised accordingly.

I hope this clarification could be helpful to you on the issues.

Yours sincerely

Jieyi Wang
Project Manager
Guodian Technology & Environment Group Co., Ltd.

[16] Source: Measurement result by the Shangdong Coal and Coke Quality Testing Centre on 16 March 2006

[17] Source: Table 1-7 of the Reference Manual of the 1996 Revised IPCC Guidelines

Annex 1 Tender on inviting CDM development entities

Clean Development Mechanism in China

Office of National Coordination Committee on Climate Change

Current Location :What's New

Tender Notice for CDM Projects' PDD Design

Tenders are hereby invited by GD Sci-Tec Environmental Protection Group Co.Ltd from all the eligible organizations both home and abroad for its two new being developed CDM projects, Shangdong Wudi and Heilongjiang Tangyuan 24 MW Biomass(straw stalks)Power Projects' PDD documents design. Specifications of work progress schedule, quoted price of various stages, organization staff quality as well as achievements in CDM projects development are indicated in Tender Form.

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Annex 2 Translation of relevant paragraph in Feasibility Study

12.2 Financial Analysis

12.2.5 Asset Split of Project Investment

The rate of fixed asset formation is 93%, the others is amortization. The depreciation period is 15 years, the recovery rate of which is 3%. The period of amortization period is 5 Years.

12.2.7 Profit and Loss Calculation

1) Sales revenue is calculated by electricity and tariff.

Tariff is RMB 595/MWh.

2) The rate of Value Added Tax (VAT) for electricity of the proposed project is 17%. City Tax is 5% of the VAT value and Education Tax is 3% of the VAT value.

3) The rate of Income Tax is 33%. Public Welfare Fund is 5% of the profit after tax.