Ref: Response to request for review "Power Generation by Waste Heat Recovery Project of Xinjiang Tianshan Cement Co. Ltd. in Urumqi City, Xinjiang Autonomous Region, P. R. China." with the Reference Number 1696

14 July 2008
UNFCCC Secretariat
Martin-Luther-King-Strasse 8
D-53153 Bonn
Germany
Attention: CDM Executive Board

Dear Sir or Madam,

We were informed that our project "**Power Generation by Waste Heat Recovery Project of Xinjiang Tianshan Cement Co. Ltd. in Urumqi City, Xinjiang Autonomous Region, P. R. China.**" (Reference number 1696) was requested for review by CDM Executive Board. As required by the Executive Board and on behalf of the project participants, we would like to answer the question and clarify the issue raised in the requests for review as follows:

Question:
Further clarification is required on how the DOE has validated the baseline determination, in particular that the continuation of grid electricity imports is more economically attractive alternative than the project activity undertaken without the CDM.

Response:
According to methodology ACM 0004, the possible alternative scenarios in absence of the CDM project activity would be as follows:
(1) The proposed project activity not undertaken as a CDM project activity;
(2) Import of electricity from the grid;
(3) Existing or new captive power generation on-site, using other energy sources than waste heat and/or gas, such as coal, diesel, natural gas, hydro, wind, etc;
(4) A mix of options (2) and (3), in which case the mix of grid and captive power should be specified
(5) Other uses of the waste heat and waste gas.

As show in Section B.4 of the PDD, it has been explained that alternative scenarios 3, 4 and 5 face certain barriers, and thus are all excluded first. Moreover, as clearly stated in the PDD, there are barriers, such as a low IRR, associated with alternative scenario 1, and thus this alternative scenario should also be excluded. Consequently,

as the only remaining alternative scenario that does not face any barriers, alternative scenario 2 is considered the baseline scenario.

In addition, for alternative scenario 2, which is not an investment activity, as per paragraph 14 of Annex 35/EB39, the following rule should be applied: *if the alternative to the project activity is the supply of electricity from a grid this is not to be considered an investment and a benchmark approach is considered appropriate.*

Despite the arguments above, a comparison analysis is conducted to prove that the continuation of grid electricity imports is economically more attractive than the project activity undertaken without CDM, as per requested.

First of all, with regard to a specific project, there are generally two possibilities for the utilization of the generated electricity:
1. the generated electricity is supplied to the grid or users other than the project developer itself, which means that revenues of the project come from the sale of electricity;
2. the generated electricity is used by the project developer itself, which means that there's no real income for the project, rather the equivalent revenues of the project equals to the avoided cost of purchasing electricity from other sources, including the grid.

With regard to possibility 1, scenario 2 (i.e. Import of electricity from the grid) is not relevant, since in that case, the service of the project is to "supply electricity to unidentified users through the grid", while the underlying service of scenario 2 is to "supply electricity to the project developer itself".

In the case of possibility 2, scenario 2 is relevant and thus the subsequent requirement (i.e. among the alternatives that do not face any prohibitive barriers, the most economically attractive alternative should be considered as the baseline scenario) may be relevant and a comparison analysis could be conducted. However, a benchmark IRR (or corresponding NPV) analysis is actually equivalent to the comparison analysis if: 1) the revenues of the project used in the analysis are the avoided cost of purchasing power from the grid; and 2) the discount rate equals to the benchmark IRR. This could be demonstrated as follows:

When a benchmark IRR analysis is utilized, the IRR of the project is calculated as follows:

$$\sum_i \frac{(INC_i - COS_i)}{(1+IRR_{project})^i} = 0$$

Where:

INC_i means the income, i.e. the avoided cost, happens in year i, and
COS_i means the cost happens in year i.

As shown in the investment analysis in section B.5 of the PDD,
$IRR_{project} < IRR_{benchmark}$.

Therefore,

$$0 = \sum_i \frac{(INC_i - COS_i)}{(1 + IRR_{project})^i} > \sum_i \frac{(INC_i - COS_i)}{(1 + IRR_{benchmark})^i}$$

$$0 > \sum_i \frac{(INC_i - COS_i)}{(1 + IRR_{benchmark})^i} = \sum_i \frac{INC_i}{(1 + IRR_{benchmark})^i} - \sum_i \frac{COS_i}{(1 + IRR_{benchmark})^i}$$

$$= NPV_{power\_purchase\_grid} - NPV_{power\_production\_project}$$

Consequently,
$NPV_{power\_purchase\_grid} < NPV_{power\_production\_project}$.
i.e. the net present value of the cost of purchasing electricity from the grid is less than the net present value of the electricity production by the project, and thus the project is financially less attractive that option “import of electricity from the grid”.

To further elaborate this point, a NPV analysis for scenarios 1 and 2 is conducted. This is presented in the table attached.

For comparison of these two scenarios the different tax situations have been considered. This is due to the fact that the scenario of the project activity without CDM (scenario 1) includes a capital investment whereas the scenario of import of grid electricity (scenario 2) does not. As a result, the depreciation and amortization is only considered for scenario 1. For both scenarios 1 and 2 the income tax will be due based on net income, but with different amounts. The alternative scenario with higher annual costs (i.e., scenario 2) leads to less net income and thus less tax to be paid. According to the conservative principle, the discount rate applied for both scenarios is the selected financial benchmark rate of return (after tax) on total investment of the Chinese power industry, 8%, with reference to *Interim Rules on Economic Assessment of Electrical Engineering Retrofit Projects*[1].

The tables attached show that the NPV of power generation for scenario 2 is minus 88.26 million Yuan RMB, the NPV for scenario 1 is minus 94.69 million Yuan RMB. Thus, it is demonstrated that scenario 1 is financially less attractive than scenario 2

[1] *Interim Rules on Economic Assessment of Electric Engineering Retrofit Projects*, State power company generation and transmission operating department, page 2

(electricity imports from the grid). As per methodology ACM0004, scenario 2 should consequently be identified as the baseline scenario.

Furthermore, practically, the implementation of scenario 2 does not face any prohibitive barriers as scenario 1 does. The continuation of grid electricity imports does not require high initial investment and no further risks are expected. On the contrary, the execution of scenario 1 may face both problems.

In conclusion, for the project participant the rational decision is the continuation of grid electricity imports, which is reasonably considered as the baseline scenario.