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Reference CDM Ref 1185  
Attention UNFCCC Secretariat

Response to request for review  
“LG Chem Naju plant fuel switching project” (1185)

Dear Members of the CDM Executive Board,

LG Chem, Ltd. (LG Chem) refers to the request for review raised by three Board members concerning the request for registration of the “LG Chem Naju plant fuel switching project” (1185).

The issues raised by the review requested and LG Chem’s responses to each issue are as follows:

**Reason for Request 1**

PP is assessing additionality using the investment barrier analysis. The investment comparison analysis using NPV as an indicator has been applied for 2 baseline alternatives: (i) continuation of usage of bunker fuel oil C; and (ii) project activity without CDM. Analysis is presented in Excel spread sheet and shows the advantages of status quo scenario. The following issues require further clarification in PDD:

- a. PA is not clearly described. It is not clear how many boilers are installed at the LG Chem plant and how many of them are retrofitted and how many natural gas burners are installed for each boilers. If one burner is installed for each boiler that would mean existence of more than two boilers. Are then they of the same age, same type, same efficiency? Clarification is thus required regarding how many boilers are to be retrofitted, how many burners are to be installed and whether the burners are of sufficient capacity for the amount of natural gas to be consumed.
- b. Are there taxes for SO<sub>2</sub> emissions in Korea and if yes, why they are not considered in investment barrier analysis?
- c. In PDD it is stated that “Even with the expected amount additional income, the Project activity

is still economically unattractive” (p.10) but not explained where this additional income comes from.

- d. In addition, the following changes are needed in Appendix1:
  - i. To change titles “Baseline emissions” (corresponds to the baseline emissions) and “Project emissions” (corresponds to the project emissions) on sheet “CER”
  - ii. It is not clear what should be calculated in cells G2:G7 (sheet CER).
  - iii. Exchange rate for KRW has to be presented

### **Response from LG Chem**

- a. There are three boilers installed at LC Chem plants. Among them, only one boiler will be retrofitted. Total four burners will be installed to use natural gas. Each of the burners has a capacity of 1,338 Nm<sup>3</sup>/hr as described in the PDD. Total capacity of the four burners is 5,352 Nm<sup>3</sup>/hr, which is sufficient for the natural gas consumption at Naju plant. Such information is reflected in the revised PDD.
- b. There are no taxes for SO<sub>2</sub> emissions in Korea. Therefore, there is no need to consider such taxes in investment analysis. Also, as described in the PDD, under the current regulations, bunker fuel oil C (Sulphur 0.5%) can be used in the Naju area.
- c. “The expected amount of additional income” means the additional income from CDM, which is from the sale of CERs. This clarification is reflected in the revised PDD.
- d. The proposed change regarding to the item d-i is reflected in the revised excel file as suggested. In cells G2:G7, the amount of bunker fuel consumption in ‘kg’ is calculated. However, there was a mistake in the calculation. In the revised excel file, they are corrected. For item d-iii, the unit used for NPV calculation is Korean Won. There is no need for the exchange rate for KRW to be presented since it will not affect the result of NPV calculation. However, as a reference, the exchange rate for KRW is provided in the revised excel file at the time of project consideration (June, 2006, when the fuel price is applied, Source: Bank of Korea).

### **Reason for Request 2**

Clarification is required why an oxidation factor has not been used in calculating the emission reductions.

### **Response from LG Chem**

As mentioned in Section B.6.2, the default values for the CO<sub>2</sub> emission factor of the natural gas and bunker fuel oil C, provided in “2006 IPCC Guidelines for National Greenhouse Gas Inventories” are

used (TABLE 1.4, Chapter 1, Volume 2) in which the default carbon oxidation factor of 1 is reflected. Therefore, the oxidation factor has been used in calculating the emission reductions.

### Reason for Request 3

The monitoring plan includes monitoring of steam expressed in TJ, which in the project scenario is calculated using the monitored fuel consumption data and energy efficiency of the project boiler, i.e. not direct measurement. Clarification required.

### Response from LG Chem

As described in Section B.6.1, emission reductions from the project activity are calculated as follows:

Project emission

$$PE_y = FF_{project,y} \cdot NCV_{NG} \cdot EF_{NG,CO2}$$

where,

$PE_y$	Project emissions during the year y (tCO <sub>2</sub> e)
$FF_{project,y}$	Quantity of natural gas combusted in the project boiler during the year y (m <sup>3</sup> )
$NCV_{NG}$	Net calorific value of the natural gas combusted (TJ/m <sup>3</sup> )
$EF_{NG,CO2}$	CO <sub>2</sub> emission factor of the natural gas combusted in the project boiler (tCO <sub>2</sub> /TJ)

Baseline emissions

$$BE_y = FF_{baseline,y} \cdot NCV_{FF} \cdot EF_{FF,CO2,y}$$

with

$$FF_{baseline,y} = FF_{project,y} \cdot \frac{NCV_{NG} \cdot \epsilon_{project}}{NCV_{FF} \cdot \epsilon_{baseline}}$$

where:

$BE_y$	Baseline emission during the year y (tCO <sub>2</sub> e)
$FF_{baseline,y}$	Quantity of bunker fuel oil C that would be combusted in the absence of the project activity in the project boiler during the year y (volume or mass unit)
$NCV_{FF}$	Net calorific value of bunker fuel oil C that would be combusted in the absence of the project activity in the project boiler (TJ/ volume or mass unit)
$EF_{FF,CO2}$	CO <sub>2</sub> emission factor of bunker fuel oil C that would be combusted in the absence of the project activity in the project boiler (tCO <sub>2</sub> /TJ)
$\epsilon_{project}$	Energy efficiency of the project boiler if fired with natural gas
$\epsilon_{baseline}$	Energy efficiency of the project boiler if fired with bunker fuel oil C

Since the above calculation only requires information about fuel consumption, net calorific value of the fuel, and boiler efficiency for the calculation emission reduction, the amount of steam generated expressed in TJ is not necessary. However, the applied methodology AMS III.B states that “Monitoring fuel use and output after the fuel switch has been implemented”. In line with this, though it is an unnecessary parameter for emission reduction calculation, LG Chem decides to monitor the amount of steam generated. However, considering its importance in the monitoring plan, indirect measurement, which is also one of the monitoring methods, was selected by LG Chem.

#### **Reason for Request 4**

There is also an inconsistency in the monitoring plan regarding the energy efficiency of the boiler which bunker fuel oil C (baseline). The source of this data parameter in Section B.6 (p.13) is “Manufacturer specification” while in Section B.4 (p.9) – “LG Chem”.

#### **Response from LG Chem**

The source of the energy efficiency of the boiler is from “Manufacturer specification”. The source in Section B.4 is changed to “Manufacture specification” from “LG Chem” in the revised PDD.

#### **Reason for Request 5**

The validation report states that, “...the validation team is of the opinion that the LG Chem Naju Plant Fuel Switching Project is in full compliance with all the major requirements for the CDM...”. The validation report should confirm that all applicable requirements of the CDM have been met.

#### **Response from LG Chem**

The validation report will be revised by KEMCO.

We hope the Board accepts the above explanations and we look forward to the registration of the project activity.

Sincerely yours,

Sung Hee Won

Manager

Environmental & Safety Team

LG Chem, Ltd.