Indicative simplified baseline and monitoring methodologies
for selected small-scale CDM project activity categories

TYPE III - OTHER PROJECT ACTIVITIES

Project participants shall take into account the general guidance to the methodologies, information on additionality, abbreviations and general guidance on leakage provided at http://cdm.unfccc.int/methodologies/SSCmethodologies/approved.html.

III.AD. Emission reductions in hydraulic lime production

Technology/Measure

1. This project category comprises alternative hydraulic lime production for construction purposes by blending a certain amount of conventional hydraulic lime with alternative material and additives. Production of hydraulic lime in the traditional manufacturing process requires more energy in comparison to the alternative lime process, since the addition of alternative material and additives reduces the amount of calcined material needed to develop the same properties per unit of final product.

2. The project activity takes into account only emission reductions associated with the reduced energy consumption by increased level of blending. Decreased chemical release of carbon dioxide during calcination process is not taken into account. Other measures such as energy efficiency improvements should be considered as a separate project and may apply under Type II categories.

3. The following definitions apply:

(a) Hydraulic lime: commercial product for construction purposes, obtained through the hydration of calcined limestone;

(b) Alternative hydraulic lime: commercial product obtained through blending of a certain amount of hydraulic lime with alternative material and additive, showing similar properties and same applications as the conventional hydraulic lime;

(c) Alternative material: non-calcined mineral components comprising limestone and/or other inert materials obtained from a quarry. Examples of non-calcined mineral components include certain types of limestone, dolomite and marbles;

(d) Additive: solid or liquid material added to the blended product in small quantities, (less or equal to 0.05 tonne-additive/ tonne alternative hydraulic lime) which notably change its properties.

4. This methodology is only applicable if the service level of alternative hydraulic lime is the same or better than the hydraulic lime, i.e. the product obtained during the crediting period shall meet or exceed relevant properties of typical commercial hydraulic lime for construction purposes/applications, measured in accordance with an applicable or related standard[1]. Standard

[1] In case where a national standard for testing hydraulic lime quality does not exist, an international standard or standard from another country shall be used as a reference (e.g., International Lime Association).

tests shall be carried out on statistically valid number of samples of project lime[2] (see paragraph 24 below).

5. The maximum blending level in the project activity is:

(a) Alternative material: 0.70 (t alterative material/t alternative hydraulic lime);

(b) Additive: 0.05 (t additive/t alternative hydraulic lime).

6. It shall be demonstrated in the PDD that there is no other allocation or use for the amount of alternative material used by the project activity, and there is enough availability of it during the crediting period. If alternative material is purchased from other quarry owners, the procedure described in paragraph 3 of AMS-III.V may be used.

7. This methodology is only applicable to a project activity implemented in an existing plant. It shall be demonstrated that the alternative hydraulic lime was not produced in that plant for at least the previous three years.

8. This methodology is limited to domestically sold output of the project activity plant and excludes export of alternative hydraulic lime.

9. Adequate data are available on baseline hydraulic lime application in the market and relevant quality standards per application.

10. In order to exclude double counting, CERs can only be claimed by the producer of alternative hydraulic lime.

11. This methodology is not applicable if local regulations require the use of proposed technologies for the manufacturing of alternative hydraulic lime.

12. Measures are limited to those that result in emission reductions of less than or equal to 60 $ktCO_2$ equivalent annually.

Project Boundary

13. The project boundary includes all physical, geographical sites where:

(a) Alternative hydraulic lime is produced;

(b) Transportation of alternative material is conducted.

Baseline emissions

14. The baseline scenario is the production of the same amount of the alternative hydraulic lime produced by the project activity, using the conventional process. The baseline emissions in year *y* shall be determined as follows:

[2] If confidential data are used, the performance evaluation of alternative lime shall be verified by the DOE and the EB-CDM along validation/verification process.

Indicative simplified baseline and monitoring methodologies
for selected small-scale CDM project activity categories

III.AD. Emission reductions in hydraulic lime production (cont)

$$BE_y = Minimum\,(BE_{ex\ ante,y}, BE_{ex\ post,y}) \quad \textbf{(1)}$$

Where:

$BE_{ex\ ante,y}$ Baseline emissions based on *ex ante* specific emission factor per tonne of hydraulic lime produced (tCO_2)

$BE_{ex\ post,y}$ Baseline emissions calculated based on *ex post* specific emission factor per tonne of hydraulic lime produced as an intermediate product before blending (tCO_2)

15. Baseline emissions as per the *ex ante* specific emission factor is determined using the historical data for the energy consumption of the three most recent years:

$$BE_{ex\ ante,y} = \frac{\sum_i EC_{FF,i,HL} * EF_{FF,CO2,i} + EC_{el,HL} * EF_{el,CO2}}{Q_{HL}} * Q_{AL,cap,y} \quad \textbf{(2)}$$

Where:

$EC_{FF,i,HL}$ Historical annual average consumption of thermal energy using fossil fuel type *i* to produce baseline hydraulic lime (GWh_{th}/year). Annual historical consumption of each fuel type *i* (volumes, mass) during the three most recent years, multiplied by the respective net calorific value (NCV_i) are used for the determination of the average $EC_{FF,i,HL}$.

$EF_{FF,CO2,i}$ CO_2 emission factor of the fossil fuel *i* (tCO_2/GWh_{th})

$EC_{el,HL}$ Annual average consumption of electricity to produce hydraulic lime in the previous three years (GWh_{el}/year)

$EF_{el,CO2}$ CO_2 emission factor for electricity consumption (tCO_2/GWh_{el})

Q_{HL} Annual average historical production of baseline hydraulic lime in the three most years (tonne/year, dry basis)

$Q_{AL,cap,y}$ Total production of alternative hydraulic lime of the project activity in the year *y* (tonne, dry basis)

Project activities involving capacity additions compared to the baseline scenario are only eligible if they comply with the related and relevant guidance in the General Guidance for SSC methodologies which require a demonstration that the baseline scenario for the added capacity is the same as the baseline scenario defined by this methodology. Otherwise, in the event production output of alternative hydraulic lime in year *y* is greater than the average historical production output of the hydraulic lime (three most recent years average historical data) before the implementation of the project activity, the value of the production output in year *y* is capped at the value of this historical average production level (tonne, dry basis)[3]

I Indices for fossil fuel types

16. *Ex post* baseline emissions is determined as per the specific emission factor for the production of hydraulic lime as an intermediate product (before blending) during the project activity, multiplied by the amount of alternative lime produced:

$$BE_{ex-post,y} = \frac{\sum_i EC_{FF,i,IHL,y} * EF_{FF,CO2,i} + EC_{el,IHL,y} * EF_{el,CO2}}{Q_{IHL,y}} * Q_{AL,cap,y} \quad \textbf{(3)}$$

Where:

$EC_{FF,,i,IHL,y}$ Thermal energy provided by the fossil fuel type *i* to produce hydraulic lime as an intermediate produce (before blending) in year *y* (GWh_{th})

$EC_{el,IHL,y}$ Consumption of electricity to produce hydraulic lime as an intermediate produce (before blending) in year *y* (GWh_{el})

$Q_{IHL,PJ,y}$ Production of hydraulic lime as an intermediate product (before blending) in year *y* (tonne, dry basis)

17. For the determination of the emission factor ($EF_{FF,CO2,i}$) and of the net calorific value (NCV_j) for the fossil fuel used in the baseline scenario, guidance by the most recent version of IPCC Guidelines for National Greenhouse Gas Inventories shall be followed where appropriate. Project participants may either conduct measurements or they may use accurate and reliable local or national data where available. In the case of coal, the data shall be based on test results for periodic samples of the coal purchased if such tests are part of the normal practice for coal purchases. Where such data is not available, IPCC default emission factors (country-specific, if available) may be used if they are deemed to reasonably represent local circumstances. All values shall be chosen in a conservative manner (i.e. lower values should be chosen within a plausible range) and the choice shall be justified and documented in the SSC-CDM-PDD. Where measurements are undertaken, project participants shall document the measurement results and the calculated average values of the emission factor or net calorific value for the baseline fuel *ex ante* in the SSC-CDM-PDD.

[3] If $Q_{AL,y}$ is the total alternative lime produced by the plant in the year *y* (uncapped), then $Q_{AL,cap,y} = Q_{AL,y}$, *for* $Q_{AL,y} \leq Q_{HL}$, and $Q_{AL,cap,y} = Q_{HL}$ for $Q_{AL,y} > Q_{HL}$.

Indicative simplified baseline and monitoring methodologies
for selected small-scale CDM project activity categories

III.AD. Emission reductions in hydraulic lime production (cont)

Project emissions

18. Project emissions are related to the energy consumption (thermal and electric) for the production of the alternative hydraulic lime during the crediting period, including the producing of the hydraulic lime as an intermediate product (before blending), but also the emissions for obtaining, processing, transporting and blending alternative/additive material.

$$PE_y = \frac{\sum_i EC_{FF,i,AL,y} * EF_{FF,CO2,i} + EC_{el,AL,y} * EF_{el,CO2}}{Q_{AL,y}} * Q_{AL,cap,y} \quad \textbf{(4)}$$

Where:

PE_y Project activity emissions in the year y (tCO_2)

$EC_{FF,i,AL,y}$ Thermal energy provided by the fossil fuel type i to produce alternative hydraulic lime in year y (GWh_{th})

$EC_{el,AL,y}$ Electricity consumption in year y to produce alternative hydraulic lime (GWh_{el})

$Q_{AL,y}$ Total production of alternative hydraulic lime in year y (tonne, dry basis)

19. For the determination of the emission factor ($EF_{FF,CO2,i}$) and of the net calorific value (NCV_j) for the fossil fuel used in the project scenario, guidance by the most recent version of IPCC Guidelines for National Greenhouse Gas Inventories shall be followed where appropriate. Project participants may either conduct measurements or they may use accurate and reliable local or national data where available. In the case of coal, the data shall be based on test results for periodic samples of the coal purchased if such tests are part of the normal practice for coal purchases. Where such data is not available, IPCC default emission factors (country-specific, if available) may be used if they are deemed to reasonably represent local circumstances. All values shall be chosen in a conservative manner (i.e. higher values should be chosen within a plausible range) and the choice shall be justified and documented in the SSC-CDM-PDD. Where measurements are undertaken, project participants shall document the measurement results and the calculated average values of the emission factor or net calorific value for the project fuel.

Leakage emissions

20. The use of additives may produce leakage emissions. The project proponent shall calculate the leakage emissions associated with[4]:

- Upstream emissions: emissions associated with energy consumption to produce the additive. (If this information is not public available, peer reviewed technical literatures may be used).

[4] If confidential data available from the relevant additive/s are used, the calculation carried out by the project participants shall be verified by the DOE and the EB. The CDM-PDD may only show the resulting emissions for each source.

- Transportation emissions: emissions associated with fossil fuel used for the transportation of the additive from production site to project plant.
- Chemical oxidation emissions: if the additive used in the project is an organic substance, which is derived from fossil fuel, the CO_2 emissions associated with its oxidation shall be calculated, taking into account the carbon content and assuming that it is totally converted to CO_2 during use.

21. If the alternative lime manufacturing equipment is transferred from another activity or if the existing equipment is transferred to another activity, leakage shall be considered.

Emission reduction

22. Emission reductions are calculated as:

$$ER_y = BE_y - PE_y - LE_y \quad \textbf{(5)}$$

Where:

ER_y Emission reduction in year y (tCO_2)

Monitoring

23. Parameters that have to be obtained prior to the project activity:

(a) $EF_{FF,CO2,i}$: CO_2 emission factor for each fossil fuel type i used in project activity (tCO_2/GWh_{th});

(b) $EF_{CO2,el}$: CO_2 emission factor for electricity consumption (tCO_2/GWh_{el});

(c) NCV_i: Net calorific value of fossil fuel i (TJ/mass or volume units);

(d) Quantity of fuel type i consumed in three most recent years historical data (mass or volume units/year);

(e) Electricity consumed in three most recent years historical data (GWh_{el}/year);

(f) Emission factors related to the leakage calculation for the additive use.

24. Parameters that shall be monitored during the crediting period:

(a) Test to validate that the alternative hydraulic lime meets or exceeds the quality standards of commercial lime for construction purposes/applications shall be conducted on a statistically valid number of alternative hydraulic lime samples chosen according to the methods of simple random sampling. (Examples of parameters that could be monitored are: compressive strength 7-28 days, autoclave expansion, residue over #200 mesh screen, etc.). If no specific guidance is included in the standard chosen then use sample sizes that provide results with a 90% confidence interval and a maximum 10% error margin.

(b) Fuel and electricity consumption shall be monitored in each equipment associated with producing of intermediate product (hydraulic lime before blending):

(i) $EC_{FF,i,IHL,y}$: Thermal energy (from fossil fuel) used for the production of hydraulic lime before blending in year y (GWh_{th});

(ii) $EC_{el,IHL,y}$: Consumption of electric energy used for the production of hydraulic lime before blending in year y (GWh_{el});

(c) Fuel and electricity consumption shall be monitored in each equipment associated with producing of final product (alternative hydraulic lime):

(i) $EC_{ff,i,AL,y}$: Thermal energy (from fossil fuel type i) used for the production of alternative hydraulic lime in year y (GWh_{th}). This value encompasses the thermal energy for the production of hydraulic lime before blending ($EC_{ff,i,IHL,y}$), plus the fossil fuel used for obtaining, processing, transporting and blending alternative material;

(ii) $EC_{el,AL,y}$: Consumption of electric energy used for the production of alternative hydraulic lime in year y (GWh_{el}). This value encompasses the electric energy for the production of hydraulic lime before blending ($EC_{el,i,IHL,y}$) plus the electricity used for obtaining, processing, transporting and blending alternative material;

(d) $Q_{AL,y}$: Total production of alternative lime in year y (t, dry basis). This shall be direct measured and recorded by weighing the final product. Representative samples are taken, to measure the moisture content of the final product, and calculate the produced quantity in dry basis;

(e) $Q_{IHL,y}$: Total production of hydraulic lime as intermediate product (before blending) in year y (t, dry basis). This shall be directly measured and recorded by weighing the intermediate product. Representative samples are taken, to measure the moisture content, and calculate the produced quantity in dry basis;

(f) Additive consumption in year y (t additive). Measured and recorded by direct weighing;

(g) Alternative material consumption in year y (t alternative material). Measured and recorded by direct weighing.

Project Activity under a programme of activities

25. Further guidance on leakage would be required[5] to adapt this methodology for application to project activities under a programme of activities.

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[5] A request for revision may be proposed in accordance with the procedures.

Indicative simplified baseline and monitoring methodologies
for selected small-scale CDM project activity categories

III.AD. Emission reductions in hydraulic lime production (cont)

History of the document

Version	Date	Nature of revision
01	EB 47, Annex 20 28 May 2009	Initial adoption.