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

TYPE III – OTHER PROJECT TYPES

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.Z. Fuel Switch, process improvement and energy efficiency in brick manufacture

Technology/measure

1. The methodology comprises shift to an alternative brick production process or partial substitution of fossil fuels with renewable biomass[1] (including solid biomass residues such as sawdust and food industry organic liquid residues[2]) in existing brick[3] production facilities. Fuel substitution and associated activities may also result in improved energy efficiency of existing facility; however project activities primarily aimed at emission reductions from energy efficiency measures shall apply AMS-II.D. Thus the methodology is applicable for the production of:

(a) Bricks that are the same in the project and baseline cases; or

(b) Bricks that are different in the project case versus the baseline case due to a change(s) in raw materials, use of different additives, and/or production process changes resulting in reduced use or avoidance of fossil fuels for forming, sintering (firing) or drying or other applications in the facility as long as it can be demonstrated that the service level of the project brick is comparable to baseline brick (see paragraph 8). Examples include pressed mud blocks (soil blocks) with cement or lime stabilisation[4] and other 'unburned' bricks that attain strength owing to fly ash, lime/cement and gypsum chemistry.

2. The measures may replace, modify or retrofit[5] systems in existing facilities or be installed in a new facility.

3. New facilities (Greenfield projects) and project activities involving capacity additions compared to the baseline scenario are only eligible if they comply with the related and relevant requirements in the General Guidance for SSC methodologies.

[1] As per annex 18, EB 23.

[2] Fatty acids from oil extraction, waste oil and waste fat of biogenic origin (includes waste oil from restaurants, agro and food industry, slaughterhouses or related commercial sectors). The sources/origin of waste oil/fat and respective volumes must be identified and clearly documented in the PDD. No CERs from waste oil/fat can be claimed under this methodology if it is not produced from biogenic origin, biogenic shall mean the oils and/or fats originate from either vegetable or animal biomass, but not from mineral (fossil) sources.

[3] Brick in the context of this methodology includes solid bricks and blocks as well as hollow blocks used in building construction.

[4] May involve mechanical and hydraulic systems for energy transmission to the soil block via a lever, toggle, cam, pivot, ball and socket joint, piston, etc.

[5] E.g., replace and/or modify an existing heating and/or firing facility(/-ies) to enable the use of biomass residues.

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III.Z. Fuel Switch, process improvement and energy efficiency in brick manufacture (cont)

4. The requirements concerning demonstration of the remaining lifetime of the replaced equipment shall be met as described in the General Guidance for SSC methodologies. If the remaining lifetime of the affected systems increases due to the project activity, the crediting period shall be limited to the estimated remaining lifetime, i.e. the time when the affected systems would have been replaced in the absence of the project activity.

5. In the case of existing facilities, this category is only applicable if it can be demonstrated, with historical data, that for at least three year prior to the project implementation, only fossil fuel (no renewable biomass) was used in the brick production systems, which are being modified or retrofitted.

6. In the case of project activities involving changes in raw materials (including additives), it shall be demonstrated that additive materials are abundant in the country/region according to the following procedures:

Step 1: Using relevant literature and/or interviews with experts, a list of raw materials to be utilized is prepared based on the historic and/or present consumption of such raw materials.

Step 2: The current supply situation for each type of raw material to be utilized is assessed and their availability abundance is demonstrated using one of the approaches below:

- Approach 1: Demonstrate that the raw materials to be utilized, in the region of the project activity, are not fully utilized. For this purpose, demonstrate that the quantity of material is at least 25% greater than the demand for such materials or the availability of alternative materials for at least one year prior to the project implementation.

- Approach 2: Demonstrate that suppliers of raw materials to be utilized, in the region of the project activity, are not able to sell all of the subject raw materials. For this purpose, project participants shall demonstrate that a representative sample of suppliers of the raw materials to be utilized, in the region, had a surplus of material (e.g., at the end of the period during which the raw material is sold), which they could not sell and which is not utilized.

7. This methodology is applicable under the following conditions:

(a) The service level of project brick shall be comparable to or better than the baseline brick, i.e. the bricks produced in the brick production facility during the crediting period shall meet or exceed the performance level ~~requirements and specifications applicable to~~ of the baseline bricks (e.g., dry compressive strength, wet compressive strength, density). An appropriate national standard shall be used to identify the strength class of the bricks, bricks that have compressive strengths lower than the lowest class bricks in the standard are not eligible under this methodology. Project bricks are tested in nationally approved laboratories at 6 months interval (at a minimum) and test certificates on compressive strength are made available for verification; ~~in accordance with an applicable national building~~

~~code or standard6. Tests in accordance with approved procedures, as defined by the applicable national building code or standard, shall be carried out on statistically valid number of sample project bricks (see paragraph 16)~~

(b) The existing facilities involving modification and/or replacement shall not influence the production capacity beyond ±10% of the baseline capacity unless it is demonstrated that the baseline for the added capacity is the same as that for the existing capacity in accordance with paragraph 3;

(c) Measures are limited to those that result in emission reductions of less than or equal to 60 kt CO_2 equivalent annually.

8. This methodology is not applicable if local regulations require the use of proposed technologies or raw materials for the manufacturing of bricks unless widespread non compliance (less than 50% of brick production activities comply in the country) of the local regulation evidenced.

Boundary

9. The project boundary is the physical, geographical site where the brick production takes place during both the baseline and crediting periods.

Baseline

10. The baseline emissions are the fossil fuel consumption related emissions (fossil fuel consumed multiplied by an emissions factor) associated with the system(s), which were or would have otherwise been used, in the brick production facility(ies) in the absence of the project activity.

(a) For projects that involve replacing, modifying or retrofitting systems in existing facilities, the average of the immediately prior three-year historical fossil fuel consumption data, for the existing facility, shall be used to determine an average annual baseline fossil fuel consumption value. Similarly, prior three-year historical production data (excluding abnormal years) for the existing facility, shall be used to determine an average annual historical baseline brick production rate in units of weight or volume. For calculating the emission factor, reliable local or national data shall be used. IPCC default values shall be used only when country or project specific data are not available or demonstrably difficult to obtain;

(b) For projects involving installation of systems in a new facility, the average annual historical baseline fossil fuel consumption value and the baseline brick production rate shall be determined as that which would have been consumed and produced, respectively, under an appropriate baseline scenario. If the baseline scenario

[6] In the case where a national standard or code does not exist for the subject bricks, a national code or standard from another country with similar building construction characteristics shall be used.

identified includes different technologies with different levels of energy consumption, a weighted average energy use of these technologies can be considered for determining the baseline emissions of the facility or facilities.

The emissions are calculated as below:

$$BE_y = EF_{BL} * P_{PJ,y} \quad \textbf{(1)}$$

Where:

BE_y The annual baseline emissions from fossil fuels displaced by the project activity in t CO_2e in year y (of the crediting period)

EF_{BL} The annual production specific emission factor for year *y*, in t CO_2 / kg or m^3

$P_{PJ,y}$ The annual net production of the facility in year *y*, in kg or m^3

The annual production specific emission factor (EF_y) can be calculated *ex ante* as follows:

$$EF_{BL} = \sum_{j,i} (FC_{BL,i,j} \times NCV_j \times EF_{CO_2,j}) / P_{Hy} \quad \textbf{(2)}$$

Where:

$FC_{BL,i,j}$ Average annual baseline fossil fuel consumption value for fuel type *j* combusted in the process *i*, using volume or weight units[7]

$NCV_{,j}$ Average net calorific value of fuel type *j* combusted, TJ per unit volume or mass unit

$EF_{,CO2,j}$ CO_2 emission factor of fuel type *j* combusted in the in the process *i* in t CO_2/ TJ

P_{Hy} Average annual historical baseline brick production rate in units of weight or volume, kg or m^3

Leakage

11. Leakage emissions on account of diversion of biomass from other uses (competing uses) shall be calculated as per "General guidance on leakage in biomass project activities".

12. In the case of project activities involving change in production process or a change in type or quantity of raw and/or additive materials as compared to the baseline, the incremental emissions associated with the production/consumption and transport of those raw and/or additive materials consumed as compared to baseline, shall be calculated as leakage**.**

~~13 If the brick making energy generating equipment is transferred from another activity leakage is to be considered.~~

Project activity emissions

[7] Volume or weight units will be used depending on which best defines the fuel consumption requirements of the brick making process(es).

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III.Z. Fuel Switch, process improvement and energy efficiency in brick manufacture (cont)

13. Project activity emissions (PE_y) consist of those emissions associated with the use of electricity or fossil fuel or both and are calculated in accordance with the "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" and/or "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion" (tCO_2e).

Emission reductions

14. Emission reductions (ER_y) achieved by the project activity will be calculated as the difference between the baseline emissions and the sum of project emissions and leakage as follows:

$$ER_y = BE_y - PE_y - Leakage \quad \textbf{(3)}$$

Where:

ER_y Emission reductions in year y (t CO_2e/yr)

BE_y Baseline emissions in year y (t CO_2e/yr)

PE_y Project emissions in year y (t CO_2/yr)

LE_y Leakage emissions in year y (t CO_2/yr)

Monitoring

15. Monitoring during the crediting period shall include:

(a) Production output (kg or m^3 per day);

(b) Principal raw and additive material purchases ~~inputs~~ on monthly basis;

(c) Tests to validate that the project bricks meet the performance requirements and specifications at six-month intervals; ~~Tests shall be conducted on a statistically valid number of samples of bricks chosen according to the methods of simple random sampling. If no specific guidance is included in the standard/code chosen then use sample sizes that provide results with a 90% confidence interval and a maximum 10% error margin. However, in the case of small scale units, they should get their product tested in standard laboratories and provide test certificates on compressive strength at 6 months interval.~~

(d) Daily ~~electricity,~~ biomass, and fossil fuel consumption of production facility. Each type of fossil fuel and solid/liquid biomass shall be monitored separately. Cross-checking with fuel purchase invoice, delivery notes and the stock is required. Monthly electricity consumption shall be monitored; ~~In the case of fly ash-lime and /or cement -gypsum with total avoidance of thermal energy, electricity consumption on monthly basis would serve the purpose.~~

(e) In order to assess the leakages specified under paragraph 12 and compliance with the applicability conditions concerning organic liquid residues monitoring shall include data on the origin of biomass residues and organic residue liquids;

(f) In order to determine the emissions of each fuel consumed the calorific value of each (fossil) fuel type and the density, mass fraction and carbon content of each biomass fuel type used.

Project activity under a programme of activities

16. In case the project activity involves the replacement of equipment, and the leakage effect from the use of the replaced equipment in another activity is neglected because the replaced equipment is scrapped, an independent monitoring of scrapping of replaced equipment needs to be implemented. The monitoring should include a check if the number of project activity equipment distributed by the project and the number of scrapped equipment correspond with each other. For this purpose scrapped equipment should be stored until such correspondence has been checked. The scrapping of replaced equipment should be documented and independently verified.

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History of the document

Version	Date	Nature of revision(s)
02	EB 47, Annex 25 28 May 2009	Simplify the requirements to establish the comparability level of service (e.g., comparability of compressive strength) of baseline bricks and the project bricks.
01	EB 46, Annex 20 25 March 2009	Initial adoption.