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.AH Shift from high carbon intensive fuel mix ratio to low carbon intensive fuel mix ratio

Technology/measure

1. This methodology comprises activities that result in increased share of low GHG intensive fossil fuel in an element process[1] of an industrial, residential, commercial, and institutional or electricity generation application[2] that uses a mix of fossil fuel. For example, shift from high carbon intensive fuel mix ratio to low carbon intensive fuel mix ratio on an annual basis in power generation[3].

2. This methodology is applicable for retrofit or replacement of existing installations. Cases involving Greenfield projects and capacity additions[4] are not eligible under this methodology.

3. Switching of fuel mix ratio may also result in energy efficiency improvements of the facility, thus both the project activities with or without energy efficiency improvements are eligible under this category. Project activities for implementation of energy efficiency measures not-related to the switch of energy sources shall apply Type II SSC methodologies.

4. The requirements for demonstration of the remaining lifetime of the equipment replaced shall be met as described in the general guidance. If the remaining lifetime of the plant increases due to the project activity, the crediting period shall be limited to the estimated remaining lifetime, i.e., the time when the existing equipment of the element process would have been replaced in the absence of the project activity.

5. This methodology is not applicable to project activities that propose switch from fossil fuel use in the baseline to renewable biomass, biofuel or renewable energy in the project scenario. This methodology is not applicable to project activities utilising waste gas or energy; these project activities may consider applying AMS-III.Q.

[1] An "*element process*" is defined as fuel combustion, energy conversion or energy use in a single equipment. Each element process generates a single output (such as electricity, steam, hot air) by using a single or combinations of fossil fuels. This methodology covers fuel switch in several element processes, i.e., project participants may submit one CDM-PDD for fuel switch in several element processes within a facility.

[2] Fuel switch in transportation technologies is not eligible under this methodology.

[3] Substitution of heavy fuel oil (HFO) engine with a Natural Gas (NG) engine to shift to a low GHG intensive fuel mix ratio of 25:74:1 (HFO: NG: Diesel) from a baseline fuel mix ratio of 69:30:1 (HFO: NG: Diesel) on an annual basis.

[4] i.e., the project capacity is within +10 % and -10% of the baseline installed capacity

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6. This category is applicable to project activities where it is possible to directly measure and record the energy use (e.g., electricity or heat) and consumption (e.g., fossil fuel) within the project boundary.

7. Heat or electricity produced under the project activity shall be for on-site captive use and/or export to other facilities included in the project boundary. In case energy produced by the project activity is delivered to another facility or facilities, to displace more carbon intensive energy source than the project fuel mix, within the project boundary, a contract between the supplier and consumer(s) of the energy will have to be entered into specifying that only the facility generating the energy can claim emission reductions from the fuel switch.

8. Export of electricity to a grid is not eligible under this category. That is, the project activity may physically connect to a grid but emission reduction can not be claimed by exporting electricity to the grid.

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

10. Regulations do not constrain the facility from using the energy sources cited in paragraph 1 before the fuel switch. Regulations do not require the use of low carbon energy source (e.g., natural gas or any other fuel) in the element processes.

11. The project activity does not result in integrated process change. The purpose is to exclude measures that affect other characteristics of the process besides switch of energy sources e.g., operational conditions, type of raw material processed, use of non-energy additives, change in type or quality of products manufactured etc.

Boundary

12. The project boundary is the physical, geographical site where the switching of energy source takes place. It includes all installations, processes or equipment affected by the switching. The boundary also extends to the industrial, commercial or residential facilities consuming energy generated by the system.

Baseline

13. Historical information (detailed records) on the use of fossil fuels and the element process output (e.g., heat or electricity) from at least three years prior to project implementation shall be used in the baseline calculations, e.g., information on coal use and heat output by a district heating plant, liquid fuel oil use and electricity generated by a generating unit (records of fuel used and output can be used in lieu of actual collecting baseline validation data). For facilities that are less than three years old, all historical data shall be available (a minimum of one year data would be required). In case of project activity exporting to other facilities included in the project boundary, the above historical information from the recipient plants are required.

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14. During the crediting period, if there is a restricted availability of a particular baseline fuel on account of local regulations this has to be considered by adjusting the baseline emissions ex post for the period where the baseline fuel is not available. The adjustment is done in a conservative manner i.e., if the restriction results in downward adjustment of baseline emissions it shall be taken into account[1] and on the other hand upward adjustment of baseline emissions are not eligible.

15. The baseline emissions can be determined as follows:

$$BE_y = \sum_{i,j} (FC_{BL,i,j,y} * NCV_j * EF_{CO2,j}) \quad \textbf{(1)}$$

Where:

BE_y	Baseline emissions during year *y* (tCO_2e)
$FC_{BL,i,j,y}$	Amount of fuel *j* consumed by the element process *i* during the year *y* operating at the baseline energy scenario (liters, tons, etc.)
NCV_j	Net calorific value of the fuel type *j* (kJ/unit)
$EF_{CO2,j}$	CO_2 emission factor of the fuel type *j* (tCO_2/kJ)

The amount of each fuel type *j* consumed is calculated ex-post using the total monitored energy output of the element process *i* during year *y* and the share of each energy source in the identified baseline scenario:

$$FC_{BL,i,j,y} = \frac{EG_{i,PJ,y} * a_{i,j,BL}}{NCV_{BL,j} * Eff_{i,BL,j}} \quad \textbf{(2)}$$

Where:

$EG_{i,PJ,y}$	Total monitored output (heat, electricity, etc) of the element process *i* during year *y* (kJ)
$a_{i,j,BL}$	Share of fuel *j* in the total input energy of the element process *i* for the identified baseline scenario (ratio)
$Eff_{i,BL,j}$	Conversion efficiency of the element process *i* when operating with fuel type *j* in the baseline scenario , see below
$NCV_{BL,j}$	Net calorific value of the baseline fuel type *j* (kJ/unit)

[1] With reference to footnote 2, if the regulations result in HFO:NG ratio of 60:39 it shall be used for baseline calculations.

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16. Efficiency of the baseline units shall be determined by adopting one of the following criteria (in a preferential order):

(a) Highest measured operational efficiency over the full range of operating conditions of a unit with similar specifications, using baseline fuel. The efficiency tests shall be conducted following the guidance provided in relevant national / international standards;

(b) Highest of the efficiency values provided by two or more manufacturers for units with similar specifications, using the baseline fuel;

(c) Default efficiency of 100%.

17. The *ex ante* calculation of the baseline emissions shall be presented in the PDD based on the estimated production of the element process *i* during the crediting period. The *ex post* calculations are done based on measured output of the element process.

Project Activity Emissions

18. Project activity emissions consist of those related to use of fossil fuel in element processes *i* during the crediting period.

$$PE_y = \sum_{i,j} FC_{PJ,i,j,y} * NCV_{PJ,j} * EF_{PJ,CO2,j} \quad \textbf{(3)}$$

Where:

PE_y	Project emissions during the year *y* (t CO_2e)
$FC_{PJ,i,j,y}$	Quantity of fuel type *j* combusted in element process *i* during the year *y* (mass or volume unit)
$NCV_{PJ,j}$	Net calorific value of the fuel type *j* (kJ/unit)
$EF_{PJ,CO2,j}$	CO_2 emission factor of the fuel type *j* (tCO_2/kJ)

Leakage

19. No leakage calculation is required.

Emission Reductions

20. The emission reduction achieved by the project activity will be calculated as the difference between the baseline emissions and the project emissions.

$$ER_y = BE_y - PE_y \quad \textbf{(4)}$$

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Where:

ER_y Emission reductions in the year y (tCO_2e)

21. For the determination of the emission factor and the net calorific value for the fossil fuels used guidance by the 2006 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 for the baseline and higher values for the project 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 *ex post* determination of the baseline and project emissions.

Monitoring

22. Monitoring shall include the energy source input ($FC_{PJ,i,j,y}$, NCV_j), and output of the element process i after the project activity has been implemented e.g., gas use and heat output by a district heating plant, gas use and electricity generated by a generating unit.

23. For electricity or steam energy exported to other facilities, monitoring of the use of electricity and thermal energy shall be undertaken in the recipient end.

24. In the case of steam energy, direct measurement of flow, temperature, pressure is required to determine enthalpy of the steam.

25. The availability of all baseline fuels shall be monitored, periods of non availability or restricted availability shall be recorded for the baseline adjustment in accordance with paragraph 13.

Project activity under a programme of activities

The following conditions apply for use of this methodology in a project activity under a programme of activities:

26. Leakage emissions resulting from fuel extraction, processing, liquefaction, transportation, re-gasification and distribution of fossil fuels outside of the project boundary shall be considered, as per the guidance provided in the leakage section of ACM0009. In case leakage emissions in the baseline situation are higher than leakage emissions in the project situation, leakage emissions will be set to zero.

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History of the document

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01	EB 50, Annex # 16 October 2009	To be considered at EB 50.
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