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

TYPE II - ENERGY EFFICIENCY IMPROVEMENT PROJECTS

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.

II.C. Demand-side energy efficiency activities for specific technologies

Technology/measure

1. This ~~category~~ methodology comprises activities that encourage the adoption of energy-efficient equipment, lamps, ballasts, refrigerators, motors, fans, air conditioners, appliances, etc. at many sites. These technologies ~~may~~ replace existing equipment ~~or be installed at new sites~~. The aggregate energy savings by a single project may not exceed the equivalent of 60 GWh per year for electrical end use energy efficiency technologies. For fossil fuel end use energy efficient technologies, the limit is 180 GWh thermal per year in fuel input.

2. For each replaced appliance/equipment the capacity or output or level of service (e.g., light output, room temperature and comfort, the rated output capacity of air-conditioners etc.) is not significantly larger or smaller (maximum ± 10%) than the baseline.

3. If the energy efficient equipment contains refrigerants, then it is ensured that the refrigerant used in the project case has lower GWP than the refrigerant used in the baseline equipment; the shift to the new refrigerant must be voluntary and not mandated by laws or regulations. This methodology credits emission reductions only due to the reduction in electricity consumption from use of more efficient equipment/appliances.

Boundary

4. The project boundary is the physical, geographical location of each measure (each piece of equipment) installed.

Baseline

5. If the energy displaced is fossil fuel based, the energy baseline is the existing level of fuel consumption ~~or the amount of fuel that would be used by the technology that would have been implemented otherwise~~. The emissions baseline is the energy baseline multiplied by an emission factor for the fossil fuel displaced. Reliable local or national data for the emission factor shall be used; IPCC default values should be used only when country or project specific data are not available or difficult to obtain. ~~IPCC default values for emission coefficients may be used.~~

6. If the energy displaced is electricity, the emission baseline is determined as the product of the baseline energy consumption of equipment/appliances and the emission factor for the electricity displaced: ~~the baseline is calculated as follows:~~

~~$E_B = \Sigma_i (n_i \cdot p_i \cdot \theta_i)$~~

$$BE_y = E_{BL,y} * EF_{CO2,ELEC,y} \quad (1)$$

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

II.C. Demand-side energy efficiency activities for specific technologies (cont)

$$E_{BL,y} = \sum_i (n_i * p_i * o_i) / (1 - l_y) \quad \textbf{(2)}$$

Where:

BE_y	Baseline emissions in year y (tCO_{2e})
$E_{BL,y}$	Energy consumption in the baseline in year y (kWh)
$EF_{CO2,ELEC,y}$	Emission factor in year y calculated in accordance with the provisions in AMS I.D (tCO_2/MWh)
~~E_B~~	~~annual energy baseline in kWh per year.~~
Σ_i	Sum over the group of "i" devices (e.g. 40W incandescent bulb, 5hp motor) replaced, for which the substituted energy efficient equipment is operating during the year, implemented as part of the project activity
n_i	Number of devices of the group of "i" devices (e.g. 40W incandescent bulb, 5hp motor) replaced, for which the substituted energy efficient equipment is operating during the year
p_i	Power of the devices of the group of "i" devices (e.g. 40W incandescent bulb, 5hp motor) replaced. In the case of a retrofit activity, "power" is the weighted average of the devices replaced. ~~In the case of new installations, "power" is the weighted average of devices on the market~~
o_i	Average annual operating hours of the devices of the group of "i" devices replaced
l_y	Average technical grid losses (transmission and distribution) during year y for the grid serving the locations where the devices are installed, expressed as a fraction. The grid losses should not contain non-technical losses such as commercial losses (e.g., theft/pilferage). The grid losses should be estimated using recent, accurate and reliable data available within the host country. It can either be estimated by a (national) utility or an official governmental body or by project participants. Reliability of the data used (e.g. appropriateness, accuracy/uncertainty, especially exclusion of non technical grid losses) shall be established and documented by the project participant. A default value of 10% may be used for technical grid losses, if no recent data is available or the data cannot be regarded accurate and reliable.

7. ~~The energy baseline is multiplied by an emission coefficient (measured in kg CO_2e/kWh) for the electricity displaced calculated in accordance with provisions under category I.D~~

8. For project activities that seek to retrofit or modify an existing unit or equipment, the baseline may refer to the characteristics (i.e., emissions) of the existing unit or equipment only to the extent that the project activity does not increase capacity or output or level of service by maximum 10%. For any increase of capacity or output or level of service beyond this range, which is due to the project activity, a different baseline shall apply. In this case, approach stated in paragraph 11 of AMS I.D and EB 22 annex 2 may be followed.

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

II.C. Demand-side energy efficiency activities for specific technologies (cont)

Project Activity Emissions

9. Project emissions consist of electricity and/or fossil fuel used in the project equipment, determined as follows.

$$PE_y = EP_{j,y} * EF_{CO2,y} \quad \textbf{(3)}$$

Where:

PE_y Project emissions in year y (tCO_2e)

$E_{PJ,y}$ Energy consumption in project activity in year y. This shall be determined *ex post* based on monitored values

$EF_{CO2,y}$ Emission factor for electricity or thermal energy displaced. The emissions associated with grid electricity consumption should be calculated in accordance with the procedures of AMS I.D. For fossil fuel displaced reliable local or national data for the emission factor shall be used; IPCC default values should be used only when country or project specific data are not available or difficult to obtain.

Project energy consumption in case of project activities that displace grid electricity is determined as follows using the data of the project equipment:

$$E_{PJ,y} = \sum_i (n_i * p_i * o_i)/(1 - l_y) \quad \textbf{(4)}$$

Leakage

10. If the energy efficiency technology is equipment transferred from another activity or if the existing equipment is transferred to another activity, leakage is to be considered.

Monitoring

11. The emission reduction achieved by the project activity shall be determined as the difference between the baseline emissions and the project emissions and leakage.

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

Where:

ER_y Emission reductions in year y (tCO_2e)

LE_y Leakage emissions in year y (tCO_2e)

12. If the devices installed replace existing devices, the number and "power" of a representative sample of the replaced devices shall be recorded in a way to allow for a physical verification by DOE[1] ~~and monitored~~.

[1] This shall be monitored while replacement is underway to avoid, e.g., that 40W lamps are recorded as 100W lamps, greatly inflating the baseline.

13. If the devices installed have a constant current (ampere) characteristics, monitoring shall consist of monitoring either the "power" and "operating hours" or the "energy use" of the devices installed using an appropriate method ~~methodology~~. Appropriate ~~Possible~~ methods ~~ologies~~ include:

(a) Recording the "power" of the device installed (e.g., lamp or refrigerator) using nameplate data or bench tests of a sample of the units installed and metering a sample of the units installed for their operating hours using run time meters.

OR

(b) Metering the "energy use" of an appropriate sample of the devices installed. ~~For technologies that represent fixed loads while operating, such as lamps, the sample can be small while for technologies that involve variable loads, such as air conditioners, the sample may need to be relatively large.~~

14. In either case, monitoring shall include annual checks of a sample of non-metered systems to ensure that they are still operating. ~~(other evidence of continuing operation, such as on-going rental/lease payments could be a substitute).~~

15. If the devices have variable current (ampere) characteristics, monitoring shall consist of metering the "energy use" of an appropriate sample of the devices installed. Monitoring shall also include annual checks of a sample of non-metered systems to ensure that they are still operating.

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:

16. In case the project activity involves the replacement of equipment, and the leakage effect of 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.

- - - - -