



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

## TYPE I - RENEWABLE ENERGY PROJECTS

*Note: Categories I.A, I.B and I.C involve renewable energy technologies that supply electricity, mechanical and thermal energy, respectively, to the user directly. Renewable energy technologies that supply electricity to a grid fall into category I.D.*

All the approved small scale methodologies, general guidance to the methodologies, information on additionality and abbreviations can be found at:

<http://cdm.unfccc.int/methodologies/SSCmethodologies/approved.html> Project participants must 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>.

### I.C. Thermal energy for the user

#### Technology/measure

1. This category comprises renewable energy technologies that supply individual households or users with thermal energy that displaces fossil fuels. Examples include solar thermal water heaters and dryers, solar cookers, energy derived from renewable biomass for water heating, space heating, or drying, and other technologies that provide thermal energy that displaces fossil fuel. Biomass-based co-generating systems that produce heat and electricity for use on-site are included in this category.
2. Where generation capacity is specified by the manufacturer, it shall be less than 15MW.
3. For co-generation systems and/or co-fired systems to qualify under this category, the energy output shall not exceed 45 MW<sub>thermal</sub> e.g. for a biomass based co-generating system the capacity for all the boilers affected by the project activity combined shall not exceed 45 MW<sub>thermal</sub>. In the case of the co-fired system the installed capacity (specified for fossil fuel use) for each boiler affected by the project activity combined shall not exceed 45 MW<sub>thermal</sub>.
4. In the case of project activities that involve the addition of renewable energy units at an existing renewable energy facility, the added capacity of the units added by the project should be lower than 45 MW<sub>thermal</sub><sup>1</sup> and should be physically distinct<sup>2</sup> from the existing units.

<sup>1</sup> Ex: 15 MW<sub>thermal</sub> of new capacity is added to existing 27 MW<sub>thermal</sub> to make the aggregate capacity of 42 MW<sub>thermal</sub> which is within the allowed limits for capacity

<sup>2</sup> Physically distinct units are those that are capable of producing thermal energy without the operation of existing units, and that do not directly affect the mechanical, thermal, or electrical characteristics of the existing facility. For example, the addition of a steam turbine to an existing combustion turbine to create a combined cycle unit would not be considered “physically distinct”.



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

***I.C. Thermal Energy for the User (cont)***

**Boundary**

5. The physical, geographical site of the renewable energy generation delineates the project boundary.

**Baseline**

6. For renewable energy technologies that displace technologies using fossil fuels, the simplified baseline is the fuel consumption of the technologies that would have been used in the absence of the project activity times an emission coefficient for the fossil fuel displaced. IPCC default values for emission coefficients may be used.

7. For renewable energy technologies that displace electricity the simplified baseline is the electricity consumption times the relevant emission factor calculated as described in category I.D.

8. In the case of project activities that involves the addition of renewable energy units at an existing renewable energy production facility, where the existing and new units share the use of common and limited renewable resources (e.g. biomass residues), the potential for the project activity to reduce the amount of renewable resource available to, and thus thermal energy production by, existing units must be considered in the determination of baseline emissions, project emissions, and/or leakage, as relevant.

For project activities that involve the addition of new energy production units (e.g. turbines) at an existing facility, the increase in energy production associated with the project (EG<sub>y</sub> in MWh/ year) should be calculated as follows:

$$EG_y = TE_y - WTE_y$$

where:

TE<sub>y</sub> = the total thermal energy produced in year y by all units, existing and new project units

WTE<sub>y</sub> = the estimated thermal energy that would have been produced by existing units (installed before the project activity) in year y in the absence of the project activity, where

$$WTE_y = \text{MAX}(WTE_{\text{actual},y}, WTE_{\text{estimated},y})$$

where,

WTE<sub>actual,y</sub> = the actual, measured thermal energy production of the existing units in year y

WTE<sub>estimated,y</sub> = the estimated thermal energy that would have been produced by the existing units under the observed availability of the renewable resource for year y;

If the existing units shut down, are derated, or otherwise become limited in production, the project activity should not get credit for generating thermal energy from the same renewable resources that would have otherwise been used by the existing units (or their replacements). Therefore, the equation for WTE still holds, and the value for WTE<sub>estimated,y</sub> should continue to be estimated assuming the capacity and operating parameters same as that at the time of the start of the project activity.



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

#### *I.C. Thermal Energy for the User (cont)*

If the existing units are subject to modifications or retrofits that increase production, then WTE<sub>y</sub> can be estimated using the procedures described for EG<sub>baseline</sub> below.

9. For project activities that seek to retrofit or modify an existing facility for renewable energy generation the baseline scenario is the following:

In the absence of the CDM project activity, the existing facility would continue to provide thermal energy (EG<sub>baseline</sub>) at historical average levels (EG<sub>historical</sub>), until the time at which the thermal energy facility would be likely to be replaced or retrofitted in the absence of the CDM project activity (DATE<sub>BaselineRetrofit</sub>). From that point of time onwards, the baseline scenario is assumed to correspond to the project activity, and baseline thermal energy production (EG<sub>baseline</sub>) is assumed to equal project thermal energy production (EG<sub>y</sub>, in MWh/year), and no emission reductions are assumed to occur.

$EG_{baseline} = \text{MAX}(EG_{historical}, EG_{estimated,y})$  until DATE<sub>BaselineRetrofit</sub>

$EG_{baseline} = EG_y$  on/after DATE<sub>BaselineRetrofit</sub>

Baseline emissions (BE<sub>y</sub> in tCO<sub>2</sub>) then correspond to the difference of the thermal energy supplied by the project activity minus the baseline thermal energy supplied in the case of modified or retrofit facilities (EG<sub>baseline</sub>). EG<sub>historical</sub> is the average of historical thermal energy delivered by the existing facility, spanning all data from the most recent available year (or month, week or other time period) to the time at which the facility was constructed, retrofitted or modified in a manner that significantly affected output (i.e., by 5% or more). A minimum of 3 years (excluding abnormal years) of historical production data is required. In the case that 3 years of historical data are not available - e.g., due to recent retrofits or exceptional circumstances, a new methodology or methodology revision must be proposed. EG<sub>estimated,y</sub> is the estimated thermal energy that would have been produced by the existing units under the observed availability of renewable resource for year *y*.

In order to estimate the point in time when the existing equipment would need to be replaced in the absence of the project activity (DATE<sub>BaselineRetrofit</sub>), project participants may take the following approaches into account:

- (a) The typical average technical lifetime of the equipment type may be determined and documented, taking into account common practices in the sector and country, e.g. based on industry surveys, statistics, technical literature, etc.
- (b) The common practices of the responsible company regarding replacement schedules may be evaluated and documented, e.g. based on historical replacement records for similar equipment.
- (c) The point in time when the existing equipment would need to be replaced in the absence of the project activity should be chosen in a conservative manner, i.e. if a range is identified, the earliest date should be chosen.

#### Leakage



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

***I.C. Thermal Energy for the User (cont)***

---

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

**Monitoring**

11. Monitoring shall consist of:

(a) Metering the energy produced by a sample of the systems where the simplified baseline is based on the energy produced multiplied by an emission coefficient.

OR

(b) Metering the thermal and electrical energy generated for co-generation projects. In the case of co-fired plants, the amount of fossil fuel input shall be monitored;

OR

(c) If the emissions reduction per system is less than 5 tonnes of CO<sub>2</sub> a year:

- (i) Recording annually the number of systems operating (evidence of continuing operation, such as on-going rental/lease payments could be a substitute); and
- (ii) Estimating the annual hours of operation of an average system, if necessary using survey methods. Annual hours of operation can be estimated from total output (e.g. tonnes of grain dried) and output per hour if an accurate value of output per hour is available.