

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

TYPE III - OTHER PROJECT ACTIVITIES

Project participants shall apply the general guidelines for the small-scale (SSC) clean development mechanism (CDM) methodologies, information on additionality (attachment A to appendix B) provided at <<http://cdm.unfccc.int/methodologies/SSCmethodologies/approved.html>> *mutatis mutandis*.

III.BE. Substitution of virgin raw materials and fuels by secondary materials recovered from scrap tires

Technology/measure

1. This methodology comprises activities for recovery and mechanical processing of scrap tires to produce marketable secondary materials which save energy and reduce greenhouse gas emissions by displacing:
 - (a) Production of virgin raw materials:
 - (i) Recycled rubber granulate <1.4 mm substitutes for bitumen and Styrene-Butadiene-Styrene (SBS) in the production of asphalt;
 - (ii) Recycled rubber granulate ≥1.4 mm substitutes for Ethylene-Propylene-Diene Monomer (EPDM)/Thermoplastic Elastomer (TPE) as an artificial turf infill material;
 - (iii) Scrap steel substitutes for scrap iron in the production of steel;
 - (b) Combustion of fossil fuels in cement plants: the residual textile fraction from the tire recycling process is used as an alternative fuel in cement production.
2. The methodology only covers facilities that limit the amount of contamination materials from free metal, fibers or other substances in the two rubber fractions to no more than 0.01 % by weight.
3. For the purpose of this methodology the following definitions apply:

Scrap tire: a tire is considered at the end of its life when it can no longer be used on vehicles (after having been retreaded or regrooved). An end-of-life tire is also referred to as a scrap tire.

Mechanical recycling: physical/mechanical processes (e.g. separation, cleaning, shredding, granulation, fractioning and/or other mechanical processes) by which marketable secondary raw materials (rubber granulate and scrap steel) and alternative fuels (residual textile fraction) are recovered from scrap tires.

Processing/recycling facility: Facility(ies) where the scrap tires undergo mechanical recycling into secondary raw materials and alternative energy sources.

Manufacturing facility: Facility(ies) that purchase outputs from the processing/recycling facility and use them with or without further processing in intermediate or finished products (asphalt, artificial turf, steel, or cement).

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

III.BE. Substitution of virgin raw materials and fuels by secondary materials recovered from scrap tires (cont)

4. The methodology is applicable under the following conditions:
- (a) The methodology excludes collection of the scrap tires generated from the production process, and it covers only end-of-life scrap tires. Project proponents shall provide evidence that the materials recycled under the project activity are recovered only from end-of-life scrap tires;
 - (b) The processing/recycling facility shall document the sources and quantities of scrap tires it processes; materials from an unknown source are not eligible under this methodology. Project proponents shall demonstrate that the proposed project activity does not collect and recycle the scrap tires imported from other countries, but from in-country sources;
 - (c) It is possible to measure and record the final output of the processing/recycling facility, i.e. the weight of materials leaving the processing/recycling facility. The output material(s) shall be sold directly to manufacturing facilities. The sales of the recycled materials/alternative fuels to manufacturing facilities shall be documented. The manufacturing facilities that purchase the materials recovered by the processing/recycling facility shall be located in an eligible CDM host country. Confirmation from those manufacturing facilities purchasing materials from the processing/recycling facility specifying the final products in which these secondary materials will be used, consistent with paragraph 1, shall be provided;
 - (d) In order to ensure that projects would indeed displace virgin materials, the evidence that the selling price of recycled materials produced from scrap tires is close to [within x % of] the price of the replaced secondary materials produced from virgin raw materials should be provided;
 - (e) It is possible to measure and record the amount of fuel and electricity consumed by the processing/recycling activities performed at the facility;
 - (f) The emission reductions under this methodology will accrue to any one of the following:
 - (i) The recycling facility; or
 - (ii) The processing facility; or
 - (iii) The collectors of scrap tires.

In order to avoid double counting of emission reductions, a contractual agreement between the collectors of scrap tires, the recycling facility and the processing facility shall indicate that only one of them will claim emission reductions;
 - (g) Emission reductions can only be claimed for the difference between: (a) The upstream emissions for the production of secondary materials from virgin raw materials and for production of the fuels that are displaced by the project activity;

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

III.BE. Substitution of virgin raw materials and fuels by secondary materials recovered from scrap tires (cont)

- and (b) The production of the equivalent secondary materials from recycled scrap tires;
- (h) Project proponents shall demonstrate that the properties of the secondary materials produced from recycled scrap tires are the same as those of the products from virgin raw materials that are displaced. Project proponents shall provide documentation (e.g. chemical composition test results or quality certificates) proving that the properties are comparable according to standard testing methods for each material;
- (i) Project proponents shall also demonstrate *ex ante*, using official government data, third party independent surveys and research, academic research/papers, independent market research that the baseline recycling rate of scrap tires (including formal and informal sector)¹ is equal to or smaller than 20% of the total amount of scrap tires that could be potentially recycled in the region/country. In case multiple studies are available showing different pictures/facts/results (including governmental and non-governmental sources), the most conservative shall be used. If the above condition is not met, the project activity is not eligible;
- (j) This methodology is not applicable in cases where recycling of scrap tires is required by local regulations and the existing mandatory policy/regulation has a high level of enforcement.
5. Measures are limited to those that result in aggregate emission reductions of less than or equal to 60 kt CO₂ equivalent annually.

Boundary

6. The project boundary is the physical geographical sites of:
- (a) Collection sites of scrap tires;
- (b) The processing/recycling facility(ies);
- (c) The production chain of secondary raw materials and fuels displaced, including mining facilities and refining plants.²

¹ The data shall include the total in-country generated amount of scrap tires that would be recycled by both formal and informal sector, including the amount that would be exported to be recycled abroad.

² Virgin material production is formally included in the project boundary, even though it is not necessary to identify the production sites, because the emission reductions are based on the assumption that virgin material production is displaced because of the project activity.

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

III.BE. Substitution of virgin raw materials and fuels by secondary materials recovered from scrap tires (cont)

Baseline

7. Baseline emissions include emissions associated with the production of secondary raw materials and fuels from virgin raw materials. Only the baseline emissions which would take place in non-Annex I countries shall be credited. Therefore the baseline emissions calculated for the total amount of recycled materials obtained in the project activity are either accounted only for the host country production, or discounted by a correction factor "B_i", calculated as the ratio of the production of the material "i" in non-Annex I countries and the total production of this material in the world. See Table 1 below. These correction factors shall be updated at each renewal of the crediting period, and project participants shall use the values from the latest version of the methodology at renewal of the crediting period.

Table 1: Baseline correction factor for production of secondary raw materials and alternative fuels from virgin materials

Secondary raw materials and alternative fuels	B _i correction factor based on the share of the production in non-Annex I countries
Bitumen and SBS	[To be determined]
EPDM/TPE	[To be determined]
Scrap iron	[To be determined]
Fossil fuels	[To be determined]

8. Baseline emissions for the production of secondary raw material and fuel *i* from virgin inputs are calculated using equation (1) or (2)

Approach 1: based on global specific CO₂e emission factor

$$BE_y = \sum_i [Q_{i,y} * B_i * L_i * SE_i] \quad (1)$$

Where:

BE_y	Baseline emissions in year <i>y</i> from recycling scrap tires (tCO ₂ e)
<i>i</i>	Indices for secondary raw material or alternative fuel type <i>i</i>
$Q_{i,y}$	Quantity of secondary raw material or alternative fuel type <i>i</i> processed/recycled and sent to manufacturing facilities in year <i>y</i> (in units of mass, volume, or calorific value, according to the final application)
B_i	B_i correction factor based on the share of the production in non-Annex I countries

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

III.BE. Substitution of virgin raw materials and fuels by secondary materials recovered from scrap tires (cont)

- L_i Net to gross adjustment factor to cover degradation in material quality and material loss in the processing of the sorted material
- SE_i Specific CO₂e emission factor for production of secondary raw material or fuel i , measured in tCO₂e/unit of mass, volume or calorific value. Take values specified in paragraph below

9. Baseline emissions for the production of secondary raw material and fuel from virgin inputs are calculated making the following conservative assumptions. These values shall be updated at each renewal of the crediting period, and project participants shall use the values from the latest version of the methodology at renewal of the crediting period.

Table 2: Specific CO₂e emission factor for production of secondary raw material and alternative fuel

Secondary raw materials and alternative fuels	Specific CO ₂ e emission factor for production of secondary raw material and alternative fuel (tCO ₂ e/unit of output)
Bitumen and SBS	[To be determined]
EPDM/TPE	[To be determined]
Scrap iron	[To be determined (Refer to AMS-III.BA “Recovery and recycling of materials from E-waste”)]
Fossil fuels	[To be determined (Refer to on the daft tool "Upstream leakage emissions associated with fossil fuel use”)]

Approach 2: based on specific electricity/fuel consumption factor

$$BE_y = \sum_i [Q_{i,y} * B_i * L_i * (SEC_{Bl,i} * EF_{el,y} + SFC_{Bl,i} * EF_{FF,CO2})] \tag{2}$$

Where:

- $SEC_{Bl,i}$ Specific electricity consumption for the production of secondary raw material and alternative fuel type i made from virgin material (MWh/unit of mass, volume or calorific value), take value specified in the paragraph below
- $EF_{el,y}$ Emission factor for grid electricity (tCO₂/MWh), determined in accordance with the provisions in AMS-I.D “Grid connected renewable electricity generation”
- $SFC_{Bl,i}$ Specific fuel consumption for the production of secondary raw material and alternative fuel type i made from virgin material (GJ/unit of mass, volume or calorific value), take value as specified in paragraph below
- $EF_{FF,CO2}$ CO₂ emission factor for fossil fuel (tCO₂e/GJ)

10. Baseline emissions associated with energy consumption for the production of secondary raw material and alternative fuel are calculated using the following specific electricity/fuel consumption factors.

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

III.BE. Substitution of virgin raw materials and fuels by secondary materials recovered from scrap tires (cont)

Table 3: Specific electricity/fuel consumption for production of secondary raw material and alternative fuel

Secondary raw materials and alternative fuels	Default specific electricity consumption factor (MWh/unit of output)	Default specific electricity consumption factor (GJ/unit of output)
Bitumen and SBS	[To be determined]	[To be determined]
EPDM/TPE	[To be determined]	[To be determined]
Scrap iron	[To be determined]	[To be determined]
Fossil fuels	[To be determined]	[To be determined]

Leakage

11. No leakage due to project activities is expected, therefore no calculation is required.

Project activity emissions

12. Project emissions from processing of scrap tires in the processing/recycling facility are calculated using equation (3).

$$PE_y = \sum_i [EC_{i,y} * EF_{el,y} + FC_{i,y} * NCV_{ff,y} * EF_{ff,CO2,y}] \quad (3)$$

Where:

PE_y	Project emissions from processing/recycling of scrap tires in year y (tCO ₂ e)
$EC_{i,y}$	Total electricity consumption of the processing/recycling facility in year y (MWh)
$FC_{i,y}$	Total fossil fuel consumption of the processing/recycling facility in year y (unit of mass or volume)
$NCV_{ff,y}$	Net caloric value of the fossil fuel consumed in the processing/recycling facility in year y (GJ/unit of mass or volume)
$EF_{ff,CO2,y}$	CO ₂ emission factor of the fossil fuel consumed in the processing/recycling plant in year y (tCO ₂ e/GJ)

13. If $EC_{i,y}$ is purchased from the grid, average annual technical grid losses (transmission and distribution) during year y for the grid serving the facilities shall be considered as per requirements in AMS-II.C “Demand-side energy efficiency activities for specific technologies”.

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

III.BE. Substitution of virgin raw materials and fuels by secondary materials recovered from scrap tires (cont)

Monitoring

14. The emission reductions achieved by the project activity shall be determined as the difference between the baseline emissions and the project emissions and leakage using equation (9).

$$ER_y = BE_y - PE_y - LE_y \quad (4)$$

Where:

ER_y Emission reductions in year y (tCO₂e)

LE_y Leakage emissions in year y (tCO₂e)

15. The following parameters shall be monitored and recorded during the crediting period as indicated in Table 4. The applicable requirements specified in the “General Guidelines for SSC CDM methodologies” are also an integral part of the monitoring guidelines specified below and therefore shall be referred by the project participants.

Table 4: Parameters for monitoring during the crediting period

No	Parameter	Description	Unit	Monitoring / recording frequency	Measurements methods and procedures
1	$Q_{i,y}$	Quantity of material i processed/recycled and sent to manufacturing facilities in year y ($i=1,2,3,4$, for #, #, #, #)	Metric tons	Each time the sorted/processed material leaves the processing/recycling facility	Direct weighing and recording of the weight, cross check with company records e.g. invoices
2	EC_y	Electricity consumption at the processing/recycling facility in year y	MWh	Continuous	Metering with calibrated equipment
3	FC_y	Fossil fuel consumption at the processing/recycling facility in year y	Unit of mass or volume	Continuous	Weight or volume & density and calorific value
4		Evidence that the materials recycled under the project activity are recovered only from end-of-life scrap tires			As per applicability condition, e.g. the PDD shall describe the collecting area and identifiable sources of the scrap tires

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

III.BE. Substitution of virgin raw materials and fuels by secondary materials recovered from scrap tires (cont)

No	Parameter	Description	Unit	Monitoring / recording frequency	Measurements methods and procedures
5		Evidence that the selling price of recycled material produced from scrap tires is close to [within x % of] the price of replaced secondary material produced from virgin materials			As per the applicability condition
6		The sales of the recycled materials/alternative fuels to manufacturing facilities. Confirmation from those manufacturing facilities purchasing rubber products from the processing/recycling facility specifying the final products in which these secondary materials will be used			As per the applicability condition

Project activity under a programme of activities

16. The methodology is applicable to a programme of activities, no additional leakage estimations are necessary other than that indicated under leakage section above.

History of the document

Version	Date	Nature of revision
01.0	20 July 2012	EB 68, Annex # To be considered at EB 68.
Decision Class: Regulatory Document Type: Standard Business Function: Methodology		