



1 **Draft revision** to the approved consolidated methodology ACM0001

2 **“Flaring or use of landfill gas”**

3 **I. SOURCE, DEFINITIONS AND APPLICABILITY**

4 **Sources**

5 This consolidated baseline and monitoring methodology is based on elements from the following  
6 approved baseline and monitoring methodologies:

- 7 • AM0002: Greenhouse Gas Emission Reductions through Landfill Gas Capture and Flaring where  
8 the Baseline is established by a Public Concession Contract (approved based on proposal  
9 NM0004-rev: Salvador da Bahia LFG project, whose project design document and baseline study,  
10 monitoring and verification plans were developed by ICF Consulting (version 03, June 2003);
- 11 • AM0003: Simplified financial analysis for LFG capture projects (approved based on proposal  
12 NM0005: Nova Gerar LFG to energy project, whose project design document and baseline study,  
13 monitoring and verification plans were developed by EcoSecurities Ltd. (version 14, July 2003)  
14 for the Carbon Finance Unit of the World Bank);
- 15 • AM0010: Landfill gas capture and electricity generation projects where LFG capture is not  
16 mandated by law (approved based on proposal NM0010-rev: Durban-landfill-gas-to-electricity  
17 project, whose project design document and baseline study, monitoring and verification plans  
18 were developed by Prototype Carbon Fund of the World Bank (April 2003);
- 19 • AM0011: Landfill gas recovery with electricity generation and no capture or destruction of  
20 methane in the baseline scenario (approved based on proposal NM0021: Cerupt methodology for  
21 LFG recovery, whose project design document and baseline study, monitoring and verification  
22 plans were developed by Onyx (July 2003).

23 The methodology also refers to the latest approved version of the following methodological tools:

- 24 • “Tool to determine project emissions from flaring gases containing methane”;
- 25 • “Tool to calculate baseline, project and/or leakage emissions from electricity consumption”;
- 26 • “Tool to calculate project or leakage CO<sub>2</sub> emissions from fossil fuel combustion”;
- 27 • “Combined tool to identify the baseline scenario and demonstrate additionality”;
- 28 • “Emissions from solid waste disposal sites”;
- 29 • “Tool to determine the remaining lifetime of equipment”;
- 30 • “Tool to determine the baseline efficiency of thermal or electric energy generation systems”;
- 31 • “Tool to determine the mass flow of a greenhouse gas in a gaseous stream”.

32 For more information regarding the approved methodologies and the tools as well as their consideration  
33 by the Executive Board please refer to <<http://cdm.unfccc.int/goto/MPappmeth>>.



34 **Selected approach from paragraph 48 of the CDM modalities and procedures**

35 “Existing actual or historical emissions, as applicable”, or

36 “Emissions from a technology that represents an economically attractive course of action, taking into  
37 account barriers to investment.”

38 **Definitions**

39 For the purpose of this methodology the following definitions apply:

40 **Available technology.** A technology which is installed and commercially operated in the host country<sup>1</sup>  
41 and which is also accessible to be implemented in the project situation, taking into account the economic  
42 and technical conditions required to make the technology viable.

43 **Best available technology (BAT).** The available technology that is the least GHG intensive technology  
44 among all the available technologies that can achieve the specified service level. The assessment of carbon  
45 intensity takes into account the available technology’s design, construction, maintenance and method of  
46 operation. In this methodology, the specified level of service relates to the firing of bricks.

47 **Landfill gas (LFG).** The gas generated by decomposition of waste in a SWDS. LFG is mainly composed  
48 of methane and carbon dioxide.

49 **Normal Temperature and Pressure (NTP).** Air at 20°C (293.15 K, 68°F) and 1 atm (101.325 kN/m<sup>2</sup>,  
50 14.7 psia, 0 psig, 29.92 in Hg, 760 torr) corresponding to a density of 1.204 kg/m<sup>3</sup> (0.075 pounds per  
51 cubic foot).

52 **Solid waste.** Material that is unwanted and insoluble (including gases or liquids in cans or containers).  
53 Hazardous waste is not included in the definition of solid waste.

54 **Solid waste disposal site (SWDS).** Designated areas intended as the final storage place for solid waste.  
55

56 **Applicability**

57 This methodology is applicable to project activities which install a new LFG capture system in a new or  
58 existing SWDS, or make an investment to increase the recovery rate at an existing LFG capture system.

59 In the project activity, the captured LFG is used in any combination of the following ways:

- 60 • Flared; and/or
- 61 • Used to generate electricity; and/or
- 62 • Used to produce thermal energy in a boiler, air heater or kiln (brick firing only);<sup>2</sup> and/or
- 63 • Supplied to consumers through a natural gas distribution network.

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<sup>1</sup> If relevant data on available technologies in the host country is not available, then data from the region of the host country or the international level can be used for the assessment.

<sup>2</sup> For claiming emission reductions for other thermal energy equipment (including other products in kilns), project participants may submit a revision to this methodology.



64 This methodology cannot be used in combination with other approved methodologies. For instance,  
65 ACM0001 cannot be used to claim emission reductions for the displacement of fossil fuels in a kiln,  
66 where the purpose of the CDM project activity is to implement energy efficiency measures at the kiln.

67 This methodology is not applicable if the management of the SWDS in the project activity is deliberately  
68 changed, compared to the situation prior to the implementation of the project activity, to increase methane  
69 generation. For example, this applies to the addition of liquids to a SWDS or the pre-treating waste to  
70 seed it with bacteria for the purpose of increasing the anaerobic degradation environment of the SWDS.

71 In the case that a LFG collection system was already installed prior to the implementation of the project  
72 activity, the methodology is only applicable if:

- 73 (a) Historical data on the amount of LFG collected and flared is available; and
- 74 (b) The collected LFG was only vented or flared and not used.

75 Furthermore, the methodology is only applicable if the implementation of the project activity does not  
76 reduce the amount of organic waste that would be recycled in the absence of the project activity.

77 If during the project activity the project participant wishes to change the use of the captured LFG, for  
78 instance from flaring to energy generation, then the latest version of the “Procedures for notifying and  
79 requesting approval of changes from the project activity as described in the registered Project Design  
80 Document” must be applied.

81 The applicability conditions included in the tools referred to above also apply.

82 Finally, this methodology is only applicable if the application of the procedure to identify the baseline  
83 scenario confirms that the most plausible baseline scenario is partial or total release of the LFG from the  
84 SWDS and, in the case that the LFG is used

- 85 (a) For electricity generation: that electricity would be generated in the grid or in captive fossil fuel  
86 fired power plants; and/or
- 87 (b) For thermal power generation: that thermal power would be generated using fossil fuels in on-site  
88 equipment.

## 89 II. BASELINE METHODOLOGY

### 90 Project Boundary

91 The project boundary of the project activity shall include the site where the LFG is captured and, as  
92 applicable:

- 93 • Sites where the LFG is flared or used (e.g. flare, power plant, boiler, air heater, kiln or natural gas  
94 distribution network);
- 95 • Captive power plant(s) or power generation sources connected to the grid, which are supplying  
96 electricity to the project activity; and
- 97 • Captive power plant(s) or power generation sources connected to the grid, which are supplying  
98 electricity in the baseline that is displaced by electricity generated by captured LFG in the project  
99 activity.



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**Table 1: Summary of greenhouse gases and sources included in and excluded from the project boundary**

	Source	Gas	Included?	Justification / Explanation
<b>Baseline</b>	Emissions from decomposition of waste at the SWDS site	CH <sub>4</sub>	Yes	The major source of emissions in the baseline
		N <sub>2</sub> O	No	N <sub>2</sub> O emissions are small compared to CH <sub>4</sub> emissions from SWDS. This is conservative.
		CO <sub>2</sub>	No	CO <sub>2</sub> emissions from decomposition of organic waste are not accounted since the CO <sub>2</sub> is also released under the project activity
	Emissions from electricity generation	CO <sub>2</sub>	Yes	Major emission source if power generation is included in the project activity
		CH <sub>4</sub>	No	Excluded for simplification. This is conservative.
		N <sub>2</sub> O	No	Excluded for simplification. This is conservative.
	Emissions from thermal energy generation	CO <sub>2</sub>	Yes	Major emission source if thermal energy generation is included in the project activity
		CH <sub>4</sub>	No	Excluded for simplification. This is conservative.
		N <sub>2</sub> O	No	Excluded for simplification. This is conservative.
	Emissions from the use of natural gas	CO <sub>2</sub>	Yes	Excluded for simplification. This is conservative
		CH <sub>4</sub>	No	Major emission source if supply of LFG through a natural gas distribution network is included in the project activity
		N <sub>2</sub> O	No	Excluded for simplification. This is conservative.
<b>Project Activity</b>	Emissions from fossil fuel consumption for purposes other than electricity generation or transportation due to the project activity	CO <sub>2</sub>	Yes	May be an important emission source
		CH <sub>4</sub>	No	Excluded for simplification. This emission source is assumed to be very small.
		N <sub>2</sub> O	No	Excluded for simplification. This emission source is assumed to be very small.
	Emissions from electricity consumption due to the project activity	CO <sub>2</sub>	Yes	May be an important emission source
		CH <sub>4</sub>	No	Excluded for simplification. This emission source is assumed to be very small.
		N <sub>2</sub> O	No	Excluded for simplification. This emission source is assumed to be very small.



103 **Procedure for estimating the end of the remaining lifetime of existing equipment**

104 This procedure applies if LFG is used in equipment that was in operation prior to the implementation of  
105 the project activity (e.g. in an existing power plant or boiler).

106 For each item of equipment which was in operation prior to the implementation of the project activity and  
107 in which the captured LFG is used after the implementation of the project activity<sup>3</sup>, project participants  
108 shall estimate its remaining lifetime by applying the latest version of the “Tool to determine the remaining  
109 lifetime of equipment”. These items of equipment and their remaining lifetime shall be recorded in the  
110 CDM-PDD.

111 At the end of the remaining lifetime of each item of equipment, the procedure for the selection of the most  
112 plausible baseline scenario related to electricity generation and/or thermal energy production shall be  
113 updated in order to determine the most plausible baseline fuel that would be used after installation of the  
114 new equipment in the absence of the CDM project activity. At this same time, the parameters related to  
115 this item of equipment shall also be updated according to the procedures in this methodology.

116 **Procedure for the selection of the most plausible baseline scenario and demonstrate additionality**

117 The latest version of the “Combined tool to identify the baseline scenario and demonstrate additionality”  
118 shall be applied to identify the baseline scenario and demonstrate additionality.

119 ***Step 1: Identification of alternative scenarios***

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121 In applying Step 1 of the tool, baseline alternatives should take into consideration the possible flaring or  
122 the use of the LFG to produce electricity and/or heat.

123 Alternatives for the destruction of LFG in the absence of the project activity , i.e. the scenario relevant for  
124 estimating baseline methane emissions, shall include, *inter alia*:

- 125 • The project activity (i.e. capture and flaring or use of LFG ) implemented without being registered  
126 as a CDM project activity;
- 127 • Atmospheric release of the LFG or partial capture of LFG and destruction to comply with  
128 regulations or contractual requirements, or to address safety and odour concerns;
- 129 • The LFG is partially not generated, as the organic fraction of the solid waste is not disposed in the  
130 SWDS but it is recycled.

131 In addition to the alternative baseline scenarios identified for the destruction of LFG, project participants  
132 should also identify alternative scenarios for the use of LFG.

133 For electricity generation, alternative(s) may include, *inter alia*:

- 134 • Electricity generation from LFG undertaken without being registered as CDM project activity;
- 135 • Electricity generation in existing or new on-site or off-site fossil fuel fired cogeneration plant(s);
- 136 • Electricity generation in existing or new on-site or off-site renewable based cogeneration plant(s);

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<sup>3</sup> Depending on the project activity, relevant items of equipment may include power plants, boilers, air heaters or kilns.



- 137       • Electricity generation in existing or new on-site or off-site fossil fuel fired captive power plant(s);
- 138       • Electricity generation in existing or new on-site or off-site renewable based captive power
- 139       plant(s);
- 140       • Electricity generation in existing and/or new grid-connected power plants.
- 141 For thermal energy generation, alternative(s) may include, *inter alia*:
- 142       • Heat generation from LFG undertaken without being registered as CDM project activity;
- 143       • Heat generation in existing or new on-site or off-site fossil fuel fired cogeneration plant(s);
- 144       • Heat generation in existing or new on-site or off-site renewable based cogeneration plant(s);
- 145       • Heat generation in existing or new on-site or off-site fossil fuel based boiler(s), air heater(s) or
- 146       kiln(s);
- 147       • Heat generation in existing or new on-site or off-site renewable energy based boiler(s), air
- 148       heater(s) or kiln(s);
- 149       • Any other source, such as district heat; and
- 150       • Other heat generation technologies (e.g. heat pumps or solar energy).
- 151 For the supply of LFG to a natural gas distribution network, the baseline is assumed to be the supply with
- 152 natural gas.
- 153 *Identification of the fuel for the baseline choice of energy source taking into account the national and/or sectoral*
- 154 *policies as applicable*
- 155 Project participants shall demonstrate that the identified baseline fuel used for generation of electric and/or
- 156 thermal energy is available in abundance in the host country and there is no supply constraint. In case of
- 157 partial supply constraints (seasonal supply), the project participants shall consider for the period of partial
- 158 supply among potential alternative fuel(s) the one that results in the lowest baseline emissions.
- 159 As a conservative approach, the lowest carbon intensive fuel, such as natural gas, may be used through out
- 160 all period of the year. Detailed justifications shall be provided and documented in the CDM-PDD for the
- 161 selected baseline fuel.
- 162 **Baseline emissions**
- 163 Baseline emissions are determined according to equation 1 and comprise the following sources:
- 164 (A) Methane emissions from the SWDS in the absence of the project activity;
- 165 (B) Electricity produced using fossil fuels in the absence of the project activity;
- 166 (C) Thermal energy produced using fossil fuels in the absence of the project activity, and
- 167 (D) Natural gas used from the natural gas network in the absence of the project activity.



$$168 \quad BE_y = BE_{CH_4,y} + BE_{EC,y} + BE_{TH,y} + BE_{NG,y} \quad (1)$$

169 Where:

- $BE_y$  = Baseline emissions in year  $y$  (t CO<sub>2</sub>e / yr)  
 $BE_{CH_4,y}$  = Baseline emissions of methane from the SWDS in year  $y$  (t CO<sub>2</sub>e / yr)  
 $BE_{EC,y}$  = Baseline emissions associated with electricity generation in year  $y$  (t CO<sub>2</sub>e / yr)  
 $BE_{TH,y}$  = Baseline emissions associated with thermal energy production in year  $y$  (t CO<sub>2</sub>e / yr)  
 $BE_{NG,y}$  = Baseline emissions associated with natural gas use in year  $y$  (t CO<sub>2</sub>e / yr)

170 **Step (A): Baseline emissions of methane from the SWDS ( $BE_{CH_4,y}$ )**

171 Baseline emissions of methane from the SWDS are determined based on the amount of methane that is  
 172 captured and flared or used under the project activity and the amount that would also be captured and  
 173 flared or used in the baseline (e.g. due to regulations). In addition, two different methane oxidation effects  
 174 are taken into account:

- 175 (a) In the absence of the project, a fraction of the LFG would oxidize in the top layer of the landfill.  
 176 Under the project activity, this effect is reduced as the LFG is collected through a system of  
 177 pipes. This effect is also considered in the methodological tool “Emissions from solid waste  
 178 disposal sites”;
- 179 (b) The installation of a LFG collection system under the project activity may suction additional air  
 180 into the SWDS. This air can decrease the amount of methane that is generated compared to the  
 181 situation in the baseline.

182 **Note:** *The Meth Panel invites stakeholders in particular to provide in their submission information on*  
 183 *the magnitude of these two effects.*

184 Baseline emissions are calculated as follows:

$$185 \quad BE_{CH_4,y} = \left( (1 - OX_{top\_layer} + MR_{air}) F_{CH_4,used,y} - F_{CH_4,BL,y} \right) GWP_{CH_4} \quad (2)$$

186 Where:

- $BE_{CH_4,y}$  = Baseline emissions of LFG from the SWDS in year  $y$  (t CO<sub>2</sub>e / yr)  
 $OX_{top\_layer}$  = Fraction of methane in the LFG that would be oxidized in the top layer of the SWDS  
 in the baseline (dimensionless)  
 $MR_{air}$  = Reduction in methane generation due to additional air suctioned into the SWDS  
 under the project activity (dimensionless)  
 $F_{CH_4,used,y}$  = Amount of methane in the LFG which is flared and/or used in the project activity in  
 year  $y$  (t CH<sub>4</sub> / yr)  
 $F_{CH_4,BL,y}$  = Amount of methane in the LFG that would be flared and/or used in the baseline in  
 year  $y$  (t CH<sub>4</sub> / yr)  
 $GWP_{CH_4}$  = Global warming potential of CH<sub>4</sub> (t CO<sub>2</sub>e / t CH<sub>4</sub>)

187 **Step A.1: Ex-post Determination of  $F_{CH_4,used,y}$**

188 During the crediting period,  $F_{CH_4,used,y}$  is determined by metering the quantity of captured methane that is  
 189 actually flared and/or used under the project activity. It is determined as the sum of the quantities of



190 methane destroyed in the flare(s) and used in power plant(s), boiler(s), air heater(s), kiln(s) and supplied to  
191 the natural gas distribution network, as follows:

$$192 \quad F_{CH_4,used,y} = F_{CH_4,flared,y} + F_{CH_4,EL,y} + F_{CH_4,TH,y} + F_{CH_4,NG,y} \quad (3)$$

193 Where:

- $F_{CH_4,used,y}$  = Amount of methane in the LFG which is flared and/or used in the project activity in year  $y$  (t CH<sub>4</sub> / yr)  
 $F_{CH_4,flared,y}$  = Amount of methane in the LFG which is destroyed by flaring in year  $y$  (t CH<sub>4</sub> / yr)  
 $F_{CH_4,EL,y}$  = Amount of methane in the LFG which is used for generation of electricity in year  $y$  (t CH<sub>4</sub> / yr)  
 $F_{CH_4,TH,y}$  = Amount of methane in the LFG which is used for generation of thermal energy in year  $y$  (t CH<sub>4</sub> / yr)  
 $F_{CH_4,NG,y}$  = Amount of methane in the LFG which is sent to the natural gas distribution network in year  $y$  (t CH<sub>4</sub> / yr)

194 The working hours of the power plant(s), boiler(s), air heater(s) and kiln(s) should be monitored and no  
195 emission reduction should be claimed for methane destruction during non-working hours.

196  $F_{CH_4,EL,y}$ ,  $F_{CH_4,TH,y}$  and  $F_{CH_4,NG,y}$  are determined directly using the latest version of the “Tool to determine  
197 the mass flow of a greenhouse gas in a gaseous stream”.

198 *Amount of methane destroyed by flaring ( $F_{CH_4,flared,y}$ )*

199  $F_{CH_4,flared,y}$  is determined as the difference between the amount of methane supplied to the flare and any  
200 methane emissions from the flare, as follows:

$$201 \quad F_{CH_4,flared,y} = F_{CH_4,sent\_flare,y} - \frac{PE_{flare,y}}{GWP_{CH_4}} \quad (4)$$

202 Where:

- $F_{CH_4,flared,y}$  = Amount of methane in the LFG which is destroyed by flaring in year  $y$  (t CH<sub>4</sub> / yr)  
 $F_{CH_4,sent\_flare,y}$  = Amount of methane in the LFG which is sent to the flare in year  $y$  (t CH<sub>4</sub> / yr)  
 $PE_{flare,y}$  = Project emissions from flaring of the residual gas stream in year  $y$  (t CO<sub>2</sub>e / yr)  
 $GWP_{CH_4}$  = Global warming potential of CH<sub>4</sub> (t CO<sub>2</sub>e / t CH<sub>4</sub>)

203  $F_{CH_4,sent\_flare,y}$  is determined directly using the “Tool to determine the mass flow of a greenhouse gas in a  
204 gaseous stream”.

205  $PE_{flare,y}$  shall be determined using the “Tool to determine project emissions from flaring gases containing  
206 methane”. If LFG is flared through more than one flare, then  $PE_{flare,y}$  is the sum of the emissions for each  
207 flare determined separately.

208 **Step A.2: Ex ante estimation of  $F_{CH_4,used,y}$**

209 An *ex-ante* estimate of the amount of methane in the LFG which is flared and/or used by the project  
210 activity in year  $y$  ( $F_{CH_4,used,y}$ ) is required to estimate the emission reductions of the proposed project activity  
211 in the CDM-PDD. It is determined as follows:





$$212 \quad F_{\text{CH}_4, \text{used}, y} = \eta_{\text{PJ}} \cdot \text{BE}_{\text{CH}_4, \text{SWDS}, y} / \text{GWP}_{\text{CH}_4} \quad (5)$$

213 Where:

$F_{\text{CH}_4, \text{used}, y}$  = Amount of methane in the LFG which is flared and/or used in the project activity in year  $y$  (t CH<sub>4</sub> / yr)

$\text{BE}_{\text{CH}_4, \text{SWDS}, y}$  = Amount of methane in the LFG that is generated from the SWDS in the baseline scenario in year  $y$  (t CO<sub>2e</sub> / yr)

$\eta_{\text{PJ}}$  = The efficiency of the capturing system that will be installed in the project activity

$\text{GWP}_{\text{CH}_4}$  = Global warming potential of CH<sub>4</sub> (t CO<sub>2e</sub> / t CH<sub>4</sub>)

214  $\text{BE}_{\text{CH}_4, \text{SWDS}, y}$  is determined using the latest version of the methodological tool “Emissions from solid waste  
215 disposal sites”. The tool estimates methane generation, using adjustment factor ( $f$ ) to account for LFG in  
216 the baseline that would have been captured and destroyed to comply with relevant regulations or  
217 contractual requirements, or to address safety and odour concerns.

218 The following guidance should be taken into account when applying the tool:

- 219 •  $f$  in the tool shall be assigned a value of 0.
- 220 • In the tool,  $x$  begins with the year that the SWDS started receiving wastes (e.g. the first year of  
221 SWDS operation); and
- 222 • Sampling to determine the fractions of different waste types is not necessary because the waste  
223 composition can be obtained from previous studies.

#### 224 ***Step A.3: Determination of $F_{\text{CH}_4, \text{BL}, y}$***

225 This step provides a procedure to determine the amount of methane that would have been flared and/or  
226 used in the baseline due to regulatory and/or contractual requirements, or to address safety and odour  
227 concerns. The following cases must be considered:

#### 228 **Case A: No contractual or regulatory requirements and no existing LFG collection system**

229 In the situation that:

- 230 (a) No regulations or contractual requirements to collect LFG are in place at the start of the project  
231 activity; and
- 232 (b) No system to collect LFG was installed or operated prior to the implementation of the project  
233 activity.

$$234 \quad F_{\text{CH}_4, \text{BL}, y} = 0 \quad (6)$$

#### 235 **Case B: Contractual or regulatory requirements exist and no existing LFG collection system**

236 In the situation that:

- 237 (a) Regulations or contractual requirements to collect LFG are in place at the start of the project  
238 activity; and
- 239 (b) No system to collect LFG was installed or operated prior to the implementation of the project  
240 activity.



241  $F_{CH_4,BL,y} = F_{CH_4,BL,R,y}$  (7)

242  $F_{CH_4,BL,R,y}$  is determined as follows:

- 243 • If contract or regulation requirements specify the amount of methane that must be flared and/or used,  
244 then that amount shall be used as  $F_{CH_4,BL,R,y}$ .
- 245 • If contract or regulation requirements specify a percentage of the LFG that is required to be flared, the  
246 amount shall be calculated as follows:

247  $F_{CH_4,BL,R,y} = \eta_{reg} \cdot F_{CH_4,used,y}$  (8)

248 Where:

$\eta_{reg}$  = Percentage of LFG that is required to be flared due to contract or regulation requirements

- 249 • If contract or regulation requirements do not specify any amount or percentage of LFG that should be  
250 destroyed but require the installation of a capture system, without requiring to flare or use the LFG,  
251 then:

252  $F_{CH_4,BL,R,y} = 0$  (9)

- 253 • If contract or regulation requirements do not specify any amount or percentage of LFG that should be  
254 destroyed but require the installation of a system to collect and flare the LFG, then a typical destruction  
255 rate of 20% is assumed:

256  $F_{CH_4,BL,R,y} = 20\% \cdot F_{CH_4,used,y}$  (10)

257 **Case C: An existing LFG collection system and no contractual and regulatory requirements**

258 In the situation that

- 259 (a) Regulations or contractual requirements to collect LFG are not in place at the start of the project  
260 activity; and
- 261 (b) A system to collect LFG was installed or operated prior to the implementation of the project  
262 activity.

263  $F_{CH_4,BL,y} = F_{CH_4,hist,y}$  (11)

264  $F_{CH_4,hist}$  is determined as follows:

265 If measurements of the amount of methane that was flared and/or used are available, then these  
266 measurements shall be used to estimate  $F_{CH_4,BL,y}$ . In determining  $F_{CH_4,BL,y}$  it is assumed that the fraction of  
267 LFG that was recovered in the year prior to the implementation of the project activity will also recovered  
268 under the project activity:

269  $F_{CH_4,hist,y} = \frac{F_{CH_4,BL,x-1}}{F_{CH_4,x-1}} \cdot F_{CH_4,used,y}$  (12)



270 Where:

- $F_{CH_4,hist,y}$  = Historical amount of methane in the LFG which is collected and destroyed  
 $F_{CH_4,BL,x-1}$  = Historical amount of methane in the LFG which is captured and destroyed in the year prior to the implementation of the project activity  
 $F_{CH_4,x-1}$  = Amount of methane in the LFG generated in the SWDS in the year prior to the implementation of the project activity

271 **Estimation of  $F_{CH_4,x-1}$**

272  $F_{CH_4,x-1}$  shall be estimated using latest version of the methodological tool “Emissions from solid waste  
 273 disposal sites”. The following guidance should be taken into account when applying the tool:

- 274 • In the tool,  $x$  begins with the year that the SWDS started receiving wastes (e.g. the first year of  
 275 SWDS operation); and
- 276 • Sampling to determine the fractions of different waste types is not necessary because the waste  
 277 composition can be obtained from previous studies.

278 **Case D: Contractual or regulatory requirements and an existing LFG collection system**

279 In the situation that

- 280 (a) Regulations or contractual requirements to collect LFG are in place at the start of the project  
 281 activity; and
- 282 (b) A system to collect LFG was installed or operated prior to the implementation of the project  
 283 activity.

284 Then  $F_{CH_4,BL,y}$  shall be determined based on information in contract of regulation requirements and  
 285 historical data, as follows:

$$286 \quad F_{CH_4,BL,y} = \max \left\{ F_{CH_4,BL,R,y}; F_{CH_4,hist,y} \right\} \quad (13)$$

287 Where:

- $F_{CH_4,BL,R,y}$  = Regulatory requirements relating to LFG  
 $F_{CH_4,hist,y}$  = Historical amount of methane in the LFG collected and destroyed prior the  
 implementation of the project activity

288

289 **Step (B): Electricity produced using fossil fuels in the absence of the project activity ( $BE_{EC,y}$ )**

290 The baseline emissions from consumption of electricity in the absence of the project activity ( $BE_{EC,y}$ ) shall  
 291 be calculated using the “Tool to calculate baseline, project and/or leakage emissions from electricity  
 292 consumption”. When applying the tool:

- 293 • Electricity sources  $k$  in the tool corresponds to the sources of electricity generated identified in the  
 294 selection of the most plausible baseline scenario; and
- 295 •  $EC_{BL,k,y}$  in the tool is equivalent to the net amount of electricity generated using LFG in year  $y$   
 296 ( $EC_{LFG,y}$ ).



297 **Step C: Thermal energy produced using fossil fuels in the absence of the project activity ( $BE_{TH,y}$ )**

298

299 To determine the amount of thermal energy that would be produced in the absence of the project activity  
300 is necessary to have information on the thermal energy generated by boiler heater using LFG as well as  
301 the fuel consumption in the kiln. The fuel consumption is determined as the minimum between the fossil  
302 fuel used in the kiln that is replaced by LFG and the energy requirements of the BAT kiln.

$$303 \quad BE_{TH,y} = fd_{CH_4} \cdot LFG_{HG,y} \cdot NCV_{LFG,y} \cdot EF_{CO_2,BL,HG,y} \cdot \min \left\{ 1; \frac{\eta_{HG,PJ,y}}{\eta_{HG,BL,y}} \right\} \quad (14)$$

304 Where:

$BE_{TH,y}$	=	Baseline emissions associated with thermal energy production in year $y$ (t CO <sub>2</sub> e / yr)
$LFG_{HG,y}$	=	Amount of LFG used for thermal energy generation due to the project activity in year $y$ (Nm <sup>3</sup> / yr)
$EF_{CO_2,BL,HG,y}$	=	CO <sub>2</sub> emission factor of the fossil fuel type used for heat generation by the boiler/air heater or kiln in the baseline in year $y$ (t CO <sub>2</sub> / TJ)
$\eta_{HG,BL,y}$	=	Efficiency of the heat generation equipment used in the baseline in year $y$
$\eta_{HG,PJ,y}$	=	Efficiency of the heat generation equipment used in the project activity in year $y$
$fd_{CH_4}$	=	Fraction of methane destroyed when used for thermal energy production
$NCV_{LFG,y}$	=	LFG net calorific value in year $y$ (TJ/Nm <sup>3</sup> )

305 **Step C.1: Determination of  $\eta_{TH,BL,y}$**

306 To estimate the energy efficiency of a boiler or air heater ( $\eta_{TH,BL,y}$ ) project participants shall apply the  
307 “Tool to determine the baseline efficiency of thermal or electric energy generation systems”

308 **Step (D): Baseline emissions associated with natural gas use ( $BE_{NG,y}$ )**

309  $BE_{NG,y}$  is estimated as follows:

$$310 \quad BE_{NG,y} = LFG_{NG,y} \cdot NCV_{LFG,y} \cdot EF_{CO_2,NG,y} \quad (15)$$

311 Where:

$BE_{NG,y}$	=	Baseline emissions associated with natural gas use in year $y$ (t CO <sub>2</sub> e / yr)
$LFG_{NG,y}$	=	Amount of LFG sent to the natural gas network due to the project activity in year $y$ (Nm <sup>3</sup> / yr)
$NCV_{LFG,y}$	=	Average net calorific value of the LFG captured in year $y$ (TJ / Nm <sup>3</sup> )
$EF_{CO_2,NG,y}$	=	Average CO <sub>2</sub> emission factor of natural gas in the natural gas network in year $y$ (t CO <sub>2</sub> / TJ)

312 **Project emissions**

313 Project emissions are calculated as follows:

$$314 \quad PE_y = PE_{EC,y} + PE_{FC,j,y} \quad (16)$$



315 Where:

- 315  $PE_y$  = Project emissions in year  $y$  (t CO<sub>2</sub>e / yr)
- 316  $PE_{EC,y}$  = Emissions from consumption of electricity due to the project activity in year  $y$  (t CO<sub>2</sub>e / yr)
- 317  $PE_{FC,j,y}$  = Emissions from consumption of fossil fuels due to the project activity, for purpose other than electricity generation, in year  $y$  (t CO<sub>2</sub>e / yr)

316 The project emissions from consumption of electricity by the project activity ( $PE_{EC,y}$ ) shall be calculated  
317 using the “Tool to calculate baseline, project and/or leakage emissions from electricity consumption”.

318 When applying the tool:

- 319 • Electricity sources  $j$  in the tool corresponds to the sources of electricity consumed due to the  
320 project activity. This shall include, where applicable, electricity consumed for the operation of the  
321 SWDS, for any processing and upgrading of the LFG, for transportation of the LFG to the flare or  
322 other applications (boilers, power generators), for the compression of the LFG into the natural gas  
323 network, etc.;
- 324 • If in the baseline a proportion of LFG is captured and flared and/or used ( $FCH_4, BL, y > 0$ ), then  
325 the electricity consumption in the tool ( $ECP_{j,y}$ ) should refer to the net quantity of electricity  
326 consumption (i.e. the increase due to the project activity). The determination of the amount of  
327 electricity consumed in the baseline shall be transparently documented in the CDM-PDD.

328 The project emissions from fossil fuel combustion for purposes other than electricity generation ( $PE_{FC,j,y}$ )  
329 shall be calculated using the “Tool to calculate project or leakage CO<sub>2</sub> emissions from fossil fuel  
330 combustion”. When applying the tool:

- 331 • Processes  $j$  in the tool correspond to the sources of fossil fuel consumption due to the project  
332 activity other than for electricity generation or and any on-site transportation by trucks or cars.
- 333 • If in the baseline a proportion of LFG is captured and flared and/or used ( $FCH_4, BL, y > 0$ ), then  
334 the fossil fuels consumption used in calculation ( $FC_{i,j,y}$ ) should refer to the net of that consumed  
335 in the baseline. A procedure to determine the amount of fossil fuel consumed in the quantity of  
336 fossil fuels consumption (i.e. the increase due to the project activity). The determination of the  
337 amount of fossil fuels consumed in the baseline shall be transparently documented in the CDM-  
338 PDD.

339 **Leakage**

340 No leakage effects need to be accounted under this methodology.

341 **Emission Reduction**

342 Emission reductions are calculated as follows:

343  $ER_y = BE_y - PE_y$  (17)

344 Where:

- 344  $ER_y$  = Emission reductions in year  $y$  (t CO<sub>2</sub>e / yr)
- $BE_y$  = Baseline emissions in year  $y$  (t CO<sub>2</sub>e / yr)
- $PE_y$  = Project emissions in year  $y$  (t CO<sub>2</sub> / yr)



345 Project participants should provide an *ex ante* estimate of emissions reductions in the CDM-PDD. This  
346 requires projecting the future GHG emissions of the SWDS for the calculation of baseline emissions.

347 If the energy component is intended to be implemented after the first year of the project activity, then  
348 project participants may exclude the energy component from the ex-ante estimation of baseline emissions.  
349 This avoids overestimating ex-ante estimate of emissions if energy generation is not implemented, or a  
350 lower capacity is implemented than originally envisaged.

### 351 **Renewal of the crediting period**

352 Project participants must consider all mandatory applicable legal and regulatory requirements at the  
353 beginning of each crediting period and adjust the selection of the most plausible baseline scenario and  
354 determination of  $F_{CH_4, BL, y}$ . If relevant, project participants shall explain how changes to regulation were  
355 converted to the amount of methane that would have been flared and/or used in the absence of the project  
356 activity (determination of  $F_{CH_4, BL, y}$ ).

### 357 **Data and parameters not monitored**

358 In addition to the parameters listed in the tables below, the provisions on data and parameters not  
359 monitored in the tools referred to in this methodology apply.  
360

<b>Data / Parameter:</b>	$OX_{top\ layer}$
Data unit:	Dimensionless
Description:	Fraction of methane that would be oxidized in the top layer of the SWDS in the absence of the project
Source of data:	
Value to be applied:	0.1
Any comment:	In the absence of the project, a fraction of the LFG would oxidize in the top layer of the landfill. Under the project activity, this effect is reduced as the LFG is collected through a system of pipes. This effect is also considered in the methodological tool “Emissions from solid waste disposal sites”

361

<b>Data / Parameter:</b>	$MR_{air}$
Data unit:	Dimensionless
Description:	Reduction in methane generation due to additional air suctioned into the SWDS under the project activity
Source of data:	
Value to be applied:	M%
Any comment:	The installation of a LFG collection system under the project activity may have suctioned additional air into the SWDS. This air can decrease the amount of methane that is generated compared to the situation in the baseline.

362



363

<b>Data/Parameter:</b>	$F_{CH_4,BL,R,y}$
Data unit:	--
Description:	Regulatory requirements relating to LFG
Source of data:	Publicly available information of the host country's regulatory requirements relating to LFG
Value to be applied:	
Any comment:	Used to determine $F_{CH_4,BL,y}$ and in the procedure to select the most plausible baseline scenario. Must be updated at renewal of the crediting period.

364

<b>Data/Parameter:</b>	$F_{CH_4,BL,x-1}$
Data unit:	t CH <sub>4</sub>
Description:	Historical amount of LFG captured and destroyed in the year prior to the implementation of the project activity
Source of data:	Information recorded by the SWDS operator
Value to be applied:	
Any comment:	Used to determine $F_{CH_4,BL,y}$ . Must be updated at renewal of the crediting period.

365

<b>Data/Parameter:</b>	$F_{CH_4,x-1}$
Data unit:	t CH <sub>4</sub>
Description:	Amount of LFG generated in the SWDS in the year prior to the implementation of the project activity
Source of data:	Estimated using the latest version of the methodological tool "Emissions from solid waste disposal sites"
Value to be applied:	
Any comment:	Used to determine $F_{CH_4,BL,y}$ . Must be updated at renewal of the crediting period.

366

<b>Date/Parameter:</b>	$GWP_{CH_4}$
Data unit:	t CO <sub>2</sub> e / t CH <sub>4</sub>
Description:	Global warming potential of CH <sub>4</sub>
Source of data:	IPCC
Value to be applied:	21 for the first commitment period. Shall be updated according to any future COP/MOP decisions
Any comment:	

367

<b>Date/Parameter:</b>	$\eta_{reg}$
Data unit:	%
Description:	Percentage of LFG that is required to be flared due to contract or regulation requirements





368

Source of data:	Publicly available information of the host country's regulatory requirements relating to LFG
Value to be applied:	
Any comment:	

369

<b>Data/Parameter:</b>	$fd_{CH4}$
Data unit:	
Description:	Fraction of methane destroyed when used for thermal energy production
Source of data:	
Measurement procedures (if any):	XX for boilers and air heaters YY for brick kilns
Any comment:	

370

<b>Data/Parameter:</b>	$\eta_{PJ}$
Data unit:	
Description:	The efficiency of the capturing system that will be installed in the project activity
Source of data:	
Measurement procedures (if any):	
Any comment:	

371

<b>Data/Parameter:</b>	$\eta_{HG,BL,y}$
Data unit:	
Description:	Efficiency of the heat generation equipment used in the baseline in year y
Source of data:	Estimate using the "Tool to determine the baseline efficiency of thermal or electric energy generation systems"
Measurement procedures (if any):	
Any comment:	

372

<b>Data/Parameter:</b>	$\eta_{HG,PJ,y}$
Data unit:	
Description:	Efficiency of the heat generation equipment used in the project activity in year y
Source of data:	Manufacturers technical specification
Measurement procedures (if any):	
Any comment:	

373



<b>Data / Parameter:</b>	$EF_{CO_2,BL,HG,y}$
Data unit:	t CO <sub>2</sub> / TJ
Description:	CO <sub>2</sub> emission factor of the fossil fuel type used for heat generation by the boiler/air heater or kiln in the baseline in year y
Source of data:	
Value to be applied:	For the case of kilns. Lower limit of the 95% confidence interval of the default values provided in table 1.4 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories
Any comment:	

374

375 **III. MONITORING METHODOLOGY**

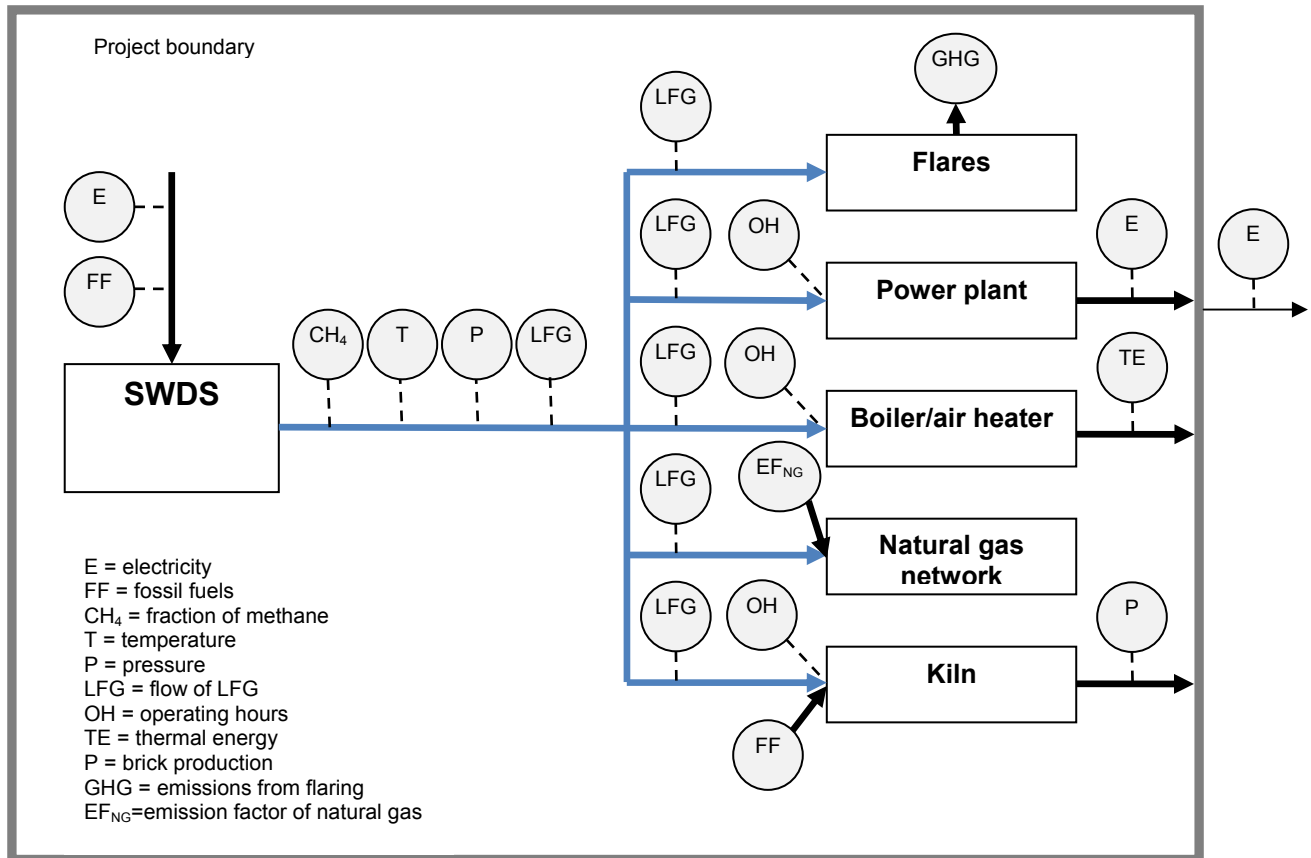
376 The main variables that are determined based on monitored parameters are:

- 377
- Amount of LFG used ( $F_{CH_4,used,y}$ );
  - 378 • Amount of LFG flared ( $F_{CH_4,flared,y}$ );
  - 379 • Amount of LFG used to generate electricity ( $F_{CH_4,EL,y}$ );
  - 380 • Amount of LFG used to produce thermal energy for use in a boiler, air-heater and/or kiln
  - 381 ( $F_{CH_4,TH,y}$ );
  - 382 • Amount of LFG sent to the pipeline to the natural gas distribution network ( $F_{CH_4,NG,y}$ ).

383 To determine these variables, the following parameters shall be monitored (as shown in Figure 1):

- 384
- Energy consumed by the project activity that is produced using fossil fuels;
  - 385 • Operating hours of the energy plant(s) boiler(s), air heater(s) or kilns(s) (as relevant).
- 386

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**Figure 1: Monitoring Plan**

Parameters required in tools referenced in this methodology include.

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- The parameters used for determining the project emissions from flaring of the residual gas stream in year  $y$  should be monitored as per the “Tool to determine project emissions from flaring gases containing methane”;
- The quantities of fossil fuels required to operate the LFG project, including the pumping equipment for the collection system and energy required to transport heat, should be monitored as per the “Tool to calculate project or leakage CO<sub>2</sub> emissions from fossil fuel combustion”. In projects where LFG is captured in the baseline to either meet the regulation or for safety reason, then fossil fuel used in the baseline too shall also be recorded;
- The quantity of electricity imported, in the baseline and the project situation, to meet the requirements of the project activity, if any, as per the “Tool to calculate baseline, project and/or leakage emissions from electricity consumption”.

405 **Data and parameters monitored**

406

<b>Data / Parameter:</b>	$F_{CH_4,EL,y}$
Data unit:	(t CH <sub>4</sub> / yr)
Description:	Amount of methane in the LFG which is used for generation of electricity in year <i>y</i>
Source of data:	Project participants
Measurement procedures (if any):	Determined directly using the latest version of the “Tool to determine the mass flow of a greenhouse gas in a gaseous stream ”
Monitoring frequency:	
QA/QC procedures:	Project participants should ensure that the point where the LFG shall ensure the appropriate location of the measurement equipment to ensure they only measure the LFG coming from the project activity
Any comment:	The working hours of the power plant(s) should be monitored and no emission reduction should be claimed for methane destruction during non-working hours

407

<b>Data / Parameter:</b>	$F_{CH_4,TH,y}$
Data unit:	(t CH <sub>4</sub> / yr)
Description:	Amount of methane in the LFG which is used for generation of thermal energy in year <i>y</i>
Source of data:	Project participants
Measurement procedures (if any):	Determined directly using the latest version of the “Tool to determine the mass flow of a greenhouse gas in a gaseous stream ”
Monitoring frequency:	
QA/QC procedures:	Project participants should ensure that the point where the LFG shall ensure the appropriate m location of the measurement equipment to ensure they only measure the LFG coming from the project activity
Any comment:	The working hours of the boiler(s), air heater(s) and kiln(s) should be monitored and no emission reduction should be claimed for methane destruction during non-working hours

408

<b>Data / Parameter:</b>	$F_{CH_4,NG,y}$
Data unit:	(t CH <sub>4</sub> / yr)
Description:	Amount of methane in the LFG which is sent to the natural gas distribution network in year <i>y</i>
Source of data:	Project participants
Measurement procedures (if any):	Determined directly using the latest version of the “Tool to determine the mass flow of a greenhouse gas in a gaseous stream ”
Monitoring frequency:	
QA/QC procedures:	Project participants should ensure that the point where the LFG shall ensure the appropriate m location of the measurement equipment to ensure they only measure the LFG coming from the project activity
Any comment:	

409



410

<b>Data / Parameter:</b>	$F_{CH_4,send\ flare,y}$
Data unit:	(t CH <sub>4</sub> / yr)
Description:	Amount of methane in the LFG which is sent to the flare in year <i>y</i>
Source of data:	Project participants
Measurement procedures (if any):	Determined directly using the latest version of the “Tool to determine the mass flow of a greenhouse gas in a gaseous stream ”
Monitoring frequency:	
QA/QC procedures:	Project participants should ensure that the point where the LFG shall ensure the appropriate m location of the measurement equipment to ensure they only measure the LFG coming from the project activity
Any comment:	

411

<b>Data / Parameter:</b>	$PE_{flare,y}$
Data unit:	(t CO <sub>2</sub> e / yr)
Description:	Amount of LFG to be flared in year <i>y</i>
Source of data:	Project participants
Measurement procedures (if any):	Determined using the “Tool to determine project emissions from flaring gases containing methane”. If LFG is flared through more than one flare, then $PE_{flare,y}$ is the sum of the emissions for each flare determined separately
Monitoring frequency:	
QA/QC procedures:	
Any comment:	

412

<b>Data / Parameter:</b>	$BE_{CH_4,SWDS,y}$
Data unit:	(t CO <sub>2</sub> e / yr)
Description:	Amount of methane in the LFG that is generated from the SWDS in the baseline scenario in year <i>y</i>
Source of data:	Project participants
Measurement procedures (if any):	Determined using the latest version of the methodological tool “Emissions from solid waste disposal sites”
Monitoring frequency:	
QA/QC procedures:	
Any comment:	

413



<b>Data / Parameter:</b>	$NCV_{LFG,y}$
Data unit:	TJ/Nm <sup>3</sup>
Description:	LFG net calorific value in year <i>y</i>
Source of data:	The source of data shall be the following, in order of preference: 1. project specific data; 2. country specific data; or
Measurement procedures (if any):	
Monitoring frequency:	Annually
QA/QC procedures:	
Any comment:	NCV for the fossil fuel that would have been used in the baseline thermal energy generation. As per guidance from the Board, IPCC default values shall be used only when country or project specific data are not available or difficult to obtain

414

<b>Data / Parameter:</b>	$LFG_{HG,y}$
Data unit:	Nm <sup>3</sup> / yr
Description:	Amount of LFG used for thermal energy generation due to the project activity in year <i>y</i>
Source of data:	Project participants
Measurement procedures (if any):	Measured by a flow meter at NTP for each flare. Data to be aggregated monthly and yearly for each flare.
Monitoring frequency:	Continuous (average value in a time interval not greater than an hour shall be used in the calculations of emission reductions)
QA/QC procedures:	Flow meters shall be subject to a regular maintenance and testing regime to ensure accuracy. Calibration shall be according to manufacturers specifications
Any comment:	

415

<b>Data / Parameter:</b>	$LFG_{NG,y}$
Data unit:	Nm <sup>3</sup> / yr
Description:	Amount of LFG sent to the natural gas network due to the project activity in year <i>y</i>
Source of data:	Project participants
Measurement procedures (if any):	Measured by a flow meter at NTP. Data to be aggregated monthly and yearly
Monitoring frequency:	Continuous (average value in a time interval not greater than an hour shall be used in the calculations of emission reductions)
QA/QC procedures:	Flow meters shall be subject to a regular maintenance and testing regime to ensure accuracy. Calibration shall be according to manufacturers specifications
Any comment:	

416



417

<b>Data / Parameter:</b>	EF <sub>CO<sub>2</sub>,NG,y</sub>
<b>Data unit:</b>	t CO <sub>2</sub> / TJ
<b>Description:</b>	Average CO <sub>2</sub> emission factor of natural gas in the natural gas network in year y
<b>Source of data:</b>	The source of data shall be the following, in order of preference: <ol style="list-style-type: none"> <li>1. project specific data;</li> <li>2. country specific data; or</li> <li>3. IPCC default values.</li> </ol>
<b>Measurement procedures (if any):</b>	Project participants shall use the latest version of the “Tool to calculate project or leakage CO <sub>2</sub> emissions from fossil fuel combustion” to calculate the emission factor using project specific data
<b>Monitoring frequency:</b>	Annually
<b>QA/QC procedures:</b>	
<b>Any comment:</b>	

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422 **IV. REFERENCES AND ANY OTHER INFORMATION**

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424 Not applicable.

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**History of the document**

Version	Date	Nature of revision
12.0.0	EB XX, Annex #	<ul style="list-style-type: none"> <li>• Clarifies that the methodology is applicable to new and existing landfills;</li> <li>• Broadens the applicability by allowing the use of landfill gas in brick kilns and by allowing the claim of certified emission reductions associated with fossil fuel displaced by landfill gas fed into a natural gas network;</li> <li>• Revises the applicability conditions, requiring that: <ul style="list-style-type: none"> <li>○ If an existing landfill gas collection system was in place prior to the implementation of the project activity, then historical information on the amount of landfill gas collected is required and the collected gas should only have been vented or flared but not used; and</li> <li>○ The implementation of the project activity does not reduce the amount of organic waste that would be recycled in the absence of the project activity;</li> </ul> </li> <li>• Incorporates: <ul style="list-style-type: none"> <li>○ The effect of methane oxidation in the top layer of the solid waste disposal site in the baseline scenario; and</li> <li>○ The effect of additional air suctioned into the solid waste disposal site after the implementation of the project activity.</li> </ul> </li> <li>• Refers to relevant tools.</li> </ul> <p>Due to the overall modification of the document, no highlights of the changes are provided.</p>





11	EB 47, Annex 6 28 May 2009	<ul style="list-style-type: none"> <li>Allow only the option of continuous measurement of methane content of the LFG;</li> <li>Include definition of continuous monitoring system.</li> </ul>
10	EB 45, Annex 9 13 February 2009	<ul style="list-style-type: none"> <li>Include guidance for air heater efficiency;</li> <li>Include a clarification that emission reductions can be claimed for generation of thermal energy provided that the LFG displaces use of fossil fuel either in a boiler or in an air heater.</li> </ul>
09.1	EB 43, Annex 2 24 October 2008	Editorial changes to reflect that the source of data for the “Regulatory requirements relating to LFG” has been changed. Publicly available information should be used instead of contacting the DNA for collecting the information.
09	EB 41, Annex 4 02 August 2008	<p>Following clarifications have been added:</p> <ul style="list-style-type: none"> <li>The measurement of both LFG flow and methane fraction in LFG have to be conducted on the same basis (wet or dry);</li> <li>Inclusion of cases where periodical measurements are allowed and guidance on performing periodical measurements for monitoring the fraction of methane in the LFG;</li> <li>The title of the “Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site” changes to “Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site”.</li> </ul>
08.1	EB 39, Paragraph 22 16 May 2008	“Tool to calculate baseline, project and/or leakage emissions from electricity consumption” replaces the withdrawn “Tool to calculate project emissions from electricity consumption”.
08	EB 36, Annex 10 30 November 2007	<ul style="list-style-type: none"> <li>Clarify the procedure to calculate the Adjustment Factor, where in the baseline the LFG was captured and destroyed/used;</li> <li>Clarify how to apply the “Tool to determine methane emissions avoided from the dumping waste at a solid waste disposal site” for estimating ex-ante LFG emissions over the crediting period.</li> </ul>
07	EB 35, Annex 11 19 October 2007	<ul style="list-style-type: none"> <li>To include AM0002, AM0003, AM0010, and AM0011;</li> <li>Reference to the following tools was added: “Tool to calculate project emissions from electricity consumption”, “Tool to calculate project or leakage CO2 emissions from fossil fuel combustion”, and “Combined tool to identify the baseline scenario and demonstrate additionality”.</li> </ul>
06	EB 32, Annex 6 22 June 2007	<ul style="list-style-type: none"> <li>Include procedures for estimating emissions reductions from use of captured LFG for energy generation;</li> <li>Expand the applicability to project activities where the captured LFG is used to supply consumers through a natural gas distribution network.</li> </ul>
05	EB 28, Annex 9 15 December 2006	Replace the procedure for estimating flare efficiency with a reference to the Methodological “Tool to determine project emissions from flaring gases containing methane”.
04	EB 25, Annex 6 21 July 2006	<ul style="list-style-type: none"> <li>Allow the use of one measurement point for LFG captured, if the captured LFG is flared only and not used for energy and/or electricity generation;</li> <li>Provide a default value for methane destruction flare efficiency (50%) should the methane destruction efficiency not be measured.</li> </ul>



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03	EB 24, Annex 6 12 May 2006	<ul style="list-style-type: none"><li>• Reflect that separate monitoring of LFG temperature and pressure is not required if the monitoring equipment used automatically adjusts the volume for these two parameters;</li><li>• Incorporate the procedures of estimating emissions reductions to take into account situations where project activities may not utilize the captured LFG but require use of fossil fuel or purchased electricity in operating the project activity.</li></ul>
02	EB 21, Annex 9 30 September 2005	Guidance on how to estimate the Adjustment Factor (AF) was provided.
01	EB 15, Annex 1 03 September 2004	Initial adoption.

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