CLEAN DEVELOPMENT MECHANISM

CDM-MP62-A07

Draft Large-scale Methodology

AM0014: Fossil fuel based cogeneration for identified recipient facility(ies)

Version 05.0 - Draft

Sectoral scope(s): 01 and 04

United Nations
Framework Convention on
Climate Change

COVER NOTE

1. Procedural background

1. The Executive Board (hereinafter referred to as the Board) of the clean development mechanism (CDM) at its seventy-second meeting approved the “Workplan for panels and working groups for 2013” wherein it mandated the Methodologies Panel (Meth Panel) to simplify and streamline methodologies and tools under the MAP project no. 120. The purpose is to revise methodologies, taking into account the "Guidelines for determining baselines for measure(s)", with the aim of reducing transaction costs especially those in regions underrepresented in the CDM.

2. During the review of the methodologies for new cogeneration systems “AM0014: Natural gas-based package cogeneration” and “AM0048: New cogeneration project activities supplying electricity and heat to multiple customers”, the Meth Panel noted that there is an overlap among the applicability of some existing methodologies for cogeneration systems.

3. In Meth Panel, there is a general consensus that simplified baseline and additionality may be proposed in a consolidated manner for the methodologies belonging to cogeneration type. During next round of work that involves revision of AM0048 and AM0058, this consolidated approach for cogeneration methodologies may be proposed.

2. Purpose

4. The purpose of the draft revision is to simplify the sections of baseline determination and baseline emissions and to provide consistency among other similar methodologies.

3. Key issues and proposed solutions

4. The draft revision takes into account the “Guidelines for determining baselines for measure(s)” by simplifying and streamlining the methodology for baseline scenario identification, with the aim of reducing transaction costs especially for those in the regions which are underrepresented in the CDM.

5. Impacts

5. The revision, if approved will improve its consistency with other standards, expand its applicability and streamline it.

6. Subsequent work and timelines

6. The Meth Panel, at its 62nd meeting, agreed on the draft revision of the methodology. After receiving public inputs on the document, the Meth Panel will continue working on the revision of the approved methodology, at its 63rd meeting, for recommendation to the Board at a future meeting of the Board.

7. Recommendations to the Board

7. Not applicable (call for public input).

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1. Introduction

1.1. Background

1. The following table describes the key elements of the methodology:

Table 1. Methodology key elements

Typical projects	Construction and operation of a fossil fuel cogeneration plant that supplies electricity and heat to a consuming facility
Type of GHG emissions mitigation action	Technology switch

2. Scope, applicability, and entry into force

2.1. Scope

2.2. Applicability

2. This methodology is applicable to project activities those aim to install cogeneration plant and to supply electricity and heat to a recipient facility(ies). Project activities can be implemented either by the owner(s) of the recipient facility(ies) or by the third party (e.g. energy service company (ESCO)). The methodology is applicable under the following conditions:

(a) Electricity generated under the project activity is supplied primarily to the recipient facility(ies) and excess can be supplied to a power grid. The excess of electricity could take place if, for example, the electricity demand of the recipient facility(ies) has daily/seasonal fluctuations. No emission reductions can be claimed from the excess electricity supplied to the grid;

(b) Heat generated under the project activity is supplied primarily to the recipient facility(ies) and excess can be supplied to a heat network. No emission reductions can be claimed from the excess heat supplied to the heat network;

(c) In the absence of the project activity, the electricity and heat demand of the recipient facility(ies) is fulfilled in separate systems (i.e. electricity and heat in the baseline cannot be generated in another cogeneration facility);

(d) The heat-to-power ratio of the project cogeneration facility shall be higher than one.

3. In case the project activity is to supply electricity and heat to multiple recipient facilities, the following applies:

(a) All recipient facilities shall be clearly identified prior to the implementation of the project activity;

(b) The sources of electricity and heat (technology) used by recipient facilities as well as average historical energy consumption over the most recent three calendar years should be presented in the CDM-PDD.

4. In addition, the applicability conditions included in the tools referred to below apply.

2.3. Entry into force

5. Not applicable (call for public input).

3. Normative references

6. This baseline and monitoring methodology is based on the following proposed new methodology "NM0018-rev: MGM baseline methodology Natural Gas-Based Package cogeneration Project".

7. This methodology also refers to the latest approved versions of the following tools:

(a) "Combined tool to identify the baseline scenario and demonstrate additionality";

(b) "Tool to determine the remaining lifetime of equipment";

(c) "Tool to calculate the emission factor for an electricity system";

(d) "Tool to determine the baseline efficiency of thermal or electric energy generation systems";

(e) "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion";

(f) The methodological tool "Upstream leakage emissions associated with fossil fuel use";

(g) The methodological tool "Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period".

8. For more information regarding the proposed new methodologies and tools, as well as their consideration by the Executive Board (hereinafter referred to as the Board) of the clean development mechanism please refer to <http://cdm.unfccc.int/methodologies/PAmethodologies/index.html>.

3.1. Selected approach from paragraph 48 of the CDM modalities and procedures

9. "Existing actual or historical emissions as applicable"; or

10. "Emissions from a technology that represents an economically attractive course of action, taking into account barriers to investment".

4. Definitions

11. The definitions contained in the Glossary of CDM terms shall apply.

12. For the purpose of this methodology, the following definitions apply:

    (a) **Cogeneration plant** - facility that generates electricity and heat simultaneously using the fossil fuel;

    (b) **Heat** - heat is useful thermal energy that is generated in a heat generation facility (e.g. a boiler, a cogeneration plant, thermal solar panels, etc.) and transferred to a heat carrier (e.g. liquids, gases, steam, etc.) for utilization in thermal applications and processes, including electric power generation. For the purposes of this methodology, heat does not include waste heat, i.e. heat that is transferred to the environment without utilization, for example, heat in flue gas, heat transferred to cooling towers or any other heat losses. Note that heat refers to the net quantity of thermal energy that is transferred to a heat carrier at the heat generation facility. For example, in case of a boiler it refers to the difference of the enthalpy of the steam generated in the boiler and the enthalpy of the feed water and, if applicable, any condensate return;

    (c) **Heat network** - the spatial extent of the heat generation facilities that are physically connected through heating pipelines. Heat network provides heat to several recipient facilities;

    (d) **A power grid** - is defined by the spatial extent of the power plants that are physically connected through transmission and distribution lines to the project activity (e.g. the cogeneration plant location or the recipient facility(ies) where electricity is being consumed) and that can be dispatched without significant transmission constraints;

    (e) **Recipient facility(ies)** - the existing facility(ies), with at least three years operational history that consumes electricity and heat.

5. Baseline methodology

5.1. Project boundary

13. The spatial extent of the project boundary encompasses:

    (a) The cogeneration plant;

    (b) Recipient facility(ies);

    (c) Captive power plant(s) and/or power grid connected physically to a recipient facility(ies) in the baseline or project scenario;

    (d) All heat generation facilities, connected physically to a recipient facility(ies) in the baseline or project scenario.

14. The greenhouse gases included in or excluded from the project boundary are shown in Table 2.

Table 2. Emission sources included in or excluded from the project boundary

Source		Gas	Included	Justification/Explanation
Baseline	Fossil fuel consumption for electricity production	CO_2	Yes	Main emission source
		CH_4	No	Excluded for simplification. This is conservative
		N_2O	No	Excluded for simplification. This is conservative
	Fossil fuel consumption for heat production	CO_2	Yes	Main emission source
		CH_4	No	Excluded for simplification. This is conservative
		N_2O	No	Excluded for simplification. This is conservative
Project activity	Fossil fuel consumption for generation of heat and electricity in the project cogeneration plant	CO_2	Yes	Main emission source
		CH_4	No	Excluded for simplification
		N_2O	No	Excluded for simplification

5.2. Selection of the baseline scenario and demonstration of additionality

15. The selection of the baseline scenario and the demonstration of additionality shall be conducted using the latest version of the "Combined tool to identify the baseline scenario and demonstrate additionality". The following additional guidance should be used when applying the tool.

16. When applying **"Sub-step 1a"** of the tool, alternative scenarios should include all realistic and credible alternatives to the project activity for the project proponent that are consistent with current laws and regulations of the host country and that provide heat and electricity supply to the recipient facility(ies) with comparable quality and quantity as the proposed CDM project activity. For the proposed project activity, the alternative scenarios can be determined as a combination of scenarios for electricity generation and heat generation provided to the recipient facility(ies) and alternative scenarios for the recipient facility where it is applicable. However, alternatives to the project activity should also include the scenario for the construction and operation of new cogeneration plant for electricity generation but using different technology/fuel.

17. For electricity generation, the realistic and credible alternative(s) may include, inter alia:

    (a) The project activity is implemented, but not as a CDM project;

    (b) Construction and operation of new captive power plant(s);

    (c) Continuation of the current practice.

18. For the generation of heat, the realistic and credible alternative(s) may include, inter alia:

    (a) The project activity is implemented, but not as a CDM project;

    (b) Construction and operation of heat boilers;

    (c) Continuation of the current practice.

19. The methodology is only applicable if the most plausible baseline scenario is continuation of current practice, and this practice is not cogeneration.

20. The remaining lifetime of the existing equipment at the recipient facility(ies) shall be taken into account. It shall be determined using the latest version of the "Tool to determine the remaining lifetime of equipment".

21. However, if the remaining lifetime of the existing equipment is shorter than the crediting period(s), and the project participants wish to claim emission reductions after the end of the lifetime of the baseline equipment, baseline scenario alternative(s) shall be adjusted. The possible baseline scenario after the end of the lifetime of the existing equipment should be economically most attractive combination of technology and fuel on the date when the lifetime ends. It may be necessary to follow the provisions for changes to registered CDM project activity as per CDM project cycle procedure, while determining the most attractive baseline scenario and documenting in PDD when the lifetime of existing equipment ends.

22. For project activities where the excess of electricity and/or heat is supplied to the power grid/heat network and where the alternative baseline scenario is continuation of a current practice, investment analysis should include revenues from selling electricity and/or heat to the grid/heat network.

23. The sensitivity analysis should also consider variations between heat-to-electricity ratios, as the level of profitability of two sources are different. For example, if the project is additional for the variation of heat-to-electricity ratio by +/- 10 per cent, then the heat-to-electricity ratio should be within this range in the project period. This shall be done by including a parameter ($\theta_{PJ,y}$).

24. The heat-to-electricity ratio of the cogeneration plant in year *y* ($\theta_{PJ,y}$) should be determined ex ante as follows:

$$\theta_{PJ,y} = \frac{HG_{PJ,y}}{3.6 \times EG_{PJ,y}} \quad \text{Equation (1)}$$

Where:

$\theta_{PJ,y}$	=	Heat-to-electricity ratio of the cogeneration plant in year *y*
$HG_{PJ,y}$	=	Amount of heat generated in the cogeneration plant and supplied to the recipient facility in year *y* (GJ)
$EG_{PJ,y}$	=	Amount of electricity generated by the cogeneration plant in year *y* (MWh)

5.3. Baseline emissions

25. Baseline emissions are calculated as a sum of emissions due to generation of electricity and heat:

$$BE_y = BE_{EG,y} + BE_{HG,y} \quad \text{Equation (2)}$$

Where:

BE_y = Baseline emissions in year *y* (t CO_2e)

$BE_{EG,y}$ = Baseline emissions for electricity generation in year *y* (t CO_2)

$BE_{HG,y}$ = Baseline emissions for heat generation in year *y* (t CO_2)

26. Determination of baseline emissions for electricity generation ($BE_{EG,y}$)

27. Baseline emissions due to electricity generation ($BE_{EG,y}$) are accounted for the amount of electricity generated by the cogeneration plant and the baseline emission factor.

$$BE_{EG,y} = EG_{PJ,y} \times EF_{BL,EG,y}$$ Equation (3)

Where:

$BE_{EG,y}$ = Baseline emissions for electricity generation in year *y* (t CO_2)

$EG_{PJ,y}$ = Amount of electricity generated by the cogeneration plant in year *y* (MWh)

$EF_{BL,EG,y}$ = Baseline emission factor for electricity generated *y* in year *y* (t CO_2/MWh)

28. Determination of the baseline emission factor for electricity generated ($EF_{BL,EG,y}$)

29. The baseline emission factor for electricity generation shall be determined as a weighted average:

$$EF_{BL,EG,y} = \frac{\sum_j EG_{BL,EG,j,y} \times EF_{BL,EG,j,y}}{\sum_j EG_{BL,EG,j,y}}$$ Equation (4)

Where:

$EF_{BL,EG,y}$ = Baseline emission factor for electricity generation in year *y* (t CO_2/MWh)

$EG_{BL,EG,j,y}$ = Amount of electricity that would have been generated in the baseline by technology/source *j* in year *y* (MWh)

$EF_{BL,EG,j,y}$ = Baseline emission factor for electricity generation in the baseline by technology/source *j* in year *y* (tCO_2/MWh)

j = Technology/source that would have been used in the baseline to generate electricity

30. Baseline emission factor for electricity generation ($EF_{BL,EG,j,y}$) depends on baseline technology and therefore have three different approaches on how it shall be determined:

(a) **Approach 1** - applicable for the amount of electricity that would have been supplied in the baseline scenario by the grid connected power plants. Baseline emission factor $EF_{BL,EG,j,y}$ shall be determined as a combined margin, calculated according to the latest version of the "Tool to

calculate the emission factor for an electricity system", using a 50/50 OM/BM weight;

(b) **Approach 2** - applicable for the amount of electricity that would have been supplied in the baseline scenario by existing captive power plant. Baseline emission factor for electricity generation shall be determined as follows:

$$EF_{BL,EG,j,y} = \frac{EF_{BL,EG}}{\eta_{BL,EG}} \times 3.6 \qquad \text{Equation (5)}$$

Where:

$EF_{BL,EG,j,y}$ = Baseline emission factor for electricity generated in the baseline by technology *j* in year *y* (t CO_2/MWh)

$EF_{BL,EG}$ = CO_2 emission factor of the fuel used in the baseline power plant (t CO_2/GJ)

$\eta_{BL,EG}$ = The energy efficiency of the baseline fossil fuel fired power plant (Fraction)

j = Technology that would have been used in a baseline to generate electricity

(i) $EF_{BL,EG}$ shall be determined as the CO_2 emission factor of the fuel identified as the baseline fuel in the baseline power plant;

(ii) Where project participants identify operation of existing captive power plant(s) as the most plausible baseline scenario, the efficiency ($\eta_{BL,EG}$) shall be determined according to the latest version of the "Tool to determine the baseline efficiency of thermal or electric energy generation systems". The values determined for $\eta_{BL,EG}$ should be documented in the CDM-PDD and shall remain fixed till the end of the lifetime of the existing captive power plant(s);

(c) **Approach 3** - applicable for the amount of electricity that would have been supplied in the baseline scenario by the combination of the grid connected power plants and existing captive power plant (combination of approach 1 and approach 2). Where the historical data for the recent three years is available, the weighted average emission factor can be used based upon the above two methods and historical shares of grid connected power versus captive power. Otherwise, baseline emission factor for electricity generation shall be determined as a minimum between emission factors for Approach 1 and Approach 2.

31. Determination of baseline emissions for heat generation ($BE_{HG,y}$)

32. Baseline emissions for heat generation $BE_{HG,y}$ are calculated by multiplying the heat generated by the cogeneration plant and delivered to the recipient facility with a baseline CO_2 emission factor for heat generation:

$$BE_{HG,y} = HG_{PJ,y} \times EF_{BL,HG,y}$$ Equation (6)

Where:

$BE_{HG,y}$ = Baseline emissions for heat generation in year *y* (t CO_2e)

$HG_{PJ,y}$ = Amount of heat supplied to the recipient facility that was generated in the cogeneration plant in year *y* (GJ)

$EF_{BL,HG,y}$ = Baseline emission factor for heat generation in year *y* (t CO_2/GJ)

33. The baseline scenario can be determined as a combination of several components for heat production. In other words, heat generated by the cogeneration plant could have been produced by different facilities and would have therefore different emission factors. To account for this, the baseline emission factor for heat generation ($EF_{BL,HG,y}$) shall be calculated as follows:

$$EF_{BL,HG,y} = \frac{\sum_k HG_{BL,HG,k,y} \times EF_{BL,HG,k,y}}{\sum_k HG_{BL,HG,k,y}}$$ Equation (7)

Where:

$EF_{BL,HG,y}$ = Baseline emission factor for heat generation in year *y* (t CO_2/GJ)

$HG_{BL,HG,k,y}$ = Amount of heat that would have been generated in a baseline by technology *k* in year *y* (GJ)

$EF_{BL,HG,k,y}$ = Baseline emission factor for heat generation in a baseline by technology *k* in year *y* (t CO_2/GJ)

k = Technology that would have been used in a baseline to generate heat

34. Baseline emission factor for heat generation ($EF_{BL,HG,k,y}$) depends on baseline technology and therefore have three different approaches on how it shall be determined:

(a) **Approach 1** - applicable if heat in the baseline scenario would have been supplied to the recipient facility from the existing heat network. Baseline emission factor for heat generation shall be determined as follows:

$$EF_{BL,HG,k,y} = \frac{\sum_m \left(HG_{m,y} \times EF_{BL,HG,m}\right)}{\sum_m HG_{m,y}}$$ Equation (8)

Where:

$EF_{BL,HG,k,y}$ = Baseline emission factor for heat generation in a baseline by technology *k* in year *y* (t CO_2/GJ)

$HG_{m,y}$ = Heat supplied by the heat generation facility *m* within the heat network in year *y* (GJ)

$EF_{BL,HG,m}$ = Baseline emission factor for heat generation of the operating heat generation facility *m* (t CO_2/GJ)

m = All operating heat generation facilities within the heat network

The baseline emission factor for heat generation of the operating heat generation facility *m* should be determined using approach 2 below.

(b) **Approach 2** - applicable if heat in the baseline scenario would have been supplied to the recipient facility by existing heat generation facility. Baseline emission factor for heat generation shall be determined as follows:

$$EF_{BL,HG,k,y} = \frac{EF_{BL,HG}}{\eta_{BL,HG}} \quad \text{Equation (9)}$$

Where:

$EF_{BL,HG,k,y}$ = Baseline emission factor for heat generation in a baseline by technology *k* in year *y* (t CO_2/GJ)

$EF_{BL,HG}$ = CO_2 emission factor of the fuel used in the baseline heat generation facility (t CO_2/GJ)

$\eta_{BL,HG}$ = The energy efficiency of the baseline heat generation facility (Fraction)

(i) $EF_{BL,HG}$ shall be determined as the CO_2 emission factor of the fuel identified as the baseline fuel in the baseline heat generation facility;

(ii) Where project participants identify operation of existing heat generation facility as the most plausible baseline scenario, the efficiency ($\eta_{BL,HG}$) shall be determined according to the latest version of the "Tool to determine the baseline efficiency of thermal or electric energy generation systems". The values determined for $\eta_{BL,HG}$ should be documented in the CDM-PDD and shall remain fixed till the end of the lifetime of the existing heat generation facility;

(c) **Approach 3** - applicable if heat in the baseline scenario would have been supplied to the recipient facility by the combination of the heat network and by existing or new heat generation facility (combination of Option 1 and Option 2). Where the historical data for the recent three years is available, the weighted average emission factor can be used. Otherwise, baseline emission factor for heat generation shall be determined as a minimum between emission factors for Approach 1 and Approach 2.

5.4. Project emissions

35. Project emissions result from the combustion of fossil fuel in the cogeneration plant. Project emissions (PE_y) shall be calculated as the CO_2 emissions from fossil fuel(s) combustion associated with the production of heat and electricity in the cogeneration plant, using the latest approved version of the "Tool to calculate project or leakage CO_2

emissions from fossil fuel combustion". The parameter PE_y corresponds to $PE_{FC,j,y}$ in the tool, where *j* is the type of the fossil fuel used in the cogeneration plant.

5.5. Leakage

36. Leakage may result from fuel extraction, processing, liquefaction, transportation, re-gasification and distribution of fossil fuels outside of the project boundary. This leakage includes mainly: (i) fugitive CH_4 emissions; (ii) CO_2 emissions from the process of CO_2 removal from the raw natural gas stream in order to upgrade the natural gas to the required market conditions; and (iii) CO_2 emissions from associated fuel combustion and flaring. In this methodology, the following leakage emission sources shall be considered:

    (a) Fugitive CH_4 emissions associated with fuel extraction, processing, liquefaction, transportation, re-gasification and distribution of natural gas used in the cogeneration plant and fossil fuels used in the absence of the project activity;

    (b) CO_2 emissions from the process of CO_2 removal from the raw natural gas stream in order to upgrade the natural gas to the required market conditions;

    (c) In the case that liquefied natural gas (LNG) is used in the cogeneration plant, CO_2 emissions due to fuel combustion/electricity consumption associated with the liquefaction, transportation, re-gasification and compression into a natural gas transmission or distribution system.

37. Leakage shall be determined using provisions of the latest version of the methodological tool "Upstream leakage emissions associated with fossil fuel use".

5.6. Emission reductions

38. Emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y - LE_y \quad \text{Equation (10)}$$

Where:

ER_y = Emission reductions in year *y* (t CO_2e)

BE_y = Baseline emissions in year *y* (t CO_2e)

PE_y = Project emissions in year *y* (t CO_2e)

LE_y = Leakage in year *y* (t CO_2e)

5.7. Changes required for methodology implementation in 2nd and 3rd crediting periods

39. Refer to the latest approved version of the methodological tool "Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period".

5.8. Project activity under a programme of activities (PoA)

40. Requirements set out in the latest approved version of the standard for "Demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities" shall be followed.

5.9. Data and parameters not monitored

Data / Parameter table 1.

<table>
<tr><td>Data / Parameter:</td><td>$EF_{BL,EG}$, $EF_{BL,HG}$, $EF_{BL,HG,m}$</td></tr>
<tr><td>Data unit:</td><td>t CO_2/GJ</td></tr>
<tr><td>Description:</td><td>CO_2 emission factor of the fuel used in the baseline power plant.
CO_2 emission factor of fuel used in the baseline heat generation facility.
CO_2 emission factor of fuel used in the operating heat generation facility m</td></tr>
<tr><td>Source of data:</td><td>The following data sources may be used if the relevant conditions apply:
<table>
<tr><th>Data source</th><th>Conditions for using the data source</th></tr>
<tr><td>(a) Values provided by the fuel supplier in invoices</td><td>This is the preferred source</td></tr>
<tr><td>(b) Measurements by the project participants</td><td>If (a) is not available</td></tr>
<tr><td>(c) Regional or national default values</td><td>If (b) is not available
These sources can only be used for liquid fuels and should be based on well-documented, reliable sources (such as national energy balances)</td></tr>
<tr><td>(d) IPCC default values at the lower limit of the uncertainty at a 95 per cent confidence interval as provided in table 1.4 of Chapter1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories</td><td>If (c) is not available</td></tr>
</table></td></tr>
<tr><td>Measurement procedures (if any):</td><td>For (a) and (b): Measurements should be undertaken in line with national or international fuel standards</td></tr>
<tr><td>Any comment:</td><td>For (a): if the fuel supplier does provide the NCV value and the CO_2 emission factor on the invoice and these two values are based on measurements for this specific fuel, this CO_2 factor should be used. If another source for the CO_2 emission factor is used or no CO_2 emission factor is provided, options (b), (c) or (d) should be used</td></tr>
</table>

Data / Parameter table 2.

Data / Parameter:	**$EG_{BL,EG,j,y}$**
Data unit:	MWh
Description:	Amount of electricity that would have been generated in the baseline by technology/source *j* in year *y*
Source of data:	From historical data of facility(ies)
Measurement procedures (if any):	Appropriate energy meter
Any comment:	This parameter is used to calculate emissions due to historical use of electricity

Data / Parameter table 3.

Data / Parameter:	**$HG_{m,y}$**
Data unit:	GJ
Description:	Heat supplied by the heat generation facility *m* within the heat network in year *y*
Source of data:	From historical data of facility(ies)
Measurement procedures (if any):	Appropriate thermal energy meter
Any comment:	This parameter is used to calculate emissions due to historical use of heat

Data / Parameter table 4.

Data / Parameter:	**$HG_{BL,HG,k,y}$**
Data unit:	GJ
Description:	Amount of heat that would have been generated in a baseline by technology *k* in year *y* (GJ)
Source of data:	From historical data of facility(ies)
Measurement procedures (if any):	Appropriate thermal energy meter
Any comment:	This parameter is used to calculate emissions due to historical use of heat

6. Monitoring methodology

41. Describe and specify in the CDM-PDD all monitoring procedures, including the type of measurement instrumentation used, the responsibilities for monitoring and QA/QC procedures that will be applied. Where the methodology provides different options (e.g. use of default values or on-site measurements), specify which option will be used. All meters and instruments should be calibrated regularly as per industry practices.

42. All data collected as part of monitoring should be archived electronically and be kept at least for two years after the end of the last crediting period. One hundred per cent of the data should be monitored if not indicated differently in the comments in the tables below.

6.1. Data and parameters monitored

Data / Parameter table 2.

Data / Parameter:	**$EG_{PJ, y,}$**
Data unit:	MWh
Description:	Amount of electricity generated in the cogeneration plant in year *y*
Source of data:	Measured by project participants using electricity meters
Measurement procedures (if any):	On-site measurements
Monitoring frequency:	Continuously
QA/QC procedures:	-
Any comment:	-

Data / Parameter table 3.

Data / Parameter:	**$HG_{PJ, y}$**
Data unit:	GJ
Description:	Amount of heat generated in the cogeneration plant and supplied to the recipient facility in year *y*
Source of data:	On-site measurements
Measurement procedures (if any):	This parameter should be determined as the difference of the enthalpy of the process heat (steam or hot water) supplied to process heat loads in the project activity minus the enthalpy of the feed-water, the boiler blow-down and any condensate return to the heat generators. The respective enthalpies should be determined based on the mass (or volume) flows, the temperatures and, in case of superheated steam, the pressure. Steam tables or appropriate thermodynamic equations may be used to calculate the enthalpy as a function of temperature and pressure
Monitoring frequency:	Calculated based on continuously monitored data and aggregated as appropriate, to calculate emissions reductions
QA/QC procedures:	-
Any comment:	-

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Document information

Version	*Date*	*Description*
Draft 05.0	10 February 2014	MP 62, Annex 7 A call for public input will be issued on this draft revised methodology. The revision simplifies and streamlines the methodology. The revision also changes the title from "Natural gas-based package cogeneration" to "Fossil fuel based cogeneration for identified recipient facility(ies)". Due to the overall modification of the document, no highlights of the changes are provided.
04.0	27 July 2007	EB 33, Annex 5 The revision expands the applicability of the methodology to project activities that replace electricity generation from captive electricity plant with electricity generation from natural gas based cogeneration plant.
03.0	04 May 2007	EB 31, Annex 8 The revision expands the applicability of the methodology to project activities that use oil or coal to generate energy in the absence of the project activity and use of approved additionality tool to demonstrate additionality.
02.0	21 July 2006	EB 25, Annex 8 The revision expands the applicability of the methodology to cogeneration systems owned or operated by the consuming facilities that receive the project heat and electricity.
01.0	3 September 2004	EB 15, Annex 5 Initial adoption.

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