



**CLEAN DEVELOPMENT MECHANISM
PROPOSED NEW METHODOLOGY: MONITORING (CDM-NMM)
Version 01 - in effect as of: 1 July 2004**

CONTENTS

- A. Identification of methodology
- B. Proposed new monitoring methodology

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**SECTION A. Identification of methodology****A.1. Title of the proposed methodology:**

>> Baseline methodology for energy efficiency **on electricity and fossil fuel consumption** through technological improvements in the metals production industry.

A.2. List of category(ies) of project activity to which the methodology may apply:

>>9 -Metal Production

A.3. Conditions under which the methodology is applicable to CDM project activities:

>> This methodology is applicable where the following conditions apply:

- Electricity and/or other fossil fuel consumption is reduced at metal smelting processes through the introduction of new technologies that lead to energy efficiency;
- No significant HFC, PFC and SF6 gases are released within the project boundary;
- The geographic and system boundaries for the relevant electricity grid can be clearly identified; and information on the characteristics of the grid is available.
- The local regulations/programs do not constrain the facility from using electricity from the grid or electricity generated with onsite fossil fuels;
- Only existing capacity within the project boundary is eligible and the project activity does not increase the lifetime of the existing facility during the crediting period (i.e. this methodology is applicable up to the end of the lifetime of existing facility if this is shorter than the crediting period).

A.4. What are the potential strengths and weaknesses of this proposed new methodology?

>>

Strengths:

- The methodology builds on an existing approved monitoring methodologies (ACM0002). It extends the scope of this methodology by making them applicable to energy efficiency in industrial process activities affecting amounts of electricity taken from a grid system.

Weaknesses:

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- The methodology does not attempt to incorporate transport and distribution losses in the grid system. Such losses, and emissions associated with them, are extremely hard to reliably quantify. Where the power produced is consumed on site as opposed to taking energy from the grid, the emissions reduction will be underestimated. This is in fact positive, as it will add to methodology conservatism.

SECTION B. Proposed new monitoring methodology

>>

B.1. Brief description of the new methodology:

>> The methodology is devised to monitor emissions as a result of both baseline (where possible) and project activities arising from project implementation. Where monitoring of grid electricity related emission are to be carried out, the monitoring methodology relies on the already approved monitoring methodologies as set out in ACM0002.

On-site fossil fuel consumption in the project scenario (vs the baseline) must be monitored.

>> A note is made here that data collection set out below to monitor both project and baseline emissions are in addition to any monitoring elements set out in ACM0002), and these monitoring elements are also to be included in any project monitoring plan.

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B.2. Option 1: Monitoring of the emissions in the project scenario and the baseline scenario:

B.2.1. Data to be collected or used in order to monitor emissions from the project activity, and how this data will be archived:

| ID number (Please use numbers to ease cross-referencing to table B.7) | Data variable | Source of data | Data unit | Measured (m), calculated (c) or estimated (e) | Recording frequency | Proportion of data to be monitored | How will the data be archived? (electronic/ paper) | Comment |
|--|--|-------------------|--------------------------|---|---------------------|------------------------------------|--|--|
| 1 | Quantity of metal produced in the facility | Project Proponent | Tonnes of metal produced | M | Constant | 100% | Electronic and Paper | This information can be evidenced through sales receipts for metal produced |
| 2 | Quantity of grid electricity | Project Proponent | MWh | M | Constant | 100% | Electronic and Paper | The quantity of electricity consumed from a grid will be metered, and this information |

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|---|--|-------------------|---|-----------------|----------|------|----------------------|---|
| | consumed | | | | | | | will be used by the electricity supplier for billing purposes |
| 3 | Quantity of grid electricity consumed per tonne of metal produced | Project Proponent | MWh/tonne metal produced | C | annually | 100% | Electronic and Paper | To be calculated by dividing ID2 by ID1. |
| 4 | Quantity of any fossil fuel utilised (source n) | | Relevant units for source (n), tonnes (coal), m ³ (natural gas), etc | M | Constant | 100% | Electronic and Paper | As with electricity, billing dockets can be used to verify actual fuel use. |
| 5 | Quantity of any fossil fuel utilised per tonne of metal produced (source n) | | Relevant units for source (n), tonnes (coal), m ³ (natural gas), etc | C | Annually | 100% | Electronic and Paper | To be calculated by dividing ID4 by ID1. |
| 6 | Emissions factors for any fossil fuel utilised (as appropriate) and for the quantification of the grid emissions factor in the baseline analysis | IPCC | Relevant units | Pre-set by IPCC | N/A | N/A | N/A | IPCC emissions factors to be utilised throughout and are therefore a trusted source |
| 7 | Grid emissions factor | As resulting from | T CO ₂ /MWh | C | N/A | N/A | N/A | As based on data sources specified in the ACM0002 monitoring methodology (e.g. |

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Deleted: Where fossil fuel consumption for source (n) is identified as material in the baseline analysis, this information should be monitored. Where it is not, it may be ignored to reduce monitoring transaction costs. ¶

¶
As with electricity, billing dockets can be used to verify actual fuel use.

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| | | | | | | | | |
|--|--|---------|--|--|--|--|--|-------------------|
| | | ACM0002 | | | | | | the grid operator |
|--|--|---------|--|--|--|--|--|-------------------|

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B.2.2. Description of formulae used to estimate project emissions (for each gas, source, formulae/algorithm, emissions units of CO₂ equ.):

>>The following equations should be used to monitor emissions associated with material production in the project scenario.

$$PE_y = PE_y(\text{offsite}) + PE_y(\text{onsite}) \quad \text{Equation 1}$$

Where:

PE_y: Project emissions in year y

PE_y(offsite): Offsite electricity emissions associated with the material being produced in year y (tCO₂e) (e.g., emissions associated with the use of grid electricity)

PE_y(onsite): Onsite project emissions associate with the material being produced in year y (such as coal/gas/oil use) (tCO₂e)

$$\begin{aligned} PE_y(\text{offsite}) &= EG_{py} \times EF_y(\text{offsite}) \\ &= (EG_{py/t} \times QP_y) \times EF_y(\text{offsite}) \end{aligned} \quad \text{Equation 2}$$

Where:

EG_{py}: Quantity of project grid electricity utilised in year y (MWh) – calculated through (EG_{py/t} x QP_y)

EF_y(offsite): Grid electricity emissions factor determined in the baseline analysis in year y (tCO₂e/MWh)

EG_{py/t}: Grid electricity consumed per tonne of metal produced in the project scenario in year y

QP_y: Quantity of production in year y (relevant units)

$$PE_y(\text{onsite}) = QP_y \times EF_{py}(\text{onsite}) \quad \text{Equation 3}$$

Where:

QP_y: Quantity of production in year y (relevant units)

EF_{py}(onsite): Project emissions factor for onsite emissions in year y (tCO₂e/relevant production unit). EF_{py}(onsite) will be defined as the emission factor associated with production of a single unit of product through on site fossil fuel use in the project scenario

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$$EF_y(\text{onsite}) = \sum(A_{\text{pny}} \times EF_{\text{ny-on}})$$

Equation 4

Where:

A_{pny} : Quantity of each individual source (n) of onsite fossil fuel in year y in relevant units (tonnes, m³) per individual unit of product (in relevant units) in project case - i.e. amount of coal used per tonne of product produced

$EF_{\text{ny-on}}$: Emissions factor applied for that source (n) in year y, using the relevant IPCC emissions factor

| B.2.3. Relevant data necessary for determining the <u>baseline</u> of anthropogenic emissions by sources of greenhouse gases (GHG) within the project boundary and how such data will be collected and archived: | | | | | | | | |
|--|-----------------------|---|---------------------------|--|---------------------|------------------------------------|---|---|
| ID number (Please use numbers to ease cross-referencing to table B.7) | Data variable | Source of data | Data unit | Measured (m), calculated (c), estimated (e), | Recording frequency | Proportion of data to be monitored | How will the data be archived? (electronic/paper) | Comment |
| 8 | Grid emissions factor | As resulting from ACM0002 | T CO ₂ /MWh | C | N/A | N/A | N/A | As based on data sources specified in the ACM0002 monitoring methodology (e.g. the grid operator) |

B.2.4. Description of formulae used to estimate baseline emissions (for each gas, source, formulae/algorithm, emissions units of CO₂ equ.):

>>

Emissions associated with baseline material production in the baseline scenario are determined as set out below:

$$BE_y = BE_y(\text{offsite}) + BE_y(\text{onsite})$$

Equation 5

Where:

BE_y : Baseline emissions (year y)

$BE_y(\text{offsite})$: Offsite electricity emissions associated with the material being produced (tCO₂e in year y) (e.g., emissions associated with the use of grid electricity)

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BE_y(onsite): Onsite baseline emissions associated with the material being produced (such as coal/gas/oil use) (tCO₂e in year y)

$$\begin{aligned} \text{BE}_y(\text{offsite}) &= \text{EG}_{by} \times \text{EF}_y(\text{offsite}) \\ &= (\text{EG}_{by/t} \times \text{QP}_{by}) \times \text{EF}_y(\text{offsite}) \end{aligned} \quad \text{Equation 6}$$

Where:

EG_{by}: Quantity of baseline grid electricity in year y (MWh) – calculated through (EG_{by/t} x QP_{by})

EF_y(offsite): Grid electricity emissions factor in year y (tCO₂e/MWh)

NB: This emissions factor for grid electricity is defined by following ACM0002 for calculation of emissions associated with grid connected renewable electricity.

EG_{by/t}: Grid electricity consumed per tonne of metal produced in the baseline scenario in year y

QP_{by}: Quantity of production in year y (relevant units)

Deleted: or another approved methodology

Deleted: generation if sufficient data to underpin ACM0002 is not available, as appropriate

$$\text{BE}_y(\text{onsite}) = \text{QP}_{by} \times \text{EF}_{by}(\text{onsite}) \quad \text{Equation 7}$$

Where:

QP_{by}: Quantity of production in year y (relevant units)

EF_{by}(onsite): Baseline emissions factor for any emissions taking place onsite (if appropriate) in tCO₂e/ production unit. EF_{by}(onsite) will be defined as the emission factor associated with production of a single unit of product through on site fossil fuel use

$$\text{EF}_{by}(\text{onsite}) = \sum (\text{A}_{bny} \times \text{EF}_{ny-\text{on}}) \quad \text{Equation 8}$$

Where:

A_{bny}: Quantity of each individual source (n) of onsite fossil fuel in relevant units (tonnes, m³) per individual unit of product (in relevant units) in year y - i.e. amount of coal used per tonne of product produced

EF_{ny-on}: Emissions factor applied for that source (n), in year y, using the relevant IPCC emissions factor (tCO₂)

B.3. Option 2: Direct monitoring of emission reductions from the project activity:

>> N/A

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**B.3.1. Data to be collected or used in order to monitor emissions from the project activity, and how this data will be archived:**

| ID number (Please use numbers to ease cross-referencing to table B.7) | Data variable | Source of data | Data unit | Measured (m), calculated (c), estimated (e), | Recording frequency | Proportion of data to be monitored | How will the data be archived? (electronic/paper) | Comment |
|--|---------------|----------------|-----------|--|---------------------|------------------------------------|---|---------|
| | | | | | | | | |
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B.3.2. Description of formulae used to calculate project emissions (for each gas, source, formulae/algorithm, emissions units of CO₂ equ.):

>>Not Applicable

B.4. Treatment of leakage in the monitoring plan:

>> As defined in ACM0002, “the main emissions potentially giving rise to leakage in the context of electric sector projects are emissions arising due to activities such as plant construction, fuel handling (extraction, processing, and transport), and land inundation (for hydroelectric projects – not applicable here). Project participants do not need to consider these emission sources as leakage in applying this methodology. Project activities using this baseline methodology shall not claim any credit for the project on account of reducing these emissions below the level of the baseline scenario.”

The methodology does not anticipate that any other forms of leakage will arise as a result of the project activities covered, but this assumption should be verified when a project is developed to validate this assumption and relevant leakage elements identified.

**B.4.1. If applicable, please describe the data and information that will be collected in order to monitor leakage effects of the project activity:**

| ID number (Please use numbers to ease cross-referencing to table B.7) | Data variable | Source of data | Data unit | Measured (m), calculated (c) or estimated (e) | Recording frequency | Proportion of data to be monitored | How will the data be archived? (electronic/paper) | Comment |
|--|---------------|----------------|-----------|---|---------------------|------------------------------------|---|---------|
| | | | | | | | | |
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B.4.2. Description of formulae used to estimate leakage (for each gas, source, formulae/algorithm, emissions units of CO₂ equ.):

>>

B.5. Description of formulae used to estimate emission reductions for the project activity (for each gas, source, formulae/algorithm, emissions units of CO₂ equ.):

>>

Following monitoring and quantification of project (PE_y) and baseline (BE_y) emissions project emissions reductions (ER_y) in year y can be determined. The emission reductions (ER_y) of the project activity during a given year y is the difference between the monitored baseline, monitored project emissions and emissions due to leakage, as expressed in the formula below.

$$ER_y = BE_y - PE_y - L_y$$

Equation 9

Where

- ER_y: Emissions Reductions (t CO₂e) in year y
 BE_y: Emissions in the baseline scenario (t CO₂e) in year y
 PE_y: Emissions in the project scenario (t CO₂e) in year y
 L_y: Leakage (t CO₂e) in year y

B.6. Assumptions used in elaborating the new methodology:

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- Emission factors, conversion factors or default data used for this analysis needs to be gathered from scientific publications, specialized institutions and consultants, the IPCC, or any other recognized sources, or from validated/documentated data gathered by the project company. Full references must be given for the sources of data used. These will need to be checked by Designated Operational Entity (DOE).
- It is assumed that the monitoring methodology ACM0002 is a suitable methodology for determining baseline and project emissions associated with any grid electricity use. As such all assumptions made in the ACM0002 monitoring methodology are also applicable in this methodology, other than where required to extend this methodology to the cohort of projects identified in A.2 above.

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It is assumed that other approved grid connected monitoring methodologies are acceptable where sufficient quality information required to apply ACM0002 in the baseline analysis is not available and the relevant baseline methodology is applied under such circumstances.

| B.7. Please indicate whether quality control (QC) and quality assurance (QA) procedures are being undertaken for the items monitored: | | |
|---|--|--|
| Data (Indicate table and ID number e.g. 3.-1.; 3.2.) | Uncertainty level of data (High/Medium/Low) | Explain QA/QC procedures planned for these data, or why such procedures are not necessary. |
| 2.1-1 & 2.3-6: Metal production | Low | Internal procedures to track and verify metal production will be utilised, these will be subject to site specific QA/QC procedures |
| 2.1-2: Grid electricity consumption | Low | Internal procedures to track and verify electricity consumption will be utilised, these will be subject to site specific QA/QC procedures |
| 2.1-3: Fossil fuel utilised | Low | Internal procedures to track and verify fossil fuel consumption production will be utilised, these will be subject to site specific QA/QC procedures |
| 2.1-4 & 2.3-9: Emissions factors | Low | External emissions factors from trusted sources will be utilised and therefore will not be subject to QA/QC |

B.8. Has the methodology been applied successfully elsewhere and, if so, in which circumstances?

>>>The methodology approach to quantify grid emissions is currently as accepted in ACM0002.

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