

 <p align="center"><b>CDM: Proposed new methodology expert form (version 03)</b> (To be used by methodology experts providing desk review for a proposed new methodology)</p>	
Name of expert responsible for completing and submitting this form	Felicity C. Thomas
Related F-CDM-NM document ID number	NM0068:GHG emission reductions at ALUAR Aluminio Argentino
<p><i>Note to those completing this form, as applicable: Please provide recommendations on the proposed new baseline and monitoring methodologies based on an assessment of annexes 3 and 4 and of their application in sections A to E of the draft CDM PDD, desk reviews and public input. Please ensure that the form is entirely filled and that arguments and expert judgements are substantiated.</i></p>	
<b>A. Evaluation of the proposed new methodologies by desk reviewers:</b>	
<b>I. Evaluation of the proposed new baseline methodology:</b>	
<p>Title of new baseline methodology:&gt;&gt;Changes in Industrial Processes, Energy Efficiency, Fuel Switching, and Cogeneration Equipment at an Aluminium Smelting Facility.</p>	
<p>i. Conditions under which this methodology is applicable to other potential projects (e.g. project type, region, data availability):</p> <p>&gt;&gt;This methodology is applicable to all aluminium smelting facilities that involves one or a combination of the following activities:</p> <ul style="list-style-type: none"> <li>- Improvements in the smelting process</li> <li>- Changes in the energy efficiency of any equipment using electricity</li> <li>- Fuel switching involved with any on-site power generation equipment</li> <li>- Addition of, or changes in, electricity self-generation equipment</li> <li>- Addition of, or changes in, electricity cogeneration equipment</li> <li>- Changes in energy efficiency (fuel saving) of any equipment using fuel</li> </ul> <p>ii. Strengths and weaknesses of the methodology:</p> <p>&gt;&gt;Strengths - Applicable to most retrofit projects at aluminium smelting plants.</p> <p>Options provided where detailed information is not available, although preference for project specific data is made.</p> <p>Attempts to build on existing approved methodologies.</p> <p>Weaknesses - Some degree of uncertainty in some data, although this uncertainty is minimised by the requirement of statistical error information in the PDD. It would be useful if advice was provided in the method regarding what to do should the statistical errors be high and thus the data collected proven to be unreliable.</p> <p>Additional clarification of why the consolidated methodology ACM0002 can be justifiably used for non-renewable energy sources. Currently the justification is unclear and the applicability of this method is therefore questionable since it was developed for renewable energy sources.</p> <p>iii. Any changes needed to improve the methodology:</p> <ul style="list-style-type: none"> <li>a. Minor changes:&gt;&gt;minor changes</li> <li>b. Major changes: &gt;&gt;</li> </ul>	
<b>II. Evaluation of the proposed new monitoring methodology:</b>	
<p>Title of new monitoring methodology: &gt;&gt;Changes in industrial process, energy efficiency, fuel switching, self-generation, and cogeneration equipment at an aluminium smelting facility.</p>	

- i. Conditions under which this methodology is applicable to other potential projects (e.g. project type, region, data availability):

>>Applicable to projects in all regions where an improvement is made at an aluminium manufacturing plant. The method accounts for differences across countries in terms of data accessibility, and where data is difficult to obtain, alternatives are provided.

- ii. Strengths and weaknesses of the methodology:

>>Strength - the method is easy to follow and builds on existing CDM Executive Board approved good practice. Weakness- The monitoring method is in some parts written in exactly the same language as in the baseline method. Whilst there are inevitable similarities, in terms of calculations to be made the method is focused on monitoring and not on the calculation of the baseline. Thus some minor changes in the language in this section would make the monitoring method clearer to identify as separate to the baseline method. However this is a minor stylistic point.

- iii. Any changes needed to improve the methodology:

- a. Minor changes:>>minor changes
- b. Major changes: >>

## **B. Details of the evaluation of the proposed new methodology by the desk reviewer:**

### **I. Proposed new baseline methodology (*specify title here*):** >>Changes in Industrial Processes, Energy Efficiency, Fuel Switching, and Cogeneration Equipment at an Aluminium Smelting Facility.

#### **(1) Short description of the methodology, including an assessment of which approach from paragraph 48 of the CDM modalities and procedures was used:**

##### *a) Describe the methodology:*

>>First all applicable baseline options for improving the aluminium smelting facility must be identified and the most probable baseline is then selected using the procedures identified in the "Tool for the demonstration and assessment of Additionality"(e.g. review of legal framework, barrier test, investment analysis and common practice analysis).

##### *b) State the approach selected:*

>>Existing actual or historical emissions as appropriate.

##### *c) Indicate (in summary form) why the approach selected is the most appropriate. Please provide your expert judgement on the appropriateness of the selected approach to the project category:*

>>The approach selected is appropriate, since the methodology is only applied to retrofit projects.

**(2) Basis for determining the baseline scenario:**

*a) State whether the documentation explains how the baseline scenario is to be chosen and identified:*

>>Yes the documentation explains how the baseline scenario is to be chosen and identified.

*b) State the basic underlying rationale for algorithms/formulae used (e.g. marginal vs. average basis) (see also section 4 below):*

>>The algorithms and formulae used to calculate the baseline are based on a combination of average and marginal basis.

*c) State whether the documentation explains how, through the use of the methodology, it can be demonstrated that a project activity is additional and therefore not the baseline scenario. If so, what are the tools provided by the project participants?*

>>The method utilises the "Tool for the demonstration and assessment of Additionality".

*d) State whether the basis for determining the baseline scenario and for assessing additionality is appropriate and adequate:*

>>The basis for determining the baseline scenario and for assessing additionality is appropriate however additional clarification could improve the methodology. In particular further justification of why the consolidated methodology ACM0002 can be justifiably used for non-renewable energy sources. Currently the description is unclear.

**(3) Assessment of the description of the proposed methodology and its applicability**

*a) State whether the methodology has been described in an adequate manner:*

>>The methodology has been described in an adequate manner.

*b) State whether the proposed methodology is appropriate for the referred proposed project activity and the referred project context (described in Sections A-E of the draft CDM-PDD and submitted along with Annex 3):*

>>The proposed methodology is appropriate for the referred proposed project activity and the referred project context.

*c) State whether the application of the methodology could result in a baseline scenario that reasonably represents the anthropogenic emissions by sources of greenhouse gases that would occur in the absence of the proposed project activity.*

>>The application of the methodology could result in a baseline scenario that reasonably represents the anthropogenic emissions of greenhouse gases that would occur in the absence of the proposed project activity.

*Please explain:*

>>The baseline method and formulae developed can be applied to most improvement projects or retrofits implemented at aluminium plants. The baseline equations utilise existing CDM Executive Board approved approaches where possible (e.g. the use of the consolidated methodology ACM 0002 equation for calculating the emission factor from the electricity grid and for the calculation of additionality).

**(4) Assessment of algorithms/formulae and type of data needed:**

*a) State whether the description of the methodology includes algorithms and generic formulae that can be applied to other potential project activities (if not, the proposed new methodology will be considered as a project-specific methodology):*

>>Yes. The baseline methods algorithms and generic formulae have been developed so as to be applicable to a wide variety of improvement projects at aluminium plants. The applicability of the emission factor method developed within ACM0002 was developed for renewable energy projects. It is thus questionable whether this method is really applicable to non-renewable energy projects. Further justification and clarification of why this is applicable would increase transparency and strengthen the method.

*b) Explain the spatial scope of data used to determine the baseline and whether the scope is appropriate:*

>>There are two spatial scopes described within the methodology, first the entire aluminium manufacturing plant including power plants on site, and the second scope is a sub-part of the aluminium manufacturing plant - in other words a subsection of the first scope.

*c) Explain the vintage of data used (in relation to the duration of the project crediting period) and whether the vintage of data is appropriate, indicating the period covered by the data:*

>>three years of Aluminium production, electricity and fuel consumption data taken before the project is implemented is required. The data will be collected using direct measurement techniques. Since the method is for retrofit projects, the vintage of the data for the baseline is appropriate.

#### **(5) Definition of the project boundary related to the baseline methodology:**

*a) State how the project boundary is defined in terms of:*

*i) Gases and sources*

>>All emissions from fuels used in electricity generation and from process emissions. Emissions from transportation of fuels and supplies are also considered.

*ii) Physical delineation*

>>The project boundary as defined in the method incorporates the physical and geographical aluminium manufacturing site including any power plants located on the site as well as emissions if a aluminium manufacturing plant is connected to the grid. The method illustrates this with a diagram. All fuels used to generate electricity in both the baseline and project scenario are considered. The method also allows for a sub-section of the entire aluminium manufacturing site to be used if the project only affects one or two of the mitigation options defined within the method, i.e. improvements are not made to all aluminium technology processes and some remain unaffected by the project and the process emissions can be calculate for these subprocesses.

*b) Indicate whether this project boundary is appropriate:*

>>The project boundary is appropriate.

#### **(6) Key assumptions/parameters (including emission factors and activity levels) and data sources:**

*a) List the implicit and explicit key assumptions. Identify those, if any, which are problematic and explain:*

>>Fugitive methane emissions are presumed to be small thus no direct measurement is required within the baseline, but rather the use of IPCC default emission factor values.

Emissions from transportation of supplies to the plant are assumed to be small and thus IPCC default emission factors are used instead of direct measurements.

It is assumed that uncertainty associated with AEF, AEO and AED measurements will be low.

*b) State whether the key assumptions are arrived at in a transparent manner:*

>>The key assumptions are clearly identified and justified.

*c) Give your expert judgement on whether the assumptions/parameters are adequate:*

>>The assumptions and parameters are in general adequate. It would be useful if the method clarified what should be done in the event that the statistical error measurements for AEF, AEO and AED were high indicating inaccuracy.

*d) Indicate which data sources are used and how the data are obtained (e.g. official statistics, expert judgement):*

>>Carbon dioxide emission factor per unit energy of fuel - Official statistics in Argentinian National

Inventory communications to the UNFCCC or site measurement of carbon content and calorific value of fuels or IPCC default emission factors can be used

Methane emission factor per unit of energy of fuel - IPCC default value

Nitrous oxide emission factor per unit of energy of fuel - IPCC default values

Baseline Emission Factor for the grid electricity generation - Determined using the method outlined in ACM 0002, or if the project is a small project following the method in the Simplified Methodology for small scale CDM project activities

Emission factor of CF<sub>4</sub> - from on site measurements of CF<sub>4</sub>, or calculations of emissions of CF<sub>4</sub> using on site measurements of the anode effect over voltage in mV/cell per day & Number of anode effects per day & Anode effect duration in minutes or IPCC default measurements.

Over voltage coefficient (kgPFC/tAl)/mV/Cell.day)- on site measurements or IPCC default emission factors

Slope (kg PFC/tAl)/AE-Minutes/cell.day)-- on site measurements or IPCC default emission factors

Emissions from grid connected electricity generation - calculated in accordance with the methods outlined in the approved consolidated method ACM0002

Transport - measured or calculated fuel consumption of transport, distance travelled by vehicles and fuel specific emission factors according to IPCC emission factors.

*e) Give your expert judgement on whether the data used are adequate, consistent, accurate and reliable:*

>>The data used are adequate, consistent, accurate and reliable

*f) State possible data gaps:*

>>There appears to be no data gaps for the project improvements described within the method.

#### **(7) Assessment of uncertainties:**

*a) State whether the methodology includes an assessment of uncertainties regarding:*

*i) The basis for determining the baseline scenario:*

>>The method reviews uncertainty associated with emission calculations in the baseline.

*ii) Algorithms/formulae:*

>>Different formulae are presented and it is identified which formulae are appropriate for different project types. Project developers utilising the method are given options and they must therefore select the most appropriate formulae according to the technology that they use.

*iii) Key assumptions:*

>>Uncertainties regarding key assumptions are assessed.

*iv) Data:*

>>The uncertainty regarding data is clearly identified and when data limitations are identified alternative data sources are provided.

*b) State whether the uncertainties presented are reasonable:*

>>The uncertainties presented are reasonable.

#### **(8) Leakage:**

*a) State how the baseline methodology addresses any potential leakage due to the project activity:*

>>If the project only reduces process emissions at the aluminium plant leakage will not occur

Leakage will occur if there are changes in fuel use patterns which result in an increase in fugitive emissions associated with increased fuel use at the industrial site or fuel transport consumption. Additionally fugitive methane emissions from fuel production and CO<sub>2</sub> emissions from transport can occur To calculate leakage a formulae is provided that requires the use of either information about transport fuels and methane

<p>emissions or either default IPCC or qualitative calculation of the values when the energy market data is not available.</p> <p><i>b) Indicate whether the treatment for leakage is appropriate and adequate:</i>          &gt;&gt;The treatment for leakage is appropriate and adequate.</p>
<p><b>(9) Transparency and “conservativeness”:</b></p> <p><i>a) Indicate whether the baseline methodology was developed in a transparent way:</i>          &gt;&gt;The baseline methodology was developed in a transparent way.</p> <p><i>b) State whether the baseline methodology is conservative:</i>          &gt;&gt;The baseline methodology is conservative.</p>
<p><b>(10) Potential strengths and weaknesses of the proposed baseline methodology (please explain):</b>          &gt;&gt;STRENGTHS</p> <ul style="list-style-type: none"> <li>-The method is applicable to a wide variety of aluminium plant retrofits</li> <li>- Option for data are provided in the event that real data is not available.</li> <li>- The method utilises to the extent possible existing approved Methods and tools.</li> </ul> <p>WEAKNESSES.</p> <ul style="list-style-type: none"> <li>- uncertainty of measurements associated with AEF, AED and AEO measurements, although this is reduced by the requirement that statistical error estimates should also be reported within the PDD.</li> <li>- Additional clarification of why the consolidated methodology ACM0002 can be justifiably used for non-renewable energy sources. Currently the description is unclear.</li> </ul>
<p><b>(11) Other considerations, such as a description of how national and/or sectoral policies and circumstances have been taken into account (please explain):</b>          &gt;&gt;The method utilises the CDM Executive Board approved Tool for calculating additionality. Therefore legal frameworks, national and sectoral policies are analysed and assessed to ensure that the project would not have taken place anyway.</p>
<p><b>(12) Applicability of the proposed methodology across project types and regions (please indicate):</b>          &gt;&gt;This method is only applicable to aluminium plant retrofit projects. It is applicable to aluminium plants that are either grid connected or have their own generation facilities, for projects that make improvements to smelting where either the prebake technology or Soderberg Technology is utilised. It is also applicable across regions, since it takes into account differences that project developers may experience in accessing data and provides options whilst clearly identifying which data is best.</p>
<p><b>(13) Any other comments:</b></p> <p><i>a) State whether any other source of information (i.e. other than documentation on this proposed methodology available on the UNFCCC CDM web site) has been used by you in evaluating this methodology. If so, please provide specific references:</i>          &gt;&gt;No other information has been used to assess this methodology.</p> <p><i>b) Indicate any further comments:</i>          &gt;&gt;no further comments.</p>
<p><b>II. Proposed new monitoring methodology (specify title here):</b> &gt;&gt;Changes in industrial process, energy efficiency, fuel switching, self-generation, and cogeneration equipment at an aluminium smelting facility.</p>
<p><i>In respect of the proposed new monitoring methodology, evaluate each section of annex 4 to the</i></p>

<p><i>draft CDM PDD. Please provide your comments section by section:</i></p> <p><b>(1) Brief description of new methodology:</b>  <i>Describe new methodology:</i>          &gt;&gt;The method requires the monitoring of all process emissions and emissions from the consumption of fuel used to generate electricity or for transportation of supplies to the plant.</p>
<p><b>(2) Key assumptions/parameters:</b></p> <p><i>a) List the implicit and explicit key assumptions. Identify those, if any, which are problematic and explain:</i>          &gt;&gt;The method assumes that leakage will be largely insignificant in terms of emissions from Transport and fugitive methane emissions from fuel production which are actually not monitored according to the method. It is acknowledged that there is a degree of uncertainty regarding measurements of AEF and AED or AEO, since measurements are dependent on computer scan rates (e.g. long scan rates will yield higher uncertainties). However, statistical error estimates for AEF and AED or AEO should be reported in the PDD and thus indication regarding uncertainty will be identified, however the method does not identify what should be done if there is a high degree of uncertainty or risk of statistical error.          The method assumes that aluminium plants will all have internal quality assurance control measure for monitoring. This may however not always be the case, and it would be helpful if the method provided some examples of good practice procedures.</p> <p><i>b) State whether the key assumptions are arrived at in a transparent manner:</i>          &gt;&gt;Assumptions are identified and arrived at in a transparent manner.</p> <p><i>c) Give your expert judgement on whether the assumptions/parameters are adequate:</i>          &gt;&gt;With the exception of the issue of quality assurance and control measures, the assumptions and parameter are adequate.</p>
<p><b>(3) Data sources and data quality:</b></p> <p><i>a) Indicate which data sources are used and how the data are obtained (e.g. official statistics, expert judgement):</i>          &gt;&gt;As in the baseline method</p> <p><i>b) Give your expert judgement on whether the data used are adequate, consistent, accurate and reliable:</i>          &gt;&gt;The data are adequate, consistent, accurate and reliable.</p> <p><i>c) State possible data gaps:</i>          &gt;&gt; Useful to include more information regarding quality assurance and quality control procedures.</p>
<p><b>(4) Assessment of the description of the proposed methodology and its applicability:</b></p> <p><i>a) State whether the proposed methodology has been described in an adequate manner:</i>          &gt;&gt;The method has been described in an adequate manner.</p> <p><i>b) State whether the proposed methodology is appropriate for the referred proposed project activity and the referred project context (described in Sections A-E of the draft CDM-PDD and submitted along with annex 4):</i>          &gt;&gt;Yes.</p> <p><i>c) State whether this proposed monitoring methodology is compatible with the proposed baseline methodology described in annex 3 of the draft CDM-PDD:</i>          &gt;&gt;Yes, with minor changes this methodology is compatible with the proposed baseline methodology.</p>



**(5) Leakage (please elaborate, if appropriate):**

>>No leakage is associated with reduction in process emissions at an aluminium plant.

One possible source of leakage is in changes in fuel use patterns whereby there is increased fugitive emissions associated with increased fuel use at the industrial site and/or where there are increased energy consumption associated with fuel transport.

Possible leakage is likely to be small in magnitude compared to other emission, and it will be monitored using estimations of fuel consumption within transport

The method also considers leakage of methane emissions from fuel production, which is appropriate and in accordance with the baseline method.

**(6) Quality assurance and control procedures (please explain):**

>>The method assumes that aluminium plants will have internal procedures for ensuring that the data will be accurately monitored. It would be useful if possible procedures were outlined in the event that an aluminium plant using this method did not have suitable procedures in place.

**(7) Potential strengths and weaknesses of the proposed monitoring methodology (please explain):**

>>Strength - the method is easy to follow and builds on existing CDM Executive Board approved good practice. Weakness- The method assumes that aluminium plants will have internal procedures for ensuring that the data will be accurately monitored. It would be useful if possible procedures were outlined in the event that an aluminium plant using this method did not have suitable procedures in place.

**(8) Applicability of the proposed methodology across project types and regions (please indicate):**

>>This method is only applicable to aluminium plant retrofit projects. It is applicable to aluminium plants that are either grid connected or have their own generation facilities, for projects that make improvements to smelting where either the prebake technology or Soderberg Technology is utilised. It is also applicable across regions, since it takes into account differences that project developers may experience in accessing data and provides options whilst clearly identifying which data is best.

**(9) Any other comments:**

a) State whether any other source of information (i.e. other than documentation on this proposed methodology available on the UNFCCC CDM web site) has been used by you in evaluating this methodology. If so, please provide specific references:

>>No alternative sources of information have been used.

b) Indicate any further comments:

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Signature of desk reviewer .....

Date: / /

**Information to be completed by the secretariat**

F-CDM-NMEX doc id number

Date when the form was received at UNFCCC secretariat

Date of transmission to the Meth Panel and EB

Date of posting in the UNFCCC CDM web site