CDM: Proposed new methodology expert form (version 03)

(To be used by methodology experts providing desk review for a proposed new methodology)

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Related F-CDM-NM document ID number	NM0068

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.

A. Evaluation of the proposed new methodologies by desk reviewers:

I. Evaluation of the proposed new baseline methodology:

Title of new baseline methodology:>> GHG emission reductions at ALUAR Alumino Argentino (Preferred title by the reviewer: Mitigation of GHG in Aluminium Smelting through Installation of a New Algorithm in the Automatic Control System (ACS))

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

>>Sector Type

ii. Strengths and weaknesses of the methodology:

>>Potential strength

i. It is applicable to a number of mitigation measures (in this case only to improvement in the anode quenching procedure in aluminium smelting process

ii. It is easy to apply

iii. Entails a limited number of parameters that are affected by the project and hence easy to verify the emission reductions

>> Potential weakness

i. Uncertainty in Anode Effect Frequency, Anode Effect Duration, Anode Effect Over-voltage measurements may affect accuracy of emission reduction estimation

ii. Uncertainty in Data Collection system may also affect the accuracy of emission reduction estimates

iii. Calculation of baseline is not clear (or is wrong), this might lead to over or underestimation of the emission reduction

iv. While it is stated that the project implementation will not result in increased Aluminium production, in the calculations of both project emissions and baseline emissions it is clear that Aluminium production will go up over the crediting period, however, the PDD does not explain how will the production increase.

v. The PDD does not explain in adequate details on what will the installation of new algorithm entail (in other works what will be the modification needed, what will be the new gadgets to be put in place, etc).

iii. Any changes needed to improve the methodology:

a. Minor changes:>>Elaboration on QA/QC on how uncertainty in AEF, AED and AEO and data collection is needed

b. Major changes: >>i. Recalculation of baseline emissions

ii. Reconcile the statements on the increase in Aluminium Production used in the calculations of emission reductions

iii. Provide adequate explanations on what physical modification will be undertaken

II. Evaluation of the proposed new monitoring methodology:

Title of new monitoring methodology: >>Changes in industrial process, energy efficiency, fuel switching, cogeneration and self generation equipment at an aluminium smelting facility (Preferred by the reviewer: Monitoring of GHG reduction in Aluminium Smelter - fitted with New Algorithm in the ACS)

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

>>Sector type

ii. Strengths and weaknesses of the methodology:

>>Potential strength

i. Straight forward

ii. Few parameters to be monitored (Current Efficiency (CE), Anode Effect Over voltage, Aluminium production)

>> Potential weakness

i. It is not mentioned how will the measurements be done

ii. Quality Assurance and Quality Control measures of monitored parameters are not elaborated

iii. Any changes needed to improve the methodology:

a. Minor changes:>> Address the above weaknesses

b. Major changes: >>None

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

I. Proposed new baseline methodology *(specify title here):* >>

(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:

>>The most common procedure for the automatic quenching of anode effect consist of tilting or pumping the anode system or lowering it until it touches the metal pad. These methods did not produce satisfactory results at ALUAR's pots and thus they are using manual killing by green poling. A proposed new Algorithm methodology is based on the principle that each pot technology has a characteristic anode-cathode distance in which a wave in the metal-bath interface develops very quickly. In this case the wave is used to produce short-circuits to the anodes, allowing a fast removal of the isolating layer and a replenishment of alumina in the polar volume. The project, therefore, involves the installation of new algorithm in the automatic control system of potlines. This will consequently result in significant reduction of over-voltage of the anode effects, which are responsible for PFC emissions, as well as improvement in energy efficiency.

b) State the approach selected:

>>i. Sector type: The methodology may be applied to different pot technologies

ii. The procedure is based on the work of Navarro et al's published in Light Metal 2003.

ii. The procedure was tested in different pot technologies and resulted in very low values of anode effect over-voltage and duration, a minimum disturbance to anode crust and high success rate, providing a significant reduction on PFC emissions (in other words it has used historical data).

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:

>>This approach in my opinion is most appropriate as it is based on peer reviewed methodology. Also the

idea of testing the procedure on a sample of pot technologies give it a strong basis for success.

(2) Basis for determining the baseline scenario:

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

>>The documentation explains clearly on how the baseline scenario is to be chosen and identified. It basically elaborates the current practices that produces GHG, namely PFC emission from primary smelting due to Anode Effect, CO2 emissions from anode consumption, CO2 emissions from the Na2CO3 consumption, CO2 emissions from the transportation of anode, CO2 emissions from electricity consumption, SF6 emissions from servicing of rectifiers. However, since the last for sources will not change (or will change slightly) by implementing the project they are discounted in the calculations of the baseline scenario.

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

>>The rationale of formulae used lies in the fact that they are based on IPCC 2000 Good Practice Guidance and IAI 2002 Anode Effect Survey Results and Analysis of GHG Emissions Monitoring and Reporting by Aluminium Industry

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?

>>Approved tools for assessing additionality (EB16 Annex 1) have been used. The documentation has provided adequate argument to justify the additionality nature of the project as follows

i. PFC emissions at ALUAR have already exceeded PFC reductions recommended by the voluntary IAI initiative which means ALUAR is not pushed by IAIA initiative to implement the project

ii. The project will not result in increase in Aluminium production and hence there is no economic incentive for carrying out the project (Although as already stated in the emission reduction calculation there is an increase in aluminium production of about 9.5% over the crediting period, this increase is not explained)

iii. There is no Law in Argentina at the moment that requires ALUAR to reduce further the GHG emissions

iv. The project emissions are lower than the baseline emissions

The PDD has adequately discussed the above in form of barriers analysis i.e. economic, technological and institutional barriers

The money required for the implementation of the project is expected from the sale of carbon credits. However, the explanation on the investment envisaged is lacking.

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

>>In my opinion the basis for determining the baseline scenario is appropriate and adequate

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

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

>>In my opinion the methodology has been described in an adequate manner, however, it is recommended that the gaps mentioned above be addressed.

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 this methodology could result in baseline scenario that reasonably represent the

anthropogenic emissions by sources of GHG that would occur in the absence of the proposed project activity

Please explain:

>>In the absence of the project the ALUAR will continue using manual killing of anode effect by green poling, since other methods of automatic quenching of anode effect, according to the PDD, seem not to produce the desired results.

(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):

>>The proposed methodology includes algorithms and generic formula that can be applied to other project activities e.g. it is stated in the PDD that the test has been conducted on different pot technologies. However the PDD is not specific on which pot technologies.

According to PDD the algorithm may also be applied to other process changes, fuel switching, energy efficiency, cogeneration and self generation at an aluminium smelting facility.

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

>>All the data used are local i.e. they are based on ALUAR facility. In my opinion the scope of data is appropriate for this project.

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:

>>The crediting period is set to start 1st March 2005, whereas the AEO and Aluminium production data is available since Jan 2002. The vintage of data therefore will be 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

>>Gases: CF4, C2F6 and CO2

Sources: Anode Effect (PFC); Anode Consumption (CO2)

ii) Physical delineation

>>The project boundary is the physical, geographical site of the potlines A and B at the ALUAR aluminium smelting plant.

b) Indicate whether this project boundary is appropriate:

>>The project boundary is appropriate since the target emission reductions are those from Anode Effect and Anode Consumption only.

(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:

>>i. In the absence of carbon finance the company would continue operating its plant with current control system without modification

ii. Since there is no IPCC guidance on Over-voltage Coefficient for Point Feed Prebake (PFPB) technology, that of Bar Broken Centre Work Prebake (CWPB) (1.9 kgPFC/tAl)/(mV/cell.day) is assumed to be adequate for the latter.

iii. Ex ante CF4 and C2F6 emission factors will remain constant throughout the project activity

iv. Emissions from CO2 from Na2CO3, transport, electricity consumption and SF6 emissions will not be

affected by the project and hence will not be monitored

v. Source of data is mainly from onsite measurements at ALUAR and IPCC default emission factors

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

>>Yes the assumptions are arrived at a transparent manner

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

>>The assumptions are adequate it will be desired to monitor Over voltage Coefficient to validate the assumption

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

>>i. Current Efficiency (CE) and Aluminium Production and these will be measured at the plant

ii. IPCC default emission factors EF(CF4) and EF(C2F6) will be used

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

>>Since the project intends to minimise PFC emissions as a result of Anode Effect and CO2 emissions from Anode Consumption only, the data used are adequate, consistent and reliable.

f) State possible data gaps:

>>None

(7) Assessment of uncertainties:

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

i) The basis for determining the baseline scenario:

>>i. PFC emissions: AEO is based on two year averages with 396 cells working all days with three shifts per day (i.e. 24 hour operation). The value has a confidence interval of 95%.

ii. Other emissions e.g. from Na2CO3, Transport, Electricity consumption and SF6 blanketing are all demonstrated to be small and hence low uncertainty is introduced by discounting them

ii) Algorithms/formulae:

>>IPCC Good Practice Guidance has been used. Two alternatives are considered i) technology based slope and ii) Pechiney Over voltage Method. Of the two Pechiney Over Voltage Method was considered to be more accurate. This may be considered to have reduced uncertainty in choice of formulae.

iii) Key assumptions:

>>Although there is no specific uncertainties assessment the calculations provided to demonstrate the magnitude of the parameters that have been discounted. This may have reduced uncertainties.

iv) Data:

>>No uncertainties assessment: Only a mention that uncertainty level of data is low which is attributed to the presence of a series of internal procedures that ensures data have low uncertainties during monitoring process.

b) State whether the uncertainties presented are reasonable:

>>Analysis on uncertainties on data need to be provided for transparency purposes.

(8) Leakage:

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

>>There is no envisaged leakage from the project

b) Indicate whether the treatment for leakage is appropriate and adequate:

>>Yes

(9) Transparency and "conservativeness":

a) Indicate whether the baseline methodology was developed in a transparent way:

>>In most cases the baseline methodology has been developed in a transparent way. However, the calculations of GHG emissions seem to be incorrect unless there is missing information. For example Application of Equations 12 - 14 to calculate Baseline emission seem not to give results tabulated in Tables E4. To be specific EF(CF4)*GWP(CF4) = 0.063*6500 = 409.5; EF(C2F6)*GWP(C2F6) = 0.0063*9200 = 57.96; Application of Equation 12 on year 2005 where P(Al) = 196,300 (tAl/year) [also note the units in Column 2 of Table of PFC are wrong instead of per year it is written per month]. (409.5 + 57.96)*196,300/1000 = 91,762 (tCO2e/year) a difference of 294 (tCO2e/year). When applied to the entire crediting period this is a significant overestimation of carbon emission.

b) State whether the baseline methodology is conservative:

>>By discounting emission reductions that may be directly attributed to the project such as those from energy saving of about 1,392 mWh/year, the baseline methodology may be considered conservative

(10) Potential strengths and weaknesses of the proposed baseline methodology *(please explain)***:**

>>i. Straight forward: The calculations are based on recommended formulae by IPCC. The calculations can even be made by using a simple calculator. Besides most of the data needed are already collected routinely at LUAR.

ii. Few parameters to be monitored (Current Efficiency (CE), Anode Effect Over voltage, Aluminium production) and archived. Verification of emission reduction will be straightforward since simple spreadsheets could be used to monitor the needed parameters.

(11) Other considerations, such as a description of how national and/or sectoral policies and circumstances have been taken into account *(please explain)***:**

>>There are no explicit explanation provided on how national circumstances have been taken into account

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

>>The proposed methodology may be applied to pot technologies and other activities that may reduce GHG emissions in aluminium smelting. This has been explained earlier.

(13) 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:

>>Cross reference with IPCC 2000 Good Practice Guidance

b) Indicate any further comments:

>>

II. Proposed new monitoring methodology ***(specify title here):*** **>>**Monitoring of GHG emission resulting from Changes in industrial process, energy efficiency, fuel switching, cogeneration and self generation equipment at an aluminium smelting facility (Preferred by the reviewer: Monitoring of GHG Reduction in Aluminium Smelter - fitted with New Algorithm in the ACS)

In respect of the proposed new monitoring methodology, evaluate each section of annex 4 to the draft CDM PDD. Please provide your comments section by section:

(1) Brief description of new methodology:

Describe new methodology:

>>The methodology include monitoring of

i. Current Efficiency of aluminium production process

ii. Anode Effect-Over voltage

iii. Aluminium Production

And using appropriate formulae to calculate Emission Reduction both for project and baseline scenarios. The methodology is applied through a spreadsheet model .

(2) Key assumptions/parameters:

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

>>i. Over-voltage for Point Feed Prebake (PFPB) is 1.9 (kgPFC/tAl)/(mV/cell.day)

ii. Ex post project CF4 and C2F6 emission factors will remain constant throughout the project activity

iii. Emissions from CO2 from Na2CO3, transport, electricity consumption and SF6 emissions will not be affected by the project and hence will not be monitored

iv. The project will not result in an increase in aluminium production

It is not clear however, why the aluminium production is expected to increase from 196,300 to 215,000 tAl/year over the crediting period.

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

>>Yes

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

>>In my opinion the assumptions are adequate

(3) Data sources and data quality:

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

>>i. All needed data will be locally measured from the aluminium smelter

ii. IPCC default values will be used

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

>>The data used is adequate, consistent and accurate. However, to ensure reliability it is recommended that QA/QC analysis is elaborated in the PDD and followed during the monitoring and verification

c) S*tate possible data gaps:*

>> None

(4) Assessment of the description of the proposed methodology and its applicability:

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

>>The description given is adequate

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):

>>The proposed monitoring methodology is appropriate for the referred proposed project

c) State whether this proposed monitoring methodology is compatible with the proposed baseline methodology described in annex 3 of the draft CDM-PDD:

>>The monitoring methodology is compatible with the proposed baseline methodology described in above. However, as for the Baseline emission calculations, application of equations 2 and 10 do not seem to give values reported in tables E1 [Again the units in the second column, for aluminium production, are wrong]

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

>>No leakage is envisaged

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

>>It is stated that ALUAR has a series of internal procedures that ensures data have low uncertainties during monitoring. However, for transparency and easy verification specific provisions for QA/QC relevant to the project need to be presented in the PDD.

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

>>Strengths: 1. It requires few parameters to be monitored and archived 2. It uses simple spreadsheet to calculate emission reduction.

>> Weakness1. The methodology has not tested

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

>>Yes the methodology may be applied to different pot technologies, and industrial process and activities that are aimed at reducing GHG emissions from aluminium smelting.

(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:

>>None

b) Indicate any further comments:

>>None

Signature of desk reviewer  ……..

Date: 17 /12 /2004

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