CLEAN DEVELOPMENT MECHANISM
PROPOSED NEW METHODOLOGY: MONITORING (CDM-NMM)
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CONTENTS

SECTION A. Identification of methodology

A.1. Title of the proposed methodology:

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Monitoring methodology for the production of sugar cane based bio-ethanol for transportation use.

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

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Transport

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

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The monitoring methodology is to be used in conjunction with the proposed baseline methodology: Baseline methodology for the production of sugar cane based bio-ethanol for transportation use.

The specific applicability for the baseline methodology that is relevant to the monitoring methodology is: It can be readily verified that the bio-ethanol will be used as a transportation fuel within the relevant national market.

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

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The strengths of the methodology are its simplicity and ease of application. Its application is directly related to the baseline methodology outlined above, and it shares the strengths and weaknesses of the baseline methodology. Use of a life-cycle approach to emissions covers all potential emission sources but requires the use of external independent data.

SECTION B. Proposed new monitoring methodology

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The baseline methodology to which this monitoring methodology is allied provides fixed factors for both baseline and project emissions and thus derives a net emission reduction co-efficient per litre of bio-ethanol produced and used as transportation fuel. Total emission reductions are calculated as bio-ethanol production used as transportation fuel multiplied by the net emission reduction coefficient minus (if required) any emissions associated with the transport of the bio-ethanol from the distillery to the place of blending distribution.

Given that the baseline methodology outlines the baseline, project and net emission reduction coefficients, the monitoring methodology could be restricted to monitoring only the bio-ethanol production at the project activity site that is used as transportation fuel and emissions associated with the transport of the bio-ethanol from the distillery to the place of blending/distribution. However we have included the fixed coefficients in the monitoring in case further studies become available on the lifecycle emissions from the production of bio-ethanol from sugar cane or the lifecycle emissions of gasoline. We do not envisage changing the ex-ante fixed coefficients within a crediting period, but monitoring of studies and developments will allow these to be considered at renewal of a crediting period.

This monitoring methodology estimates "adjusted" baseline emissions (from the net emission reduction coefficient) and "partial" project emissions (those associated with the transport of bio-ethanol from the distillery to the place of blending/distribution). Option 1 is thus followed below, as this most closely resembles the actual monitoring process.

B.1. Brief description of the new methodology:

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The methodology is designed for projects utilising the baseline methodology: Baseline methodology for the production of sugar cane based bio-ethanol for transportation. Projects must therefore have satisfied the applicability conditions for that methodology. The key condition in relation to the monitoring methodology is that it can be readily verified that the bio-ethanol will be used as a transportation fuel within the relevant national market.

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

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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 D_y	*Distance*	*Proprietary data*	*km*	*e*	*Annual*	*100%*	*Electronic*	*Distance is measured if the contract is for delivered bio-ethanol by the project activity and will be estimated if the project activity has a factory gate contract.*
2 FE	*Fuel efficiency*	*Manufacturer's data*	*km/l*	*m*	*Annual*	*100%*	*Electronic*	*This will be taken from vehicle records.*

3 CEF_t	*Carbon emission factor*	*IPCC*	*CO_2/l*	*m*	*Annual*	*100%*	*Electronic*	
4 TEC_y	*Operator*	*Determined from evaluation of gasoline supply at blending/ distribution points*	*0/1*	*c*	*Annual*	*100%*	*Electronic*	*If value is set to 1 then transport emissions are calculated, if it is set to zero then transport emissions do not apply.*
5 EFP_y	*Carbon emission factor*	*Macedo et al study*	*tCO_2e/l*	*Constant*	*Annual*	*100%*	*Electronic*	*This data represents the project emissions constant in the baseline methodology. It will be monitored annually as a check against new studies on project emissions.*

B.2.2. Description of formulae used to estimate project emissions (for each gas, source, formulae/algorithm, emissions units of CO_2 equ.):

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$$TE_y = \frac{D_y}{FE}.CEF_t.TEC_y \qquad (1)$$

Where:

TE_y = Additional emissions from the transportation of bio-ethanol to the blend/distribution location, tCO_2e

D_y = Distance travelled by transporters in year y, km

FE = Fuel efficiency of transporter, km/l

CEF_t = CO_2 emissions factor, tCO_2/l

TEC_y = whether the calculation of transport emissions required

B.2.3. Relevant data necessary for determining the baseline 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
6 BFP_y	*Volume quantity*	*Factory records Purchaser records*	*l*	*M*	*Annual*	*100%*	*Electronic*	*The verifier must obtain confirmation from the buyer that the fuel has been used in transportation*
7 EFB_y	*Carbon emission factor*	*LBST study*	*tCO_2e/l*	*Constant*	*Annual*	*100%*	*Electronic*	*The data represents the baseline emissions constant in the baseline methodology. It will be monitored annually as a check against new studies on baseline emissions.*

B.2.4. Description of formulae used to estimate baseline emissions (for each gas, source, formulae/algorithm, emissions units of CO_2 equ.):

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$$BE = BFP_y . NEF_y \quad (2)$$

BE = "Adjusted" baseline emissions
BFP_y = Bio-ethanol production and sale for use in transportation, l
NEF_y = Net emissions reduction coefficient, tCO_2e/l

Where:

$$NEF_y = EFB_y - EFP_{y\,y} \quad (3)$$

Where:

NEF_y = Net emissions reduction coefficient, tCO_2e/l
EFB_y = Baseline lifecycle emissions coefficient, tCO_2e/l
EFP_y = Project lifecycle emissions coefficient, tCO_2e/l

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

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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

B.3.2. Description of formulae used to calculate project emissions (for each gas, source, formulae/algorithm, emissions units of CO_2 equ.):

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

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Given the wide project boundary and associated life-cycle approach to emissions taken, leakage is not envisaged.

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

B.4.2. Description of formulae used to estimate leakage (for each gas, source, formulae/algorithm, emissions units of CO_2 equ.):

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B.5. Description of formulae used to estimate emission reductions for the project activity (for each gas, source, formulae/algorithm, emissions units of CO_2 equ.):

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$$CER_y = BFP_y . NEF_y - TE_y \qquad (3)$$

Where:

BFP_y = Bio-fuel production and sale for use in transportation, l

NEF_y = Net emissions reduction coefficient, tCO_2e/l

TE_y = Additional emissions from the transportation of bio-ethanol to the blend/distribution location, tCO_2e

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

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The key assumption is the use of externally sourced lifecycle emissions data for gasoline and sugar cane based bio-ethanol. It is from these data that the net emission reduction coefficient (NEF) is derived.

The IPCC figure is taken for the fuel used in the transportation of bio-ethanol to the blend/distribution location (CEF_t in equation 3).

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.
1	*Low*	*This data can be checked by confirming the location of delivery through receipts or from haulage company records.*
2	*Low*	*This data will be sourced directly from the manufacturer, so is not considered to require QC/QA*
3	*Low*	*IPPC data. No QC/QA*
4	*N/A*	*Qualitative data. No QC/QA*
5	*Low*	*This will be checked against new studies as and when they become available.*
6	*Low*	*This data may be checked against financial receipts.*
7	*Low*	*This will be checked against new studies as and when they become available.*

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

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No

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