CDM: Proposed new methodology expert form (version 03)

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

Name of expert responsible for completing and submitting this form	Jürg M. Grütter
Related F-CDM-NM document ID number	NM 082

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:>>Production of sugar cane based bio-ethanol for transportation use

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

>>applicable to all countries and regions with projects to blend ethanol with gasoline for usage in the domestic transport market going beyond mandatory blending requirements; no specific data requirements

ii. Strengths and weaknesses of the methodology:

>>Strengths: Simple, straightforward, no data requirements

Weaknesses:

1. Using literature for life-cycle emissions for gasoline needs a more comprehensive approach to ensure conservatism and to ensure credibility of data used

2. Using literature for ethanol life-cycle emissions is not applicable as emissions depend very much on national/regional/local circumstances such as sugar-cane production type, bagasse usage, fertilizers used etc etc. A benchmark from a study can not be used as variations are very large. If literature would be used then a transparent process showing clearly the conservatism of the study would be required.

3. The differing energy contents of ethanol and gasoline are not taken into account

4. The attribution of emission reductions to the producer and not the user of ethanol is unclear. Double counting can thus potentially occur.

5. Leakage is not taken into account. The major leakage problem is change of land-usage due to increased sugar-cane production as result of the project activities.

6. Lack of transparency why specifically the 2 studies selected should be the most appropriate to provide the data.

iii. Any changes needed to improve the methodology:

a. Minor changes :>>1. Include other life-cycle assessments for gasoline emissions and relate these to the gasoline type valid in the country (including projections of future fuel specifications). 2. Take the lower energy content of ethanol into account and adapt the corresponding formulae leading to a significantly smaller difference between GHG emissions of gasoline and ethanol than proposed in the methodology. 3. Include in the methodology the approach of selection and determination of the most appropriate study.

b. Major changes: >>1. Realize a life-cycle assessment of ethanol-emissions for the

specific project. The methodology recommended would require individual life-cycle assessments per project site. World-wide emission values are not valid as large differences exist according to site-specific production elements. 2. Include leakage due to land-use change as direct or indirect consequence of additional sugar-cane production provoked by the project. 3. Include in the methodology a condition that ethanol-blending is realized with gasoline and that clients will be offered only the blended gasoline. If this condition is not fulfilled then the owner of the GHG reductions by using ethanol fuel would be the fuel user and not the fuel producer as the consumer could choose to use e.g. gasoline, gasoline-ethanol blends or even pure ethanol and could claim that he is the agent of change and thus the owner of emission reductions. This would be the same position as e.g. fuel-switch projects (e.g. usage of LPG instead of gasoline) where emission reductions have to the moment in all cases been allocated to the fuel user and not the fuel supplier. The production constraint criteria given by the project developer is not relevant in this aspect as it does not identify the change agent.

II. Evaluation of the proposed new monitoring methodology:

Title of new monitoring methodology: >>Production of sugar cane based bio-ethanol for transportation use

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

>>applicable to all countries and regions with projects to blend ethanol with gasoline for usage in the domestic transport market going beyond mandatory blending requirements; no specific data requirements

ii. Strengths and weaknesses of the methodology:

>>Methodology is in line with the baseline proposed. With the baseline methodology proposed no major monitoring is required. However the proposed baseline meth is flawed and not acceptable.

Strength: simple

Weaknesses:

1. Problems of baseline methodology (fixed factors instead of measurements)

2. Lack of monitoring of domestic vs. export usage of ethanol

3. lack of monitoring of usage as gasoline blend for transport usage

4. Lack of leakage monitoring

iii. Any changes needed to improve the methodology:

a. Minor changes:>>

b. Major changes: >>1. See problems of fixed factors and leakage in baseline methodology 2. Monitor domestic usage of ethanol blend as transportation fuel

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

I. Proposed new baseline methodology *(specify title here):* >>Production of sugar cane based bio-ethanol for transportation use

(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 general approach of the methodology determines baseline emissions based on the existing and historical fuel mix based on a life-cycle calculation. The calculation of baseline emissions is based on literature sources. Emissions avoided are based on calculations of life-cycle emissions of bio-ethanol production, again based on literature sources. The methodology is based on arguments of a supply-

constrained market in ethanol transport-fuels and complete usage of ethanol produced for domestic transport purposes. Emission reductions are calculated based on the difference of life-cycle CO2 emissions from gasoline and ethanol.

b) State the approach selected:

*>>*according to document b; in reality however approach a is used as the baseline emissions are calculated based on existing historical or actual emissions

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 baseline approach chosen is mistaken. The baseline approach should use Para 48a approach based on historical or actual emissions. The ethanol producer does not evaluate different economically attractive courses of action in choosing a certain fuel e.g. diesel, gasoline, bio diesel, ethanol, CNG, LPG, hydrogen etc. The actor which could choose from such different economically attractive courses of action are governments (they differentiate e.g. fuel taxes according to their preferences) or fuel-production companies engaged in different fuels. For an ethanol production facility however the different economically attractive courses of action are either sugar production, ethanol production or production of other agricultural goods. The relation would thus have to be made with these alternatives and not with the alternative of gasoline. For additionality purposes the methodology is based on a comparison of investment alternatives which might have led to the confusion of the baseline approach.

While the document states that approach "b" has been chosen in reality however approach a has been taken. This is the appropriate approach.

(2) Basis for determining the baseline scenario:

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

*>>*yes

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

*>>*lifecycle-emissions of gasoline vs. those of bio-ethanol. The methodology allows users to calculate own lifecycle-emissions or use such of literature. It suggests using life-cycle emissions of specific publications for gasoline and for ethanol. Transport from refineries is only included if the distribution of gasoline does not involve the transport of fuel to a distribution local. The algorithm for calculating transport emissions is based on estimated distances and IPCC factors for CO2 emissions of trucks used. Volumes of gasoline and ethanol are compared.

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?

*>>*yes; Usage of "Draft consolidated tools for demonstration of additionality provided by the Meth Panel"

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

*>>*Additionality: Yes

Baseline: No

1. The methodology includes a "production-constrained" ethanol market. This is based on the current gasoline consumption levels and a technical ceiling "commonly" applied of 20%. If ethanol production levels are below these 20% then we have - in the view of the authors - a supply constrained system. The ceiling of 20% is however arbitrary. In Europe many producers only guarantee ethanol blends up to 10%. A technical level is not necessarily a level accepted commonly by car producers. The ceiling might thus be much lower e.g. at 5 or 10%. Also ceilings may arise from non-acceptance of the product from customers. In practice the relevance of having a so-called supply-restrained market is unclear. If baseline emissions are gasoline and ethanol reduces GHG emissions then higher levels of blends will always have a positive impact, independent of a ceiling.

2. The real problem is however who the owner of the benefits is. This is not solved with the production-constrained approach. Car users or fleet owners may choose to buy ethanol blends instead of conventional gasoline just like they choose between CNG and gasoline/diesel. Car owners have potentially certain disadvantages using ethanol and can choose between fuels. It is thus highly questionable if the fuel producer should be the owner of emission reduction credits and not the fuel user. In the case of fuel-switch projects to the moment credits have always been given to the user e.g. changing from coal to gas and not to the producer. To be able to accrue the reduction benefits to the producer and to avoid double-counting of reductions the methodology must thus specify clearly that consumers cannot have options to choose from. Gasoline is simply blended with ethanol by the user. If both types of fuels are however on the market the owner of reduction credits would need to be the buyer who takes the decision, pays potentially a higher price and takes potential risks (e.g. malfunctioning of car, guarantee waiver etc)

3. Literature results can be used for gasoline lifecycle emissions as variations between sources are very small. The methodology would need to include however at least some indications on how to get to a conservative estimate. For example: The data used in the proposed study (GM et al) refers basically to fuels used in industrialized countries with low sulphur levels. The production of low-sulphur fuels entails however in general higher lifecycle CO2 emissions than the production of high-level sulphur fuels typically used in developing countries, thus inflating potentially the baseline emissions of gasoline. Also European fuels include as octane-enhancer

MTBE while lead is still used in many developing countries. Latter leads to slightly lower GHG life-cycle emissions. This is not reflected in the methodology proposed.

4. Literature results can NOT be used of ethanol production as life-cycle emissions vary very significantly from source to source depending basically on type of plants used, agricultural production methods, farm sizes and transport distances farms to production and usage facilities and fertilizers used. Also lifecycle emissions depend on the usage of residuals e.g. for co-generation. The suggested Macedo study might be appropriate for certain production facilities in Brazil - however various factors such as usage of bagasse, usage of fertilizers including their N2O emissions also in the production of latter are not necessarily the same in other countries. Other reviews show higher lifecycle-emissions of ethanol thus questioning if this approach is conservative.

5. 1 litre (volume) of gasoline and ethanol are compared when calculating baseline vs. project emissions. The energy contents of the 2 fuels is however different. Gasoline has around 57MJ/l while ethanol 34 MJ/l. 1 litre of gasoline is thus in energy contents about equivalent to 1.5 litres of ethanol. This means to substitute the energy content of 1 litre gasoline (AND ONLY THE ENERGY CONTENT IS RELEVANT NOT THE VOLUME) we will need 1.5 litre of ethanol. The formula must be based on energy content and not on volume as currently in the methodology. This has been falsely neglected in the methodology thus overstating grossly the GHG reductions. (N.B. If high-level blends of ethanol are used then motors can be optimized to the higher octane thus reducing energy usage. In low-level blends this plus-point cannot be used. The energy saving is however in the order of 5% for 85% blends while the additional fuel (volume) usage is in the order of 50%. Authors of the methodology obviously make confusion between energy and volume contents of fuels).

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

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

*>>*yes

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):

*>>*no see (2); Main problems:

- Methodology not appropriate to identify ownership of reduction credits

- Baseline methodology used based on life-cycle calculations derived from literature not applicable and not conservative

- Methodological/algorithm errors considering comparison of ethanol with gasoline

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.

*>>*baseline emissions (gasoline) yes; ; project emissions: No

Please explain:

*>>*Baseline emissions are gasoline related. The methodology should state that only ethanol-gasoline blends are accounted for as ethanol may also be sold as pure fuel or as diesel-blend.

(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

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

appropriate:

>>Life-cycle is appropriate: however for project emissions the emissions need to be based on calculations for the project site and not on literature

- energy contents of fuel needs to be included in formulae

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:

>>yes

(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 GHG acc. to KP

ii) Physical delineation

>>life-cycle emissions

b) Indicate whether this project boundary is appropriate:

>>appropriate; if using life-cycle studies for the project region then the physical delineation would not only be the production plant but would include the sugar-cane growing sites

(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:

>>1. Production constraint implying that emission reductions accrue to ethanol producer

1a: Clients cannot choose between fuels (ethanol-gasoline blends; implicit assumption)

2. Ethanol is used nationally

3. Ethanol is used for transportation

4. Ethanol is used as gasoline-blend (implicit assumption)

5. Constant life-cycle emissions gasoline

6. Constant life-cycle emissions ethanol

7. Life-cycle emissions from literature for gasoline are appropriate and conservative

8. Life-cycle emissions from literature for ethanol are appropriate and conservative

9. No leakage occurs

10. 1 litre of gasoline is equivalent to 1 litre ethanol

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:

>>1. Non relevant. Relevant would be is blending is made without offering clients a choice of fuels. This has not been included in the methodology. 1a. would be relevant

2. Critical and needs to be controlled. If ethanol is exported to Annex B countries latter can use them to reduce their KP obligations. Double-counting would thus occur.

3. Critical and needs to be controlled ethanol can also be used to substitute other fuel usages with other emission factors

4. Important factor which needs to be assessed. Ethanol diesel blends are also on the market. The emission factor of diesel is however different from gasoline. Ethanol can also be used as pure fuel. The emission factor would then be dependent on which type of fuel would be replaced (e.g. CNG, LPG, diesel etc)

5 and 6: OK if sugarcane-production method remains constant i.e. needs to be monitored. But assumption upfront of being constant is OK

7.OK - however questionable if conservative: see point 2 (due to different sulphur levels in Europe); differences are however probably minor

8. Very critical: Assumption is not appropriate and not conservative (see point 2)

9. Critical: Assumption is problematic (see point 8)

10. Critical: assumption that energy contents of ethanol and gasoline is equivalent is erroneous.

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

>>Data sources for life-cycle emissions; For gasoline OK but needs to be corroborated with other estimates especially for sulphur/MTBE/lead levels comparable to project site to ascertain if levels are conservative. For ethanol a project site relevant life-cycle assessment needs to be realized. The literature source cited is not relevant for the project site and cannot be used as overall benchmark.

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

>>Data non reliable for life-cycle emissions ethanol

f) State possible data gaps:

>>Project site related life-cycle ethanol study required

(7) Assessment of uncertainties:

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

i) The basis for determining the baseline scenario:

>>yes

ii) Algorithms/formulae:

>>yes

iii) Key assumptions:

>>yes

iv) Data:

>>yes

b) State whether the uncertainties presented are reasonable:

>>The magnitude of uncertainties is not reflected in the project document

(8) Leakage:

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

>>not addressed

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

>>Leakage is considered to be included having a life-cycle approach. This is not the fact. The major potential leakage which needs to be addressed is that sugarcane production might lead to land-use changes including the deforestation of forests. Increased production of biofuels may directly lead to deforestation or indirectly through a reduced quantity of land available for traditional crops thus increasing the pressure on non-agricultural land. Land-use changes (e.g. from forests to sugar-cane) change the carbon-storage balance. Additional leakage might occur if large quantities of subsidized ethanol (ethanol potentially pays no fuel taxes and thus receives an indirect subsidy) lead to lower fuel prices and therefore increased transport activities. For smaller production facilities and for production costs not significantly lower than gasoline this element could however be waived.

(9) Transparency and "conservativeness":

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

>>partially; it is not transparent why exactly the two cited studies are used as data-source

b) State whether the baseline methodology is conservative:

>>no, see life-cycle emissions (high ones for baseline, low ones for project activities thus not being conservative)

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

>>Strengths: Simple, straightforward

Weaknesses:

- Using literature for life-cycle emissions for gasoline needs a more comprehensive approach to ensure conservatism and to ensure credibility of data used

- Using literature for ethanol life-cycle emissions is not applicable as emissions depend very much on national/regional/local circumstances such as sugar-cane production type, bagasse usage, fertilizers used etc etc. A benchmark from a study can not be used as variations are very large. If literature would be used then a transparent process showing clearly the conservatism of the study would be required.

- The differing energy contents of ethanol and gasoline are not taken into account

- The attribution of emission reductions to the producer and not the user of ethanol is unclear.

- Leakage is not taken into account

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

>>The methodology takes into account if the country has an enforced mandate to use ethanol for transport.

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

>>applicable for all regions

(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:

>>Review of life-cycle studies ethanol (e.g. Ecobilan, 2002; Ardonne 1999; EPFL, 2002; EC 2000; IEA, 2004;FVV, 2004; Vagverket 2001

b) Indicate any further comments:

>>

II. Proposed new monitoring methodology *(specify title here):* >>Production of sugar-cane based bio-ethanol for transportation use

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 proposed methodology is derived from the baseline methodology which establishes fixed factors concerning project as well as baseline emissions. The only monitored data is the fuel production and eventual additional fuel transport emissions. Additionally the methodology proposes to review the literature on life-cycle emissions. However these factors will only be monitored to have data for new crediting periods. It is also not mentioned how such monitoring of new data shall take place on a systematic place. They are thus not valid for the current crediting period and not further considered.

(2) Key assumptions/parameters:

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

>>1. Key factors are constant (project and baseline emissions per litre of ethanol and gasoline). This is an element of the baseline methodology and has thus already been discussed in the baseline part.

2. Usage of ethanol domestically (implicit)

3. Usage of ethanol for gasoline blends (implicit)

4. Usage of ethanol for transportation

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:

>>1. See baseline discussion

2. Not monitored. Needs to be monitored to avoid double-counting (e.g. if ethanol is exported by the buyer to Annex B countries)

3. Needs to be monitored as has an influence on emission factors

4. Needs to be monitored as other usage may occur with different emission factors. The monitoring methodology has included this as comment. This very important aspect requires however concrete and verifiable proof of buyers over quantity of blends sold domestically with the corresponding traceability to avoid double-counting (e.g. 5 ethanol projects selling the same distributor but latter exports 40% and only uses a part for the domestic market: How can each individual project ensure that the ethanol it has produced has been used domestically?)

(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):

>>only producer records

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

>>inadequate especially considering the usage of ethanol in the domestic market for transportation usage

c) S*tate possible data gaps:*

>> gaps are:

1. usage of ethanol domestically

2. usage of ethanol for transportation

3. leakage monitoring

(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:

>>yes

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):

>>no; see problems of the baseline methodology; additional lack of monitoring of key aspects related to the domestic usage of ethanol blends for the transportation market

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

>>partially with exception of monitoring the usage for the domestic transport market

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

>>not included but should be included (see baseline)

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

>>OK

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

>>Strength: simple

Weaknesses:

1. Problems of baseline methodology (fixed factors instead of measurements)
2. Lack of monitoring of domestic vs. export usage of ethanol
3. lack of monitoring of usage as gasoline blend for transport usage
4. Lack of leakage monitoring

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

>>potentially all countries which use ethanol blends above mandatory levels

(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

b) Indicate any further comments:

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Signature of desk reviewer

Date: 16/12 /2004

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	