



**CDM: Proposed new methodology expert form
(version 04)**
(To be used by methodology experts providing desk review for a proposed new methodology)

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| Name of expert responsible for completing and submitting this form | Deepak Mawandia |
| Related F-CDM-NM document ID number | NM 108 : 30 TPD Biodiesel CDM project in Andhra Pradesh, India |

Note to those completing this form, as applicable: Please provide recommendations on the proposed new baseline and monitoring methodologies based on an assessment of CDM-NMB and CDM-NMM 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:>> Biodiesel production and switching fossil fuels from petro-diesel to bio diesel in (the) transport sector - 30 TPD Biodiesel CDM project in Andhra Pradesh, India.

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

>> **Project Type** : This methodology is applicable to projects that involve a voluntary partial / complete substitution of liquid fossil fuel with bio diesel in the transport sector.

Region : The methodology should be relevant & applicable to regions across the world, provided the country does not have local legislations requiring a mandatory shift to bio-diesel / fuel and the baseline is petro diesel based i.e. fuel switch to LNG, LPG etc. is not a viable alternative.

Others : The entire production volume is consumed in the country of origin / another non annex 1 country with similar regulatory and operating environment. There is no incidence of 'leakage' to a non similar country.

- ii. Strengths and weaknesses of the methodology:

>> **Strengths** : Clearly structured, the methodology is simple and easy to use.

The proposed use of IPCC data as applicable to European diesel vehicles is conservative.

The decision not to account for emissions reduction on account of a possible increase in sequestering due to plantation related activities is conservative.

Weakness:

(1) Whereas the methodology does touch upon the issue of GHG emissions on account of the change in land use, it does address the issue of additional GHG emissions on account of the disposal of the cleared biomass - i.e. emissions on account of open field burning / land fill etc.

(2) Given the fact that a lot of cities/regions in India are witnessing an increase in CNG / LPG fuelled vehicles, I am not entirely convinced by the argument that " development of other alternative fuels such as CNG, LNG and LPG are not realistic and credible baselines for the project activity" , especially when one considers the recent gas finds in India, the new LNG terminals that are being developed and the fact that the judiciary in India is getting increasingly active on the issue of vehicular air pollution. The same holds true for the use of Fuel Ethanol. The market for fuel ethanol has not caught on as yet partially due to supply and pricing related issues (as well as competition from the manufacturers of potable alcohol for the molasses). With increases in the prices of petroleum products, it would not be fair to write off fuel ethanol as a possible alternative. In view of the same, suitable provisions should be incorporated to comprehensively confirm, on an annual basis that a material shift to alternative fuel options warranting a baseline

revision, has not occurred .

(3) In my opinion, maintaining a less than 20% bio diesel blend will be a very challenging task, especially when considers the ground realities in the target market. Accordingly, the assumption that the use of bio diesel will not have any significant impact on the 'performance' / efficiency of the engine may not be entirely accurate.

Being a new technology and given the fact that the engine types in the target Indian market would in all probability be different as compared to the other markets where biodiesel is being widely used. I am of the opinion that it will be very difficult to establish the changes in 'engine efficiency' and thus the "efficiency multiplier of petro diesel' on account of bio diesel usage.

I find it difficult to visualise how the required data (fuel consumption, mileage etc.) is going to be reliably collected from the vast number of vehicles that will be using the blended fuel. This in my opinion, is one of the key challenges for the development of this methodology.

(4) Whereas at the current prices, we are not witnessing a significant shift to bio fuel (i.e. without regulatory requirements/subsidies), increase in prices of petroleum beyond a point will significantly hasten the shift to bio-fuels, including bio-diesel.

In view of the same, it may be desirable to provide details establishing the 'gap' between the final delivery cost of bio diesel to the customer and the corresponding cost of petro diesel that it seeks to substitute.

It may also be desirable to present a detailed analysis on value gap (in terms of \$\$) that is bridged due to CDM registration. This will also help in establishing the point of inflexion, i.e. the price of petro diesel beyond which the use of bio diesel becomes economically attractive and thus perhaps the baseline scenario.

(5) The methodology, while touching upon the issue, does not suitably address the fact that the bio diesel could also be used in stationery power generation engines.

(6) GHG emissions (if any) on account of the waste water/effluent treatment needs to be addressed.

(7) My understanding of the steps involved in the whole process chain is (a) Jatropha Plantation; (b) Seed harvesting; (c) Use of mechanical expellers to extract the oil; (d) The extracted oil is then treated in the project setup to produce bio diesel.

Possibility of GHG emissions on account of the use of energy to run the mechanical expellers and the disposal of the 'expeller' waste should be explored and if significant be accounted for.

iii. Any changes needed to improve the methodology:

a. Minor changes:>> (a) Assuming that the Bio-diesel is an ideal substitute for Perto Diesel (at a < 20% blend), without significant impact on the performance of the engine, the primary driver for the acceptance of the product by the market would be:

- (i) Cost - in comparison to petro-diesel and
- (ii) availability;

In view of the same, it would be desirable if a cost (including selling price) comparison table of the proposed product vis-à-vis traditional petro diesel was included in the PDD. This would assist in assessing the impact of project's registration under the CDM on its viability and further enhance the integrity of the project document.

(b) Details of the various grants / subsidies (if any), be it in cash or kind (land allocation, tax breaks etc) should be included in the PDD, along with an assessment of their impact on the overall project and its viability.

(c) Suitable provisions should be made to address the issue of leakages on account of spillage, product expiry, pilferage etc. of the bio-diesel. The assumption that whatever is produced is consumed may not be entirely accurate and should be substantiated.

(d) I have seen two methodologies (NM 69) and the one under review, both claiming that the project is the first of its kind (incidentally, both PDD are very similar and seem to be prepared by the same team) clarity on which is the 'first' project would be appreciated.

- b. Major changes:>>(1) The assumption that the switch does not result in any changes in the efficiency of the vehicle, may well be true, but adequate provisions should be made to identify and account for any material variances. Whereas the current document does try to address this issue by making use of the 'efficiency multiplier of petro diesel', I have my reservations on how the required 'multiplier' is going to be computed accurately. Detailed explanation on how the required data is proposed to be collected should be included.
- (2) GHG emissions on account of activity prior to the receipt of the bio diesel by the project (expeller + disposal of expeller waste), if any, needs to be addressed.
- (3) GHG emissions on account of waste water / effluent treatment (if any) needs to be addressed.
- (4) GHG emissions on account of the disposal of the cleared biomass (prior to plantation activity) needs to be accounted for.

II. Evaluation of the proposed new monitoring methodology:

Title of new monitoring methodology: >> **Monitoring methodology for bio diesel production and switching fossil fuels from petro-diesel to biodiesel in the transport sector.**

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

>> After addressing the issues raised elsewhere in this document, the monitoring methodology should be applicable to all similar projects, regardless of the regional location. The key criteria being that the project should involve a voluntary fuel switch from petro-diesel to bio-diesel. With minor modifications, the methodology could be applicable to fuel switch from motor spirits to fuel ethanol.

- ii. Strengths and weaknesses of the methodology:

>> **Strength:** The methodology is simple and easy to implement.

Weakness:

(1) Lack of suitable provisions to monitor the actual quantity of bio diesel consumed (and the resultant replacement of petro-diesel). As the CER computation is based on the bio diesel actually consumed (and the corresponding net reduction in consumption of petro diesel for a similar level of service delivery), this is a key factor to ensure the environmental integrity of the methodology.

(2) Absence of suitable provisions to monitor increase (if any) in the consumption of petro diesel, on account of blending bio-diesel. Whereas I find the concept of using the 'Efficiency multiplier' very appropriate, I am unable to visualise how the required data is going to be monitored / collected accurately. Detailed explanation should be included in the document.

(3) Lack of suitable provisions to monitor and account for possible 'leakages' of the bio diesel on account of sale by the distributor to a 3rd party for exports to an Annex 1 country.

(4) Leakages on account of destruction of 'expired' bio diesel stock (in its unblended form) by the distributor / retailer needs to be monitored effectively. The incentive for doing this is evident.

In my opinion, the primary weakness, in an otherwise good methodology, is on account of the difficulties that the developer will face while effectively monitoring actual bio diesel consumption and the net replacement of petro diesel for a given level of service delivered.

(5) Lack of provisions for monitoring the use (or lack of it) of nitrogenous fertilisers / synthetic fertilisers. This needs to be monitored as GHG emissions on account of any increased use of synthetic fertilizers have not been accounted for as possible leakage.

It should be pointed out that the claim that the project is not accounting for GHG emissions reduction on account of use of bio fertilizers is conservative, does not take into consideration the fact that the said land is 'waste land' and in the BAU, there is a high possibility that the land use would not change, thus there would be no use of synthetic fertilizers. It may thus be argued that the use of bio fertilizers does not replace the use of synthetic fertilizers as in the BAU synthetic fertilizers would not have been used.

iii. Any changes needed to improve the methodology:

a. Minor changes:>>

b. Major changes:>>

Suitable amendments must be made to monitor the following :

i) GHG emissions on account of disposal of the biomass cleared for the plantation activity.

ii) Consumption of Bio-diesel - monitoring actual consumption and accounting for the net quantity of petro diesel (after adjustments for changes on account of efficiency) is very complicated and a key concern. This needs to be suitably addressed in greater details.

iii) GHG emissions during the treatment of waste water generated by the project activity (if any) needs to be monitored and accounted for as a leakage.

iv) GHG emissions (if any) on account of (a) energy used for 'expelling' the oil from the seeds and (b) disposal of the expellor waste, needs to be addressed / accounted for.

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

I. Proposed new baseline methodology (specify title here): >> Biodiesel production and switching fossil fuels from petro-diesel to bio diesel in (the) transport sector - 30 TPD Biodiesel CDM project in Andhra Pradesh, India.

(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 methodology is developed for fuel switch activities that partially or completely substitute petro-diesel with bio-diesel. The methodology considers anthropogenic greenhouse gas emissions avoided by substituting petro-diesel with bio-diesel as the baseline emission. The methodology is applicable to projects that manufacture bio-diesel and results in a fuel switch from petro-diesel to bio-diesel.

The methodology uses the consolidated additionality tools to establish that the proposed project activity is not the baseline scenario and is thus additional.

In the next step, the methodology tries to determine the baseline emissions on account of the oxidation of petro diesel. To do this, the methodology proposes to estimate the carbon emission factor for the petro diesel replaced, based on the carbon content / IPCC emission factors where applicable.

The baseline emission is computed using the carbon emission factor computed as above multiplied by the quantum of bio-diesel consumed.

The GHG emissions reduced as computed above is then adjusted for leakages on account of project activity.

b) State the approach selected:

>> 48(a) "existing actual or historical emissions, as applicable".

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 PDD seeks to justify it's the selection of 48(a) based on the argument that in the absence of the proposed CDM project, the baseline scenario will be the continuation of the existing practice of using petro-diesel. Despite the fact that I do not completely agree with the assumptions as alternative fuel switch options too are a possible, the selection of 48(a) is perhaps justified in the absence of a clear choice.

(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 document 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 underlying rationale is to answer the question on what the petro diesel vehicle owners would do in the absence of the proposed project. The stated assumption underpinning the rationale is that the baseline scenario in the absence of the project activity would be the continuation of the existing practice of using petro diesel.

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?

>> Being one of the first projects of its kind in the country (though the document claims it to be the first of its kind, something that needs to be clarified as this document is very similar to NM 69), the PDD clearly establishes the fact that the proposed project activity is additional and not the baseline scenario by using the additionality tools suggested by the EB namely:

Step 0 : Preliminary screening of the project activity for starting date

Step 1: Identification of alternatives to the project activity

Step 2: Investment analysis OR Step 3 : Barrier analysis (selected)

Step 4: Common practice analysis

Step 5: Impact of CDM registration.

I have no hesitation whatsoever in confirming the fact that the project, being one of the first of its kind in India is quite clearly additional and thus not the baseline scenario.

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, though generally appropriate needs to be more detailed and thorough in order to be adequate. For instance, sweeping assumptions that CNG/LNG/Fuel Ethanol are not viable alternatives are not necessarily accurate. Experience has shown that even without regulatory requirements, vehicle owners do consider shifting to alternative (read cheaper) fuels like CNG / LPG. The shift to alternative fuel options should thus be considered as a possible baseline option.

The project, being one of first of its kind (commercial project) in India, the issue of the project activity being additional has been appropriately addressed. It would however be desirable for the PDD to contain a detailed explanation on what is the precise impact of registration on the project's viability, in terms of concrete monetary terms, say monetary impact on the selling price per litre etc.

(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 generally been described adequately. In fact barring certain issues (wrt. alternative fuel options, fuel efficiency etc.), I am of the opinion that the outline of the methodology is very concise and well written.

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 CDM-NMB):

>> Subject to suitably addressing the issues raised elsewhere in this review document, I am of the opinion that the proposed methodology is appropriate for the said 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.

>> Whereas I am of the opinion that the application of the methodology would result in a baseline scenario which is not in material variance with the anthropogenic emissions by sources of GHG that would occur in the absence of the proposed project activity, certain issues concerning potential leakages and alternative fuel options too should be considered to further strengthen / comprehensively establish the environmental integrity of the baseline.

Please explain:

>> (1) It is not entirely accurate to assume that alternative fuel options viz. CNG/LPG/ LNG / Fuel Ethanol etc. are not viable alternatives in the absence of suitable regulations. Economics too has a very critical part to play in the fuel switch related decision making process.

The new gas field that have been discovered in India, coupled with the increasing thrust by the government in facilitating imports of gas based fossil fuel and the promotion of blending fuel ethanol by the government in its policy decisions, would seem to merit a detailed evaluation of alternative baseline scenario.

(2) Issues wrt. possible change in the efficiency /service delivery and the resultant increase (if any) of fossil fuel consumption to compensate for the change needs to be addressed / established with more concrete evidence. I am concerned about the availability of the required data to compute the 'Efficiency multiplier' that is proposed to be used to adjust for change in efficiency levels.

(3) Leakages on account of GHG emissions due to (a) energy used to run the Expellers; (b) disposal of the Expeller waste and (c) treatment of waste water / effluents, needs to be addressed and accounted for if material. .

(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 methodology contains algorithms and generic formulae that, subject suitable changes (as highlighted elsewhere in this document) should be applicable to other similar project activities.

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

>> The methodology uses the following data :

- i) Quantity of Bio-diesel produced & Methanol consumption : source - Proprietary - production records;
- ii) CO₂ emission factor for petro diesel, Carbon content, oxidation factor : source - National / official statistics;
- iii) CO₂, CH₄ and N₂O emission factors for petro-diesel & Methane emission factor for methanol production : source - Revised 1996 IPCC guidelines for NGGI.

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:

>>Vintage of data corresponds to the year of production of the bio diesel and the time of occurring of the fuel switch. The data used is sourced from the revised 1996 IPCC guidelines and a recent study by the Ministry of non conventional energy sources (of India) and would seem to 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*

- >> a) CH₄ : on account of an increased demand for Methanol (IPCC specified emission factor of 0.002 tCH₄/t of methanol produced);
- b) CO₂ : an account of (i) avoided emissions - petro diesel replaced; (ii) Grid related electricity consumption; (iii) Transport related emissions.
- c) N₂O : transportation linked fuel combustion - to be considered only where relevant data is available.

ii) *Physical delineation*

- >> a) The bio diesel production plant site
- b) Transportation of the bio diesel and the feed stock
- c) Combustion sources or vehicles that substitute petro-diesel with bio diesel.
- d) the preparation / harvesting of oil bearing seeds from new plantations..

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

>> It may be desirable to also include the site where the oil seeds are processed through the expellers within the project boundary. Otherwise, the project boundary is generally 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:*

>> (a) The quantity of bio diesel sold is equal to the quantity of bio diesel consumed. This, in my opinion is problematic as there could be variance in sales and actual usage, especially if unblended bio diesel is also sold.

In my opinion, the monitoring of sales and consumption data will be a key issue, especially in the target market. The end use of the bio diesel will, to a large extent be also guided by its price in the international markets and, (in my opinion) should the FOB prices for exports to an Annex 1 country be higher than the local selling price, one can expect leakages and export to Annex 1 countries.

(b) Impact on the efficiency / delivery of service per unit of fuel, on account of the fuel switch is assumed to be negligible. Whereas the use of the 'Efficiency multiplier' is certainly an excellent idea, I am sceptical about its effective implementation, as could be very difficult to collect the required data accurately.

(c) Emissions on account of a plantation related activity is limited to the clearing and plantation process - is problematic as the disposal of the cleared biomass could result in significant GHG emissions that are directly attributable to the project activity.

(d) Carbon Emission factor based on the IPCC data applicable to vehicles in Europe are used. This in my opinion is very conservative.

(e) Fuel switch to alternative fuel options (CNG / LNG/ LPG / Fuel Ethanol) are not a viable option : This is problematic as it is in variance with what has been observed in many parts of the country. In my opinion, with increasing petroleum prices, the search for cheaper fuel will cause users to consider switching to non traditional fuels, bio diesel being an option, but NOT the only one.

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

>> Yes, the key assumptions are arrived at in a transparent manner.

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

>> Subject to the issues raised above, the assumptions / parameters are generally adequate.

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

expert judgement):

>> The data used has been sourced either from project activity reports (quantity of bio-diesel produced), actual invoices (sale of bio diesel, transportation of seeds + bio diesel), national / official statistics (CO₂ emission factor, oxidation factor & carbon content for petro diesel) or Revised 1996 IPCC guidelines (CO₂, CH₄ & N₂O emissions factor for petro diesel & CH₄ emission factor for methanol production).

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

>> Subject to issues raised elsewhere in this document, in my opinion, the data used are generally adequate, consistent, accurate and reliable.

f) State possible data gaps:

>> (i) The quantum of Bio-diesel sold may not be equal to the quantity produced on account of various factors, including secondary transportation loss, pilferage, product expiry, exports to Annex 1 countries etc. (ii) GHG emissions on account of plantation related activities needs to consider GHG emissions on account of disposal of the biomass cleared. (iii) GHG emissions (if any) on account of (a) energy used for running the oil expellers, (b) disposal of the expeller waste and (c) treatment of the waste water / effluents needs to be addressed.

(7) Assessment of uncertainties:

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

i) The basis for determining the baseline scenario:

>> Yes it does

ii) Algorithms/formulae:

>> Yes it does

iii) Key assumptions:

>> Yes it does

iv) Data:

>> Yes it does

b) State whether the uncertainties presented are reasonable:

>> While certain issues have been addressed, many relevant uncertainties related to key assumptions are not addressed (see 6.a)

(8) Leakage:

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

>> The methodology accounts for the following leakages:

(i) CH₄ emissions on account of an increased demand for Methanol;

(ii) GHG emissions on account of power drawn from the Grid for running the plant;

(iii) Transportation (feed stock + bio-diesel) related GHG emissions.

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

>> Whereas the treatment for leakages are generally appropriate and adequate, the following needs to be addressed / explained:

(i) potential leakage on account of a variance between the quantum of bio-diesel sold and the quantity consumed within the host country;

(ii) Plantation related GHG emissions - primarily on account of disposal of the cleared biomass.

(iii) GHG emissions (if any) on account of (a) energy used for running the oil expellers, (b) disposal of the expeller waste and (c) treatment of the waste water / effluents needs to be addressed..

(9) Transparency and “conservativeness”:

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

>> Yes - the methodology has generally been developed in a transparent way.

b) *State whether the baseline methodology is conservative:*

>> Subject to issues raised elsewhere in this document, the methodology is conservative in its approach and intent.

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

>>**Strengths** : Clearly structured, the methodology is simple and easy to use.

The proposed use of IPCC data as applicable to European diesel vehicles is conservative.

The decision not to account for emissions reduction on account of a possible increase in sequestering due to plantation related activities is conservative.

Weakness:

(1) Whereas the methodology does touch upon the issue of GHG emissions on account of the change in land use, it does address the issue of additional GHG emissions on account of the disposal of the cleared biomass - i.e. emissions on account of open field burning / land fill etc.

(2) Given the fact that a lot of cities/regions in India are witnessing an increase in CNG / LPG fuelled vehicles, I am not entirely convinced by the argument that "*development of other alternative fuels such as CNG, LNG and LPG are not realistic and credible baselines for the project activity*", especially when one considers the recent gas finds in India, the new LNG terminals that are being developed and the fact that the judiciary in India is getting increasingly active on the issue of vehicular air pollution. The same holds true for the use of Fuel Ethanol. The market for fuel ethanol has not caught on as yet partially due to supply and pricing related issues (as well as competition from the manufacturers of potable alcohol for the molasses). With increases in the prices of petroleum products, it would not be fair to write off fuel ethanol as a possible alternative. In view of the same, suitable provisions should be incorporated to comprehensively confirm, on an annual basis that a material shift to alternative fuel options warranting a baseline revision, has not occurred .

(3) In my opinion, maintaining a less than 20% bio diesel blend will be a very challenging task, especially when considers the ground realities in the target market. Accordingly, the assumption that the use of bio diesel will not have any significant impact on the 'performance' / efficiency of the engine may not be entirely accurate.

Being a new technology and given the fact that the engine types in the target Indian market would in all probability be different as compared to the other markets where biodiesel is being widely used. I am of the opinion that it will be very difficult to establish the changes in 'engine efficiency' and thus the "efficiency multiplier of petro diesel" on account of bio diesel usage.

I find it difficult to visualise how the required data (fuel consumption, mileage etc.) is going to be reliably collected from the vast number of vehicles that will be using the blended fuel. This in my opinion, is one of the key challenges for the development of this methodology.

(4) Whereas at the current prices, we are not witnessing a significant shift to bio fuel (i.e. without regulatory requirements/subsidies), increase in prices of petroleum beyond a point will significantly hasten the shift to bio-fuels, including bio-diesel.

In view of the same, it may be desirable to provide details establishing the 'gap' between the final delivery cost of bio diesel to the customer and the corresponding cost of petro diesel that it seeks to substitute.

It may also be desirable to present a detailed analysis on value gap (in terms of \$\$) that is bridged due to CDM registration. This will also help in establishing the point of inflexion, i.e. the price of petro diesel beyond which the use of bio diesel becomes economically attractive and thus perhaps the baseline scenario.

(5) The methodology, while touching upon the issue, does not suitably address the fact that the bio diesel could also be used in stationery power generation engines.

(6)GHG emissions (if any) on account of the waste water/effluent treatment needs to be addressed.

(7) My understanding of the steps involved in the whole process chain is (a) Jatropha Plantation; (b) Seed harvesting; (c) Use of mechanical expellers to extract the oil; (d) The extracted oil is then treated in the project setup to produce bio diesel.

Possibility of GHG emissions on account of the use of energy to run the mechanical expellers and the disposal of the 'expeller' waste should be explored and if significant be accounted for.

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

>> Whereas national / sectoral policies have generally been addressed, the scenario that is emerging on account of increased availability of gas based fossil fuel (and the related economics) and the increasing viability of fuel ethanol on account of increased petroleum prices needs to be looked at and addressed in greater details.

In addition, the impact of the proposed plans Bio Diesel promotion plans of the Government of India needs to be looked into and addressed.

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

>> Suitable to addressing the issues mentioned in this review document, the methodology should be applicable to similar projects located in countries faced with similar 'operating' environment, regardless of the regional location. In my opinion, the principles of this methodology could be developed to formulate a standard methodology relevant to any / most voluntary fuel switch project that involves a switch from fossil to bio fuels.

(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:

>> General Web search on bio diesel and related issues.

b) Indicate any further comments:

>> Ownership related issues remain: I am not entirely convinced about the possibility of entering into CER transfer agreements with each and every single end user.

It must also be mentioned that competitive market forces can be expected to play a part in the transfer of benefits to the end users to a large extent, the cap being the price of the commodity that the bio-diesel seeks to substitute - in this case petro diesel. Details of the target selling price and its computation, if included in the document, would help in clarifying these issues to a large extent.

On a broader issue, not related to climate change but perhaps touching upon sustainable development, I am of the opinion that promotion of bio diesel and related plantation activity needs to be looked at very carefully as it could end up competing with food grains for agricultural land, with potentially significant (adverse) impact on the food security of countries.

II. Proposed new monitoring methodology (specify title here): >> Monitoring methodology for bio diesel production and switching fossil fuels from petro-diesel to bio diesel in the transport sector.

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

(1) Brief description of new methodology:

Describe new methodology:

>> The monitoring methodology requires the monitoring of the following data to ascertain the GHG emissions reduction on account of the project activity:

(i) Emission factor for each of the applicable green house gases

(ii) Quantity of bio diesel produced, sold and consumed

(iii) electricity consumed by the bio diesel plant during its operation

(iv) Quantity of petro diesel consumed for off-site transport - raw material, by products + bio diesel

(v) Emissions related to the manufacture of Methanol used.

(2) Key assumptions/parameters:

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

>> (i) Quantity of bio diesel sold is equal to the quantity of bio diesel consumed. This is problematic as depending on the market + export prices, a sizeable proportion of the bio diesel sold may find its way to Annex 1 countries.

(ii) Use of the most conservative emission factor as applicable to the developed countries - this is a conservative option.

(iii) Quantity of Bio Diesel produced is considered to be same as the petro-diesel substituted - this is problematic as it does not account for leakages / loss of bio diesel due to transportation, pilferage, expiry etc.

(iv) Efficiency multiplier of petro diesel can be computed using publicly available data on the efficiency of motors using bio diesel compared to motors using petro diesel under traffic conditions similar to those of the host country - this is problematic as reliable data to compute this may not be available.

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

>> The key assumptions have generally been arrived at in a transparent manner.

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

>> The assumptions / parameters, subject to the various related issues raised elsewhere in this document, 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) Electricity used by the project - source: project operation records

(ii) Grid emission factor - source: Official statistics

(iii) Petro diesel consumed for off-site transport - source: project operation records/ third party data

(iv) Methanol consumed - source : plant operation data

(v) Emission factor for fossil fuel used on site - National data / IPCC emission factor

(vi) Emission factor for vegetation clearance - National forest inventory / publicly available data

(vii) Fossil fuel used for plantation related activity - Plantation fuel bills

(viii) CO₂e emission factor for petro diesel - either national data or is based on the lowest (most conservative) IPCC emission factor for diesel vehicles.

(ix) Efficiency multiplier of petro diesel - Publicly available sources for the efficiency of motor using bio diesel compared to motors using petro diesel under similar operating conditions as is prevalent in the host country.

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

>>The data used are generally adequate, consistent, accurate and reliable with the following exceptions:

(i) Petro diesel consumed for off-site transport - the data should be cross checked with details of the distance covered by each vehicle. This should be relatively simple to do as the details of the distance travelled are usually stated in the bills raised by the transport operators.

(ii) Methane emission on account of methanol usage should be computed / cross checked using theoretical consumption data (i.e. Opening stock + purchase - closing stock = consumption), as this will also account for the 'loss'/ additional demand on account of the project activity.

(iii) Efficiency multiplier - I am very sceptical about the possibility of getting reliable data for computing an accurate and representative multiplier. This should be explained in greater details as it is a key concern.

(iv) Bio diesel produce = bio diesel sold = bio diesel consumed. This is an overtly simplistic assumption. The possibility of leakages on account of bio diesel sold in the host country but consumed in an Annex 1 country needs to be suitably addressed. This is all the more problematic as the local selling price will (probably) be reflective of local purchasing power (subsidised by grants / CERs etc.) and exporting it to Annex 1 countries could be an economically attractive option...

(v) Use of bio diesel sold for non vehicular use too is a possibility that needs to be addressed.

c) State possible data gaps:

>> In addition to issues raised elsewhere in this report, the single biggest cause for concern is the potential for variance between the quantity of bio-diesel produced and the quantity actually consumed as intended. This needs to be suitably addressed.

(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 CDM-NMM):

>> Subject to suitably addressing the issues raised in this review document, the proposed methodology is appropriate for the referred proposed project activity and the referred project context.

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

>> Subject to addressing the issues highlighted, the proposed monitoring methodology is compatible with the proposed baseline methodology described in annex 3 of the draft CDM-PDD.

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

>> Potential for leakages on account of the following have not been addressed:

(i) Mismatch in the production, sale and consumption of bio diesel on account of various loss (transportation, storage, product expiry, export to a Annex 1 country, etc.)

(ii) Possible increase in consumption of petro diesel to compensate for any adverse impact of the bio-diesel on the performance of the engine - in my opinion, the efficiency multiplier is an excellent option, but generation of the data required to compute it will be very difficult.

(iii) Increased GHG emissions on account of plantation related activities - other issues have been considered barring the GHG emissions on account of disposal of the biomass cleared from the 'waste land'

(iv) Methane emission on account of the methanol 'lost' on account of the project activity (but pilferage, evaporation etc).

(v) GHG emissions (if any) on account of (a) energy used to operate the Expellers, (b) disposal of the biomass waste generated by the expellers (c) waste water / effluent treatment.

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

>> (i) **Electricity used by the project** : monitored using calibrated, tamper proof energy meters installed within the premises. Electricity bills will be regularly verified and the energy meters periodically calibrated according to the industry standards / as suggested by the electricity supplier.

(ii) **Grid Emission factor**: Obtained from the national statistics.

(iii) **Petro diesel consumed for off site transport**: Project proponents will maintain a record of the petro diesel purchased for the vehicles used for transportation. Bills & amounts paid towards the purchase of the petro diesel will be verified. -- In my opinion the QA /QC needs to be strengthened by cross checking the actual consumption of petro diesel with the theoretical based on approximate distances travelled.

(iv) **Bio-diesel produced**: Two tamper proof electronic flow meters will be installed at the final product

outlet point to measure and record the flow of outlet bio diesel. The flow meters will be calibrated periodically. The verified quantity will be cross checked with the quantity of raw material consumed and the sales bill for the bio diesel.

(v) **CO2 emission factor for petro diesel:** based on national data / official statistics or IPCC emission factors based on the most conservative option is considered.

(vi) **Methanol consumed :** The quantity of methanol consumed will be measured using an electronic weighing scale installed at the entry of the project premises. An inventory check too will be carried out.

(vii) **Plantation related emissions:** Based on actual data, national forest inventory etc.

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

>>**Strength:** The methodology is simple and easy to implement.

Weakness:

(1) Lack of suitable provisions to monitor the actual quantity of bio diesel consumed (and the resultant replacement of petro-diesel for a given level of service delivery). As the CER computation is based on the bio diesel actually consumed (and the corresponding net reduction in consumption of petro diesel for a similar level of service delivery), this is a key factor to ensure the environmental integrity of the methodology.

(2) Absence of suitable provisions to monitor increase (if any) in the consumption of petro diesel, on account of blending bio-diesel. Whereas I find the concept of using the 'Efficiency multiplier' very appropriate, I am unable to visualise how the required data is going to be monitored / collected accurately. Detailed explanation should be included in the document.

(3) Lack of suitable provisions to monitor and account for possible 'leakages' of the bio diesel on account of sale by the distributor to a 3rd party for exports to an Annex 1 country.

(4) Leakages on account of destruction of 'expired' bio diesel stock (in its unblended form) by the distributor / retailer needs to be monitored effectively. The incentive for doing this is evident.

In my opinion, the primary weakness, in an otherwise good methodology, is on account of the difficulties that the developer will face while effectively monitoring actual bio diesel consumption and the net replacement of petro diesel for a given level of service delivered.

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

>>After addressing the issues raised elsewhere in this document, the monitoring methodology should be applicable to all similar projects, regardless of the regional location. The key criteria being that the project should involve a voluntary fuel switch from petro-diesel to bio-diesel.

(9) Any other comments:

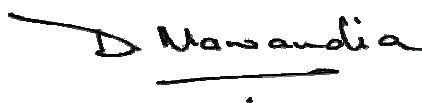
a) State whether any other source of information (i.e. other than documentation on this proposed methodology available on the UNFCCC CDM web site) has been used by you in evaluating this methodology. If so, please provide specific references:

>> No.

b) Indicate any further comments:

>> With suitable modifications, the methodology can be extended to other fuel switch projects that involves a switch from a fuel with a high carbon emission factor to one with a lower (including nil) carbon emission factor.

In my opinion, the single biggest issue in this methodology is monitoring and accurately establishing the actual consumption of the bio diesel.



Signature of desk reviewer

Date: 24/May /2005

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 | |