



**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

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Related F-CDM-NM document ID number

NM0083

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:>> [Baseline methodology for road transport sector in India](#)

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

>>[India, alternative fuels for transport where no compulsory regulations concerning the usage of alternative fuels apply](#)

ii. Strengths and weaknesses of the methodology:

>>[Strengths: None](#)

[Weaknesses:](#)

1. Unclear and non-transparent; The reader cannot derive finally how the baseline is calculated. Many figures have no fundamentals, formulas miss and unfounded assumptions are made.
2. Severe methodological failures including the usage of fixed emission factors based on averages of population groups, the usage of fixed and non-transparent growth and scrap rates and market diffusion rates which in itself are unclear why they are required.
3. Usage of static data overstating potential benefits.
4. Non discussion of leakage

Assuming that only fixed emission factors are the baseline then the baseline would still not be useful for the purpose of comparing a specific alternative fuel project with emissions in absence of the project due to following core reasons:

1. Average data can not be used: emissions of vehicles of the same category may differ by the factor 5 or more basically due to type of vehicle (e.g. small, low powered car vs. SUV: both would fall in the same category of petrol cars). If a project would thereafter target basically small cars popular also in India and compare project emissions against the average significant (theoretical) reductions would be calculated even if the cars would not change fuel. The correct baseline would need to establish average emissions of the cars replaced and not of the total population of cars.
2. Data can not be static over time: Vehicle technology is changing quickly and emissions per km have gone down significantly in the last decade and will continue to go down (see e.g. agreement in EU and USA of car industry with governments). The Indian time-lag of technology adoption is not relevant in this context (the time lag only refers to absolute emission levels and not to improvement rates).
3. Vehicle categories used are insufficient: Categories such as trucks (different types), diesel cars, petrol taxis, or different types of buses (smaller, larger units) are not included. The PDD for

example has as categories thereafter MUVs (multi-usage vehicles), mini-buses and light commercial vehicles. None of these are mentioned in the baseline.

4. The averages are historical and do not include shifts in fuel patterns which India is realizing such as a shift of major cities to CNG, the usage of ethanol blends and of bio diesel. The arguments in the text that these shifts are non-significant are not convincing, especially due to the fact that India is operating the worlds largest public transport CNG fleet.

5. Depending on the alternative fuel used a life-cycle assessment needs to be realized. The main GHG emissions of biofuels are in the phase of growing the biofuels (usage of fertilizers, energy) and the production. Such fuels would require a life-cycle assessment. The usage of the same methodology indistinct of the alternative new fuel is thus not valid.

6. All emission values are derived from 1 study in India using data of 1997. The study itself is based on theoretical values based on the Indian Drive Cycle and not on actual measurements. The average distance travelled used in the report is based on not further explained "personnel communication". The quality of the study and the data used is thus considered as questionable.

iii. Any changes needed to improve the methodology:

a. Minor changes:>>

b. Major changes: >>In its present form the approach needs to be revamped from scratch.

II. Evaluation of the proposed new monitoring methodology:

Title of new monitoring methodology: >>RFID based electronic monitoring methodology for the road transport sector

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

>>any transport project

ii. Strengths and weaknesses of the methodology:

>>Strengths:

1. Simple and straightforward

2. Potentially fairly accurate

3. Measures fuel dispatch per vehicle (however not fuel usage per vehicle)

4. Measures mileage per vehicle based on odometer readings

Weaknesses:

1. Needs to discuss issue of fuel usage from other refill stations as not the fuel usage is recorded but the fuel sale i.e. fuel bought from other stations is not recorded thus underestimating potentially severely the project emissions

2. Leakage is not included (LPG used for non-transport purposes - see point 1) and potentially LPG produced not anymore as residual but as special fuel with severely increased life-cycle emissions

3. Odometer reading problems are not discussed (problem of exactitude and problem of malfunctioning odometers)

4. QA is not addressed appropriately thus not assuring high quality data and reliability

iii. Any changes needed to improve the methodology:

a. Minor changes:>>1. Assess odometer readings; 2. Assess leakage

b. Major changes: >>1. Monitor fuel usage of cars and not fuel dispatch or ensure that 100% of fuel usage is dispatched by RFID equipped stations; 2. Develop QA system

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

I. Proposed new baseline methodology (*specify title here*): >>Baseline methodology for road transport sector in 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 relies on constant emission factors per type of cars based on a study realized in India. Vehicles taken into account include 2 wheeler, 3 wheeler (both 4-stroke), petrol cars, diesel taxis and buses. Other vehicle categories (two-strokes, diesel cars, trucks, different sizes of buses) are not taken into consideration. The emission factors are considered as static over time. Any changes due to the usage of alternative fuels is related against this static baseline. The methodology proposes the same approach independent of alternative fuel used. No life-cycle approach is used. All emission values are derived from 1 study in India using data of 1997. The study itself is based on theoretical values based on the Indian Drive Cycle and not on actual measurements. The average distance travelled used in the report is based on not further explained "personnel communication".

b) State the approach selected:

>>48a). existing actual or historical 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 approach selected is appropriate if the intention is to have an overall baseline of road transport in India. This is however no statement that the baseline itself can be used but just that the approach using historical emissions is OK.

(2) Basis for determining the baseline scenario:

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

>>No; based on 1 concrete study; the document implies that for different categories fixed emission factors are taken as baseline. In the second part (section E) then however confusion arises over how the baseline is really calculated. Here the baseline emissions rely on projected vehicle sales, with a target market for alternative fuels and fixed distances travelled. It is completely unclear where market share data are derived from. Even after reading the document various times it remains unclear what the baseline is and how the baseline is calculated. At first it seems to be fixed emission coefficients per km which would be fairly simple but then fixed km, market shares etc are introduced in a confusing manner and it is simply unclear what is made why and in which manner.

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

>>Average emissions on a historical base are used for selected categories of vehicles. The rationale for using averages is not explained. The rationale for using historical data is based on the availability of a study. The rationale for keeping emission factors static over time is based on no influence of alternative fuels. The rationale for using fixed km, for market shares, for growth rates, for scrap rates etc are all unclear.

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?

>>Usage of the Consolidated tool for demonstration of additionality

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

>>Additionality: the tool itself is appropriate.

Baseline scenario: The basic rationale for the underlying formulae is not appropriate. The baseline especially including section E is completely confusing. Assuming that only fixed emission factors are the baseline then the baseline would still not be useful for the purpose of comparing a specific alternative fuel project with emissions in absence of the project due to following core reasons:

1. Average data can not be used: emissions of vehicles of the same category may differ by the factor 5 or more basically due to type of vehicle (e.g. small, low powered car vs. SUV: both would fall in the same category of petrol cars). If a project would thereafter target basically small cars popular also in India and compare project emissions against the average significant (theoretical) reductions would be calculated even if the cars would not change fuel. The correct baseline would need to establish average emissions of the cars replaced and not of the total population of cars. This is essential as the "population of cars" of the baseline (leading to its average) is not necessarily identical to the "population of cars" of the project. If this baseline would be accepted potentially 50% of all currently operating cars could apply for CERs (as 50% have - by definition of an average - lower emissions than those fixed by the baseline). Obviously this cannot be considered.
2. Data can not be static over time: Vehicle technology is changing quickly and emissions per km have gone down significantly in the last decade and will continue to go down (see e.g. agreement in EU and USA of car industry with governments). The Indian time-lag of technology adoption is not relevant in this context (the time lag only refers to absolute emission levels and not to improvement rates). Emission data needs to be adjusted over time reflecting technological change and vehicle replacement. The baseline stated is thus not conservative but over inflates potential project benefits.
3. Vehicle categories used are insufficient: Categories such as trucks (different types), diesel cars, petrol taxis, or different types of buses (smaller, larger units) are not included. The PDD for example has as categories thereafter MUVs (multi-usage vehicles), mini-buses and light commercial vehicles. None of these are mentioned in the baseline. The categories used in the baseline are much too broad and incomplete (see also argument point 1)

4. The averages are historical and do not include shifts in fuel patterns which India is realizing such as a shift of major cities to CNG, the usage of ethanol blends and of bio diesel. The arguments in the text that these shifts are non-significant are not convincing, especially due to the fact that India is operating the worlds largest public transport CNG fleet. While this has been to a large extent in New Delhi it remains unclear what the future steps will be and how this is taken into consideration in the baseline.

5. Depending on the alternative fuel used a life-cycle assessment needs to be realized. The main GHG emissions of biofuels are in the phase of growing the biofuels (usage of fertilizers, energy) and the production. Such fuels would require a life-cycle assessment. The usage of the same methodology indistinct of the alternative new fuel is thus not valid.

6. All emission values are derived from 1 study in India using data of 1997. The study itself is based on theoretical values based on the Indian Drive Cycle and not on actual measurements. The average distance travelled used in the report is based on not further explained "personnel communication". The quality of the study and the data used is thus considered as questionable.

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

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

>>completely confusing; Why this is calculated in this manner is fully unclear. It's more of mixing some data-tables than a methodology. To get the point the reader must go through the text various times as a large amount of non-relevant data and text has been added which is later not used. It is for example to the end not clear if the table given on page 15 with CO2 emissions from different categories is the fixed emission factors that are suggested as baseline. The text states..."The details of the baseline.... at the speed of 20km/h are reproduced below". What implies the 20km/h? Does that mean that the emission factors will be adjusted according to the average speed? What then are all these elements of sector E which are also used in the PDD. Does the methodology imply that the baseline is calculated based on growth factors and fixed kilometres for vehicle types? Why? You could simply have the number of converted vehicles and the difference rate of emissions.

Also the methodology says that the quantity of emissions must be multiplied by the distance driven. Which distance driven? I assume that the author means that emission factors per km are constant and that the distance driven is based on the monitored distance driven in the project. However this is not explicitly said in the document.

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 points above (part 2). The LPG project proposed has the following problems additionally to the points described formerly:

- Average cars of the baseline are not necessarily equal to the average cars switched to LPG. Differences of the car population may lead to emission reductions which are not due to the project but of pure statistical order.
- Emissions are considered as static over time from the baseline as well as from the project
- Vehicle categories used by the project are not equivalent to those in the baseline.
- It is unclear why the project promoter is the owner of the emission reductions. The car owner has to invest in the technology change and he takes the risks so he could claim the emission reduction benefits.
- LPG reduction benefits estimated are based on Euro III cars according to the PDD document while the same document states that India has currently Euro II and most cars are Euro 0 or before. Also the reductions estimated refer to dedicated OEM vehicles. The project however plans to refurbish existing and old petrol vehicles to LPG. Reductions achieved may be significantly lower due to car technology, or retrofit kits used.
- Vehicles are assumed to run after retro-fit only on LPG. The experience is however that retrofitted cars run on both fuels, depending on relative fuel prices, availability and drivers

perception.

- The rebound effect is mentioned but wrongly not taken into account (see leakage part 8)
- An aspect which needs discussion is also that life-cycle GHG emissions of LPG vary significantly if the fuel is a residual or if it is produced specifically. If the market demand for LPG grows strongly latter will occur leading to significantly higher life-cycle emissions of LPG. This needs some consideration when discussing leakage.

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.

>>No

Please explain:

>>The first problem is that it remains unclear what the baseline in fact is. Assuming that the baseline would be fixed emission coefficients (and forgetting the completely unclear elements of Part E) then still serious problems remain: The basic problem is that the baseline chosen represents the average vehicle emissions of India currently. This is however not equal to the BAU emissions of India in the future (due to technology and fuel changes) and most of all is not directly related to the project activities as other types of vehicles might be replaced by the project than the average population underlying the baseline averages. The BAU data is also non-reliable (study itself is questionable and not based on actual measurements) and unclear.

(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):

>>no because it is not clear what is being done

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

>>for all India; would need to be differentiated as in some regions fuel mixtures are different e.g. New Delhi public transport uses compulsory CNG thus resulting in different average emission factors

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:

>>Historical data is used. The report used as reference is based on data from before 1997. This is not appropriate as vehicle technology changes over time resulting in reduced fuel consumption levels. A big change is e.g. changing to electronic injection in petrol and direct injection in diesel. Both changes are not reflected in the current averages used in the baseline. The baseline thus clearly overstates BAU emissions. The data used from the report is based on theoretical calculations and unclear data sources ("personnel communications").

(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

>>CO₂ only

ii) Physical delineation

>>vehicles switching to alternative fuel

b) Indicate whether this project boundary is appropriate:

>>gases: CH₄ and N₂O needs to be included as various fuels also have emissions of these gases and the methodology applies to cover all alternative fuels

physical delineation: OK

(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. Constant emission factors over time

2. Same population group for project and baseline for different categories of vehicles (implicit assumption when using averages)

3. Constant vehicle speed over time

4. No change in fuel composition over time

5. Theoretical consumption values are comparable to real consumption values.

6. Vehicle groups are clearly separable.

7. Distance driven is not influenced by fuel type

Next to this various assumptions derived in part E which is however unclear:

8. Fixed growth values per vehicle category

9. Fixed discard rate for vehicle categories

10. Market share fixed???

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

>>no, with exception of assumption 4 no discussion on key factors is made

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

>>1. Not adequate as technology changes occur and have occurred leading to change of emission factors.

2. Important aspect. The implicit assumption of comparable vehicle groups is not statistically founded and non-acceptable.

3. Must be checked for as emission factors used in this methodology are fixed and dependent on vehicle speed

5. Not verified. The study source is not sufficient to warrant this assumption.

7. Not inside project boundary but should be considered when discussing leakage

4&6. OK

8. Unclear why this is needed and should be fixed beforehand.

9. Unclear how this figure was derived.

10. Completely unclear

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

>>study realized (non-official) and personnel communications

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

>>Non adequate and non-reliable

f) State possible data gaps:

>>- emission trends to future; control of emission factors based on measurements

(7) Assessment of uncertainties:

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

i) The basis for determining the baseline scenario:

>>no

ii) Algorithms/formulae:

>>no

iii) Key assumptions:

>>no

iv) Data:

>>no

b) State whether the uncertainties presented are reasonable:

>>no

(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:

>>No; rebound effect should be included as minimum (cheaper fuel leads to increased mileage; the rebound effect is dependent on the price elasticity and not only the income elasticity. The total cost of the car is thus not the only relevant factor; if the cost per km goes down of variable costs drivers have an incentive to use more their cars and if LPG is cheaper then the variable per km costs go down. This would reduce the emission reductions.

When using biofuels the life-cycle including leakage due to land-use change must be included

Project emissions cannot be using on a hypothesis that users use 100% the alternative fuel as cars are often dual-fuel ones e.g. a LPG car can run on LPG or gasoline. If we only compute LPG consumption and assume 100% of mileage we overstate grossly the emission reductions as at least a certain percentage of miles will be driven with gasoline.

(9) Transparency and “conservativeness”:

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

>>No

b) State whether the baseline methodology is conservative:

>>No, the baseline is in general overstating grossly the project benefits

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

>>Strengths: None

Weaknesses:

1. Unclear and non-transparent

2. Severe methodological failures including the usage of fixed emission factors based on averages of population groups, the usage of fixed and non-transparent growth, scrap and market diffusion rates.
3. Usage of static data overstating potential benefits.
4. Non discussion of leakage

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

>>partially included i.e. a description has been made however without major consequences on the proposed baseline

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

>>India, all alternative fuels according to document. Restrictions apply to regions with compulsory alternative fuel rates. In practice methodology should however clearly differentiate between alternative fuel types especially biofuels due to their high life-cycle emissions

(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:

>>

b) Indicate any further comments:

>>

II. Proposed new monitoring methodology (specify title here): >>RFID based electronic monitoring methodology for the road transport sector

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 relies on RFID measurements. RFID equipment basically identifies the vehicle at a refuelling station. It also records the data of fuel purchased, the fuel consumption during idling time and records the odometer mileage of the vehicle. It is important to notice that RFID does not record the fuel consumption in total of the vehicle but just the quantity of fuel sold at this outlet. Only fuel stations equipped with RFID would register consumptions. The equipment automatically shuts off if gasoline is used instead of LPG during driving (dual-fuel vehicles)

(2) Key assumptions/parameters:

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

>>1. All LPG used by car-owners is sold through RFID equipped stations (implicit assumption)

2. Odometer work and are correct (implicit)

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

>>Not discussed

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

>>1. Problematic. If RFID equipped stations try to recover conversion-kit costs through fuel sales the relative fuel prices of LPG in such stations might be higher than in open market ones thus giving an incentive to the user to fill LPG in other than RFID equipped stations. This would also increase his benefits of CERs as the car would appear to consume much lower fuel levels than reality. To expect a 100% brand loyalty is unrealistic. This parameter thus needs to be checked.

2. Especially mechanical odometers tend to be very inexact (+/- 15%). However if variations are in the + - range they will statistically seen neutralize themselves. This needs however to be checked or ascertained e.g. with vehicle manufacturers. More severe is the problem of non-functioning or mal-functioning odometers (on purpose or by chance). Older cars in developing countries equipped with mechanical odometers often have problems in this respect. Experiences of an Inspection/Maintenance Project in Central America showed that a high number of odometers (+20%) were out of order. The reliability of odometer readings is thus problematic and must be addressed.

(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):

>>RFID; electronic readings based on fuel dispatch and odometer readings basically

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

>>Unclear why measurement is made of idle fuel consumption and how this is technically performed. Odometer readings are problematic (see above). Accuracy is given with 99%. However it is unclear how the author derived this accuracy. The odometer accuracy is at best 90%, thus it is unclear how thereafter processed data can be more reliable than the original database.

c) State possible data gaps:

>> Fuel consumption in total of vehicle must be measured as re-filling may occur in other stations than those equipped with RFID.

(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:

>>Partially

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):

>>Partially; idle measurement unclear why required; Fuel measurement needs to be expanded; Odometer readings must be quality checked.

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

>>No; the baseline in itself is unclear but seems to state fixed mileage and fixed consumption rates. Thus it is unclear how the monitoring of mileage is related to this baseline.

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

>>Not included; As LPG is subsidized for cooking purposes the usage of LPG unsubsidized in cars gives a large incentive to use subsidized fuel in the transport sector. This is technically seen rather simple and regulations which prohibit this usage might be in place but enforcement would be rather tricky. It must thus be expected that, due to economic reasons, such cross-using would take place. As this consumption is not registered the project would understate emissions.

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

>>Not included. Reliance is on RFID however QA must tackle following issues:

- wrong odometer readings
- errors in reading electronically data from odometer and fuel measurement
- transmission errors
- reliability of equipment
- data assurance and safety

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

>>Strengths: Simple, potentially fairly accurate, measures fuel dispatch per vehicle and mileage per vehicle

Weaknesses: Needs to discuss issue of fuel usage from other refill stations, leakage, odometer reading problems and QA

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

>>applicable in all transport projects

(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:

>>

b) Indicate any further comments:

>>

Signature of desk reviewer



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Information to be completed by the secretariat

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