

 <p align="center">CDM: Proposed new methodology expert form (version 03) <i>(To be used by methodology experts providing desk review for a proposed new methodology)</i></p>	
Name of expert responsible for completing and submitting this form	Deepak MAWANDIA
Related F-CDM-NM document ID number	NM 0083 AutoLPG in India - a road transport sector fuel-switching project
<p><i>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.</i></p>	
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	
<p>i. Conditions under which this methodology is applicable to other potential projects (e.g. project type, region, data availability):</p> <p>>>Despite the fact that the methodology states that it is India specific, I am of the opinion that suitably modified, and subject to addressing the various issues raised in this review document, the basic building blocks in the said methodology can be applied to most (if not all) voluntary fuel switch projects in non Annex 1 countries, regardless of its location.</p> <p>However, the methodology, in its current form can only be applicable to countries where :</p> <p>(a) The baseline scenario is the continuation of the use of fuel types that have a higher GHG emission factor per unit of service delivered.</p> <p>(b) The absence of regulatory guidelines requiring the use of a particular fuel / fuel type.</p> <p>(c) Availability of data on the number and types of vehicles in the target market.</p> <p><i>Note: The methodology in its current form is very unclear and needs to be thoroughly revised to get a sharper focus and edit the unnecessary content / repetitions, for example it is very difficult to comprehend the message that section A.3 of the proposed new baseline methodology is trying to convey.</i></p> <p>ii. Strengths and weaknesses of the methodology:</p> <p>>> Strengths: Innovative</p> <p>Weakness: Environmental integrity as well as additionality cannot be comprehensively established.</p> <p>(a) The impact of the increased interest shown by the judiciary has not been addressed suitably.</p> <p>(b) Assumptions with regards to market share seem optimistic.</p> <p>(c) Impact of the project's registration under the CDM on its viability has not been adequately explained.</p> <p>(d) Potential for leakages have not be adequately addressed.</p> <p>(e) Alternative baseline scenario is possible as a fuel switch to other low emission fuels are a distinct possibility.</p> <p>(f) The data & a lot of the computation is based on a USAID funded study t on Emissions from vehicular transport in India. To quote the PDD (annex 3) " <i>This study covers various emissions in 7</i></p>	

cities in India, including Delhi and also gives emissionsGHG and general emissions data for the year 1997 in India." In my opinion, 1997 data is not really applicable to today's ground realities. This needs to be updated. In addition, reference to reports / studies, other than IPCC would require a detailed analysis of the methodology used etc. to prepare them. In my opinion the methodology should be complete in itself, without referring to 3rd party studies (i.e. other than IPCC / official government data).

iii. Any changes needed to improve the methodology:

- a. Minor changes:>> Account for the variance (if any) in the GHG emissions on account of the difference in driving habits of people in the cities as against those in the coastal region.

Explain why the emissions have been considered at 20 Km / hr.

b. Major changes: >>>

(i) The methodology fails to account for / address the potential impact of the various initiatives taken by the various courts in India wrt. vehicular pollution. For instance, the methodology fails to address the fact that the Calcutta High court has been putting a lot of pressure on the state government to address the issue of vehicular pollution and the fact that the State government had opted for LPG as the possible solution. Similarly in Mumbai, it has been reported that out of the 84,000 autos (3 wheelers - a form of small taxi) in Mumbai, 58,000 have already converted to either LPG or CNG (source : The Telegraph Friday, April 02, 2004). (Incidentally Calcutta also happens to be the city where the initial pilot sites will be implemented.)

(ii) That LPG is a viable and cost effective solution, is borne out by the fact that vehicle owners have been known to voluntarily shifting to LPG even in the absence of regulatory guidelines. The fact that state owned oil companies are setting up LPG refuelling stations, WITHOUT CDM registration would seem to suggest that the business model is a viable and it would not be out of place to suggest that LPG could become the baseline scenario in a significant portion of the market being targeted by the project developer.

(iii) The cost advantages of using LPG as an auto fuel (in my opinion) will be the prime driver for the fuel switch from Diesel / petrol (with or without the additional revenue from sale of Carbon Credits). The methodology seems to stress on the costs involved in retro fitting the vehicles. Whereas this certainly is an issue, most rational vehicle owners tend to look at the over all life cycle cost of the investment. This would be especially true in case of commercial vehicle owners who seem to be the initial targets. It would be desirable if details of the costs involved and the expected pay back computation were presented, along with a suitable scenario analysis to highlight the issue.

(iv) There is a certain co-relation between the price of fuel and its consumption. Whereas the PDD finds it unrealistic to assume that the average person will drive aimlessly in a 'over crowded and dirty metropolitan city like Calcutta' just because fuel is cheaper by 50%. From personal experience of living (and driving) in an "over crowded and dirty metropolitan city like Calcutta", I am of the opinion that cheaper LPG availability will result in an increase in the miles driven and this increase needs to be accounted for as a potential leakage. In addition, it must be borne in mind that once the retrofit related expenses have been incurred, the vehicle owner would typically tend towards using the vehicle more than he normally would have without the retrofit (in the expensive fuel scenario), as part of the cost would be sunk and the incremental cost per additional kilometre travelled would be lower than in the baseline (petrol /diesel) scenario. In addition, the shift from the use of public transport systems to personal vehicles on account of lower fuel costs, too needs to be considered.

(v) The Project developer needs to confirm the current status of the project. This is important to ascertain whether the developer has been able to raise the resources required to commence implementation without CDM registration.

(vi) When discussing the investment barriers, the PDD outlines the possible reasons as to why the oil majors did not invest in the project. In my opinion, the explanations tend to border on an

inadequate appreciation of the various strategic issues that may be at play. For example, (a) the oil majors may themselves be looking at entering the vehicular LPG market and would thus logically be unwilling to invest in a competing venture; (b) The value proposition being offered by the project developer may not be adequate to swing the investment decision in their favour; (c) Step 3a, sub point d, does not seem convincing as it does not address critical issues like market share (of the total addressable market) and profitability related issues.

(v) Continuing with Investment Barriers : The fact that the project promoter has not been successful in raising the resources required to implement the project may also have something to do with the promoters background / track record of the management team etc. Detailed information wrt. the project's financial projections and the key financial ratios needs to be given, along with a comparative analysis highlighting the impact of the additional CER linked revenue on the financial performance of the project. Without a detailed financial analysis, I am unable to confirm that absence of free riding by use of creative structuring. Incidentally, it is quite a normal practice for promoters to use their own resources for funding the equity component of projects, especially if one does not have a suitable track record in the relevant business space.

(vi) A projected 30% market share within a reasonably short span of time would seem to contradict all arguments made regarding barriers to market acceptance. It would tend to suggest that the shift from petrol / diesel to LPG is indeed close to (if not) the baseline scenario. Given the fact that the additional revenue from sale of possible CERs is not a complete pass thru to the end users, it would seem that Auto LPG is indeed a very viable and profitable venture.

(vii) It would be desirable to consider using a dynamic baseline, especially in view of the vehicular GHG emissions baseline could witness a downwards trend on account of a host of issues including switch to Fuel ethanol / bio diesel / CNG / more efficient engines etc. It must also be pointed out that plans are in place to build a national gas grid. This too would have an impact of the projects proposed baseline scenario.

(viii) The study referred to in the PDD estimates the emissions in 7 major Indian cities. I would think that the conditions in the major cities would be very different from the coastal region where a lot of the stations are proposed to be rolled out.

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):

>> This is an excellent monitoring methodology and can be replicated anywhere in the world.

ii. Strengths and weaknesses of the methodology:

>> **Strengths:**

(i) Very innovative

(ii) very high level of accuracy possible

(iii) almost Idiot proof - cannot be tampered with easily.

Weakness: (i) Possibility of tampering with the solenoid switch at the vehicle owners end;

(ii) Possibility of tampering with data centrally.

iii. Any changes needed to improve the methodology:

a. Minor changes:>> Address possible leakages on account of tampering with the solenoid switch in dual fuel vehicles.

Explain the audit trail to verify and cross check the data generated to ensure that the data system has not be compromised.

b. Major changes: >> None.

B. Details of the evaluation of the proposed new methodology by the desk reviewer:**I. Proposed new baseline methodology (specify title here): >> [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 describes the conversion of a projected number of vehicles to Auto LPG from petrol or diesel. The baseline methodology uses the CO₂ emission data for petrol and diesel vehicles of different types, based on data sourced from a research report prepared by Dr. Moti Mittal and Dr. Sharma.

The computation of the GHG emissions data are based on the specific assumption that the engines are new and do not account for engine deterioration on account of usage.

The expected emissions reductions are based on the projected number of vehicles converting to alternative fuel options (in this case Auto LPG) from petrol / diesel. the target market share of 30% has been assumed.

It is proposed that the difference between the baseline emissions and the projected emissions from the vehicles converted to alternative fuel (LPG), multiplied by the distance travelled in kilometres and the fuel consumption during idling time will be the actual GHG emissions reduction on account of the proposed 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 justification given in the Methodology is very unclear and confusing. Section C.2. which should be dealing with the justification of why the approach has been selected, contains a lot of information but, in my opinion does not address the issue of why 48(a) has been considered to be most appropriate. It would seem that 48(a) has been selected on account of the fact that historical emissions data is being used.

However, for want of greater clarity in the matter, I am unable to comment on the appropriateness of the selected approach to the project category.

(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):

>> The basic underlying rationale is the following:

- (i) Shift to alternative fuel options will have a minimal impact on the net baseline emissions;
- (ii) Regulatory guidelines / actions of the judiciary are not expected to have a material impact on the baseline;
- (iii) The price elasticity of the use of the vehicle is marginal - regardless of the price levels of the fuel, the usage will remain fairly constant. This would also seem to suggest that the price of fuel is not a factor encouraging a shift to using public transport.

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 the documentation does explain how, through the use of the methodology, it can be demonstrated that the project activity is additional and thus not the baseline scenario. This is done by using the consolidated additionality tools

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

>> Whereas the methodology does refer to the consolidate additionality tools (in the CDM-NMB), in my opinion the description is sketchy fails to establish its case convincingly.

Certain critical issues have not been addressed / glossed over, including :

(i) Increased interest by the judiciary in matters relating to vehicular emissions. This is NOT restricted to New Delhi alone but is also applicable to cities like Calcutta (where the first pilot project is scheduled to come up). The Calcutta High Court has been very active in promoting clean fuel and LPG has been identified as a viable option by the state Government. " *Clean fuel switch prod for autos: Following in the footsteps of Delhi and Mumbai - albeit in slow motion - the Buddhadeb Bhattacharjee government is finally planning to make it mandatory for three-wheelers to switch to LPG.*" Source: *The Telegraph, Calcutta, 5/5/2004*

(ii) Barrier Analysis:

(a) Investment barrier: the arguments are weak at times bordering on an inadequate appreciation of the various strategic issues that could be at play. In my opinion, there could be a lot of reasons for the difficulties that the project developer is facing in raising the required resources, including, but not limited to (1) Lack of suitable track record; (2) Management related concerns (3) the target companies own plans to enter the LPG space etc.

The assumptions wrt. the investment barrier for the vehicle owner needs to be looked at in the right prospective. Assuming a rational vehicle owner, we would need to evaluate the life cycle costs of the retro fit, as well as compare the cost of the retro fit to the overall cost of the vehicle. Additional details on the IRR / payback computation for the retro fit assuming the mileages considered in the documentation should be included to better understand the retro fit decision making process for the various vehicle owners. The issue wrt. the 50% share of CER linked revenue too needs to be explained as there are far too many loose ends in terms of (1) what is the selling price; (2) why should the developer take 50% of the, when the end user is clearly the owner of the CERs.

(b) Technology barriers : Auto LPG has been around for a long time and in my opinion does not face a significant technology barrier. Issues regarding training would be similar to those for any such project, even a chain of petrol pumps. There seems to be a contradiction of sorts in the statement that " *Further, since all*

...., all transactions will be electronic. Special training also needs to be imparted to operate the fully automated electronic systems & dispensers installed at the RO's" if the whole system is automatic, the training cannot be all the difficult! One would also needs to examine the relevance of the various ISO certifications to the project activity.

(c) Barriers due to prevailing practices: The fact that the project would be the 'first of a kind' green-field project taken up in India's private sector, in my opinion does not mean much. Why should one differentiate between the private and the public sector. The fact remains that Oil companies in India (most were / are public sector as the market has recently been opened to the private sector) have set up up LPG retailing outlets and in all likely hood will continue to do so. To give preferential treatment to a company from the private sector as against one from the public sector would be unfair. We need to assess projects on their stand alone merit. It is my opinion that even if this particular project fails to achieve financial closure, LPG retail outlets will be set up across the country. The shift to LPG is natural and will happen with or without CDM registration....if nothing else, the increasing price of petroleum will ensure that the shift happens.

(iii) Impact of CDM registration : The real impact of CDM registration on the proposed project activity is not suitably addressed. I am unable to confirm whether the registration will result in actually helping the project overcome real barriers or the registration will merely enhance the financial returns from the project. This can be easily addressed by providing more details on the projects financials.

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

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

>> Subject to the issues raised elsewhere in this document, the methodology has been described in an adequate manner.

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):

>> Subject to the issues raised elsewhere in this document, the methodology is generally appropriate.

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 principal issues that needs to be addressed (in addition to those mentioned elsewhere in this review document) are :

(i) Economic attraction of Auto LPG being a driver for its adoption (and creation of a corresponding supply infrastructure) and its corresponding impact on the baseline scenario..

(ii) Impact of the increasing interest shown by the judiciary in matters relating to clean air.

(iii) Establishing the actual (and not perceived) reasons for the inability of the developer to achieve financial closure.

(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:

>> The methodology is based on a report prepared by Dr. Moti L. Mittal & Dr. C.Sharma titled "Anthropogenic Emissions from energy activities in India: Generation and source characterization - Emissions from vehicular transport in India".

The data covers 7 major cities in India.

c) Explain the vintage of data used (in relation to the duration of the project crediting period) and whether the vintage of data is appropriate, indicating the period covered by the data:

>> The vintage of the data used is ambiguous. In certain parts of the document, the vintage seems to be recent, while in other sections its seems to be of 1997 vintage. The document, needs to clearly state the vintage of the data used.

(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 - Combustion of petrol / diesel in vehicles during motion and during idling.

During motion : CO₂ gms / Km & during idling its in CO₂ gms / hr.

ii) Physical delineation

>> The project boundary includes the planned retail outlets and the vehicles that use the Auto LPG, purchased from the retail outlets

b) Indicate whether this project boundary is appropriate:

>> The project boundary in general seems appropriate. It may however be desirable to conduct a life cycle analysis of GHG emissions on a 'from the well to the pump' basis.

(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: Data source: most of the data is sourced from a particular study. This is problematic as we do not know the precise agenda of the study, its objectives, the methodology / models used and their under lying assumptions. In addition, the data used too seems to be of 1997 vintage AND the study is limited to 7 major Indian cities.

2: Baseline scenario will remain petrol / diesel : problematic as the economics of alternative fuels will drive the market toward switching.

3: Regulatory guidelines will not play a major role : problematic, as was witnessed in New Delhi and is now being witnessed in Calcutta, the Judiciary is increasingly playing a major role in compelling state governments to adopt cleaner fuels. My expectation is that this will only intensify.

4: GHG emissions at 20 km/hr are representative : problematic as I fail to understand / agree with the logic behind this.

5: Oil companies will not launch LPG for automobiles in a big way : problematic as I believe that this is going to happen. The demand pull on account of high petrol / diesel prices will drive the setting up of the retail network for LPG.

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

>> Some of the assumptions have been arrived at in a transparent manner while others are ambiguous.

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

>> No

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

>> Most (if not all) of the data is sourced from a study on emissions from vehicular transport in India.

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

>> In my opinion the data used are not adequate, consistent, accurate or reliable. There are far too many unexplained issues.

f) State possible data gaps:

>> 1: Emissions are based on 1997 data - this is 2005!

2: Baseline is computed considering an average speed of 20 km / hr. I fail to understand the reasoning

3: 7% growth rate in vehicle population - I'm not sure that 1998 to 2002 based CAGR is representative.

4: Rationale for considering a 3% discard rate.

5: I am not convinced that the mix of vehicles between the cities and the coastal regions would be similar. In view of the same, the vehicle mix in the targeted coastal states needs to be revised. Else, one could select the most conservative option from a GHG emissions point of view. This would ensure environmental integrity.

6: A 30% market share seems ambitious. I cannot help but wonder whether the PDD is attempting to create as high a possible baseline scenario as possible. Assuming that, the "30% market share is again assumed conservatively", in that case, the project has a very compelling business case and would probably be implemented in a BAU scenario.

(7) Variations in fuel types have not been considered.

(8) Alternative baseline scenarios have not been considered. I am of the view that the baseline should be dynamic, with a stipulation that of the ex-ante and ex-post scenario, the more conservative baseline be selected.

(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:

>> No

iii) Key assumptions:

>> No

iv) Data:

>> No

b) State whether the uncertainties presented are reasonable:

>> No - the documentation refers to the USAID sponsored study "anthropogenic emission from vehicular transport in India" for assessment of uncertainties. I am unable to comment on the reasonableness of the uncertainties without getting into the details of the model/algorithms used in the said study, something that is not within the scope of this review..

(8) Leakage:

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

>> Principle source of leakage are :

(a) LPG transportation related emissions - assumed to be negligible / compensated as similar emissions would have occurred in the case of transporting crude.

(b) Use of alternative fuel reserved for the priority sector : assumed that the construction of the container / cylinder will prevent any possibility of diversion to the automobile segment.

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

>> The treatment for leakage is generally appropriate and adequate, however, it should be pointed out that diversion of fuel from the priority to the automobile segment is a distinct possibility as can be seen from the large number of 'illegal' LPG retrofits that have been carried out in the past.

(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:

>> I am unable to comment on this as the model used to prepare the study that the PDD refers to is not available. However, on the basis of the available data, I am not entirely convinced about the environmental integrity / conservative nature of the proposed methodology.

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

>> **Strengths:** Innovative

Weakness: Environmental integrity as well as additionality cannot be comprehensively established.

(a) Full impact of the increased interest shown by the judiciary has not been addressed suitably.

(b) Assumptions with regards to market share seem optimistic.

(c) Impact of the project's registration under the CDM on its viability has not been adequately explained.

(d) Potential for leakages have not been adequately addressed.

(e) Alternative baseline scenario is possible as a fuel switch to other low emission fuels are a distinct possibility.

(f) The data & a lot of the computation is based on a USAID funded study on Emissions from vehicular transport in India. To quote the PDD (annex 3) " This study covers various emissions in 7 cities in India, including Delhi and also gives emissionsGHG and general emissions data for the year 1997 in India." In my opinion, 1997 data is not really applicable to today's ground realities. This needs to be updated. In addition, reference to reports / studies, other than IPCC would require a detailed analysis of the methodology used etc. In my opinion the methodology should be complete in itself, without referring to 3rd party studies.

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

>> Whereas the methodology does state that it is not based on any direct or indirect legislative obligation to fulfil national and/or sectoral policies or circumstances, I am not entirely convinced. The selection of Calcutta for the initial pilot outlets itself is interesting, as the Calcutta High court has been very active in the matter of reducing vehicular emissions in the city of Calcutta and the state government had, in a study submitted to the Supreme Court proposed LPG as an option.

Whereas this could be a coincidence, it certainly deserves a detailed study. Alternatively, suitable provisions should be included to review the baseline should there be any material development that could affect the rate of fuel switch.

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

>> Despite the fact that the methodology states that it is India specific, I am of the opinion that suitably modified, and subject to addressing the various issues raised in this review document, the basic building blocks in the said methodology can be applied to most (if not all) voluntary fuel switch projects in non Annex 1 countries, regardless of its location. The methodology, in its current form can only be applicable to countries where :

(a) The baseline scenario is the continuation of the use of fuel types that have a higher GHG emission factor per unit of service delivered.

(b) The absence of regulatory guidelines requiring the use of a particular fuel / fuel type.

(c) Availability of data on the number and types of vehicles in the target market.

Note: The methodology in its current form is very unclear and needs to be thoroughly revised to get a sharper focus and edit the unnecessary content / repetitions, for example it is very difficult to comprehend the message that section A.3 of the proposed new baseline methodology is trying to convey.

(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:

>> **Kolkata: Operation persuasion for LPG:** The oil companies have decided to organise awareness drives in Calcutta to prod car-owners into switching to liquefied petroleum gas (LPG) for the sake of both environment and economy. The transport department plans to join hands with the oil firms. **Source:** The Telegraph, Calcutta, 30/4/2004

Kolkata: Bharat II deadline for government vehicles: The West Bengal government has ordered its departments to ensure that all vehicles run by them start following Bharat Stage II norms from this month, failing which vehicles will be grounded. Mr H Mohan, joint secretary to the state government, wrote to the heads of the departments in March asking them to take immediate steps to convert the existing engines, **either by introducing LPG kits** or by installing Bharat stage II engines. **Source:** The Statesman, Kolkata, 5/5/2004

Crackdown on cars with illegal gas kits: Delhi transport department will soon launch a drive against vehicles running on illegal LPG conversion kits. The enforcement wing of the department will soon start checking vehicles across the city, sources said. The first advice to vehicle owners is to switch over to approved LPG kit or the CNG mode. If they don't convert within a stipulated time-frame (to be 2-3 months), the vehicle will be impounded for being hazardous. "We have asked petrol pumps to inform us about vehicles running on illegal LPG kits as they are unsafe," transport commissioner Rajiv Talwar. Nine types of LPG kits for four wheelers have been approved by the department and can be installed at a price ranging between Rs 20,000-25,000. **Source:** The Hindustan Times, New Delhi, 9/3/2004

<http://www.hindustanpetroleum.com/news/oilnews.php?id=6336>

<http://www.shrishakti.com/governmentguide.html>

b) Indicate any further comments:

>> The methodology is certainly very innovative and relevant to the transportation sector in most Non - Annex 1 countries.

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 proposes to use second-generation RFID to carry out the following functions :

- Identification of the vehicle
- secure payment authorisation etc.
- Record details of the fuel purchased
- Record data of the fuel consumption during idling time

- Record the odometer mileage of the individual vehicle.

This is proposed to be done every time a vehicle comes into any Retail Outlet for refueling.

The data captured above is consolidated to compute the project activity related GHG emissions reduction.

(2) Key assumptions/parameters:

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

>> No assumptions have been made.

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

>> - Not applicable -

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

>> Based on the description and assuming the technology will do what it is expected to do, the assumptions / parameters 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) distance travelled : Measured automatically - Vehicle's odometer mileage. For dual fuel vehicles, the change in the solenoid switch will shut down the electronic recording system completely, thus generate results of the distance covered on LPG only.

(ii) Auto LPG consumption : Measured automatically - Fuel sensor backed by RFID.

(iii) Auto LPG purchased by the customer : Electronic dispenser + billing data.

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

>> Yes, the data used are adequate, consistent, accurate and reliable (assuming that the RFID technology will perform as expected)

c) State possible data gaps:

>> Tampering with the solenoid switch to record higher distance covered on LPG could be a possibility.

(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):

>> Yes

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

>> Yes

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

>> As far as the monitoring methodology is concerned, material leakage is not expected.

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

>> The use of RFID as described in the methodology should generate very accurate and reliable data. The data is captured automatically using RFID technology and the QA/QC procedures planned would be very stringent and fail safe eg. to transfer the vehicle's mileage and fuel consumption data, the vehicle owner

must create an electronic hand shake between the RFID tag and the RFID reader installed on the Point-of-Sale computer near the LPG dispensers. Failing which the Auto LPG will not be dispensed by the dispenser till the data transfer is complete. There will be no over riding mechanism that can be exercised at the retail outlets. Similarly for fuel purchase, the data will be generated from the dispensing machines and cross checked with the retail outlet's sales figures.

The only risk I can think of is (i) tampering of the switch and (ii) tampering of data at the central computer. Otherwise the system is very comprehensive and suitable.

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

>> **Strengths:**

- (i) Very innovative
- (ii) very high level of accuracy possible
- (iii) almost Idiot proof - cannot be tampered with easily.

Weakness: (i) Possibility of tampering with the solenoid switch at the vehicle owners end;

(ii) Possibility of tampering with data centrally.

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

>> This is an excellent monitoring methodology and can be replicated anywhere in the world .

(9) Any other comments:

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

>> None

b) Indicate any further comments:

>> In my opinion, the monitoring mechanism is really innovative and should prove to be very effective.

Signature of desk reviewer

Date: 20/ December /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	