CLEAN DEVELOPMENT MECHANISM

AM0110

Large-scale Methodology

Modal shift in transportation of liquid fuels

Version 01.0.0

Sectoral scope(s): 07

United Nations
Framework Convention on
Climate Change

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1. Introduction

1. The following table describes the key elements of the methodology:

Table 1. Methodology key elements

Typical project(s)	Transportation of liquid fuels using newly constructed pipeline
Type of GHG emissions mitigation action	(a) Energy efficiency. Displacement of a more-carbon-intensive transportation mode

2. Scope, applicability, and entry into force

2.1. Scope

2. This methodology may be used by project activities that construct a new pipeline and result in a shift in mode of transportation of liquid fuels[1] (e.g. ethanol, petroleum products, crude oil, etc.) from road transportation using trucks to pipeline transportation.

2.2. Applicability

3. The methodology is applicable under the following conditions:

(a) The methodology is applicable for the transportation of liquid fuels[2] only;

(b) The pipeline network operator is the project participant. If the pipeline network operator is not the owner of the liquid fuels to be transported under the clean development mechanism (CDM) project activity, the owner(s) may also be included as project participants;

(c) If the owner(s) of the liquid fuel is/are not project participants, a contractual agreement between the liquid fuel owner(s) and the project participants shall ensure that the liquid fuel owner(s) do not claim any certified emission reductions (CERs) from the transportation of the liquid fuel by pipeline;

(d) The liquid fuel is transported using two or multiple pre-identified nodes of pipeline network. The nodes and corresponding branches of the pipeline network are defined in the CDM project design document (CDM-PDD) at the validation of the project activity and remain fixed during the crediting period;

(e) The type of liquid fuel to be transported under the project activity is defined in the CDM-PDD at the validation of the project activity and no change of type of liquid fuel is allowed[3] thereafter;

[1] Excluding liquefied natural gas (LNG).

[2] Project participants wishing to expand this methodology to transport other materials/fuels/feedstock, wastewater may propose a revision to this methodology.

[3] In case different types of liquid fuels are transported during the crediting period, a change to the project design document and the relevant procedures shall apply.

(f) The methodology is not applicable for operational improvements of an existing pipeline that is in operation;

(g) The geographic conditions of the project site permit the use of different transportation means (e.g. pipeline, trucks, etc.);

(h) There is sufficient road transportation capacity to transport the liquid fuel from the point of origin (o_j) to point of destination (d_j) by trucks at the time of implementing the CDM project activity and for the duration of the crediting period;

(i) If blended biofuel is used, the conservative approach shall be applied in adopting a zero emission factor for biofuels in the baseline scenario and in the project activity it shall be considered as the same emission factor of the fossil fuel being used.

4. In addition, the applicability conditions included in the tools referred to above apply.

5. Finally, this methodology is only applicable if the most plausible baseline scenario, as identified per the section “Selection of the baseline scenario and demonstration of additionality” below, is “M1: road transportation using trucks”.

2.3. Entry into force

6. The date of entry into force is the date of the publication of the EB 70 meeting report on the 23 November 2012.

3. Normative references

7. This baseline and monitoring methodology is based on the following proposed new methodology:

(a) “NM0360 Use of lower energy-intensive intermodal transportation method to transport freight (use of pipeline rather than over-the-road truck)" prepared by LOGUM Logística S.A.

8. This methodology also refers to the latest approved versions of the following tools:

(a) “Combined tool to identify the baseline scenario and demonstrate additionality”;

(b) “Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion”;

(c) “Tool to calculate baseline, project and/or leakage emissions from electricity consumption”;

(d) “Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period”.

9. For more information regarding the proposed new methodology and the tools as well as their consideration by the CDM Executive Board (hereinafter referred to as the Board) please refer to <http://cdm.unfccc.int/methodologies/PAmethodologies/index.html>.

3.1. Selected approach from paragraph 48 of the CDM modalities and procedures

10. "Existing actual or historical emissions, as applicable"

    and/or

11. "Emissions from a technology that represents an economically attractive course of action, taking into account barriers to investment".

4. Definitions

12. The definitions contained in the "Glossary of CDM terms" shall apply.

13. For the purpose of this methodology, the following definitions apply:

    (a) **Pipeline** - A pipeline comprises all parts of the physical facility through which liquid fuels (crude oil, ethanol, petroleum products, etc.) are transported. A pipeline includes pipes, valves and other equipment attached to the pipes, compressor units, pump stations, metering stations, regulator stations, delivery stations, holders and fabricated assemblies;

    (b) **Biofuel** - Biofuel in this methodology are liquid fuels made from biomass, such as ethanol or biodiesel;

    (c) **Fossil fuels** - Fossil fuels are liquid fuels that have been derived from petroleum;

    (d) **Liquid Production Centres (LPCs)** - Facilities where liquid fuel is produced (e.g. sugarcane mills, petroleum refineries, etc.);

    (e) **Pipeline Inlet Stations (PISs)** - A point in the pipeline where the product is injected into the line. Storages facilities, pumps and compressors are usually located at these locations;

    (f) **Pipeline Outlet Stations (POSs)** - A point in the pipeline where the product is withdrawn. Storages facilities, pumps and compressors are usually located at these locations;

    (g) **Point of origin (o_j)** - point of origin (in the baseline or project scenario) where trucks are fed in order to transport liquid fuel. Usually liquid production centres are the point of origins;

    (h) **Point of destination (d_j)** - point of destination (in the baseline or project scenario) where liquid is transported to. This is where the product will be stored, mixed or distributed to the consumer. It could be a tank terminal for liquid pipeline, a refinery or a port for ship;

    (i) **Route (j)** - distance between point of origin (oj) and point of destination (dj). In case of project activity, it is the distance along which the liquid fuel is transported using pipeline and trucks in complementary routes, if any, and in case of baseline, it is the distance along which the liquid fuel is transported using trucks;

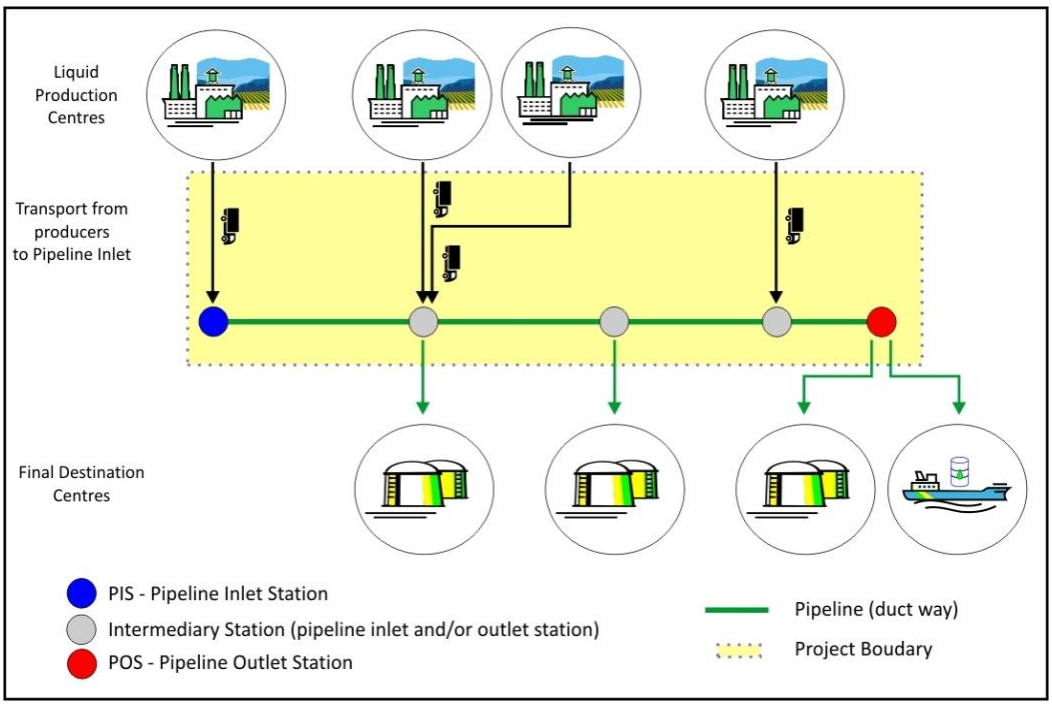
5. Baseline methodology

5.1. Project boundary

14. The spatial extent of the project boundary encompasses all areas in which the project activity takes place. It shall cover all the processes where changes in GHG emissions occur due to the implementation of the project activity. The boundary must consider the complete route of the liquid fuel transportation (point of origin to final destination) as defined in the CDM-PDD and must guarantee that complementary modes of transportation are also included, if any.

15. Project participants shall identify and transparently document the project area (i.e. the land area under the CDM project activity) in the CDM-PDD, delineating the project area with GPS data.

Figure 1. Project boundary



16. The greenhouse gases included in or excluded from the project boundary are shown in Table 2.

Table 2. Emission sources included in or excluded from the project boundary

Source		Gas	Included	Justification/Explanation
Baseline	Emissions from road transportation of liquid fuels from point of origin to point of destination	CO_2	Yes	Significant emission source
		CH_4	No	Excluded for simplification. CH_4 emissions are assumed to be very small
		N_2O	No	Excluded for simplification. N_2O emissions are assumed to be very small
Project activity	Emissions from road transportation of liquid fuel in complementary routes	CO_2	Yes	Significant emission source if electricity is produced from fossil fuels
		CH_4	No	Excluded for simplification. CH_4 emissions are assumed to be very small
		N_2O	No	Excluded for simplification. N_2O emissions are assumed to be very small
	Emissions from on-site use of electricity and/or fossil fuels to operate the pipeline system	CO_2	Yes	Significant emission source
		CH_4	No	Excluded for simplification. CH_4 emissions are assumed to be very small
		N_2O	No	Excluded for simplification. N_2O emissions are assumed to be very small
	Emissions from land use changes associated with land clearance	CO_2	Yes	May be significant emission source for change associated with land clearance
		CH_4	No	Excluded for simplification. CH_4 emissions are assumed to be very small
		N_2O	No	Excluded for simplification. N_2O emissions are assumed to be very small

5.2. Selection of the baseline scenario and demonstration of additionality

17. The selection of the baseline scenario and the demonstration of additionality shall be conducted using the latest version of the "Combined tool to identify the baseline scenario and demonstrate additionality". The following additional guidance shall be used when applying the tool.

18. When applying "Sub-step 1a" of the tool, alternative scenarios for liquid transportation shall include all realistic and credible alternatives to the project activity that are consistent with current laws and regulations of the host country.

19. The following likely scenarios of transportation modes shall be assessed, inter alia:

    (a) M1: Road transportation using trucks;

    (b) M2: Rail transportation;

    (c) M3: Water transportation using barges or ships;

    (d) M4: Other transportation modes (e.g. air transportation, ropeway, if relevant);

    (e) M5: Combination of M1, M2, M3 and M4;

    (f) M6: Partial implementation of CDM project activity (i.e. construction of partial pipeline network and transportation of liquid fuel combining trucks and pipeline);

    (g) M7: CDM project activity without being considered as CDM (e.g. pipeline network).

20. All considered scenarios shall provide the same service, that is they shall be able to transport the same amount of liquid fuel as transported under the project activity from the same point of origin (o_j) to the same point of destination (d_j).

21. Step 3 of the tool, investment analysis, is mandatory regardless of the outcome of Step 2 of the tool. In applying Step 3, the following guidance shall be followed:

    (a) The cost of transportation of liquid fuel for different modes of transportation shall be based on available information on the transport tariffs. If such information is not available from the liquid fuel owner(s) or the project participants, the transport tariffs of this third party transport service provider shall be used in the investment analysis and verified by the designated operational entities (DOE);

    (b) If the project activity provides a different quality of service than other alternative scenarios, such as faster or more reliable transportation, these benefits may be monetized and be taken into account in the investment analysis. Any monetization of time or quality of service shall be supported by "revealed/stated preference" type studies to be verified by the DOE. The typical transport time for the liquid fuel from point of origin to the point of destination for both the project activity and baseline scenario shall be estimated and documented in the CDM-PDD.

22. When applying Step 4 of the tool "common practice analysis", the project participants shall follow the Sub-step 4b. In this case, similar activities shall be considered as transportation of any types of liquid fuel.

5.3. Baseline emissions

23. The baseline emissions from the transportation of the liquid fuel are calculated based on the amount of liquid fuel transported by the pipeline in each route *j* under the project activity, distance of the baseline route *j* (i.e. the distance between point of origin and point of destination for transportation of liquid fuel by trucks in route *j*) and a baseline emission factor in g CO_2 per kilometre and tonne of liquid fuel transported. The amount of liquid fuel transported under the project activity is monitored during the crediting period. The baseline route is determined once at the validation of the project activity and fixed throughout the crediting period.

24. The baseline emission factor shall be determined by applying one of two options (see Step 2):

    (a) The first option is applying a conservative default emission factor. This option can, for example, be used if the project participants do not have historical records of the fuel consumption in trucks;

    (b) The second option allows project participants to calculate the emission factor based on historical records of the fuel consumption for transportation of liquid fuel by trucks.

25. Baseline emissions are calculated as follows:

$$BE_y = \sum_j \left(T_{j,y} \times AD_j \times EF_{BL,j} \times 10^{-6}\right) \quad \text{Equation (1)}$$

Where:

BE_y	=	Baseline emissions in year *y* (t CO_2)
$T_{j,y}$	=	Amount of liquid fuel transported by the pipeline in route *j* in year *y* (tonne)
AD_j	=	Distance of the baseline route *j* (km)
$EF_{BL,j}$	=	Baseline emission factor for transportation of liquid fuel in route *j* (g CO_2 per tonne.km, that is g CO_2 per tonne of liquid fuel and km travelled)

5.3.1. Step 1: Determination of the distance of the baseline route *j* (*ADj*)

26. At validation, project participants shall clearly identify and document the point of origin (o_j) and point of destination (d_j) from/to where the liquid fuel is transported for each route *j.*

27. The distance of the baseline route *j* (AD_j) is considered as the one way distance between the point of origin (o_j) and point of destination (d_j) for which the liquid fuel has to be transported in the baseline scenario.

    (a) If there is a documented historical record of the route used for the transportation of liquid fuel prior to the implementation of the project activity, the historical route shall be considered;

    (b) If such historical records are not available or if more than one route was used prior to the implementation of the project activity, then the project participants shall provide, with justification, a route between origin and destination which leads to the least fuel consumption.

28. The distance of the baseline route *j* (AD_j) shall be documented transparently in the CDM-PDD. The baseline trip route is determined once at the validation of the project activity and fixed throughout the crediting period.

5.3.2. Step 2: Determination of baseline emission factor for transportation of liquid fuel in route *j* ($EF_{BL,j}$)

29. The baseline emission factor ($EF_{BL,j}$) for transportation of liquid fuel in route *j* shall be determined using one of the following options:

5.3.2.1. Option A: Default[4] value

30. The project participants shall use the default emission factor[5] of 76 g CO_2/tonne.km[6] if trucks consume petrodiesel or gasoline in the host country.[7]

    (a) If trucks consume natural gas or if petrodiesel is blended with biofuels in the host country, the default emission factor shall be adjusted as follows:

        (i) If trucks consume natural gas in the host country, the default value shall be multiplied by the ratio of the emission factor of natural gas to the emission factor of petrodiesel (both expressed in g CO_2/GJ);

        (ii) If petrodiesel is blended with biofuels in the host country, the default value shall be multiplied by the share (fraction) of petrodiesel in blended diesel determined on an energy basis.

31. In addition, the default value shall be used in case the demand for the transportation of liquid fuel is new.

5.3.2.2. Option B: Historical data

32. The baseline emission factor ($EF_{BL,j}$) for transportation of liquid fuel in route *j* shall be calculated based on historical data on the amount of fuels consumed for transportation of the liquid fuel, the net calorific values and CO_2 emission factors of the fuel types used, the amount of liquid fuel transported, the distance of the baseline route and a factor to account for non-empty return trips in route *j*. This option shall be applied only if:

    (a) The liquid fuel was transported in dedicated trucks which were not used for other purposes than transportation of liquid fuel; and

    (b) Data on the amount of liquid fuel transported, the amount of fuel consumed and the fuel types used is available for the trucks dedicated to the transportation of the liquid fuel.

[4] Project participants wishing to use different default factors for road transportation may propose a revision of this methodology.

[5] This default factor take into account the emissions generated by the empty trips caused by the main trips.

[6] This default emission factor is based on value for liquid fuel type “Solid mineral fuels and petroleum products” in the approved methodology “AM0090: Modal shift in transportation of cargo from road transportation to water or rail transportation”.

[7] This default emission factor is determined on the basis of trucks consuming petrodiesel, however, it can also be used if trucks consume gasoline in the host country (this is conservative as gasoline trucks are less energy efficient than petrodiesel trucks).

33. The baseline emission factor is calculated for transportation of liquid fuel in route *j* as follows:

$$EB_{BL,j} = \frac{\sum_i FC_{BL,i,j,x} \times NCV_{i,x} \times EF_{CO2,i,x}}{T_{j,x} \times AD_j} \quad \text{Equation (2)}$$

Where:

$EB_{BL,j}$ = Baseline emission factor for transportation of liquid fuel in route *j* (g CO_2 per tonne.km)

$FC_{BL,i,j,x}$ = Amount of fuel *i* consumed by the trucks for transportation of liquid fuel in route *j* in year *x* (litre or m^3)

$EF_{CO2,i,x}$ = CO_2 emission factor of fuel *i* consumed by the trucks in year *x* (g CO_2/GJ)[8]

$NCV_{i,x}$ = Average net calorific value of fuel *i* consumed by the trucks in year *x* (GJ per litre or m^3)

$T_{j,x}$ = Amount of liquid fuel transported in trucks in route *j* in year *x* (tonne)

AD_j = Distance of the baseline route *j (*km)

x = Year (365 days) prior to the implementation of the project activity

5.4. Project emissions

34. The project emissions include the emissions resulting from the consumption of electricity to operate the pipeline system, the consumption of fossil fuel in the trucks used for the transportation of liquid fuel in complementary routes[9] under the project activity and the land use change associated with land clearance for construction of the pipeline. The emission associated with the construction of the pipeline and upstream emissions related to the production of materials used in the pipeline are considered to be small and therefore are ignored. Project emissions are calculated as follows:

$$PE_y = PE_{EC,y} + PE_{FF,y} + PE_{CR,y} + PE_{CL} \quad \text{Equation (3)}$$

Where:

PE_y = Project emissions in year *y* (t CO_2)

$PE_{EC,y}$ = Project emissions from electricity consumption to operate the pipeline system in the project activity in year *y* (t CO_2)

[8] If the fuel is blended with biofuel, the emission factor of the blend shall be calculated assuming an emission factor of zero for the biofuel.

[9] Complementary routes, for the purpose of this methodology, are routes to transport the liquid fuel in the project situation: (i) from the point of origin (oj), to the pipeline inlet stations; and (ii) pipeline outlet stations to the point of destination (dj).

$PE_{FF,y}$ = Project emissions from fossil fuel consumption to operate the pipeline system in the project activity in year *y* (t CO_2)

$PE_{CR,y}$ = Project emissions from transportation of liquid fuels in complementary routes in trucks in year *y* (t CO_2)

PE_{CL} = Project emissions from land use changes associated with land clearance for construction of pipeline (t CO_2)

5.4.1. Step 3: Determination of project emissions from electricity consumption to operate the pipeline system in the project activity in year *y* ($PE_{EC,y}$)

35. Project emissions from electricity consumption to operate the pipeline system in the project activity in year *y* ($PE_{EC,y}$) are calculated using the latest version of the "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" where the electricity consumption sources *j* in the tool corresponds to all electricity consumption sources under the project activity. In case the project activity consumes electricity from more than one electricity grid, the parameter $EF_{EL,j/k/l,y}$ in the tool shall refer to the emission factor of the grid with highest emission factor among the electricity grids that the project activity consumes the electricity. All emission sources shall be documented transparently in the CDM-PDD.

5.4.2. Step 4: Determination of project emissions from fossil fuel consumption to operate the pipeline system in the project activity in year *y* ($PE_{FF,y}$)

36. Project emissions from fossil fuel consumption to operate the pipeline system in the project activity in year *y* ($PE_{FF,y}$) are calculated using the latest version of the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion", where the sources *j* in the tool correspond to fossil fuel consumption to operate pipeline system in the project activity. All emission sources shall be documented transparently in the CDM-PDD.

5.4.3. Step 5: Determination of project emissions from transportation of liquid fuels in complementary routes in trucks in year *y* ($PE_{CR,y}$)

37. Project emissions from transportation of liquid fuel in complementary routes in trucks in year *y* ($PE_{CR,y}$) are calculated using the latest approved version of the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion", where the sources *j* in the tool correspond to fossil fuel consumption in the trucks used for the transportation of liquid fuel in complementary routes in the project activity.

5.4.4. Step 6: Determination of project emissions from land use changes associated with land clearance for construction of pipeline (PE_{CL})

38. Project emissions from land use changes associated with land clearance for construction of pipeline (PE_{CL}) shall be accounted as a one-time project emission in the first year of the first crediting period and determined using the following procedure:

    (a) Divide the pipeline network into segments not exceeding 5km in length, and attribute each segment the type of vegetation (forest land, grassland, cropland, etc.) and location (tropical/temperate, wet/dry), according to classifications cited in IPCC 2006 guideline volume 4;

(b) If the segment can be classified as forest land, then calculate the area of segment deforested on the basis of the length of segment deforested for segment *s* ($L_{DEF,s}$) and average width of segment deforested for segment *s* ($W_{DEF,s}$);

(c) Assign a default value for aboveground biomass for segment s ($M_{A,s}$) to be deforested for each segment, on the basis of conservative interpretation of IPCC 2006 Guidelines;[10]

(d) Calculate the project emission from land use changes associated with land clearance for construction of pipeline as follows:

$$PE_{CL} = \sum_{s} \left(L_{DEF,s} \times W_{DEF,s} \times M_{A,s} \times 0.5 \times \frac{44}{12} \right) \times 100 \qquad \text{Equation (4)}$$

Where:

PE_{CL}	=	Project emissions from land use changes associated with land clearance for construction of pipeline (t CO_2)
$L_{DEF,s}$	=	Length deforested for segment *s* (km)
$W_{DEF,s}$	=	Width deforested for segment *s* (km)
$M_{A,s}$	=	Aboveground biomass of land to be deforested for segment *s* (tonnes d.m./ha)
0.5	=	Carbon fraction of dry matter (t-C/tonnes d.m.)
s	=	Segment of pipeline network

39. Alternatively, if the information is required by the local regulation, it can also be used to determine the total area for each vegetation type and appropriately determine the total aboveground biomass to be deforested for the project activity, instead of performing procedures above. In this case the total aboveground biomass to be deforested has to be multiplied by (0.5x44/12) to determine the project emissions from land use changes associated with land clearance for construction of pipeline.

5.5. Leakage

40. Leakage emissions are negligible and are accounted for as zero.

5.6. Emission reductions

41. Emission reductions are calculated as follows:

$$\mathrm{ER}_y = \mathrm{BE}_y - \mathrm{PE}_y \qquad \text{Equation (5)}$$

[10] Volume 4, Chapter 4, tables 4.7 and 4.8

Where:

ER_y = Emission reductions in year *y* (t CO_2)

BE_y = Baseline emissions in year *y* (t CO_2)

PE_y = Project emissions in year *y* (t CO_2)

5.7. Changes required for methodology implementation in 2nd and 3rd crediting periods

42. Refer to the latest approved version of the methodological tool "Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period".

5.8. Data and parameters not monitored

43. In addition to the parameters listed in section 5.6, the provisions on data and parameters not monitored in the tools referred to in this methodology apply.

Data / Parameter table 1.

Data / Parameter:	$FC_{BL,i,j,x}$
Data unit:	litre or m^3
Description:	Amount of fuel *i* consumed by the trucks for transportation of liquid fuel in route *j* in year *x* (litre or m^3)
Source of data:	Historical data from the project participants
Measurement procedures (if any):	
Any comment:	

Data / Parameter table 2.

Data / Parameter:	$EF_{CO2,i,x}$
Data unit:	g CO_2/GJ
Description:	CO_2 emission factor of fuel *i* consumed by the trucks in year *x*

<table>
<tr><td>Source of data:</td><td>The following data sources may be used if the relevant conditions apply:
<table>
<tr><th>Data source</th><th>Conditions for using the data source</th></tr>
<tr><td>(a) Values provided by the fuel supplier in invoices</td><td>This is the preferred source</td></tr>
<tr><td>(b) Measurements by the project participants</td><td>If (a) is not available</td></tr>
<tr><td>(c) Regional or national default values</td><td>If (a) is not available. These sources can only be used for liquid fuels and shall be based on well-documented, reliable sources (such as national energy balances)</td></tr>
<tr><td>(d) IPCC default values at the lower limit of the confidence interval with 95% confidence level, as provided in Table 1.2 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories</td><td>If (a) is not available</td></tr>
</table></td></tr>
<tr><td>Measurement procedures (if any):</td><td>For (a) and (b): Measurements should be undertaken in line with national or international fuel standards</td></tr>
<tr><td>Any comment:</td><td>For (a): If the fuel supplier provides the CO_2 emission factor on the invoice and the value is based on measurements for this specific fuel, this CO_2 factor shall be used. If another source for the CO_2 emission factor is used or no CO_2 emission factor is provided, Options (b), (c) or (d) shall be used. If the fuel is blended with biofuel, the emission factor of the blend shall be calculated assuming an emission factor of zero for the biofuel</td></tr>
</table>

Data / Parameter table 3.

Data / Parameter:	$NCV_{i,x}$
Data unit:	GJ per litre or m^3
Description:	Average net calorific value of fuel *i* consumed by the trucks in year *x*

<table>
<tr><td>Source of data:</td><td>The following data sources may be used if the relevant conditions apply:
<table>
<tr><th colspan="2">Data source</th><th>Conditions for using the data source</th></tr>
<tr><td>(a)</td><td>Values provided by the fuel supplier in invoices</td><td>This is the preferred source</td></tr>
<tr><td>(b)</td><td>Measurements by the project participants</td><td>If (a) is not available</td></tr>
<tr><td>(c)</td><td>Regional or national default values</td><td>If (a) is not available. These sources can only be used for liquid fuels and shall be based on well-documented, reliable sources (such as national energy balances)</td></tr>
<tr><td>(d)</td><td>IPCC default values at the lower limit of the confidence interval with 95% confidence level, as provided in Table 1.2 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories</td><td>If (a) is not available</td></tr>
</table></td></tr>
<tr><td>Measurement procedures (if any):</td><td>For (a) and (b): Measurements should be undertaken in line with national or international fuel standards</td></tr>
<tr><td>Any comment:</td><td>QA/QC procedures: Verify that the values under (a), (b) and (c) are within the uncertainty range of the IPCC default values as provided in Table 1.2, Vol. 2 of the 2006 IPCC Guidelines. If the values out of this range, collect additional information from the testing laboratory to justify the outcome or conduct additional measurements. The laboratories in (a), (b) or (c) should have ISO17025 accreditation or justify that they can comply with similar quality standards</td></tr>
</table>

Data / Parameter table 4.

Data / Parameter:	AD_j
Data unit:	km
Description:	Distance of the baseline route *j* (km)
Source of data:	Historical data or measurement from the project participants

Measurement procedures (if any):	-
Any comment:	-

Data / Parameter table 5.

Data / Parameter:	$T_{j,x}$
Data unit:	tonne
Description:	Amount of liquid fuel transported in trucks in route *j* in year *x*
Source of data:	Historical data from the project participants
Measurement procedures (if any):	-
Any comment:	-

Data / Parameter table 6.

Data / Parameter:	$L_{DEF,s}$
Data unit:	km
Description:	Length deforested for segment *s*
Source of data:	Measurement from the project participants
Measurement procedures (if any):	-
Any comment:	-

Data / Parameter table 7.

Data / Parameter:	$W_{DEF,s}$
Data unit:	km
Description:	Width deforested for segment *s*
Source of data:	Measurement from the project participants
Measurement procedures (if any):	-
Any comment:	-

Data / Parameter table 8.

Data / Parameter:	$M_{A,s}$
Data unit:	tonnes d.m./ha
Description:	Aboveground biomass of land to be deforested for segment *s*

Source of data:	Default value for aboveground biomass for segment *s*, to be deforested for each segment on the basis of conservative interpretation of IPCC 2006 Guidelines[11]
Measurement procedures (if any):	-
Any comment:	-

6. Monitoring methodology

6.1. Monitoring procedures

44. Describe and specify in the CDM-PDD all monitoring procedures, including the type of measurement instrumentation used and the responsibilities for monitoring and QA/QC procedures that will be applied. Where the methodology provides different options (e.g. use of default values or on-site measurements), specify which option will be used. Meters should be installed, maintained and calibrated according to equipment manufacturer instructions and be in line with relevant standards. If such standards are not available, use national standards. If a national standard is not available, then use international standards.

45. All monitoring shall be attended to by appropriate and adequate personnel, as assessed by the project participants. All data collected as part of monitoring shall be archived electronically and be kept at least for two years after the end of the last crediting period. One hundred per cent of the data shall be monitored if not indicated otherwise in the tables below. All measurements shall be conducted with calibrated measurement equipment according to relevant industry standards.

46. In addition, the monitoring provisions in the tools referred to in this methodology apply.

6.2. Data and parameters monitored

Data / Parameter table 9.

Data / Parameter:	$T_{j,y}$
Data unit:	tonne
Description:	Amount of liquid fuel transported by the pipeline in route *j* in year *y*
Source of data:	Onsite measurements by project participants
Measurement procedures (if any):	The amount of liquid transported by the pipeline in route *j* under the CDM project by shall be measured at the point of origin (o_j) using flow meter or mass meter. The amount shall be cross-checked with the liquid fuel received at the point of destination (d_j). In case the measurement is recorded in terms of m^3 of liquid fuel, it shall be multiplied by the average density of the liquid fuel transported by the pipeline in route *j* in year *y*

[11] Volume 4, Chapter 4, tables 4.7 and 4.8

Monitoring frequency:	Daily, summed for a year
QA/QC procedures:	-
Any comment:	The project participants shall estimate the $T_{j,y}$ to be used for ex ante calculation in the CDM-PDD and for the investment analysis and document in the PDD. The sensitivity analysis shall be performed as per the procedure in the "Combined tool to identify the baseline scenario and demonstrate additionality". Changes to the value of $T_{j,y}$ during the crediting period as compared to the ex ante estimate (e.g. by more than 10%) represent a change to the project design document and the relevant procedures shall apply

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Document information

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