CLEAN DEVELOPMENT MECHANISM

CDM-SSCWG44-A10

Draft Small-scale Methodology

AMS-III.AK: Biodiesel production and use for transport applications

Version 02.0 - Draft

Sectoral scope(s): 07

United Nations
Framework Convention on
Climate Change

COVER NOTE

1. Procedural background

1. Following the approval of the methodological tool “Project emissions from cultivation of biomass” at the seventy-fifth meeting of the Board, the SSC WG requested a mandate from the Board to integrate this tool into SSC methodologies. Consequently, the Board mandated this task at its seventy-sixth meeting (EB 76, para 53).

2. Purpose

2. The draft revision:

   (a) Introduces the methodological tool “Project emissions from cultivation of biomass”, taking advantage of its procedures and applicability criteria, and removing obsolete procedure;

   (b) Streamlines biomass cultivation procedures;

   (c) Streamlines transport and energy consumption related project emissions procedures;

   (d) Introduces project and leakage emissions equations instead of cross-reference to another methodology.

3. Key issues and proposed solutions

3. None.

4. Impacts

   (a) Increased environmental integrity;

   (b) Simplified and streamlined procedures.

5. Subsequent work and timelines

4. The SSC WG, at its 44th meeting, agreed on the draft revised methodology. After receiving public inputs on the document, the SSC WG will continue working on the methodology, at its 45th meeting, for recommendation to the Board at a future meeting of the Board.

6. Recommendations to the Board

5. Not applicable (call for public input).

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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)	Biodiesel production that is used for transportation applications, where the biodiesel is produced from oilseed cultivated on dedicated plantations and from waste oil/fat
Type of GHG emissions mitigation action	Renewable energy. Displacement of more-carbon-intensive fossil fuel for combustion in vehicles/transportation applications by use of renewable biomass

2. Scope, applicability, and entry into force

2.1. Scope

2. This methodology comprises project activities for cultivation of oilseeds and sourcing of waste oil/fat[1] to be used in production of biodiesel[2] for use in transportation applications.[3]

2.2. Applicability

3. This methodology is only applicable if the final biodiesel blending proportion is a maximum of 20 per cent by volume (B20). This is to ensure that technical performance characteristic of the blended biodiesel do not differ from those of petrodiesel.

4. Only biodiesel consumed in excess of mandatory regulations is eligible for the purpose of the project activity.[4]

5. This methodology is applicable under the following conditions:

   (a) In the baseline situation the vehicles/transportation applications use diesel;

   (b) Biodiesel or its blends are end-used in a captive fleet of vehicles/transportation applications;

   (c) The petrodiesel, the biodiesel and the blended biodiesel comply with the national regulations (if existent) or with applicable international standards such as ASTMD6751, EN14214, or ANP42;

[1] Waste oil/fat is defined as a residue or waste stream of biogenic origin from restaurants, agro and food industry, slaughterhouses or related commercial sectors.

[2] Biodiesel is a diesel fuel consisting of long-chain alkyl (methyl, propyl or ethyl) esters which is produced by esterification of vegetable oils and/or waste oil/fat with alcohols from biogenic and/or fossil origin.

[3] Domestic water borne transport as defined by IPCC 2006, vol.2, chapter 3 ~~can be considered as~~ is eligible.

[4] Regulations that have been implemented since the adoption by the COP of the Modalities and Procedures of CDM (Decision 17/CP.7, 11 November 2001) need not to be taken into account.

(d) Final users and the producer of the biodiesel and its blends are bound by a contract that states that the final consumers shall not claim emission reductions resulting from its consumption. The contract also enables the producer to monitor the consumption of biodiesel and its blends. Only the producer of the biodiesel ~~can~~ may claim emission reductions under this methodology;

(e) The alcohol used for esterification is methanol from fossil fuel origin. Volumes of biodiesel produced with alcohols other than methanol (for example, ethanol) are not included in the quantity of biodiesel for which emission reductions are claimed;[5]

(f) The export of biodiesel produced under this category is not allowed.

6. Measures are limited to those that result in emission reductions of less than or equal to 60 kt CO_2 equivalent annually.

7. If the project activity utilizes biomass sourced from dedicated plantations, the applicability conditions prescribed in the methodological tool "project emissions from cultivation of biomass" shall apply

~~8. The following conditions have to be met only if the feedstock for production of the biodiesel is vegetable oil produced from oil seeds cultivated in dedicated plantations:~~

~~(a) The project activity does not lead to a shift of pre-project activities outside the project boundary i.e. the land under the proposed project activity can continue to provide at least the same amount of goods and services as in the absence of the project;~~

~~(b) The plantations are established on a land:~~

~~(i) Which was at the start of the project implementation, classified as degraded or degrading as per the "Tool for the identification of degraded or degrading lands for consideration in implementing CDM A/R project activities"; or~~

~~(ii) Area that is included in the project boundary of one or several registered A/R CDM project activities;~~

~~(c) Plantations established on the peatlands are not eligible even if qualifying under condition (b) above.~~

2.3. Entry into force

8. Not applicable (call for public input).

[5] Only methanol from fossil fuel origin is included because the methodology does not provide procedures for estimating emissions associated with the use of other alcohols than methanol from fossil fuel origin. Project proponents are invited to propose procedures to estimate the emissions associated with the production of other alcohols that could be used for esterification, such as ethanol or methanol from renewable sources, as a revision to this methodology.

3. Normative references

9. Project participants shall apply the "General guidelines ~~to~~ for SSC CDM methodologies and "Guidelines on the demonstration of additionality of small-scale project activities ~~information on additionality (attachment A to Appendix B)~~ provided at <http://cdm.unfccc.int/methodologies/SSCmethodologies/approved.html> mutatis mutandis.

10. This methodology also refers to the latest approved versions of the following approved methodologies and tools:

~~(a) "ACM0017: Production of biodiesel for use as fuel";~~

(b) "AMS-I.D: "Grid connected renewable electricity generation";

(c) "AMS-III.F: "Avoidance of methane emissions through composting";

(d) "AMS-III.G: "Landfill methane recovery";

(e) "AMS-III.H: Methane recovery in wastewater treatment";

(f) "Project emissions from cultivation of biomass";

(g) "Project and leakage emissions from transportation of freight";

(h) "Upstream leakage emissions associated with fossil fuel use";

~~(i) "Tool for the identification of degraded or degrading lands for consideration in implementing CDM A/R project activities".~~

(j) "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion";

(k) "Tool to calculate baseline, project and/or leakage emissions from electricity consumption".

4. Definitions

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

5. Baseline methodology

5.1. Project boundary

12. The project boundary is the geographical area of the oil seeds cultivation, itinerary for transportation of the feedstock sources[6] processing of oil-seeds and biodiesel production, the sites where the waste water and solid waste are treated, the areas where biodiesel is blended and sold to the final users. The vehicles/transportation applications of the final users where the biodiesel or blends thereof are consumed are also included in the project boundary.

[6] Feedstock sources are the harvested parts of the plants from dedicated plantations that are transported from the fields to the facility for plant oil processing and/or biodiesel production. In case of waste oil/fat the feedstock sources are the activities where they are generated.

5.2. Baseline

13. Baseline emissions are calculated based on the amount of displaced petrodiesel determined as follows.

$$BE_y = BD_y \times NCV_{BD,y} \times EF_{CO2,PD,y} \quad \text{Equation (1)}$$

With

$$BD_y = min[(P_{BD,y} - P_{BD,on-site,y} - P_{BD,other,y}), (f_{PJ,y} \times f_{PD,y} \times C_{BBD,y} - P_{BD,other,y})] \quad \text{Equation (2)}$$

Where:

BE_y	=	Baseline emissions during the year y (t CO_2)
$NCV_{BD,y}$	=	Net calorific value of biodiesel produced for the year *y*
BD_y	=	Quantity of biodiesel eligible for crediting in year *y* (tonnes)
$P_{BD,y}$	=	Production of biodiesel in the project plant in year *y* (tonnes)
$P_{BD,on-site,y}$	=	Quantity of biodiesel consumed at the project biodiesel production plant in year *y* (tonnes)
$P_{BD,other,y}$	=	Quantity of biodiesel that is either produced with other alcohols than methanol from fossil origin or that is produced using other oil seeds or waste oil(s)/fat(s) than those eligible under this methodology according to the applicability conditions[7]
$C_{BBD,y}$	=	Consumption of (blended) biodiesel from the project plant by the captive consumer(s) in year *y* (tonnes)
$f_{PJ,y}$	=	Fraction of blending in year *y* (volume ratio)
$EF_{CO2,PD,y}$	=	Carbon dioxide emissions factor for petrodiesel (t CO_2/GJ)
$f_{PD,y}$	=	1.0 if pure petrodiesel is used for blending otherwise use the fraction of petrodiesel in the fuel used for blending (blending rate shall be established volume by volume)

14. BD_y is determined in equation (2) as the lowest value between the amounts calculated based on: (a) the production of biodiesel in year *y* ($P_{BD,y}$); and (b) the consumption of biodiesel by the captive consumers in year *y* ($C_{BD,y}$). In the case of blended biodiesel, the consumption of eligible quantity of biodiesel is calculated by the multiplying the consumption of eligible quantity of blended biodiesel by the blending fraction ($C_{BBD,y}$ x $f_{PJ,y}$). In case the biodiesel produced by the project activity is blended with already blended biodiesel, then only the fraction of petrodiesel shall be considered ($f_{PD,y}$). Only

[7] If in a particular year some amount of biodiesel produced has not been consumed and the excess stock is carried over to the next year then it can be added to the amount produced in the next year.

those (blended) biodiesel quantity shall be considered as eligible for which the applicability conditions are fulfilled. Therefore, biodiesel quantity produced and consumed for the purpose of the project activity (self-consumption) are subtracted from the first amount, and quantity which do not fulfil the applicability criteria are subtracted from the amount of biodiesel in both cases.

15. Only biodiesel and blends thereof which are consumed by captive fleets and which is sold to the end users at filling stations and recorded by calibrated metering systems are included.

5.3. Project ~~Activity~~ Emissions

16. Project ~~activity~~ emissions (PE_y) are the emissions related to the cultivation of oil seeds and production and distribution of biodiesel ("field-to-tank" emissions). The emissions from the combustion of the renewable carbon content in biodiesel ("tank to wheel") are carbon neutral and may be disregarded. The following sources of project emissions shall be considered:

(a) CO_2 emissions from on-site consumption of fossil fuels due to the project activity shall be calculated using the latest version of the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion", including the consumption of fossil fuels for processing (e.g. pressing and filtering, transesterification, degumming, neutralization) of biodiesel and excluding the consumption of fossil fuels related to the cultivation of oil seeds, if any;

(b) CO_2 emissions from electricity consumption by the project activity using the latest version of the "Tool to calculate baseline, project and/or leakage emissions from electricity consumption", including the consumption of fossil fuels for processing (e.g. pressing and filtering, transesterification, degumming, neutralization) of biodiesel and excluding the consumption of electricity related to the cultivation of oil seeds, if any;

(c) Project methane emission from solid waste disposal, wastewater are calculated as per provisions in AMS-III.G (landfill); AMS-III.F (composting) and AMS-III.H. (waste water treatment) in the cases where the waste are disposed in anaerobic conditions;

(d) Project emissions from cultivation of oil seeds are calculated using the latest version of the tool "Project emissions from cultivation of biomass";

(e) Project emissions from transportation of oil seeds to the biodiesel production plant are estimated using the latest version of the tool "Project and leakage emissions from transportation of freight", if the transportation distance is more than 200 km, otherwise they can be neglected;

~~(f) Emissions associated with the cultivation of land to produce the oil seeds used for production of biodiesel/plant oil;~~

~~(g) Emissions due to transportation of feedstock sources from their originating sites to the biodiesel production facility;[8]~~

~~(h) Emissions from energy use for biodiesel production;~~

(i) Emissions from fossil fuel carbon in the biodiesel due to the use of methanol from fossil origin in the trans-esterification process;

~~(j) Where applicable CH_4 emissions due to stockpiling, land filling of solid waste generated by the project or from the waste water generated in the biodiesel production facility.~~

17. The project activity emissions of sources (a), (b) and (c) above will be allocated to the biodiesel produced from each oilseed type *k* and its co- and by-products, apportioning by market prices. For each oilseed type *k* the project emissions shall be calculated separately and then summed to determine the total project emissions in year *y*, as follows:

$$PE_y = \sum_k [FP_{BD,k,y} \times AF_{k,y} \times (PE_{CC,k,y} + PE_{TT,k,y} + PE_{PP,k,y})] + PE_{MeOH,y} + PE_{CH4,k,y}$$ Equation (3)

Where:

PE_y = Project emissions in year y (t CO_2e)

$FP_{BD,k,y}$ = Amount of biodiesel produced with plant oil type *k* that is produced by the project activity in year *y* (tonnes)

$AF_{k,y}$ = Allocation factor for the production of biodiesel from oilseed type *k* in year *y* (fraction)

$PE_{CC,k,y}$ = Emissions from cultivation of crops for oilseeds type *k* in year *y* (t CO_2e)

$PE_{TT,k,y}$ = Emissions from transportation of feedstock sources of type *k* and/or biodiesel in year *y* (t CO_2e)

$PE_{PP,k,y}$ = Emissions from biodiesel production using oilseeds type *k* in year *y* (t CO_2e)

$PE_{MeOH,y}$ = Emissions from fossil fuel carbon in methanol used in the trans-esterification process in year *y* (t CO_2e)

$PE_{CH4,k,y}$ = Where applicable project emissions of CH_4 from solid waste and/or waste water in year *y* (t CO_2e)

18. The allocation factor is calculated using the amount of fuels, co-products and by-products obtained from the oilseed type *k* and respective market prices, as per the following equation:

[8] ~~In case all the feedstock sources (crop cultivation areas) are situated within 50 km from the facility for biodiesel production the project emissions for transportation may be disregarded, however, in this case the long distance transportation of crude oil for petrodiesel production in the leakage section (paragraph 24) shall also be disregarded.~~

$$AF_y = \frac{FP_{BD,k,y} \times MP_{BD,k,y}}{FP_{BD,k,y} \times MP_{BD,k,y} + M_{OM,k,y} \times MP_{OM,k,y} + M_{G,k,y} \times MP_{G,y}}$$ Equation (4)

Where:

$FP_{BD,k,y}$ = Amount of biodiesel from oilseed type *k* produced and consumed in the year *y* (tonnes)

$MP_{BD,k,y}$ = Market price of biodiesel from oilseed type *k* in year *y* ($/tonnes)

$M_{OM,k,y}$ = Amount of oilseed meal (press-cake) obtained from oilseed type *k* in year *y* (tonnes)

$MP_{OM,k,y}$ = Market price of oilseed meal (press-cake) obtained from oilseed type *k* in year *y* ($/tonnes)

$M_{G,k,y}$ = Amount of glycerin associated with the production of biodiesel from oilseed type *k* in year *y* (tonnes)

$MP_{G,y}$ = Market price of glycerin in year *y* ($/tonnes)

19. If any other co-products or by-products from oilseed crop type *k* are sold in the market, they may be included in the denominator of the above equation accordingly.

~~5.3.1. Project emissions associated with the cultivation of lands to produce oil seeds ($PE_{BC,y}$)~~

~~20. This step calculates emissions associated with the cultivation of lands to produce the oil seeds used for biodiesel production.~~

~~21. If the oil seeds are sourced from a plantation area that is registered as one or several A/R CDM project activities, these emissions are not accounted as project emissions under this methodology.~~

~~22. Project participants may choose among two options to calculate this emission source:~~

~~(a) Option A provides a simplified approach, using conservative default values for the emissions associated with the cultivation of lands, taking into account different geographical regions where the crop is grown. This approach can only be used for oil seeds from palm or jatropha;~~

~~(b) Option B calculates the emissions based on actual data from the cultivation process and is more accurate than option A but requires additional data collection efforts.~~

~~5.3.1.1. Option A: Use of a default emission factor~~

~~$PE_{CC,k,y} = A_{k,y} \times EF_{k,y}$~~ ~~Equation 5~~

Where:

$A_{k,y}$ = Total area in which oil seed type k is cultivated for use in the project plant in year y (ha)

$EF_{k,y}$ = Default emission factor for the GHG emissions associated with the cultivation of land to produce oil seed type s (tCO2e/ha). See Table 2III.AK.1 below for available values

Table 2 Conservative default emission factors for the GHG emissions associated with the cultivation of land to produce oil seeds

Crop	Climate Zone	EFs,y (tCO2e/ha)
Palm	Tropical Moist	1.87
Palm	Tropical Wet	1.87
Jatropha	Tropical Moist	1.76
Jatropha	Tropical Dry	2.52

5.3.1.2. Option B: Use of project specific data

20. The project emissions from cultivation of oil seeds are calculated using the latest version of the tool "Project emissions from cultivation of biomass".

21. Project emissions associated with the cultivation of land shall be determined as per the relevant procedures of ACM0017.

21. The project emissions from transportation of feedstock and biodiesel are estimated using the latest version of the tool "Project and leakage emissions from transportation of freight"; if the transportation distance is more than 200 km, otherwise they can be neglected.

22. is calculated as follows:

$$PE_{TT,k,y} = (Q_{k,y} / CT_y) \times DAF_{k,y} \times EF_{CO2}$$ Equation 6

Where:

$Q_{k,y}$ = Quantity of feedstock from oilseed type k transported from the cultivation area to the processing/producing facility or biodiesel transported from production plant to blending site or site of its consumption in the year y (tonnes)

CT_y = Average truck capacity for transportation (tonnes/truck)

$DAF_{k,y}$ = Average distance for feedstock transportation for oilseed type k (km/truck)

EF_{CO2} = CO2 emission factor from fuel use due to transportation (kgCO2/km, IPCC default values or local values may be used)

23. Project emissions from energy use for processing (e.g. pressing and filtering, transesterification, degumming, neutralization) are determined as follows:

$$PE_{PP,k,y} = EC_{PP,k,y} \times EF_{CO2,ELEC} + \sum_i \left(FC_{i,PP,k,y} \times NCV_i \times EF_{CO2,i} \right)$$ Equation 7

Where:

$EC_{PP,k,y}$ = Electricity consumption in biodiesel production for crop *k* or for processing of the waste oil/fat in year *y* (MWh)

$EF_{CO2,ELEC}$ = Emissions factor for grid electricity supplied to the project facility using the calculation methods of AMS-I.D (t CO_2e/MWh)

$FC_{i,PP,k,y}$ = Consumption of fossil fuel type *i* for plant oil processing or biodiesel production from crop *k* or from waste oil/fat in year *y* (tonnes)

NCV_i = Net calorific value of fossil fuel *i* (GJ/tonnes)

$EF_{CO2,i}$ = Emissions factor of fossil fuel *i* (t CO_2/GJ fuel)

23. Project emissions from fossil fuel carbon in the biodiesel due to the use of methanol from fossil origin in the esterification process are estimated as follows:

$$PE_{MeOH,y} = MC_{MeOH,y} \times EF_{C,MeOH} \times \frac{44}{12}$$ Equation (5)

Where:

$PE_{MeOH,y}$ = Project emissions from fossil carbon in the biodiesel due to esterification with methanol of fossil origin in year *y* (t CO_2e)

$MC_{MeOH,y}$ = Quantity of methanol consumed in the biodiesel plant, including spills and evaporations in year y (tonnes)

$EF_{C,MeOH}$ = Carbon emission factor of methanol, based on molecular weight (tC/tMeOH) (= 12/32)

$\frac{44}{12}$ = Molecular weight ratio to convert tonnes of carbon into tonnes of CO_2 (t CO_2/tC)

24. Project emission of CH_4 from solid waste disposal and/or wastewater treatment is calculated as per provisions in AMS-III.G (landfill), AMS-III.F (composting) or AMS-III.H (waste water treatment).

5.4. Leakage

25. In case If the biodiesel oil is produced from waste oil/fat, the "General guidance on leakage in biomass project activities" for small-scale projects shall be taken into account. Leakage emissions shall be estimated accordingly and deducted from the emission reductions.

26. If it is demonstrated that the use of the waste oil/fat by the project activity does not result in increased fossil consumption elsewhere the leakage form the displacement of existing

~~uses of waste oil/fat is to be neglected, otherwise the leakage should be considered as per the relevant provisions of ACM0017 and its equations 12, 13 and 14.~~

26. Leakage effects due to the upstream emissions for the methanol production may be disregarded, if the leakage due to the avoided production of petrodiesel (including production of crude oil and refining of crude oil) is also disregarded. Otherwise, the leakage emissions due to the production of methanol used in the esterification process shall be calculated as ~~per the relevant equation 11 of ACM0017~~follows:~~.~~

$$LE_{MeOH,y} = MC_{MeOH,y} \cdot EF_{MeOH,PC}$$

Where:

$LE_{MeOH,y}$	=	Leakage emissions associated with production of methanol used in biodiesel production in year *y* (t CO_2)
$MC_{MeOH,y}$	=	Quantity of methanol consumed in the biodiesel plant, including spills and evaporation on-site in year *y* (t MeOH)
$EF_{MeOH,PC}$	=	Pre-combustion (i.e. upstream) emissions factor for methanol production (t CO_2/t MeOH)

27. The substitution of plant oil for petrodiesel reduces indirect ("upstream") emissions associated with the production of petrodiesel and is treated as negative leakage[9] and can be calculated as per the methodological tool "Upstream leakage emissions associated with fossil fuel use" ~~relevant sections of ACM0017 and its equations 16, 17 and 18~~.

5.5. Emission reduction

28. The emission reductions achieved by the project activity shall be calculated as the difference between the baseline emissions and the sum of the project emissions and leakage.

$$ER_y = BE_y - PE_y - LE_y \qquad \text{Equation (6)}$$

~~$ER_y = BE_y - PE_y - LE_y - LE_{WOF,y} - LE_{MEOH,y} + LE_{PD,y}$~~

Where:

ER_y	=	Emission reductions in the year y (t CO_2e)
LE_y	=	Leakage ~~due to equipment transfer~~emissions in year y (t CO_2e)
~~$LE_{PD,y}$~~	=	~~Leakage related to the avoided production of petrodiesel (t CO_2/yr)~~
~~$LE_{MEOH,y}$~~	=	~~Leakage emissions associated with production of methanol used in biodiesel production in year y (t CO_2)~~

[9] Emission reduction from reducing international bunker fuel consumption is not eligible under CDM as per EB 25 report, paragraph 58.

~~$LE_{WOF,y}$ = Leakage emissions from displacement of existing utilization of waste oil/fat in year y (t CO_2)~~

6. Monitoring methodology

29. Relevant parameters shall be monitored as indicated in the ~~T~~tables ~~III.AK.2~~ below. The applicable requirements specified in the "General guidelines ~~to~~ for SSC methodologies" (e.g. calibration requirements, sampling requirements) are also an integral part of the monitoring guidelines specified below and therefore shall be referred by the project participants.

~~**Data / Parameter table 1.**~~

~~**Data / Parameter:**~~	~~**Ak,y**~~
~~Data unit:~~	~~ha~~
~~Description:~~	~~Total area in which oil seed type *k* is cultivated for use in the project plant in year *y*~~
~~Measurement procedures (if any):~~	~~Measured or calculated (e.g. using maps). Measurements results shall be consistent with yield of the cultivation~~
~~Monitoring frequency:~~	~~Annually~~
~~Any comment:~~	~~-~~

Data / Parameter table 1.

Data / Parameter:	**$P_{BD,y}$**
Data unit:	Tonnes
Description:	Production of biodiesel in the project plant in year *y*
Measurement procedures (if any):	Measurements are undertaken using calibrated meters. Measurement results shall be cross checked with records for consumption and sales (e.g. invoices/receipts)
Monitoring frequency:	Continuously or in batches
Any comment:	-

Data / Parameter table 2.

Data / Parameter:	**$P_{BD,on\text{-}site,y}$**
Data unit:	Tonnes
Description:	Quantity of biodiesel that is either produced with other alcohols than methanol from fossil origin or that is produced using other oil seeds or waste oil(s)/fat(s) than those eligible under this methodology according to the applicability conditions
Measurement procedures (if any):	Measurements are undertaken using calibrated meters at production site
Monitoring frequency:	Continuously or in batches
Any comment:	-

Data / Parameter table 3.

Data / Parameter:	**$P_{BD,on\text{-}site,y}$**
Data unit:	tonnes
Description:	Quantity of biodiesel consumed at the project biodiesel production plant and/or the oil production plant(s) in year *y*
Measurement procedures (if any):	Measurements are undertaken using calibrated meters at production site
Monitoring frequency:	Continuously or in batches
Any comment:	-

Data / Parameter table 4.

Data / Parameter:	**$C_{BBD,y}$**
Data unit:	tonnes
Description:	Consumption of (blended) biodiesel from the project plant by the captive consumer(s) in year *y*
Measurement procedures (if any):	Measurements are undertaken using calibrated meters at fuelling stations. Measured with calibrated metering system at fuelling stations. Measurement results shall be cross checked with records for sales (e.g. invoices/receipts)
Monitoring frequency:	Continuously or in batches
Any comment:	-

Data / Parameter table 5.

Data / Parameter:	**$NCV_{BD,y}$**
Data unit:	GJ/tonnes
Description:	Net calorific value of biodiesel produced in year *y*
Measurement procedures (if any):	Measured according to relevant national/ international standards Analysis has to be carried out by accredited laboratory
Monitoring frequency:	Annually
Any comment:	-

Data / Parameter table 6.

Data / Parameter:	**$f_{PJ,y}$**
Data unit:	%
Description:	Fraction of blending in year *y* (ratio)
Measurement procedures (if any):	Measured volumes or flows by calibrated meters at blending stations. ~~To be determined as per ACM0017~~
Monitoring frequency:	Every produced blend must be monitored~~Continuously~~

QA/QC procedures:	During the process of creating the blended biodiesel at the blending station, the blending operation shall be monitored to assure adequate mixing of the products in the correct proportions. For automotive purposes the blending ratio must not exceed 20%. This includes measuring and recording the volumes and blend levels as verified through bills of lading, meter printouts or other auditable records of both the biodiesel and diesel fuel, which comprise the blend
Any comment:	See "BQ-9000 Quality Assurance Program Requirements for the Biodiesel industry" for further information

Data / Parameter table 7.

Data / Parameter:	$f_{PD,y}$
Data unit:	%
Description:	Fraction of petrodiesel in the fuel used for blending
Measurement procedures (if any):	Data from the supplier of the fuel used for blending
Monitoring frequency:	Continuously or in batches
Any comment:	-

Data / Parameter table 8.

Data / Parameter:	$FP_{BD,k,y}$
Data unit:	tonnes
Description:	Amount of biodiesel from oilseed type *k* produced and consumed in the year *y* (tonnes)
Measurement procedures (if any):	Measurements are undertaken using calibrated meters at fuelling stations. Measurement results shall be cross checked with records for consumption and sales (e.g. invoices/receipts)
Monitoring frequency:	Continuously or in batches
Any comment:	-

Data / Parameter table 9.

Data / Parameter:	$M_{OM,k,y}$
Data unit:	tonnes
Description:	Amount of oilseed meal (press-cake) obtained from oilseed type *k* in year *y* (tonnes)
Measurement procedures (if any):	Measurements are undertaken at production site. Measurement results shall be cross checked with records for consumption and sales (e.g. invoices/receipts)
Monitoring frequency:	Continuously or in batches
Any comment:	-

Data / Parameter table 10.

Data / Parameter:	**$M_{G,k,y}$**
Data unit:	Tonnes
Description:	Amount of glycerin associated with the production of biodiesel from oilseed type *k* in year *y* (tonnes)
Measurement procedures (if any):	Measurements are undertaken at production site. Measurement results shall be cross checked with records for consumption and sales (e.g. invoices/receipts)
Monitoring frequency:	Continuously or in batches
Any comment:	-

~~**Data / Parameter table 12.**~~

~~**Data / Parameter:**~~	~~**$Q_{k,y}$**~~
~~Data unit:~~	~~tonnes~~
~~Description:~~	~~Quantity of feedstock from oilseed type *k* transported from the cultivation area to the processing/producing facility and biodiesel from production plant to blending site or site of its consumption in the year *y* (tonnes)~~
~~Measurement procedures (if any):~~	~~Measurements are undertaken using calibrated mass or volumetric meters at production site for every transported material (e.g. oil seeds, plant oil, biodiesel)~~
~~Monitoring frequency:~~	~~Continuously or in batches~~
~~Any comment:~~	~~-~~

~~**Data / Parameter table 13.**~~

~~**Data / Parameter:**~~	~~**CT_y**~~
~~Data unit:~~	~~tonnes~~
~~Description:~~	~~Average truck capacity for transportation (tonnes/truck)~~
~~Measurement procedures (if any):~~	~~Annually~~
~~Monitoring frequency:~~	~~Annually~~
~~Any comment:~~	~~-~~

~~**Data / Parameter table 14.**~~

~~**Data / Parameter:**~~	~~**$DAF_{k,y}$**~~
~~Data unit:~~	~~km~~
~~Description:~~	~~Average distance for feedstock transportation for oilseed type *k* (km/truck)~~
~~Measurement procedures (if any):~~	~~Measurements are undertaken using vehicles odometer readings. The consistency of distance records provided by truck operators shall be cross-checked with other information sources (e.g. maps)~~
~~Monitoring frequency:~~	~~Annually~~
~~Any comment:~~	~~-~~

Data / Parameter table 15.

Data / Parameter:	**$EF_{CO2,ELEC}$**
Data unit:	tCO_2e/kWh
Description:	CO_2 emission factor for grid electricity supplied to the project plant in year *y*
Measurement procedures (if any):	Grid emission factor shall be determined following the provisions of AMS-I.D
Monitoring frequency:	Annually
Any comment:	

Data / Parameter table 16.

Data / Parameter:	**$EF_{CO2,i}$**
Data unit:	tCO_2e/GJ
Description:	CO_2 emission factor of fossil fuel type *i*
Measurement procedures (if any):	As per the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion"
Monitoring frequency:	Annually
Any comment:	-

Data / Parameter table17.

Data / Parameter:	**$EC_{PP,k,y}$**
Data unit:	MWh
Description:	Electricity consumption in biodiesel production for crop *k* or for processing of the waste oil/fat in year *y*
Measurement procedures (if any):	As per the "Tool to calculate baseline, project and/or leakage emissions from electricity consumption"
Monitoring frequency:	As per the "Tool to calculate baseline, project and/or leakage emissions from electricity consumption"
Any comment:	-

Data / Parameter table 18.

Data / Parameter:	**NCV_i**
Data unit:	GJ/mass or volume unit
Description:	Net calorific value of fossil fuel type *i*
Measurement procedures (if any):	As per the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion"
Monitoring frequency:	Annually
Any comment:	-

Data / Parameter table 19.

Data / Parameter:	**$FC_{PP,i,k,y}$**
Data unit:	Mass or volume unit

~~Description:~~	~~Consumption of fossil fuel type *i* for biodiesel production from crop *k* or from waste oil/fat in year *y* (tonnes)~~
~~Measurement procedures (if any):~~	~~As per the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion"~~
~~Monitoring frequency:~~	~~As per the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion"~~
~~Any comment:~~	

~~**Data / Parameter table 20**~~

~~**Data / Parameter:**~~	~~NCV_{PD}~~
~~Data unit:~~	~~GJ/tonnes~~
~~Description:~~	~~Net calorific value of diesel~~
~~Measurement procedures (if any):~~	~~2006 IPCC Guidelines on National GHG Inventories~~
~~Monitoring frequency:~~	~~-~~
~~Any comment:~~	~~-~~

Data / Parameter table 11.

Data / Parameter:	**$MC_{MeOH,y}$**
Data unit:	tonnes
Description:	Mass of MEOH consumed in the biodiesel plant, including spills and evaporation, in year *y*
Measurement procedures (if any):	Measured continuously by calibrated equipment at the project site. Cross-checked with purchase data and adjusted for stock changes when deemed necessary
Monitoring frequency:	Continuously or in batches
Any comment:	-

6.1. Project activity under a programme of activities

30. The methodology is applicable to a programme of activities; no additional leakage estimations are necessary other than that indicated under leakage section above..

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Document information

Version	*Date*	*Description*
Draft 02.0	14May 2014	SSCWG44, Annex 10 A call for public input will be issued on this draft revised methodology. Revision to remove the applicability conditions related to land eligibility and project emission calculations related to the cultivation of biomass and to include reference to the approved tools.
01.0	30 July 2010	EB 55, Annex 30 Initial adoption.

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