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TYPE III - OTHER PROJECT ACTIVITIES

Project participants shall take into account the general guidance to the methodologies, information on additionality, abbreviations and general guidance on leakage provided at http://cdm.unfccc.int/methodologies/SSCmethodologies/approved.html.

III.T. Plant oil production and use for transport applications

Technology/measure

1. This methodology ~~covers~~ comprises project activities for ~~involving the~~ cultivation of oilseeds and sourcing of waste oil/fat[1] ~~, the~~ to be used in production of plant oil[2] and biodiesel[3] ~~the use of plant oil for~~ for use in transportation applications[4]. Plant oil in contrast to bio-diesel is not trans-esterified but only pressed and filtered from oilseeds.

2. This methodology is only applicable to plant oil:

   (a) that is used in blends of up to 10% by volume of plant oil mixed with conventional petrodiesel in unconverted vehicles/transportation applications; or ~~used as pure~~

   (b) ~~In case~~ that is used in blends above 10% by volume of plant oil or used as pure plant oil ~~is used it shall be used as a fuel only~~ in converted vehicles[5]. The use of pure plant oil in vehicles where engine conversions have not been carried out is not covered under this methodology.

3. For the case of biodiesel, this methodology is only applicable if the biodiesel blending proportion is a maximum of 20 % by volume (B20). This is to ensure that technical performance characteristic of the blended biodiesel do not differ significantly from those of petrodiesel.

4. The export of plant oil/ biodiesel produced under this category is not allowed.

5. Only biodiesel or plant oil consumed in excess of mandatory regulations are eligible for the purpose of the project activity[6]

6. This methodology is applicable under the following conditions:

   (i) In the baseline situation the vehicles/transportation applications use diesel.

[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] Plant oil, or vegetable oil, is oil of plant origin composing of triglycerides. Although many different parts of the plants may yield oil, most often oil is extracted from the seeds or fruits of the plant. Examples of plant oil are sunflower oil, rapeseed oil or jatropha oil.

[3] 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.

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

[5] Conversion measures include adaptations of fuel supply, combustion and injection.

[6] 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).

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III.T. Plant oil production and use for transport applications (cont)

(ii) Plant oil or biodiesel or their blends are end-used in a captive fleet of vehicles/transportation applications.

(iii) In case of plant oil blending, plant oil is blended with pure diesel and not with bio-diesel or bio-diesel blends.

(iv) In case of biodiesel blending, biodiesel is blended with petrodiesel.

(v) Plant oil must comply with national quality regulations or in absence of the latter with the quality standards stipulated in table III.T.1.

(vi) The petrodiesel, the biodiesel and the blended biodiesel comply with the national regulations (if existent) or with suitable international standards such as ASTMD6751, EN14214, or ANP42.

(vii) ~~The retailers,~~ Final users and the producer of the plant oil and/or biodiesel ~~or its blend~~ are bound by a contract that states that the ~~retailers and~~ final consumers shall not claim emission reductions resulting from its consumption. The contract also enables the producer to monitor the consumption of plant oil and/or biodiesel ~~or its blend~~. Only the producer of the plant oil and/or biodiesel can claim emission reductions under this methodology.

~~(viii) Under this methodology only the CO_2 emissions from diesel displaced by plant oil is considered.~~[7]

(ix) In accordance with the approved "General guidance on leakage in biomass project activities" for small scale projects, the project participants should demonstrate that the area where the biomass is grown is not a forest (as per DNA forest definition) and has not been deforested, according to the forest definition by the national DNA, during the last 10 years prior to the implementation of the project activity. In the absence of forest definition from the DNA, definitions provided by relevant international organizations (e.g., FAO) shall be used.

(x) No biomass and/or wastes generated/used in the cultivation and processing of the oilseeds will be stockpiled, disposed or treated in such a way as to allow anaerobic decay that result in methane emissions.

(xi) In the case of biodiesel, 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.[8]

[7] ~~Project participants are encouraged to submit procedures to calculate upstream emissions related to the production and use of fossil fuel in the baseline for consideration and approval by the Board~~

[8] 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.

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III.T. Plant oil production and use for transport applications (cont)

Table III.T.1: Proposed Quality Control Parameters for Plant Oil

Properties	Unit	Proposed Limiting Value		Possible Testing Method
		Min.	Max.	
Acid Value	mg KOH/g	-	2.0	DIN EN ISO 660
Oxidation Stability (110°C)	h	5.0	-	ISO 6886
Ash Content	Mass-%	-	0.01	DIN EN ISO 6245
Contamination	mg/kg	-	25	DIN EN 12662
Phosphorus Content	mg/kg	-	15	ASTM D3231-99
Water Content	Mass-%	-	0.075	Pr EN ISO 12937
Kinematic Viscosity (40°C)	mm^2/s	-	Variable	DIN EN ISO 3104

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

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:

(i) On land 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) On a land area that is included in the project boundary of one or several registered A/R CDM project activities.

Boundary

9. The project boundary is the geographical area of the oil seeds cultivation, itinerary for transportation of the feedstock sources[9] ~~production and~~ processing of oil-seeds and plant oil/biodiesel production, the areas where plant oil and/or biodiesel ~~is~~ are blended and sold to the final users. The vehicles/transportation applications of the final users where the plant oil and/or biodiesel or blends thereof ~~is~~ are consumed are also included in the project boundary.

Baseline

[9] 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.

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III.T. Plant oil production and use for transport applications (cont)

~~10 Baseline emissions are calculated based on the amount of plant oil consumed by the project. For this purpose the amount of diesel fuel that would have been consumed in absence of using plant oil is calculated. Calculations are based on the relative net calorific values of the fuels used.~~

$$FC_{D,y} = \sum_{k=1..n} \frac{NCV_k}{NCV_D} \times FC_{k,y} \quad \text{(1)}$$

~~Where:~~

~~$FC_{D,y}$ Diesel fuel which would have been consumed in the absence of the project activity in the year *y* (tonnes)~~

~~NCV_k Net calorific value of plant oil "k" (GJ/m^3)~~

~~NCV_D Net calorific value of diesel (GJ/m^3)~~

~~$FC_{k,y}$ Plant oil type *k* consumed in the year *y* (tonnes)~~

~~"k" Types of plant oil used (dependent on oil seed source)~~

~~Under the condition of:~~

$$FC_{k,y} \leq FP_{k,y} \quad \text{(2)}$$

~~Where:~~

~~$FP_{k,y}$ Plant oil type *k* produced in the year *y* (tonnes)~~

10. Baseline emissions from displaced petrodiesel are determined as follows:

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

with

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

Where:

BE_y	Baseline emissions during the year *y* (tCO_2)
$NCV_{BD,y}$	Net calorific value of biodiesel/plant oil produced for the year *y*
BD_y	Quantity of biodiesel/plant oil eligible for crediting in year *y* (tonnes)
$P_{BD,y}$	Production of biodiesel/plant oil in the project plant in year *y* (tonnes)
$P_{BD,on-site,y}$	Quantity of biodiesel/plant oil consumed at the project biodiesel production plant and/or the oil production plant(s) in year *y* (tonnes)
$PD_{BD,other,y}$	Quantity of biodiesel/plant oil 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
$C_{BBD,y}$	Consumption of (blended) biodiesel/plant oil from the project plant by the captive consumer(s) in year *y* (tonnes)
$f_{PJ,y}$	Fraction of blending in year *y* (ratio)
$EF_{CO2,PD,y}$	Carbon dioxide emissions factor for petrodiesel (tCO_2/GJ)

11. BD_y is determined in equation (2) as the lowest value between the amounts calculated based on (a) the production of biodiesel/plant oil in year *y* ($P_{BD,y}$), and (b) the consumption of biodiesel/plant oil by the captive consumers in year y ($C_{BD,y}$). In the case of blended biodiesel/plant oil, the consumption of eligible biodiesel/plant oil is calculated by the multiplying the consumption of eligible blended biodiesel/plant oil by the blending fraction ($C_{BBD,y}*f_{PJ,y}$). Only those (blended) biodiesel/plant oil quantities shall be considered as eligible for which the applicability conditions are fulfilled and for which the baseline is the use of petrodiesel. Therefore, biodiesel/plant oil quantities produced and consumed for the purpose of the project activity (self-consumption) are subtracted from the first amount, and quantities which do not fulfil the applicability criteria are subtracted from the amount of biodiesel/plant in both cases.

12. The net calorific values (in GJ/m^3) of petrodiesel, ~~and of~~ plant oil of source "k" and biodiesel derived from source "k" ~~used~~ are determined based on direct measurements of a representative sample.

13. Only plant oil, biodiesel and blends thereof which ~~is~~ are consumed ~~in non-annex 1 countries~~ by captive fleets and which is sold to the end users at filling stations and recorded by calibrated metering systems are included. ~~Captive fleets, retailers and final consumers are bound by a contract that allows the producer to monitor the consumption of plant oil and states that the captive fleet, the retailer or end user shall not claim emission reductions resulting from its consumption.~~

~~13. Total baseline emissions are determined as follows:~~

~~$BE_y = FC_{D,y} \times NCV_D \times EF_{CO2,D}$ (3)~~

~~Where:~~

~~BE_y Baseline emissions in year *y* (tCO_2e)~~

~~NCV_D Net calorific value of diesel (GJ/tonnes)~~

~~$EF_{CO2,D}$ CO_2 emission factor diesel (tCO_2e/GJ)~~

Project Activity Emissions

14. Project activity emissions are the emissions related to the cultivation of oil seeds and production and distribution of plant oil and/or biodiesel ("field-to-~~wheel~~ tank" emissions). ~~These emissions will be attributed to the plant oil produced, and not shared over the different co-~~

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III.T. Plant oil production and use for transport applications (cont)

~~products~~[10] . The emissions from the combustion of the plant oil or 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) emissions associated with the cultivation of land to produce the oil seeds used for production of biodiesel/plant oil .

(b) Emissions due to transportation of feedstock sources from their originating sites to the plant oil processing or biodiesel production facility[11].

(c) Emissions from energy use for processing of plant oil (e.g., pressing and filtering) and biodiesel production;

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

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

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

Where:

PE_y	Project emissions in year *y* (tCO_{2e})
$FP_{k,y}$	Amount of pure plant oil type *k* and/or 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 plant oil and or 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* (tCO_{2e})
$PE_{TT,k,y}$	Emissions from transportation of feedstock sources of type *k* and/or biodiesel/plant oil *k* in year *y* (tCO_{2e})
$PE_{PP,k,y}$	Emissions from plant oil processing and/or biodiesel production using oilseeds type *k* in year *y* (tCO_{2e})
$PE_{MeOH,y}$	Emissions from fossil fuel carbon in methanol used in the trans-esterification

~~[10] Project Proponents are encouraged to submit procedures to allocate emissions associated with the cultivation of oil seeds and production of plant oil among by-products for consideration and approval by the Board~~

[11] In case all the feedstock sources (crop cultivation areas) are situated within 50 km from the facility for plant oil processing and/or 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.

process in year *y* (tCO_{2e})

16. 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:

$$AF_y = \frac{FP_{PO,k,y} \times MP_{PO,k,y} + FP_{BD,k,y} \times MP_{BD,k,y}}{FP_{PO,k,y} \times MP_{PO,k,y} + FP_{BD,k,y} \times MP_{BD,k,y} + M_{OM,k,y} \times MP_{OM,k,y} + M_{G,k,y} * MP_{G,y} + \ldots} \quad \textbf{(4)}$$

Where:

$FP_{PO,k,y}$	Amount of pure plant oil of oilseed type *k* used as fuel in the year *y* (tonnes)
$MP_{PO,k,y}$	Market price of plant oil of oilseed type *k* used as fuel in year *y* ($/tonnes)
$FP_{BD,k,y}$	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)

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.

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

17. This step calculates emissions associated with the cultivation of lands to produce the oil seeds used for biodiesel/plant oil production.

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.

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

- 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**;
- 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.

Option A: Use of a default emission factor

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III.T. Plant oil production and use for transport applications (cont)

$$PE_{CC,k,y} = A_{k,y} \times EF_{k,y} \quad (5)$$

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 (tCO_2e/ha). See table III.T.2 below for available values.

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

Crop	Climate Zone	$EF_{s,y}$ (tCO_2e/ha)
Palm	Tropical Moist	1.87
Palm	Tropical Wet	1.87
Jatropha	Tropical Moist	1.76
Jatropha	Tropical Dry	2.52

Option B: Use of project specific data

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

18. The project emissions from transportation of feedstock and/or plant oil/biodiesel is calculated as follows:

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

Where:

$Q_{k,y}$	Quantity of feedstock from oilseed type *k* transported from the cultivation area to the processing/producing facility or quantity of plant oil/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}	CO_2 emission factor from fuel use due to transportation ($kgCO_2$/km, IPCC default values or local values may be used)

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

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

Where:

$EC_{PP,k,y}$	Electricity consumption in plant oil processing and/or 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 (tCO_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* (tCO_2/GJ fuel)

20. 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:

$$PE_{MeOH,y} = MC_{MeOH,y} \times EF_{C,MeOH} \times \frac{44}{12} \quad \textbf{(8)}$$

Where:

$PE_{MeOH,y}$	Project emissions from fossil carbon in the biodiesel due to esterification with methanol of fossil origin in year *y* (tCO_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)
44/12	Molecular weight ratio to convert tonnes of carbon into tonnes of CO_2 (tCO_2/tC)

~~19. Project emissions from the cultivation of oil seeds and production of oil plants, in accordance with the "General guidance on leakage in biomass project activities" for small scale project, are:~~

~~(e) Emissions from energy use for processing (e.g., pressing and filtering) of plant oil;~~

~~(f) N_2O emissions resulting from either from fertilizer application and/or from nitrogen in crop residues (above-ground and below-ground).~~

~~For each oilseed/plant oil type *k* the project emissions shall be calculated separately.~~

~~$PE_y = \sum_k PE_{PO,k,y}$ (9)~~

~~Where:~~

~~PE_y Total project emissions from plant oil production (tCO_2e/tonnes plant oil produced) in year "y"~~

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III.T. Plant oil production and use for transport applications (cont)

$PE_{PO,k,y}$ Project emissions from plant oil production of crop *k* (tCO_{2e}/tonnes plant oil "k" produced) in year *y*

$$PE_{PO,k,y} = \frac{PE_{FA,k,y} + PE_{OFP,k,y}}{H_{k,y} \times OY_{k,y}} \quad (10)$$

Where:

$PE_{OFP,k,y}$ Project emissions from energy use for oil-seed processing (e.g., pressing and filtering) of crop *k* in year *y* (tCO_2)

$PE_{FA,k,y}$ Project emissions of N_2O in cultivation of crop *k* in year *y* (tCO_{2e})

$H_{k,y}$ Harvest of crop *k* in year *y* (tonnes crop)

$OY_{k,y}$ Oil yield of crop *k* in year *y* (tonnes oil/t crop)

20. Project emissions from energy use for processing (e.g., pressing and filtering) of plant oil are determined as follows:

$$PE_{OFP,k} = EC_{OFP,k} \times EF_{CO2,ELEC} + \sum_i \left(FC_{OFP,i,k} \times NCV_i \times EF_{CO2,i} \right) \quad (11)$$

Where:

$EC_{OFP,k}$ Electricity consumption in processing (e.g., pressing and filtering) for crop *k* in year *y* (MWh)

$EF_{CO2,ELEC}$ Emissions factor for grid electricity supplied to the project plant using the calculation methods of AMS-I.D (tCO_2e/MWh)

$FC_{,OFP,i,k}$ Consumption of fossil fuel *i* for filtering and pressing for crop *k* in year *y* (tonnes)

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

$EF_{CO2,i}$ Emissions factor of fossil fuel *i* (tCO_2/GJ fuel)

21. The N_2O emissions from cultivation of plant oil are determined as follows:

$$PE_{FA,k} = \left[\left(F_{ON,k} + F_{SN,k} + F_{CR,k} \right) \times EF_{N2O\_direct} \right] \times \frac{44}{28} \times GWP_{N2O} \quad (12)$$

Where:

$F_{ON,k}$ Amount of organic fertilizer nitrogen applied in crop *k* in year *y* (tonnes N)

$F_{SN,k}$ Amount of synthetic fertilizer nitrogen applied in crop *k* in year *y* (tonnes N)

$F_{CR,k}$ Amount of N in residues of crop *k* in year *y* (tonnes N). For N-fixing crops like soybean F_{CR} shall be taken into account. For other types of crops F_{CR} can be ignored. F_{CR} shall be calculated in accordance with 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Vol 4, chapter 11

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III.T. Plant oil production and use for transport applications (cont)

~~EF_{N20_direct} N_2O emission factor for emissions from N inputs (tonnes N_2O-N/tonnes N input). A default value of 0.01 can be taken in accordance with 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Vol 4, Table 11.1 p.11.26~~

~~GWP_{N2O} Global warming potential of N_2O (tCO_{2e}/tN_2O) (value of 310)~~

~~22. Project emissions from clearance of lands are addressed by the applicability conditions of the methodology.~~

Leakage

21. If equipment is transferred from another activity or if the existing equipment is transferred to another activity, leakage is to be considered.

22. 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.

23. 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 esterificarion process shall be calculated as per the relevant equation 11 of ACM0017.

24. The substitution of plant oil for petrodiesel reduces indirect ("upstream") emissions associated with the production of petrodiesel and is treated as negative leakage[12] and can be calculated as per the relevant sections of ACM0017 and its equations 16, 17 and 18.

~~23. Leakage emissions due to a shift of pre-project activities shall be accounted for as per the approved "general guidance on leakage in biomass project activities" for small-scale project activities.~~

~~24. In case plant oil is produced in the baseline situation in the area of land where plant oil is cultivated in the project situation, the guidance on competing uses for biomass in "the general guidance on leakage in biomass project activities" for small scale projects shall be taken into account. Leakage shall be estimated accordingly and deducted from the emission reductions.~~

Emission Reduction

25. 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.

$$ER_y = BE_y - PE_y - LE_y - LE_{WOF,y} - LE_{MEOH,y} + LE_{PD,y} \quad \textbf{(9)}$$

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

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III.T. Plant oil production and use for transport applications (cont)

Where:

ER_y	Emission reductions in the year y (t CO_2e)
LE_y	Leakage due to equipment transfer in year y (t CO_2e)
$LE_{PD,y}$	Leakage related to the avoided production of petrodiesel (tCO_2/yr)
$LE_{MeOH,y}$	Leakage emissions associated with production of methanol used in biodiesel production in year y (tCO_2)
$LE_{WOF,y}$	Leakage emissions from displacement of existing utilization of waste oil/fat in year y (tCO_2)

Monitoring

26. Relevant parameters shall be monitored as indicated in the **Table III.T.3** below:

~~(i) The crop harvest, oil content of the oil seeds and amount of plant oil produced per crop source per production location. The extent of the area where plant oil is produced should be consistent with the yield of the cultivation, the plant oil extraction and with the amount of plant oil consumed by end-users.~~

~~(ii) The energy use (electricity and fossil fuel) for the production of plant oil and the amount of fertilizer applied for the cultivation of plant oil per crop source per production location.~~

~~(iii) The occurrence of shift of pre-project activities and the competing uses of biomass shall be monitored and verified.~~

~~(iv) The NCV of plant oils are determined based on direct measurements of a representative sample.~~

~~(v) The compliance of pure plant oil and plant oil blends with national regulations or in absence of latter compliance with the parameters identified in table III.T.1.~~

~~(vi) The amount and type of plant oil sold to retailers and filled into the vehicles of the final end users and captive fleets must be recorded by a calibrated metering system. Records of these vehicles and the plant oil (blends) consumed by these vehicles shall be provided.~~

~~(vii) In case the plant oil is sold and/or used as blend then the following shall be recorded by the retailer or by the owner of the captive fleet:~~

~~(viii) The amount of plant oil bought (FB_{PO});~~

~~(ix) The amount of diesel bought (FB_D);~~

~~(x) The amount of blended plant oil used (FC_{PO}) by the captive fleet or sold to final clients.~~

~~(xi) In case of blending, the maximum blending ratio of 10% shall be controlled at the sites that sell the plant oil blends. FB_{PO} can be maximally 10% of FB_D. In addition the~~

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III.T. Plant oil production and use for transport applications (cont)

procedure for blending shall ensure that the blending ratio is maximally 10% by volume.

(xii) In case of use of pure plant oil it shall be monitored and verified by random sampling that the vehicles have carried out engine conversions.

(xiii) The contracts between the producer of plant oil and the final users and retailers specifying that only the producer of plant oil can claim CERs, the obligation for engine conversions in case of pure plant oil use shall be verified by random sampling.

(xiv) It shall be monitored and verified that no plant oil is exported to annex 1 countries.

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

$$ER_y = BE_y - PE_y - LE_y \quad \textbf{(13)}$$

Where:

ER_y Emission reductions in the year y (t CO_2e)

LE_y Leakage in year y (t CO_2e)

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III.T. Plant oil production and use for transport applications (cont)

Table III.T.3

No	Parameter	Description	Unit	Monitoring/recording Frequency	Measurement Methods and Procedures
1	$A_{k,y}$	Total area in which oil seed type k is cultivated for use in the project plant in year y	ha	Annually	Measured or calculated (e.g. using maps). Measurements results shall be consistent with yield of the cultivation.
2	$P_{BD,y}$	Production of biodiesel/plant oil in the project plant in year y	tonnes	Continuously	Measurements are undertaken using calibrated meters. Calibration should be undertaken as prescribed in the relevant paragraph of General Guidelines to SSC Methodologies Measurement results shall be cross checked with records for consumption and sales (e.g., invoices/receipts).
3	$P_{BD,on\text{-}site,y}$	Quantity of biodiesel/plant oil consumed at the project biodiesel production plant and/or the oil production plant(s) in year y	tonnes	Continuously	Measurements are undertaken using calibrated meters at production site. Calibration should be undertaken as prescribed in the relevant paragraph of General Guidelines to SSC Methodologies
4	$C_{BBD,y}$	Consumption of (blended) biodiesel/plant oil from the project plant by the captive consumer(s) in year y	tonnes	Continuously	Measurements are undertaken using calibrated meters at fuelling stations. Calibration should be undertaken as prescribed in the relevant paragraph of General Guidelines to SSC Methodologies Measured with calibrated metering system at fuelling stations.

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III.T. Plant oil production and use for transport applications (cont)

No	Parameter	Description	Unit	Monitoring/recording Frequency	Measurement Methods and Procedures
					Measurement results shall be cross checked with records for sales (e.g., invoices/receipts).
5	$N_{CVBD,y}$	Net calorific value of biodiesel/plant oil produced in year y	GJ/tonnes	Annually	Measured according to relevant national/ international standards Analysis has to be carried out by accredited laboratory.
6	$f_{PJ,y}$	Fraction of blending in year y (ratio)	%	Continuously	Measured volumes or flows by calibrated meters at blending stations. To be determined as per ACM0017.
7	$F_{Pk,y}$	Amount of pure plant oil type k and/or of biodiesel produced with plant oil type k that is produced by the project activity processing/producing facility in year y	tonnes	Continuously	Measurements are undertaken using calibrated meters at production site. Calibration should be undertaken as prescribed in the relevant paragraph of General Guidelines to SSC Methodologies Measurement results shall be cross checked with records for consumption and sales (e.g., invoices/receipts).
8	$FP_{PO,k,y}$	Amount of pure plant oil of oilseed type k used as fuel in the year y (tonnes)	tonnes	Continuously	Measurements are undertaken using calibrated meters at fuelling stations. Calibration should be undertaken as prescribed in the relevant paragraph of General Guidelines to SSC Methodologies Measurement results shall be cross checked with records for consumption and sales (e.g., invoices/receipts).
9	$FP_{BD,k,y}$	Amount of biodiesel from oilseed type k produced and	tonnes	Continuously	Measurements are undertaken using calibrated meters at fuelling stations.

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III.T. Plant oil production and use for transport applications (cont)

No	Parameter	Description	Unit	Monitoring/recording Frequency	Measurement Methods and Procedures
		consumed in the year y (tonnes)			Calibration should be undertaken as prescribed in the relevant paragraph of General Guidelines to SSC Methodologies Measurement results shall be cross checked with records for consumption and sales (e.g., invoices/receipts).
10	$M_{OM,k,y}$	Amount of oilseed meal (press-cake) obtained from oilseed type k in year y (tonnes)	tonnes	Continuously	Measurements are undertaken at production site. Measurement results shall be cross checked with records for consumption and sales (e.g., invoices/receipts).
11	$M_{G,k,y}$	Amount of glycerin associated with the production of biodiesel from oilseed type k in year y (tonnes)	tonnes	Continuously	Measurements are undertaken at production site. Measurement results shall be cross checked with records for consumption and sales (e.g., invoices/receipts).
12	$Q_{k,y}$	Quantity of feedstock from oilseed type k transported from the cultivation area to the processing/producing facility and plant oil/biodiesel from production plant to blending site or site of its consumption in the year y (tonnes)	tonnes	Continuously	Measurements are undertaken using calibrated mass or volumetric meters at production site for every transported material (e.g., oil seeds, plant oil, biodiesel). Calibration should be undertaken as prescribed in the relevant paragraph of General Guidelines to SSC Methodologies

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III.T. Plant oil production and use for transport applications (cont)

No	Parameter	Description	Unit	Monitoring/recording Frequency	Measurement Methods and Procedures
13	CT_y	Average truck capacity for transportation (tonnes/truck)	tonnes	Annually	Records of truck operator, plant records, vehicle manufacturer information.
14	$DAF_{k,y}$	Average distance for feedstock transportation for oilseed type k (km/truck)	km	Annually	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).
15	$EF_{CO2,ELEC}$	CO2 emission factor for grid electricity supplied to the project plant in year y	t CO2e/kWh	Annually	Grid emission factor shall be determined following the provisions of AMS-I.D.
16	$EF_{CO2,i}$	CO2 emission factor of fossil fuel type i	tCO2e/GJ	Annually	As per the "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion"
17	$EC_{pp,,k,y}$	Electricity consumption in plant oil processing and/or biodiesel production for crop k or for processing of the waste oil/fat in year y	MWh	Continuous monitoring, hourly measurement and at least monthly recording	Measurements are undertaken using energy meters. Calibration should be undertaken as prescribed in the relevant paragraph of General Guidelines to SSC Methodologies Measurement results shall be cross checked with records for purchased electricity (e.g., invoices/receipts).
18	NCV_i	Net calorific value of fossil fuel type i	GJ/mass or volume unit	Annually	As per the "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion"
19	$FC_{pp,,i,k,y}$	Consumption of fossil fuel type i for plant oil processing or biodiesel production from crop k or	Mass or volume unit	According to industrial practice	As per the "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion"

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III.T. Plant oil production and use for transport applications (cont)

No	Parameter	Description	Unit	Monitoring/recording Frequency	Measurement Methods and Procedures
		from waste oil/fat in year y (tonnes)			
20	NCV_{PD}	Net calorific value of diesel	GJ/tonnes		2006 IPCC Guidelines on National GHG Inventories
21	$MC_{MeOH,y}$	Mass of MEOH consumed in the biodiesel plant, including spills and evaporation, in year y	tonnes	Continuous	Measured continuously by calibrated equipment at the project site. Cross-checked with purchase data and adjusted for stock changes when deemed necessary.

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III.T. Plant oil production and use for transport applications (cont)

Project activity under a programme of activities

27. The methodology is applicable to a programme of activities. ~~In order this methodology to be used under a programme of activities a further analyses is required, for instance a further analysis concerning issues related to the shift of the pre-project activities in the lands where the oil crops are grown and the competing use of biomass is required. Project Proponents are encouraged to submit procedures to address these issues as a revision to this methodology to make this methodology applicable to a programme of activities for EB approval~~.

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History of the document

Version	Date	Nature of revision
02	EB xx, Annex # dd mm 2010	Include biodiesel production and provide simplified procedures based on the use of default factors.
01	EB 36, Annex 22 30 November 2007	Initial adoption