CLEAN DEVELOPMENT MECHANISM

CDM-EB85-AA-A11

Concept note

Broadening applicability of the CDM – development of methodologies for biofuel activities

Version 01.0

United Nations
Framework Convention on
Climate Change

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1. Procedural background

1. Global biofuel production grew from 16 billion litres in 2000 to more than 100 billion litres in 2010.[1] National interests in promoting biofuels remain significant both in developed and developing countries. More than 50 countries have blending targets or mandates and have already implemented or are preparing to implement biofuel quotas for future years, and have supported biofuel programmes through various incentives.[2] Promotion of biofuels is either the sole objective or one of the objectives in one-fourth of the nationally appropriate mitigation actions (NAMAs) proposed so far. However, there are only a couple of biofuel project activities registered under the clean development mechanism (CDM) to date and no biofuel programme of activities PoA) on biofuel activities has entered the CDM pipeline yet, despite seven methodologies for biofuels having been approved.

2. The Executive Board of the CDM (the Board), at its eighty-second meeting (EB 82), agreed on the development of methodologies in the areas of aviation, renewable energy, electrification and household energy supply. With regard to methodologies for cities, transport, biofuels and agriculture, the Board requested the secretariat to elaborate concept notes for its consideration before the development of the methodologies after receiving inputs from Methodologies Panel (MP) and the Small-Scale Working Group (SSC WG) on each specific area.

3. Based on this request, the secretariat developed this concept note covering the area of biofuels. The elements outlined in the concept note include the inputs received from MP 66 and MP 67 and SSC WG 47 and SSC WG 48.

4. This work relates to the activity 'Top down development of Methodologies/Standardized baselines and tools'[3] under objective 1(c): "Develop simplified and user-friendly standards and procedures that increase efficiency and ensure environmental integrity" as referred to in table 4 of the management plan 2015 (EB 81, annex 1).

2. Purpose

5. The purpose of this work is to:

   (a) Analyse key constraints for developing biofuel CDM project activities and PoAs and possible root causes of the constraints;

   (b) Identify possible alternatives to eliminate current constraints;

   (c) Identify areas where further guidance from the Board is required to choose an option to address current constraints.

[1] International Energy Agency (IEA), 2011.

[2] IEA, 2011; United States Agency for International Development, 2009.

[3] The title of this activity changed to 'Development of new methodologies to broaden the applicability of the CDM' as per CDM EB workplan 2015, adopted at EB82.

3. Key issues and proposed solutions

6. The work described in this concept note was conducted through:

   (a) Listing the measures covered by the current CDM standards for biofuels (e.g. matrix of measures and methodologies by reviewing the current CDM standards) as well as reviewing registered CDM project activities applying these standards;

   (b) Evaluating the applicability conditions of the current CDM methodologies for biofuels and their rationale;

   (c) Analysing what measures and methods are covered by other greenhouse gas (GHG) standards (e.g. standards and tools developed by the European Union (EU), World Bank, Green Environmental Facility, Verified Carbon Standard (VCS)) to learn whether and how concerns identified in the CDM standards are addressed;

   (d) Analysing barriers, bottlenecks and needs for improvement, including but not limited to:

      (i) Eligible types of biofuels and applicability conditions on land use, user/producer consumption of biofuels besides baseline-setting, measurement/survey requirements;

      (ii) Value addition, cost/benefit of requirements, positive/negative impacts on land-use change and water use;

   (e) Recommending improvements of the current CDM methodologies for biofuels, including broadening the coverage (e.g. to include ethanol), developing default factors for various crop types, consolidation, modular structure, etc.

3.1. Overview of methodological standards for biofuel activities

3.1.1. CDM standards

7. Currently one methodological tool, two large-scale methodologies and four small-scale methodologies that cover biofuel applications are approved by the Board. A summary of these methodological standards under the CDM and the status of project activities applying these standards are presented in table 1 below.

Table 1. Summary of methodological standards for biofuel activities and status of project activities applying them under the CDM

Methodology	Methodology's coverage	Validation[4]	Registered	Issuance
ACM0017	Construction and operation of a biodiesel production plant for production of blended biodiesel that is used as fuel in existing stationary installations (e.g. diesel generators) and/or in vehicles. Biodiesel is produced from waste oil/fat and/or vegetable oil that is produced from oilseeds from plants that are cultivated on dedicated plantations established on lands that are degraded or degrading at the start of the project. GHG emissions are from the displacement of more GHG-intensive fossil fuel for combustion in vehicles and/or stationary installations.	12	1	0
AM0089	Production of petro/renewable diesel by switching the feedstock of hydrodesulphurization process (HDS) unit from 100% gasoil to a mixture of gasoil and vegetable oil in an existing refinery, where the vegetable oil comes from oilseeds from plants that are cultivated on dedicated plantations established on lands that are degraded or degrading at the start of the project. GHG emissions are from the displacement of more GHG-intensive feedstock for the production of diesel.	0	0	0
AMS-I.G	Plant oil production that is used for generation of thermal, mechanical and electrical energy in stationary equipment including cogeneration. The plant oil is produced from pressed and filtered oilseeds from plants that are cultivated on dedicated plantations. GHG emissions are from the displacement of more GHG-intensive fossil fuel for combustion in stationary installations.	0	0	0
AMS-I.H	Biodiesel is produced from oilseeds cultivated on dedicated plantations and from waste oil/fat and used to generate thermal, mechanical or electrical energy in equipment including cogeneration. GHG emissions are from the displacement of more GHG-intensive fossil fuel for combustion in stationary installations.	0	0	0

[4] The figure represents the accumulated number of cases to date. There is currently no ongoing validation activity for a biofuel project activity or PoA.

Methodology	Methodology's coverage	Validation[4]	Registered	Issuance
AMS-III.T	Plant oil production that is used for transportation applications, where the plant oil is produced from pressed and filtered oilseeds from plants that are cultivated on dedicated plantations. GHG emissions are from the displacement of more GHG-intensive petrodiesel for transport.	1	1	0
AMS-III.AK	Biodiesel production that is used for transportation applications, where the biodiesel is produced from oilseed cultivated on dedicated plantations and from waste oil/fat. GHG emissions are from the displacement of more carbon-intensive fossil fuel for combustion in vehicles/transportation applications by use of renewable biomass.	1	0	0
Tool "Project and leakage emissions from biomass"	This tool provides procedures to calculate project and leakage emissions relevant for project activities which utilize biomass. The biomass may be used as either fuel or feedstock in the project activity. The biomass may be biomass residues or cultivated in a dedicated plantation.	-	-	-

3.1.2. Non-CDM standards

8. The following non-CDM standards were identified as covering biofuel applications:

   (a) Gold Standard (GS) methodology "Biodiesel from waste oil/fat from biogenic origin for use as fuel"[5] which is largely based on AM0047 and uses the same captive fleet concept;

   (b) VCS methodology "Fuel Switch from Gasoline to Ethanol in Flex-Fuel Vehicle Fleets";[6]

   (c) EU directive 2009/28/EC[7] which relies on the Intergovernmental Panel on Climate Change (IPCC) model and independent research.

3.2. Key issues

9. The following could be considered the broad issues that constrain the application of the biofuel standards to project activities and PoAs:

   (a) Double counting;

   (b) Feedstock issues, particularly emissions arising from land use change (LUC);

[5] <http://www.goldstandard.org/wp-content/uploads/2011/10/GS_Biodiesel_from_waste_oil_and_fat_06_08_2009.pdf>

[6] <http://www.v-c-s.org/methodologies/fuel-switch-gasoline-ethanol-flex-fuel-vehicle-fleets-v10>

[7] <http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:32009L0028>

(c) Other improvements.

3.3. Double counting

10. CDM methodologies for biofuel activities have potential double counting risk as the emissions reduced could be counted at several levels by:

    (a) Biofuel producers;

    (b) Biofuel consumers;

    (c) Consumers or activities in other countries if the fuel is internationally traded.

3.3.1. Review of CDM standards for double counting provisions

11. CDM methodologies apply the captive fleet approach, which implies the inclusion of the consumers in the project boundary. The requirement of "captive fleet" is included to ensure that there is no double issuance of emission credits to producers and consumers. This particular requirement is due to the decision by the Board at EB 26 (EB 26 report, annex 12), which requires that all the consumers be within the project boundary and "emission reductions from the use of biofuel are estimated based on monitored consumption by the consumers included within the project activity". In the case of transport activities, the use of biodiesel is possible if the fleet is owned and operated by the project proponents, thus ensuring that actual consumption can be monitored. Consumers of the project biofuels are included within the project activity and relinquish their claim for emission reductions to the producers of the biofuels.

12. All the other non-CDM standards referred to in paragraph 8 above also use the same provisions as in the CDM standards to address the issue of double counting and offer no additional guidance.

13. Blended biofuels (i.e. biofuels that are blended with fossil fuel such as diesel) are not likely to be internationally traded or stored. If this assumption is justified (by reviewing data from major biofuel producers), the CDM methodologies could be simplified, assuming that the biofuel that is blended in the project boundary will be used within the host country. Also, if fuel is sold as blended biofuel, the consumers cannot/may not claim emission reductions for its use. This approach is equivalent to, and simpler than, demonstrating that no biofuels are being exported from the host country. If the above issues are addressed adequately, the consumers can be excluded from the project boundary. The suggestions would result in eliminating monitoring/sampling effort of the project activities by:

    (a) Monitoring at the production facility; or

    (b) If the above rationale could not be established then the captive fleet requirement could be relaxed where it is possible to monitor in the point of consumption, using automated data acquisition/aggregation.

3.3.2. Review of non-CDM standards for double counting provisions

14. The GS methodology referred to in paragraph 8 (a) above states that "The methodology ensures that the emission reductions can only be issued to the producer of the biodiesel

and not to the consumer". It also includes the consumers in the project boundary, thereby effectively avoiding double counting.

15. The VCS methodology referred to in paragraph 8 (b) above also includes the consumers in the project boundary, thereby effectively avoiding double counting.

16. The EU directive referred to in paragraph 8 (c) above requires publishing information about the source of biomass for biofuels, but has no detailed procedure regarding the identification of double counting.

3.4. Feedstock issues

3.4.1. Categorization of biofuel-related emissions

17. Emissions associated with biofuel project activities can be categorized as follows:

    (a) For the baseline:

        (i) Emissions due to the fossil fuels replaced by the project activity;

        (ii) Upstream emissions due to the extraction and processing of the baseline fossil fuel. Note that the Board has taken a policy decision that when the baseline upstream emissions from fossil fuels are higher than the upstream emissions of the project biofuels, the net value of upstream emissions from fossil fuels is accounted as zero;

        (iii) Fuel transport emissions both within the project boundary and upstream;

    (b) For the project activity:

        (i) Emissions due to biofuel combustion, which is generally considered zero;

        (ii) Emissions due to production/processing of the biofuel;

        (iii) Emissions due to cultivation of biomass (feedstock) (direct land-use change impacts (dLUC));

        (iv) Emissions due to indirect land-use change (iLUC) impacts;

        (v) Fuel transport and handling emissions.

3.4.2. Land-use change impacts on the GHG balance of biofuel feedstock production project activities

3.4.2.1. Definition for land-use change

18. dLUC impacts: Emissions/removals resulting from the change of land-use practices (e.g. soil and vegetation management practices) within the project boundary resulting from the

implementation of a biofuel project activity, also called emissions due to cultivation of biomass.[8]

19. iLUC impacts: Emissions/removals resulting from the change of land use practices (e.g. soil and vegetation management practices) outside the project boundary, resulting from the implementation of a biofuel project activity. This is what is called 'leakage emissions' under the CDM.

3.4.2.2. Accounting of land-use change impacts in CDM standards

20. The findings from the review of the CDM methodologies concerning accounting of LUC impacts are contained in appendix 2. Small-scale CDM biofuel methodologies account for dLUC impacts by applying the methodological tool "Project and leakage emissions from biomass".

21. Large-scale CDM biofuel methodologies address the dLUC impacts by applying certain applicability conditions. These methodologies do not currently refer to the methodological tool "Project and leakage emissions from biomass", which provides a more comprehensive method for assessing dLUC impacts.

22. The iLUC impacts referred to in paragraph 19 above can result from:

    (a) Displacement of the pre-project activity by the project activity when the two types of activities cannot simultaneously occur in the same area of land (activity shifting effects);

    (b) Increased cultivation of biofuel feedstock or food crops (in the case where food produced in the baseline gets diverted to biofuel industry) occurring outside the project boundary. These impacts are termed 'market leakage' in the CDM terminology.

23. As the infographics in appendix 1 show, the iLUC impacts of biofuel production can have a wide range of values, affecting the GHG mitigation potential of different types of biofuel differently.

24. Due to the impacts of international trading, and the nature of the globalized markets, iLUC can be identified and quantified for a cohesive region or nationwide, rather than for a specific project activity. There is still no accepted standard on how to account for iLUC in biofuel projects.[9]

3.4.2.3. Accounting of land-use change impacts in non-CDM standards

25. The California Low Carbon Fuel Standard (LCFS) approved by the California Air Resources Board (CARB) takes into account the iLUC impacts of biofuel production.

[8] Emissions resulting from land-use change (LUC) impacts can also have a negative value, that is, net emission reductions or net removals can result from LUC induced by the project activity. While net emission reductions can be accounted in the project activity, net removals cannot.

[9] Climate smart agriculture sourcebook, FAO, as well as Low Indirect Impact Biofuels Methodology, Ecofys et al.

26. The Renewable Fuels Standard issued by the US Environmental Protection Agency (EPA) in compliance with the Energy Independence and Security Act of 2007 (EISA) takes into account direct and significant indirect emissions including iLUC impacts.

27. The European Commission has proposed amending the Renewable Energy Directive and the Fuel Quality Directive to ensure that emissions that might be caused by iLUC are included in the reporting of fuel imports to EU countries.

3.4.3. Review of non-CDM standards for feedstock-relevant provisions

28. Non-CDM standards and schemes were reviewed with regard to methodologies to account for biofuel-related emissions, as possible sources of information that could be used to simplify CDM standards.

29. The GS methodology referred to in paragraph 8 (a) above follows the UNFCCC methodology, and offers no additional guidance. Furthermore, as the methodology is applicable only for waste oil/fat, no LUC is considered.

30. The VCS methodology referred to in paragraph 8 (b) above, although it uses ethanol, has no provision for upstream emissions of ethanol. It only requires that "ethanol used in the project shall have lower lifecycle emissions than the gasoline used in the baseline". Still, this provision is qualitative, and does not quantify LUC effects, as it allows lifecycle emissions of bioethanol to be unaccounted for, if they are smaller than the lifecycle emissions of gasoline. Considering the same if LUC is adequately dealt with, the methodology could be expanded to all types of biofuels.

31. The VCS methodology allows for sampling of the project parameters, which are measured on the consumers' side.

32. The EU directive referred to in paragraph 8 (c) above is consistent with the emission categorization detailed in section 3.4.1 above. In this directive, the default emission values for each relevant crop-biofuel-process combination are a result of review of actual operation data of existing fuel supply chains. These default values exclude emissions due to soil carbon stock changes (cultivation), which must be calculated in accordance with the IPCC model. Furthermore, other than requiring that the biofuel's source be reported, the directive is silent about the qualification and quantification of iLUC. The CDM methodologies are more robust as they do include this aspect.

33. Moreover, the directive gives specific emission factors as tonnes of carbon dioxide per litre of biofuel, an approach which could also be considered for CDM standards. Though the current CDM approach of emissions per hectare of land creates incentive for efficient land use, the approach used by the EU directive simplifies monitoring requirements, and allows for not identifying the source agricultural land altogether.

3.5. Other issues

34. **Additionality:** It is often referenced by stakeholders that in addition to the issues of double counting and feedstock, they also face significant difficulty in demonstrating additionality of biofuel project activities. Considering the large potential of biofuel projects, it may be prudent to identify a positive list of technologies which are additional, e.g. third generation biofuels.

35. **Blending ratio:** The current methodology for biodiesel activities is limited to 20 per cent blending of biodiesel in conventional diesel due to engine warranty limitation in addition to the efficiency issues. However, this restriction would not apply to blending of gasoline with bioethanol, as flexible engines are available to use (burn) fuel up to 100 per cent of bioethanol. It could be explored to allow for higher blending ratios, taking into account improvements in automotive industry and detailed analysis of technical literature where the blending rates could be increased without any adjustments to efficiency.

3.6. Proposed solutions

36. The proposed solutions to identify alternative approaches to increase the usability of the CDM methodologies for biofuel activities and broadening their applicability are presented below.

3.6.1. Double counting issue

37. The following measures could simplify addressing double counting:

(a) Monitoring could be conducted at the production site (i.e. the consumers could be excluded from the project boundary). This approach would be adequate if biofuels are not exported outside the host country, possibly including a check of whether the host country is an exporter of biofuels;

(b) As blended biofuels are not likely to be internationally traded or stored, monitoring could be conducted at the production site (i.e. not including consumers in the project boundary) if biofuels are blended inside the project boundary;

(c) Adjusting eligible amount of biofuel for crediting to mandatory level of blending without assessing the enforcement levels;

(d) Removing the need for captive fleet for transportation if it is possible to directly monitor the consumption of biofuel at the consumer side (e.g. by using automated data acquisition/aggregation) without identifying the consumers at the validation stage.

3.6.2. Feedstock issues

38. The methodological tool “Apportioning emissions from production processes between main product and co and by-product” should be applied for the project emissions in a situation in which biofuels are considered co-products of the biomass cultivated and/or of the biofuel processing. In this, the standards could benefit from default apportioning values, where these could be reliably identified for specific crops and processes.

39. LUC emissions may be ignored in projects where biomass is sourced from waste/residues and no cultivation takes place and no edible biomass is used as feedstock.

40. The conditions under which iLUC does not need to be taken into account should be established, rather than trying to quantify it for any specific project activity. This could include:

(a) Provisions already established in the methodological tool “Project and leakage emissions from biomass”:

(i) Land which had no gainful use before the implementation of the project activity;

(ii) Project activities that demonstrate retaining the pre-project land-use unchanged, parallel to the project activity;

(b) Non-agrar-based biomass production, such as lignocellulose under specific conditions or algae, no iLUC emissions occur;

(c) A procedure to rule out iLUC on a national level.

41. Development of default values for biomass cultivation emissions:

(a) The main reason for not including default values for crops to estimate biomass cultivation emissions other than perennial crop was due to the limitation of the applicability of methodologies to degraded lands. According to IPCC calculations, the switch from degraded to cultivated land leads to high level of emissions due to soil carbon losses. The methodological tool “Project and leakage emissions from biomass” can address this limitation, and therefore specific emission factors for other crops could be provided;

(b) The default values for non-perennial crops could be included in the methodologies, with the conditions that the land-use practice remains unchanged or would increase soil carbon due to project intervention. If this is not feasible, default values could be developed without including soil carbon loss and leaving the calculation related to soil carbon loss to project participants.

3.6.3. Other issues: The Board may wish to

(c) Allow blending ratios above 20 per cent for biodiesel and up to 100 per cent for bioethanol if technical literature confirms the possibility.

(d) Identify where it is possible to create a positive list of technologies deemed automatically additional, e.g. second/third generation biofuels such as algae.

(e) Allow, for the large-scale methodologies, non-transesterified fuel (e.g. plant oil), similarly to AMS-I.G and AMS-III.T, provided that its toxicity issue is resolved;

(f) Allow a wider range of biofuels, as currently some methodologies are applicable specifically for biodiesel, and could also be applicable for other biofuels as the issue of direct and leakage emissions related to LUC could not be addressed methodologically(e.g. bio-ethanol).

(g) Allow the use of biofuels in domestic cook stove applications or other non-road-transport applications.

4. Impacts

42. The revision and/or development of methodologies or standards would, increase the usability, simplify, streamline and broaden the applicability of biofuel methodologies. The proposed work does not foresee any cost implications for third parties/stakeholders.

5. Subsequent work and timelines

43. Subsequent work will be subject to guidance received from the Board at EB 85.

44. After receiving guidance from the Board, the secretariat in consultation with the Methodologies Panel and Small-Scale Working Group would revise the existing standards and/or develop new standards taking into account stakeholder inputs prior submitting them to the Board for approval.

6. Recommendation

The secretariat recommends that the Board provide guidance on the identified areas for further work in simplification and broadening the application of the biofuel methodologies as contained in section 3.6.

Appendix 1. Infographics showing indirect land-use change impacts of biofuel feedstock production

Figure 1. Causes of global LUC-related GHG emissions (Source: EU report)

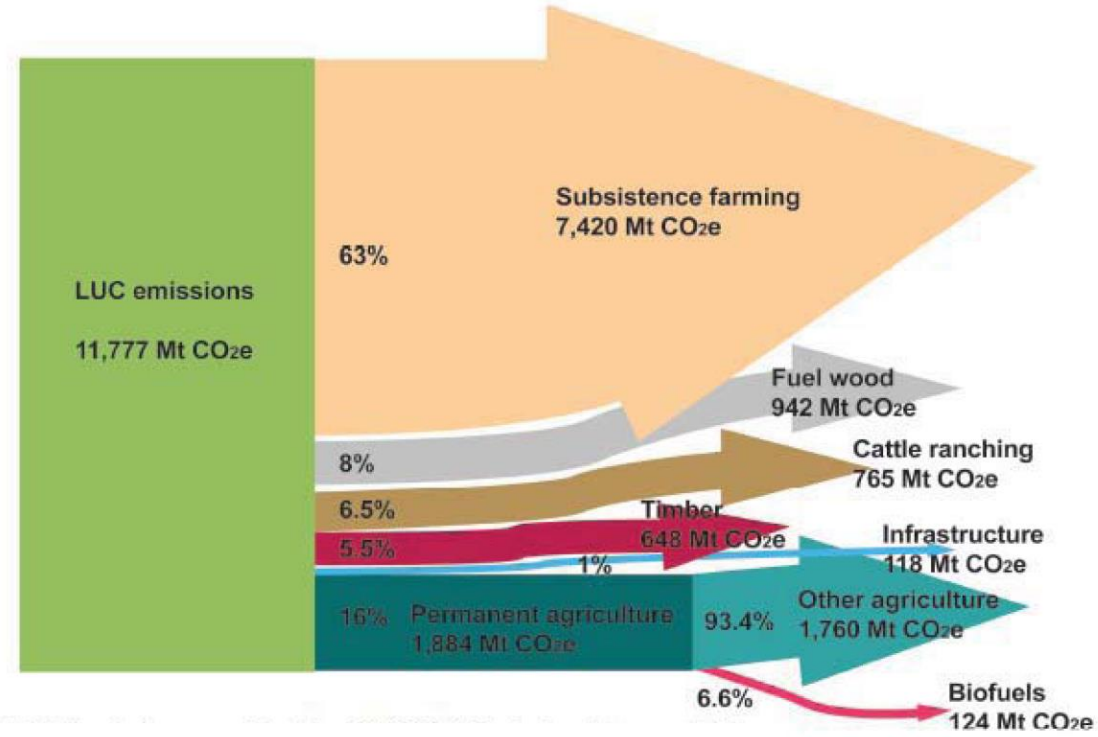


Figure 2. Carbon intensity values for gasoline and fuels that substitute gasoline

Fuel	Pathway Description	Carbon Intensity Values (gCO_2e/MJ)		
		Direct Emissions	Land Use or Other Indirect Effect	Total
Gasoline	CARBOB – based on the average crude oil delivered to California refineries and average California refinery efficiencies	95.86	0	95.86
Ethanol from Corn	Midwest average; 80% Dry Mill; 20% Wet Mill; Dry DGS	69.40	30	99.40
	California average; 80% Midwest Average; 20% California; Dry Mill; Wet DGS; NG	65.66	30	95.66
	California; Dry Mill; Wet DGS; NG	50.70	30	80.70
	Midwest; Dry Mill; Dry DGS, NG	68.40	30	98.40
	Midwest; Wet Mill, 60% NG, 40% coal	75.10	30	105.10
	Midwest; Dry Mill; Wet, DGS	60.10	30	90.10
	California; Dry Mill; Dry DGS, NG	58.90	30	88.90
	Midwest; Dry Mill; Dry DGS; 80% NG; 20% Biomass	63.60	30	93.60
	Midwest; Dry Mill; Wet DGS; 80% NG; 20% Biomass	56.80	30	86.80
	California; Dry Mill; Dry DGS; 80% NG; 20% Biomass	54.20	30	84.20
	California; Dry Mill; Wet DGS; 80% NG; 20% Biomass	47.40	30	77.40
Ethanol from Sugarcane	Brazilian sugarcane using average production processes	27.40	46	73.40
	Direct pathways for Brazilian sugarcane (e.g., use of bagasse for electricity production as a co-product credit), as deemed warranted by the Executive Officer		46	
Compressed Natural Gas	California NG via pipeline; compressed in California	67.70	0	67.70
	North American NG delivered via pipeline; compressed in California	68.00	0	68.00
	Landfill gas (bio-methane) cleaned up to pipeline quality NG; compressed in California	11.26	0	11.26
Liquefied Natural Gas	Pathways for North American-sourced LNG and biogas-sourced LNG liquefied in California			
Electricity	California average electricity mix	124.10	0	124.10
	California marginal electricity mix of natural gas and renewable energy sources	104.70	0	104.70

Source: Air Resources Board. URL: http://www.arb.ca.gov/fuels/lcfs/lcfs_att_b_mod.pdf)

Figure 3. GHG performance of biofuel from new corn ethanol plants by fuel source and lifecycle stage average (projected technology for 2022) (Source: EPA. Available at: <http://www.epa.gov/otaq/renewablefuels/420r10006.pdf>

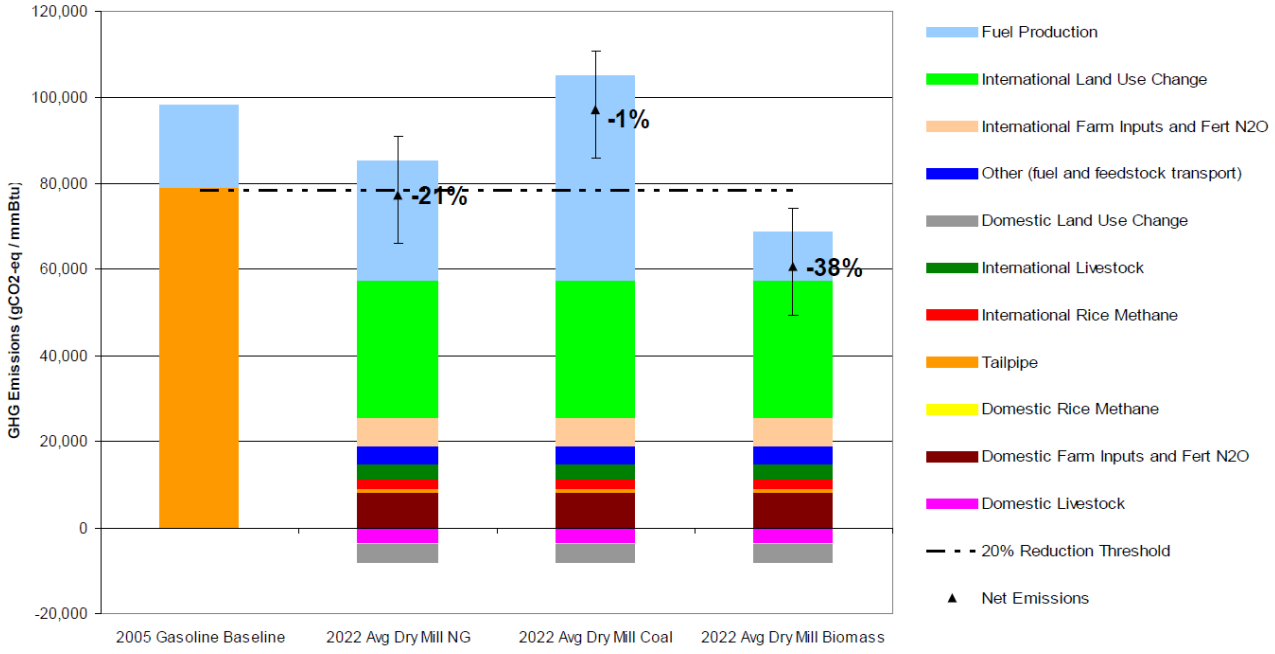


Figure 4. GHG performance of biodiesel by lifecycle stage soybean and waste grease feedstock

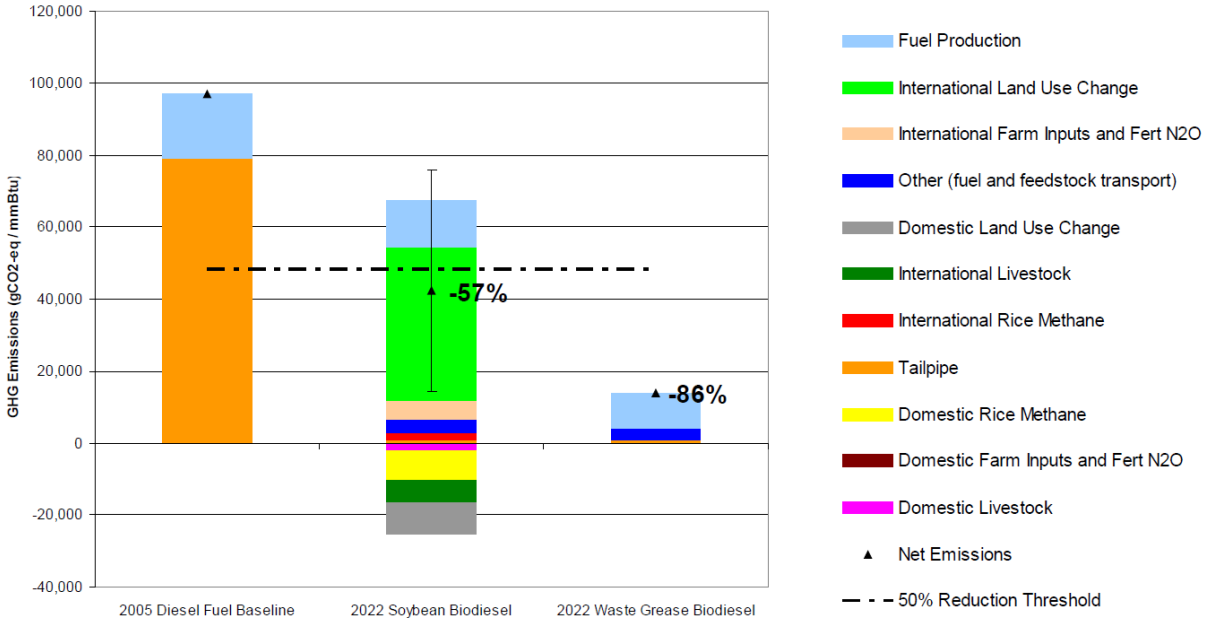


Figure 5. GHG performance of sugarcane ethanol by lifecycle stage with and without residue collection and CBI (i.e. distilled in the Caribbean Basin Initiative countries) (Source: ibid.)

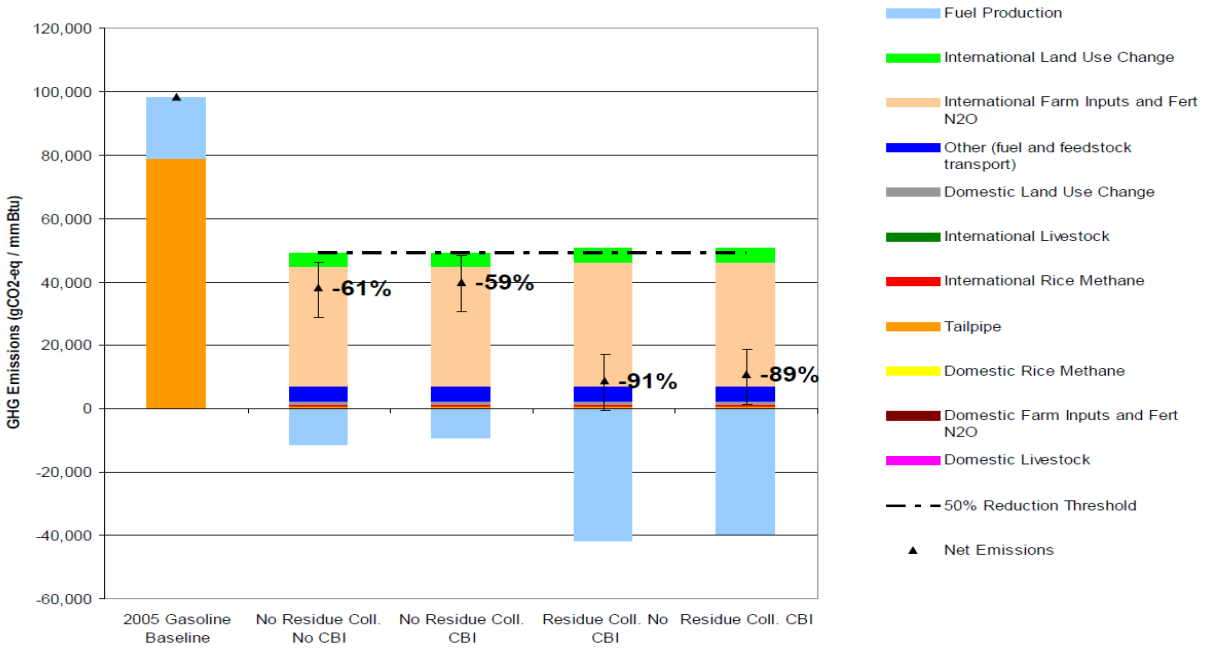
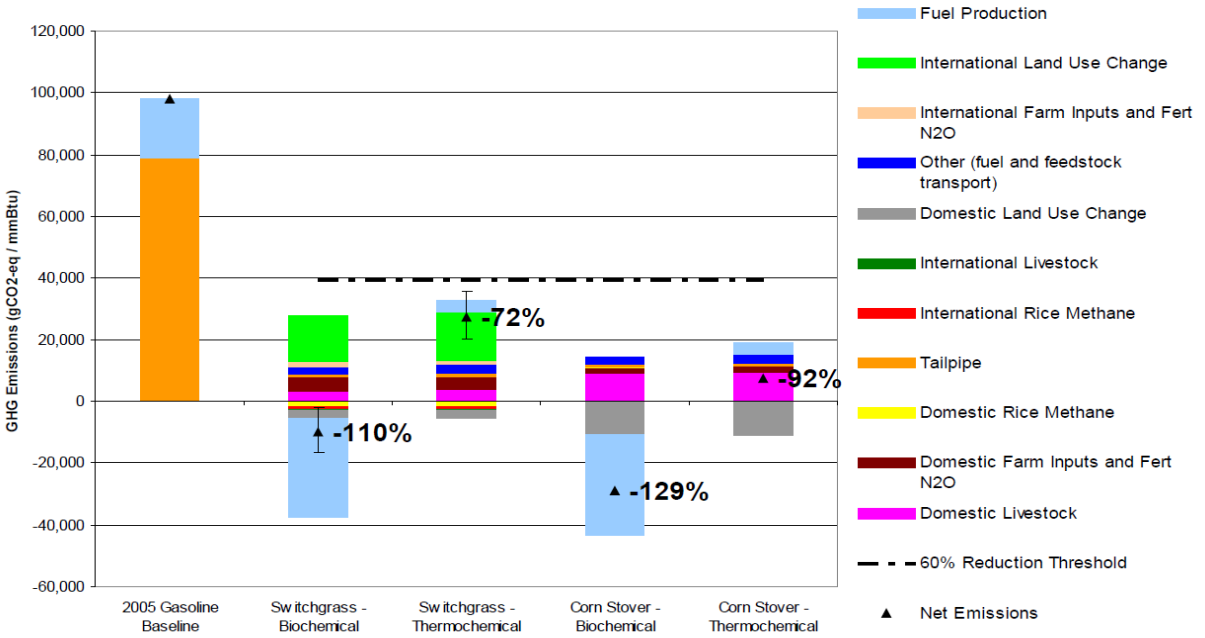


Figure 6. GHG performance of cellulosic ethanol by lifecycle stage biochemical and thermochemical for switchgrass and corn stover (Source: ibid.



Appendix 2. Accounting of land-use change impacts in CDM methodologies for biofuel activities

1. ACM0017 “production of biodiesel for use as fuel”:

   (a) Uses **afforestation and reforestation (A/R) methodological tool**: “Tool for the identification of degraded or degrading lands for consideration in implementing CDM A/R project activities”. This tool does not exist. The reference could be changed to the new tool “Project and leakage emissions from biomass”;

   (b) **“Biomass residues** are defined as biomass that is a by-product, residue or waste stream from agriculture, forestry and related industries. This shall not include municipal waste or other wastes that contain fossilized and/or non-biodegradable material (however, small fractions of inert inorganic material like soil or sands may be included).” Only 'surplus' residues should be used: need to demonstrate an economic surplus (to avoid market leakage) and ecologic surplus (to avoid loss of ecosystem carbon, especially soil organic carbon);

   (c) Dedicated plantations (the following applicability conditions have to be met only if the feedstock is vegetable oil from oil seeds produced 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. Again, there is a mention of a tool that does not exist anymore. The ‘no shift’ condition effectively rules out any possibility of a project with dedicated biomass plantation: normally, cropland and grazing land activities cannot coexist with biomass production for energy needs. Possible solution: leakage estimation could be allowed (as in the new biomass cultivation tool: use this tool in this methodology).

2. AM0089 “Production of diesel using a mixed feedstock of gasoil and vegetable oil”:

   (a) Uses **A/R methodological tool**: “Tool for the identification of degraded or degrading lands for consideration in implementing CDM A/R project activities”. This tool does not exist;

   (b) The same issue about shift of pre-project activities: effectively rules out most/all lands;

   (c) In baseline determination for land use (in the case of a dedicated plantation) scenario “L2: Conversion to another plantation (annual or perennial)” contradicts with “The project activity **does not lead to a shift of pre-project activities”.** If the baseline happens to be different from the pre-project land-use then the pre-project land use becomes a ‘disconnected scenario’ and does not have to continue in the project;

(d) Emissions from dedicated plantation. Option 2: Use of a default emission factor. A major part of emissions can arise from loss of soil organic carbon, thus default factors are difficult to justify. Cultivation methods may be identical/uniform, but emissions from soil organic carbon will still vary greatly;

(e) Possible solution: most issues might be solved by using the new tool on emissions and leakage from biomass cultivation.

3. AMS-I.G “Small-scale methodology: Plant oil production and use for energy generation in stationary applications”:

(a) Applicability: 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.

4. AMS-I.H “Small-scale Methodology: Biodiesel production and use for energy generation in stationary applications”:

(a) Project emissions consist of: The project emissions from cultivation of oil seeds are calculated using the latest version of the tool “Project emissions from cultivation of biomass”;

(b) This is good; except that the title of the tool might be updated in this methodology.

5. AMS-III.AK “Small-scale methodology: Biodiesel production and use for transport applications”:

(a) Applicability: “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”;

(b) This is good; except that the title of the tool might be updated in this methodology.

6. AMS-III.T “Small-scale methodology: Plant oil production and use for transport applications”:

(a) Applicability: 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 designated national authority (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. The plantations established on peat lands are not eligible under this methodology;

(b) If the project activity utilizes oil seeds sourced from dedicated plantations, the applicability conditions prescribed in the methodological tool “Project emissions from cultivation of biomass” shall apply;

(c) Project emissions:Project emissions cultivation of oil crop k (*PEFA,k,y*) are calculated using the latest version of the tool "Project emissions from cultivation of biomass";

(d) This is good; except that the title of the tool might be updated in this methodology.

7. Tool 16 "Project and leakage emissions from biomass":

(a) Definitions: (c) Indirect land use change - is land-use change that may be induced on land areas not included in the project boundary as a result of shifting of pre-project activities;

(b) "32. Project proponents are advised to avoid pre-project activities from being shifted outside the project boundary, to avoid indirect land use changes as a result of the project activity. Rather, project proponents are encouraged to include in the project boundary the land in which the pre-project activities will take place after the project implementation." This sounds good: iLUC effects are being recognized/mitigated;

(c) "If the value of any of these two indicators (activity displacement factors) is higher than 10 per cent and less than or equal to 50 per cent, then leakage shall be equal to 15 per cent of the difference between baseline emissions and project emissions";

(d) "If the value of either of these two indicators is larger than 50 per cent, then this tool is not applicable and a new procedure must be submitted for the approval of the Board".

Appendix 3. Input from 67th meeting of Methodologies Panel

1. Feedstock issues:

   (a) Crop wise approach to be adopted before ignoring land use change (LUC)-related emissions for lignocellulose crops.

2. Blending ratio:

   (a) The rationale of restricting blending to 20 per cent in biodiesel engines is due to manufacturer warranty in addition to the efficiency issues. However this restriction would not apply to blending of gasoline with ethanol, as flexible engines are available to use (burn) up to 100 per cent ethanol. Any simplification to blending would have to take into account the current warranty limitations.

3. Expansion of methodology:

   (a) Combustion of non-trans esterified fat (i.e. plant oil) could be poisonous. Therefore, expanding methodologies to include these could be harmful (e.g. acrolein-related emissions);

   (b) If adequate procedures are employed to address the issues relating to land use change, biodiesel methodologies should be expanded to cover bio-ethanol.

4. Double counting:

   (a) Blended fuels are not likely to be internationally traded or stored. If this assumption can be justified (reviewing data from major biofuel producers), methodologies could be simplified, assuming that fuel which is blended in the project boundary will be used within the host country. Also, if a fuel is sold as a blended fuel, the consumers cannot/may not claim emission reductions for its use. This approach is equivalent to, and simpler than, demonstrating that no biofuels are being exported by the host country. If the above issues are addressed adequately, the consumers can be eliminated from the project boundary.

5. Development of default values:

   (a) The main reason for not including default values for crops other than perennial crop was the limitation of the applicability to degraded lands. According to IPCC calculations, the switch from degraded to cultivated land leads to a high level of emissions due to soil carbon losses. The tool “Project and leakage from biomass” can address this limitation, and therefore specific emission factors for other crops could be provided;

   (b) The default values for non-perennial crops could be included with the conditions that the land use practice remains unchanged or would increase soil carbon due to project intervention. However if this is not feasible, default values could be developed without including soil carbon loss and leaving the calculation related to soil carbon loss to project participants.

Appendix 4. Input from 48th meeting of Small-Scale Working Group

1. A simplified procedure to rule out indirect land use change (iLUC) should focus on the baseline scenario and not the pre-project scenario. This is especially important because climate vulnerability of agriculture might force the expansion of agricultural land.

2. iLUC may be accounted for, or ruled out, by reviewing the deforestation in a country. Also, If accounting for iLUC, it should be accounted for in the project's year 1, and would eventually be compensated for by the continuous emission reductions the project generates. Projects could therefore be allowed to have iLUC, accounted for in year 1, and work towards a point in the future where the emission reductions become positive.

3. The best means to account for iLUC is through increased land productivity, so as to provide for pre-project land use within the project boundary.

4. For biofuel projects, more engagement with the designated national authority (DNA) on the evaluation and approval process may be considered to address local issues related to water consumption and other environmental impacts (e.g. soil and river nitrification, pesticides, air and water quality effects, etc.).

5. Biofuel blending might result in decreased engine efficiency. A careful analysis should be conducted prior to opening it up for unlimited blending.

6. Methodology revisions should consider a possible synergy of methodologies – the use of compost from a CDM project to reduce soil carbon loss.

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