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Concept note

Indirect greenhouse gas emissions – definitions and accounting

Version 01.0



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1. Procedural background

1. The Executive Board of the clean development mechanism (CDM) (the Board), at its eighty-second meeting (EB 82), requested the secretariat to prepare concept notes on the possible broadening of the applicability of the CDM methodologies for cities, transport, biofuels and agriculture.
2. The Board, at EB 85, considered a concept note on broadening the applicability of the CDM biofuel methodologies and requested the secretariat to prepare a concept note on the definition or set of definitions of “indirect emissions” in CDM projects. The Board also requested the secretariat to include in the concept note a “legal assessment of whether the consideration of indirect emissions is part of the existing modalities and procedures of the CDM”.
3. This concept note contains an analysis of the definition(s) of “indirect emission” and the use of the concept of indirect emissions in the approved CDM methodologies and in other greenhouse gas (GHG) accounting standards. The document also includes an analysis of how the concept of indirect emissions is incorporated in the modalities and procedures of the CDM.
4. This work relates to the activity “Development of new methodologies to broaden the applicability of the CDM” 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 2016 Management Plan (EB 87 meeting report, annex 1).

2. Purpose

5. The present concept note aims to:
 - (a) Clarify the use of the term “indirect emissions” in CDM methodologies;
 - (b) Provide information on the accounting of “indirect emissions” in standards outside of the CDM;
 - (c) Provide a legal assessment on whether consideration of indirect emissions is part of the existing modalities and procedures of the CDM.

3. Key issues and proposed solutions

3.1. Definition and accounting of indirect emissions

3.1.1. Indirect emissions in the clean development mechanism methodologies

6. Although the term “indirect emission” has not been defined in any of the regulatory documents of the CDM, this term has been used in many of the approved CDM methodologies. Tables 1 and 2 in Appendix 1 contain relevant extracts from the approved CDM methodologies in which the term “indirect emission” has been used.

7. As can be seen from tables 1 and 2 in Appendix 1, the term “indirect emission” has been used in the CDM methodologies to imply two different types of emissions as follows:¹
- (a) Emissions resulting from activities occurring outside the project boundary that are attributable to the project activity (leakage):
 - (i) These emissions, also known as “leakage” in the CDM methodologies, can result from activities that are situated upstream and downstream of the project activity in the value chain of the goods/services produced by the project activity. Such indirect emissions can also result from the shifting/displacement of the goods/services that exist in the baseline but cannot co-exist with the project activity.
 - (ii) The following examples illustrate different types of indirect emissions recognized in the approved CDM methodologies:
 - a. **Example 1** – Leakage emissions from upstream activities: In energy sector projects, emissions arising due to activities such as power plant construction, fuel/feedstock handling (extraction, processing, and transport), and land inundation (for hydroelectric projects) can fall outside the project boundary depending upon how the project boundary is defined. Such emissions are treated as indirect emissions (leakage) in CDM methodologies (AM0005, AM0007, AM0089, ACM0017, AMS-III.U, AMS-III.AQ, AMS-I.H, AMS-III.AK, AMS-III.T);
 - b. **Example 2** – Leakage emissions from downstream activities: In a mass rapid transit (MRT) project, emissions caused by MRT passengers’ travel segment from the exit point of the MRT facility to their final destination fall outside of the project boundary and therefore are treated as indirect (leakage) emissions (ACM0016, AM0101, AMS-III.U);
 - c. **Example 3** – Indirect emissions from the shifting/displacement of goods/services existing in the baseline: In a bioenergy project, the use of biomass at the project site can restrict/prevent the access of the baseline users to such biomass and consequently the users start using fossil fuel to meet their energy needs. This can cause additional emissions and such emissions are treated as indirect emissions (AM0007).
 - (b) Emissions resulting from the effects of the project activity on the demand and supply equilibrium of goods and services (the market leakage):
 - (i) These emissions result from the market effects of the project activity and can be significant or insignificant depending upon the price elasticity of the goods and services consumed or produced by the project activity and the size of the project activity relative to the market size;

¹ It should be noted the terms “leakage” and “indirect emissions” have been used synonymously in the CDM methodologies. The present analysis cites only those CDM methodologies in which the term “indirect emissions” has been explicitly used.

- (ii) The following example illustrates how these types of indirect emissions are recognized in the approved CDM methodologies:

- a. **Example 4** – Indirect emissions from market effects of the project activity: In the case of a project activity involving the introduction of a bus rapid transport (BRT) system, the taxis and conventional buses outside of the project boundary may continue to operate at lower load factors as the demand for these transport modes goes down. As a result, although the GHG emissions per passenger kilometre of the BRT system is lower than the baseline, the GHG emissions per passenger kilometre of the taxis and conventional buses competing with the BRT system is higher than the baseline. This effect partially offsets the emission reduction resulting from the project activity (AM0031).²

3.1.2. Indirect emissions in other greenhouse gas accounting standards

3.1.2.1. Greenhouse Gas Protocol

8. The Greenhouse Gas Protocol (GHG Protocol) is an initiative supported by the World Business Council for Sustainable Development and the World Resources Institute to develop internationally accepted GHG accounting and reporting standards and/or protocols for corporate businesses.
9. The GHG Protocol defines “indirect GHG emissions” as “emissions or removals that are a consequence of a project activity, but occur at GHG sources or sinks not owned or controlled by the project developer”.³
10. The GHG Protocol further defines three “scopes” for GHG accounting and reporting purposes:
 - (a) **Scope 1** – Direct GHG emissions: Direct GHG emissions occur from sources that are owned or controlled by the company, for example emissions from combustion in owned or controlled boilers, furnaces, vehicles, etc.;
 - (b) **Scope 2** – Electricity indirect GHG emissions: Scope 2 accounts for GHG emissions from the generation of purchased electricity consumed by the company. Purchased electricity is defined as electricity that is purchased or otherwise brought into the organizational boundary of the company. Scope 2 emissions physically occur at the facility where electricity is generated;
 - (c) **Scope 3** – Other indirect GHG emissions: Scope 3 is an optional reporting category that allows for the treatment of all other indirect emissions. Scope 3 emissions are a consequence of the activities of the company, but occur from sources not owned or controlled by the company. Some examples of scope 3 activities are extraction and production of purchased materials; transportation of purchased fuels; waste disposal, etc.

² Note that this is different from the “rebound effect” whereby the average kilometre per passenger logged by the users of the BRT may increase compared to the baseline as a result of the lower cost and better comfort of the travel service provided by the BRT.

³ See <<http://www.ghgprotocol.org/standards/project-protocol>>.

3.1.2.2. ISO 14064 standard

11. The International Organization for Standardization (ISO) is an international standard-setting body composed of representatives from various national standards organizations.
12. ISO 14064 is a standard issued by the ISO that specifies principles and requirements at the organizational level for the quantification and reporting of GHG emissions and removals.
13. ISO 14064 defines two types of “indirect emissions”:⁴
 - (a) Energy indirect GHG emission: GHG emission from the generation of imported electricity, heat or steam consumed by the organization;
 - (b) Other indirect GHG emission: GHG emission, other than energy indirect GHG emissions, which is a consequence of an organization's activities, but arises from GHG sources that are owned or controlled by other organizations.
14. ISO 14064 requires that the reporting organization “shall quantify indirect GHG emissions from the generation of imported electricity, heat or steam consumed by the organization” and that the reporting organization “may quantify other indirect GHG emissions based on the requirements of the applicable GHG programme, internal reporting needs or the intended use for the GHG inventory”.⁵

3.1.3. Use of the term “indirect emissions” in reports and guidelines of the Intergovernmental Panel on Climate Change

15. The term “indirect emissions” is defined and described by the Intergovernmental Panel on Climate Change (IPCC) as follows:⁶

“Indirect emissions: Emissions that are a consequence of the activities within well-defined boundaries of, for instance, a region, an economic sector, a company or process, but which occur outside the specified boundaries. For example, emissions are described as indirect if they relate to the use of heat but physically arise outside the boundaries of the heat user, or to electricity production but physically arise outside of the boundaries of the power supply sector”.
16. The IPCC also defines “indirect land-use change (iLUC)” as follows:

“Indirect land-use change refers to shifts in land use induced by a change in the production level of an agricultural product elsewhere, often mediated by markets or driven by policies. For example, if agricultural land is diverted to fuel production, forest clearance may occur elsewhere to replace the former agricultural production”.

⁴ See ISO 14064-1:2006 “Greenhouse gases -- Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals”.

⁵ Examples of organizational activities that might result in other indirect emissions are included in Annex B of ISO 14064-1:2006.

⁶ IPCC, 2014: Annex II: Glossary [Mach, K.J., S. Planton and C. von Stechow (eds.)]. In: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland, pp. 117-130.

17. The IPCC defines “leakage” in the sense of market effects (refer to section 7. b above) of the project activity:

“Leakage: Phenomena whereby the reduction in emissions (relative to a baseline) in a jurisdiction/sector associated with the implementation of mitigation policy is offset to some degree by an increase outside the jurisdiction/sector through induced changes in consumption, production, prices, land use and/or trade across the jurisdictions/sectors.” Leakage can occur at a number of levels, be it a project, state, province, nation, or world region.”

18. Thus both “indirect emission” and “leakage”, as defined by the IPCC, are emissions occurring outside the defined boundary of an action/activity/jurisdiction. While what is included in “indirect emissions” depends upon how the boundary of an action/activity/jurisdiction is defined, “leakage” depends upon the “induced changes in consumption, production, prices, land use and/or trade across the jurisdictions/sectors”. Thus what has been described in the preceding analysis as “market leakage” is defined by the IPCC as “leakage”, whereas what has been described in the preceding analysis as “leakage” is defined by the IPCC as “indirect emission”.

3.2. Indirect emissions under the modalities and procedures of the clean development mechanism

19. The term “indirect emission” does not appear in the CDM modalities and procedures (decisions 3/CMP.1, 4/CMP.1, or 5/CMP.1).
20. However, as set out in paragraph 7 above, it can be seen that during the period 14 April 2004 to date (a period of 12 years), through the approval and revision of methodologies listed in Tables 1 and 2 of the appendix 1, the Board has repeatedly used the term “indirect emissions”. It must be assumed that the use of the term “indirect emissions” by the Board in the context of these methodologies and their revisions was intentional and understood, even if it is the case that the term is not used in all CDM methodologies. As such, it is concluded that, from the legal perspective, there is a practice of the Board to include indirect emissions within the requirements of certain CDM methodologies. In the occurrence, there appears to be a connection in the practice of the Board in using “indirect emissions” with the use of the term “leakage” (see Tables 1 and 2).
21. The CMP has not, to date, defined the term in the context of the CDM and thus the meaning(s) attributed through that practice are those assumed to be applicable.
22. The term “leakage” is defined in 3.CMP.1 as follows:

“Leakage is defined as the net change of anthropogenic emissions by sources of greenhouse gases which occurs outside the project boundary, and which is measurable and attributable to the CDM project activity” (decision 3/CMP.1, annex, paragraph 51; and also in decision 4/CMP.1, annex II, paragraph 30 (with additional non-definitional wording that follows)).
23. Thus “leakage” appears to have a definition relative to the “project boundary”.

24. Although the term “project boundary” is not explicitly defined in the CDM modalities and procedures, the requirement to be met by the project boundary of a CDM project activity is prescribed as follows:

“The project boundary shall encompass all anthropogenic emissions by sources of greenhouse gases under the control of the project participants that are significant and reasonably attributable to the CDM project activity” (decision 3/CMP.1, annex, paragraph 52).

25. Thus all significant GHG emissions that are attributable to the project activity but are not under the control of the project participants are defined as the “leakage” of the project activity. This can be compared to uses outside the modalities and procedures of the CDM - definition of leakage can be interpreted essentially the same as the definition of “indirect emissions” provided in GHG accounting standards. The term “indirect emissions” used in the CDM methodologies also carries the same meaning.
26. In the above CDM definition of “leakage”, as is provided in the CDM modalities and procedures, the terms “under the **control** of the project participants” and “**attributable** to the project activity” are the defining terms. However, both of the terms “control” and “attributable” are not defined or described in the text of the CDM modalities and procedures.
27. The term “under the control” has been described in GHG accounting standards other than the CDM. For example, ISO 14064 specifies that the concept of “owned or controlled” can be operationalized either through the “control” approach or the through “equity share” approach. Under the “control” approach, the organization accounts for all GHG emissions from facilities over which it has financial or operational control. Under the “equity share” approach, the organization accounts for its portion of GHG emissions from respective facilities. The term “control” used in the CDM methodologies also carries more or less the same meaning.
28. Proceeding from the dictionary meaning of the word “attributable”, the GHG emissions attributable to a project activity could possibly be divided into the following two categories:
- (a) Emissions resulting from activities that are necessary for the project activity to take place;
 - (b) Emissions resulting from activities that are not necessary for the project activity to take place but are caused/triggered indirectly by the project activity (the consequent, secondary, or knock-on effects).

3.2.1. Emissions resulting from activities that are necessary for the project activity to take place

29. The activities that are necessary for the project activity to take place can be either linked immediately to the project activity or linked to the project activity through a causal/value chain of activities in which each activity must take place in order for the project activity to take place. These are the activities that have been referred to above as “upstream” or “downstream” activities. The examples in the table illustrate the typical upstream and downstream activities in the context of project activities using fossil fuel and biofuel, respectively, as source of energy.

Table 1. Examples of upstream and downstream activities in the context of project activities using fossil fuel and biofuel

Indirect activities necessary for enabling fossil fuel consumption		Indirect activities necessary for enabling biofuel consumption	
Upstream activities			
(i)	Transport of the fossil fuel to the site of the project activity from the point of distribution	Transport of the biofuel to the site of the project activity from the point of distribution.	
(ii)	Transport of the fossil fuel from the site of processing plant/refinery plant to the point of distribution, and its storage	Transport of the biofuel from the site of processing plant/bio-refinery plant to the point of distribution, and its storage	
(iii)	Operation of the processing plant/refinery plant that produces the fossil fuel	Operation of the processing plant/bio-refinery plant that produces the biofuel	
(iv)	Transport from the mines/wells to the processing plant/refinery plant	Transport of biomass from the cultivation fields or collection points to the processing plant/bio-refinery plant	
(v)	Mining/extraction of the fossil fuel	Cultivation of the biomass	
(vi)	Prospecting for the fossil fuel production site, including drilling operations resulting in dry holes, excavation of unsuccessful mining pits, etc.	N/A	
(vii)	Vacation of the well/mining site through the shifting of earlier land-use activities in order to make the site available for production of fossil fuel	Vacation of the land for cultivation of biomass through the shifting of earlier land-use activities in order to make the site available for production of biomass	
(viii)	Preparation of the mining site including clearance of vegetation and disturbance of soils	Preparation of the land for cultivation of biomass including clearance of vegetation and disturbance of soils	
(ix)	Closure of mine pits and rehabilitation of the land, etc.	N/A	
Downstream activities			
(x)	Transport and disposal of the ash resulting from the combustion of the fossil fuel under the project activity	Transport and disposal of the ash resulting from combustion of the biofuel under the project activity	

30. A crucial question arising in the context of the above examples is this: How far down the causal/value chain of activities should an activity be located so that it can no longer be said to be “attributable” to the project activity? Neither the CDM modalities and procedures nor other GHG accounting standards considered in the present analysis provide a clear answer to this question.
31. In practice, however, the CDM methodologies and tools address this question on the basis of the specificities of individual methodologies and tools. The criteria or rationales used for excluding certain sources/activities from accounting are, inter alia, the following:
- (a) Significance of the emissions relative to the project/ baseline emissions;

- (b) Significance of the difference in emissions from the same source in the baseline and in the project (where the same source/activity is present both in the baseline and in the project);
 - (c) Technological feasibility and cost feasibility of monitoring/quantification of the emissions (e.g. cost-effective measurements, availability of relevant equations/methods in the IPCC reports).
- 32. The CDM tool for the estimation of upstream emissions from the combustion of fossil fuels accounts for the emissions resulting from activities (i) to (v) listed in the first column of the table. On the other hand, the CDM tool for the estimation of upstream emissions resulting from combustion of biofuels accounts for emissions resulting from all the activities listed in column 2 of the table.
- 33. The CDM modalities and procedures contains the following criteria with respect to the accounting of emissions (inter alia):
 - (a) In the case of emissions by sources under the control of the project participants, the emissions that are **significant** and **reasonably attributable** to the project activity are to be included in accounting (these are called project emissions in the approved CDM methodologies);
 - (b) In the case of emissions by sources not under the control of the project participants, the emissions that are **measurable** and **attributable** to the project activity are to be included in accounting (these are called leakage emissions in the approved CDM methodologies).
- 34. Whether the emissions resulting from a particular activity are accounted for as project emissions or leakage emissions depends upon the presence or absence of the “control” of the project participants on that activity. Since the choice of “control” can be made by the project participants quite arbitrarily (e.g. they may choose to generate electricity themselves or buy it from the market), the issue of categorization of the emissions as project emissions or leakage emissions appears to be of secondary importance. Of crucial importance is the determination of whether all significant emissions “attributable” to the project activity **are** accounted for, irrespective of their category.

3.2.2. Emissions resulting from market effects of the project activity

- 35. The activities that are not necessary for the project activity to take place but are triggered by the economic/market effect of the project activity can be said to have a causal link with the project activity and hence could be considered attributable to the project activity. The following example illustrates this through a hypothetical scenario:
 - (a) **Example 6** – Emissions resulting from market effects: If the farmers producing and supplying biomass to the project participants decide to put more and more of their land resources to biomass production and meet their other needs for land through increased access to the commons (e.g. community pasture lands, public

forests), the increased use of commons results in additional emissions which could be attributable to the project activity.⁷

36. The text of the CDM modalities and procedures does not explicitly provide that emissions resulting from market-induced effects of CDM project activities are to be treated as leakage. However, the text does not explicitly exempt project activities from such emissions either.
37. In practice, however, some of the approved CDM methodologies and tools include accounting of emissions resulting from market effects of project activities (e.g. AM0031, as described in example 4).

Table 2. Consideration of emissions resulting from market leakage for project activities using fossil fuel and biofuel

Market leakage for projects using fossil fuel	Market leakage for projects using biofuel
ACM0025: Natural gas is sufficiently available in the region or country, e.g. future natural gas based power capacity additions, comparable in size to the project activity, are not constrained by the use of natural gas in the project activity	Tool “Project and leakage emissions from biomass”: Demonstrate that there is an abundant surplus of the biomass residue in the project region which is not utilized. For this purpose, demonstrate that the total quantity of that type of biomass residues annually available in the project region is at least 25 per cent larger than the quantity of biomass residues which is utilized annually in the project region (e.g. for energy generation or as feedstock), including the project facility

3.3. Conclusion

38. In view of the preceding analysis, the following conclusions emerge:
- (a) The term “indirect emission” is used, as a practice of the Board, in some approved CDM methodologies to imply the emissions defined as “leakage” in the CDM modalities and procedures. Other approved CDM methodologies have used the term “leakage” for the same type of emissions;
 - (b) The term “leakage” as defined in the CDM modalities and procedures includes the emissions that are **measurable** and **attributable** to the project activity but are not under the control of the project participant. Whether the emissions resulting from market effects of the project activity, which are not under the control of the project participants, are to be treated as “leakage” is not clear from a textual reading of the CDM modalities and procedures since the term “attributable” has not been defined;
 - (c) Based on the specificities of individual methodologies and tools (as indicated in para. 31), the approved CDM methodologies and tools allow excluding some of

⁷ Note that this phenomenon can involve a combined effect of “shifting/displacement” of the baseline activity (i.e. where the size of land resources or services consumed remains the same as in the baseline but shifted elsewhere), and the market effect (i.e. where the size of land resources or services consumed is greater in project than in the baseline).

the sources/activities from accounting even though such sources/activities are attributable to the relevant project activity;

- (d) In some approved CDM methodologies the emissions resulting from the market effects of the project activity are also included in accounting;
- (e) In order to improve the consistency of terminology in approved CDM methodologies, it would be appropriate to replace the term “indirect emissions” with the term “leakage” whenever the methodologies are taken up for revision, whilst recognizing that the term “indirect emissions” does not appear to be being “wrongly” used by the Board at the current time.

4. Impacts

- 39. The final outcome of this analysis is expected to enhance the consistency, objectivity, accessibility and usability of the CDM methodologies and tools while ensuring their environmental integrity.

5. Subsequent work and timelines

- 40. The present concept note does not envisage work in the immediate future.
- 41. The decision(s) taken by the Board will determine the possible future direction of work, including improving consistency in the use of terminology in CDM methodologies that are approved or revised in the future.

6. Recommendations to the Board

- 42. The Board may wish to:
 - (a) Take note of the analysis contained in the present concept note and provide any further guidance;
 - (b) Agree to revise the methodologies where the term “indirect emissions” is being used by replacing “indirect emissions” with “leakage”, as and when these methodologies are recommended for revision under other mandates.

7. References

- 43. The following sources were used for the purpose of the analysis contained in this document:
 - (a) The Kyoto Protocol and the CDM modalities and procedures (decisions 3/CMP.1, 4/CMP.1, 5/CMP.1);
 - (b) The approved CDM methodologies as listed in tables 1 and 2 of Appendix 1;
 - (c) The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised edition). World Resources Institute, 2004;
 - (d) The Greenhouse Gas Protocol: The GHG Protocol for Project Accounting. World Resources Institute, 2005;

- (e) ISO 14064-1: 2006 “Greenhouse gases — Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals”. The International Organization for Standardization, 2006;
- (f) Climate Change 2014: Mitigation of Climate Change – Working Group III Contribution to the Fifth Assessment Report of the IPCC. Intergovernmental Panel on Climate Change, 2014.

Appendix 1. Extracts from approved CDM methodologies and tools where the term “indirect emission” has been used

1. This appendix contains tabular summaries of how the term “indirect emissions” is used in approved CDM methodologies.

Table 1. Use of the term “indirect emission” in the approved large-scale CDM methodologies

*Note: The words “indirect emission(s)” have been highlighted through **boldface** solely for the purpose of ease of readability.*

Methodology and the relevant text about indirect emission	Provisions on accounting of indirect emissions	First version using “indirect emissions”	Last revision
<p>AM0005 “Baseline methodology (barrier analysis, baseline scenario development and baseline emission rate, using combined margin) for small grid-connected zero-emissions renewable electricity generation”, Sectoral Scope: 1,</p> <p>“The main indirect emissions potentially giving rise to leakage in the context of electric sector projects are emissions arising due to activities such as power plant construction, fuel handling (extraction, processing, and transport), and land inundation (for hydroelectric projects)”</p>	<p>“Project activities using this baseline methodology shall not claim any credit for the project on account of reducing these emissions below the level of the baseline scenario. The project developer must justify why the project is not responsible for such indirect emissions to a degree that exceeds corresponding indirect emissions from the baseline scenario”</p>	14 Apr 04 (version 1)	14 Apr 04 (version 1)

Methodology and the relevant text about indirect emission	Provisions on accounting of indirect emissions	First version using "indirect emissions"	Last revision
<p><i>AM0007 "Analysis of the least-cost fuel option for seasonally-operating biomass cogeneration plants"</i> <i>Sectoral Scopes: 1 and 4</i></p> <p>"Potentially two sources of indirect emissions can be identified for the switch of fossil fuel to renewable biomass. First, leakage can occur in the form of transport emissions from the collection of biomass to the project site. Second, the use of biomass at the project site can potentially lead to a crowding out of biomass and consequentially an increase in the consumption of fossil fuel at other plants in case the supply of biomass is short of demand"</p>	<p>The project participants are required to use one of the two following options:</p> <ul style="list-style-type: none"> - Demonstrate that biomass is abundant in the area from which biomass will be sourced; - Determine the percentage of biomass that would meet economic and social needs (e.g. cooking, feedstock, biomass cogeneration etc.) and the percentage of biomass that would meet no social and economic needs (e.g. biomass would be left to rot, be burned, decompose, etc.) 	14 Jun 04 (version 1)	14 Jun 04 (version 1)
<p><i>ACM0017 "Production of biodiesel for use as fuel" Sectoral Scopes: 01 and 05</i></p> <p>The substitution of biodiesel for petrodiesel reduces indirect ("upstream") emissions associated with the production of petrodiesel. For the purpose of this methodology, these include the following emission sources:</p> <p>(1) Production of crude oil. These include emissions from venting, flaring and energy uses;</p> <p>(2) Oil refinery. These include emissions from energy uses, production of chemicals and catalysts, disposal of production wastes (including flaring) and direct emissions;</p> <p>(3) Long distance transport</p>	<p>Accounts for indirect emissions by using separate emission factors for production of crude oil, oil refining, and long distance transportation</p>	16 Oct 09 (version 1)	17 Sep 10 (version 2.1)

Methodology and the relevant text about indirect emission	Provisions on accounting of indirect emissions	First version using “indirect emissions”	Last revision
<p><i>ACM0016 “Mass rapid transit projects” Sectoral Scope: 07</i></p> <p>“Project emissions are based on the fuel and/or electricity consumed by the MRTS (direct project emissions) plus emissions caused by project passengers from their trip origin to the entry station of the project and from the exit station of the project to their final destination (indirect project emissions), as illustrated in Figure 2”</p>	Indirect emissions are estimated through survey and are accounted	16 Oct 09 (version 1)	24 Jul 15 (version 4)
<p><i>AM0101 “High speed passenger rail systems”/ Sectoral scope: 07</i></p> <p>“Project emissions are emissions associated with the transportation of the passengers travelling in the project HSR system from their rail entry station to their rail exit station. Therefore, project emissions include direct project emissions defined as emissions from the operation of the project HSR system plus indirect project emissions defined as rail-based emissions from the rail entry station to the HSR entry station and from the HSR exit station to the rail exit station”</p>	Indirect emissions are estimated through survey and are accounted	02 Mar 12 (version 1)	24 Jul 15 (version 2)

Methodology and the relevant text about indirect emission	Provisions on accounting of indirect emissions	First version using “indirect emissions”	Last revision
<p><i>ACM0005 Sectoral scope: 04</i></p> <p>“The project boundary includes the cement production plant, any onsite power generation (if applicable), and the power generation in the grid (if applicable).</p> <p>The power grid or plant from which the cement plant purchases electricity and its losses will be considered in determining indirect emissions. Any transport related emissions for the delivery of additional additives will be included in the emissions related to the project activity as leakage. Emissions reductions from transport of raw materials for clinker production are not taken into account as a conservative simplification”</p>	<p>The following applies to consumption of electricity in baseline and in project:</p> <p>Direct emission from self-generation sources and indirect emission from plants connected to the grid supplying the plant with electricity</p>	30 Sep 05 (version 1)	02 Mar 12 (version 7.1)
<p><i>AM0089 Sectoral Scopes: 01 and 05</i></p> <p>“Leakage emissions related to the avoided production of petrodiesel. The production of renewable diesel reduces indirect (“upstream”) emissions associated with the production of petrodiesel which is displaced by the renewable diesel. For the purpose of this methodology, these include the following emission sources:</p> <p>(1) Production of crude oil. These include emissions from venting, flaring and energy uses;</p> <p>(2) Oil refinery. These include emissions from energy uses, production of chemicals and catalysts, disposal of production wastes (including flaring) and direct emissions;</p> <p>(3) Long distance transport”</p>	<p>Accounts for indirect emissions by using separate emission factors for production of crude oil, oil refining, and long distance transportation</p>	17 Sep 10 (version 1)	24 Jul 15 (version 2)

Table 2. Use of the term “indirect emission” in the approved small-scale CDM methodologies

*Note: The words “indirect emission(s)” have been highlighted through **boldface** solely for the purpose of ease of readability.*

Methodology/ tool and the relevant text about indirect emission	Provisions on accounting of indirect emissions	First version using “indirect emissions”	Date of last revision
<p><i>AMS-III.U “Small-scale Methodology: Cable cars for mass rapid transit system (MRTS)” Sectoral Scope: 07</i></p> <p>“Project emissions are based on the fuel and/or electricity consumed by the project multiplied with the respective GHG emission factor. Indirect emissions caused by project passengers from their trip origin to the project entry station and from the project exit station to the final trip destination are taken into account.”</p>	Indirect emissions are estimated through survey and are accounted	26 Sep 08 (version 1)	24 Jul 15 (version 2)
<p><i>AMS-III.AQ “Small-scale Methodology: Introduction of Bio-CNG in transportation applications” Sectoral scope(s): 07</i></p> <p>“36. The substitution of Bio-CNG for CNG from fossil origin reduces indirect (“upstream”) emissions associated with the production of fossil CNG and is treated as negative leakage $LE_{PROCESS,y,CNG}$ that can be calculated as per the latest approved version of the tool “Upstream leakage emissions associated with fossil fuel use”.</p> <p>37. The substitution of Bio-CNG for gasoline reduces indirect (“upstream”) emissions associated with the production of gasoline and is treated as negative leakage $LE_{PROCESS,y,GAS}$ (leakage emissions related to production and refining of the gasoline) that can be calculated using the latest approved version of the tool “Upstream leakage emissions associated with fossil fuel use”</p>	Indirect emissions are estimated using the approved tool	26 Nov 10 (version 1)	01 Jun 14 (version 2)

Methodology/ tool and the relevant text about indirect emission	Provisions on accounting of indirect emissions	First version using “indirect emissions”	Date of last revision
<p><i>AMS-I.H “Small-scale Methodology: Biodiesel production and use for energy generation in stationary applications” Sectoral scope(s): 01</i></p> <p>“The substitution of biodiesel for petrodiesel reduces indirect (“upstream”) emissions associated with the production of petrodiesel ($LE_{upstream}$) and is treated as negative leakage⁴ and can be calculated as per the methodological tool “Upstream leakage emissions associated with fossil fuel use”</p>	Indirect emissions are estimated using the approved tool	30 Jul 10 (version 1)	28 Nov 14 (version 2)
<p><i>AMS-III.AK “Small-scale Methodology: Biodiesel production and use for transport applications” Sectoral scope(s): 07</i></p> <p>“The substitution of biodiesel for petrodiesel reduces indirect (“upstream”) emissions associated with the production of petrodiesel ($LE_{upstream}$) and is treated as negative leakage⁴ and can be calculated as per the methodological tool “Upstream leakage emissions associated with fossil fuel use”</p>	Indirect emissions are estimated using the approved tool	28 Nov 14 (version 2)	28 Nov 14 (version 2)
<p><i>AMS-III.T “Small-scale Methodology: Plant oil production and use for transport applications” Sectoral scope(s): 07</i></p> <p>The substitution of plant oil for petrodiesel reduces indirect (“upstream”) emissions associated with the production of petrodiesel ($LE_{upstream}$) and is treated as negative leakage⁷ and can be calculated as per the methodological tool “Upstream leakage emissions associated with fossil fuel use”</p>	Indirect emissions are estimated using the approved tool	28 Nov 14 (version 3)	28 Nov 14 (version 3)

Appendix 2. Inputs received from the Methodology Panel on issue of indirect emissions

1. The MP provided feedback to the secretariat on the issue of “Indirect leakage emissions in CDM projects” as follows:
 - (a) The leakage emissions should be considered consistently and equitably between the fossil fuels and biofuels. The decisive factor for accounting for emission sources should be the significance of the different project and leakage emission sources. Furthermore, different sources of information should be assessed in order to avoid any bias especially in the case of indirect land use change emissions;
 - (b) The level and scope of the leakage emission considered in the development of the upstream emission tool, i.e. sources pertaining to extraction, production and transportation of fossil fuels, should be used as an example for biofuels as well;
 - (c) Indirect emissions are defined as leakage in the CDM and should be measurable and attributable to the project. Thus, in CDM methodologies the leakage due to shift of pre-project activities of biomass should be addressed by applying the “Tool for project and leakage emissions from biomass”;
 - (d) It is suggested that the term “indirect leakage emissions” be removed from some existing methodologies in order to be aligned with CDM specific terms such as project and leakage emissions.

Appendix 3. Inputs received from Small scale working group on the issue of indirect leakage emissions

1. The SSC WG provided feedback to the secretariat on the issue of “Indirect leakage emissions in CDM projects” as follows:
 - (a) The leakage emissions should be considered consistently and equitably between the fossil fuels and biofuels;
 - (b) The level and scope of the leakage emission considered in the development of the upstream emission tool, i.e. sources pertaining to extraction, production and transportation of fossil fuels, should be used as an example for biofuels as well;
 - (c) Indirect emissions are defined as leakage in the CDM and should be measurable and attributable to the project. Thus, in small-scale project activities the leakage due to shift of pre-project activities of biomass should be addressed by applying the “Tool for project and leakage emissions from biomass”;
 - (d) The SSC WG suggested that the expression “indirect leakage emissions” be removed from some existing methodologies in order to be aligned with CDM specific terminologies such as project and leakage emissions.

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Document information

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