CLEAN DEVELOPMENT MECHANISM

CDM METHODOLOGY BOOKLET

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The production of this booklet benefited from the suggestions of Secretariat staff and thoughtful comments from several experts on the content that would be most helpful to people wishing to find and understand methodologies and methodological tools of interest to them. In order to enhance its utility and respond to the needs of stakeholders the Secretariat welcomes comments and suggestions, which can be emailed to: CDM-info@unfccc.int.

This booklet will also be updated regularly in order to reflect changes in approved methodologies and methodological tools. The latest version of the booklet is available on the UNFCCC website. It is also possible to contact the Secretariat and request USB sticks of the booklet.

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FOREWORD

The international community achieved a resounding success with the new, universal climate change agreement adopted at COP21 in Paris in December 2015. The Paris Agreement marks a historic turning point in our common journey towards a secure and sustainable world. The Paris Agreement will shape international climate policy for the next decades. It holds great challenges, but also exciting, transformational opportunities driven by ambitious national action and increased international cooperation.

The Paris Agreement is a catalyst for policies and action for low-carbon development, climate finance, technology transfer, capacity building and market-driven approaches. For market-based approaches, different types of contributions and units are available for transfer. Compatibility, comparability and fungibility among these units ensures there is no double counting and safeguards environmental integrity. Internationally recognized standards to quantify emission reductions is key for environmental integrity.

Environmental integrity is crucial for the Clean Development Mechanism, or CDM, and methodologies form the foundation for integrity. Methodologies help establish a project's emissions baseline, or anticipated emissions if the project does not move forward. They also help monitor, quantify and accurately estimate emissions once a project is built. Eligible certified emission reduction units are determined by the difference between the baseline and actual emissions. Methodologies are essential to quantify real and accurate emission reductions. Standardized baselines allow methodologies also to cover sector-wide emissions.

While the necessity of methodologies is easy to understand, how they are constructed is quite complex. To make standards applicable to projects from diverse sectors, techno-economic situations and geographical regions, they must be diverse in composition and application. This publication is designed to guide users through the complex world of CDM methodologies.

This booklet clearly summarizes mitigation methodologies available under the CDM. This can help market actors choose the right method to estimate their emission reductions. It is my firm belief and that of the team that developed this work, that this will contribute to more CDM projects where there is larger impact on sustainable development. This holds great potential to improve the livelihoods of people, reduce poverty, promote better health, directly benefit women and children and enhance the regional distribution of projects, which is a key desire of Parties to the Kyoto Protocol, the CDM Executive Board and this secretariat.

CDM has played a critical role in promoting climate action on the ground in more than one hundred developing countries and remains one of the most successful running international market mechanisms. It is clear from the Paris Agreement that the CDM will continue to be an important tool in meeting the climate change challenge, and this report helps accomplish that vision.

James Grabert, *Director*
Sustainable Development Mechanisms (SDM)
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Chapter I

INTRODUCTION

1.1. METHODOLOGIES AND THE BOOKLET

BASELINE AND MONITORING METHODOLOGIES

The Clean Development Mechanism (CDM) requires the application of a baseline and monitoring methodology in order to determine the amount of Certified Emission Reductions (CERs) generated by a mitigation CDM project activity in a host country. Methodologies are classified into five categories:

- Methodologies for large-scale CDM project activities;
- Methodologies for small-scale CDM project activities;
- Methodologies for large-scale afforestation and reforestation (A/R) CDM project activities;
- Methodologies for small-scale A/R CDM project activities;
- Methodologies for carbon capture and storage (CCS) project activities.[1]

Methodologies often refer to methodological tools, which address specific aspects of the project activity, e.g. to calculate Greenhouse Gas (GHG) emissions from specific sources.

PURPOSE OF THE BOOKLET

This booklet provides concise summaries of CDM methodologies and description of methodological tools, approved by the CDM Executive Board (Board). It is arranged to assist CDM project developers in identifying methodologies that are suitable for their CDM project activities.[2] The general purpose of the booklet is to help in achieving the objective of the Board to raise awareness of CDM methodologies.

USE OF THE BOOKLET

The booklet is intended for use by varied audiences interested in the CDM and in particular potential CDM project developers who already have an idea of the mitigation project activities they intend to implement. It facilitates the initial selection of potentially applicable methodologies. However, it cannot provide detailed guidance on specific elements of each methodology nor replace the approved methodologies. Therefore, the project developers should refer to the original methodologies available on UNFCCC CDM methodologies website.

This edition of the Booklet reflects the effective status of methodologies and methodological tools as of November 2016 (up to EB 91). However, as methodologies and methodological tools may change, users of the booklet are encouraged to consult EB meeting reports subsequent to EB 91 to find out whether any changes have occurred.

CONTENT OF THE BOOKLET

Each methodology is presented through a one-page summary sheet, which provides the following information:

- Typical project(s) to which the methodology is applicable;
- Type(s) of GHG emission mitigation action;
- Important conditions for application of the methodology;
- Key parameters that need to be determined or monitored;
- Visual description of baseline and project scenarios.

A short textual description of each methodological tool is also contained in the booklet.

HOW TO FIND A SUITABLE METHODOLOGY

1. CATEGORIZATION BY MITIGATION ACTIVITY TYPE

This way of looking up methodologies is according to the relevant sectoral scopes and type of mitigation activities such as renewable energy, low carbon electricity generation, energy efficiency measures, fuel and feedstock switch, GHG destruction, GHG emission avoidance, displacement of a more-GHG-intensive output and GHG removal by sinks. Project developers knowing the type of mitigation activity to be implemented in their project activities can thus easily identify potentially suitable methodologies.

2. CATEGORIZATION BY APPLIED TECHNOLOGY TYPE/MEASURE

This second way of looking up methodologies focuses on the technology applied in the project activity. The categorization by technology type enables project developers to identify a set of comparable methodologies applicable to the technology that is going to be implemented in their project activities.

[1] There are no approved methodologies for CCS project activities

[2] For the purpose of this booklet, CDM project activities also refer to CDM programme of activities.

AFTER FINDING POTENTIALLY SUITABLE METHODOLOGIES

After identifying potentially applicable methodologies through the summary sheet, users should access the full text of the methodologies available on the UNFCCC CDM methodologies website. It is also advisable to look at information about existing CDM project activities that have already applied the methodologies, which is also available through this website.

If there is no approved methodology applicable, then one can propose a new methodology or request a revision of an approved methodology or methodological tool. In general, the new methodology option should be pursued if a project activity requires methodological approaches substantially different from an approved methodology. The revision option is suitable if an approved methodology is not applicable to a project activity, but the project activity is broadly similar to the one to which the approved methodology is applicable. For cases where an approved methodology is applicable to a project activity but minor changes in the methodology application are required due to the project-specific circumstances, requesting a deviation of an approved methodology could be considered.

If an approved methodology is unclear or ambiguous in its methodological procedures, a request for clarification may be submitted.

CDM PROJECT CYCLE

Once project participants have selected an applicable approved methodology, they apply it to their project activity and prepare a Project Design Document (PDD); this is the first step in the CDM project cycle. The methodology provides provisions for the core elements of a PDD:

- the demonstration of additionality;
- the establishment of the baseline scenario and the estimation of emission reductions or net removals; and
- the monitoring plan.

The main steps of the CDM project cycle and their actors are the following:

- Project design (Project Participants);
- National approval (Designated National Authority);
- Validation (Designated Operational Entity);
- Registration (CDM Executive Board);
- Monitoring (Project Participant);
- Verification (Designated Operational Entity);
- Issuance (CDM Executive Board).

USEFUL LINKS

UNFCCC CDM website
<https://cdm.unfccc.int/>

CDM methodologies, submission of proposed new methodologies and requests for clarification and revision
<https://cdm.unfccc.int/methodologies/index.html>

CDM project cycle
<http://cdm.unfccc.int/Projects/diagram.html>

CDM project activities
<https://cdm.unfccc.int/Projects/index.html>

CDM programmes of activities (PoA)
<https://cdm.unfccc.int/ProgrammeOfActivities/index.html>

CDM sectoral scopes
<https://cdm.unfccc.int/DOE/scopes.html>

CDM standardized Baselines
<http://cdm.unfccc.int/methodologies/standard_base/index.html>

UNEP Risø CDM pipeline analysis and database
<http://cdmpipeline.org/>

Finding applicable methodologies — two categorization approaches

There are two ways the booklet categorizes methodologies. The first approach – the methodology categorization table – is based on the sectoral scopes defined by the UNFCCC (see <https://cdm.unfccc.int/DOE/scopes.html>). This table allocates the methodology to generic mitigation activity types. This approach is useful for project developers who have not yet made a technology choice or CDM stakeholders who are interested in a type of mitigation activity.

It structures methodologies according to technology and the history of methodology development that has led to several "families" of methodologies all relating to a specific technology. It is appropriate for project developers who have already decided on a particular technology for their project.

1.2. CATEGORIZATION BY MITIGAION ACTIVITY TYPE (METHODOLOGY CATEGORIZATION TABLE)

In addition to the methodology sectoral scopes[3], methodologies in this table are also categorized by the type of mitigation activity, these being renewable energy, low carbon electricity generation, energy efficiency measures, fuel switch, GHG destruction, GHG emission avoidance and GHG removal by sinks.

Sectoral scopes 1 to 3 (energy sectors – generation, supply and consumption) are first distinguished according to:

- Electricity generation and supply;
- Energy for industries;
- Energy (fuel) for transport;
- Energy for households and buildings.

And then categorized in terms of type of mitigation activity:

- Displacement of a more-GHG-intensive output:
  i. Renewable energy;
  ii. Low carbon electricity.
- Energy efficiency;
- Fuel and feedstock switch.

Sectoral scopes 4 to 15 (other sectors) are categorized according to these mitigation activities:

- Displacement of a more-GHG-intensive output;
- Renewable energy;
- Energy efficiency;
- GHG destruction;
- GHG emission avoidance;
- Fuel switch;
- GHG removal by sinks.

DESCRIPTION OF TYPES OF MITIGATION ACTIVITIES

DISPLACEMENT OF A MORE-GHG-INTENSIVE OUTPUT

This category refers to project activities where the consumption of a more-GHG-intensive output is displaced with the output of the project. The category is separately defined because of the importance of not just implementing the project activity, but also ensuring that the more-GHG-intensive output is displaced by the output of the project activity.

All renewable energy generation and low carbon energy generation project activities are part of this category. Many other methodologies are also allocated to this category depending upon how the emission reductions are calculated in the corresponding methodologies.

Examples:

- Power generation from waste energy recovery and supply to a recipient who was receiving more-GHG-intensive power;
- Power generation using renewable or low carbon energy sources and export of power to a grid with combined margin emission factor of more than zero and/or to a recipient using fossil fuel based power in the absence of project activity.

[3] The Methodology categorization table allocates the methodology to the sectoral scope(s) that have been formally defined for it, which are primarily used as the basis of DOE accreditation. However, if there are additional sectoral scopes that are also applicable to the methodology, then the methodology is also shown in these sectors in the table. This is to make it potentially easier to look up the methodology.

RENEWABLE ENERGY

This category includes the use of various renewable energy sources.

Examples:

- Hydro power plant;
- Wind power plant;
- Solar cooker;
- Biomass-fired boiler.

LOW CARBON ELECTRICITY

This encompasses mainly greenfield electricity generation based on less carbon intensive fuel such as natural gas. As no power plant exists at the project location before implementation of the project, the mitigation activity is not fuel switch. At the same time the applied technology might not be best available technology, differentiating it from energy efficiency measures. A typical low carbon electricity project is the construction of a greenfield natural-gas-fired power plant. Also projects that reduce emissions due to grid extension or connection are included under this category where applicable.

ENERGY EFFICIENCY

The category energy efficiency includes all measures aiming to enhance the energy efficiency of a certain system. Due to the project activity, a specific output or service requires less energy consumption. Waste energy recovery is also included in this category.

Examples:

- Conversion of a single cycle to a combined cycle gas-fired power plant;
- Installation of a more efficient steam turbine;
- Use of highly efficient refrigerators or compact fluorescent lamps;
- Recovery of waste heat from flue gases;
- Recovery and use of waste gas in a production process.

FUEL OR FEEDSTOCK SWITCH

In general, fuel switch measures in this category will replace carbon-intensive fossil fuel with a less-carbon-intensive fossil fuel, whereas a switch from fossil fuel to renewable biomass is categorized as "renewable energy". In case of a feedstock switch, no differentiation between fossil and renewable sources is applied.

Examples:

- Switch from coal to natural gas;
- Feedstock switch from fossil sources of CO_2 to renewable sources of CO_2;
- Use of different raw material to avoid GHG emissions;
- Use of a different refrigerant to avoid GHG emissions;
- Blending of cement in order to reduce demand for energy intensive clinker production.

GHG DESTRUCTION

The category GHG destruction covers activities that aim at the destruction of GHG. In many cases, the project includes capture or recovery of the GHG. The destruction is achieved by combustion or catalytic conversion of GHGs.

Examples:

- Combustion of methane (e.g. biogas or landfill gas);
- Catalytic N_2O destruction.

GHG EMISSION AVOIDANCE

This category includes various activities where the release of GHG emissions to the atmosphere is reduced or avoided.

Examples:

- Avoidance of anaerobic decay of biomass;
- Reduction of fertiliser use.

GHG REMOVAL BY SINKS

All A/R activities are allocated to this category. Through photosynthesis in plants, CO_2 from the atmosphere is removed and stored in form of biomass.

- Methodologies for large-scale CDM project activities
- Methodologies for small-scale CDM project activities
- Methodologies for small and large-scale afforestation and reforestation (A/R) CDM project activities
- AM0000 Methodologies that have a particular potential to directly improve the lives of women and children

Table VI-1. **Methodology Categorization in the Energy Sector**

Sectoral scope	Type	Electricity generation and supply	Energy for industries	Energy (fuel) for transport	Energy for households and buildings
1 Energy industries (renewable-/ non renewable sources)	Renewable energy	AM0007	AM0007	AM0089	AM0053
		AM0019	AM0036	ACM0017	AM0069
		AM0026	AM0053		AM0072
		AM0042	AM0069		AM0075
		AM0052	AM0075		AM0094
		AM0100	AM0089		ACM0022
		AM0103	ACM0006		ACM0024
		ACM0002	ACM0020		AMS-I.A.
		ACM0006	ACM0022		AMS-I.B.
		ACM0018	ACM0024		AMS-I.C.
		ACM0020	AMS-I.C.		AMS-I.E.
Displacement of a more-GHG-intensive output		ACM0022	AMS-I.F.		AMS-I.F.
		AMS-I.A.	AMS-I.G.		AMS-I.G.
		AMS-I.C.	AMS-I.H.		AMS-I.H.
		AMS-I.D.			AMS-I.I.
		AMS-I.F.			AMS-I.J.
		AMS-I.G.			AMS-I.K.
		AMS-I.H.			AMS-I.L.
		AMS-I.M.			
	Low carbon electricity	AM0045	AM0099		
		AM0074	ACM0025		
		AM0099	ACM0026		
		AM0104			
		AM0108			
		ACM0025			
		ACM0026			
	Energy efficiency	AM0048	AM0048		AM0058
		AM0049	AM0049		AM0048
		AM0061	AM0055		AM0084
		AM0062	AM0056		AM0107
		AM0076	AM0076		
		AM0084	AM0084		
		AM0107	AM0095		
		ACM0006	AM0098		
		ACM0007	AM0107		
		ACM0012	ACM0006		
		ACM0013	ACM0012		
		ACM0018	ACM0018		
		AMS-II.B.	ACM0023		
		AMS-II.H.			
		AMS-III.AL.			

Table VI-1. **Methodology Categorization in the Energy Sector** (continued)

Sectoral scope	Type	Electricity generation and supply	Energy for industries	Energy (fuel) for transport	Energy for households and buildings
1 Energy industries (renewable-/ non renewable sources) (continued)	Fuel/feedstock switch	AM0049	AM0049		AM0081
		ACM0006	AM0056		
		ACM0011	AM0069		
		ACM0018	AM0081		
		AMS-I.M.	ACM0006		
		AMS-III.AG.	ACM0009		
		AMS-III.AH.	ACM0018		
		AMS-III.AM.	AMS-III.AM.		
2 Energy distribution	Renewable energy	AMS-III.AW.	AM0069		AMS-III.AW.
		AMS-III.BB.	AM0075		
		AMS-III.BL.			
	Energy efficiency	AM0067			
		AM0097			
		AMS-II.A.			
		AMS-III.BB.			
		AMS-III.BL.			
	Fuel/feedstock switch	AMS-III.BB.	AM0077		
		AMS-III.BL.			
3 Energy demand	Renewable energy				AMS-III.AE.
					AMS-III.AR.
	Energy efficiency	AMS-III.AL.	AM0017		AM0020
			AM0018		AM0044
			AM0020		AM0046
			AM0044		AM0060
			AM0060		AM0086
			AM0068		AM0091
			AM0088		AM0113
			AM0105		AMS-II.C.
			AMS-I.I.		AMS-II.E.
			AMS-II.C.		AMS-II.F.
			AMS-II.F.		AMS-II.G.
			AMS-II.G.		AMS-II.J.
			AMS-II.L.		AMS-II.K.
			AMS-II.N.		AMS-II.L.
			AMS-II.P.		AMS-II.N.
			AMS-II.S.		AMS-II.M.
					AMS-II.O.
					AMS-II.Q.
					AMS-II.R.
					AMS-III.AE.
					AMS-III.AR.
					AMS-III.AV.
					AMS-III.X.
	Fuel/feedstock switch	AMS-III.B.	ACM0003		AMS-II.F.
			ACM0005		AMS-III.B.
			AMS-II.F.		
			AMS-III.B.		

Table VI-2. **Methodology Categorization other Sectors**

Sectoral scope	Renewable energy	Energy Efficiency	GHG destruction	GHG emission avoidance	Fuel/Feedstock Switch	GHG removal by sinks	Displacement of a more-GHG-intensive output
4 Manufacturing industries	AM0007	AM0049	AM0078	ACM0005	AM0049		AM0070
	AM0036	AM0055	AM0096	ACM0021	AM0092		AM0095
	ACM0003	AM0070	AM0111	AM0057	ACM0003		AM0114
	AMS-III.Z.	AM0106	AMS-III.K.	AM0065	ACM0005		AM0115
	AMS-III.AS.	AM0109		AM0092	ACM0009		ACM0012
	AMS-III.BG.	AM0114		AMS-III.L.	ACM0015		
		AM0115			AMS-III.N.		
		ACM0012			AMS-III.Z.		
		AMS-II.D.			AMS-III.AD.		
		AMS-II.H.			AMS-III.AM.		
		AMS-II.I.			AMS-III.AS.		
		AMS-III.P.					
		AMS-III.Q.					
		AMS-III.V.					
		AMS-III.Z.					
		AMS-III.AS.					
		AMS-III.BD.					
		AMS-III.BG.					
5 Chemical industries	ACM0017	AM0055	ACM0019	AM0053	AM0027		AM0053
	AM0053	AM0114	AM0021	AMS-III.M.	AM0037		AM0055
	AM0075	AMS-III.AC.	AM0028	AMS-III.AI.	AM0050		AM0069
	AM0089	AMS-III.AJ.	AM0098		AM0063		AM0081
					AM0069		AM0098
					AMS-III.J.		AM0114
					AMS-III.O.		AM0115
6 Construction					AMS-III.BH.		AMS-III.BH.
7 Transport	AMS-I.M.	AM0031			AMS-III.S.		
	AMS-III.T.	AM0090			AMS-III.AY.		
	AMS-III.AK.	AM0101					
	AMS-III.AQ.	AM0110					
		AM0116					
		ACM0016					
		AMS-III.C.					
		AMS-III.S.					
		AMS-III.U.					
		AMS-III.AA.					
		AMS-III.AP.					
		AMS-III.AT.					
		AMS-III.BC.					
8 Mining/mineral production	ACM0003		ACM0008		ACM0005		
			AM0064		ACM0015		
			AMS-III.W.				
9 Metal production	AM0082	AM0038		AM0030	AM0082		
		AM0059		AM0059			
		AM0066		AM0065			
		AM0068					
		AM0109					
		AMS-III.V.					

Table VI-2. **Methodology Categorization other Sectors** (continued)

Sectoral scope	Renewable energy	Energy Efficiency	GHG destruction	GHG emission avoidance	Fuel/Feedstock Switch	GHG removal by sinks	Displacement of a more-GHG-intensive output
10 Fugitive emissions from fuel (solid, oil and gas)			AM0064	AM0023	AM0009	AM0074	AM0009
			ACM0008	AM0043	AM0037		AM0077
			AMS-III.W.	AMS-III.BI.	AM0077		
11 Fugitive emissions from production and consumption of halocarbons and SF_6			AM0001	AM0035	AM0071		
			AM0078	AM0065	AM0092		
			AM0096	AM0079	AMS-III.AB.		
			AM0111	AM0092			
			AMS-III.X.	AMS-III.X.			
12 Solvent use							
13 Waste handling and disposal	ACM0022	AMS-III.AJ.	AM0073	AM0057			
	AM0112	AMS-III.BA.	ACM0001	AM0080			
	AMS-III.BJ.		ACM0010	AM0083			
			ACM0014	AM0093			
			AMS-III.G.	AM0112			
			AMS-III.H.	ACM0022			
			AMS-III.AX.	AMS-III.E.			
				AMS-III.F.			
				AMS-III.I.			
				AMS-III.Y.			
				AMS-III.AF.			
				AMS-III.AO.			
				AMS-III.BE.			
14 Afforestation and reforestation						AR-AM0014	
						AR-ACM0003	
						AR-AMS0003	
						AR-AMS0007	
15 Agriculture			AM0073	AMS-III.A.	AMS-III.R.		
			ACM0010	AMS-III.AU.			
			AMS-III.D.	AMS-III.BE.			
			AMS-III.R.	AMS-III.BF.			
				AMS-III.BK.			

1.3. CATEGORIZATION BY APPLIED TECHNOLOGY TYPE/MEASURE (METHODOLOGY FAMILY TREES)

There have been distinct development phases of methodologies over time, leading to "families" when one methodology catalyzed the development of other methodologies.[4] The figures below show the families of methodologies in form of family trees. They are designed as follows: Each methodology is denoted by a box showing its unique identification number. Methodologies that can be found in the same family tree deal with comparable technologies or measures.

Methodologies for large-scale CDM project activities
Methodologies for small-scale CDM project activities
Methodologies for small and large-scale afforestation and reforestation (A/R) CDM project activities
AM0000 Methodologies that have a particular potential to directly improve the lives of women and children

Figure VII-1. **Methodologies for renewable electricity**

Biomass electricity	AM0007, AM0042, ACM0006, ACM0018, ACM0020
Grid electricity	AM0019, AM0026, AM0100, ACM0002, AMS-I.D.
Offgrid electricity/ isolated grids	AM0103, AMS-I.A., AMS-I.L., AMS-III.BL., AMS-I.M.
Enhanced generation	AM0052
Captive power	AMS-I.F.

[4] The concept of methodology families and family trees was initially adopted in the following guidebook: Understanding CDM Methodologies: A guidebook to CDM Rules and Procedures, written by Axel Michaelowa, Frédéric Gagnon-Lebrun, Daisuke Hayashi, Luis Salgado Flores, Phlippe Crête and Mathias Krey, commissioned by the UK Department for Environment Food and Rural Affairs (© Crown Copyright 2007).

Figure VII-2. **Methodologies for renewable energy (thermal or mechanical energy)**

Renewable thermal energy	AM0036	AM0072	AM0075	AM0082
	AM0094	ACM0003	AMS-I.C.	AMS-I.E.
	AMS-I.I.	AMS-I.J.	AMS-I.K.	AMS-III.BG.
Renewable mechanical energy	AMS-I.B.			

Figure VII-3. **Methodologies for efficient or less-carbon-intensive fossil-fuel-fired power plants**

Co- or trigeneration	AM0048	AM0049	AM0076	AM0084
	AM0107	ACM0026	AMS-II.H.	AMS-II.K.
	AMS-III.AM.			
Gas – newly built	AM0049	AM0099	AM0107	ACM0013
	ACM0025	ACM0026		
Fuel cell – newly built	AMS-III.AC.			
Coal – newly built	ACM0013			
Low carbon electricity	AM0074			
Energy efficiency	AM0061	AM0062	ACM0007	
	AMS-II.B.	AMS-III.AL.		

Figure VII-4. **Methodologies for fuel switch**

Coal/oil to gas	ACM0009, ACM0011, AMS-II.F., AMS-III.B., AMS-III.AG., AMS-III.AH., AMS-III.AM., AMS-III.AN.
Other low-carbon fuels	AM0081, ACM0003, AMS-III.Z., AMS-III.AM., AMS-III.AN., AMS-III.AS.

Figure VII-5. **Methodologies for biofuel**

Plant oil	AMS-I.G., AMS-III.T.
Biodiesel	AM0089, ACM0017, AMS-I.H., AMS-III.AK.
Bio-CNG	AMS-III.AQ.

Figure VII-6. **Methodologies for industrial energy efficiency**

Steam systems	AM0017	AM0018		
Water pumping	AM0020	AMS-II.C.	AMS-II.P.	AMS-II.S.
Waste gas/energy recovery	AM0055	AM0058	AM0066	AM0095
	AM0098	AM0115	ACM0012	AMS-II.I.
	AMS-III.P.	AMS-III.Q.	AMS-III.BI.	
Metal	AM0038	AM0059	AM0066	AM0068
	AM0109	AMS-III.V.	AMS-III.BD.	
Boilers	AM0044	AM0056	ACM0023	AMS-II.D.
Chillers	AM0060			
Kilns	AM0066	AM0068	AM0106	AMS-III.Z.
District heating	AM0058			
Lighting	AMS-II.L.			
Agriculture	AMS-II.F.	AMS-II.P.	AMS-II.S.	AMS-III.A.
	AMS-III.BE.			
Efficient motor or motor appliances (pump, fans, compressor)	AMS-II.S.			
Other/various technologies	AM0088	AM0105	AM0114	AM0115
	AMS-II.C.	AMS-II.D.		

Figure VII-7. **Methodologies for household & building energy efficiency**

Cookstove	AMS-II.C., AMS-II.G.
Water pumping	AMS-II.C., AMS-II.S.
Water purifier	AM0086, AMS-II.C., AMS-III.AV.
Water saving	AMS-II.M.
Refrigerators/chillers	AM0060, AM0070, AMS-II.C., AMS-II.O., AMS-III.X.
Lighting	AM0046, AM0113, AMS-II.N., AMS-II.J., AMS-II.L., AMS-II.N., AMS-III.AR.
Whole building	AM0091, AMS-II.E., AMS-II.Q., AMS-II.R., AMS-III.AE.
Others/various technologies	AMS-II.C.

Figure VII-8. **Methodologies for gas flaring and gas leak reduction**

Oil production	AM0009, AM0037, AM0077
Compressors and distribution systems	AM0023
Pipe replacement	AM0043

Figure VII-9. **Methodologies for feedstock switch**

Cement	ACM0015		
Cement blending	ACM0005		
Inorganic	AM0027	AM0050	
Paper	AM0057	AMS-III.M.	
Metal	AMS-III.BA.		
Plastic	AMS-III.AJ.	AMS-III.BA.	
Other industries	AM0063	AMS-III.J.	AMS-III.AD.
Avoidance/decrease of usage	AMS-III.AI.		

Figure VII-10. **Methodologies for industrial gases**

HFC-23	AM0001			
Other HFCs	AM0071	AMS-III.N.	AMS-III.X.	AMS-III.AB.
N_2O, adipic acid	AM0021			
N_2O, nitric acid	AM0028	ACM0019		
PFC	AM0030	AM0059	AM0092	AM0096
	AM0111			
SF_6	AM0035	AM0065	AM0078	AM0079

Figure VII-11. **Methodologies for waste management and wastewater**

Alternative treatment – composting	ACM0022, AMS-III.F., AMS-III.AF.
Alternative treatment – other technologies	ACM0022, AM0112, AMS-III.E., AMS-III.L., AMS-III.R., AMS-III.Y., AMS-III.BJ.
Alternative treatment – aerobic	AM0083, AM0093, AMS-III.AX.
Landfill gas	ACM0001, AMS-III.G.
Lagoons and biodigester – biogas	ACM0014, AMS-III.H., AMS-III.AO.
Manure and comparable animal waste	AM0073, ACM0010, AMS-III.D.
Aerobic wastewater treatment	AM0080, AMS-III.I.
Biogenic methane	ACM0024, AM0053, AM0069, AM0075, AMS-III.O., AMS-III.R.

Figure VII-12. **Methodologies for transport**

Bus systems	AM0031			
Mass rapid transit systems	ACM0016	AMS-III.U.		
High speed rail systems	AM0101			
Energy efficiency	AMS-III.C.	AMS-III.AA.	AMS-III.AP.	AMS-III.BC.
Fuel switch	AMS-III.S.	AMS-III.AK.	AMS-III.AQ.	AMS-III.AY.
Transportation of cargo	AM0090			
Transportation of liquid fuels	AM0110			
Technology for improved driving	AMS-III.AT.	AMS-III.BC.		
Electric taxiing systems for airplanes	AM0116			
Solar power for domestic aircraft at-gate operations	AMS-I.M.			

Figure VII-13. **Other methodologies**

Methane from mining activities	AM0064, ACM0008, AMS-III.W.
Charcoal production	ACM0021, AMS-III.K., AMS-III.BG.
Electricity grid connection	AM0045, AM0104, AM0108, AMS-III.AW., AMS-III.BB., AMS-III.BL.
Efficient transmission and distribution	AM0067, AM0097, AMS-II.A.
Afforestation and reforestation	AR-AM0014, AR-ACM0003, AR-AMS0003, AR-AMS0007
Agriculture	AMS-III.AU., AMS-III.BF., AMS-III.BK.
Construction	AMS-III.BH.

1.4. PROGRAMMES OF ACTIVITIES

THE CONCEPT

In the CDM, a Programme of Activities (PoA) is defined as a voluntary coordinated action by a private or public entity that coordinates and implements any policy/measure or stated goal, which leads to emission reductions or net removals that are additional to any that would occur in the absence of the PoA, via an unlimited number of Component Project Activities (CPAs).

A CPA is a single measure, or a set of interrelated measures under a PoA, to reduce emissions or result in net removals, applied within a designated area.

A PoA is therefore like an "umbrella program", which is registered by the Board. Individual CPAs that comply with the eligibility criteria specified in the PoA Design Document (PoA-DD) of the registered PoA can be included under this "umbrella" and actually generate emission reductions or net removals to benefit from carbon revenues.

BENEFITS

Compared to regular CDM project activities, PoAs have many benefits, particularly for less developed countries or regions. The process for the inclusion of individual CPAs under a registered PoA is considerably simplified and results in lower costs as compared to registration of regular project activities.

The main benefits of PoAs are:

- Transaction costs, investment risks and uncertainties for individual CPA participants are reduced;
- PoAs are managed by a designated Coordinating and Managing Entity (CME). The CME is responsible for most of the CDM process. Therefore, direct engagement of individual project developers in the CDM process is not required;
- Access to the CDM is extended to smaller project activities which would not be viable as regular project activities;
- Emission reductions can be continuously scaled up after PoA registration, since an unlimited number of CPAs can be added at a later stage;
- Many technologies with high co-benefits, e.g. household technologies, are supported by PoAs;
- Specific regional policy goals can be effectively supported by accessing carbon finance through PoAs;
- Monitoring/Verification of parameter values may be undertaken on a collective basis by utilizing a sampling approach;
- No registration fee is due for each CPA included after registration. Registration fees are based on the expected average emission reductions or net removals of the "actual case" CPAs submitted at the PoA registration.

PoA IN THE CDM PIPELINE

At the time of preparation of this edition of the Booklet, there were some sectors that have a higher proportion of PoAs in the CDM pipeline than regular project activities: energy efficiency demand side (sectoral scope 3), waste (sectoral scope 13) and solar energy (sectoral scope 1). Furthermore, out of the registered PoAs, it was observed that some methodologies were commonly used, such as:

- ACM0002 Grid-connected electricity generation from renewable sources
- AMS-I.C. Thermal energy production with or without electricity
- AMS-I.D. Grid connected renewable electricity generation
- AMS-II.G. Energy efficiency measures in thermal applications of non-renewable biomass
- AMS-II.J. Demand-side activities for efficient lighting technologies
- AMS-III.R. Methane recovery in agricultural activities at household/small farm

1.5. STANDARDIZED BASELINES

A standardized baseline can be a positive list containing names of emission reduction activities that, if implemented in a given country or region, would be considered automatically additional under certain conditions. It can also be a baseline emission factor to be used for the purpose of estimation of baseline emissions (e.g. grid emission factor).

THE CONCEPT

A standardized baseline is a baseline established for a Party or a group of Parties to facilitate the calculation of emission reduction and removals and/or the determination of additionality for CDM project activities.

The following elements may be standardized by an approved standardized baseline:
(a) Additionality; and/or
(b) Baseline (baseline scenario and/or baseline emissions).

BENEFITS

The objective of standardized baselines is to scale up the abatement of GHG emissions while ensuring environmental integrity by potentially:

- Reducing transaction costs;
- Enhancing transparency, objectivity and predictability;
- Facilitating access to the CDM, particularly with regard to underrepresented project types and regions;
- Simplifying measuring, reporting and verification.

APPROVED STANDARDIZED BASELINES

ASB0001	Grid emission factor for the Southern African power pool
ASB0002	Fuel switch, technology switch and methane destruction in the charcoal sector of Uganda
ASB0003	Grid emission factor for the Republic of Uzbekistan
ASB0004	Technology switch in the rice mill sector of Cambodia
ASB0005	Grid emission factor for the Belize national power grid
ASB0006	Grid emission factor for the national power grid of Uganda
ASB0007	Grid emission factor for the electricity system of the Republic of Armenia
ASB0008	Standardized Baseline for Methane Emissions from Rice Cultivation in the Republic of the Philippines
ASB0009	Standardized baseline: Emission factors for central grid and regional mini-grids of The Gambia
ASB0010	Landfill gas capture and flaring in Sao Tome and Principe
ASB0011	Landfill gas capture and flaring in the Dominican Republic
ASB0012	Landfill gas capture and flaring in Antigua and Barbuda
ASB0013	Landfill gas capture and flaring in Belize
ASB0014	Landfill gas capture and flaring in Grenada
ASB0015	Grid emission factor for the Dominican Republic
ASB0016	Institutional Cook Stoves in Uganda
ASB0017	Rwanda grid emission factor
ASB0018	Baseline woody biomass consumption for household cookstoves in Burundi
ASB0019	Grid emission factor of Mauritius
ASB0020	Grid Emission Factor of São Tomé and Príncipe
ASB0021	Cape Verde standardized Baseline for the Power Sector
ASB0022	Landfill gas capture and destruction in Cameroon
ASB0023	Landfill gas capture and destruction in the Republic of Sudan
ASB0024	Grid emission factor for the Republic of Sudan
ASB0025	Cook stoves in Senegal
AR-ASB0001	Afforestation and reforestation project activities in Namibia

1.6. METHODOLOGIES ADDRESSING SUPPRESSED DEMAND

THE CONCEPT

Under the CDM, suppressed demand is defined as a "Scenario where future anthropogenic emissions by sources are projected to rise above current levels, due to the specific circumstances of the host Party".

The concept of suppressed demand is included in some CDM methodologies to consider situations where key services such as lighting and heating, water supply, waste disposal and transportation are only available in quantities that are insufficient to meet basic human needs before the implementation of a CDM project activity. This can be due to low income and lack of technologies/infrastructures or resources for its implementation. The minimum service level required to fulfil generally accepted basic human needs is expected to be reached in the future as host countries develop their economies, hence incomes increase, resources improve and technologies/infrastructures are implemented.

For example, before the start of a CDM project activity, households may be devoid of access to an electricity grid and have only a few kerosene lamps in place that are operated for short time periods, or just use candles. Or they may not have access to clean drinking water and therefore boil a small quantity of water manually.

The concept of suppressed demand is included in CDM methodologies for the baseline calculation specifying a minimum service level. For example, the daily amount of drinking water availability recommended by the World Health Organization is used as baseline water provision volume for the methodology AM0086 for water purification. In other methodologies such as AMS-I.A. and AMS-I.L., suppressed demand is taken into account by applying default emission factors for high emission technologies (e.g. kerosene lamps) assumed to be used due to the suppressed demand situation. In the methodology ACM0022, a default emission factor for a shallow landfill can be used in the absence of an organized waste collection and disposal system. If suppressed demand were not included, baseline emissions would be so small that project activities would become unattractive under the CDM due to the small number of CERs generated.

Methodologies addressing the issue of suppressed demand are labelled with a specific icon "Suppressed demand", put on the top right of the summary sheet.

BENEFIT

The consideration of suppressed demand allows host countries to improve life conditions by implementing CDM project activities.

Another benefit is the reduction of transaction costs for CDM project developers. Detailed data gathering to establish parameter values for baseline emission calculations may not be necessary as CDM methodologies that address the issue of suppressed demand usually include default values that are representative for the specific service level, such as the amount of kerosene used for lighting.

METHODOLOGIES ADDRESSING SUPPRESSED DEMAND

AM0086	Installation of zero energy water purifier for safe drinking water application
AM0091	Energy efficiency technologies and fuel switching in new and existing buildings
ACM0022	Alternative waste treatment processes
AMS-I.A.	Electricity generation by the user
AMS-I.B.	Mechanical energy for the user with or without electrical energy
AMS-I.L.	Electrification of rural communities using renewable energy
AMS-II.R.	Energy efficiency space heating measures for residential buildings
AMS-III.F.	Avoidance of methane emissions through composting
AMS-III.AR.	Substituting fossil fuel based lighting with LED/CFL lighting systems
AMS-III.AV.	Low greenhouse gas emitting safe drinking water production systems
AMS-III.BB.	Electrification of communities through grid extension or construction of new mini-grids
AMS-III.BL.	Integrated methodology for electrification of communities

1.7. METHODOLOGIES HAVING BENEFITS FOR WOMEN AND CHILDREN

The dual goals of the CDM are to promote sustainable development and reduce GHG emissions or enhance GHG removals. The outcomes of a CDM project activity should therefore directly or indirectly improve the living conditions of all people.

What has been highlighted in the booklet is that some methodologies have a particular potential to directly improve the lives of women and children effected by the project activity. These methodologies are labelled with a specific icon “Women and children”, put on the top right of the summary sheet.

The criteria used to label these methodologies as having particular benefits for women and children are the potential to:

- increase access to affordable household fittings and appliances (e.g. light globes, refrigerators);
- optimize tasks typically undertaken by women or children (e.g. fuel wood gathering, cooking, water collection);
- improve the living environment of women and children (e.g. better air quality, heating, lighting); or
- utilize community-based participatory approaches, that give women and children an opportunity to learn about the projects and contribute to decision making processes.

In the case of A/R CDM project activities, this icon is also indicated for project activities that generate new local employment opportunities because these positions are often filled by women.

It is important to note that a methodology that has not been labelled with this icon will not impact adversely on women and children.

The following publication, “CDM and Women”, accessible on the CDM website, further highlights some women-friendly methodologies and aims to encourage project developers to consider the CDM when planning projects to help empower and improve women’s lives.

1.8. INTRODUCTION TO METHODOLOGY SUMMARY SHEETS

The methodology summary sheets are distinguished as being for large-scale and small-scale CDM project activities, as well as large-scale and small-scale A/R CDM project activities. Each methodology summary sheet has the sections as follows:

TYPICAL PROJECT(S) APPLICABLE TO THE METHODOLOGY

Project activities for which the methodology is applicable are described. Practical examples are mentioned for better understanding of the purpose of the specific methodology.

TYPE(S) OF GHG EMISSION MITIGATION ACTION

This refers to the type of mitigation activity presented in the methodology categorization table (section 1.2. above). The type of mitigation action, such as fuel switch or energy efficiency, is briefly described.

IMPORTANT CONDITIONS UNDER WHICH THE METHODOLOGY IS APPLICABLE

Methodologies are only applicable under particular conditions and the most relevant conditions are listed in this section. However, not all conditions can be listed and it is important to consult the full text of each methodology.

IMPORTANT PARAMETERS THAT NEED TO BE DETERMINED OR MONITORED

In order to calculate emission reductions or net removals of a project activity, certain parameters have to be determined at the beginning when the project activity is validated and various parameters have to be monitored during the operation of the project activity. Therefore this section is divided into parameters "at validation" and parameters "monitored". In addition, some methodologies require checking of specific conditions or parameters to prove that applicability conditions are met.

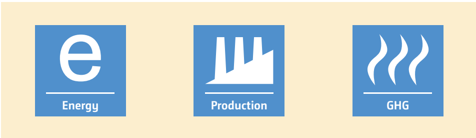
VISUAL DESCRIPTION OF BASELINE AND PROJECT SCENARIOS

An important feature of the booklet is the use of diagrams made of icons to illustrate the baseline and project scenarios. These diagrams enable readers to quickly grasp the scope of the methodology.

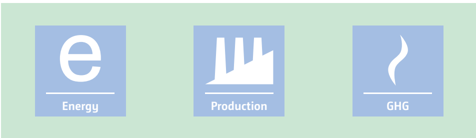
The baseline scenario represents the situation that would occur in the absence of the project activity. The project scenario refers to the situation that is achieved by the implementation of the project activity. Complex scenarios cannot be displayed by a simplified diagram. Therefore, the simplified diagrams focus on the main activity that results in emission reductions or net removals. The diagrams do not replace the necessity to consult the full methodology text.

A list of icons used in the booklet is given in chapter II. Some exemplifications of diagrams are presented below.

EXEMPLIFICATION OF DIAGRAMS



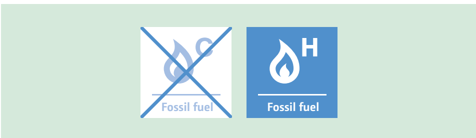
Full intensity in the baseline scenario is depicted with bold colour.



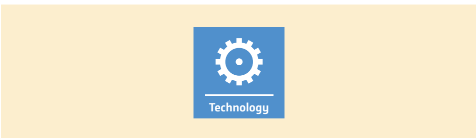
Reduced, decreased intensity in the project activity is depicted with pale colour.

Avoidance and replacement is depicted with crossed icons.

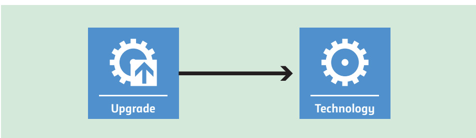
A carbon-intensive fossil fuel is used in the baseline scenario.



Instead of the carbon-intensive fossil fuel, a less-carbon-intensive fossil fuel is used due to the project activity.

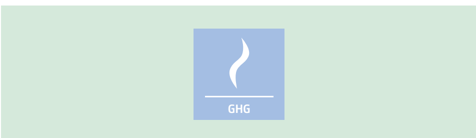


A less-efficient technology is used in the baseline scenario.



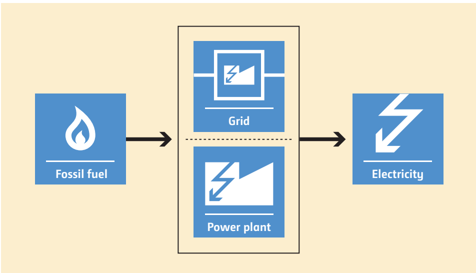
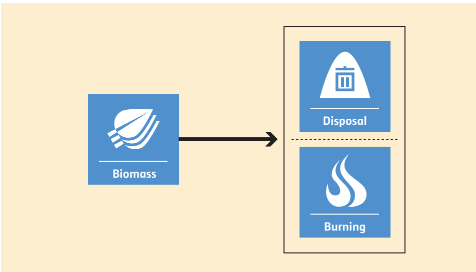
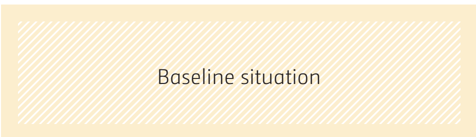
A more-efficient technology is used due to the project activity.

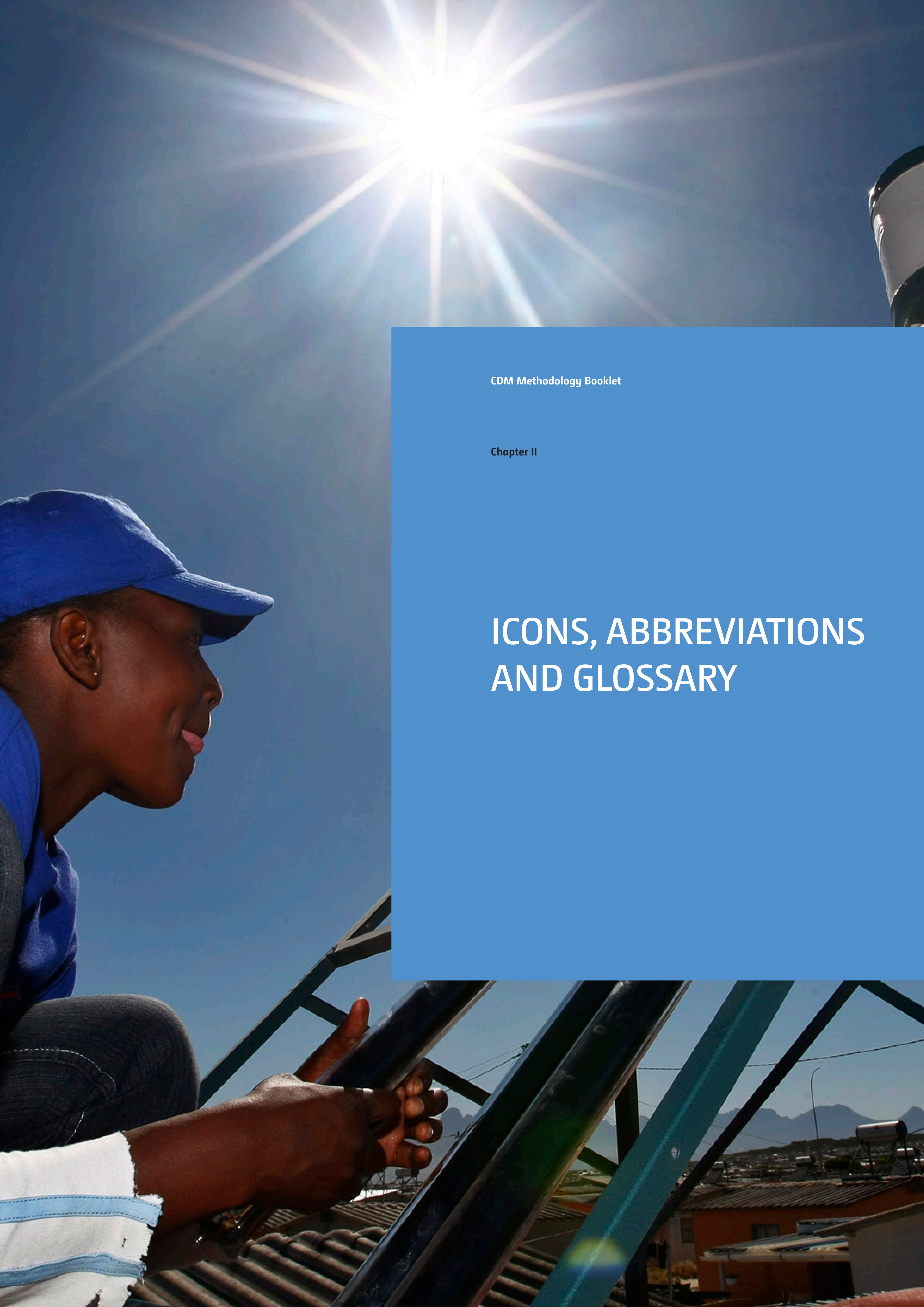
Activities in the baseline scenario result in GHG emissions.



Less GHG emissions are occurring due to the project activity.

EXEMPLIFICATION OF DIAGRAMS

	Activities in the baseline scenario result in GHG emissions.
	These GHG emissions are avoided due to the project activity.
	Electricity is either produced by power plants connected to the grid or a captive power plant using fossil fuel.
	Biomass is either left to decay or burned in an uncontrolled manner.
	The project boundary encompasses all emissions of GHG under the control of the project participants that are significant and reasonably attributable to the CDM project activity. Due to the simplification of the diagrams, please consult each methodology for the detailed delineation of the project boundary.
	



Chapter II

ICONS, ABBREVIATIONS AND GLOSSARY

2.1. ICONS USED IN THIS BOOKLET

Afforestation/reforestation areas
Small afforestation/reforestation areas.

Agricultural activity
Production of crops or livestock.

Agricultural land
Land with crops on solid ground. Also plantations not meeting definition of forest.

Air

Airplane
Any kind of airplane-based transport.

Animal grazing
Grazing livestock in pasture land or any other land.

Biomass
Unless stated otherwise, renewable biomass is implied. Types of biomass include residues, plant oil, wood.

Buildings
Any kind of building.

Burning
Uncontrolled burning of biomass, flaring or venting of waste gas.

Bus
Any kind of bus-based transport.

Car
Any kind of car-based transport.

Catalysis
Catalysis of substances (i.e. GHGs) in order to convert them into substances with less or no GWP.

Cement
Products such as clinker, cement, lime or bricks.

Charcoal production
Charcoal production activity.

Commercial Consumer
Commercial consumer, e.g. industrial or institutional consumer.

Consumer
Residential or commercial consumer.

Contaminated land
May indicate chemically polluted land (e.g. mine spoils) or naturally hostile land (e.g. naturally occurring salinity or alkalinity). The specific type is shown in the icon caption.

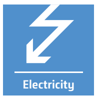
Controlled burning
Any kind of combustion or decomposition in a controlled manner to dispose combustible substances. Also combustion to produce feedstock such as CO_2 or heat.

Cooling

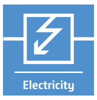
Data centre

Disposal
Any kind of disposal. E.g. landfilling.

Drinking water

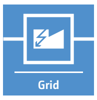


Electricity



Electricity distribution grid

This icon is used to depict an electricity distribution system and is used when generated electricity is/has to be supplied to the electricity grid or if the project activity occurs directly within the electricity distribution system.

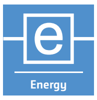


Electricity grid

This icon is used to depict all (fossil-fuel-fired) power plants connected and providing electricity to the grid (e.g. national or regional grid).

Energy

Any kind of energy. This icon is used, if different types of energy are depicted. E.g. electricity, heat, steam or mechanical energy.



Energy distribution system

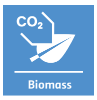
Any kind of energy distribution system. E.g. electricity grid or heat distribution system.

Energy generation

Any kind of plant, facility or equipment used to generate energy. This icon represents any co- or tri-generation system as well as systems to provide mechanical energy. The icon is also used, if either electricity or heat are produced.

Exploitation

Any kind of exploitation activity such as mining activities, oil and gas production.



Fixation of CO_2 in Biomass

Fixation of atmospheric CO_2 from the atmosphere in biomass through the process of photosynthesis

Fossil fuel

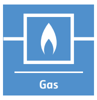
Any kind of fossil fuel used for combustion. Can be gaseous, liquid or solid. E.g. natural gas, fuel oil, coal.

Fuelwood collection

Collecting fuelwood without full-tree harvest.

Gas

Any kind of combustible gas. E.g. natural gas, methane, biogas, landfill gas.



Gas distribution system

Any kind of gas distribution system. E.g. natural gas pipeline system.

Grassland

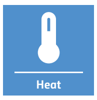
Grass on ground without cracks.

Greenhouse gas emissions

Emissions of greenhouse gases, i.e.:
Carbon dioxide (CO_2)
Methane (CH_4)
Nitrous oxide (N_2O)
Hydrofluorocarbons (HFCs)
Perfluorocarbons (PFCs)
Sulphur hexafluoride (SF_6).
Where applicable, the specific GHG is presented in the icon caption.

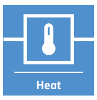
Harvesting

Harvesting activity.



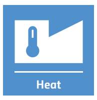
Heat

Any kind of thermal energy. E.g. steam, hot air, hot water.



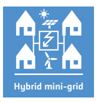
Heat distribution system

Any kind of heat distribution system.
E.g. steam system, district heating system.



Heat generation

Any kind of plant, facility or equipment used to generate heat. This includes fossil-fuel-fired boilers to generate steam, incinerators, but also small applications such as radiators, cookers and ovens.

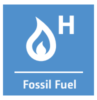


Hybrid mini-grid

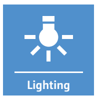
Input or output material

Any kind of material. Can be gaseous, liquid or solid. E.g. raw materials, substances used for production, products such as plastics. This icon is also used if a GHG such as CO_2 is used as feedstock.

Land application
The material (e.g. sludge) is applied to land.



Less-carbon-intensive fossil fuel
Any kind of less-carbon-intensive fossil fuel used for combustion. E.g. natural gas.



Lighting
Any kind of lighting equipment such as incandescent light bulbs, compact florescent lamps.

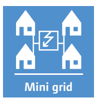
Livestock
Any kind of livestock.

Losses
Any kind of losses from leaks in pipe systems and other distribution systems.

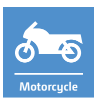
Manure
Manure from livestock.

Mechanical energy

Milk production



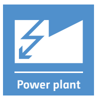
Mini grid



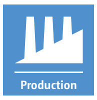
Motorcycle
Any kind of motorcycle-based transport.

Oil
Oil of fossil origin. E.g. crude oil.

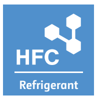
Planting or seeding
Afforestation/reforestation activity by planting, seeding or other measures.



Power plant
Any kind of plant, facility or equipment used to produce electricity. This includes fossil-fuel-fired power plants, renewable power plants such as hydro power plants, but also (small) photovoltaic systems.



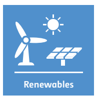
Production
The output of the production can be specified in the icon caption. E.g. aluminium, iron, cement, refrigerators.



Refrigerant
Refrigerant that contains HFC.

Refrigerators and chillers
Any kind of refrigerator or chiller.

Release
Any kind of release of substances or energy without using the substance or the energy content of the substances.



Renewables

Residential Consumer
Residential consumer, e.g. households.

Sand dunes or barren land
Sand dunes or barren land without vegetation.

Seeds
Any type of seeds.

Settlement land
Land within settlements (parks, lawns, etc.) or along infrastructure (roads, powerlines, railways, waterways, etc.).

Ship
Any kind of transport based on ships or barges.

Shrub and/or single tree vegetation
Non-forest woody vegetation: shrubs and single trees on "solid" ground (without cracks).

Suppressed demand
Methodologies that address the issue of suppressed demand.

Technology
Any kind of technology, equipment, appliance.

Train
Any kind of train-based transport.

Treatment
Any kind of treatment of waste or materials, e.g. production of RDF from municipal waste.

Treatment
Any kind of treatment of wastewater or manure, e.g. lagoons, pits, aerobic treatment systems.

Truck
Any kind of truck-based transport.

Upgrade
Any type of upgrade. Can be retrofitting of existing equipment or installation of more-advanced technology to displace existing less-advanced equipment. E.g. replacement of incandescent light bulbs by compact fluorescent lamps. Also applicable to upgrade agricultural activity processes.

Waste
Any kind of waste. Can be gaseous, liquid or solid. The specific substance can be specified in the icon caption.

Water
Any kind of water. E.g. drinking water, waste water.

Wetland
Lands with wet to moist soil, e.g. swamp or peatland.

Women and children
Project activities using these methodologies have a particular potential to directly improve the lives of women and children.

2.2. ABBREVIATIONS USED IN THIS BOOKLET

%	Percent
°C	Degree Celsius
A/R	Afforestation/ Reforestation
ACM	Approved Consolidated Methodology
AL	Aluminium
AM	Approved Methodology
AMS	Approved Methodology for Small-scale CDM project activities
AOR	Ammonia Oxidation Reactor
Board	CDM Executive Board (also referred to as EB)
BRT	Bus Rapid Transit
BSG	Baseline Sample Group
$CACO_3$	Calcium Carbonate
CCHP	Trigeneration (Combined Cooling, Heating and Power generation)
CDD	Cooling Degree Days
CDM	Clean Development Mechanism
CDR	Carbon Dioxide Recovery
CER	Certified Emission Reduction
$(CF_3CF_2C(0)CF(CF_3)_2$	Perfluoro-2-methyl-3-pentanone
CFC	Chlorofluorocarbons
CFL	Compact Fluorescent Lamps
CH_4	Methane
CHP	Cogeneration (Combined Heat and Power generation)
CM	Combined Margin
CNG	Compressed Natural Gas
CO_2	Carbon Dioxide
COD	Chemical Oxygen Demand
COG	Coke Oven Gas
COP	Coefficient of Performance
CWPB	Centre Worked Pre-Baked
DC	Direct Cool
DME	Dimethyl ether
DMI	Dry Matter Intake
DOE	Designated Operational Entity
DOM	Dead Organic Matter
DRI	Direct Reduced Iron
DSS	Decision Support System
DWW	Dewatered Wastewater
FF	Frost Free
GHG	Greenhouse Gas
GIEE	Gas Insulated Electrical Equipment
GIS	Geographic Information System
GWh	Gigawatthours
GWP	Global Warming Potential
HDD	Heating Degree Days
HDPE	High Density Polyethylene
HFC	Hydrofluorocarbon
HPO (process)	Hydroylamin-Phosphat-Oxim (process)
HRSG	Heat Recovery Steam Generator
HSR	High Speed Rail
HSS	Horizontal Stud Soederberg
IAI	International Aluminium Institute
ICL	Incandescent Lamps
IEC	International Electronic Commission
IG	Intermediate Gas
IPCC	Intergovernmental Panel on Climate Change
ISO	International Organization for Standardization
kg	Kilogramme
km	Kilometre
kV	Kilovolt
kt	Kiloton
LCD	Liquid Crystal Display
LDPE	Low Density Polyethylene
LFG	Landfill gas
LNG	Liquefied Natural Gas
LPG	Liquefied Petroleum Gas
LSC	Large-scale
m	Metre
m^2	Square metre
m^3	Cubic metre
$MgCO_3$	Magnesium Carbonate
MRG	Methane Rich Gas
MRTS	Mass Rapid Transit System
MSW	Municipal Solid Waste
MW	Megawatt
N_2O	Nitrous Oxide
ODP	Ozone Depleting Potential
PDD	Project Design Document
PFC	Perfluorocarbon
PFPB	Point Feeder Pre-Baked
PoA	Programme of Activities
PoA-DD	Programme of Activities Design Document
PSG	Project Sample Group
P-U	Power-Voltage (characteristic curve)
PUF	Polyurethane Foam
PV	Photovoltaic
RDF	Refuse-Derived Fuel
RHF	Rotary Hearth Furnace
SB	Stabilized Biomass
SF_6	Sulphur Hexafluoride
SiMn	Silicomanganese
SO_2	Sulphur Dioxide
SOC	Soil Organic Carbon
SSC	Small-scale
SWDS	Solid Waste Disposal Site
SWPB	Side Worked Pre-Baked
TG	Tailgas
VAM	Ventilation Air Methane
VSS	Vertical Stud Soederberg
W	Watt

2.3. GLOSSARY

Explanations on general terminologies used in this booklet are listed below. More definitions are given in the Glossary of CDM terms. For terminologies specific to a certain methodology, please refer to the definition section of the respective methodology available at <https://cdm.unfccc.int/methodologies/index.html>.

Above-ground biomass[5]	All living biomass above the soil including stem, stump, branches, bark, seeds, and foliage as well as herbaceous vegetation.
Additional/Additionality	**For a CDM project activity** (non-A/R) or **CPA** (non-A/R), the effect of the CDM project activity or CPA to reduce anthropogenic GHG emissions below the level that would have occurred in the absence of the CDM project activity or CPA; or **For an A/R or SSC A/R CDM project activity** or **CPA** (A/R), the effect of the A/R or SSC A/R CDM project activity or CPA (A/R) to increase actual net GHG removals by sinks above the sum of the changes in carbon stocks in the carbon pools within the project boundary that would have occurred in the absence of the A/R or SSC A/R CDM project activity or CPA (A/R). Whether or not a CDM project activity or CPA is additional is determined in accordance with the CDM rules and requirements.
Afforestation	The direct human-induced conversion of land that has not been forested for a period of at least 50 years to forested land through planting, seeding and/or the human-induced promotion of natural seed sources.
Agroforestry	Growing of both trees and agricultural / horticultural crops on the same piece of land.
Allometric biomass equations	Regression equations calculating biomass based on measured parameters of a tree (or shrub), for example, quantifying the relationship between above-ground tree biomass and the diameter at breast height and tree height of a specific tree species.
Baseline scenario	**For a CDM project activity** (non-A/R) or **CPA** (non-A/R), the scenario for a CDM project activity or CPA that reasonably represents the anthropogenic emissions by sources of GHG that would occur in the absence of the proposed CDM project activity or CPA. **For an A/R** or **SSC A/R CDM project activity** or **CPA** (A/R), the scenario for an A/R or SSC A/R CDM project activity or CPA (A/R) that reasonably represents the sum of the changes in carbon stocks in the carbon pools within the project boundary that would occur in the absence of the A/R or SSC A/R CDM project activity or CPA (A/R).
Below-ground biomass[5]	All living biomass of roots. Fine roots of less than (suggested) 2 mm diameter are oft en excluded because these oft en cannot be distinguished empirically from soil organic matter or litter.
Biomass expansion factor	Ratio of total stand biomass to stand (merchantable) volume (e.g. as derived from forest yield tables).
Biomass	Non-fossilized and biodegradable organic material originating from plants, animals and micro-organisms, including: (a) Biomass residue; (b) The non-fossilized and biodegradable organic fractions of industrial and municipal wastes; and (c) The gases and liquids recovered from the decomposition of non-fossilized and biodegradable organic material.
Biomass, non-renewable	Biomass not fulfilling the conditions of renewable biomass is considered as non-renewable.

Biomass,[6] renewable	Biomass which meets one of the following conditions: (a) The biomass originates from land areas that are forests where: (i) The land area remains a forest; (ii) Sustainable management practices are undertaken on these land areas to ensure, in particular, that the level of carbon stocks on these land areas does not systematically decrease over time (carbon stocks may temporarily decrease due to harvesting); and (iii) Any national or regional forestry and nature conservation regulations are complied with; (b) The biomass is woody biomass and originates from croplands and/or grasslands where: (i) The land area remains cropland and/or grasslands or is reverted to forest; and (ii) Sustainable management practices are undertaken on these land areas to ensure in particular that the level of carbonstocks on these land areas does not systematically decrease over time (carbon stocks may temporarily decrease due to harvesting); and (iii) Any national or regional forestry, agriculture and nature conservation regulations are complied with; (c) The biomass is non-woody biomass and originates from croplands and/or grasslands where: (i) The land area remains cropland and/or grasslands or is reverted to forest; and (ii) Sustainable management practices are undertaken on these land areas to ensure in particular that the level of carbon stocks on these land areas does not systematically decrease over time (carbon stocks may temporarily decrease due to harvesting); and (iii) Any national or regional forestry, agriculture and nature conservation regulations are complied with; (d) The biomass is a biomass residue and the use of that biomass residue in the CDM project activity (A/R) does not involve a decrease of carbon pools, in particular dead wood, litter or soil organic carbon, on the land areas from which the biomass residues originate; (e) The biomass is the non-fossil fraction of an industrial or municipal waste.
Biomass, residues	Non-fossilized and biodegradable organic material originating from plants, animals and micro-organisms which is a by-product, residue or waste stream from agriculture, forestry and related industries.
Captive generation	Electricity generation in a power plant that supplies electricity only to consumer(s) and not to the electricity grid. The consumer(s) are either located directly at the site of the power plant or are connected through dedicated electricity distribution line(s) with the power plant but not via the electricity grid.
Carbon sequestration	Carbon sequestration is defined as a biological, chemical or physical process of removing carbon from the atmosphere and depositing it in a reservoir.
Cogeneration	Simultaneous production of electricity and useful thermal energy in one process.
Deadwood[5]	All non-living woody biomass not contained in the litter, either standing, lying on the ground, or in the soil. Dead wood includes wood lying on the surface, dead roots, and stumps larger than or equal to 10 cm in diameter or any other diameter used by the country.
Emission factor	Measure of the average amount of GHG emitted to the atmosphere by a specific process, fuel, equipment, or source.
Energy efficiency	Energy efficiency is defined as the improvement in the service provided per unit power, for example, project activities which increase unit output of traction, work, electricity, heat, light (or fuel) per MW input are energy efficiency project activities.
Feedstock	Gaseous, liquid or solid raw material used in manufacturing.
Forest	A minimum area of land of 0.05 –1.0 hectare with tree crown cover (or equivalent stocking level) of more than 10 – 30 per cent with trees with the potential to reach a minimum height of 2 – 5 metres at maturity in situ and may include: (a) Either closed forest formations where trees of various storeys and undergrowth cover a high proportion of the ground or open forest; (b) Young natural stands and all plantations which have yet to reach a crown density of 10–30 per cent or tree height of 2–5 metres; (c) Areas normally forming part of the forest area which are temporarily unstocked as a result of human intervention such as harvesting or natural causes but which are expected to revert to forest. The definition of forest becomes applicable to a Party when: (a) For an Annex I Party, the Party selects a single minimum tree crown cover value between 10 and 30 per cent, a single minimum land area value between 0.05 and 1 hectare and a single minimum tree height value between 2 and 5 metres, as provided under paragraph 16 of the Annex to decision 16/CMP.1; (b) For a non-Annex I Party, the Party selects a single minimum tree crown cover value between 10 and 30 per cent, a single minimum land area value between 0.05 and 1 hectare and a single minimum tree height value between 2 and 5 metres, as provided under paragraph 8 of the Annex to decision 5/CMP.1.

Fossil fuel	Fuels formed by natural resources such as anaerobic decomposition of buried dead organisms (e.g. coal, oil, and natural gas).
Greenfield facility	The construction of a new facility at a location where previously no facility exists, for example, construction of new power plant at a site where previously no power generation activity exists.
Greenhouse gas (GHG)	A greenhouse gas listed in Annex A to the Kyoto Protocol, unless otherwise specified in a particular methodology.
Grid	The spatial extent of the power plants that are physically connected through transmission and distribution lines to the project activity (e.g. the renewable power plant location or the consumers where electricity is being saved) and that can be dispatched without significant transmission constraints.
Harvesting	Cutting and removal of trees from forests for timber or other uses. In sustainable forestry, harvesting is followed by planting or natural regeneration of the forest.
Industrial gases	Greenhouse gases originating from chemical production processes that are not naturally occurring. In addition, N_2O from chemical production processes is included in this group of greenhouse gases.
Land use, land-use change and forestry	A GHG inventory sector that covers emissions and removals of GHG resulting from direct human-induced land use, land-use change and forestry activities.
Leakage	**For a CDM project activity** (non-A/R) or **PoA** (non-A/R), the net change of anthropogenic emissions by sources of GHG which occurs outside the project boundary, and which is measurable and attributable to the CDM project activity or PoA, as applicable. **For an A/R** or **SSC A/R CDM project activity** or **PoA** (A/R), the increase in GHG emissions by sources or decrease in carbon stock in carbon pools which occurs outside the boundary of an A/R or SSC A/R CDM project activity or PoA (A/R), as applicable, which is measurable and attributable to the A/R or SSC A/R CDM project activity or PoA (A/R), as applicable.
Litter[5]	Includes all non-living biomass with a diameter less than a minimum diameter chosen by the country (for example 10 cm), lying dead, in various states of decomposition above the mineral or organic soil. This includes the litter, fumic, and humic layers. Live fine roots (of less than the suggested diameter limit for below-ground biomass) are included in litter where they cannot be distinguished from it empirically.
Low-carbon electricity	Electricity that is generated using a less-GHG-intensive fuel than in the baseline (for example, electricity generated using natural gas in the project is low carbon electricity, when coal is used in the baseline for electricity generation).
Merit order	A way of ranking existing power plants in ascending order of their short-run marginal costs of electricity generation, so that those with the lowest marginal costs are the first ones to be brought on line to meet demand and the plants with the highest marginal costs are the last to be brought on line.
Project boundary	**For a CDM project activity** (non-A/R) or **CPA** (non-A/R), the significant anthropogenic GHG emissions by sources under the control of the project participant that are reasonably attributable to the CDM project activity or CPA, as determined in accordance with the CDM rules and requirements. **For an A/R** or **SSC A/R CDM project activity** or **CPA** (A/R), geographically delineates the A/R or SSC A/R CDM project activity or CPA (A/R) under the control of the project participant as determined in accordance with the CDM rules and requirements.
Reforestation	The direct human-induced conversion of non-forested land to forested land through planting, seeding and/or the human-induced promotion of natural seed sources, on land that was forested but has been converted to non-forested land.
Renewable energy	Energy that comes from solar, wind, rain, tides, geothermal heat and biological sources which are renewable (naturally replenished) in nature.
Sectoral scope	The category of GHG source sectors or groups of activities that apply to CDM project activities or PoAs. It is based on the sectors and source categories set out in Annex A to the Kyoto Protocol. A CDM project activity or PoA may fall within more than one sectoral scope.
Soil organic carbon[5]	Organic carbon in mineral and organic soils (including peat) to a specified depth chosen by the country and applied consistently through the time series. Live fine roots (of less than the suggested diameter limit for below-ground biomass) are included with soil organic matter where they cannot be distinguished from it empirically.

Standardized baseline	A baseline developed for a Party or a group of Parties, on a sub-national, national or group-of-countries basis rather than on a project basis, to facilitate the calculation of GHG emission reductions and removals by sinks and/or the determination of additionality for CDM project activities or PoAs, while providing assistance for assuring environmental integrity.
Suppressed demand	A scenario where future anthropogenic emissions by sources are projected to rise above current levels, due to the specific circumstances of the host Party.
Trigeneration	Simultaneous generation of electrical energy and thermal energy in the form of cooling and heating in one process.
Waste energy	Energy contained in a residual stream from industrial processes in the form of heat, chemical energy or pressure, for which it can be demonstrated that it would have been wasted in the absence of the project activity. Examples of waste energy include the energy contained in gases flared or released into the atmosphere, the heat or pressure from a residual stream not recovered (i.e. wasted).
Wetland	Area of land whose soil is saturated with moisture either permanently or seasonally.

[5] According to Intergovernmental Panel on Climate Change Good Practice Guidance for Land Use, Land-Use Change and Forestry, table 3.2.1 on page 3.15

[6] In accordance with the A/R modalities and procedures.