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 CDs of the booklet.

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FOREWORD

Environmental integrity is at the heart of the CDM and methodologies have a major role in ensuring this integrity. Methodologies are required to establish a project's emissions baseline, or expected emissions without the project, and to monitor the actual ongoing emissions once a project is implemented. The difference between the baseline and actual emissions determines what a project is eligible to earn in the form of credits. Methodologies are essential when quantifying emission reductions in an uncapped environment on a project-by-project basis.

The function of methodologies is easy to grasp, but the methodologies themselves can be quite complex. They are necessarily diverse in their composition and application in order to accommodate the wide range of activities and locales covered by the CDM. Hence this publication, designed to guide users through the complex world of CDM methodologies.

By clearly summarizing, classifying and illustrating the methodologies available under the CDM, and then enhancing the means by which to search those methodologies, this publication serves to guide potential CDM project participants.
It is my fervent hope, and that of the team that developed this work, that it will contribute to a rise in the number of CDM projects, increase the use of methodologies that 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.

Christiana Figueres, *Executive Secretary*
United Nations Framework Convention on Climate Change

CDM Methodology Booklet

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 four 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 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. 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 the UNFCCC website.

This edition of the Booklet reflects the effective status of methodologies and methodological tools as of November 2012 (up to EB69). However, as methodologies and methodological tools may change, users of the booklet are encouraged to consult EB meeting reports subsequent to EB 69 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.

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 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>

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 MITIGATION ACTIVITY TYPE (METHODOLOGY CATEGORIZATION TABLE)

In addition to the methodology sectoral scopes[1], 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.

[1] 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		AMS-I.A.
		ACM0002	ACM0020		AMS-I.B.
		ACM0006	ACM0022		AMS-I.C.
		ACM0018	AMS-I.C.		AMS-I.E.
		ACM0020	AMS-I.F.		AMS-I.F.
Displacement of a more-GHG-intensive outputv		ACM0022	AMS-I.G.		AMS-I.G.
		AMS-I.A.	AMS-I.H.		AMS-I.H.
		AMS-I.C.			AMS-I.I.
		AMS-I.D.			AMS-I.J.
		AMS-I.F.			AMS-I.K.
		AMS-I.G.			AMS-I.L.
		AMS-I.H.			
	Low carbon electricity	AM0029	AM0087		
		AM0045	AM0099		
		AM0074			
		AM0087			
		AM0099			
		AM0104			
		AM0108			
	Energy efficiency	AM0014	AM0014		AM0058
		AM0048	AM0048		AM0048
		AM0049	AM0049		AM0084
		AM0061	AM0054		AM0107
		AM0062	AM0055		
		AM0076	AM0056		
		AM0084	AM0076		
		AM0102	AM0084		
		AM0107	AM0095		
		ACM0006	AM0098		
		ACM0007	AM0102		
		ACM0012	AM0107		
		ACM0013	ACM0006		
		ACM0018	ACM0012		
		AMS-II.B.	ACM0018		
		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-III.AG.	ACM0006		
		AMS-III.AH.	ACM0009		
		AMS-III.AM.	ACM0018		
			AMS-III.AM.		
2 Energy distribution	Renewable energy	AMS-III.AW.	AM0069		AMS-III.AW.
		AMS-III.BB.	AM0075		
	Energy efficiency	AM0067			
		AM0097			
		AMS-II.A.			
		AMS-III.BB.			
	Fuel/feedstock switch	AMS-III.BB.	AM0077		
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		AMS-II.C.
			AM0105		AMS-II.E.
			AMS-I.I.		AMS-II.F.
			AMS-II.C.		AMS-II.G.
			AMS-II.F.		AMS-II.J.
			AMS-II.G.		AMS-II.K.
			AMS-II.L.		AMS-II.L.
			AMS-II.N.		AMS-II.N.
			AMS-II.P.		AMS-II.M.
					AMS-II.O.
					AMS-II.Q.
					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	AM0014	AM0078	ACM0005	AM0014		AM0070
	AM0036	AM0049	AM0096	ACM0021	AM0049		AM0095
	ACM0003	AM0055	AMS-III.K.	AM0041	AM0092		ACM0012
	AMS-III.Z.	AM0070		AM0057	ACM0003		
	AMS-III.AS.	AM0106		AM0065	ACM0005		
		AM0109		AM0092	ACM0009		
		ACM0012		AMS-III.L.	ACM0015		
		AMS-II.D.			AMS-III.N.		
		AMS-II.H.			AMS-III.Z.		
		AMS-II.I.			AMS-III.AD.		
		AMS-III.P.			AMS-III.AM.		
		AMS-III.Q.			AMS-III.AS.		
		AMS-III.V.					
		AMS-III.Z.					
		AMS-III.AS.					
		AMS-III.BD.					
5 Chemical industries	ACM0017	AM0055	ACM0019	AM0053	AM0027		AM0053
	AM0053	AMS-III.AC.	AM0021	AMS-III.M.	AM0037		AM0055
	AM0075	AMS-III.AJ.	AM0028	AMS-III.AI.	AM0050		AM0069
	AM0089		AM0034		AM0063		AM0081
			AM0051		AM0069		AM0098
			AM0098		AMS-III.J.		
					AMS-III.O.		
6 Construction							
7 Transport	AMS-III.T.	AM0031			AMS-III.S.		
	AMS-III.AK.	AM0090			AMS-III.AY.		
	AMS-III.AQ.	AM0101					
		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)

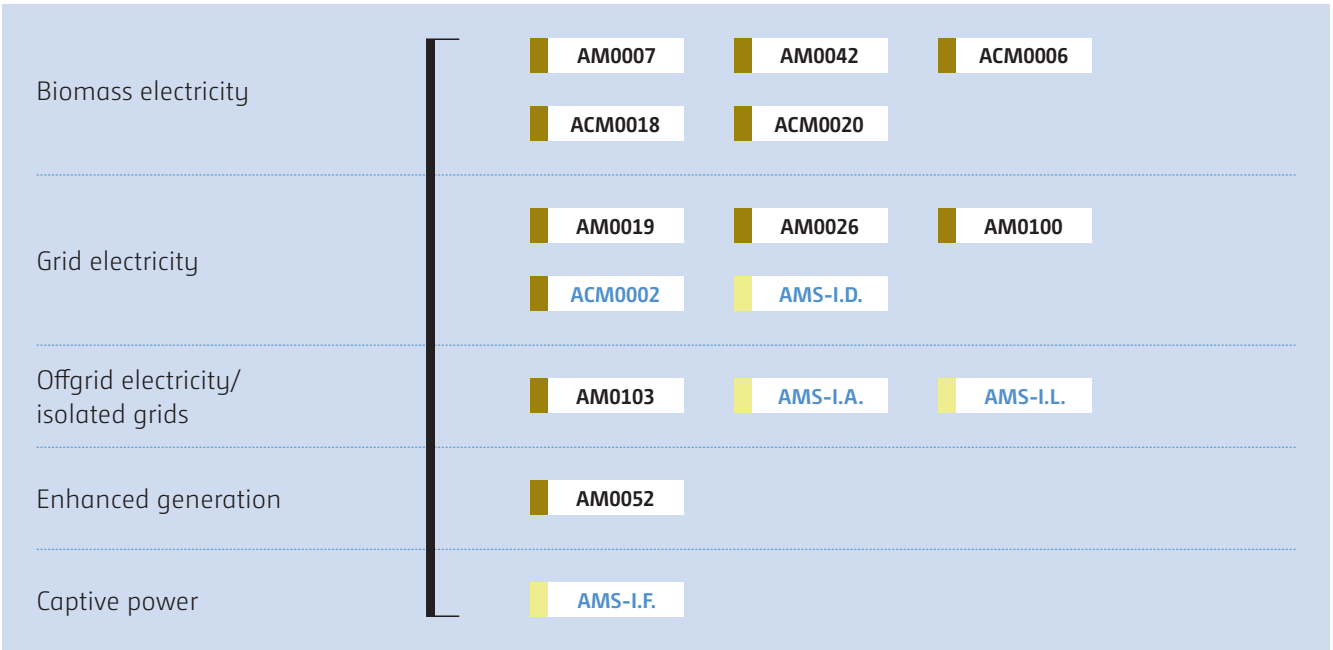
Sectoral scope	Renewable energy	Energy Efficiency	GHG destruction	GHG emission avoidance	Fuel/Feedstock Switch	GHG removal by sinks	Displacement of a more-GHG-intensive output
10 Fugitive emissions from fuel (solid, oil and gas)			AM0064 ACM0008 AMS-III.W.	AM0023 AM0043	AM0009 AM0037 AM0077	AM0074	AM0009 AM0077
11 Fugitive emissions from production and consumption of halocarbons and SF_6			AM0001 AM0078 AM0096 AMS-III.X.	AM0035 AM0065 AM0079 AM0092 AMS-III.X.	AM0071 AM0092 AMS-III.AB.		
12 Solvent use							
13 Waste handling and disposal	ACM0022	AMS-III.AJ. AMS-III.BA.	AM0073 ACM0001 ACM0010 ACM0014 AMS-III.G. AMS-III.H. AMS-III.AX.	AM0057 AM0080 AM0083 AM0093 ACM0022 AMS-III.E. AMS-III.F. AMS-III.I. AMS-III.Y. AMS-III.AF. AMS-III.AO.			
14 Land-use, land-use change and forestry						AR-AM0002 AR-AM0004 AR-AM0005 AR-AM0007 AR-AM0009 AR-AM0010 AR-AM0011 AR-AM0012 AR-AM0013 AR-AM0014 AR-ACM0001 AR-ACM0002 AR-AMS0001 AR-AMS0002 AR-AMS0003 AR-AMS0004 AR-AMS0005 AR-AMS0006 AR-AMS0007	
15 Agriculture			AM0073 ACM0010 AMS-III.D. AMS-III.R.	AMS-III.A. AMS-III.AU.	AMS-III.R.		

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.[2] 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**



[2] 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).

The guidebook can be downloaded at: <http://www.perspectives.cc/home/groups/7/Publications/CDM_Guidebook_Perspectives_DEFRA_122007.pdf>.

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

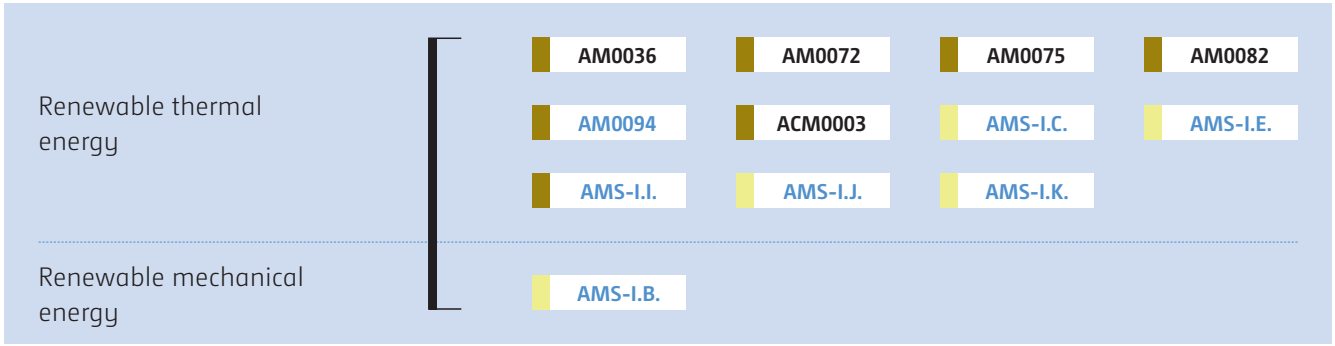


Figure VII-3. **Methodologies for efficient or less-carbon-intensive fossil-fuel-fired power plants**

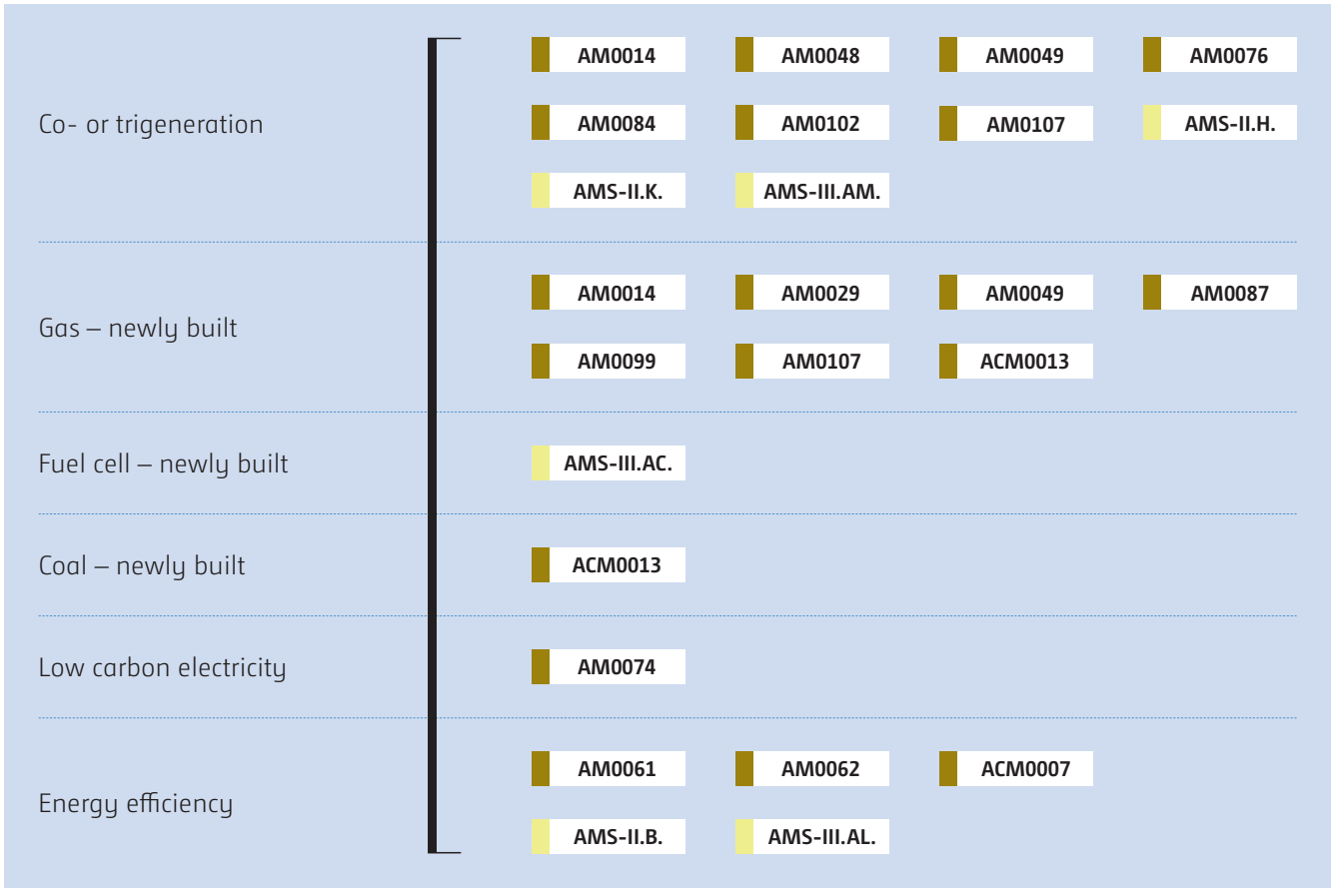


Figure VII-4. **Methodologies for fuel switch**

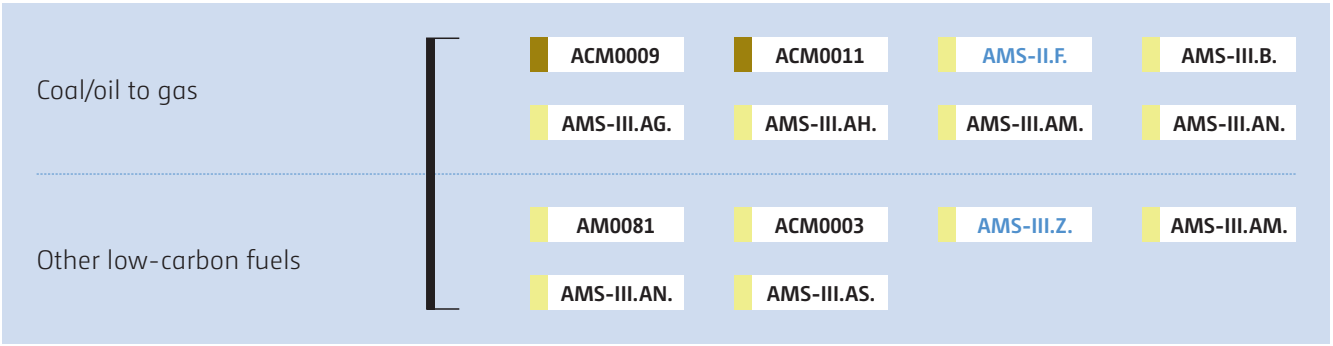


Figure VII-5. **Methodologies for biofuel**

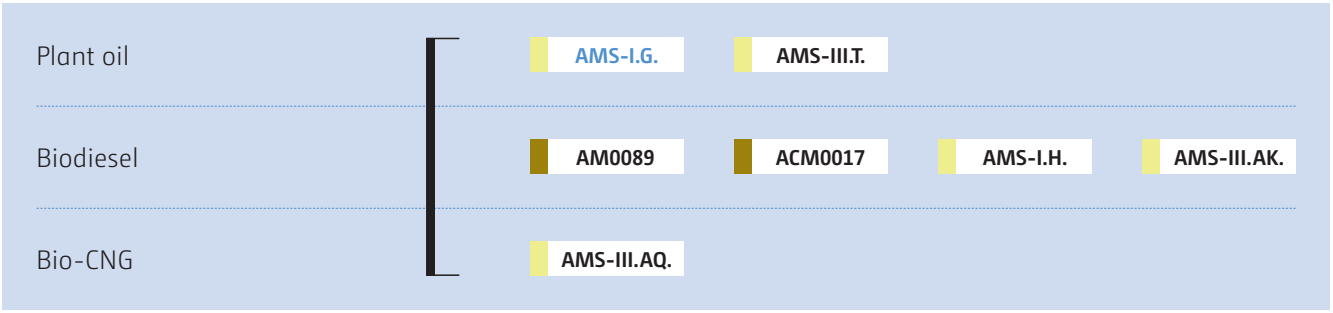


Figure VII-6. **Methodologies for industrial energy efficiency**

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

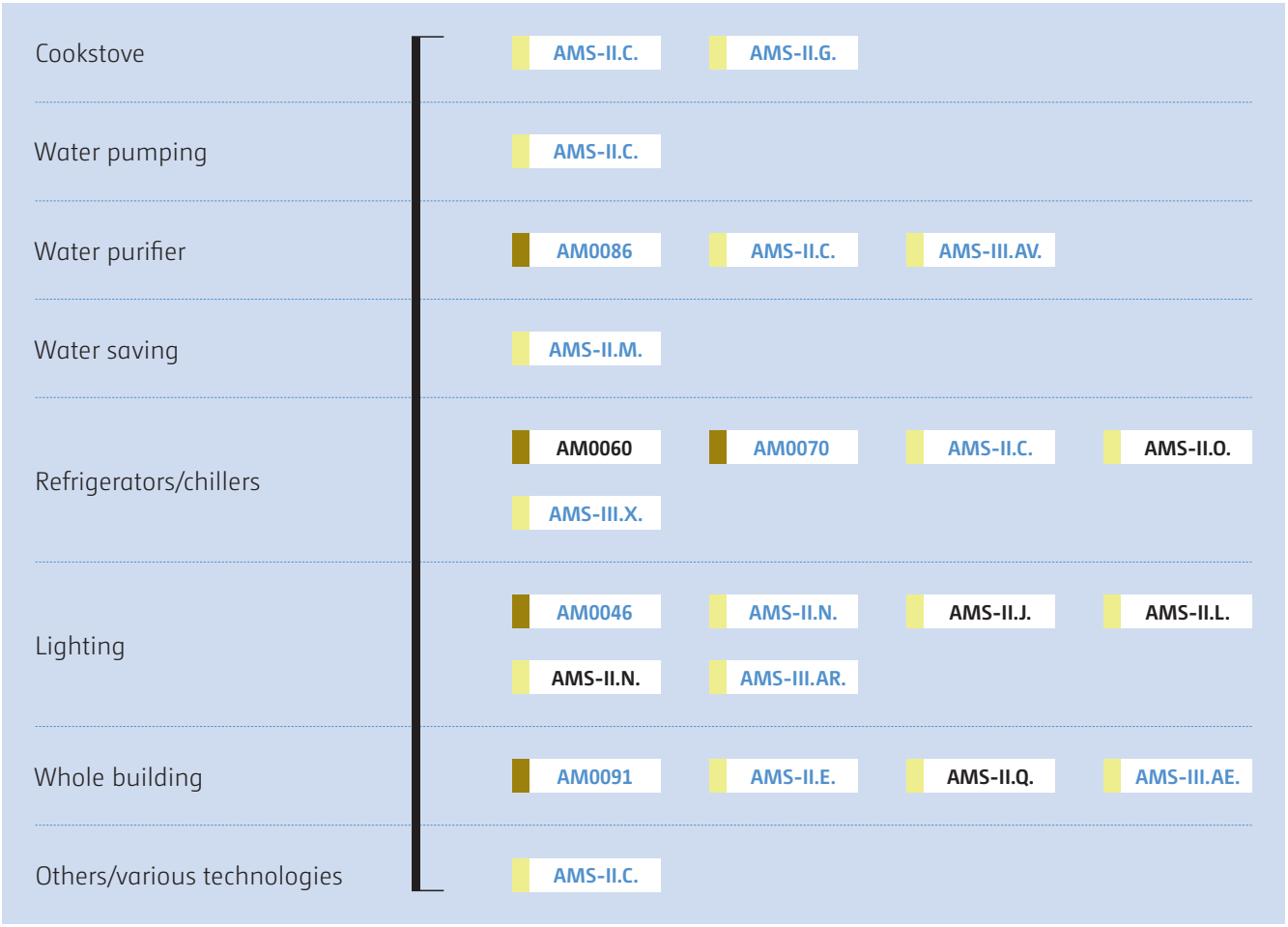


Figure VII-8. **Methodologies for gas flaring and gas leak reduction**

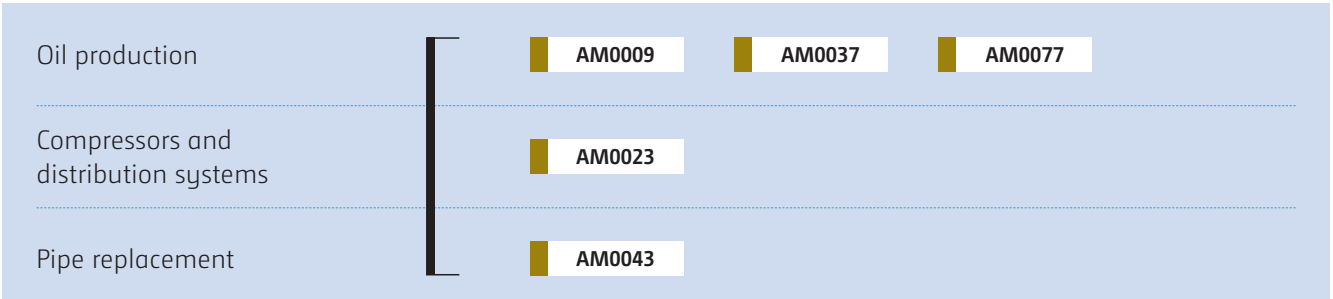


Figure VII-9. **Methodologies for feedstock switch**

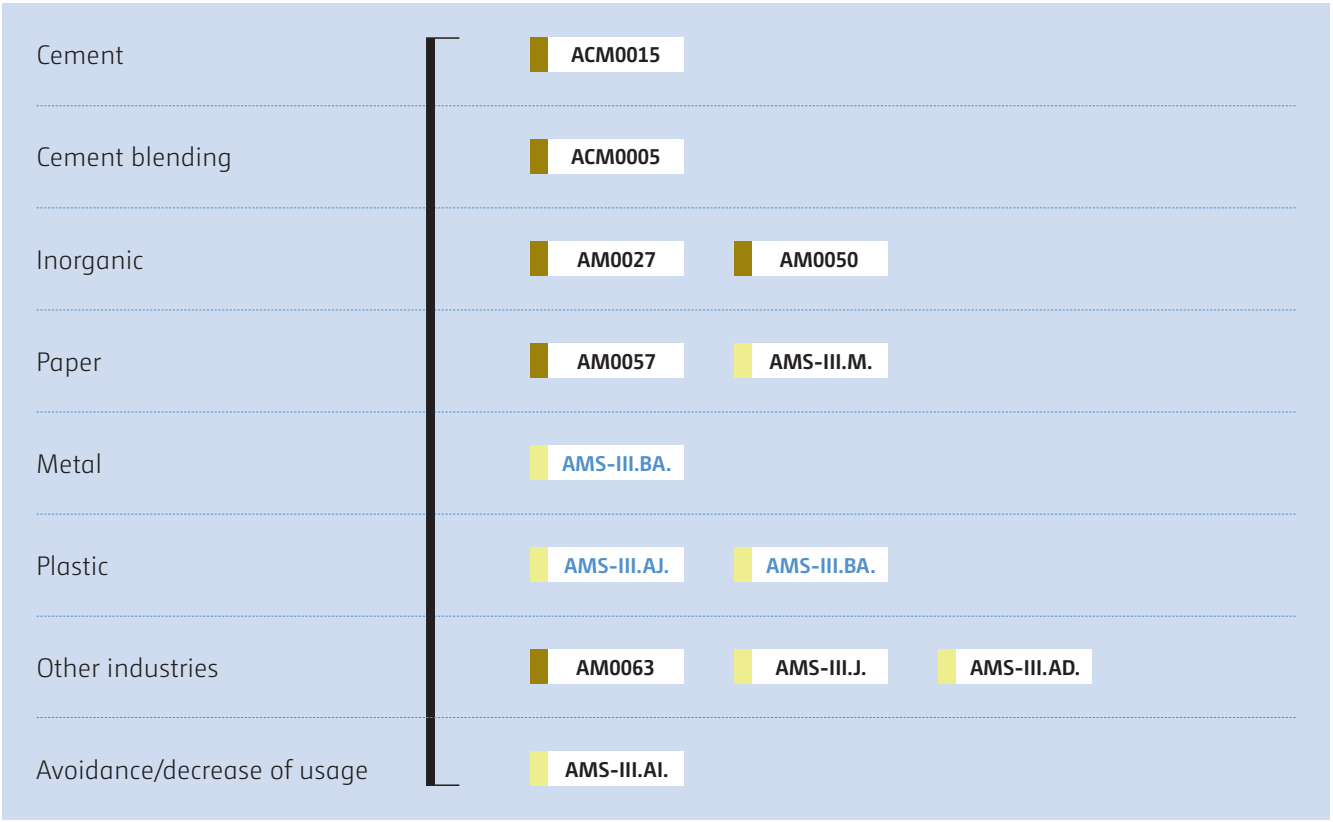


Figure VII-10. **Methodologies for industrial gases**

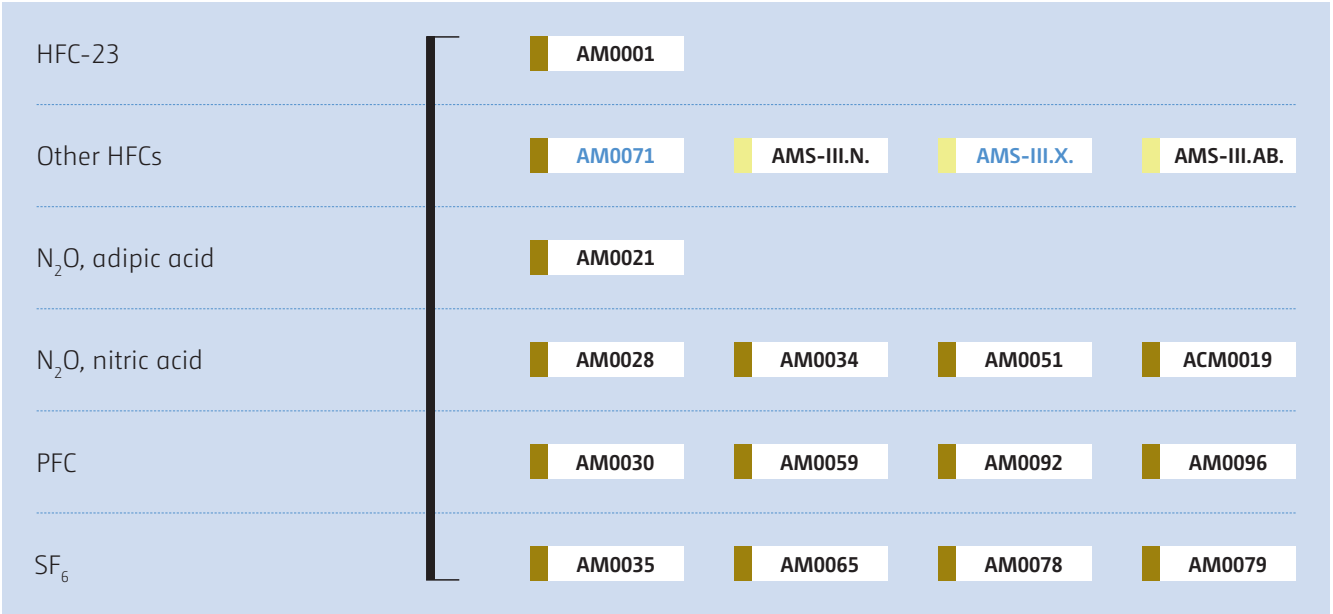


Figure VII-11. **Methodologies for waste management and wastewater**

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

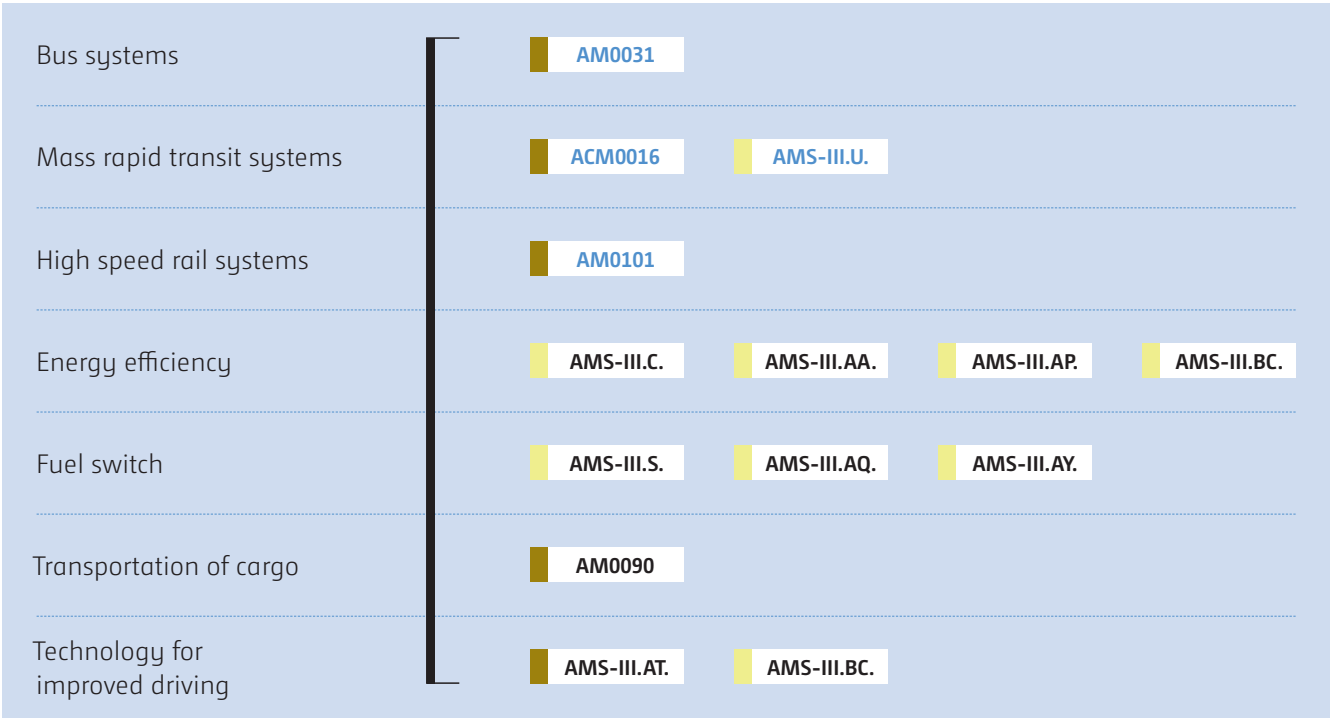
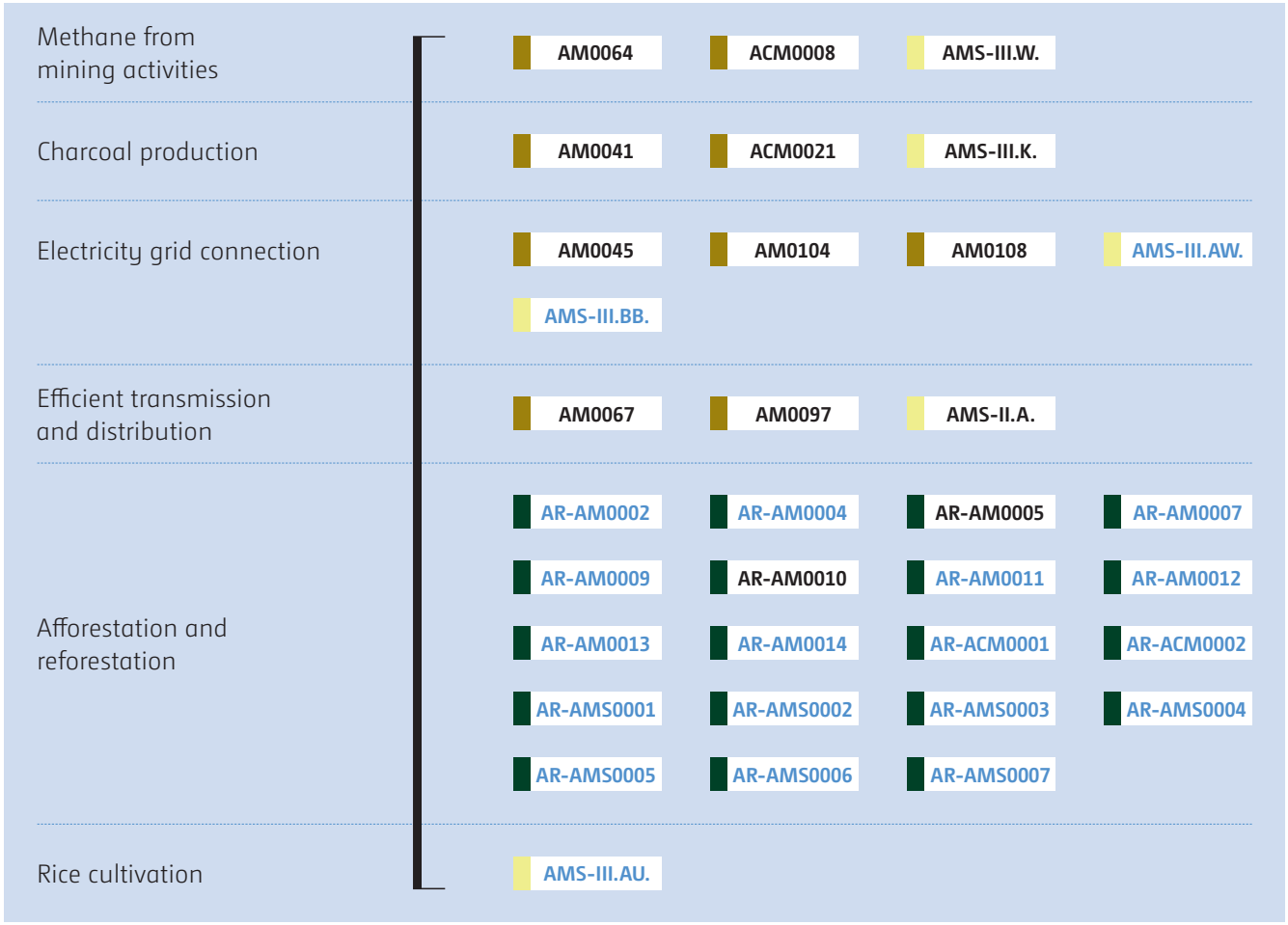


Figure VII-13. **Other methodologies**



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 a programmatic approach, or 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. on the household level, 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

1.5. 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
ACM0022	Alternative waste treatment processes
AMS-I.A.	Electricity generation by the user
AMS-I.L.	Electrification of rural communities using renewable energy
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

1.6. 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.

1.7. 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.

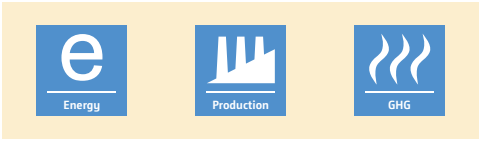
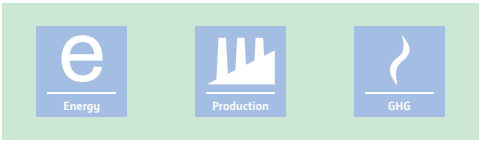
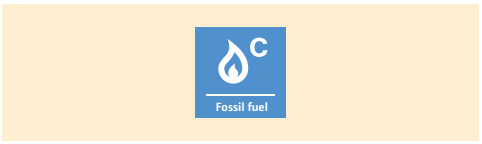
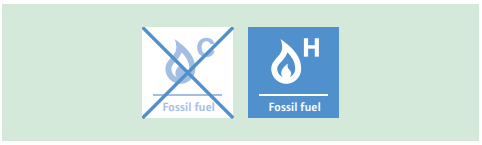
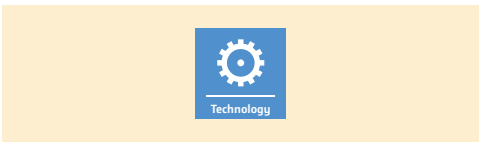
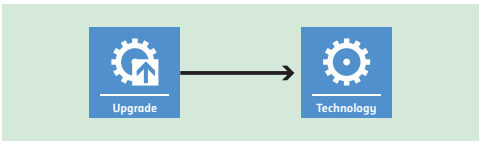
VISUAL DESCRIPTION OF BASELINE AND PROJECT SCENARIOS

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.

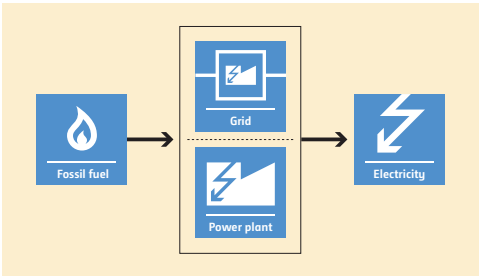
A list of icons used in the booklet is given in chapter II. Some exemplifications of diagrams are presented below.

EXEMPLIFICATION OF DIAGRAMS

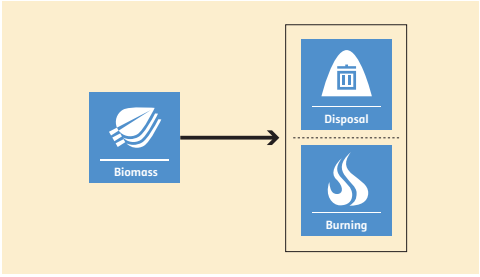
	Full intensity in the baseline scenario is depicted with bold colour.
	Reduced, decreased intensity in the project activity is depicted with pale colour.
	Avoidance and replacement is depicted with crossed icons.
	A carbon-intensive fossil fuel is used in the baseline scenario. Instead of the carbon-intensive 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

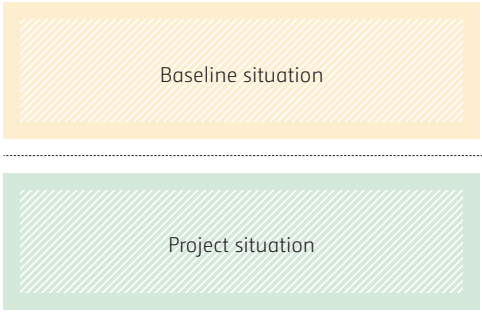
Activities in the baseline scenario result in GHG emissions.
These GHG emissions are avoided due to the project activity.



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.

CDM Methodology Booklet

Chapter II

ICONS, ABBREVIATIONS AND GLOSSARY

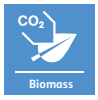
2.1. ICONS USED IN THIS BOOKLET

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

Carbon-intensive fossil fuel
Any kind of carbon-intensive fossil fuel used for combustion. E.g. fuel oil, coal.

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

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



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

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

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

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

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

Electricity

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

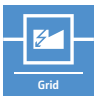
Cooling

Mechanical energy

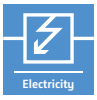
Power plant
Any kind of plant, facility or equipment used to produce electricity. This includes fossil-fuel-fired power plants, renewable power plants such as hydro power plants, but also (small) photovoltaic systems.

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.

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.



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).



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.

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

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

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

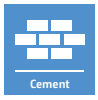
Exploitation
Any kind of exploitation activity such as mining activities, oil and gas production.

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

Air

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.

Refrigerant
Refrigerant that contains HFC.



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

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

Manure
Manure from livestock.

Technology
Any kind of technology, equipment, appliance.

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

Refrigerators and chillers
Any kind of refrigerator or chiller.

Drinking water

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.

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

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.

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

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

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

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

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.

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.

Residential Consumer
Residential consumer, e.g. households.

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

Consumer
Residential or commercial consumer.

Buildings
Any kind of building.

Data centre

Train
Any kind of train-based transport.

Bus
Any kind of bus-based transport.

Truck
Any kind of truck-based transport.

Car
Any kind of car-based transport.

Motorcycle
Any kind of motorcycle-based transport.

Ship
Any kind of transport based on ships or barges.

Airplane
Any kind of airplane-based transport.

Degraded land
Degraded land, e.g. with cracks (not roots), no vegetation on top. This symbol can be grouped with any of the land covers below to depict a combination (e.g. "degraded grassland" by showing both "land" and "grassland")

Grassland
Grass on ground without cracks.

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

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

Afforestation/reforestation areas
Small afforestation/reforestation areas.

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

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

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

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.

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

	**Planting or seeding** Afforestation/reforestation activity by planting, seeding or other measures.
	**Harvesting** Harvesting activity.
	**Fuelwood collection** Collecting fuelwood without full-tree harvest.
	**Charcoal production** Charcoal production activity.
	**Livestock** Any kind of livestock.
	**Animal grazing** Grazing livestock in pasture land or any other land.
	**Agricultural activity** Production of crops or livestock.
	**Women and children** Project activities using these methodologies have a particular potential to directly improve the lives of women and children.
	**Suppressed demand** Methodologies that address the issue of suppressed demand.

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
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
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

GENERAL 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 full methodology. A specific glossary for A/R methodologies follows this list.

Additional/Additionality	The effect of a 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. 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.
Capacity addition	A capacity addition is an increase in the installed power generation capacity of an existing power plant through the installation of a new power plant beside the existing power plant/units, or the installation of new power units, additional to the existing power plant/units. The existing power plant/units continue to operate after the implementation of the project activity.
Capacity increase	A (minor) increase in the design capacity due to the installation of improved equipment compared to the original design.
Captive generation	Captive generation is defined as generation of electricity in a power plant that supplies electricity only to consumer(s) or multiple consumers and not to the electricity grid. The consumer(s) or multiple consumers are either located directly at the site of the power plant or are connected through dedicated electricity line(s) with the power plant but not via the electricity grid.
Baseline scenario	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.
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, renewable	Biomass is "renewable" if one of five conditions is met. These are described in the Glossary of CDM terms.
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.
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	A cogeneration plant is a heat and power generation plant in which at least one heat engine simultaneously generates both heat and power. If power, heat and cooling is provided at the same time, the term tri-generation is used instead of co-generation.
Degraded land	Land degradation is a long-term decline in ecosystem function and productivity and measured in terms of net primary productivity. All forms of land degradation will ultimately lead to a reduction of soil fertility and productivity. The general effect is reduced plant growth, which in turn causes loss of protective soil cover and increased vulnerability of soil and vegetation to further degradation (e.g. erosion).
Emission factor	An emission factor is defined as the 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, that is, project activities which increase unit output of traction, work, electricity, heat, light (or fuel) per MW input are energy efficiency project activities.
Feedstock	Raw material used in manufacture. Can be gaseous, liquid or solid.
Fossil fuel	Fuels formed by natural resources such as anaerobic decomposition of buried dead organisms (e.g. coal, oil, and natural gas).
Greenfield	Greenfield activities refer to the construction of a new facility at a location where previously no facility exists. E.g. construction of new power plant where previously no power generation activity exists.
Greenhouse gas	A greenhouse gas listed in Annex A to the Kyoto Protocol, unless otherwise specified in a particular methodology.
Grid	The grid or electricity system is an interconnected network for delivering electricity from suppliers to consumers. It includes all power plants that are physically connected through transmission and distribution lines.
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	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.
Low-carbon electricity	Electricity that is generated with a less-GHG-intensive fuel than in the baseline (e.g., natural gas in the project, and coal in the baseline).
Merit order	A way of ranking available power plants in ascending order of their short-run marginal costs of production, 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	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.
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 natural resources such as sunlight, wind, rain, tides, and geothermal heat, which are renewable (naturally replenished).
Retrofit	To modify existing industrial, commercial and residential facilities, automobiles, energy conversion systems etc. which are already in service using new, improved or more efficient parts and equipment developed or made available after the time of original manufacture or installation of the facility, automobiles, energy conversion systems etc., in accordance with any guidance from the Board on the lifetime of parts and equipment.
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. Sectoral scopes are used for the accreditation of DOEs. A full list of sectoral scopes, related methodologies and DOEs is available at: <https://cdm.unfccc.int/DOE/scopes.html>
Waste energy	A by-product gas/heat/pressure from machines and industrial processes having potential to provide usable energy, which is currently wasted. For example gas flared or released into the atmosphere, the heat or pressure not recovered (therefore wasted).

SPECIFIC GLOSSARY TO A/R METHODOLOGIES

Above-ground biomass[3]	All living biomass above the soil including stem, stump, branches, bark, seeds, and foliage as well as herbaceous vegetation.
Additional/Additionality	The effect of the A/R CDM project activity or CPA 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 CDM project activity or CPA. Whether or not an A/R CDM project activity or CPA is additional is determined in accordance with the CDM rules and requirements.
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). E.g. quantifying the relationship between above-ground tree biomass and the diameter at breast height and tree height of a specific tree species.
Baseline scenario	The scenario for an A/R CDM project activity or CPA 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 CDM project activity or CPA.
Below-ground biomass[3]	All living biomass of roots. Fine roots of less than (suggested) 2 mm diameter are often excluded because these often 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).
Deadwood[3]	Includes 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.
Degraded land	Land degradation is a long-term decline in ecosystem function and productivity and measured in terms of net primary productivity. All forms of land degradation will ultimately lead to a reduction of soil fertility and productivity. The general effect is reduced plant growth, which in turn causes loss of protective soil cover and increased vulnerability of soil and vegetation to further degradation (e.g. erosion).
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.
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.

[3] 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

Leakage	Increase in GHG emissions by sources or decrease in carbon stock in carbon pools which occurs outside the boundary of an A/R CDM project activity or PoA, as applicable, which is measurable and attributable to the A/R CDM project activity or PoA, as applicable.
Litter[4]	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.
Non-forest woody vegetation	Woody vegetation which does not reach the threshold for forest definition, e.g. single trees and shrubs.
Project boundary	The geographic delineation of the A/R CDM project activity or CPA under the control of the project participant as determined in accordance with the CDM rules and requirements.
Silvopastoral activities	Integration of trees with forage and livestock production (grazing) on forest land.
Soil organic carbon[4]	Includes 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.
Thinning	Selective removal of trees to reduce stand density and competition between trees in a stand, primarily undertaken to improve the growth rate or health of the remaining trees.
Wetland	Area of land whose soil is saturated with moisture either permanently or seasonally.

[4] 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