Example and Pitfalls
Waste Sector CDM Project Development

Waste Sector CDM Projects –Category

By the analysis of the methodologies, we conclude that waste in the field of CDM projects could be categorized into four types. They are biomass, solid waste, water and gas.

- The waste type of biomass contains biomass waste/residues and manure. In which, the biomass waste/residues mainly include by-products and residues or waste streams from food production and processing, but excludes wastes from wood production and processing and municipal solid waste.
- The waste type of solid waste contains municipal solid waste (MSW) and bio-organic solid waste.
- The waste type of water is organic waste water.
- The waste type of gas refers to landfill gas in particular. The other waste gas, such as industrial waste gas and biogas are not included.

Waste Sector CDM Projects -Applicable methodologies

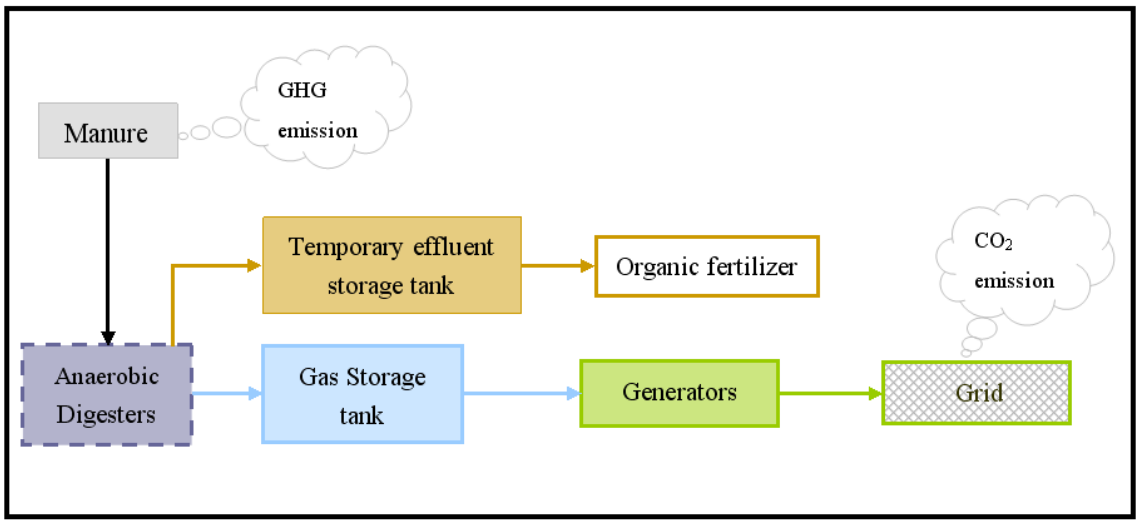
According to the Approved Methodologies published on the EB website, twelve methodologies are applicable for the waste sector CDM projects. If a waste sector project is going to be developed as a CDM project, an appropriate methodology must be chosen firstly based on the real scenario of the project. All of the methodologies are listed in the following table.

Type	Meth. No.	Meth. Title	Sectoral scope	Applicable conditions
Biomass	AM0057	Avoid emissions from biomass wastes through use as feed stock in pulp and paper production or in bio-oil production	4,13	·Combustion of biomass to generate power and/or heat; ·Producing bio-oil or paper products by using the specific compositions of biomass; ·Manure management and generating power
	AMS-III.E.	Avoidance of methane production from decay of biomass through controlled combustion, gasification or mechanical/thermal treatment	13	
	AMS-III.F.	Avoidance of methane production from decay of biomass through composting	13	
	AMS-	Avoidance of methane production	13	

	III.L.	from biomass decay through controlled pyrolysis		and/or heat.
	ACM0010	Consolidated baseline methodology for GHG emission reductions from manure management systems	13,15	
Solid Waste	AM0025	Avoided emissions from organic waste through alternative waste treatment processes	1,13	·Generation power and/or heat; ·Co-composing to avoid the GHG emission.
	AM0039	Methane emissions reduction from organic waste and bioorganic solid waste using co-composting	13	
Water	ACM0014	Mitigation of greenhouse gas emissions from treatment of industrial wastewater	13	Recovering and combustion of methane to generate power and/or heat.
	AMS-III.H.	Methane recovery in wastewater treatment	13	
	AMS-III.I.	Avoidance of methane production in wastewater treatment through replacement of anaerobic lagoons by aerobic systems	13	
Gas	ACM0001	Consolidated baseline and monitoring methodology for landfill gas project activities	13	Capturing and burning landfill gas to generate power and/or heat.
	AMS-III.G.	Landfill methane recovery	13	

Example and pitfalls-Biomass

Methodology: ACM0010: Consolidated baseline methodology for GHG emission reductions from manure management systems;



Application: This methodology is applicable generally to **manure management** on livestock farms where the existing anaerobic manure treatment system, within the project boundary, is replaced by one or a combination of more than one animal waste management systems (AWMSs) that result in less GHG emissions.

This methodology is applicable to manure management projects with the following conditions:

• Farms where livestock populations, comprising of cattle, buffalo, swine, sheep, goats, and/or poultry, are managed under confined conditions;

• Farms where manure is not discharged into natural water resources (e.g. rivers or estuaries);

• In case of anaerobic lagoons treatments systems, the depth of the lagoons used for manure management under the baseline scenario should be at least 1m;

• The annual average temperature in the site where the anaerobic manure treatment facility in the baseline existed is higher than 5°C;

• In the baseline case, the minimum retention time of manure waste in the anaerobic treatment system is greater than 1 month;

• The AWMS/process in the project case should ensure that no leakage of manure waste into ground water takes place, e.g., the lagoon should have a non-permeable layer at the lagoon bottom.

Pitfalls:

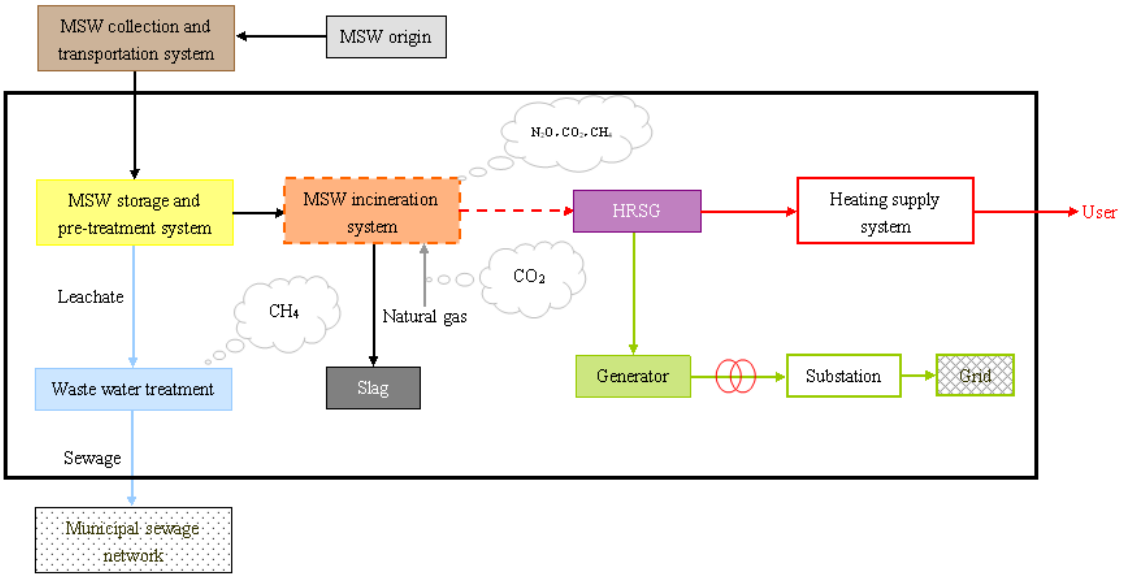
•The conditions of the proposed project must comply with the basic conditions defined in Methodology;

•The proportions and characteristics of different types of manure can be determined;

Make sure that no leakage of manure waste into ground water takes place.

Example and pitfalls-Solid waste

Methodology: AM0025 Avoided emissions from organic waste through alternative waste treatment processes



Application:

The methodology is applicable under the following conditions:

• The project activity involves one or a combination of the following waste treatment options for the fresh waste that in a given year would have otherwise been disposed of in a landfill:

• In case of anaerobic digestion, gasification or RDF processing of waste, the residual waste from these processes is aerobically composted and/or delivered to a landfill;

• In case of composting, the produced compost is either used as soil conditioner or disposed of in landfills;

• In case of RDF/stabilized biomass processing, the produced RDF/stabilized biomass should not be stored in a manner that may result in anaerobic conditions before its use;

• If RDF/SB is disposed of in a landfill, project proponent shall provide degradability analysis on an annual basis to demonstrate that the methane generation, in the life-cycle of the SB is below 1% of related emissions. It has to be demonstrated regularly that the characteristics of the produced RDF/SB should not allow for re-absorption of moisture of more than 3%. Otherwise, monitoring the fate of the produced RDF/SB is necessary to ensure that it is not subject to anaerobic conditions in its lifecycle;

• In the case of incineration of the waste, the waste should not be stored longer than 10 days. The waste should not be stored in conditions that would lead to anaerobic decomposition and, hence, generation of CH4;

• The proportions and characteristics of different types of organic waste processed in the project activity can be determined, in order to apply a multiphase landfill gas generation model to estimate the quantity of landfill gas that would have been generated in the absence of the project activity;

• The project activity may include electricity generation and/or thermal energy generation from the biogas, syngas captured, RDF/stabilized biomass produced, combustion heat generated in the incineration process, respectively, from the anaerobic digester, the gasifier, RDF/stabilized biomass combustor, and waste incinerator. The electricity can be exported to the grid and/or used internally at the project site. In the case of RDF produced, the emission reductions can be claimed only for the cases where the RDF used for electricity and/or thermal energy generation can be monitored;

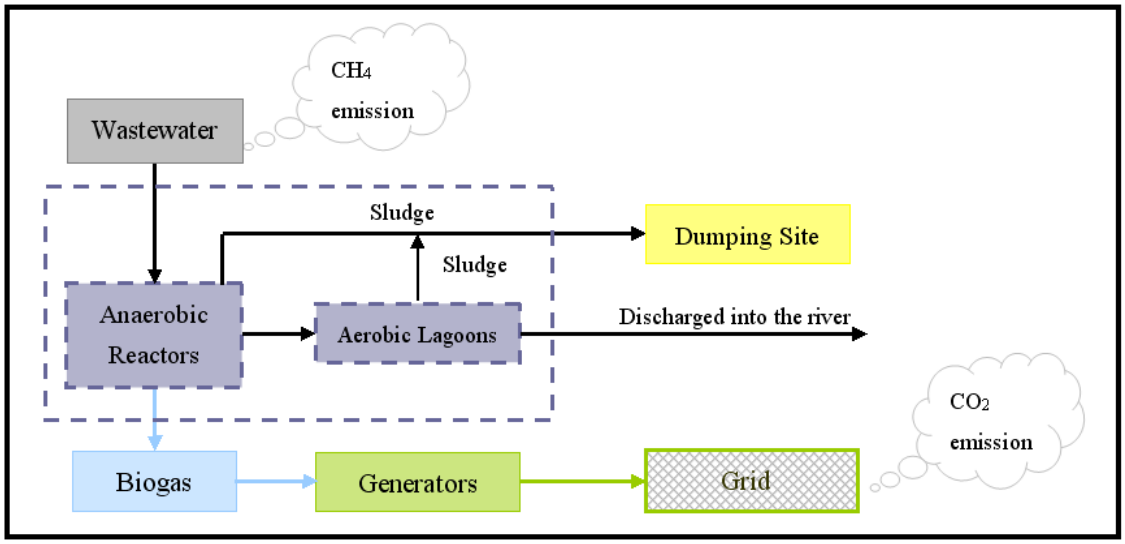
• Waste handling in the baseline scenario shows a continuation of current practice of disposing the waste in a landfill despite environmental regulation that mandates the treatment of the waste, if any, using any of the project activity treatment options mentioned above;

• The compliance rate of the environmental regulations during (part of) the crediting period is below 50%; if monitored compliance with the MSW rules exceeds 50%, the project activity shall receive no further credit, since the assumption that the policy is not enforced is no longer tenable;
• Local regulations do not constrain the establishment of RDF production plants/thermal treatment plants nor the use of RDF/stabilized biomass as fuel or raw material;
• In case of RDF/stabilized biomass production, project proponent shall provide evidences that no GHG emissions occur, other than biogenic CO2, due to chemical reactions during the thermal treatment process (such as Chimney Gas Analysis report);
• The project activity does not involve thermal treatment process of neither industrial nor hospital waste;
• In case of waste incineration, if auxiliary fossil fuel is added into the incinerator, the fraction of energy generated by auxiliary fossil fuel is no more than 50% of the total energy generated in the incinerator.

Pitfalls:
• The proportions and characteristics of different types of waste utilized can be determined;
• The waste can be treated either through one or a combination of the following process: composting, gasification, anaerobic digestion, RDF processing/thermal treatment without incineration, and incineration.
• Following the government policies and regulations continuously.

Example and pitfalls-Water

Methodology: ***AMS-III.H.*** Methane recovery in wastewater treatment



Application:

• This methodology comprises measures that recover biogas from biogenic organic matter in wastewater by means of one, or a combination

• In cases where baseline system is anaerobic lagoon the methodology is applicable if:

(a) The lagoons are ponds with a depth greater than two meters, without aeration. The value for depth is obtained from engineering design documents, or through direct measurement, or by dividing the surface area by the total volume. If the lagoon filling level varies seasonally, the average of the highest and lowest levels may be taken;

(b) Ambient temperature above 15°C, at least during part of the year, on a monthly average basis;

(c) The minimum interval between two consecutive sludge removal events shall be 30 days.

• The recovered biogas from the above measures may also be utilized for the following applications instead of combustion/flaring:

(a) Thermal or mechanical, 2 electrical energy generation directly;

(b) Thermal or mechanical, electrical energy generation after bottling of upgraded biogas, in this case additional guidance provided in Annex 1 shall be followed; or

(c) Thermal or mechanical, electrical energy generation after upgrading and distribution, in this case additional guidance provided in Annex 1 shall be followed:

(i) Upgrading and injection of biogas into a natural gas distribution grid with no significant transmission constraints;

(ii) Upgrading and transportation of biogas via a dedicated piped network to a group of end users; or

(iii) Upgrading and transportation of biogas (e.g. by trucks) to distribution points for end users.

(d) Hydrogen production;

(e) Use as fuel in transportation applications after upgrading.

• If the recovered biogas is used for project activities covered under paragraph 3 (a), that component of the project activity can use a corresponding methodology under Type I.

• For project activities covered under paragraph 3 (b), if bottles with upgraded biogas are sold outside the project boundary, the end-use of the biogas shall be ensured via a contract between the bottled biogas vendor and the end-user. No emission reductions may be claimed from the displacement of fuels from the end use of bottled biogas in such situations. If however the end use of the bottled biogas is included in the project boundary and is monitored during the crediting period CO_2 emissions avoided by the displacement of fossil fuel can be claimed under the corresponding Type I methodology, e.g. AMS-I.C .Thermal energy production with or without electricity.

• For project activities covered under paragraph 3 (c) (i), emission reductions from the displacement of the use of natural gas are eligible under this methodology, provided the geographical extent of the natural gas distribution grid is within the host country boundaries.

• For project activities covered under paragraph 3 (c) (ii), emission reductions for the displacement of the use of fuels can be claimed following the provision in the corresponding Type I methodology, e.g. AMS-I.C.

• In particular, for the case of 3 (b) and (c) (iii), the physical leakage during storage and transportation of upgraded biogas, as well as the emissions from fossil fuel consumed by vehicles for transporting biogas shall be considered. Relevant procedures in paragraph 11 of Annex 1 of AMS-III.H : Methane recovery in wastewater treatment shall be followed in this regard.

• For project activities covered under paragraph 3 (b) and (c), this methodology is applicable if the upgraded methane content of the biogas is in accordance with relevant national regulations (where these exist) or, in the absence of national regulations, a minimum of 96% (by volume).

• If the recovered biogas is utilized for the production of hydrogen (project activities covered under paragraph 3 (d)), that component of the project activity shall use the corresponding methodology AMS-III.O .Hydrogen production using methane extracted from biogas..

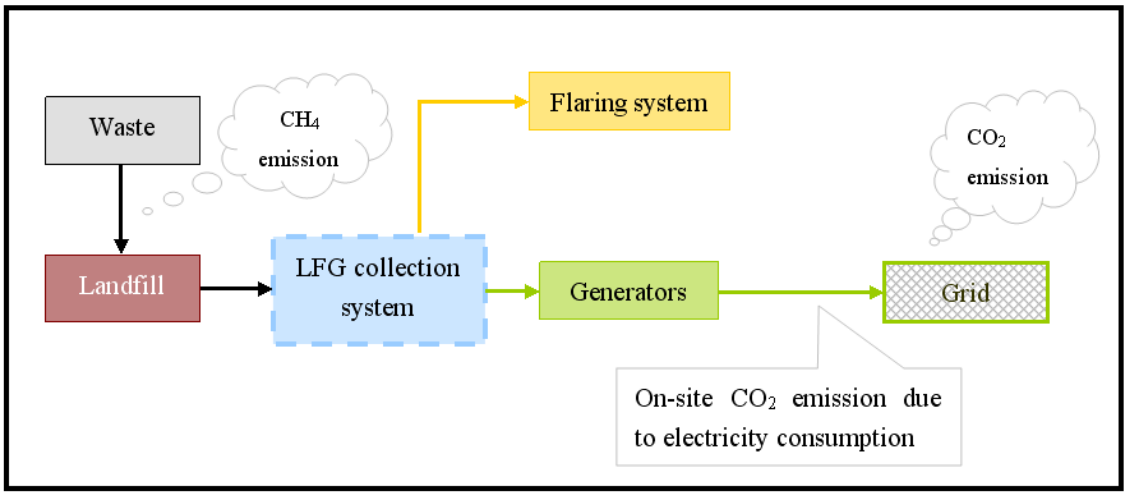
• If the recovered biogas is used for project activities covered under paragraph 3 (e), that component of the project activity shall use corresponding methodology AMS III.AQ .Introduction of Bio-CNG in road transportation..

• New facilities (Greenfield projects) and project activities involving a change of equipment resulting in a capacity addition of the wastewater or sludge treatment system compared to the designed capacity of the baseline treatment system are only eligible to apply this methodology if they comply with the relevant requirements in the .General guidelines to SSC CDM methodologies.. In addition the requirements for demonstrating the remaining lifetime of the equipment replaced, as described in the general guidelines shall be followed.
• The location of the wastewater treatment plant as well as the source generating the wastewater shall be uniquely defined and described in the PDD.
• Measures are limited to those that result in aggregate emissions reductions of less than or equal to 60 kt CO2 equivalent annually from all Type III components of the project activity.

Pitfalls:
•The methodology can only be applicable for small-scale projects with ER less than 60,000tCO_2e;
•AMS-III.H. and AMS-III.I. are similar. The applicable methodology should be chosen according to the disposal method of methane of the proposed project;
•The conditions of the proposed project must comply with the basic conditions defined in Methodology.

Example and pitfalls-Gas

Methodology: ACM0001 Consolidated baseline and monitoring methodology for landfill gas project activities



Application: This methodology is applicable to **landfill gas capture project activities**, where the baseline scenario is the partial or total atmospheric release of the gas and the project activities include situations such as:

(a) The captured gas is flared; and/or

(b) The captured gas is used to produce energy (e.g. electricity/thermal energy). Emission reductions can be claimed for thermal energy generation, only if the LFG displaces use of fossil fuel either in a boiler or in an air heater. For claiming emission reductions for other thermal energy equipment (e.g. kiln), project proponents may submit a revision to this methodology;

(c) The captured gas is used to supply consumers through natural gas distribution network. If emissions reductions are claimed for displacing natural gas, project activities may use approved methodology AM0053.

Pitfalls:

• The proportions and characteristics of different types of waste can be determined (FSR)

• Project emission: On-site CO_2 emission due to electricity consumption or emissions from consumption of heat.