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Approved Carbon Methodologies (ACM) List

final version

European Bank
for Reconstruction and Development

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Content

1. Introduction

1.1. Objective

In 2011 the European Bank for Reconstruction and Development (EBRD) launched the Turkey Mid-Size Sustainable Energy Financing Facility (the "Facility" or MidSEFF) with the purpose to support Turkish banks and project investors in harnessing the country's potential in renewable energy, energy efficiency and waste-to-energy projects. The Facility is organised as a framework operation under which credit lines totalling in the order of EUR 1 billion are provided to 5-7 'Participating Banks' in Turkey. These banks forward the received credit lines to mid-size (10 – 50 MW) renewable energy investments, commercial energy efficiency investments, and private sector investments in municipal or industrial waste-to-energy projects. Once fully implemented, the Facility is expected to result in a substantial amount of greenhouse gas (GHG) emission reductions, estimated at 800,000 tons CO_2 equivalent per year. To enable banks to capitalise on the generated emission reductions, the EBRD promotes access to carbon markets through the Carbon Finance Consultant (CFC) operational under the Facility. The task of the CFC is to facilitate the Turkish banks' and sub-borrowers' access to carbon finance through a close cooperation between the Participating Banks' investment branches and a pool of specialists familiar with the domestic carbon market.

As part of the support of carbon market transactions in Turkey, this report presents a list of Approved Carbon Methodologies (ACM) applicable to the development of Turkish emission reduction projects. By providing a comprehensive overview of all relevant methodologies, the ACM list facilitates cost effective development and registration of projects under a recognised carbon market standard. The ACM list is applicable both to projects financed under the Facility as well as to commonly developed project categories in Turkey.

1.2. Approach

Two complementary approaches are used in forming the ACM List presented in this report.

First, the most popular carbon market standards are screened for their most widely methodologies. The standards include the Clean Development Mechanism (CDM) of the UN Framework Convention on Climate Change (UNFCCC) as well as two voluntary carbon market standards, the Verified Carbon Standard (VCS) and the Gold Standard (GS). The CDM is the leading global standard for carbon project development and the front-runner and originator of most methodologies developed today. The VCS and the GS are the two most popular standards being applied in Turkey.[1] Under the first screening, the top 25 CDM methodologies and the top 13 and 10 methodologies under the VCS and GS are identified, together covering 90% (81.5% in the case of GS) of all projects in the pipeline.

In a second step, Turkey's 2011 National Climate Change Action Plan (NCCAP) is assessed to understand how Turkey plans to combat climate change and which sectors offer the largest mitigation potential. Project activities in these sectors are likely to represent the bulk of investments in emission reduction projects in Turkey and thereby stand to benefit most from carbon finance. The most widely used methodologies identified under the first step are subsequently allocated to the relevant sectors of the NCCAP. Further methodologies are identified where none of the most widely used methodologies cover a priority sector under NCCAP.

[1] Due to its special situation under the UNFCCC, under which it is not strictly classified as either a developed or developing nation, Turkey is not eligible to participate in either the CDM (applicable to developing nations) or Joint Implementation (JI) the sister mechanism applicable to developed nations but is an important player in the voluntary market.

2. Analysis

2.1. Available Methodologies

Turkey is currently only eligible to host emission reduction projects developed under a number of standards in the voluntary market. The two most popular standards include the Gold Standard (GS) and the Verified Carbon Standard (VCS). These standards provide frameworks and procedures for ensuring that the emission reductions certified by the standards are real, measurable and verifiable. Both the GS and the VCS accept methodologies applicable under the CDM but also feature additional methodologies on technologies or project types not covered under the CDM.

As of today (May 2012), 201 different methodologies have been approved by the CDM Executive Board, excluding the ones that have been withdrawn. Methodologies are divided into small and large scale methodologies, depending on the size of the project activity. Small scale methodologies are applicable to the following categories of projects:

- Type (i): renewable energy project activities with a maximum output capacity equivalent to up to 15 megawatts (or an appropriate equivalent);
- Type (ii): energy efficiency improvement project activities which reduce energy consumption, on the supply and/or demand side, by up to the equivalent of 60 gigawatt hours per year; and
- Type (iii): other project activities that both reduce anthropogenic emissions by sources and directly emit less than 60 kilotonnes of carbon dioxide equivalent annually.

Furthermore, consolidated methodologies have been adopted by the CDM Executive Board covering several similar large-scale methodologies.

Methodologies are further grouped into 15 sectoral scopes under the CDM and a distinction is made between methodologies for emission reduction projects and those for afforestation and reforestation activities (sectoral scope 14). A full list of all approved methodologies, methodology summary sheets and alternatives for categorisation can be found in the CDM Methodology Booklet.[2] Abbreviations denote the following:

- AM: large scale methodology
- ACM: consolidated methodology
- AMS: small scale methodology
- AR-AM/ACM/AMS: forestry methodology

In addition to the CDM, there are 46 VCS specific methodologies[3] and 7 GS specific methodologies[4].

2.2. Step 1: Identifying the most widely used methodologies in CDM and voluntary markets

While there are over 200 approved methodologies available, more than half of the entire CDM project pipeline is represented by renewable energy projects applying the consolidated methodology ACM0002 or its small scale version AMS-I.D. Together these methodologies account for 52% of all projects under validation.

The third most often used methodology but accounting for only about 6% of projects is small scale methodology AMS-I.C, applicable to biomass based co-generation projects.

The remaining 42% of projects are covered by a diverse set of methodologies. Table 1 below lists the top 25 most widely used methodologies in the CDM, which together cover 90% of all projects. The assessment is based on 10,653 projects uploaded on the UNFCCC website by 21 November 2011.[5]

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[2] http://cdm.unfccc.int/methodologies/documentation/meth_booklet.pdf.
[3] http://www.v-c-s.org/methodologies/find
[4] http://www.cdmgoldstandard.org/project-certification/gs-methodologies.
[5] *A full list of validated and registered projects is available at* http://cdm.unfccc.int/Projects/Validation/index.html *and* http://cdm.unfccc.int/Projects/projsearch.html.

Note that the ranking is based on the number of projects using the methodology. A different ranking would result if the amount of credits generated under a methodology were to be compared as some project technologies render substantially greater amounts of emission reductions than others.

Table 1: Top 25 methodologies under the CDM (used in projects under validation)

Rank	Methodology	Technology/sector	# of Usage	% of Total	Cumulative Coverage
1	**ACM0002**	Grid-connected renewable energy	2.890	27,1%	27,1%
2	**AMS-I.D**	Grid-connected renewable energy	2.650	24,9%	52,0%
3	**AMS-I.C**	Biomass co-generation	621	5,8%	57,8%
4	**ACM0006**	Biomass co-generation	398	3,7%	61,6%
5	**ACM0012**	Waste energy recovery	372	3,5%	65,1%
6	**AMS-III.H**	Wastewater treatment	345	3,2%	68,3%
7	**ACM0001**	Landfill gas	310	2,9%	71,2%
8	**AMS-III.D**	Animal manure management	309	2,9%	74,1%
9	**ACM0004**	Waste heat recovery. Replaced by ACM0012	228	2,1%	76,3%
10	**AMS-II.D**	EE and fuel switch in industrial facilities	226	2,1%	78,4%
11	**ACM0008**	Coal bed/mine methane	151	1,4%	79,8%
12	**AMS-III.Q**	Waste energy recovery	134	1,3%	81,0%
13	**AM0025**	Organic waste	117	1,1%	82,1%
14	**AMS-III.E**	Waste combustion, gasification, other treatment	107	1,0%	83,2%
15	**AMS-III.B**	Fossil fuel switch	96	0,9%	84,1%
16	**AMS-III.F**	Composting or biodigestion	95	0,9%	84,9%
17	**AM0029**	Natural gas power plants	90	0,8%	85,8%
18	**ACM0005**	Increasing blend in cement	70	0,7%	86,4%
19	**AM0034**	N2O reduction at nitric acid plants	62	0,6%	87,0%
20	**AMS-I.A.**	Electricity generation by the user	58	0,5%	87,6%
21	**AMS-III.G.**	Landfill gas	56	0,5%	88,1%
22	**ACM0013**	New fossil fuel power plants	55	0,5%	88,6%
23	**AMS-I.F.**	Renewable energy for mini-grids	52	0,5%	89,1%
24	**AMS-II.E**	Energy efficiency in buildings	51	0,5%	89,6%
25	**AMS-II.J**	Efficient lighting	46	0,4%	90,0%
Sum:			**9.589**	**90,0%**	**90%**

Performing the same analysis for the VCS and the GS results in a fairly similar distribution of methodologies. However, small scale methodologies have a relatively greater representation in the voluntary standards than under

the CDM. In addition to the CDM methodologies there are three additional VCS and GS specific methodologies that also feature high on the list.

The base of projects is with 685 (VCS) and 133 (GS) much lower than for CDM projects and only registered projects are assessed.

Note that for the GS coverage of only 81.5% can be achieved by top methodologies. This is due to the fact that after that every methodology is used only once in a project, making further ranking impossible.

Table 2: Top 13 methodologies under the VCS, used in validated projects

Rank	Methodology	Technology	# of Usage	% of Total	Cumulative Coverage
1	**AMS-I.D.**	Grid-connected renewable energy	217	31.7%	31.7%
2	**ACM0002**	Grid-connected renewable energy	204	29.8%	61.5%
3	**AMS-I.C.**	Biomass co-generation	48	7.0%	68.5%
4	**AMS-I.E.**	Switch from non-renewable biomass	29	4.2%	72.7%
5	**AMS-III.D.**	Animal manure management	23	3.4%	76.1%
6	**VCS v1 Project Specific**	Coal mine methane	23	3.4%	79.4%
7	**ACM0001**	Landfill gas	18	2.6%	82.0%
8	**AMS-III.H.**	Wastewater treatment	15	2.2%	84.2%
9	**ACM0012**	Waste energy recovery	13	1.9%	86.1%
10	**ACM0006**	Biomass co-generation	10	1.5%	87.6%
11	**ACM0008**	Coal bed/mine methane	8	1.2%	88.8%
12	**ACM0014**	Industrial wastewater	8	1.2%	89.9%
13	**AM0029**	Natural gas power plants	5	0.7%	90.7%
Sum:			**685**	**90.7%**	**90.7%**

Table 3: Top 10 methodologies under the GS, used in validated projects

Rank	Methodology	Technology	# of Usage	% of Total	Cumulative Coverage
1	ACM0002	Grid-connected renewable energy	62	45.9%	45.9%
2	GS Improved Cook-Stoves	Cook stoves	16	11.9%	57.8%
3	AMS-I.D	Grid-connected renewable energy	14	10.4%	68.1%
4	AMS-I.A	Electricity generation by the user	3	2.2%	70.4%
5	ACM0012	Waste energy recovery	3	2.2%	72.6%
6	AMS-II.G.	Energy efficiency upgrades in biomass boilers	3	2.2%	74.8%
7	GS Small Scale Biodigester	Biodigesters	3	2.2%	77.0%
8	AMS-I.C	Biomass co-generation	2	1.5%	78.5%
9	AMS-III.H	Wastewater treatment	2	1.5%	80.0%
10	ACM0001	Landfill gas	2	1.5%	81.5%
Sum:			**133**	**81.5%**	**81.5%**

The consolidated list of the most widely used methodologies in CDM and voluntary markets is provided in table 4 below.

Table 4: Combined list of most widely used methodologies in CDM, VCS and GS projects in alphabetic order*

Combined List of Methodologies Used in CDM, VCS and GS Projects			
1	ACM0001	16	AMS-I.F.
2	ACM0002	17	AMS-II.D
3	ACM0005	18	AMS-II.E
4	ACM0006	19	AMS-II.J
5	ACM0008	20	AMS-III.B
6	ACM0012	21	AMS-III.D
7	ACM0013	22	AMS-III.E
8	ACM0014	23	AMS-III.F
9	AM0025	24	AMS-III.G.
10	AM0029	25	AMS-III.H
11	AM0034	26	AMS-III.Q
12	AMS-I.A.	27	AMS-II.G.
13	AMS-I.C	28	GS Improved Cook-Stoves
14	AMS-I.D	29	GS Small Scale Biodigester
15	AMS-I.E.		

* Methodology ACM0004 is not listed as it has been withdrawn and replaced by ACM0012. Furthermore, VCS v1 Project Specific methodology is omitted as it is not a replicable methodology.

2.3. Step 2: Assessment of the priority sectors identified in Turkey's NCCAP

In the second step of the assessment, Turkey's macro strategy tackling climate change as presented in the NCCAP was reviewed in order to identify sectors and projects with the most attractive mitigation potential. Turkey's GHG emissions profile differs from other OECD countries. On the one hand, per capita electricity consumption and per capita GHG emission levels are about one-third of the OECD average. On the other hand, the energy intensity of the entire economy is 30% higher than that of other OECD countries[6]. The NCCAP, which has been drafted in reaction to the rising energy intensity of the domestic economy, indicates that the Turkish government has ambition to step up its efforts in defining a low-carbon development plan that will support Turkey's goals to join global efforts against climate change. The NCCAP lists the energy sector, the building sector, transportation, industry, waste, agriculture, land use and forestry as key sectors where mitigation action is to take place. An overview of the stated ambitions are illustrated in the table below.

Table 5: Overview of sectoral targets of the NCCAP (2011)

Sector	Objective
Energy	Reduce primary energy intensity by 10% compared to 2008 by 2015 as a result of implemented and planned policies and measures
	Generate 30% of power supply from renewable sources by 2023
	Reduce nationwide electricity distribution losses to 8% by 2023
Building	Decrease annual energy consumption in the buildings and premises of public institutions by 10% until 2015 and by 20% until 2023
	Develop instruments that will provide the necessary financial support with regard to energy efficiency, renewable energy and EPB until the end of 2013
Industry	Making legal arrangements for energy efficiency and limitation of greenhouse gas emission
Transportation	Limiting emission growth rate of individual vehicles in intracity transport
	Making legal arrangements and building capacity to increase the use of alternative fuels and clean vehicles until 2020
Waste	Reduce the quantity of biodegradable wastes in weight admitted to landfill sites by 75% till 2015, by 50% till 2018 and by 35% till 2025, taking year 2005 as a basis
	Termination of uncontrolled disposal of wastes by 100% by 2020
Agriculture	Determine and increase the quantity of carbon stock captured in the soil
	Decrease the growth rate of GHG emissions originating from vegetal and animal production
Land Use and Forestry	Increase the amount of carbon sequestered in forests by 15% by 2020 compared to 2007 levels (14,500 Gg in 2007, 16,700 Gg in 2020)
	Increase the amount of sequestered carbon as a result of agricultural and forestry activities by 10% by 2020 compared to 2007 levels
	Make necessary legal arrangements for combating climate change in land use and forestry by the end of 2013

Allocating the most widely used methodologies to the sectors of the NCCAP results in the list of relevant methodologies for Turkey presented in the next section.

[6] International Energy Agency, 2010; Turkish Statistical Institute, 2011

3. Results

3.1. Overview of methodologies relevant for Turkey

Table 6 lists and describes all methodologies deemed most relevant for application in Turkey. For that, the most widely used methodologies in CDM and voluntary markets are allocated to the sectors highlighted for climate change mitigation in the NCCAP. The initial list is then further tailored for country-specific circumstances resulting in the following additions and eliminations:

- As none of the most popular methodologies belong to the forestry sector whereas the NCCAP identifies land use and forestry as a priority sector, the two most commonly used afforestation and reforestation methodologies AR-AMS0001 and AR-ACM0001 have been added to the list;
- The two GS methodologies for improved cook stoves and household biodigesters have been taken from the list as these are no likely project categories for Turkey.

The result is a list of 29 methodologies.

Note that methodologies marked in red are relevant for Turkey as a whole but are not applicable to projects financed under MidSEFF.

Table 6: Relevant methodologies for Turkey

	Methodology	Definition	Typical Project(s)	Type	Comments
Energy	ACM0002	Consolidated baseline methodology for grid-connected electricity generation from renewable sources	Construction and operation of a power plant that uses renewable energy sources and supplies electricity to the grid (greenfield power plant). Retrofit, addition of an existing power plant is also applicable.	Renewable Energy	This methodology is the most widely used methodology in Turkey for renewable energy projects, especially wind- and hydro-power projects.
	AMS-I.D	Grid connected renewable electricity generation	Construction and operation of a power plant that uses renewable energy sources and supplies electricity to the grid (greenfield power plant) or retrofit, replacement or capacity addition of an existing power plant that uses renewable energy sources and supplies electricity to the grid.	Renewable Energy	This methodology is the small scale version of ACM0002.
	ACM0013	Consolidated baseline and monitoring methodology for new grid connected fossil fuel fired power plants using a less GHG intensive technology	Construction and operation of a new fossil fuel fired power plant that supplies electricity to the grid using more-efficient power generation technology than would otherwise be used with the given fossil fuel (e.g. construction of a supercritical coal fired power plant).	Energy Efficiency	This methodology covers efficient thermal power plants like supercritical coal power plants. The methodology is out of MidSEFF's scope. However, the methodology can be used for future Turkish

					projects.
	AMS-I.F.	Renewable electricity generation for captive use and mini-grid	Production of electricity using renewable energy technologies such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass that supply electricity to user(s).	Renewable Energy	There are few opportunities for this methodology in Turkey. In addition, emission reductions from these projects are expected to be lower than MidSEFF requires. On the other hand, TurSEFF projects could benefit from this methodology through a PoA.
	AMS-I.C.	Thermal energy production with or without electricity	Thermal energy production using renewable energy sources including biomass-based cogeneration (heat/power). Projects that seek to retrofit or modify existing facilities for renewable energy generation are also applicable	Renewable Energy	The methodology falls into supported project types by the NCCAP. It is suitable for Turkey but the potential project size is too small for MidSEFF as there are no sizable forms to develop high CAPEX projects with this methodology.
	AM0029	Baseline methodology for grid connected electricity generation plants using natural gas	The construction and operation of a new natural-gas-fired power plant that supplies electricity to the grid.	Low carbon electricity	Although there are new sizable grid connected NG fired power plants on the way in Turkey the project type is outside MidSEFF coverage
	AMS-I.A.	Electricity generation by the user	Renewable electricity generation such as solar, hydro, wind or biomass gasification are implemented by the users as new installations (greenfield) or replacement of existing onsite fossil-fuel-fired generation.	Renewable Energy	Electricity penetration is too high in Turkey. Therefore there is limited application area for this methology. In addition, potential underlying project sizes would be too small for MidSEFF.

	AMS-I.E.	Switch from non-renewable biomass for thermal applications by the user	Generation of thermal energy by introducing renewable energy technologies for end-users that displace the use of non-renewable biomass. Examples of these technologies include but are not limited to biogas stoves, solar cookers or passive solar homes and safe drinking water applications.	Renewable Energy	Potential projects would be out of MidSEFF coverage. Development of carbon projects with this methodology would require a PoA due to comparatively high development costs.
	AMS-II.G.	Energy efficiency measures in thermal ,applications of non-renewable biomass	Introduction of high-efficient thermal energy generation units utilizing non-renewable biomass or retrofitting of existing units (e.g. complete replacement of existing biomass fired cook stoves or ovens or dryers with more-efficient appliances) reduces use of non-renewable biomass for combustion.	Energy efficiency	Potential projects would be out of MidSEFF coverage. Development of carbon projects with this methodology would require a PoA due to comparatively high development costs.
	ACM0008	Consolidated methodology for coal bed methane, coal mine methane and ventilation air methane capture and use for power (electrical or motive) and heat and/or destruction through flaring or flameless oxidation	Capture and destruction of coal bed methane, coal mine methane or ventilation air methane through oxidation or energy generation, from new or existing coal mines.	Mining/mineral production	There is no known application of the project type in Turkey. However, potential projects might be in MidSEFF coverage.
Industry	ACM0012	Consolidated baseline methodology for GHG emission reductions from waste energy recovery projects	Energy from waste heat, waste gas or waste pressure in an existing or new industrial facility is recovered and used for in-house consumption or for export, by installation of a new power and/or heat and/or mechanical energy generation equipment, or by installation of a more-efficient electricity generation equipment than already existing	Energy Efficiency	The methodology covers most of the industrial energy efficiency projects which might be covered under MidSEFF.
	ACM0006	Consolidated methodology for electricity and heat generation from biomass residues	Generation of power and heat in thermal power plants, including cogeneration plants using biomass residues. Typical activities are new plant, capacity expansion, energy efficiency improvements or fuel switch projects.	Renewable Energy	The methodology may have target areas in agribusiness like sugar manufacturing which is abundant in Turkey. Potential financing volumes fall under MidSEFF coverage.
	ACM0005	Consolidated baseline methodology for increasing the blend in cement production of nitric acid plants	Installation of a catalytic reduction unit inside an ammonia oxidation reactor of a nitric Use of blending material (e.g. fly ash, gypsum, slag) to decrease the share of clinker in cement.	Cement Production	The project type is out of MidSEFF coverage.

	AM0034	Catalytic reduction of N2O inside the ammonia burner of nitric acid plants	Installation of a catalytic reduction unit inside an ammonia oxidation reactor of a nitric acid plant to destroy N2O emissions.	GHG destruction	There is no known application of the methodology in Turkey. In addition the project type is out of MidSEFF coverage.
	AMS-II.D.	Energy efficiency and fuel switching measures for industrial facilities	Energy efficiency measures such as efficient motors, pumps, boilers, power generation, etc., for specific industrial or mining and mineral production processes (such as steel furnaces, paper drying, tobacco curing, etc.) through new installation or retrofit/replacements.	Energy Efficiency	The methodology has target areas in Turkey, especially in steel manufacturing. However, potential emission reductions from these projects can be an issue for MidSEFF requirements.
	AMS-III.Q.	Waste energy recovery (gas/heat/pressure) projects	Utilization of waste energy at existing facilities as an energy source for producing electrical / thermal / mechanical energy, including cogeneration	Energy Efficiency	This methodology is the small scale version of ACM0012.
	AMS-III.B.	Switching fossil fuels	The fossil fuel switching in new or existing industrial, residential, commercial, institutional or electricity generation applications.	Fuel/feedstock switch	There is no known application in Turkey.
Waste Management	ACM0001	Consolidated baseline and monitoring methodology for landfill gas project activities	Capture of landfill gas (LFG) and its flaring and/or use to produce energy and/or use to supply consumers through natural gas distribution network.	GHG destruction	The methodology has wide application areas. The project type falls under MidSEFF coverage.
	AM0025	Avoided emissions from organic waste through alternative waste treatment processes	The project involves one or a combination of the following waste treatment options: composting process in aerobic conditions; or gasification to produce syngas and its use; or anaerobic digestion with biogas collection and flaring and/or its use (this includes processing and upgrading biogas and then distribution of it via a natural gas distribution grid); or mechanical/thermal treatment process to produce refuse-derived fuel (RDF)/ stabilized biomass (SB) and its use; or incineration of fresh waste for energy generation, electricity and/or heat.	Renewable Energy	The methodology has wide application areas. The project type falls under MidSEFF coverage.

	ACM0014	Mitigation of greenhouse gas emissions from treatment of industrial wastewater	Treatment of industrial wastewater in a new anaerobic digester, capture and flaring or utilizing of the generated biogas for electricity or heat generation; or treatment of industrial wastewater in the same treatment plant as in the baseline situation but treatment of the sludge from primary and/or secondary settler either in a new anaerobic digester or treatment of sludge under clearly aerobic conditions.	Waste handling and disposal	The methodology has wide application areas. The project type falls under MidSEFF coverage.
	AMS-III.E.	Avoidance of methane production from decay of biomass through controlled combustion, gasification or mechanical/thermal treatment	Decay of the wastes that would have been left to decay or are already deposited in a waste disposal site is prevented through controlled combustion; or gasification to produce syngas/producer gas; or mechanical/thermal treatment to produce refuse-derived fuel (RDF) or stabilized biomass (SB)	Waste handling and disposal	The methodology has wide application areas. It is the small scale version of AM0025. The project type falls under MidSEFF coverage.
	AMS-III.F.	Avoidance of methane emissions through controlled biological treatment of biomass	Controlled biological treatment of biomass or other organic matter is introduced through one, or a combination, of the following measures: aerobic treatment by composting and proper soil application of the compost; or anaerobic digestion in closed reactors equipped with biogas recovery and combustion/flaring system.	Waste handling and disposal	The methodology has wide application areas. The project type falls under MidSEFF coverage.
	AMS-III.G.	Landfill methane recovery	Capture and combustion of methane from landfills used for disposal of residues from human activities including municipal, industrial and other solid wastes containing biodegradable organic matter	Waste handling and disposal	The methodology has wide application areas. It is the small scale version of AM0001. The project falls under MidSEFF coverage
	AMS-III.H.	Methane recovery in wastewater treatment	Recovery of biogas resulting from anaerobic decay of organic matter in wastewaters through introduction of anaerobic treatment system for wastewater and/or sludge treatment	Waste handling and disposal	The methodology has wide application areas. The project type falls under MidSEFF coverage.
Buildings	AMS-II.E.	Energy efficiency and fuel switching measures for buildings	Installation of, or replacement or retrofit of, existing equipment with energy efficiency (e.g. efficient appliances, better insulation) and optional fuel switching (e.g. switch from oil to gas) measures in residential, commercial or institutional buildings.	Energy Efficiency	Heat insulation is underlined in the NCCAP. However, the project type is out of MidSEFF coverage.
	AMS-II.J.	Demand-side activities for efficient lighting technologies	Activities for adoption of self-ballasted compact fluorescent lamps (CFLs) to replace incandescent lamps (ICLs) in residential applications.	Energy Efficiency	The project type is out of MidSEFF coverage

Agriculture	AMS-III.D.	Methane recovery in animal manure management systems	Replacement or modification of existing anaerobic manure management systems in livestock farms to achieve methane recovery and destruction by energetic use of the recovered methane.flaring/combustion or	GHG destruction	The methodology will have application areas in Turkey but potential project sizes would be too small for MidSEFF as there are no sizable forms to develop high CAPEX projects to be developed with this methodology.
Land Use	AR-AMS0001	Simplified baseline and monitoring methodologies for small-scale A/R CDM project activities implemented on grasslands or croplands with limited displacement of pre-project activities	Afforestation/reforestation of grasslands or croplands.	GHG removal by sinks	The project type is outside of MidSEFF coverage
	AR-ACM0001	Afforestation and reforestation of degraded land	Afforestation/reforestation of degraded lands.	GHG removal by sinks	The project type is outside of MidSEFF coverage

3.2. Overview of methodologies relevant for MidSEFF projects

From the 29 methodologies identified above, 14 methodologies are applicable to the three project categories financed under MidSEFF: Renewable energy of 10 – 50 MW, commercial energy efficiency investments, and private sector investments in municipal or industrial waste-to-energy projects.

Table 7: Relevant methodologies for projects financed under MidSEFF

	Methodology	Definition	Typical Project(s)	Type	Comments
Renewable Energy	**ACM0002**	Consolidated baseline methodology for grid-connected electricity generation from renewable sources	Construction and operation of a power plant that uses renewable energy sources and supplies electricity to the grid (greenfield power plant). Retrofit, addition of an existing power plant is also applicable	Renewable Energy	This methodology is the most widely used methodology in Turkey for renewable energy projects, especially wind- and hydro-power.
	AMS-I.D	Grid connected renewable electricity generation	Construction and operation of a power plant that uses renewable energy sources and supplies electricity to the grid (greenfield power plant) or retrofit, replacement or capacity addition of an existing power plant that uses renewable energy sources and supplies electricity to the grid.	Renewable Energy	This methodology is the small scale version of ACM0002.
Energy Efficiency	**ACM0012**	Consolidated baseline methodology for GHG emission reductions from waste energy recovery projects	Energy from waste heat, waste gas or waste pressure in an existing or new industrial facility is recovered and used for in-house consumption or for export, by installation of a new power and/or heat and/or mechanical energy generation equipment, or by installation of a more-efficient electricity generation equipment than already existing	Energy Efficiency	The methodology covers most of the industrial energy efficiency projects which may be carried out under MidSEFF.
	AMS-II.D.	Energy efficiency and fuel switching measures for industrial facilities	Energy efficiency measures such as efficient motors, pumps, boilers, power generation, etc., for specific industrial or mining and mineral production processes (such as steel furnaces, paper drying, tobacco curing, etc.) through new installation or retrofit/replacements.	Energy Efficiency	The methodology has application areas in Turkey especially in steel manufacturing.
	AMS-III.Q.	Waste energy recovery (gas/heat/pressure) projects	Utilization of waste energy at existing facilities as an energy source for producing electrical / thermal / mechanical energy, including cogeneration	Energy Efficiency	This methodology is the small scale version of ACM0012.
Waste to	**ACM0006**	Consolidated methodology for electricity and heat generation from biomass residues	Generation of power and heat in thermal power plants, including cogeneration plants using biomass residues. Typical activities are new plant, capacity expansion, energy efficiency improvements or fuel switch projects.	Renewable Energy / Waste to Energy	The methodology may have target areas in agribusiness like sugar manufacturing, which has extensive application in Turkey.

	ACM0008	Consolidated methodology for coal bed methane, coal mine methane and ventilation air methane capture and use for power (electrical or motive) and heat and/or destruction through flaring or flameless oxidation	Capture and destruction of coal bed methane, coal mine methane or ventilation air methane through oxidation or energy generation, from new or existing coal mines.	Mining/mineral production	There is no known application of the methodology in Turkey. However, potential projects may fall under MidSEFF coverage.
	ACM0001	Consolidated baseline and monitoring methodology for landfill gas project activities	Capture of landfill gas (LFG), flaring and/or energy generation and/or to supply consumers through natural gas distribution network.	GHG destruction	The project type is supported by NCCAP. The methodology has wide application areas. The project type also falls under MidSEFF coverage.
	AM0025	Avoided emissions from organic waste through alternative waste treatment processes	The project involves one or a combination of the following waste treatment options: composting process in aerobic conditions; or gasification to produce syngas and its use; or anaerobic digestion with biogas collection and flaring and/or its use (this includes processing and upgrading biogas and then distribution of it via a natural gas distribution grid); or mechanical/thermal treatment process to produce refuse-derived fuel (RDF)/ stabilized biomass (SB) and its use; or incineration of fresh waste for energy generation, electricity and/or heat.	Waste to Energy / Renewable Energy	The project type is supported by NCCAP. The methodology has wide application areas. The project type also falls under MidSEFF coverage.
	ACM0014	Mitigation of greenhouse gas emissions from treatment of industrial wastewater	Treatment of industrial wastewater in a new anaerobic digester, capture and flaring or utilizing of the generated biogas for electricity or heat generation; or treatment of industrial wastewater in the same treatment plant as in the baseline situation but treatment of the sludge from primary and/or secondary settler either in a new anaerobic digester or treatment of sludge under clearly aerobic conditions.		The project type is supported by NCCAP. The project type falls under MidSEFF coverage.

	AMS-III.E.	Avoidance of methane production from decay of biomass through controlled combustion, gasification or mechanical/thermal treatment	Decay of the wastes that would have been left to decay or are already deposited in a waste disposal site is prevented through controlled combustion; or gasification to produce syngas/producer gas; or mechanical/thermal treatment to produce refuse-derived fuel (RDF) or stabilized biomass (SB)	Waste handling and disposal	The project type is supported by NCCAP. The methodology is the small scale version of AM0025. The project type falls under MidSEFF coverage
	AMS-III.F.	Avoidance of methane emissions through controlled biological treatment of biomass	Controlled biological treatment of biomass or other organic matter is introduced through one, or a combination, of the following measures: aerobic treatment by composting and proper soil application of the compost; or anaerobic digestion in closed reactors equipped with biogas recovery and combustion/flaring system.	Waste handling and disposal	The project type is supported by NCCAP. The project falls under MidSEFF coverage.
	AMS-III.G.	Landfill methane recovery	Capture and combustion of methane from landfills used for disposal of residues from human activities including municipal, industrial and other solid wastes containing biodegradable organic matter	Waste handling and disposal	The project type is supported by NCAAP. The methodology is the small scale version of AM0001. The project type falls under MidSEFF coverage.
	AMS-III.H.	Methane recovery in wastewater treatment	Recovery of biogas resulting from anaerobic decay of organic matter in wastewaters through introduction of anaerobic treatment system for wastewater and/or sludge treatment	Waste handling and disposal	The project type is supported by NCAAP. The project type falls under MidSEFF coverage.