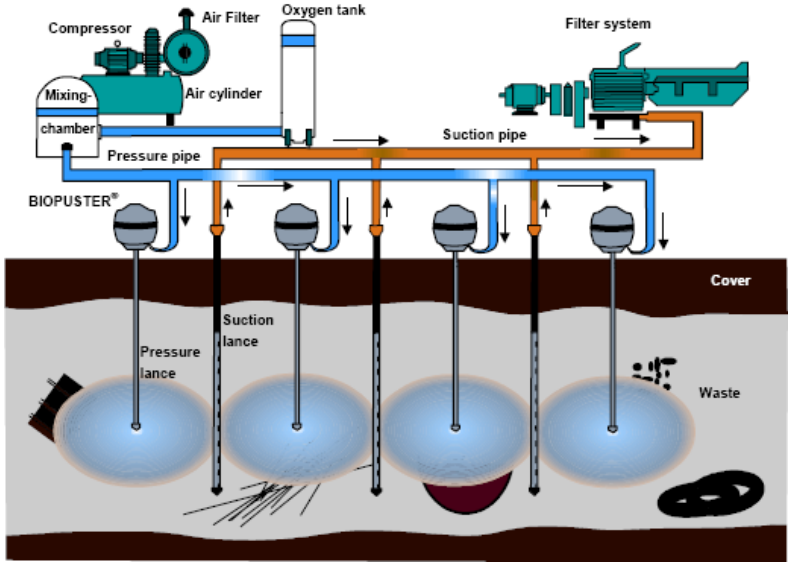
Annotation Agenda #43

AMS-III.AF ‘Avoidance of methane emissions through excavating and composting of partially decayed municipal solid waste (MSW)’

AMS-III.AF Avoidance of methane emissions through controlled biological treatment of partially decayed municipal solid waste (MSW)



AMS-III.AF

- Step 1: Aerobic pre-treatment
  - Aerate closed SWDS with 20-40% O2 enriched high pressure air or low pressure air for safe operation of the subsequent excavation
  - Short period e.g. a few of weeks (in contrast to 6-7yrs for bio-stabilization in AM0083)
  - Sample based monitoring of extraction gas pipes as well as monitoring wells (O2 => 1% and CH4<=5%)
- Step 2: Excavation and separation
  - Separate the excavated MSW into inert and non-inert
  - Non inert passes through mesh size of 25-60mm, rest is inert;
  - Excavation to commence immediately after the aerobic pre-treatment phase, i.e., without significant time lag
- Step 3: Composting and soil application
  - Composting non-inert material in enclosed chambers or roofed site
  - Proper soil application of the compost
- SWDS land not used for a landfill not equipped with methane recovery and combustion

AMS-III.AF Controlled biological treatment of MSW

Baseline emissions is min of ex-ante and ex-post calculations:

- **Ex-ante** (*BEy, ex-ante*) as per the approaches in **AMS-III.E with three options** to choose from i.e.
  - weighted average age considering yearly amount of waste deposited in SWDS (if yearly amount is unknown arithmetic mean age i.e. half of maximum age)
  - Based on yearly amount of waste removed from SWDS relative to total waste in the SWDS
  - Based on age distribution of the waste removed from SWDS (waste divided into n components and weighted average age is determined)
- **Ex-post** (*BEy, ex-post*), based on **laboratory analysis** of **sample of non inert waste** removed from SWDS
  - **methane generation potential** (Lo) based on biochemical methane potential (BMP) analysis
  - **90/10 precision for sampling**
  - National/international standard (e.g. EN TR 15310) can be used for sampling and lab test
  - Exponential decay rates consistent with AM 00083

AMS-III.AF Controlled biological treatment of MSW

Project emissions:

- CO_2 emissions from electricity and/or fossil fuel consumption
- Emissions from the oxygen consumption during aeration process, if applicable;
  - In the absence of project specific data a default value of 0.64 tCO_2e/Nm^3 O_2
- Methane emissions during composting process, neglected if sample based monitoring shows oxygen content >8%

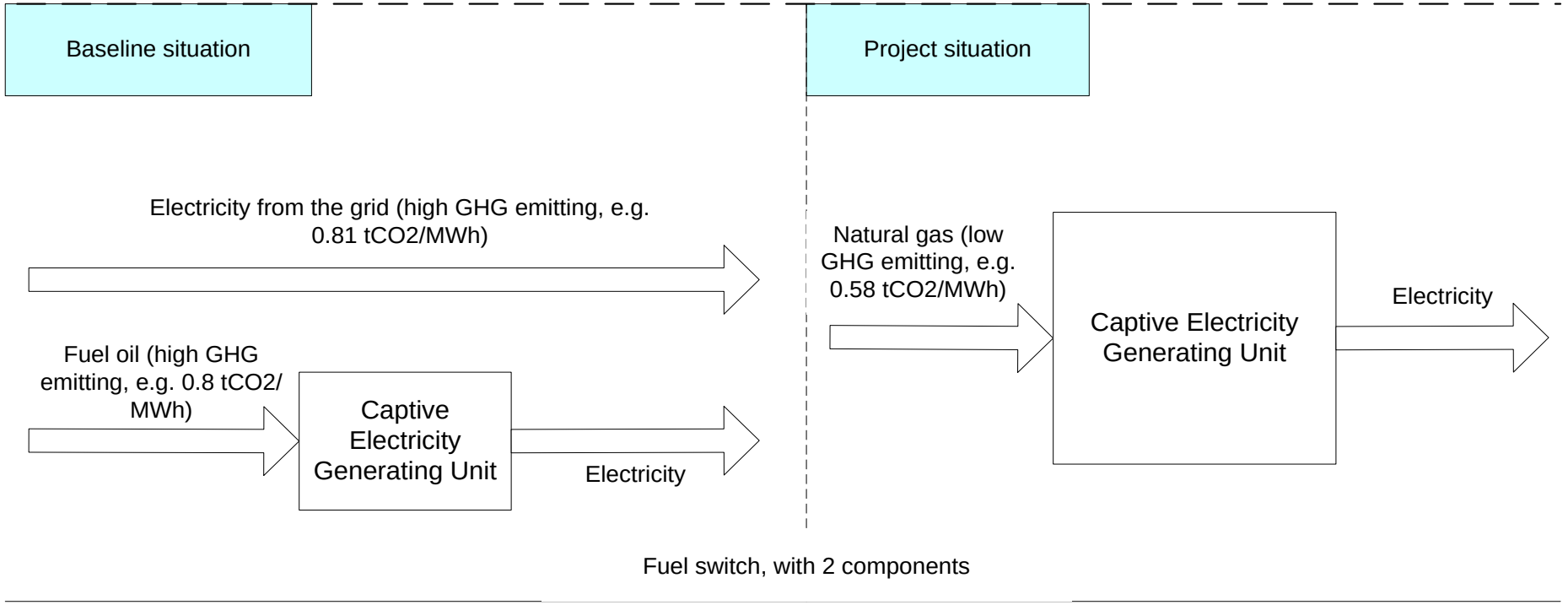
Key parameters monitored:

- Quantity of non inert waste excavated and quantity of compost produced;
- Quantity of oxygen consumed for high pressure aeration process, if applicable;
- Parameters related to *ex post* determination of baseline emissions i.e. methane production potential

Annotation Agenda #44

AMS-III.AG ‘Switching from high carbon intensive grid electricity to low carbon intensive fossil fuels’

AMS-III AG: Switching from high carbon intensive grid electricity to low carbon intensive fossil fuels



- Sole energy source or **one of the energy sources** in the baseline is **high carbon intensive grid electricity**

- Applicable for **retrofit or replacement of existing installations**, **not applicable** to **Greenfield projects**, emission reductions from **grid export of electricity** i.e. electricity is for captive consumption.

AMS-III AG: Switching from high carbon intensive grid electricity to low carbon intensive fossil fuels

- **Baseline emission** determined:
  - based on **historical information** (**3 years data** or for newer facilities **at least one year data**).
  - **As project energy output** multiplied by baseline **emission factor (minimum of the two- the grid emission factor and baseline plant emission factor**)
  - **Grid emission factor** as per **AMS I D methods and tool to calculate emission factor** for an electricity systems

Annotation Agenda #45

AMS-III.AH Shift from high carbon intensive fuel mix ratio to low carbon intensive fuel mix ratio

AMS-III.AH: Shift from high carbon intensive fuel mix ratio to low carbon intensive fuel mix ratio

- **Baseline fuel mix ratio for electricity production:**

  Heavy Fuel Oil: Natural Gas: Diesel in the ratio **69:30:1**

  (Share of NG could not be increased due to technical limitations of the engine in the baseline)

- **Project fuel mix ratio for electricity production:**

A new gas engine is installed:

  - During gas availability period (75% of the year) Heavy Fuel Oil: Natural Gas: Diesel use ratio is **0:99:1**
  - During gas shedding period ratio is : **100:0:1**
  - Over the year: **25:74:1**

•Applicable for **retrofit/replacement of existing installations**, **not applicable to new facilities, capacity expansion**

AMS-III.AH: Shift from high carbon intensive fuel mix ratio to low carbon intensive fuel mix ratio

- **Heat/Electricity generation for captive use, ER does not accrue from export of electricity to the grid**
- **Baseline emission** determined:
  - based on **historical information** (**3 years data** or for newer facilities **at least one year data**).
  - During the crediting period, if there is a restricted availability of a particular baseline fuel on account of local regulations the baseline is adjusted in a conservative manner i.e., baseline adjusted downwards but no upward adjustment of baseline emissions is allowed

Annotation Agenda #46

Revision of AMS-III.Y:
Methane avoidance through separation of solids from wastewater or manure treatment systems

Revision of AMS-III.Y:

Methane avoidance through separation of solids from wastewater or manure treatment systems

- Methodology expanded to allow the use of flocculent in the pre-separation phase
- Default emission factors related to production and combustion of flocculent included.
- EB guidelines on type III new facilities and existing facilities added (as per AMS III.H)
- Procedures of AMS III H for baseline emissions (historical records or 10 days measurement campaign) added.
- Flexibility to use IPCC COD or BOD values for methane producing potential of waste water added (0.25 kg of methane per kg COD or 0.6 kg methane per kg of BOD with a model correction factor of 0.89)

Annotation Agenda #47

Revision of AMS-I.D:
Grid connected renewable electricity generation

Revision of AMS-I.D:
Grid connected renewable electricity generation

- In response to **SSC_323** requesting clarification on **consideration of thresholds and reservoir emissions in SSC hydro projects**, SSC WG recommends that:
  - Such emissions/thresholds are considered as per ACM0002 procedures (i.e. in accordance with Board's procedures defined in Annex 5 of EB 23)
  - Hydro power plants with reservoirs satisfy atleast one of the following conditions to be eligible to apply AMS I D:
    - The project implemented in an existing reservoir, with no change in the volume of reservoir;
    - The project implemented in an existing reservoir, where the volume of reservoir is increased such that power density is greater than 4 W/m2;
    - The project results in new reservoirs such that the power density of the power plant is greater than 4 W/m2.

Revision of AMS-I.D:
Grid connected renewable electricity generation

The thresholds are as follows:

i. Hydroelectric power plants with **power densities** (installed power generation capacity divided by the flooded surface area) **less than or equal to 4 W/m2 cannot use current methodologies**;

ii. Hydroelectric power plants with **power densities greater than 4 W/m2 but less than or equal to 10 W/m2** can use the **currently approved methodologies**, with **an emission factor of 90 gCO2eq/kWh** for project reservoir emissions;

iii. Hydroelectric power plants with **power densities greater than 10 W/m2 can use current approved methodologies and the project emissions from the reservoir may be neglected.**

Revision of AMS-I.D:
Grid connected renewable electricity generation

Type of dam	Validating	Registered	Rejected/ validation terminated etc	Total	% of total
Run of the river	325	186	48	559	81.0
Existing Dam	15	19	6	40	6.0
New Dam	52	30	7	89	13.0
Total	392	235	61	688	100.0

Revision of AMS-I.D:
Grid connected renewable electricity generation

- **81% projects** (559 out of 688) are **run of the river**
- **13% projects** (89 total, 30 registered and 52 validating) are '**new dam**' where the **reservoir emissions can not be ruled out.**
- **Existing dam** projects **6%** (19 registered, 15 validating) reservoir emissions may be relevant in cases where the volume of the reservoir is increased.
- **Project emissions** for a hypothetical SSC project with power density **>4 W/m2 but <=10 W/m2** will **be11% of total emission reductions**
  - assuming installed capacity of 15 MW
  - taking utilization factor of 50%
  - emission factor of 800 g CO2/kWh
  - 90 gCO2e/kWh default from annex 5 EB 23.

Revision of AMS-I.D:
Grid connected renewable electricity generation

- Other changes: project emissions of geothermal power plants referred to ACM 002 procedures (e.g., non-condensable gases, electricity/fossil fuel consumption)

Annotation Agenda #48

General guidelines for sampling and surveys for SSC project activities

General guidelines for sampling and surveys for SSC project activities

- EB 47 considered draft sampling guidelines recommended by the SSC WG
- Requested public inputs on the draft
- Taking into account public inputs SSC WG 22 recommended a revised guidelines

Sampling guidelines- public inputs

- Remove examples and equations in favor of **referring to standard text** or alternatively **examples annexed for illustration** only (**more examples** of project types demonstrating **application of sampling methods** should be included)
  - **Random, systematic and stratified** sampling well illustrated with examples but equations/examples for **cluster, multi stage and area sampling not sufficiently covered**
- More clarity on use of **90/30 precision and 80/20** precision e.g. use for leakage estimation
- Consideration of non-response or circumstances of inadequate information e.g. use of discounting of reductions

Sampling guidelines- public inputs

- Use of data from national sources e.g. National level statistic bureaux (e.g. office responsible for taking Census)
- Subsections for different sectors (transport v/s demand side EE), guidance for CPA of PoA v/s normal project
- Guidance to DOE in the VVM

General guidelines for sampling and surveys for SSC project activities

- Subject to two requirements of ***unbiased ness and reliability*** **PPs have broad discretion** in the sampling approach for the estimates:
  - *Unbiased* estimates (sampling will not systematically underestimate or overestimate the mean)
  - *Reliability* is minimum confidence/precision levels e.g. 90/10
- **Procedures for reliability** of sample estimates and **guidelines for sampling plan documentation** provided
- Commonly used **sampling methods** are summarized along with description of **circumstances where each is most applicable**
- **Guidance** on good **practices for sampling frame**, **effective information collection, minimizing non response and** a set of questions for **evaluation criteria** included
- **Equations/Examples are not currently included**, WG will propose a comprehensive set of non binding best practice examples at a later date

General guidelines for sampling and surveys for SSC project activities

- Procedure: Where there is **no specific guidance** in the applicable **methodology**, **90/10 confidence/precision** should be chosen for reliability of sampling.
- Sampling plan documentation
  - **Sampling Objective:** time frame of parameter value and confidence/precision e.g. mean monthly value of parameter “X” and with a 90/10 confidence/precision
  - **Field Measurement Objectives and Data to be collected:** Variables and data to collected, the scope and method of the survey or field measurements, their frequency

Sampling guidelines

- Sampling plan documentation (contd)
  - **Sample Method.**
  - **Desired Precision/Expected Variance and Sample Size:** present and justify the sample size including a prediction of the variance of parameters and basis for the prediction, include formulas for confidence and precision of determined parameter value
  - **Procedures for Data Collection and Minimizing Non-Sampling Errors**. Data collection, training of field personnel, provisions for maximizing response rates. An overall quality control and assurance strategy should be documented
  - **Implementation:** Schedule of implementation, qualifications, experience and any potential conflicts of interest of those involved in the data collection and analyses

Guidance on sampling and surveys

Coefficient of variation=0.5		
Precision	Confidence Level	
	90%	95%
1%	6765	9604
5%	271	384
10%	68	96

Coefficient of variation=1.0		
Precision	Confidence Level	
	90%	95%
1%	27060	38416
5%	1082	1537
10%	271	384

Sampling guidelines

- Choice of a type of sample depends on
  - types of information to be collected through sampling,
  - the known characteristics of the population,
  - the cost of information gathering.
- A **simple random sample:** (each individual has the same probability of being chosen at any stage during the sampling process)
- **Systematic Sampling:** (every *k*th element in the frame is selected, chosen sampling interval does not hide a pattern, homogeneous population)
- **Stratified Random Sample:** for relatively homogeneous subpopulations (e.g. the population of participants in a commercial lighting program might be grouped according to building type)
- **Cluster Sampling:** population is divided into sub-groups (clusters), and the sub-groups are sampled (e.g. operating hours of the motors by sampling buildings instead of the motors, and then meter all of the motors in the selected buildings). Area sampling or geographical cluster sampling are variations of cluster sampling
- **Multistage sampling:** In contrast to cluster sampling where all of the secondary units (elements) are measured, data are collected for only a sample of the sub-units

Guidance on sampling and surveys