NAMAs on Waste Management: Modelling reduction potential/ BAU Scenarios

Sandra Aparcana
UNEP DTU Partnership

NAMA training
Maputo, Mozambique - Sep 2015

Key aspects

Key sources of GHG emissions and the factors influencing their generation:

- Organic material and its content of degradable organic carbon (DOC): GHG emissions are directly proportional to the DOC (depends greatly on the waste composition and characteristic).

Emissions from recycling can be accounted including other industrial production processes where the recycled material is used and transportation, might be calculated depending on the project boundaries -- geography, duration, process boundaries, etc.

The summarized first step for calculating GHG emissions is to determine data on:

✓ Waste generation (amounts)

✓ Waste composition

✓ Waste management practices (treatment and final disposal)

Collecting data - approaches

✓ Default data or Tier 1

- Region-specific default data on per capita MSW generation, composition, and management practices has been estimated by the IPCC guidelines, based on country-specific data from a limited number of countries in the regions.

✓ Country-specific data or tier 2

considered good practice to use country own specific data on waste generation, waste composition and waste practices, when it comes to the calculation of GHG emissions.

✓ Data from waste stream analyses or tier 3

Data collection of specific projects and technologies used in the country. A more accurate but data intensive approach for data collection is to follow the waste flows and their treatment, to determine changes in composition and, therefore, in GHG emissions. It requires high quality country-specific data on waste quantities, treatments and current state of the used technology. This approach is often complemented with modelling.

UNEP DTU PARTNERSHIP

MSM generation and treatment data - regional defaults (IPCC, 2006)

Region	MSW Generation Rate[1, 2, 3] (tonnes/cap/yr)	Fraction of MSW disposed to SWDS	Fraction of MSW incinerated	Fraction of MSW composted	Fraction of other MSW management, unspecified[4]
Asia					
Eastern Asia	0.37	0.55	0.26	0.01	0.18
South-Central Asia	0.21	0.74	-	0.05	0.21
South-East Asia	0.27	0.59	0.09	0.05	0.27
Africa[5]	0.29	0.69	-	-	0.31
Europe					
Eastern Europe	0.38	0.90	0.04	0.01	0.02
Northern Europe	0.64	0.47	0.24	0.08	0.20
Southern Europe	0.52	0.85	0.05	0.05	0.05
Western Europe	0.56	0.47	0.22	0.15	0.15
America					
Caribbean	0.49	0.83	0.02	-	0.15
Central America	0.21	0.50	-	-	0.50
South America	0.26	0.54	0.01	0.003	0.46
North America	0.65	0.58	0.06	0.06	0.29
Oceania[6]	0.69	0.85	-	-	0.15

Relevant existing methodologies

- ✓ CDM, e.g "ACM0022: Alternative waste treatment processes" (https://cdm.unfccc.int/methodologies/DB/YINQ0W7SUYOO2S6GU8E5DYVP2ZC2N3); Methodological tool "emissions from solid waste disposal sites" (https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-04-v6.0.0.pdf) can be used for calculating emissions from landfills.
- ✓ Methodological “Tool to calculate baseline, project and/or leakage emissions from electricity consumption”. For energy recovery, as used as electricity
- ✓ and others…

These methodologies include procedures to calculate baselines, project or leakage emissions, as well as the estimation of total emission reductions of waste management projects. Depending on type of waste treatment or processing chain to be applied, the application of tools and their equations may vary and be combined differently.

Business as Usual Scenario (BAU)

- Starting by:

  - ✓ Calculating waste generation, waste composition and current waste practices.
  - ✓ Generated waste: may be calculated: based on statistics of yearly waste generation per capita (kg waste/person/day), yearly increase of waste generation per capita (% increase/year), and population growth.
  - ✓ The waste composition can be estimated based on a sample of waste analysis locally performed and can be used for the estimation of baselines on a regional or national level.
  - ✓ In theory, the waste composition should also be modelled according to possible changes due to consumption behaviour changes, industrial development, etc., (difficult to forecast due to high uncertainties).

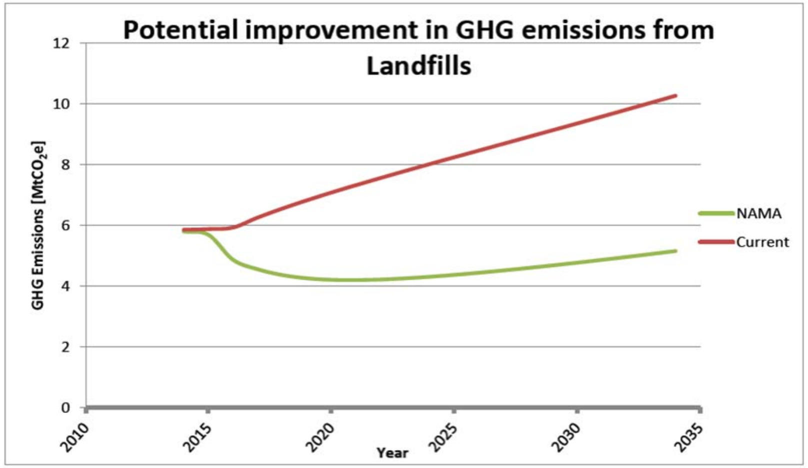
BAU and mitigation strategy - Colombia

Total emissions waste sector: 10.3 million tCO_2e. Waste sector emissions are expected to double by 2035 under a BAU scenario, due to an anticipated strong economic and population growth.

NAMA - expected results:

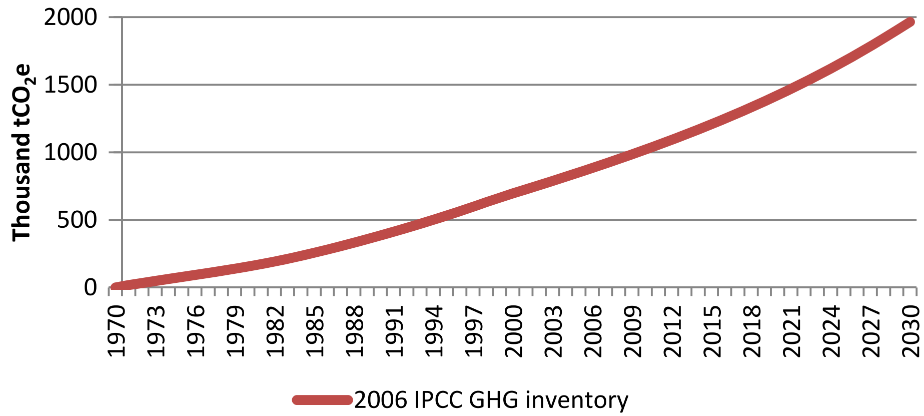
- ✓ 50% landfill diversion rate (within the first 3 years): expected emission reduction of 18.2 $MTCO_2e$. Emission reductions will be achieved through:
- ✓ Reduction of biogas emissions from landfills and dump sites - a 50% diversion of waste from landfills will result in a 50% reduction of emissions from landfills; over time diversion rates are expected to increase as confidence in costs and operation of the technology improves
- ✓ Increased recycling – representing 15% of total reductions
- ✓ Increased use of compost - displacing the use of chemical fertilisers (16% of total reductions)
- ✓ Refuse-Derived Fuel use - displacing fossil fuels in cement kilns and other industrial applications (6% of total reductions)
- ✓ Decrease in transport of waste from the city to the treatment plants, thus reducing GHG emissions due to less transport over a 20 year period
- ✓ GHG emission reductions will be immediate and will mostly be methane, a strong Short-Lived Climate Pollutant (SLCP)

Baseline examples



Colombia

Mozambique



Group work: Calculation GHG emissions, reduction potential through NAMA

Identify a reporter

- BAU scenario
  1. Identify current GHG sources
  2. Describe current WM situation (collection, recycling treatment rates), technologies, etc.
  3. Explain how GHG emission would be calculated and main assumptions to be considered

Expected NAMA GHG reduction

1. Identity NAMA measures for GHG reduction
2. Describe their GHG reduction potential (how the reduction would take place? short, long term?, etc.)
3. Explain how GHG emission reduction would be calculated
4. Explain main assumptions for the calculations

UNEP DTU PARTNERSHIP

Questions & Discussion

Thanks!