Problem Statements

- Indonesia has declared a commitment to reduce 26% GHG emission using self-efforts and 41% GHG emission using international assistances by 2020.
- Waste sector ranked the fourth biggest emission contributor among all sectors that accounted 11%.
- National plan for waste sector, sets to reduce GHG emission as amount of 0.048 GtCO$_2$e for 26% target plan and 0.078 GtCO$_2$e for 41% target plan.
- Various efforts have been made by Indonesia cities to achieve the target by managing their waste with 3Rs and zero waste principles.
**Problem Statements**

- Those efforts facing many **problems:**
  1. Recycling efforts are generally done partially, not in integrated system.
  2. Development of mechanical biological treatment are still required especially for rapid composting and designing of dry anaerobic digestion.
  3. R&D for low investment and O&M of thermal technology are required.
  4. Need to sift the open dumping landfill site into sanitary landfill and treatment of their LFG.
  5. The finding a new location for landfill is very difficult.

- The TNA Study (2012): the most appropriate technology to be applied in Indonesia are mechanical-biological treatment.

**Past and on Going Efforts**

**The Past Situation:**
- Municipal solid waste management used the old paradigm.
- Waste is only collected, transported, and then disposed of to landfill.
- Waste is not considered as a resource so that attempts to recycle them into useful products is limited done.
- Most of the wastes dumped at open dumping landfill site.
- These things lead to a deterioration of environmental quality.
Past and on Going Efforts

On Going Efforts:
- MSW management sifted to the new paradigm: **waste is a resource**.
- Waste is useful materials that can be recovered its **material** and **energy** contains.
- The organic waste is **biologically** converted into compost and biogas, while plastic, paper and metal are recycled into secondary materials at neigbourhood scale and full scale.
- Research to treat residual waste using a **thermal** system.
- Landfill site are no longer using open dumping system but use **sanitary landfill**
- LFG is extracted and converted into **energy** (using low and high tech)

Mechanical/Manual Material Recovery Facilities

**Mechanical Sorting**

**Manual Sorting**

- **Organic**
- **Plastic**
- **Glass**
- **Paper**
- **Metal**
**Biological Treatment (Composting)**

- Aerobic System
- Manual/Mechanical
- Communal/Big Scale

- Mechanical Windrow Composting
- Aerated Windrow Composting
- Granulated Compost

**Biological Treatment (Biogas)**

- Anaerobic Digestion of MSW
  - Dry/Wet System
  - Batch/Continuous

- Household Scale Biogas
- Anareobic Vessel Big Scale
- Communal Scale Biogas
- Power Generation
**Mechanical Plastic Recycling**

- **Plastic Crushing**
- **Extruder**
- **Pelletizing**
- **Plastic Pellet**

**Landfill Gas Extraction and Utilization**

- Low and High tech landfill gas recovery technology
- Use for cooking, flaring, power generation

- **LFG Flaring**
- **LFG Distribution into Household**
- **BANTARGEBABNG POWER HOUSE**
Research of Thermal Treatment

Thermal Process
- Combustion (stoichiometric or excess air)
- Gasification (sub-stoichiometric air)
- Pyrolysis (no air)

Thermal Facilities
- High investment, O&M
- Low tipping fee in Indonesia (2 – 5 USD)
- No plant installed in Indonesia
- Batam and DKI Jakarta plan to build Incinerator Plant
**Assistance Requested**

- Although there are many experts of municipal solid waste, enhancing skill and knowledge of MSW treatment are still needed.
- Local government has limited human resources to manage the MSW.
- The need assistance and capacity building:
  - Identification and analysis of applied system and technology
  - Recommendation for improvement technologies.
  - Formulation the design concept of “Integrated Mechanical Biological and Thermal Treatment of Municipal Solid Waste”

**Expected Benefits**

- **The medium impact**
  Improvement the applied technology of biological and thermal treatment of municipal solid waste to mitigate the climate change in waste sector.

- **The long impact**
  Application low carbon technology using the concept of integrated mechanical biological and thermal treatment of municipal solid waste.
Post Technical Assistance Plans

- It is expected there will be the availability of a **capable team** of integrated solid waste management which consists of various stakeholders that will act as advisor toward the development of integrated mechanical biological and thermal treatment of municipal solid waste.
- Specifically, follow-up activities to be carried out after the technical assistance namely:
  - **Disseminate information** of integrated mechanical biological and thermal treatment of municipal solid waste concept.
  - **Support** the Indonesia government to implement integrated mechanical biological and thermal treatment of municipal solid waste concept.
  - **Assist the monitoring and evaluation** activities

Alignment with National Priority

- Mechanical Biological Treatment is the 1st ranking of Indonesia Technology Need Assessment 2012.
- RPJMN target 2015-2019: decentralised and centralised 3R facilities
## Key Stakeholders

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<th>Stakeholder</th>
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