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International Solid Waste Association

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# PROMOTING ANAEROBIC DIGESTION OF MUNICIPAL SOLID WASTE IN INDONESIA

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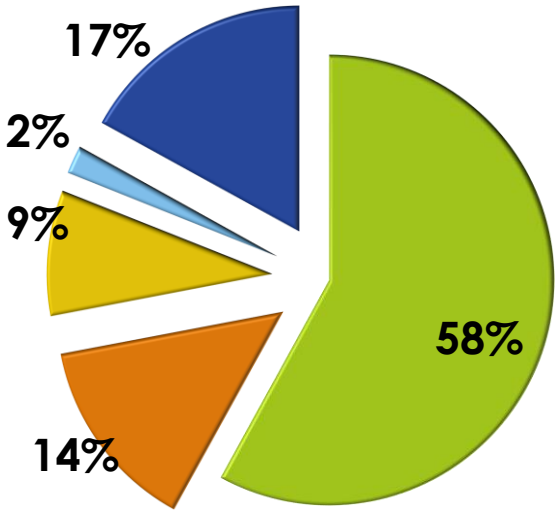
# The Archipelago of Indonesia

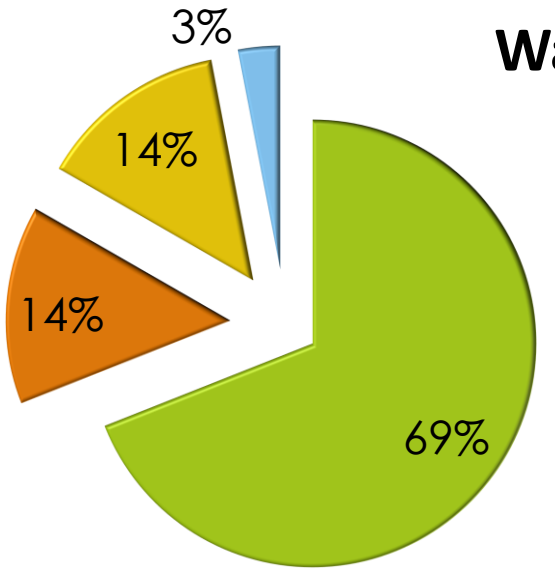

- 255 million population in 1.9 million km$^2$
- 34 provinces, 511 Cities + Regencies, 17,000 islands
- Almost 60% of the population in Java Island

# Municipal Solid Waste Characteristics and Handling




## Waste Composition

- Organic
- Plastic
- Paper
- Metal
- Woods, Glass, Rubber, Fabric, Sand, Other




## Waste Handling

- Transported to Landfill
- Buried, Burnt
- Composted, other
- Disposed

**Source**: Indonesia Domestic Solid Waste Statistics, MoE, 2008

# Policy framework: Law No 18/2008 on MSW Management

**Central Government authority:**

- Policy and strategy formulation
- Formulate national standards, procedure and guidelines
- Conduct capacity building, coordination and facilitation

**MSW Management Policy:**

- **Minimization** → 3R & EPR; **Handling** → collecting, segregation, transportation, landfill and final processing
- Close open dumping practices and shift to sanitary landfilling / W2E / other methods
- Enhance local government's services to the community

**City and District authority:**

- Responsible for the implementation of MSW management policies
- Carry out monitoring, evaluation and control

# Anaerobic digestion of MSW as an alternative energy source

- Indonesia has a long experience in the application of AD for micro / small food industries (e.g. tofu, cassava flour) and the utilization of animal manure in animal husbandry in rural areas;

- Energy is generated from waste, which would otherwise be dumped or landfilled, with savings in transport costs, and a decrease of air, soil and water pollution;

- AD development shall complement the activity of waste banks, which have been very successful in Indonesia in the recycling of inorganics (e.g. paper, plastics, etc.);

- Given the high shares of organic waste that are left untreated, there is an enormous untapped potential to generate energy from waste through AD conversion in Indonesia.

# Policy framework in Indonesia for waste-to-energy

**A Feed-in tariff system for bioenergy-based power generation is in place in Indonesia through Regulation No. 19 (2013) and No. 27 (2014) of the Ministry of Energy and Mineral Resources:**

| No. | Energy | Capacity | Electricity Tariff | Note |
|---|---|---|---|---|
| **Medium Voltage** | | | | |
| 1. | Biomass | until 10 MW | IDR 1.150,- / kWh X F ($ 8 cents) | |
| 2. | Biogas | until 10 MW | IDR 1.050,- / kWh X F ($ 7 cents) | Non Municipal Solid Waste |
| 3. | Municipal Solid Waste (MSW) | until 10 MW | IDR 1.450,- / kWh ($ 11 cents) | Zero waste |
| 4. | Municipal Solid Waste (MSW) | until 10 MW | IDR 1.250,- / kWh ($ 9 cents) | Sanitary Landfill |
| **Low Voltage** | | | | |
| 1 | Biomass | until 10 MW | IDR 1.500,- / kWh X F ($ 11 cents) | |
| 2 | Biogas | until 10 MW | IDR 1.400,- / kWh X F ($ 10 cents) | Non Municipal Solid Waste |
| 3 | Municipal Solid Waste (MSW) | until 10 MW | IDR 1.798,- / kWh ($ 13 cents) | Zero waste |
| 4 | Municipal Solid Waste (MSW) | until 10 MW | IDR 1.598,- / kWh ($ 15 cents) | Sanitary Landfill |

***F is an incentive factor based on the region where the power plant installed**

# Piloting the anaerobic digestion conversion of municipal solid waste in Jambi City (South Sumatra) and Malang Regency (East Java)

# Overview of Jambi City

| | |
|---|---|
| **Population** | 681,616 inhabitants |
| **Area** | 205.40 $km^2$ |
| **Daily waste generation** | 362.5 tons/day |
| **Waste generation rate** | 0.53 kg/capita/day |
| **Waste collection rate (waste transported to the landfill)** | 72% |
| **Institution responsible for waste management** | Sanitation, Landscaping, and Cemetery Agency |
| **Coverage area of waste management services** | 100% |