NEDO’s Feasibility Studies with the Aim of Developing a Joint Crediting Mechanism **Country**: Indonesia

“Investigation for developing energy saving and heat recovering waste treatment system “

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1. List of abbreviations

PPLi : PT. Prasadha Pamunah Limbah Industri
       Indonesian industrial waste treatment company

KLHK : Kementrian Limgkungan Hidup dan Kehutanan
       Ministry of environment and forest in Indonesia

AMDAL : Analisis Mengenai Dampak Lingkungan
         Environmental impact assessment

B3 : Bahan Berbahaya dan Beracun
     From initial B expressing a material, harm, poisonousness by Indonesian
     The B3 waste means the harmful and the toxic waste.

CDM : Clean Development Mechanism

JCM : Joint Crediting Mechanism

MRV : Measurement, Reporting and Verification

LFG : Landfill Gas

HFC : Hydrofluorocarbon

PLN : Persaahan Listrik Negara(Persero)
      Power supply national enterprise
2. Project Background

We started this project for 1st Dec 2015. We'll end up this survey by 31st May 2016 and proceed to next demonstration stage. So, this is an intermediate report. We show overview of our project in figure 2.

Figure 2 overview of this project

2-1. Japanese participants for the study

- DOWA ECO-SYSTEM Co., Ltd. (DES)

**DES** is a company dedicated to environmental management and recycling, and a wholly owned subsidiary company of **DOWA Holdings** Co., Ltd. **DOWA Eco-System** business is centered on resource recycling, waste management, soil remediation and environmental consultation.
Figure 2-1 Business Activities of DES

- **Yachiyo Engineering Co., Ltd. (YEC)**
  YEC is now one of the largest firms of consulting engineers, planners, architects and specialists operating throughout the world.

2-2. Host country’s participant for the study

- **PT Prasadha Pamunah Limbah Industri (PPLi)**
  PPLi is an Indonesian company that has been in operation since 1994 providing collection, recycling, treatment and disposal services for hazardous waste and non-hazardous waste.
  PPLi is 95% owned by DOWA and 5% by the Government of Indonesia through the Ministry of State Owned Enterprises. PPLi holding company, **DOWA Eco-System Co., Ltd.** is a company dedicated to environmental management and recycling, and a wholly owned subsidiary company of **DOWA Holdings Co., Ltd.** The Group was established in 1884 as a mining and metal smelting/refining company in Japan.
3. Project description

3-1. Objective of the FS

In Indonesia, we’ll develop the **energy saving and heat recovering waste treatment system** in PPLi. Detail is the following.

- We collect combustion energy such as the waste as thermal energy and perform fossil fuel reduction by using energy collected.

- We utilize methane gas from the landfill as substitute fossil fuel (fossil fuel replacement) of the energy saving and heat recovering waste treatment system.
  So, this method affects fossil fuel reduction and using methane gas performs reduction of the greenhouse gas by making it CO2.

- We utilize HFC as substitute fossil fuel (fossil fuel replacement) of the energy saving and heat recovering waste treatment system.
  So, this method affects fossil fuel reduction.
  And the greenhouse gas emission will be reduced by the result of destructing HFC.

We show the overview of energy saving and heat recovering system as figure 3-1.

![Figure 3-1. The image of “Energy saving and heat recovery waste treatment system”](image)

Then, rough estimation of expected GHG emission reductions (unit: tCO2/year) is as follows.

- Heat recovery : around 5-10% of generation efficiency in 1,479 - 2,958tCO2/ year.
- Using methane gas from landfill as substitute fossil fuel: 177tCO2/ year
- Using HFC as substitute fossil fuel : 12.7t-CO2/year

Additional effects are follows.
- Destruction of methane : 1,074t-CO2/ year (by old data)
- Destruction of HFC : 20,185t-CO2/ year (HFC is 0.1% of waste gross weight)
3-2. Project location and project partner

PPLi (PT. Prasadha Pamunah Limbah Industri) is located in State of west Java Bogor (Bogor), Indonesia and performs waste treatment and the landfill, recycling (mainly paper, plastic, drums). PPLi has landfill (US-EPA conformity) in the only B3 waste in Indonesia.

![Figure 3-2-1. PPLi photograph](image)

PPLi takes following steps other than the landfill as main waste treatment.

- Stabilization (to landfill after this process)
- Fuel blending (after processing, we provide it to the cement factory of the neighborhood as fuel)
- Throughput of the liquid processing (as for the chemical processing, the bio processing, the sludge to landfill) year is approximately 160,000t.

We show wastes treatment flow of PPLi in figure 3-2-2.
The quantity of waste included the organic matter is approximately 16,000t. And the waste from the food company is 3,500t. Thus, we thought that these organic wastes and residues from liquid waste treatment are maybe in a factor to produce methane gas from landfill.

We develop a transportation base and an office throughout Indonesia for collecting B3 waste by cargo of B3 waste from the various places in Indonesia. The hazardous waste is collected to PPLi from the whole land of Indonesia.
3-3. The investigation contents

We have five investigation contents.
As follows;

3-3-1. Using energy form waste treatment

The purpose of this investigation is compared with the method and the cost of each scenario. Each scenario is shown as follows.

- Recovering heat water from waste treatment facility
- Recovering vapor from waste treatment facility
- Recovering electricity from waste treatment facility and using only in PPLi
- Recovering electricity from waste treatment facility and selling electricity to PLN

3-3-2. Investigation for the methane gas form landfill in PPLi

This investigation result is used for deciding the capacity and the equipment of the facility collecting methane gas from landfill and feeding to waste treatment system.

![Measurement of methane gas form landfill](image)

Figure 3-3-2 Measurement of methane gas form landfill

3-3-3. Investigation for flammable wastes as substitute fossil fuel

Now we calculate the caloric value of B3 wastes from historical data. If other wastes such as not available for anyone are found by this investigation, we can recalculate the caloric value of total waste feeded to the waste treatment system. So, waste treatment system is changed by this investigation result.

3-3-4. Investigation for energy saving and heat recovering waste treatment system

This investigation targets are as follows;

- The permission of a waste treatment facility construction
- Waste treatment system
- Methane gas collecting system

Other investigation result affects these targets.
3-3-5. Developing of the MRV methodology

We think that it is necessary to examine three patterns. We show these patterns as follows.

- About energy collected from waste treatment related with investigation 3-3-1 and 3-3-4
- About methane collection related with investigation 3-3-2 and 3-3-4
- About flammable wastes as substitute fossil fuel such as the HFC related with 3-3-3 and 3-3-4

We show the image of CO2 reduction as figure 3-3-5.
4. Agenda of this survey

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5. Formation of this survey

- We order a waste treatment facility investigation to the Japanese incinerator maker. The Japanese incinerator maker places an order in two companies.
- We carry out investigations to suppliers of waste treatment through the consultant who is familiar with local circumstances to investigate how many substitute fuel (flammables such as HFC) is around PPLi.