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

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23th Feb 2016

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Today's Outline

1. Self-introduction
2. Over views of JCM FS Project
3. Description of technology
4. Contents of the Feasibility Studies
5. Key Result and Outcome

DOWA

1.Self-introduction : Business Activities of DOWA ECO-SYSTEM

1 Waste Treatment

Collection of mainly industrial waste and some municipal waste, and treatment of waste.

2 Soil & Groundwater Remediation

Investigation and remediation of soil & groundwater contaminated by heavy metals (lead, arsenic, etc.), oils and Volatile Organic Compounds (VOCs).

3 Metal Recycling

Recycle of precious metals from waste and scraps, such as factory discharge, discarded home appliances and end-of-life vehicles.

4 Logistics

Transportation of waste and recyclable materials mentioned above.

5 Clean Technology

Business corresponding to low-carbon societies such as biodiesel, Freon processing, the thermal recycling

Waste treatment and heat recovering plant

Soil remediation plant

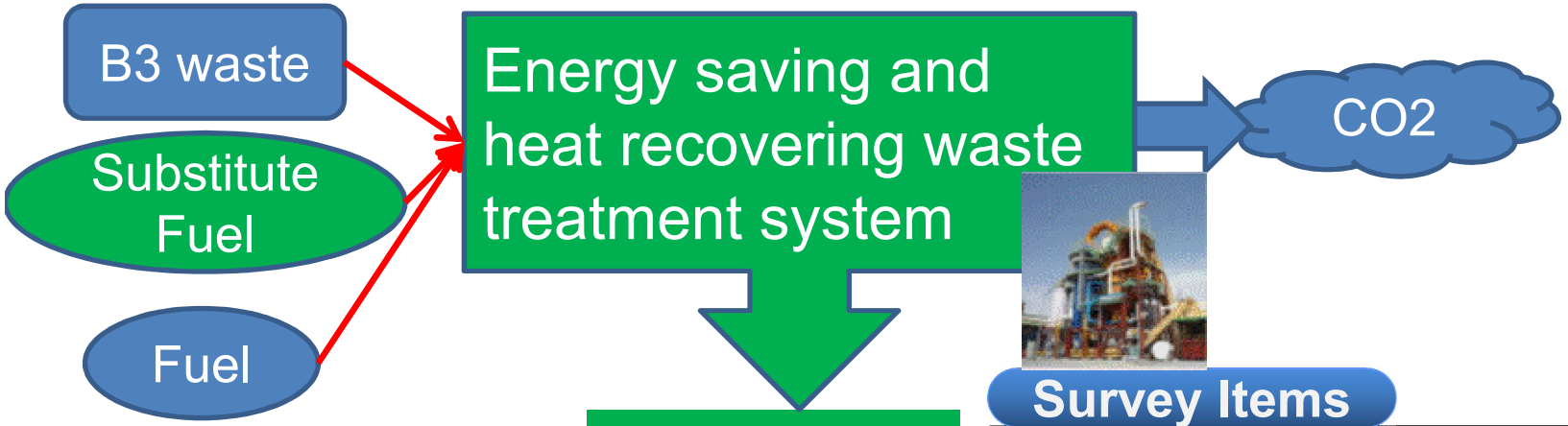
KOSAKA smelting recycling furnace

motivate our planet

2.Over views of JCM FS Project 1 : The image of Introducing waste treatment system

Reference scenario

Project scenario



Generation
- Heat water
- Vapor
- Electricity

Survey Items

- **Heat recovering**
- **Substitute fuel**
- **Energy saving and heat recovering waste treatment system**

2.Over views of JCM FS Project 2 : Estimated Emission Reduction

Estimated Emission Reduction

CO2 reduction target

- **Heat recovering**
- **Effective use of methane gas from the landfill**
- **Effective use of HFC for substitute fossil fuel**

Predict of results

・Heat recovery : 1,479 - 2,958tCO2/ year (estimate around 5-10% of generation efficiency)

・Methane as Substitute Fuel: 177tCO2/ year

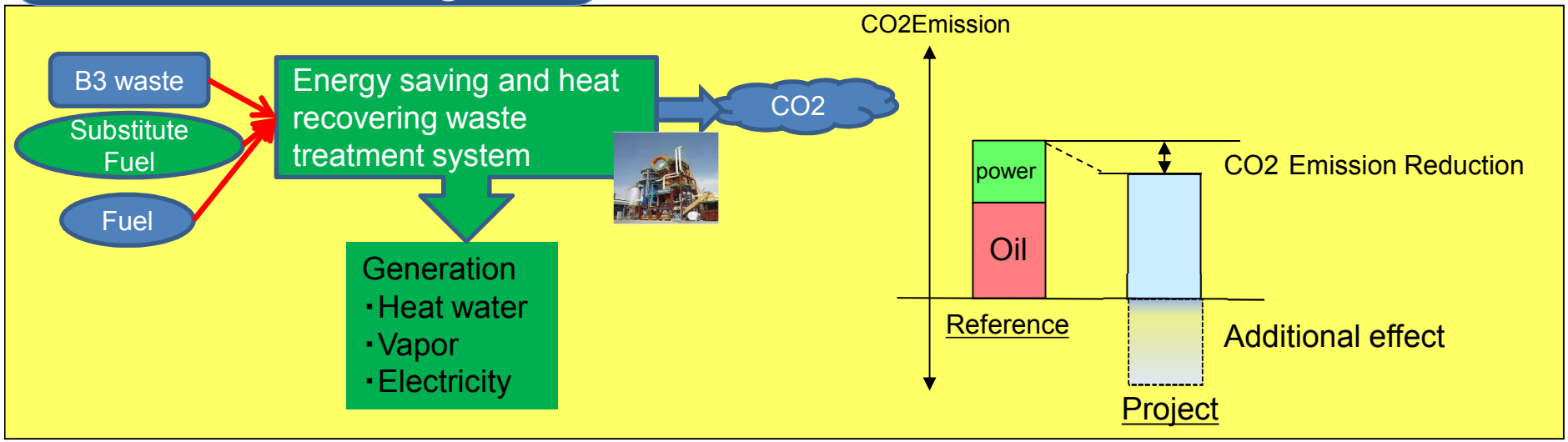
・HFC as Substitute Fuel : 12.7t-CO2/year

Additional effect

・Methane combustion: 1,074t-CO2/ year (by some spots data)

・HFC destruction: 20,185t-CO2/ year (0.1% of gross waste weight)

Reduction image



2.Over views of JCM FS Project 3 : Project details

Survey in Summary

Investigation for developing energy saving and heat recovering waste treatment system in the Republic of Indonesia

This is the study for proceeding to demonstration stage.

Schedule of this survey

Year 2015 2016

Month 12 1 2 3 4 5

Start Finish

Formation of surveying

NEDO

DOWA ECO-SYSTEM

Survey Items

- **Construction of the waste treatment system**
- **MRV methodology**

YACHIYO ENGINEERING

Survey Items

- **Regulation of heat recovering**
- **Methane gas emission from landfill in PPLi**
- **Flammable wastes as substitute fuel**

Partner / Site

PPLi

（PT. Prasadha Pamunah Limbah Industri）

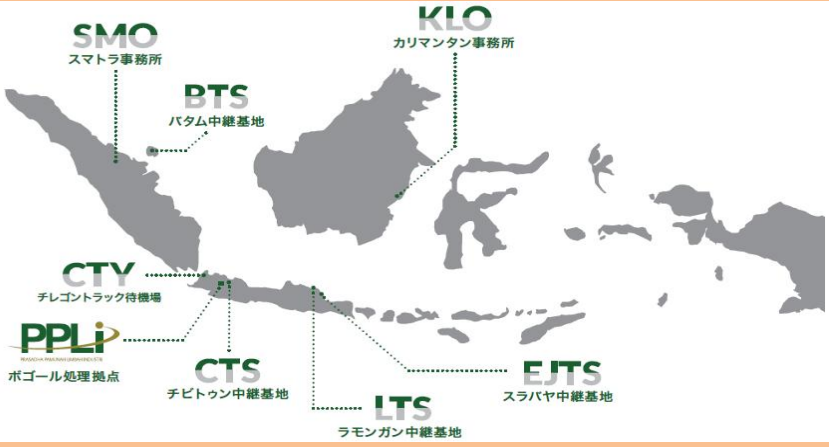
Location

Indonesia West Java Bogor

Shareholdings

DOWA=95%

The Indonesian government＝5%



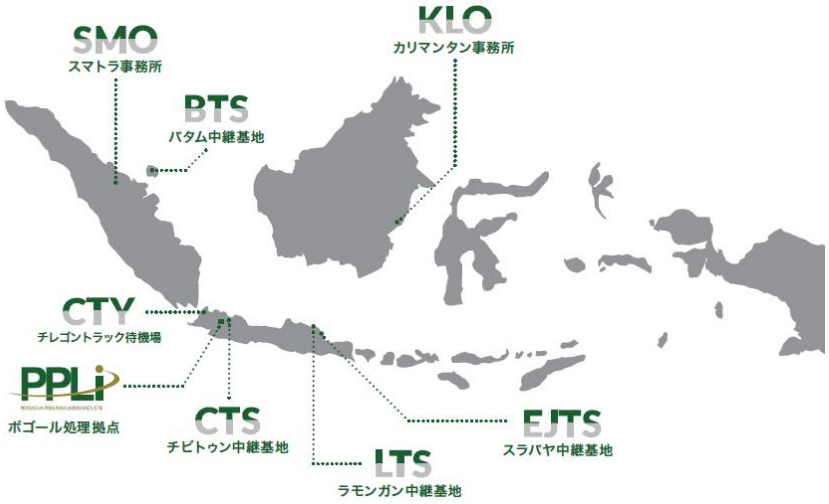
2.Over views of JCM FS 4 : Indonesia partner “PPLi”

PT. PRASADHA PAMUNAH LIMBAH INDUSTRI (PPLi)

Photograph of PPLi

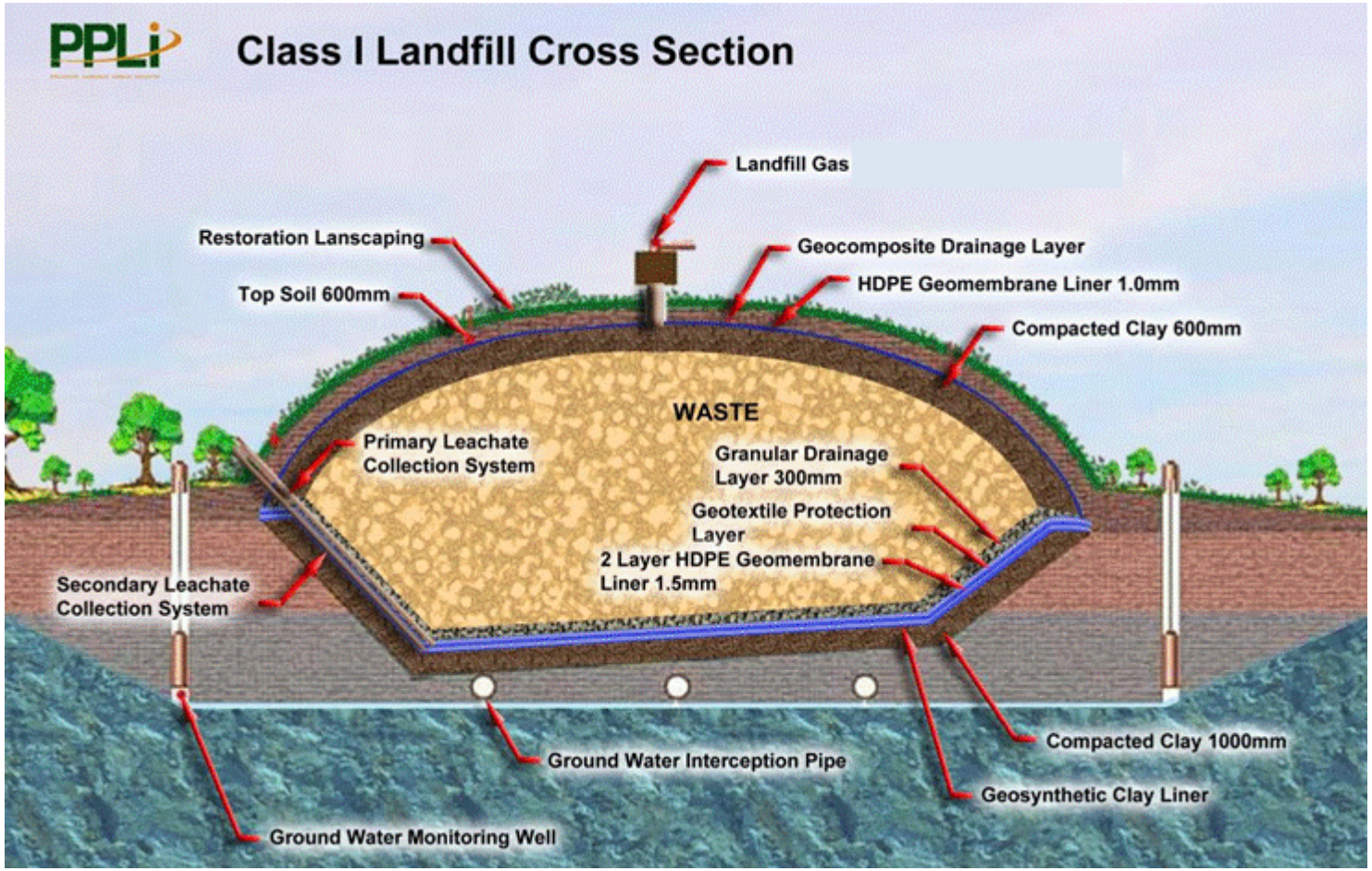
Business activities of PPLi

- Operating Landfill for B3 waste
- Fuels Blending and Recycling
- Liquid waste treatment
- Laboratory and Technical service
- Transportation Service
- Site Service
- CFC-Collecting



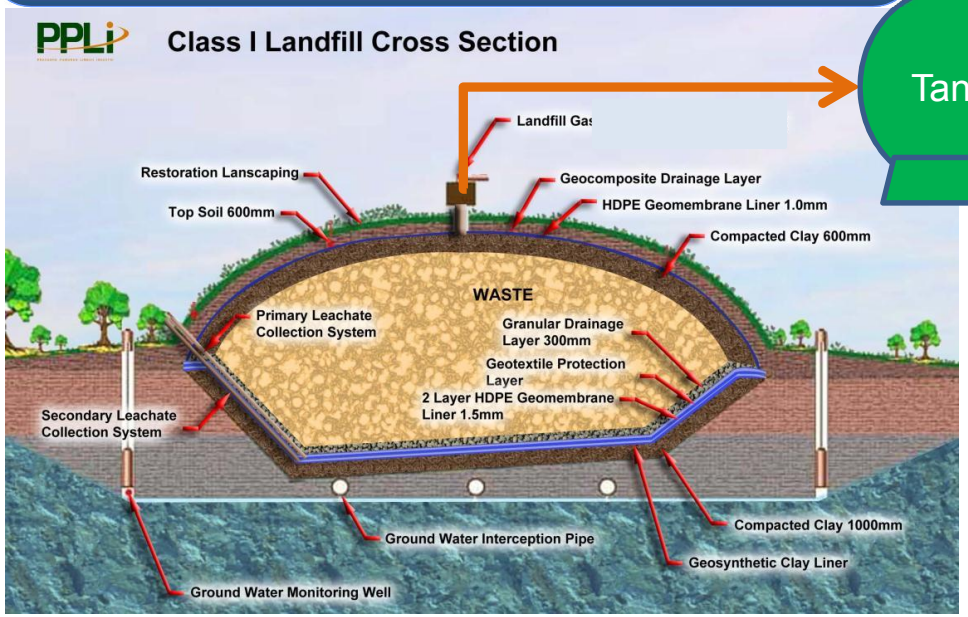
PPLi location

The only landfill for B3 waste in Indonesia
Class I (Hazardous) Landfill Schematic



3.Description of technology 2 : Waste treatment system

Collecting Methane gas from landfill



Tank

Waste treatment and heat recovering

HFC as substitute fuel

Generation
- Heat water
- Vapor
- Electricity

3.Description of technology 3 : Summary of Introduced Technology

Energy saving and heat recovering waste treatment system has a capacity of 50t/day for waste treatment

Vertical Combustor

※Vertical Combustor is a trademark of Plantec Inc.

http://www.plantec-kk.co.jp/english/products_vertical/index.html

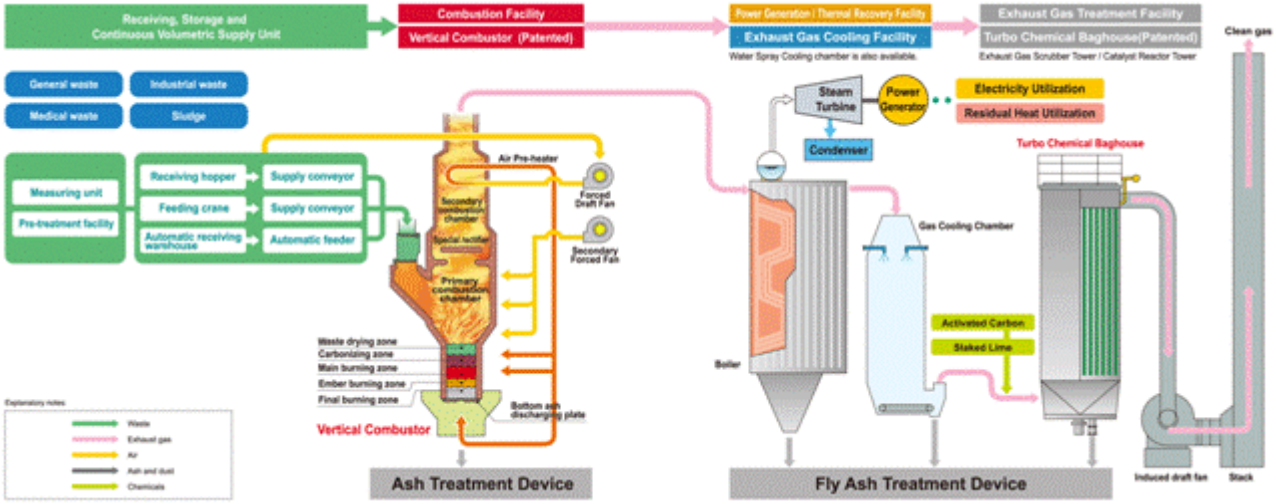
The vertical combustor has the following advantages in comparison with other industrial waste incinerators of 50-120t/day.

1. *Reduction of using a fuel*

- **Even low caloric value (1,000kcal/kg) of waste can drive the combustor, then reduce a fuel .**
- **We can use methane gas and HFC as substitute fuel.**

2. *Heat recovery*

- **We can collect heated water (75-90 degrees Celsius) from a cooling jacket.**
- **In case of rather large heat capacity, setting boiler is available.**



http://www.plantec-kk.co.jp/english/products_vertical/img/flow/flow_2000.jpg

4.Contents of the Feasibility Studies

Investigation for heat recovering

- **In the case of using generation of electricity on our own site : Permission is not required.**
- **In the case of selling generation of electricity : Guideline is now reviewing.**
  Fee of selling electricity by B3 waste only is not defined.

Investigation for methane gas emission from landfill in PPLi

- **The measurement of gas from landfill in various situation**
- **Investigation for waste record of landfill**

Landfill gas pipe

Collecting landfill gas

5.Key Result and Outcome

Prospect for the Project

For example

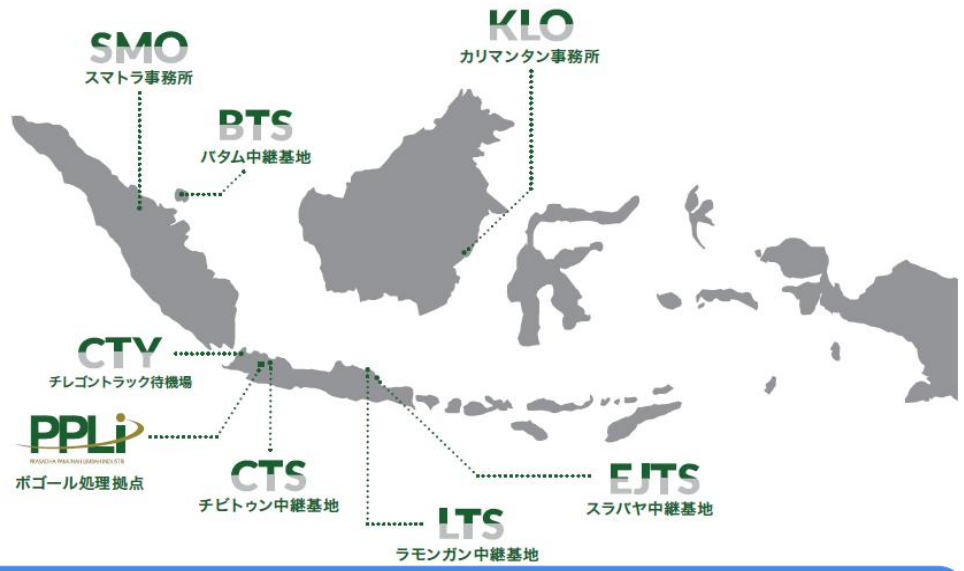
Waste treatment system
・Capacity : 50t/day

Investment: 1,500 million yen

Details;
・ Waste treatment facility : 1,200 million yen
・Gas collecting facilities : 200 million yen
・Substitute fuel using facilities : 50 million yen
・Monitoring system: Around 50 million yen

More information is necessary to proceed to next stage.

(Outcome)
After finishing this project successfully , we will extend the energy saving and heat recovering waste treatment system to Kalimantan, Sumatra , east Java area and so on.



PPLi network