

**Japan-Indonesia Business Forum for Energy Efficiency,
Conservation and Renewable Energy**

Solar and Waste to Energy

- 1. Gyro Tracking Solar System**
- 2. ERS Waste to Energy**
- 3. Carbonizer Waste to Energy**



高砂熱学工業株式会社
Takasago Thermal Engineering Co.,Ltd.

Corporate Profile

- **Leading Japanese engineering company providing designing, constructions, manufacturing and installation services for HVAC systems in Japan & internationally.**

Company name	Takasago Thermal Engineering Co., Ltd.
Established	November 16, 1923
Chairman & CEO	Atsushi Ouchi
Head Office	6-27-30, Shinjuku, Shinjuku-ku, Tokyo 160-0022 Japan
Number of employees	4,831 (consolidated as of Mar 2017)
Revenue	289.9 billion Japanese Yen (FY2017)
Capital	13,134 million Japanese Yen
End of fiscal year	March
Stock listing	First Section of the Tokyo Stock Exchange

Core Business Domains

HVAC systems, clean rooms and associated systems

District Heating & Cooling (DHC) systems and co-generation systems

HVAC systems for nuclear energy facilities and high-precision HVAC systems

Discharged-heat recovery systems and heating/cooling systems

Refrigerating/freezing systems and plumbing and sanitation systems

Consulting and services concerning energy saving and environmental measures

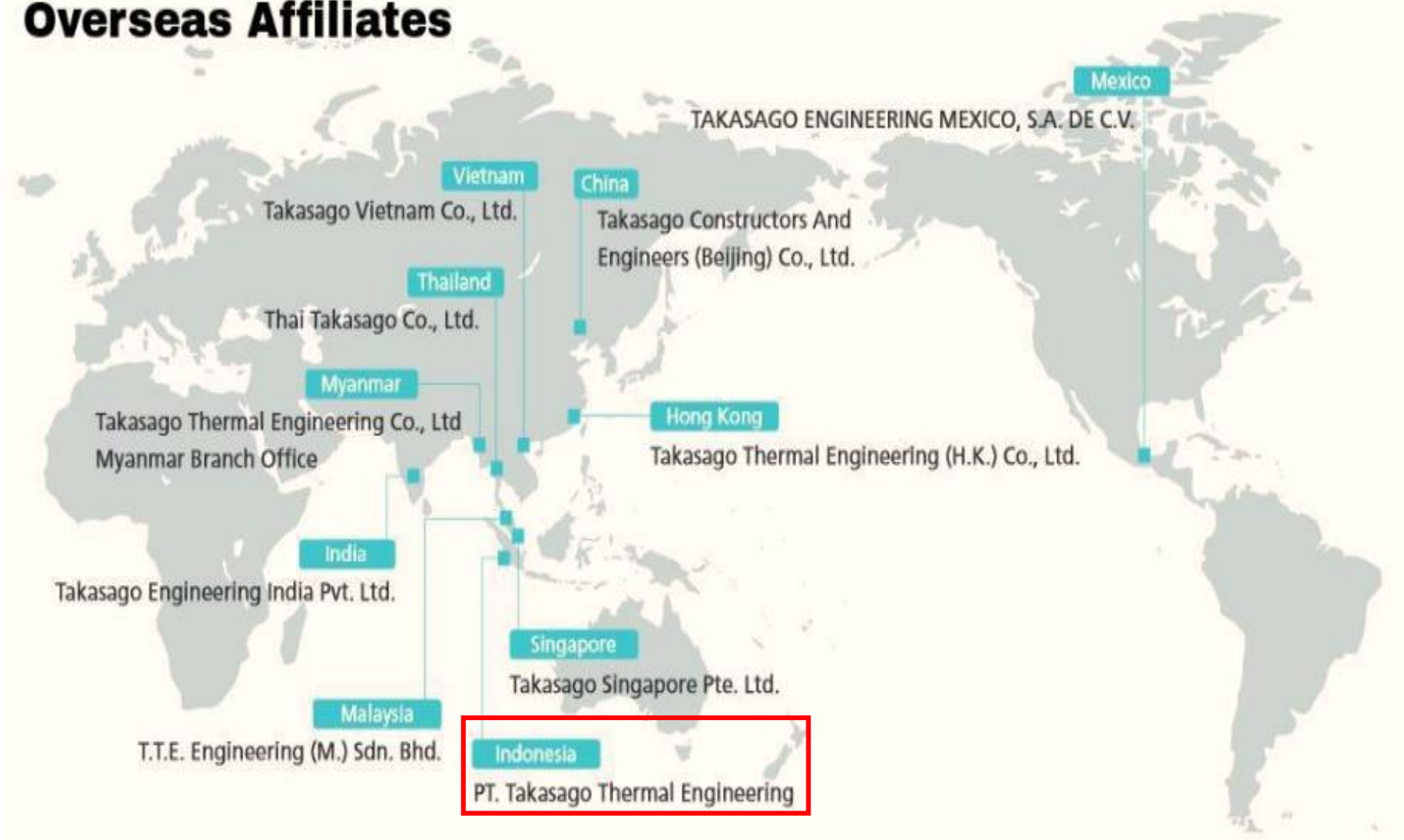
Energy supply business and power generation business

Water treatment business

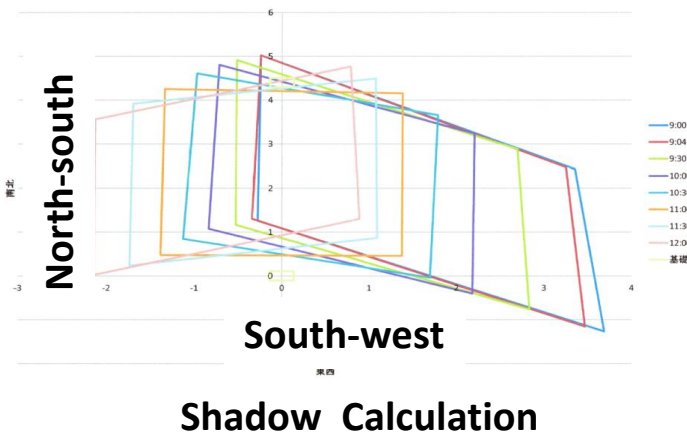


Our Global Network

Overseas Affiliates

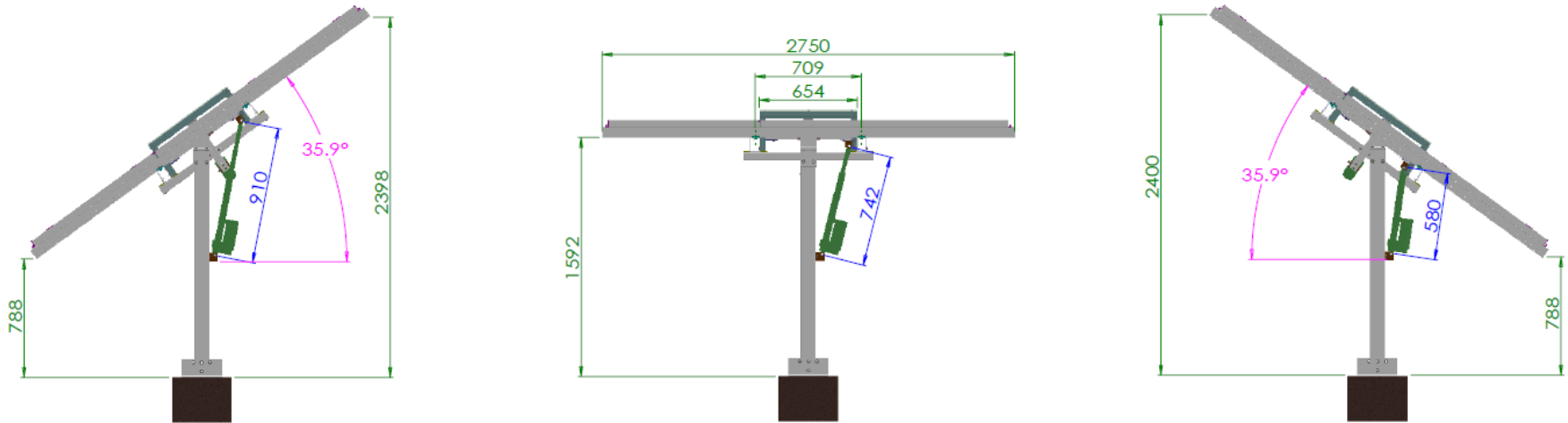


1. Gyro Tracking Solar System



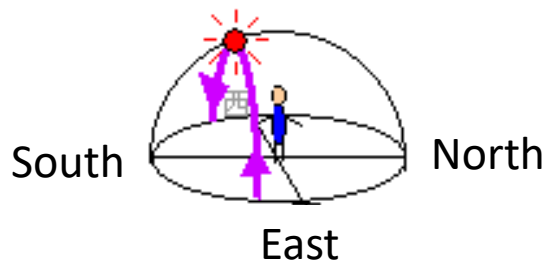
1. The initial investment in SolarFlame® structure is lower than conventional PV structure.
2. Easy installation at slope , unused land space such as small island, odd land etc.
3. Efficient sun tracking system of trajectory for Indonesia. Approx. 1.3 times higher output power generation.

1. Gyro Tracking Solar System

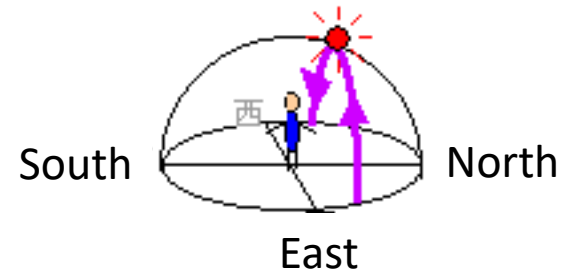


Omni directional solar tracking System

A tilt angle of 35 degrees is possible in any direction.



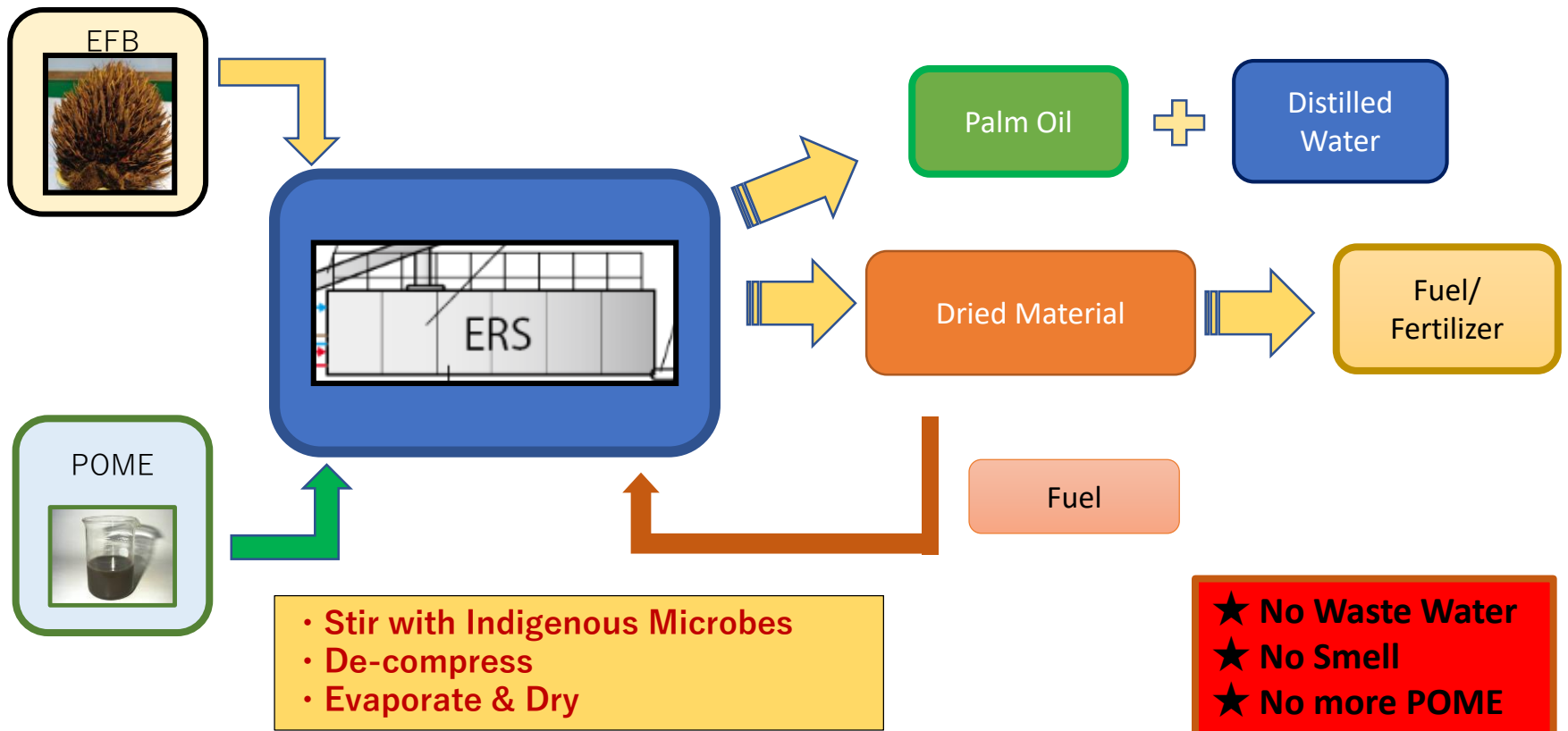
At the time of the winter solstice
pass through the southern sky



At the time of the summer solstice
pass through the northern sky

2. ERS (Environment Recycling System) “Waste-to-Value”

*High Speed Indigenous Microbes Fermentation System
(Vacuum Fermentation Drying System)*

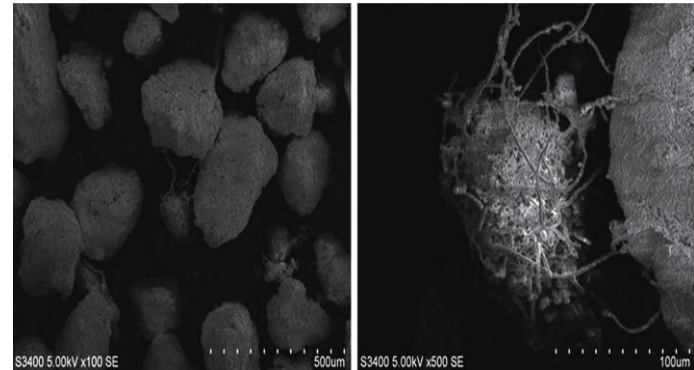
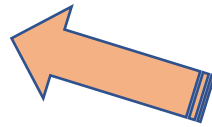


Recycling palm oil residues to solve environmental issues in Indonesia

2. ERS (Environment Recycling System) “Waste-to-Value”



- Stir with Indigenous Microbes
- De-compress
- Evaporate & Dry

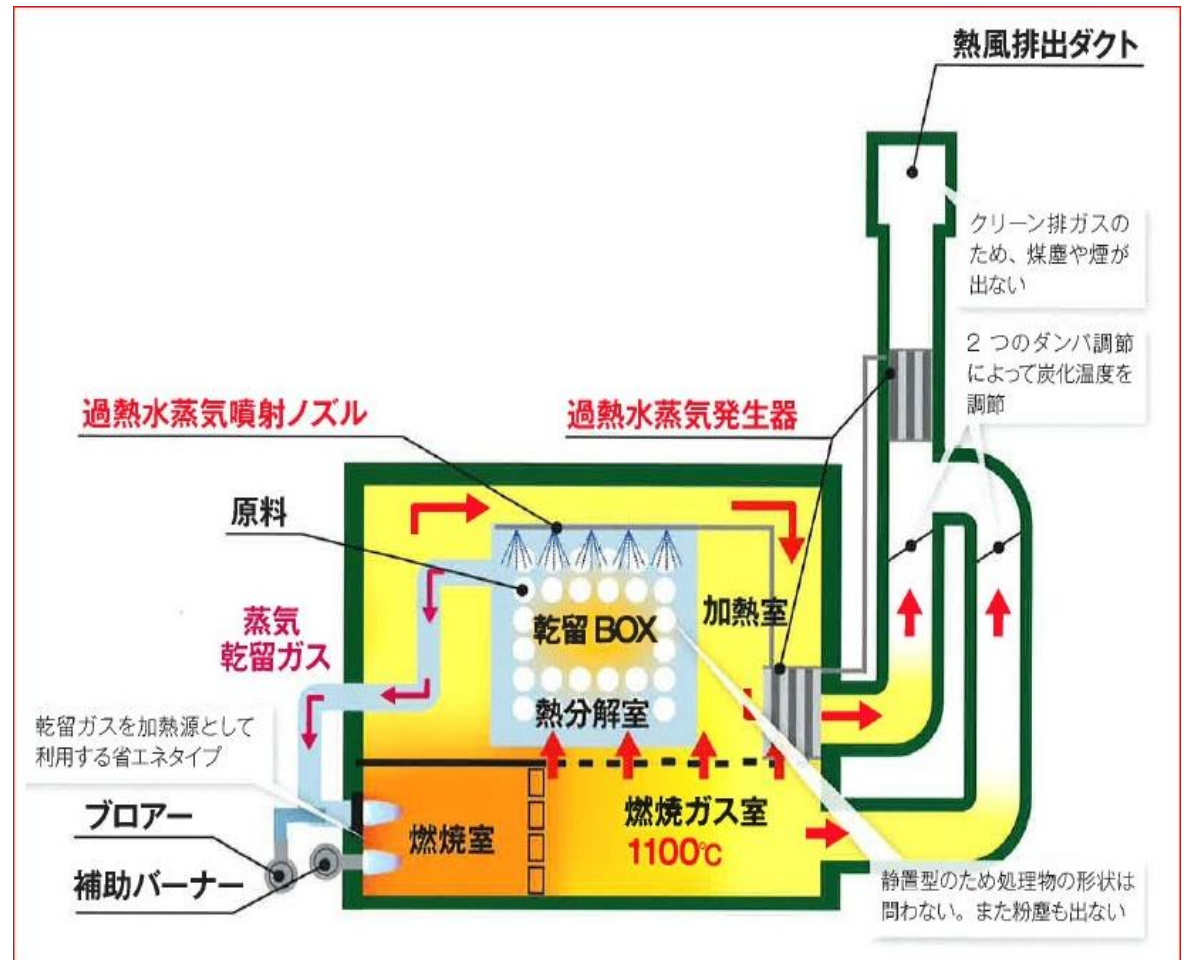


- ERS utilize specific microbes which are collected from the local soil for the fermentation and drying process.
- 3 types of microbes are specified and deposited to International Depository Authority .

High Energy Efficient Carbonization

Direct enhanced enthalpy heating with superheated steam

Convection equal heating effect inside distillation heating box



3. Carbonizer Waste to Energy, Value

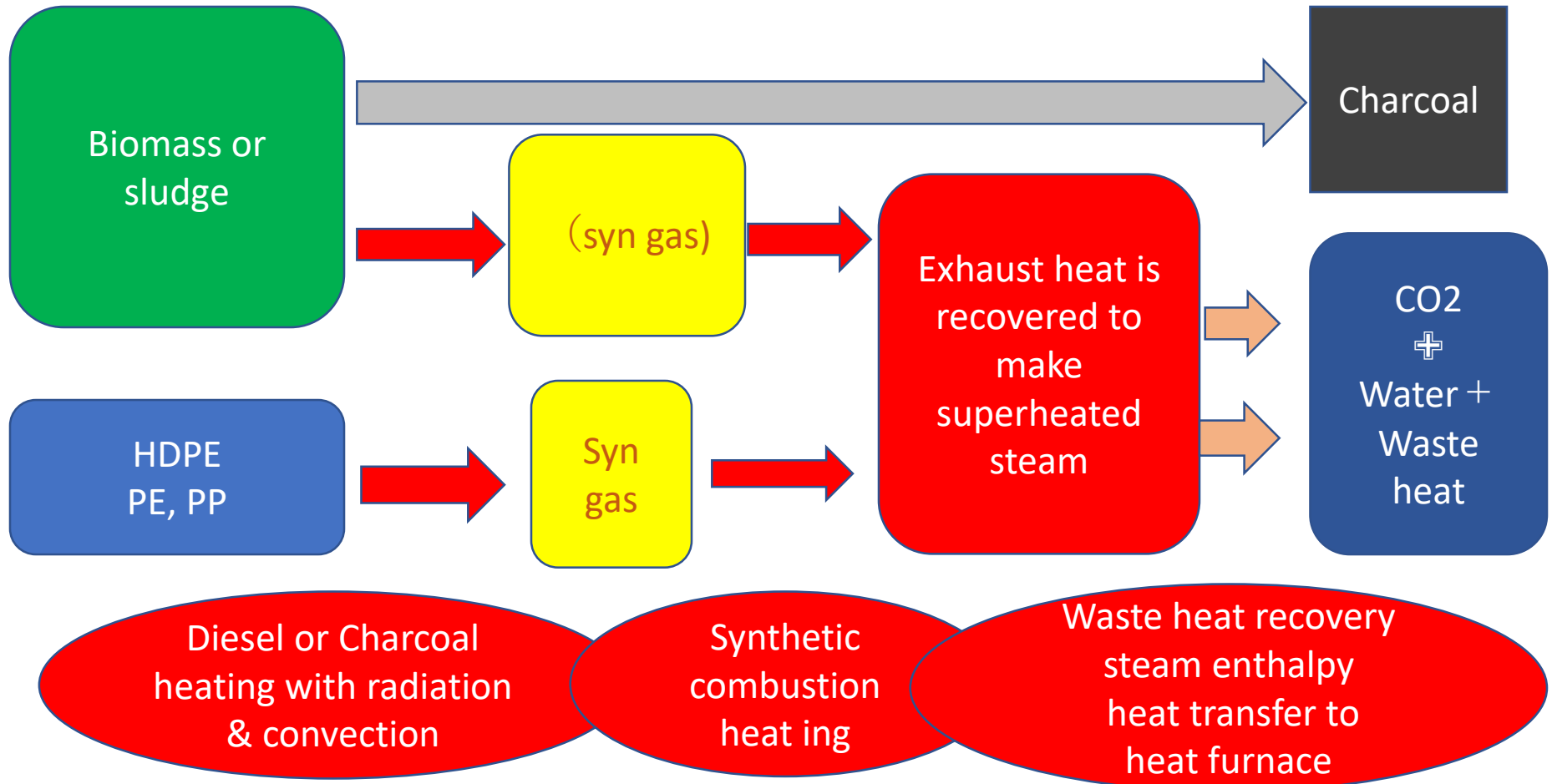
High Efficiency Carbonizer

Enhanced carbonizer volume for 2ton/hour



3. Carbonizer Waste to Energy, Value

Energy saving from; Hydrothermal (HTC) Superheated steam heat transfer ,exhaust gas energy recovery, syngas combustion



Environmental Challenge!

TakasaGo!



Environmental solution professional company
contributing to the global environment

Takasago Thermal Engineering Group