

1st JAPAN-INDIA BUSINESS SEMINAR 2021

Contribution to a Low-Carbon Society by Biomass Power Plants

24th Feb. 2021



TAKUMA CO., LTD.

TAKUMA

Value Technology,
Value People,
Value the Earth



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1. Company Introduction

Company Outline

Name	TAKUMA CO., LTD.
Head office	Amagasaki City, Japan
Representative Director	Hiroaki NANJO President and CEO
Established	10 June, 1938
Capital* ²	13,367 million JPY (891 crore INR approx.)
Net sales* ^{1,3}	134,454 million JPY (8,963 crore INR approx.)
Number of employees * ^{1,2}	3,816

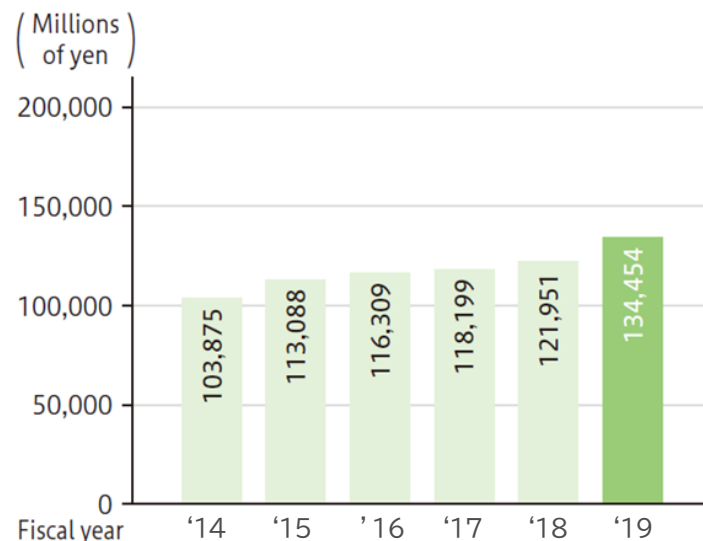
*1 Consolidated
 *2 As of March 31, 2020
 *3 FY2019



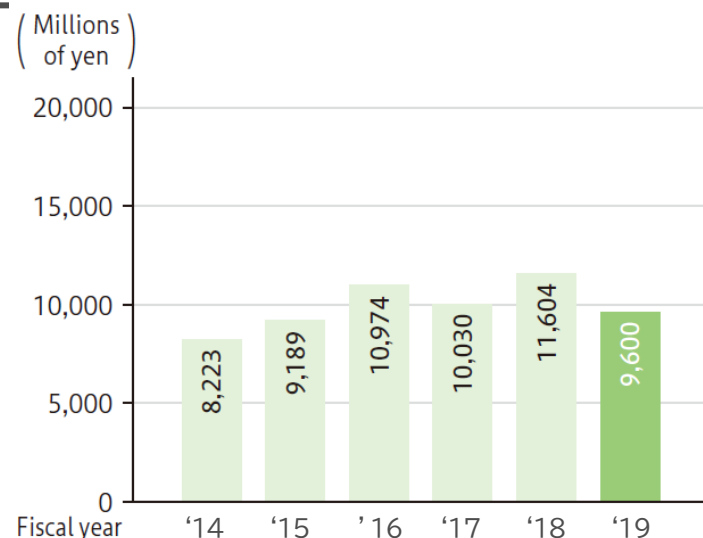
Head office



● Net sales



● Operating income



TAKUMA is an **EPC company** focusing on the **Environment and Energy** fields.

Environment & Energy



Waste-to-Energy Plant

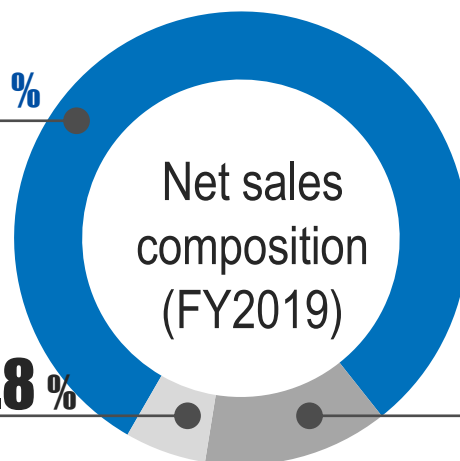


Biomass Power Plant



Water Treatment Plant

81.0%



Equipment & System



5.8%

Package Boiler



13.2%

2. Role of “Biomass” against Climate Change

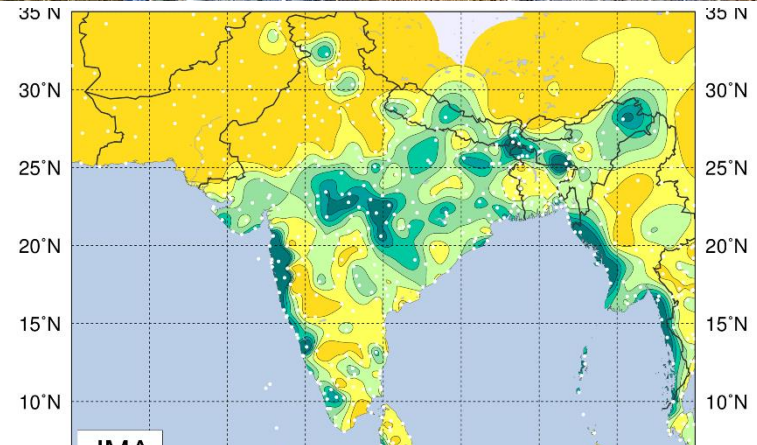
In recent years, **natural disasters** due to heavy rain, and large typhoons **have occurred frequently** in Japan and India.

Japan

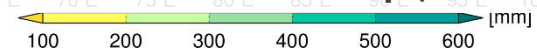


Source : FDMA

India



Precipitation Distribution Map (As of Sep. 2019)



Source : Cabinet office (Above), JMA (Below)

Point

- To limit global warming to **well below 2°C**, preferably to 1.5°C, compared to pre-industrial levels
- To achieve this goal, countries aim to reach global peaking of GHG emissions ASAP to achieve **a climate neutral world by mid-century**.

Target for GHG reduction



Japan **26% Reduction** by **2030** (Compared to 2013)



India **33-35% Reduction** by **2030** (Compared to 2005)
CO₂ emission per GDP



EU **40% Reduction** by **2030** (Compared to 1990)



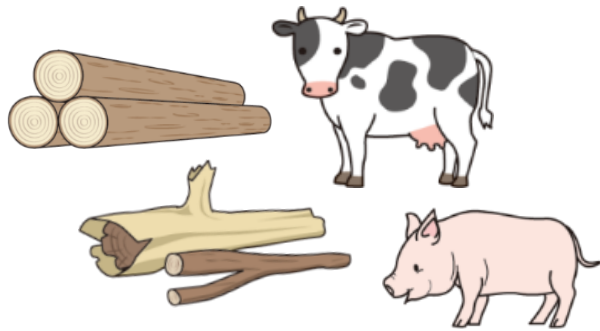
China **60-65% Reduction** by **2030** (Compared to 2005)
CO₂ emission per GDP



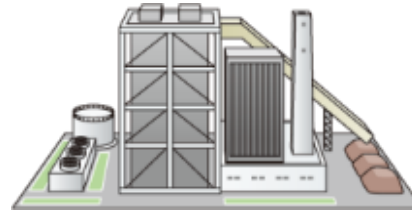
Picture : MOEJ

Source: Intended Nationally Determined Contributions (INDC) to UNFCCC

Biomass energy, unlike fossil fuels, emits **very little GHG**.
Stable power and heat supply is possible day and night throughout the year.



Wood, crop residues,
livestock manure etc.



Biomass Power Plant

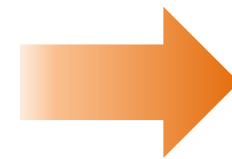
Possible for stable
power supply with very
little GHG emission



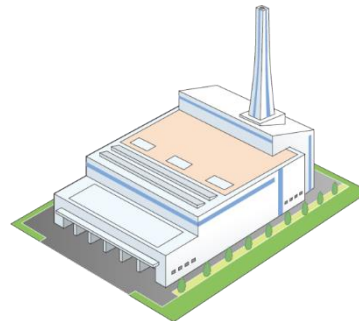
Electricity



Heat
(Steam / Hot water)



Kitchen waste, paper, plants,
night soil sludge etc.



WtE Plant

3. Utilization of energy from “Biomass”

~ Biomass Power Plant ~

Our **4 types of combustion models** realize the **utilization of various biomass** that is difficult to be incinerated.

Examples of biomass fuel



Wood chip



Bagasse



PKS (Palm Kernel Shell)



RPF (Refuse Paper Fuel)

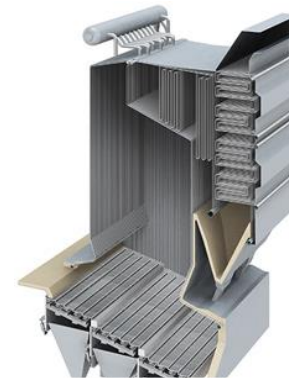


Bark

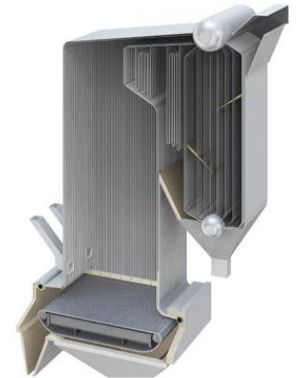


Construction waste

Our various combustion models



Step grate stoker



Traveling stoker



Bubbling fluidized bed



Circulating fluidized bed

Over 640 units of Biomass Boiler and Power Plants

For a variety of biomass fuels such as Wood, PKS, Bagasse, Palm residues, Manure

Bagasse Fired Boiler Plant (Thailand)



< 1st Phase >

Steam throughput : 150t/h x 2 units

Completion : 2012

< 2nd Phase >

Steam throughput : 170t/h x 2 units

Completion : 2019

Wood Biomass Power Plant (Japan)



Steam throughput : 29.2t/h x 1 unit

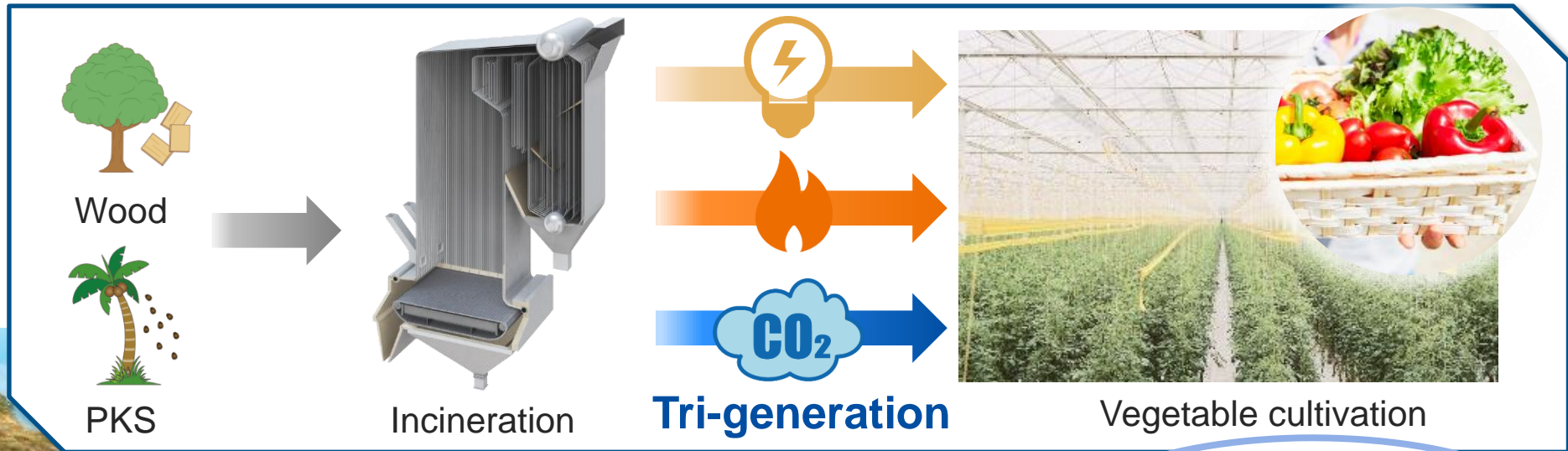
Power Generation : 6.25MW

Completion : 2018

New value creation by biomass power plants



Adopting "tri-generation" that **effectively uses not only electricity and heat but also CO₂** in the exhaust gas



**Growth promotion
Yield improvement**



4. Utilization of energy from “Waste”

~ Waste to Energy Plant ~

About 80% of total MSW in Japan is treated by incineration **for sanitary disposal and for reduction of the amount of landfill disposal.**
MSW is expected to be one of the **stable energy supply sources**

Total waste generated

42 million

Tons per year

Ratio for
Incineration treatment

80.0

%

Number of plants
In Japan

1,082

plants

(as of FY2018)

History for waste treatment plant business

TAKUMA

TAKUMA has been a pioneering company of **“Waste Treatment”** & **“Waste-to-Energy (WtE)”** plants.

about **60** Years of Experience

1938

Company established



1963

Sumiyoshi plant, Osaka City
Japanese 1st continuous waste incineration plant



1998

SHIN-KOTO plant, Tokyo
The largest WtE plant in Japan



2010

Lakeside EfW plant, UK

Over 360 plants of Waste Treatment including WtE Plants

Top class achievements in Japan for both number of plants and capacity

Suminoe plant (Osaka, Japan)

The plant equipment will be **renewed by utilizing the existing WtE plant building.**



Waste throughput: 400 t/day (200t/day × 2 lines)

Power generation: 11.3 MW

Completion : 2023 (Scheduled)

Project scheme : DBO (Design – Build – Operate)

Gaoantun Plant (Beijing, China)

Stable combustion of low-calorific waste with **high-efficiency power generation.**



Waste throughput: 1600 t/day (800t/day × 2 lines)

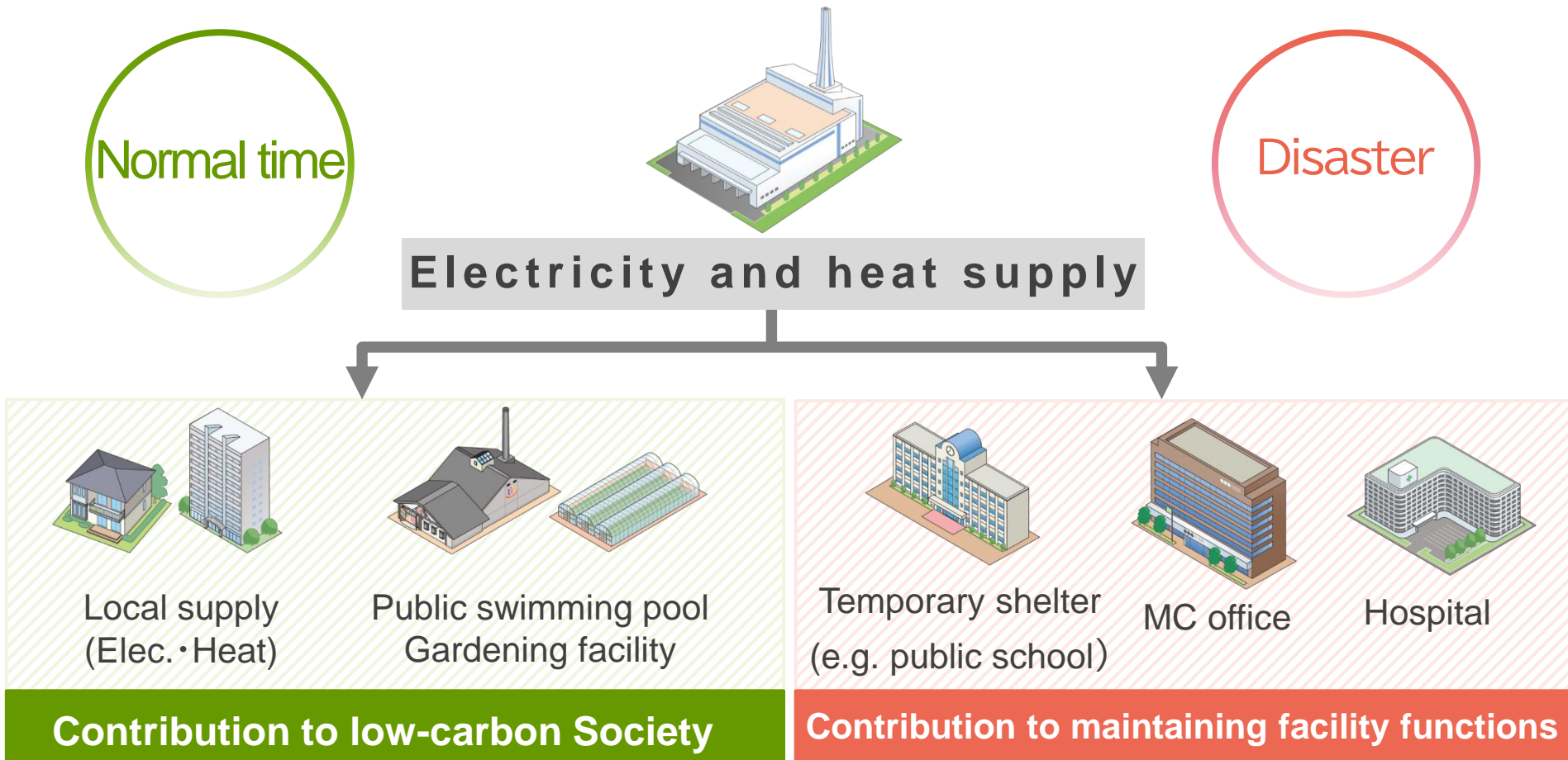
Power generation: 15 MW × 2 units

Completion : 2009

Waste energy: Useful even in the event of a disaster **TAKUMA**

Maximizing the energy from waste and generating environment-friendly electricity and heat to the local area

Expected to play a role in **maintaining stable energy supply and basic functions even in the event of a disaster**



New value creation by WtE plants (1/2)



<Example> Imabari City Clean Center (Ehime Pref., Japan)

This plant can generate without power supply from outside if there is waste for incineration, and provide a temporary shelter for local people for evacuation even in the event of a disaster.

**Japan Resilience Award
2019 Grand Prix Winner**



ジャパン・レジリエンス・アワード
2019グランプリ受賞



New value creation by WtE plants (2/2)



As a shelter where you can evacuate with peace of mind in the event of a disaster

Lighting, air conditioning, baths, and toilets can be used even if electricity, water, and sewerage are cut off.

We will provide local people with a place where they can evacuate.



धन्यवाद

Thank you for your attention.

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