

Seminar on Low Carbon Technologies

At the Regional Environmental Center for Central and Eastern Europe (REC)

# Contribution of **Kawasaki Green Technologies** to the Global Environment

**February, 2017**

Kawasaki Heavy Industries, Ltd.

**Takashi SHIMAKAWA**



 **Kawasaki**  
Powering your potential

- 1. Introduction of Kawasaki H.I.**
- 2. Contribution of Kawasaki Green Technology**
  - ① **Gas Cogeneration System**
  - ② **Waste to Energy System**
  - ③ **CO2 Free Hydrogen Chain Concept**
- 3. Activities in East Europe**

# 1. Introduction of Kawasaki Heavy Industries

## Profile

1. Company Name : Kawasaki Heavy Industries, Ltd.

2. Head Offices



Tokyo Head Office    Kobe Head Office

3. Founded : April 1878

4. Incorporated : October 15, 1896

5. Paid-in Capital : ¥104 billion

6. Number of Employees : 34,605 (consolidated)

7. Number of

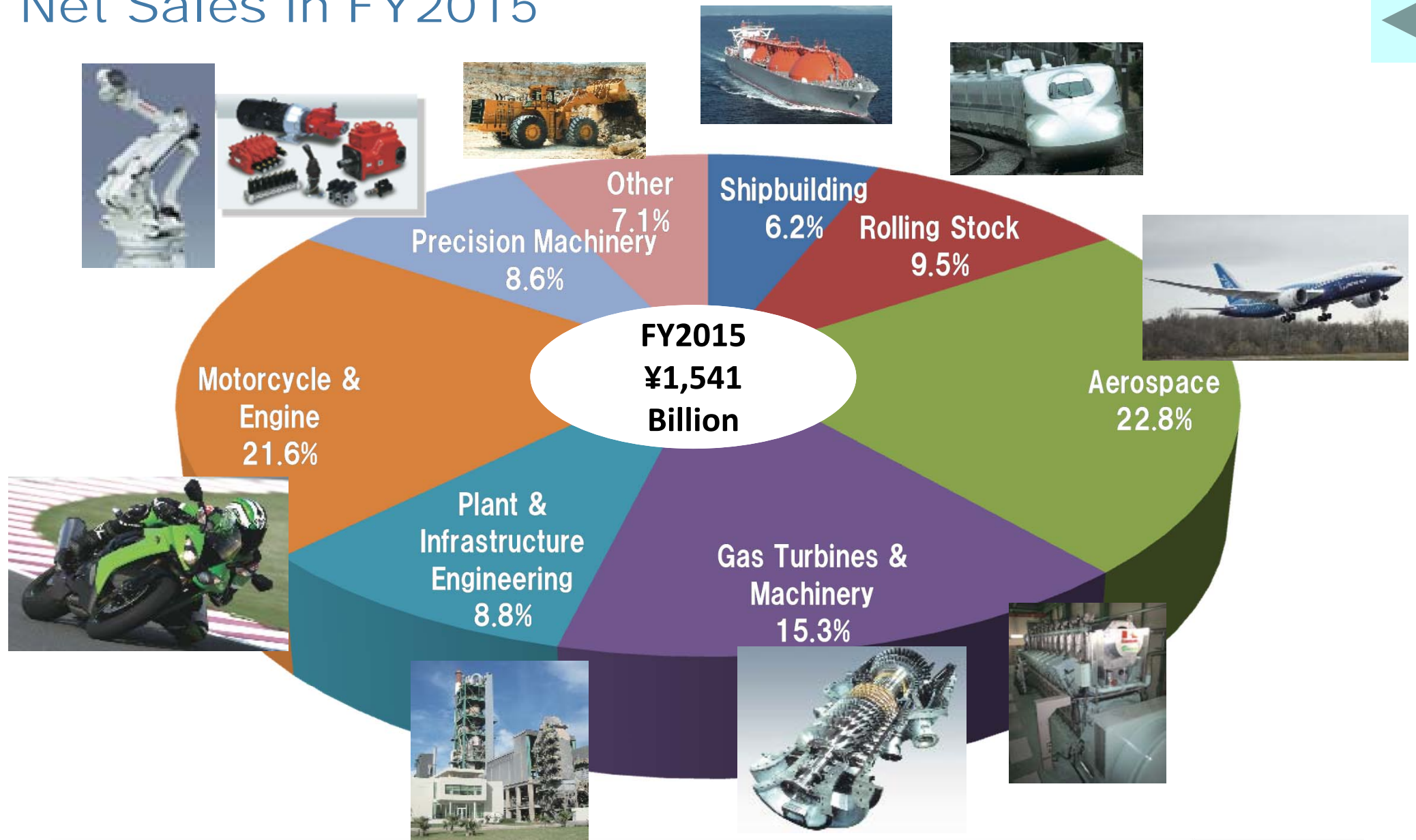
Consolidated Subsidiaries : 99

8. Main Production Bases : 15 in Japan, 17 overseas  
(consolidated)

(as of March 31, 2016)

# 1. Introduction of Kawasaki Heavy Industries

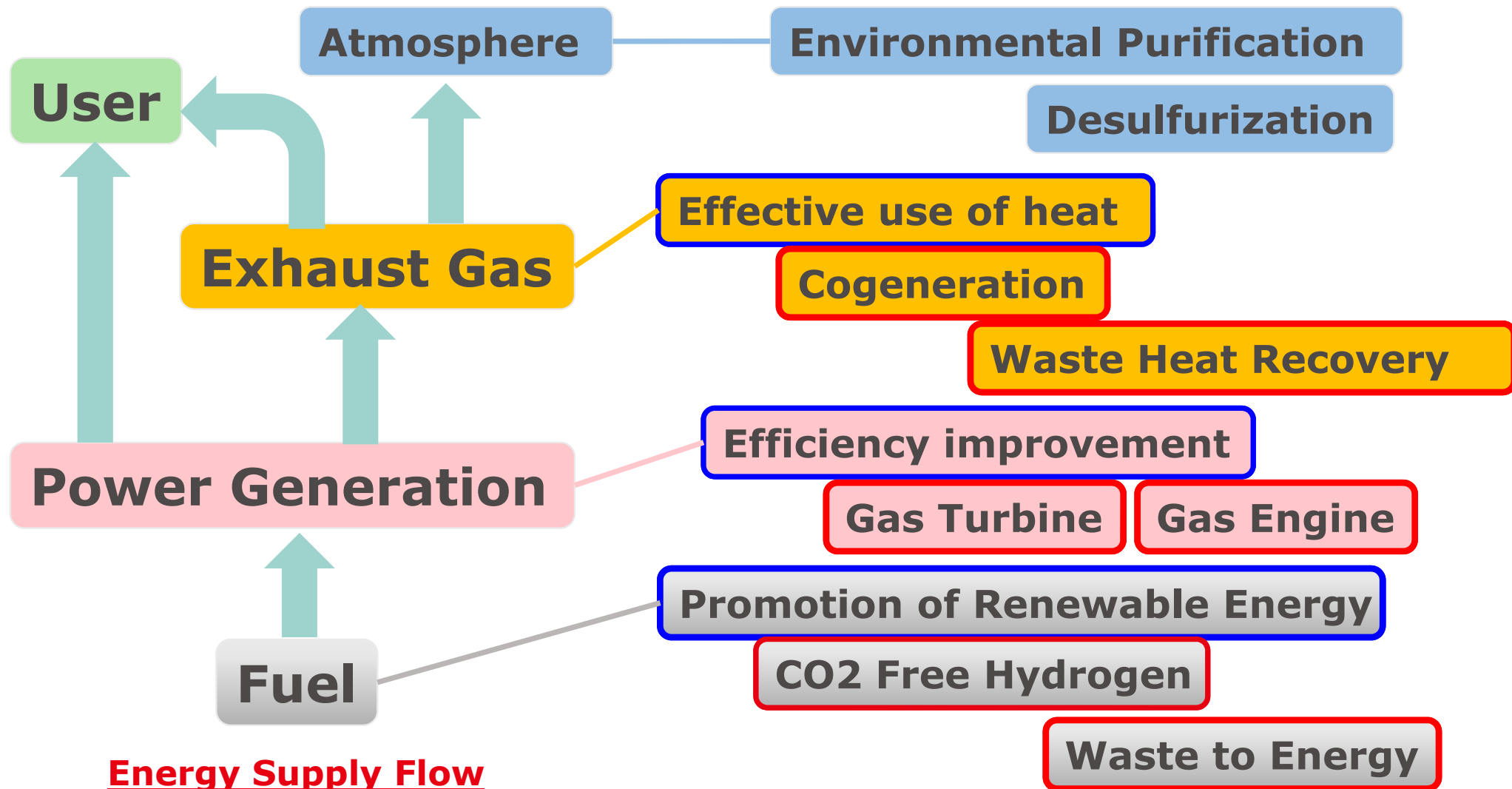
Net Sales in FY2015



# 2. Contribution of Kawasaki Green Technology

## Strategy of Kawasaki

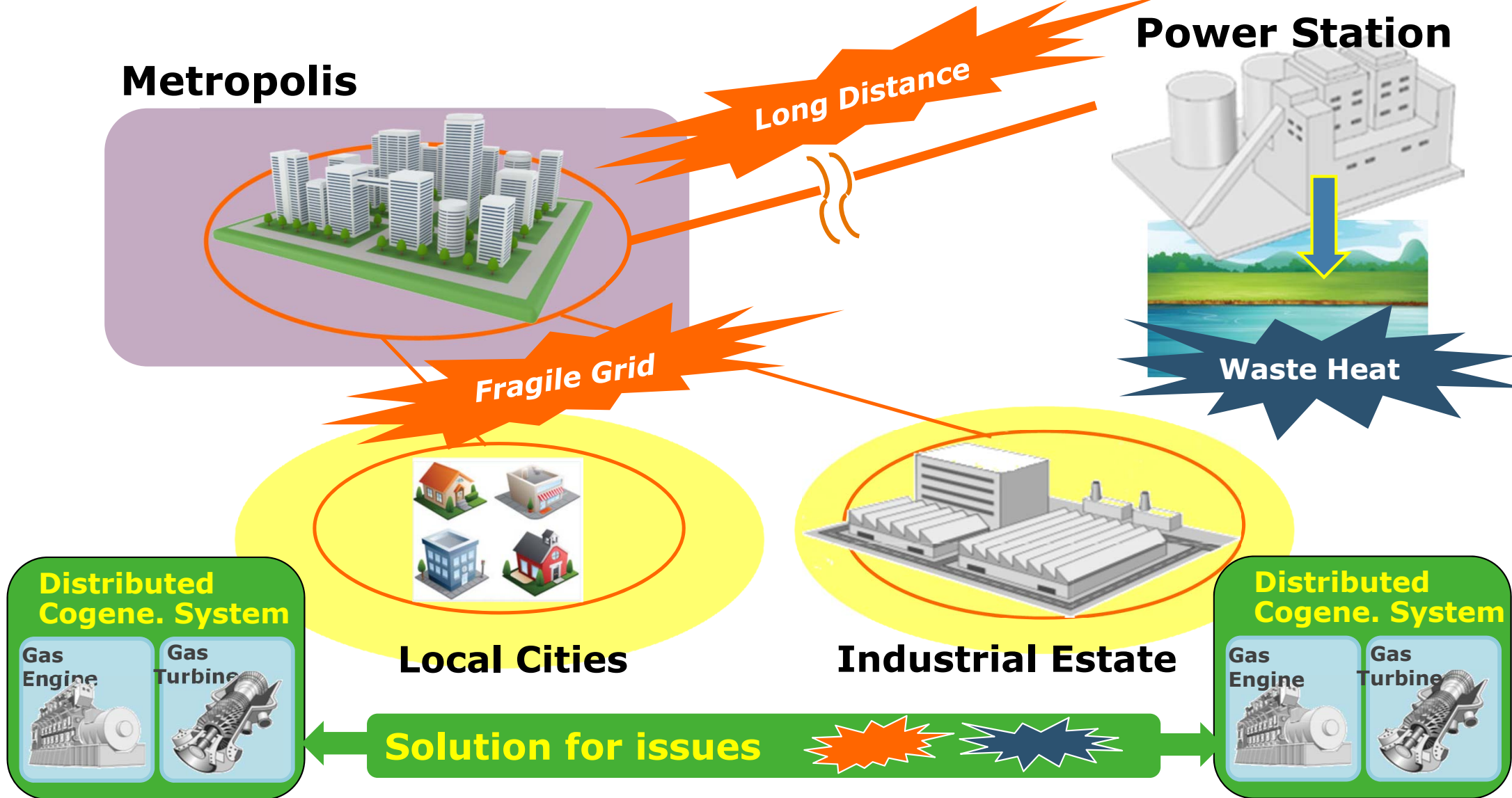
## Kawasaki Green Technologies



# 2. Contribution of Kawasaki Green Technology

## ① Gas Cogeneration System

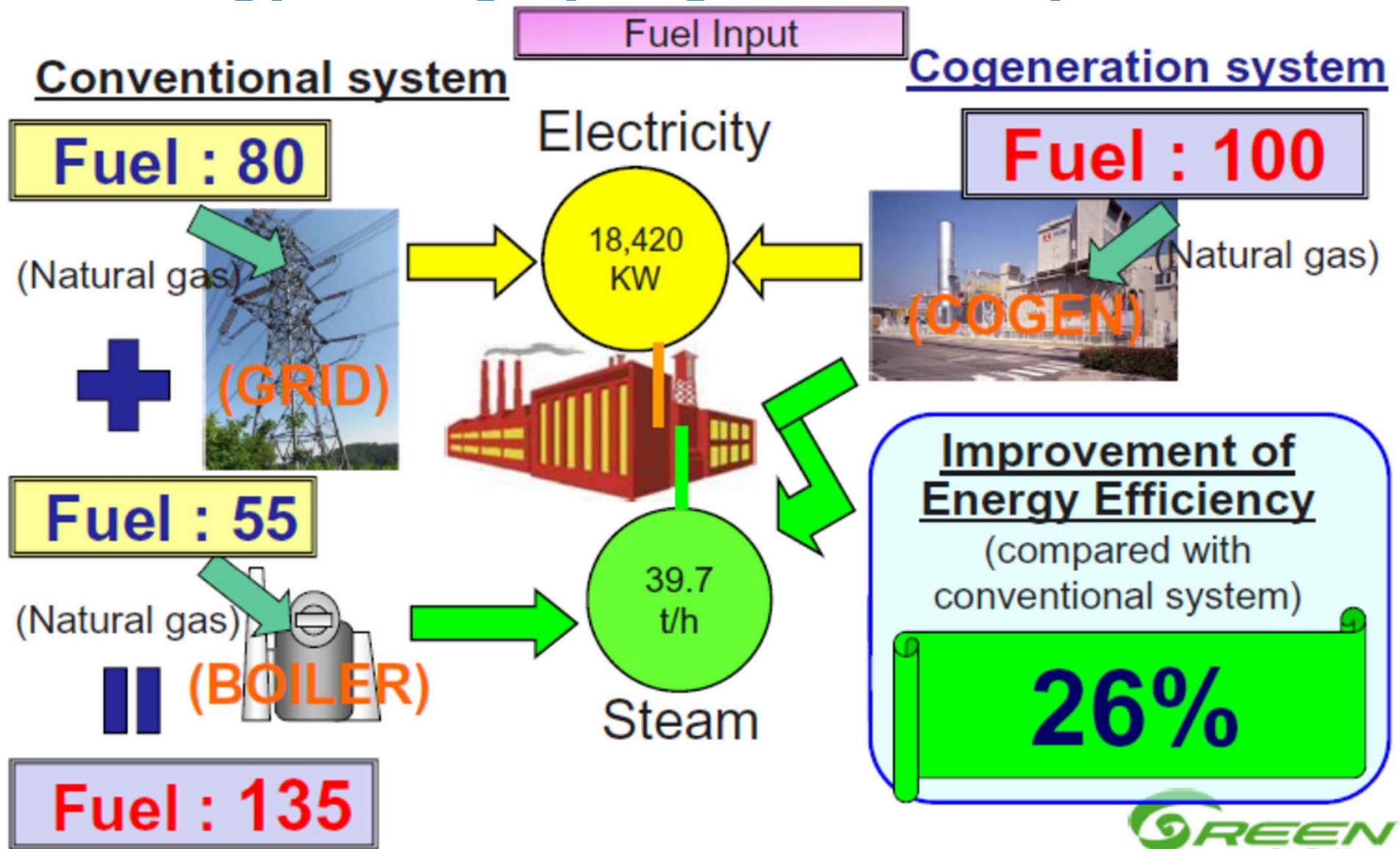
### Image of Distributed Cogeneration System



## 2. Contribution of Kawasaki Green Technology

### ① Gas Cogeneration System

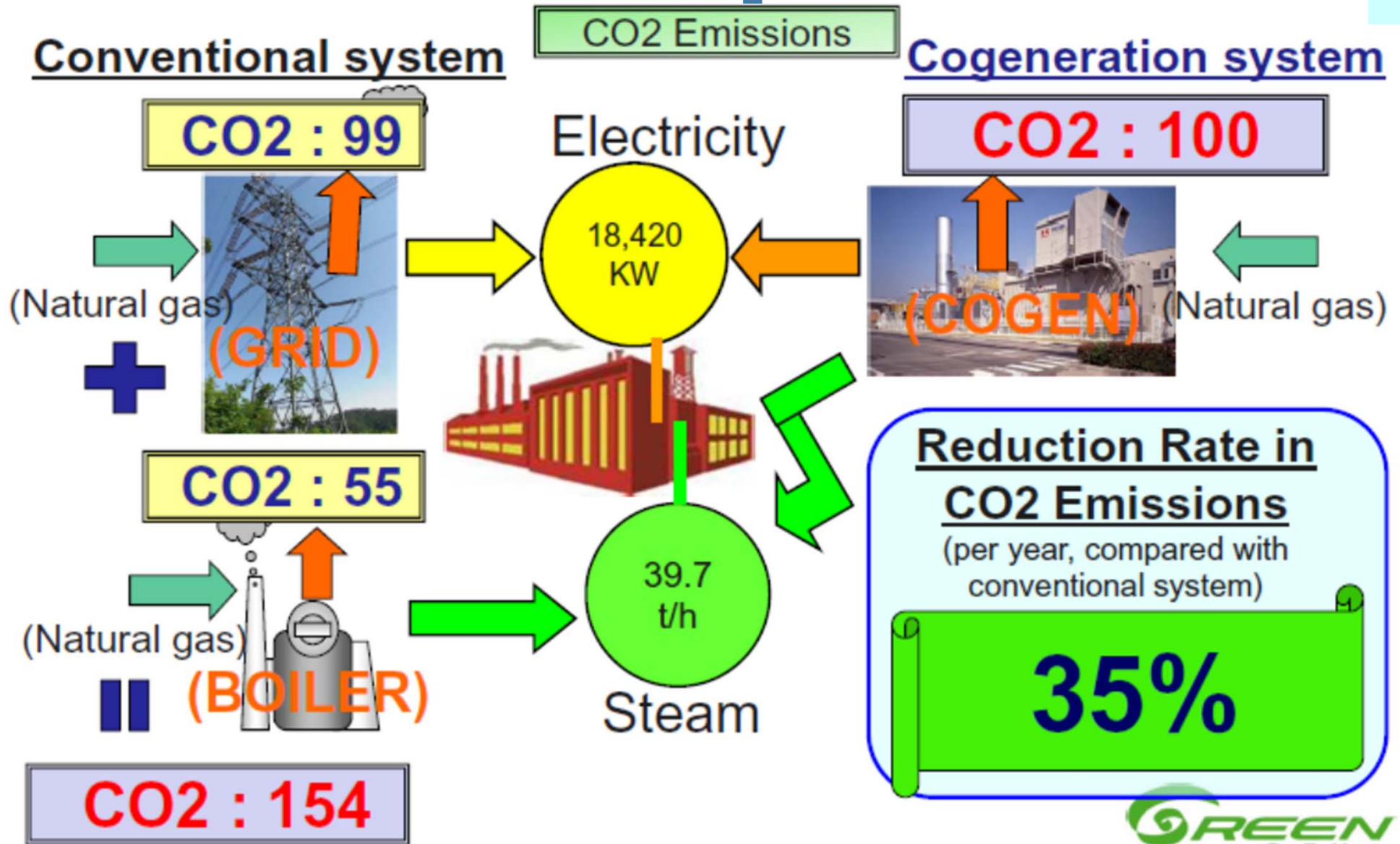
#### Energy Saving by Cogeneration System



# 2. Contribution of Kawasaki Green Technology

## ① Gas Cogeneration System

### Reduction of CO<sub>2</sub> Emission





## 2. Contribution of Kawasaki Green Technology

### ① Gas Cogeneration System



## Advantage of Kawasaki green gas engine (High performance and environment friendly)

• **Kawasaki Original Technology**

• **World's highest efficiency (49.5%@LHV)**

• **Partial Load Performance (45% at 50% Load)**

• **Wide range operation (30%~100%)**

• **Rapid startup (Full Load after 10 min.)**

• **Low NOx (Half of conventional, no de-nitration equipment)**



## 2. Contribution of Kawasaki Green Technology

### ① Gas Cogeneration System



## Kawasaki Green Gas Turbine cogeneration

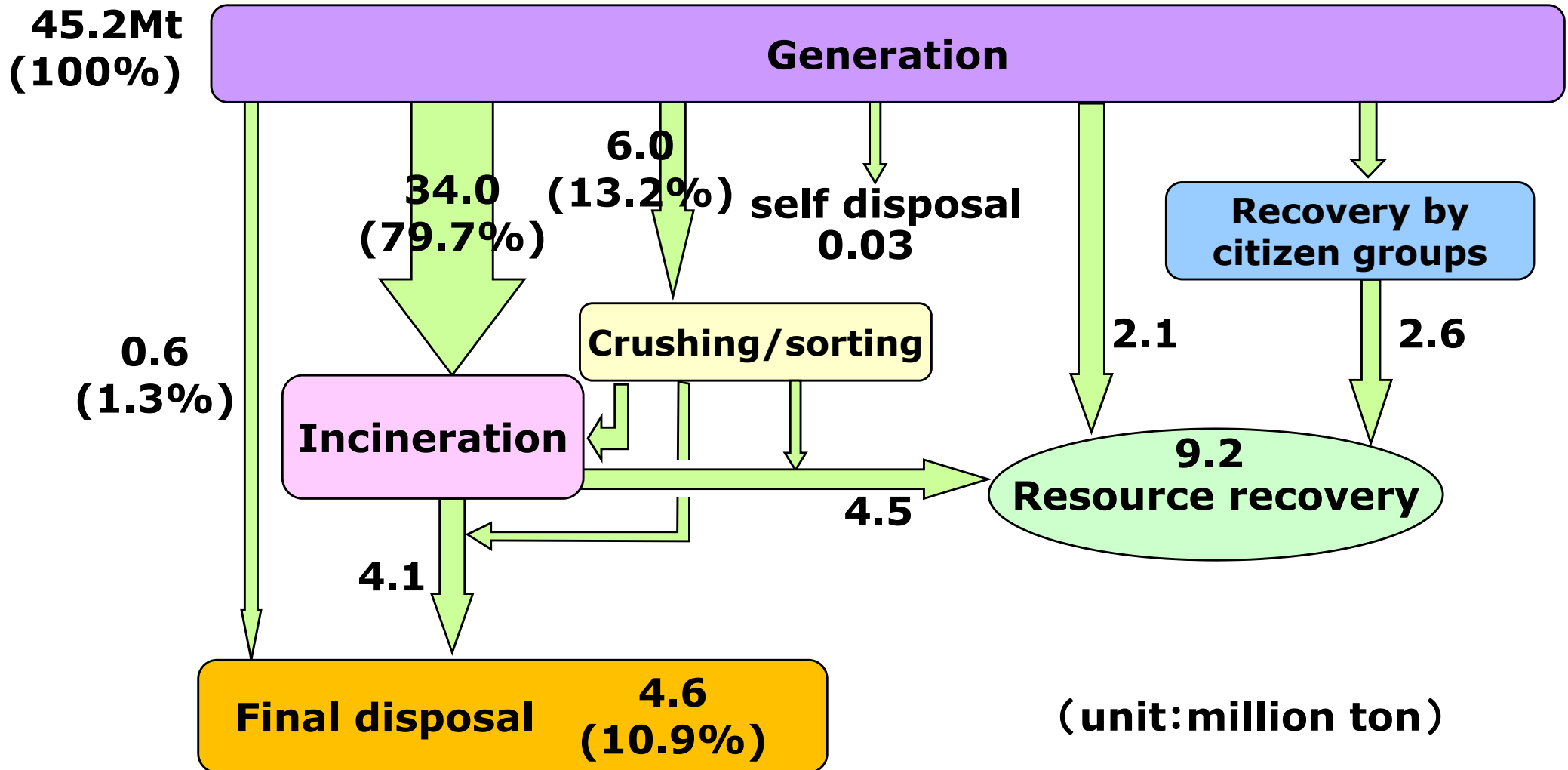
### ◆ Kawasaki Original Technology

- State-of-the-Art design
- High efficiency & low emission output
- High reliability & availability
  - Delivery over 8,600 units  
(11,500 machines)
  - Development & production  
experience over 40 years



# 2. Contribution of Kawasaki Green Technology

## ② Waste to Energy System



〔 Treatment/disposal flow sheet of MSW in Japan (Fiscal Year 2012) 〕

# 2. Contribution of Kawasaki Green Technology

## ② Waste to Energy System



1. Association of Kishiwada city and Kaizuka city
2. Kishiwada Kaizuka Clean Center
3. 177 t/24h x 3units (+ 36 t/24h x 2units)
4. 12,000 kW
5. Mar. 2007

- Legend
1. Customer
  2. Name of Plant
  3. Incineration capacity  
(+ Ash melting furnace capacity)
  4. Power generating capacity
  5. Completion

1. City of Kyoto
2. Tohokubu Clean Center
3. 350 t/24h x 2units (+ 24 t/24h x 1unit)
4. 15,000 kW
5. Mar. 2001



1. City of Nagoya
2. Nanyo Incineration Plant
3. 500 t/24h x 3units
4. 27,000 kW
5. Mar. 1997

1. Fukuoka Clean Energy Corp.
2. Tobu Incineration Plant
3. 300 t/24h x 3units
4. 29,200 kW
5. Jul. 2005



1. Clean Association of TOKYO23
2. Setagaya Incineration Plant
3. 150 t/24h x 2units (+60 t/24h x 2units)
4. 6,750 kW
5. Dec. 2007

1. Clean Association of TOKYO23
2. Chitose Incineration Plant
3. 600 t/24h x 1unit
4. 12,000 kW
5. Mar. 1996



# 2. Contribution of Kawasaki Green Technology

## ② Waste to Energy System

**Total No. of Delivery : 339 units for 174 Plants  
(as of April 2013)**

Country	Incineration type	No. of Plants	No. of Units	Incineration Capacity [ton/day]
Japan	Stoker type	146	294	32,302
	Fluidized Bed type	10	20	717
	Internal Circulation Fluidized Bed type	1	1	315
	Fluidized Bed Gasification and Melting	2	4	375
	Shaft Gasification and Melting	1	1	43
Singapore	Stoker type	2	4	1,920
South Korea	Stoker type	7	8	1,400
Taiwan	Stoker type	1	2	900
Italy	Stoker type	1	1	210
China	CKK system	3	4	1,300
Total		174	339	39,482



**Gumi Plant, South Korea  
100 t/24h x 2unit (2010)**



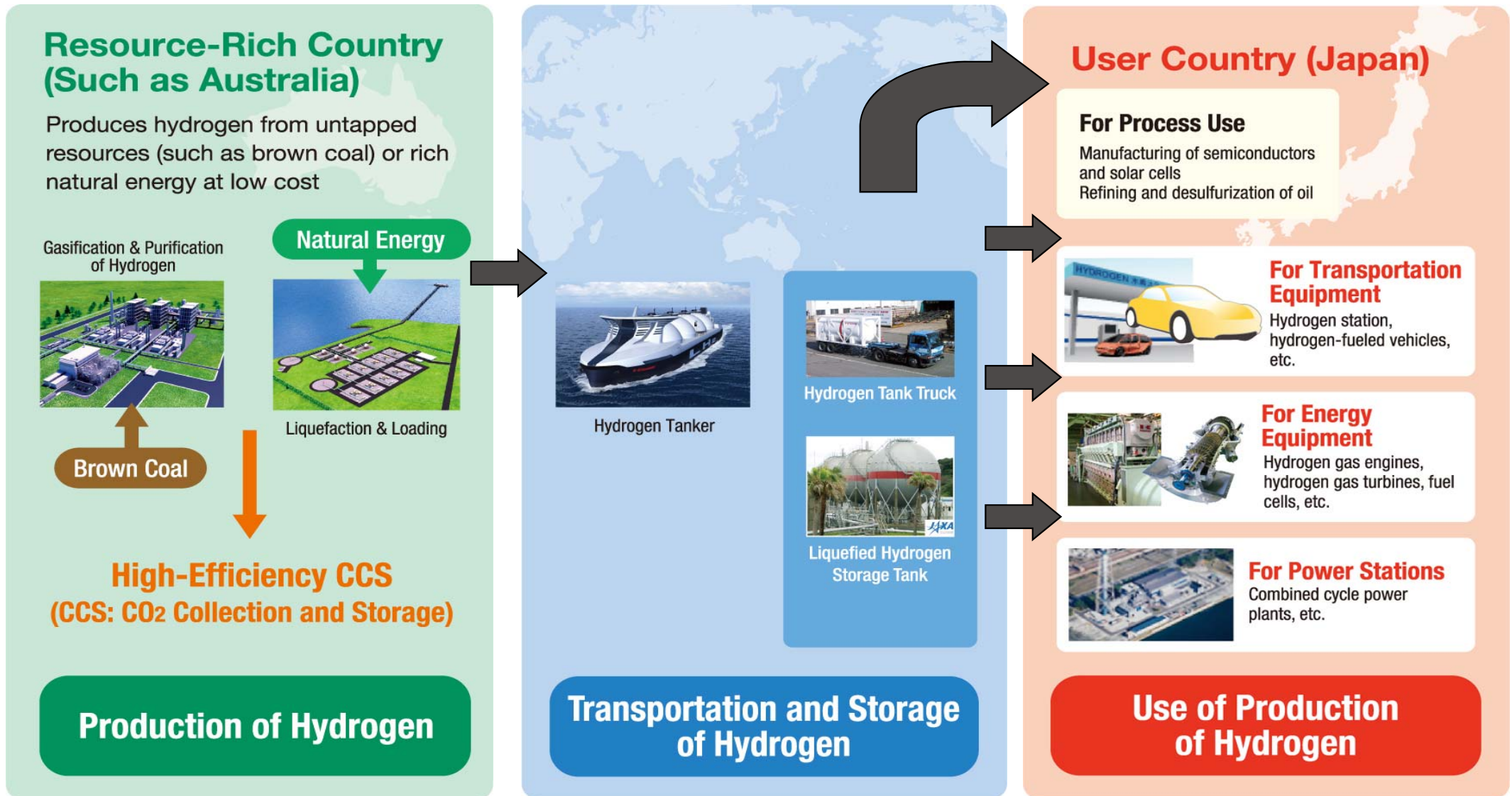
**Ping-tung Plant, Taiwan  
450 t/24h x 2unit (2000)**

# 2. Contribution of Kawasaki Green Technology

## ③ CO2 Free Hydrogen Chain Concept



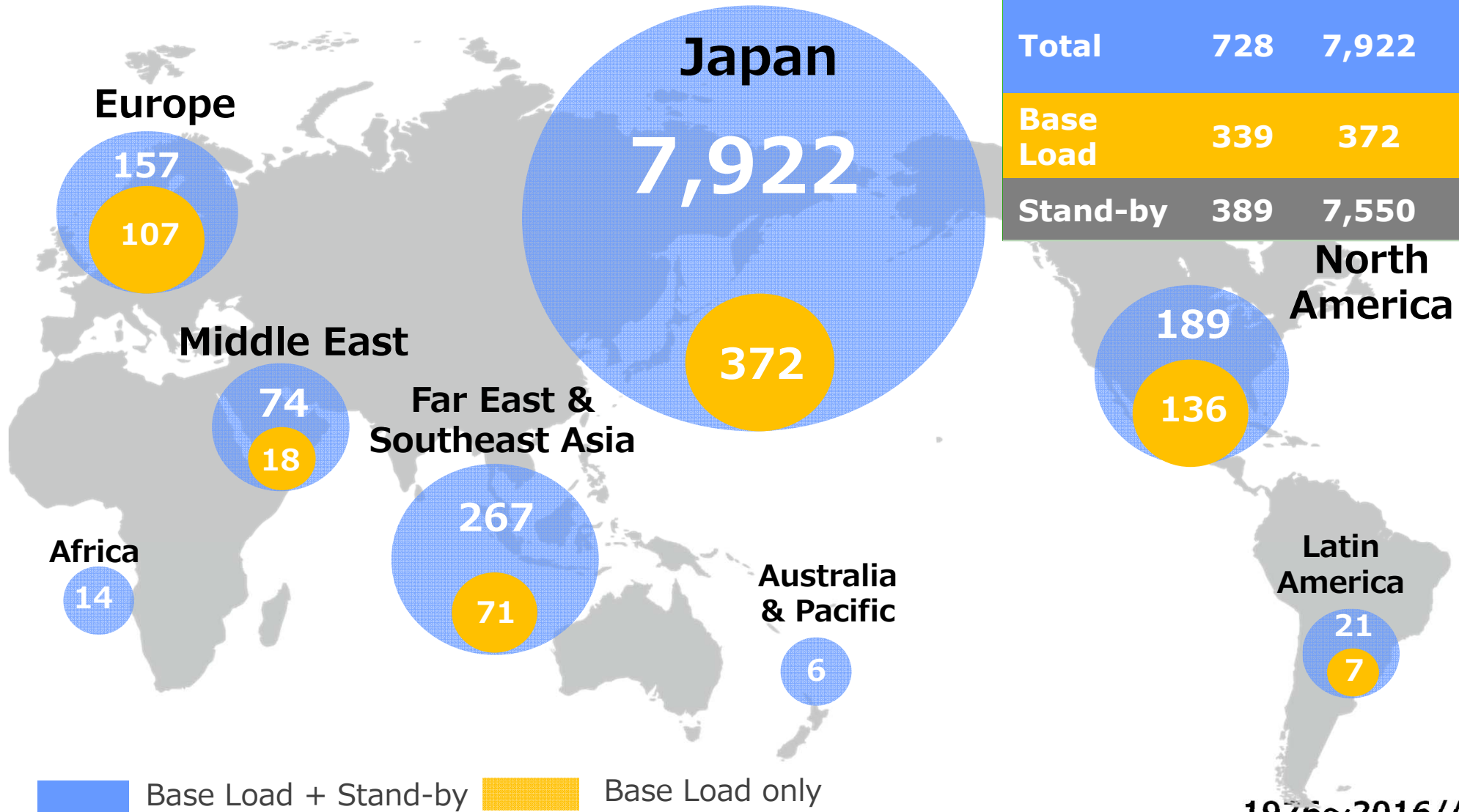
### Promotion of CO2-Free Hydrogen Chain Concept



# 3. Activities in East Europe



## Track Record of Gas Turbine



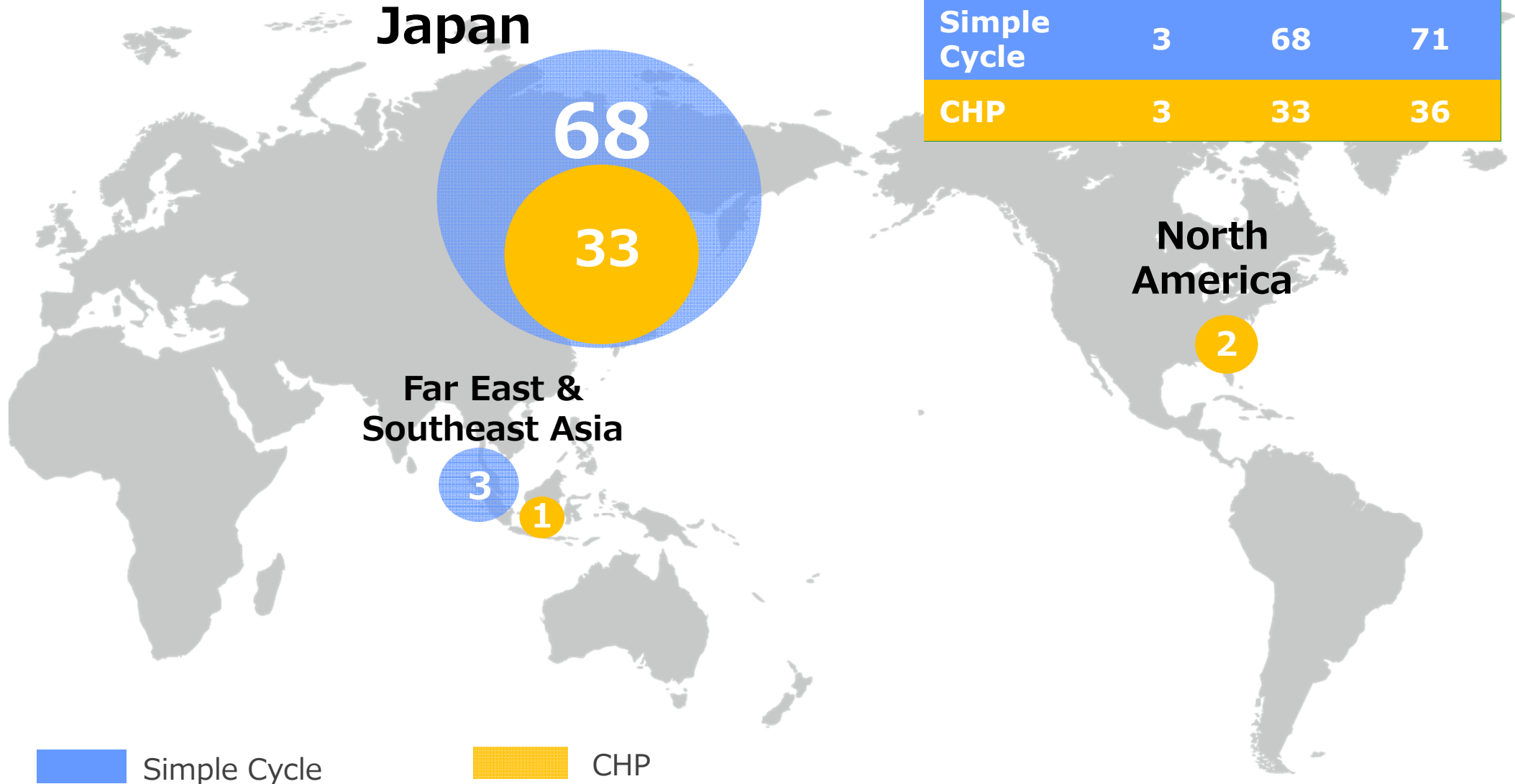
	World wide	Japan	Total
Total	728	7,922	8,650
Base Load	339	372	711
Stand-by	389	7,550	7,939

1976~2016/April

# 3. Activities in East Europe



## Track Record of Gas Engine



2012~2016/March



# 3. Activities in East Europe



## Track Record in Europe



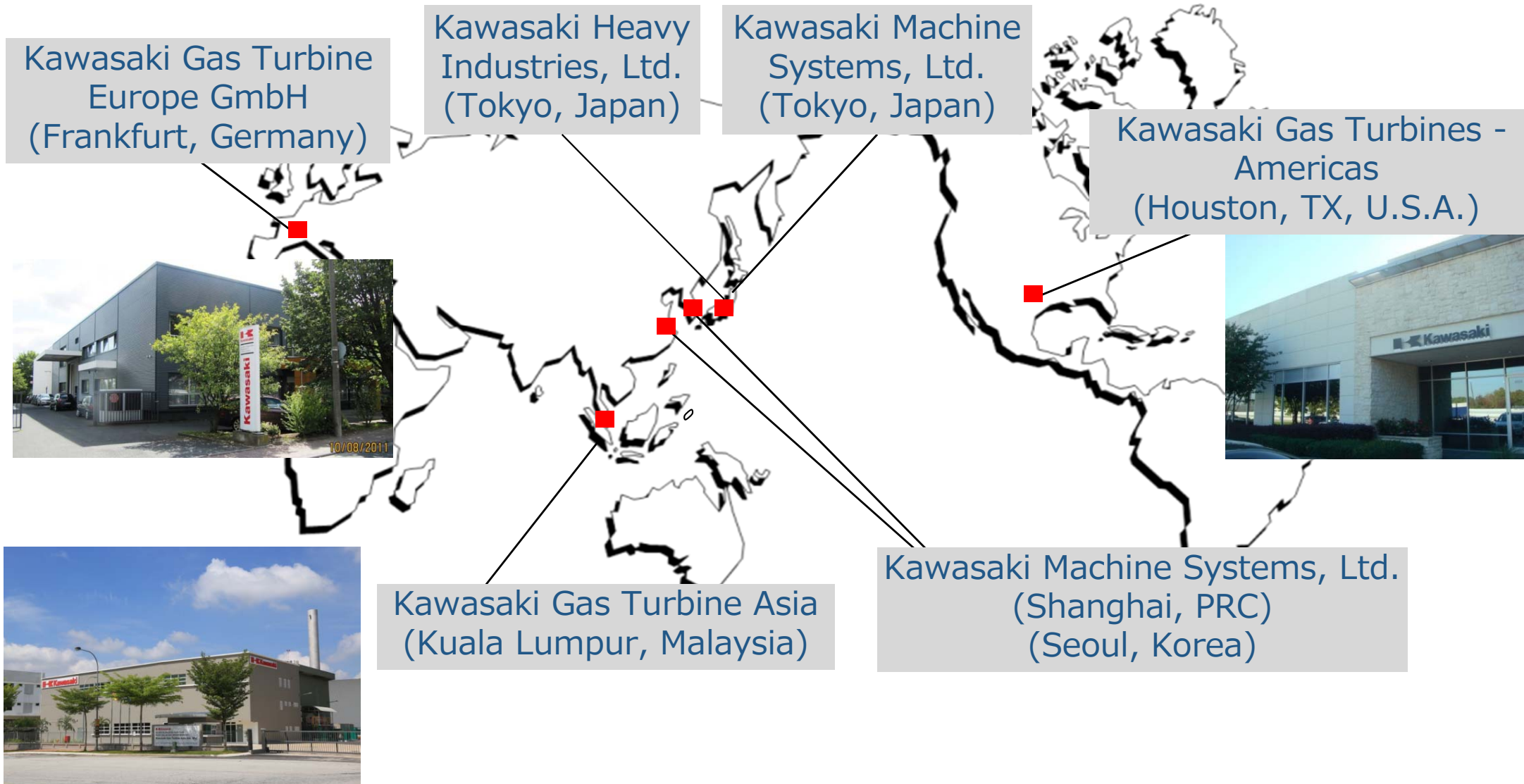
example of installation in EDP, Portugal



1976~2016/March

# 3. Activities in East Europe

## Global Network of Kawasaki Cogeneration System



# Dziękuję za uwagę

Kawasaki, working as one for the good of the planet  
“Global Kawasaki”