

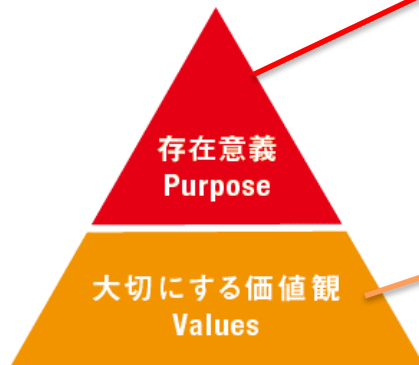
Introduction of Gas Co-generation System and Absorption Chiller to Fiber Factory in Thailand (Selected in 2018)



1. Introduction of KEPCO

Company Name	The Kansai Electric Power Company , Incorporated
Head Office	3-6-16, Nakanoshima, Kita-ku, Osaka, 530-8270 Japan
Date of establishment	May 1, 1951
Operating Revenues	¥ 2,851.8 billion (consolidated)
Electricity sales	100.7 billion kWh
Business	Electric power supply, gas supply, heat supply Telecommunications, etc.

Kansai Electric Power Group Purpose & Values



「あたりまえ」を守り、創る
Serving and Shaping the Vital Platform for a Sustainable Society

公正 × 誠実 × 共感 × 挑戦
Fairness × Integrity × Inclusion × Innovation

私たちは、安全を守り抜くことを前提に、
「公正」「誠実」「共感」「挑戦」を大切に行動します

With dedication to safety and security, we will act upon the values of Fairness, Integrity, Inclusion and Innovation

KEST, which is 100%-owned subsidiary of KEPCO in Thailand, provides energy related services.

1) Energy saving consulting service

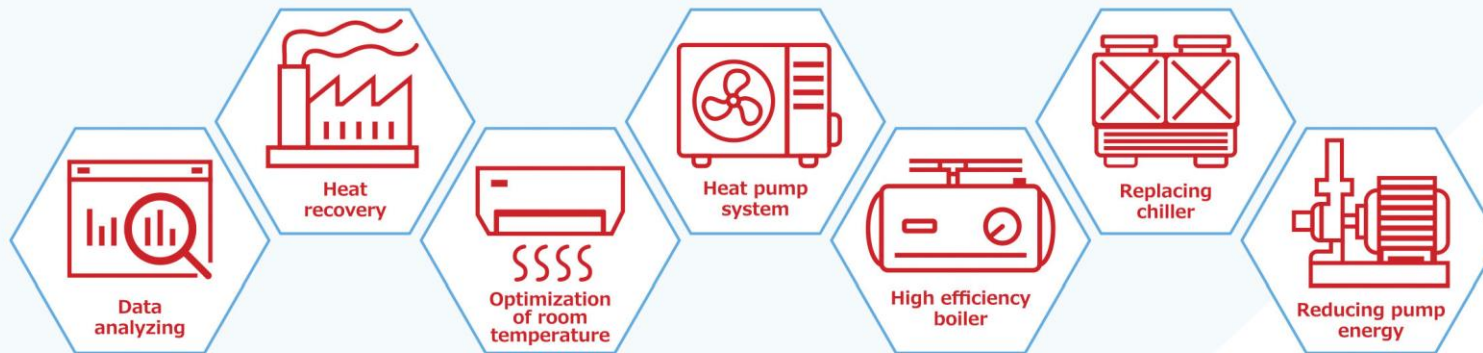
Energy saving consulting service

This is a service that proposes energy-saving measures for equipment in the customer's factory.

Consulting flow



Equipment subject to consulting (example)



These equipment are just an example, not limited. We will consider it according to your consultation.

Target client

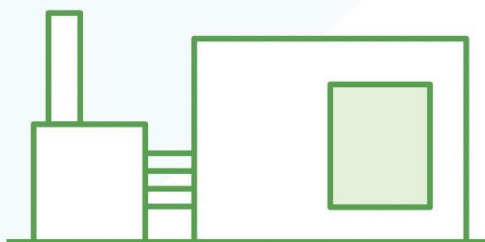
Client who want to consider a wide range of energy-saving measures for the entire factory.



2) On-site service

KEST invests and introduces facilities on the site of customer

On-site service menu

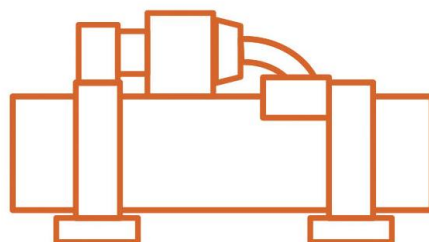


Co-generation system

Heat Electricity supply

For client who use a lot of electricity and heat (Textiles, rubber industry, etc.)

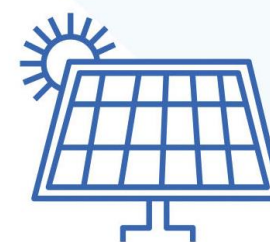
Today's topic



Turbo chiller

Heat (Chilled water) supply

For client who has a demand to cold water (Food, Textiles, Precision machinery, etc.)



Solar panel

Electricity supply

For all client

2. GHG reduction measures

What is important for GHG reduction ?

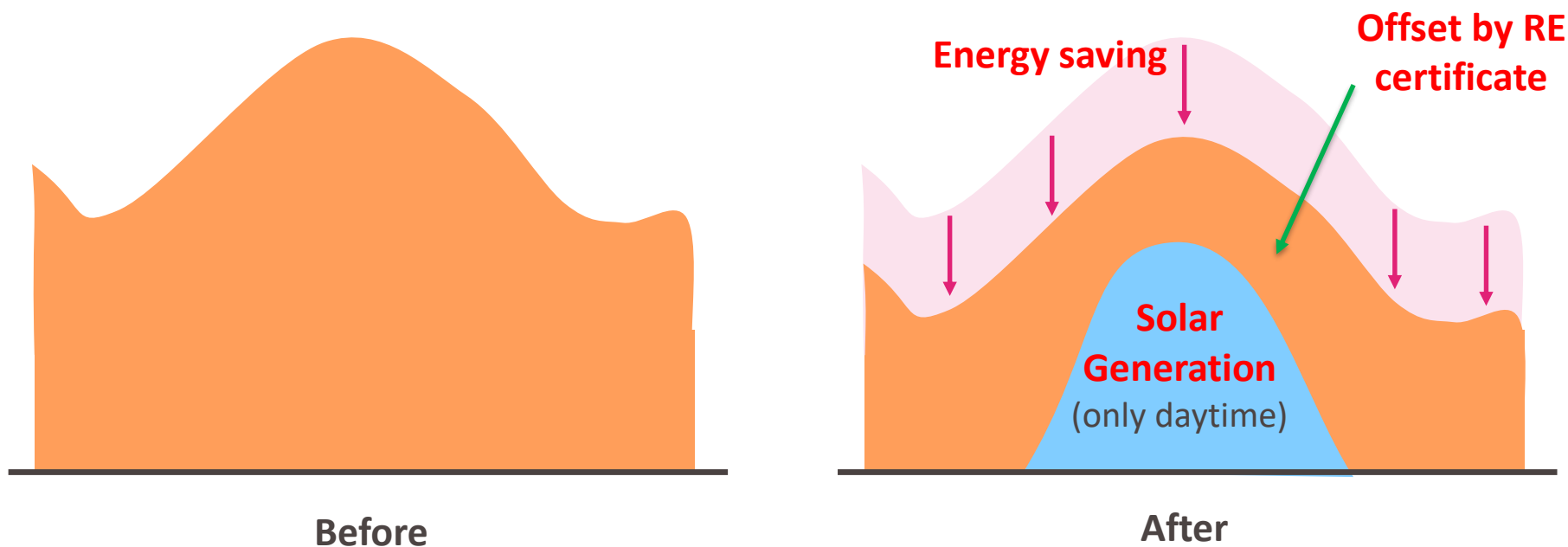
Combination of these 3 approaches are very important for GHG reduction

1. RE Generation

2. Energy Saving

Today's topic

3. Offset by RE certificate



Both of “Operation improvement” and “introducing high-efficient facilities ”are important for energy saving activities

Energy saving without investment (Operation Improvement)

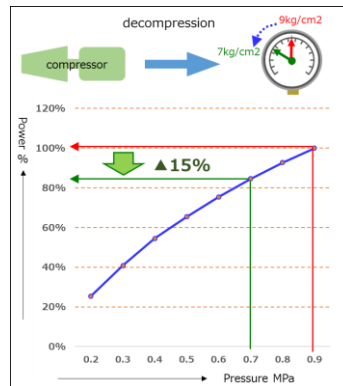
1. Leakages check

- Steam trap,
- Compressed air
- Insulation
- Etc..



2. Adjusting parameters

- Compressed air pressure
- Chilled water temperature
- Inverter Hz
- Etc...



Energy saving with investment (Introducing high-efficient facilities)

Scope of JCM Financing Programme

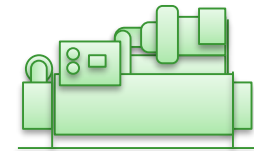
1. Cogeneration

Today's topic



2. High efficient Chiller or Heat Pump

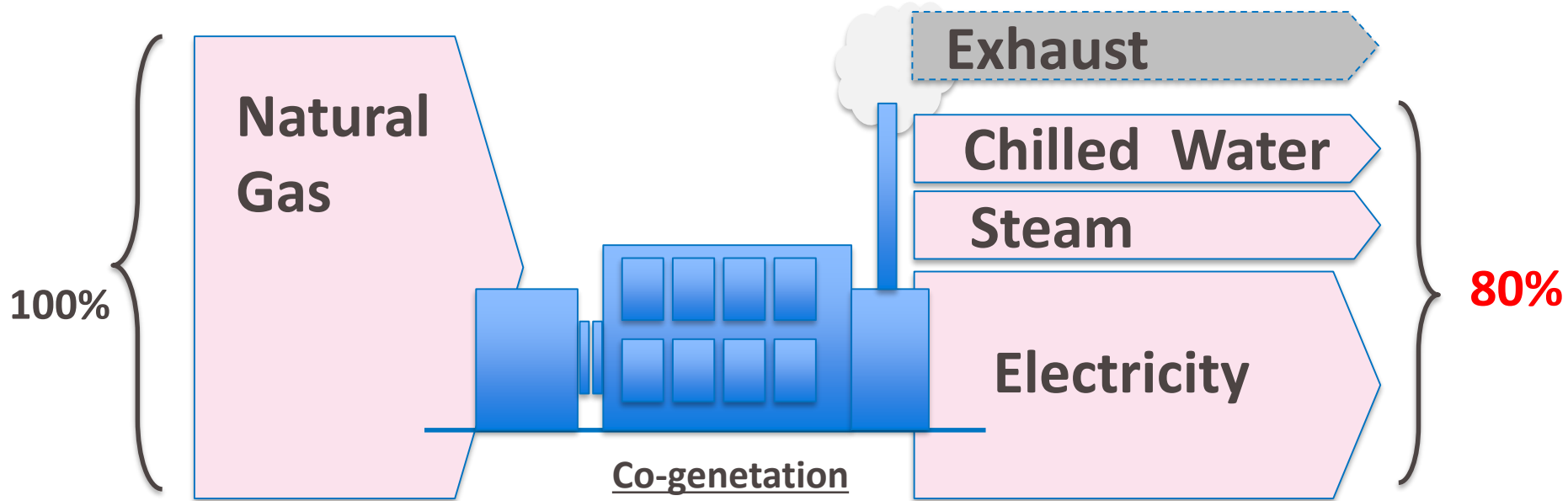
- Turbo chiller with inverters
(module type)
- Heat Pump
- Etc...



3. Inverters for pumps or fans

What is Co-generation ?

Co-generation system is high efficient system, which generate not only electricity but also heat (steam, hot water, chilled water etc.)



1. High total efficiency

2. Contribution for power stability for the factory

Attention

- Cogeneration system needs stable fuel source, such as pipeline natural gas, LPG, or biomass fuels.

- The balance of electricity and heat is very important factor.

If the factory uses the steam so much, it is suitable for cogeneration.

Ex) fiber, rubber, chemical, or food industry.

If there are no heat demand, cogeneration cannot save GHG and energy cost.

3. JCM Model Project

System

Gas Engine Generator
(4.99MW x 2 unit)
+ Exhaust Gas Boiler
(2.6t/h x 2unit)
+ Absorption Chiller
(800 USRt)

Total Efficiency

80.4% (Planning)

Factory Type

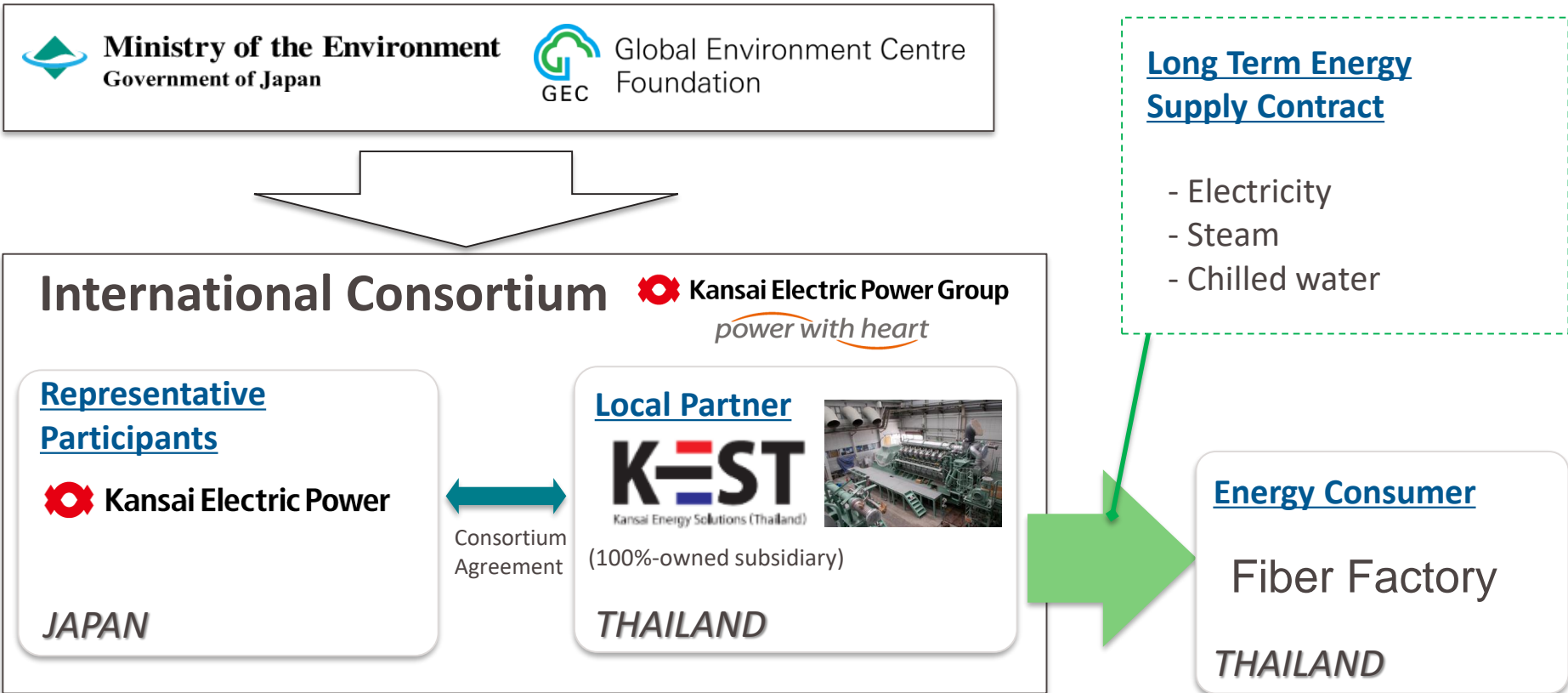
Fiber factory



Expected GHG Emission Reductions

16,158 tCO₂-eq./year

Kansai Electric Power Group provides one-stop service to the energy consumer. Customer can easily enjoy the merit of Co-generation.



4. Summary

1. Combination of these 3 approaches are very important for GHG reduction.
 - ① Renewable Energy Generation
 - ② Energy Saving
 - ③ Offset by RE certificate
2. One of the promising energy saving measures is introduction of Co-generation, especially for the factory which uses both of heat and electricity.
3. Financing Programme for JCM Model Projects is highly recommended to make the project feasible.

Thank you.

