# Additional Information:

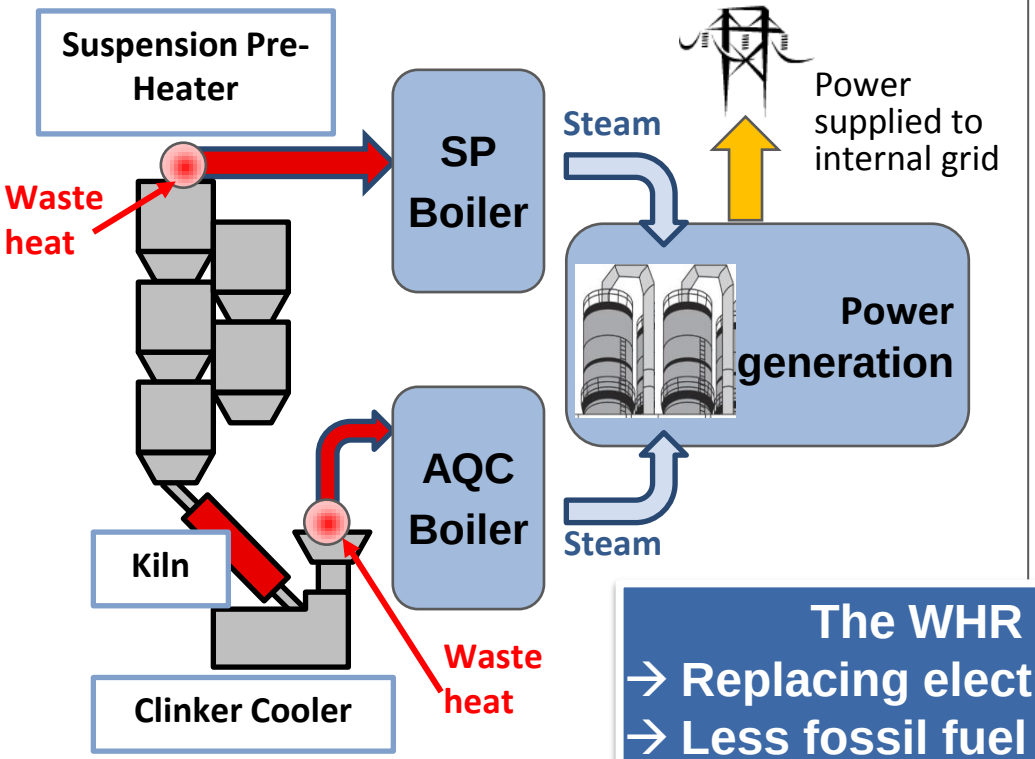
# Power generation by waste heat recovery in cement industry

JFE Engineering Corporation

# Project Overview

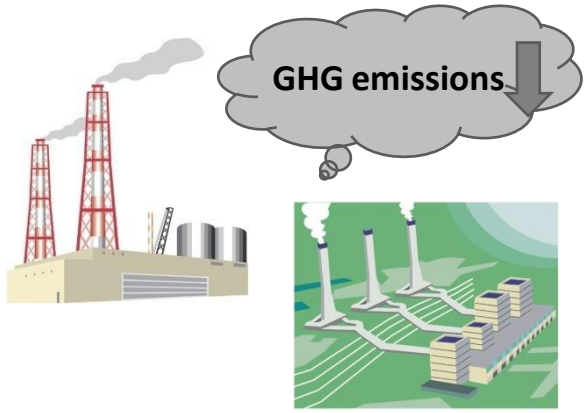
■ A WHR system recovers waste heat energy, generates steam which is fed into a steam turbine to generate power.

■ Cement plant



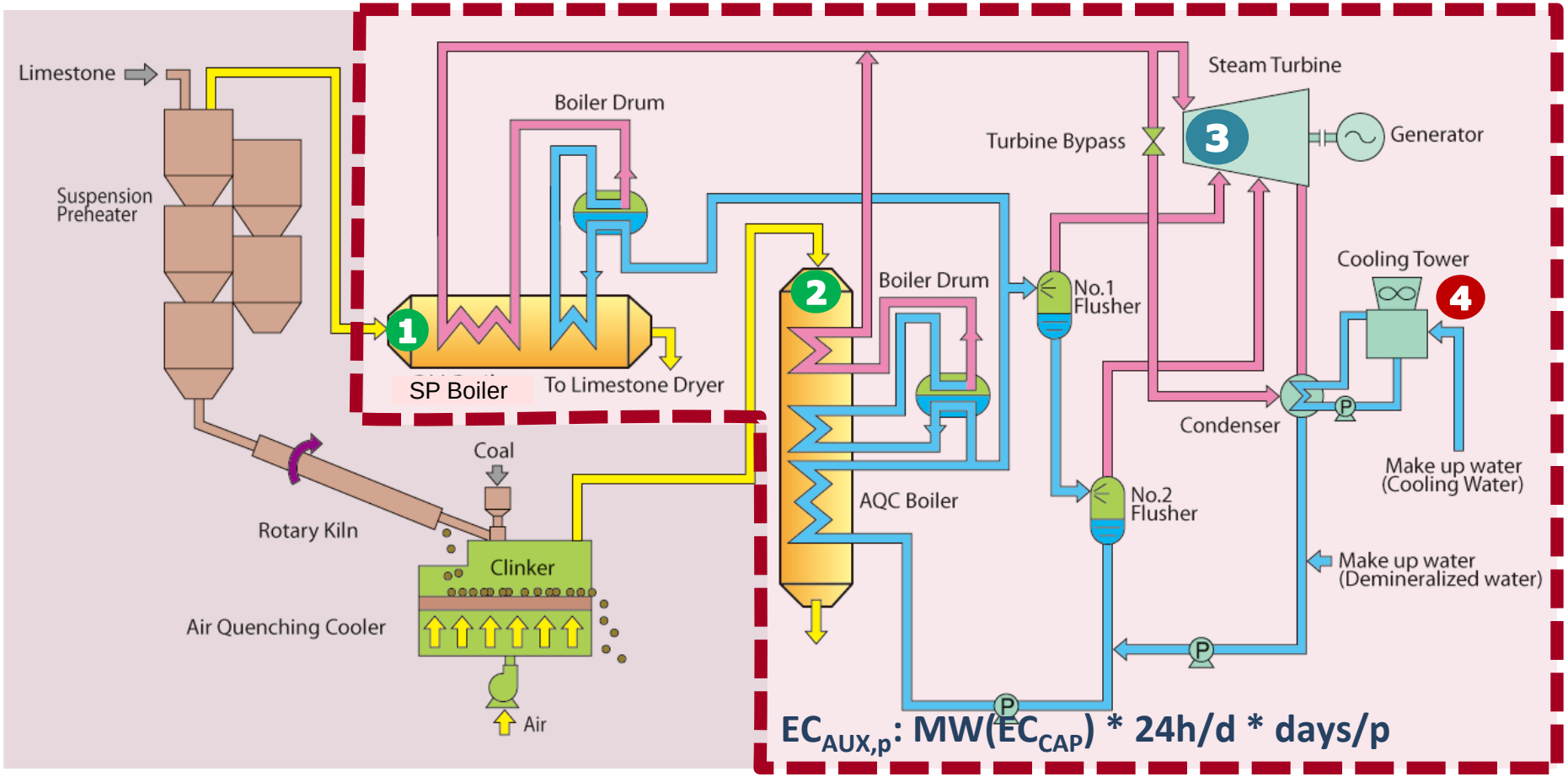

Less electricity import

■ Fossil fuel fired power plants in the grid




**The WHR system will generate power**
**→ Replacing electricity import from the grid**
**→ Less fossil fuel fired in the grid**
**→ Less GHG emissions from the grid**

# Typical System Flow




**Clinker Production Process**

**Waste Heat Recovery System**

# WHR Systems in Indonesia

## Background

- ✓ **Only 1 WHR system installed to 1 plant out of existing 25 plants in Indonesia**
- ✓ **The installation of the WHR system mentioned above was undertaken as a CDM project (registered on 11 July 2011)**
- ✓ **The starting date of this project is 19 March and no plant has been installed ever since**

## Barriers

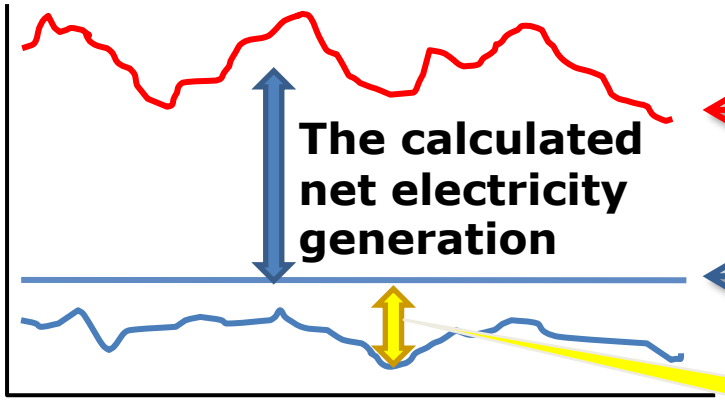
- ✓ **WHR systems are not production facilities**
- ✓ **With moderate economic growth and projection for increased cement demand in the future, investment in ancillary facilities such as WHR systems is not the top priority of private companies**

**→ As a result, WHR systems have had a limited diffusion rate**

# Reference Emissions

## Calculation

- ✓ **Reference emissions are calculated conservatively through the following method:**
  - **Net electricity generation is calculated from "Power supplied" – "Power consumed"**
  - **Power consumption ($EC_{AUX,p}$) is calculated from the theoretically maximum load to the equipment consuming electricity ($EC_{CAP}$)**




The quantity of electricity supplied by the WHR system to the cement facility

**Power consumption:**
**$EC_{AUX,p}$: MW($EC_{CAP}$) * 24h/d * days/p**

**Corresponds to net emission reductions**

# Reference Emissions

## Calculation

- ✓ **Net electricity generated by the WHR system ($EG_p$) which replaces grid electricity import is calculated by the following:**
  - **$EG_p$ = Electricity supplied by WHR (A) – Electricity consumed by WHR (C)**
  - **Amount of electricity consumption at (B) is already deducted from amount of electricity supplied at (A)**