Additional Information:
Power generation by waste heat recovery in cement industry
Project Overview

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

Cement plant

- Suspension Pre-Heater
- SP Boiler
- AQC Boiler
- Kiln
- Clinker Cooler
- Steam

Power generation

- Power supplied to internal grid
- Less electricity import
- Less fossil fuel fired in the grid
- Less GHG emissions from the grid

Fossil fuel fired power plants in the grid

GHG emissions

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

EC\text{AUX,p} = MW(\text{EC}\text{CAP}) \times 24\text{h/d} \times \text{days/p}
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:

$EC_{AUX,p}$: $MW(EC_{CAP}) \times 24h/d \times days/p$

Corresponds to net emission reductions
Net electricity generated by the WHR system (\( EG_p \)) which replaces grid electricity import is calculated by the following:

- \( EG_p = \text{Electricity supplied by WHR (A)} - \text{Electricity consumed by WHR (C)} \)
- Amount of electricity consumption at (B) is already deducted from amount of electricity supplied at (A)