JCM Model Project
Power generation by waste heat recovery in cement industry
About JFE Engineering Corporation

Project Information

Project Scheme & Schedule

Advantage & Challenge

Future Market
JFE Group Structure

JFE Holdings (holding company)

45.93 %

JFE Steel
Net Sales (million US$) 26,900
Employees 42,500

JFE Engineering
Net Sales (million US$) 2,840
Employees 7,400

JFE Shoji Trade
Net Sales (million US$) 17,800
Employees 6,200

Japan Marine United

JFE Holdings 45.93%
IHI 45.93%
Hitachi Zosen 8.15%
JFE Engineering Business Field

Industrial Machinery
- Logistics
  (Bicycle Parking System, Container warehouse, Port cranes)

Steel Structure
- Bridges
- Coastal structure
- High rise structure

Net Sales (million $)
2,840

Environment
- Waste-to-Energy
- Biomass
- Water Solution

Energy
- Pipeline
- LNG
- Power Plant
Global Network

**Europe**
- Frankfurt (Germany)
- Rome (Italy)

**Asia & Oceania**
- Singapore
- Kuala Lumpur (Malaysia)
- Jakarta (Indonesia)
- Hanoi, Ho Chi Minh (Vietnam)
- Yangon (Myanmar)
- Manila (Philippines)
- Mumbai, Pune (India)
- Brisbane (Australia)

**Middle East**
- Al Khobar

**America**
- Shanghai
- Beijing
- Hong Kong
- Long Beach (USA)

**Subsidiary Company**
- J&M Steel Solutions Company Limited (Myanmar)
- PT. Enercon (Indonesia)
<table>
<thead>
<tr>
<th>Project Name</th>
<th>Power generation by waste heat recovery in cement industry</th>
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</table>
| Project Participants | JFE Engineering Corporation  
                        | PT Semen Indonesia*1 |
| Total Investment | 44 Million US$*2 |
| Project Period | July 2014～August 2016 |
| Site | Tuban Plant, East Jawa |
| Power Generation | 28MW |
| GHG Reduction | 122,000t-CO2/y |

*1: The biggest Cement Company in Indonesia  
*2: US$1=JPY120
Cement Production Process

- Cement making
  - limestone quarry
  - dump truck
  - excavator
  - clay, limestone, and sand
  - kiln
  - clinker cooler

- Process:
  - hot exhaust gas at 350°C
  - 1450°C
  - 400°C
  - Hot Exhaust Gas

- Equipment:
  - preheater tower
  - crusher
  - secondary crusher
  - proportioning equipment
  - grinding mill
  - cement storage
  - shipping
**GHG Reduction**

Self-Consumption 21,024 MWh

Net Electricity Generation 165,126 MWh

Grid Power

Coal-fired Power Plant

Cement Production Process

Hot Exhaust Gas

Steam

SP Boiler

AQC Boiler

Turbine Generator

Steam

Net Electricity Generation 165,126 MWh

GHG Reduction 122,000 tCO₂/y

= 165,126 MWh/y * 0.741 tCO₂e/MWh

Self-Consumption 21,024 MWh

Steam
JCM Model Project Scheme

Japanese Government Ministry of the Environment

Indonesian Government

at least half of JCM credits issued

Finance (up to the half)

International Consortium

JCM Joint Committee

JFE Engineering Corporation

PT Semen Indonesia
## Project Schedule

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<th>FY2014</th>
<th>FY2015</th>
<th>FY2016</th>
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<tr>
<td>Feasibility Study</td>
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<td>Submit Proposed Methodology</td>
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<td>Apply for Finance</td>
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<td>Project Execution</td>
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<td>Develop PDD</td>
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<td>October 2016~March 2021</td>
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<td>Issuance</td>
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JCM Model Project Advantage

- Reduce Initial Investment
- Employ High and Reliable Technology

→ Energy Save = Cost Reduction
JCM Model Project Challenge

◆ How to monitor power consumption efficiently?

◆ How could we execute project successfully as consortium?
Future Market

Vietnam
- Cement Production: 22.5Mt/y
- Power Generation: 57MW
- GHG Reduction: 250,000t-CO2/y

Thailand
- Cement Production: 45.0Mt/y
- Power Generation: 112.5MW
- GHG Reduction: 490,000t-CO2/y

Malaysia
- Cement Production: 20.3Mt/y
- Power Generation: 50MW
- GHG Reduction: 270,000t-CO2/y

Indonesia
- Cement Production: 45.0Mt/y
- Power Generation: 112.5MW
- GHG Reduction: 710,000t-CO2/y
Thank you for your kind attention!