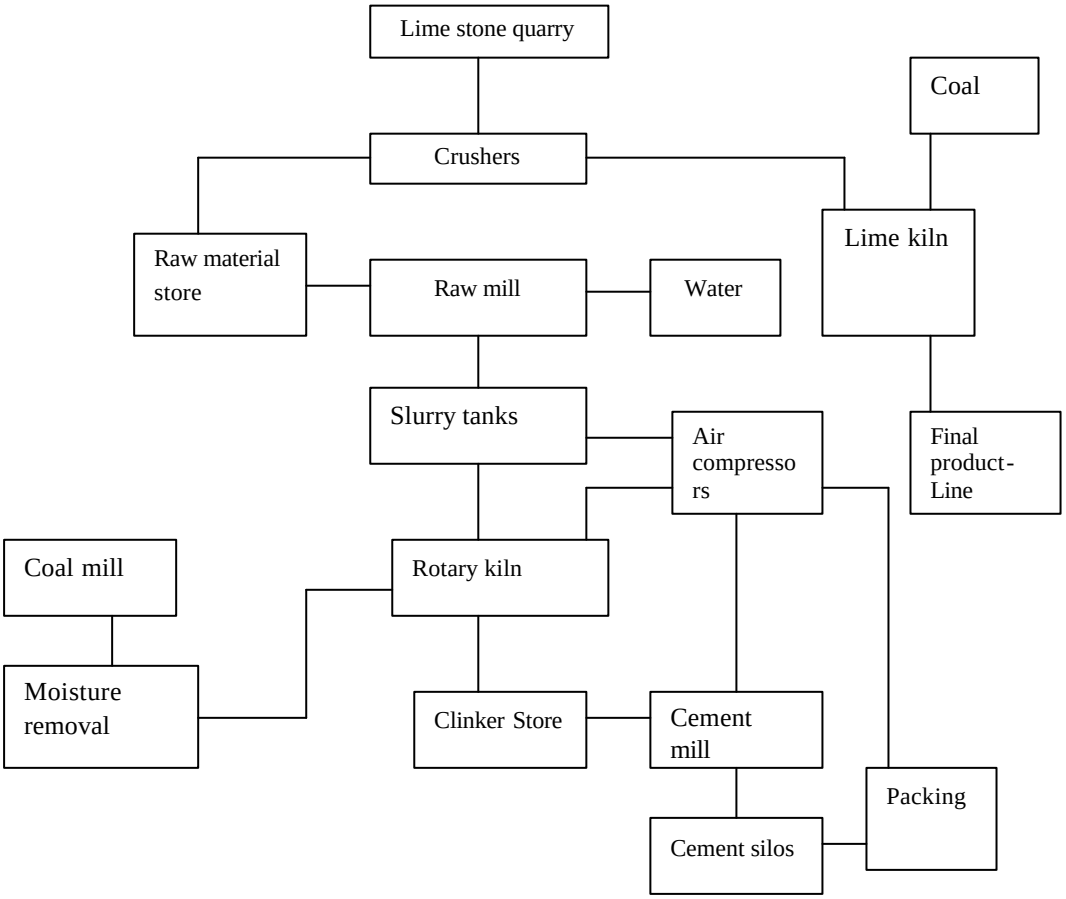
HUTUL CEMENT PLANT

COMPANY DESCRIPTION

The Hutul Cement Company is located in Selenge, Aimag, Mongolia and was established in 1983. The company has 848 employees who work in 3 working shifts. The kiln operates 24 hours a day but the plant is closed for five months between November and March because of the cold weather when everything freezes! The annual production is 70,000 tons of cement and 40,000 tons lime. The company has not been involved in any energy efficiency projects prior to GERIAP. The GERIAP assessment is also the first of its kind for the company.

PROCESS DESCRIPTION

The production process is illustrated below. Most important inputs include limestone, electricity, coal, water, and iron ore. Most important outputs include cement, dust, waste, and emissions.



METHODOLOGY APPLICATION

The draft *Company Energy Efficiency Methodology* was used as a basis for the plant assessment to identify and implement options to reduce energy and other materials and wastes. Some of the interesting experiences are:

- ***Task 1d – Select focus areas***

A meeting was held with the Director and the Team to identify large energy users, where old equipment is used and where scope for improvement exists. Based on the outcome of this process, the Team selected the 3 focus areas.

- *Kiln Section*: This area was selected as the first focus area because Hutul Cement wants to reduce coal consumption (and the Kiln Section is using 52 % coal consumed by the plant), and the kiln is operating 24 hours per day.
- *Steam system (boiler):* The district heating boilers, including economizer, air pre-heater and fans, were selected because the boilers consume 34% of coal and are therefore the second largest coal user of the plant and because the boiler efficiency is low.
- *Cement Mills:* The Cement Mills were selected as the third focus area because they are one of the largest electricity consumers and use open circuit ball mills, which is an older technology.

- ***Task 2e – Quantify losses through a material and energy balance***

Material and energy figures were provided for the plant as a whole. However, a materials and energy balance for the three focus areas was not prepared as part of the first visit to the plant because data were not readily available in English.

OPTIONS

- Three focus areas were selected for an energy assessment: (1) Kiln, (2) Steam system, and (3) Cement mill.
- The Team identified a total of 13 energy and waste minimization options. These included:
  1. Kiln / Reduce O2 levels in exit flue gas from kiln cyclone from 8% to ideally 4% to improve fuel efficiency
  2. Kiln/ Introduce procedure to monitor the surface temperature of kiln to determine condition of insulation
  3. Kiln – coal / Manage coal consumption by improved drying of coal before feeding into the kiln
  4. Kiln – coal / Install coal monitoring equipment and monitor and reporting coal consumption
  5. Kiln – dust / Reduce dust by improved sealing of dust control system
  6. Kiln – dust / Reduce dust by installing EPS to improve dust collector effectiveness (because there are no $ savings it is difficult to justify the investment)
  7. Kiln – fans / Install variable speed drive (VSD) motors on cooler fans (investment costs are the main barrier)
  8. Steam system – boiler/ Improve boiler efficiency by reducing fines in coal, reducing O2 levels in flue gas, and controlling unburnt in bottom ash
  9. Heating system – boiler/ Replace existing boiler with FBC (fluidized bed coal) boiler and rehabilitation of existing boilers (investment costs were the main barrier but the option was implemented)
  10. Steam system – boiler/ Install variable speed drive (VSD) motors on fans (investment costs are the main barrier)
  11. Cement mill / Control the wearing rate of the balls of mills by properly checking the composition of the balls used in the mills

12. Cement mill / Monitor the ball loading in cement mills and other ball mills separately
13. Cement mill – dust/ Improve dust monitoring control at the clinker feeding and gypsum feeding point and at the material transfer location (because there are no $ savings it is difficult to justify the investment)

- For the four options implemented, the total investment costs were US$ 148400, annual savings were US$ 55400 and the combined payback is 2.7 years
- For the four options implemented, the total coal reductions were 2670 tons per year and greenhouse gas (GHG) reductions were 6691 tons CO2 per year

A summary of implemented options is given in the table below.

Table: EXAMPLES OF OPTIONS IMPLEMENTED

FOCUS AREA/ OPTION	CP TECHNIQUE	FINANCIAL FEASIBILITY	ENVIRONMENTAL BENEFITS	COMMENTS
Kiln/ Introduce procedure to monitor the surface temperature to determine condition of insulations	Improved process management	▪ Investment: US$ 700 ▪ Cost savings: US$ 400/yr ▪ Payback period: 1.7 yr	▪ Coal savings: 20 t/yr ▪ GHG emission reductions: 50 tCO2	Infrared surface indicator must be bought
Rehabilitation of boiler and controlling unburnt in bottom ash *(see case study)*	Improved process management	▪ Investment: US$ 70,000 ▪ Cost savings: US$ 28,000 ▪ Payback period: 2.5 years	▪ Coal savings: 1400 tons ▪ Annual GHG emissions reduction: 3,514 tons	Combustion analyzer and contact thermometer must be bought
Replacement of boiler with FBC boiler *(see case study)*	New technology / equipment	▪ Investment: US$ 40,000 ▪ Cost savings: US$ 13000 ▪ Payback period:3.1 years	▪ Coal savings: 650 tons ▪ Annual GHG emissions reduction: 1,630 tons	Implemented in October 2004 New boiler was a FBC boiler

FOR MORE INFORMATION

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