



HUTUL CEMENT

Rehabilitation and/or Replacement of Existing Boilers

SUMMARY OF THE OPTION

Hutul Cement is located in Mongolia and produces 70,000 tons of cement and 40,000 tons lime per year. The three district heating boilers consume 35% of the plant's coal and were found to be operating inefficiently.

The company replaced one boiler with a FBC (fluidized bed combustion) boiler. Investment costs were US\$ 140,000, annual savings were US\$ 45,000 and the payback period was 3.1 years. Each year 2250 tons of coal is saved, which equals 5640 tons of CO₂ emissions.

The company also replaced lining, bent-tubes and cyclones in the boilers. Investment costs were US\$ 3000, annual savings were US\$ 2000 and the payback period was 1.5 years. Each year 100 tons of coal is saved, which results in a reduction of 251 tons of CO₂ emissions.

KEY WORDS

Cement, Mongolia, Boilers and thermic heaters

OBSERVATIONS

The following was observed during the energy assessment of the district heating boilers:

- Coal consumption and costs are high: Annual coal consumption is 15000 tons/year. Annual operation cost is US\$380,000. As the heating system consumes 35% of the plant's coal, it is necessary to run the boiler efficiently.
- Combustion efficiency is not monitored. The coal feed to the boiler contains a large quantity of fines. This type of boiler can burn fines up to 30%.
- The O₂ percentage in flue gas is not monitored and can be maintained between 6-8 %.
- The bottom ash contains un-burnt carbon, which is not monitored.

OPTIONS

The Team suggested the following options:

- Improve boiler efficiency to 70% by
 - Rehabilitation of existing boilers
 - Reducing fines in coal to below 30%
 - Reducing O₂ levels in flue gas to below 8%
- Replace existing boiler with a FBC (fluid bed combustion) boiler

The following options were implemented:

- Boiler N1 was replaced with a FBC boiler in October 2004.
- Boiler N3 was rehabilitated by changing of lining (insulations) and bent-tubes
- 6 cyclones for all 3 boilers were changed



Fines in coal have been reduced up to 15 % by increasing of blow down ventilators.



Figure 1. Reconstruction work for district heating boilers

RESULTS

1. Replacement of boiler with FBC boiler

Financial benefits

- Investment: US\$ 40,000
- Annual operation cost: no additional operating costs
- Annual cost savings: US\$ 13000
- Payback period: 3.1 years

Environmental benefits

- Annual coal savings: 650 tons
- Annual GHG emissions reduction: 1630 tons CO₂ (= 650 tons of coal X 2.51 tCO₂/t coal)

2. Rehabilitation of boiler and controlling unburnt in bottom ash

Financial benefits

- Investment: US\$ 70000 (water softening, changing of insulations and bent-tubs other improvements)
- Annual operation cost: no additional operating costs
- Annual cost savings: US\$ 28000
- Payback period: 2.5 years

Environmental benefits

- Annual coal savings: 1400 tons
- Annual GHG emissions reduction: 3514 tons CO₂ (= 1400 tons of coal X 2.51 tCO₂/t coal)



FOR MORE INFORMATION

GERIAP National Focal Point for Mongolia

Ms. J. Batsukh, Director
International Cooperation Department
Ministry of Nature and Environment
Government Building 3, Baga toiruu 44
Ulaanbaatar 11, Mongolia
Tel: +976 99 119200 / + 976 11 321 401
Fax: + 976 11 321 401
Email: mne@magicnet.mn

GERIAP Consultant for Mongolia

Mr. Dorjpurev Jargal
Director, Energy conservation and Environmental Consulting Co. Ltd (EEC)
Bayangol, 1st District
015-5, Ulaanbaatar, Mongolia
Tel/Fax: +976 11 330968
E-mail: mecc@magicnet.mn

GERIAP Company in Mongolia

Mr. A. Shoovdor, Managing Director
Hutul Cement Plant
Selenge Aimag, Saikhan sum
Hutul, Mongolia
Tel: +976 013651-2151
Fax: +976 136512368
E-mail: khutul_cement.lime@railcom.mn

Disclaimer:

This case study was prepared as part of the project “ Greenhouse Gas Emission Reduction from Industry in Asia and the Pacific” (GERIAP). While reasonable efforts have been made to ensure that the contents of this publication are factually correct, UNEP does not accept responsibility for the accuracy or completeness of the contents, and shall not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance on, the contents of this publication. © UNEP, 2006.