



VIET TRI PAPER COMPANY

Construct a Coal Storage to Reduce the Moisture in Coal

SUMMARY OF THE OPTION

Viet Tri Paper Company is located in Phu Tho province, Vietnam. It is specialized in manufacturing of printing paper, writing paper, toilet paper and wrapping paper. Annually, the company purchases over 6,000 tons of coal to supply three old coal fired boilers. The moisture content in coal was generally in the range of 15% -16%. In order to maintain moisture at around 10% the company has installed a metal roofing house. This needs a total investment cost of US\$ 6,349 and would be paid back in 4.6 years. Annual GHG emission reduction is 148 tons CO₂.

KEY WORDS

Pulp and Paper, Vietnam, Fuels and combustion, Coal handling

OBSERVATIONS

One element that influences the handling of coal and impacts the operation and efficiency of the boiler is water. Additional moisture coming from rain and other climatic conditions not only lowers the heating value of the coal, but it also creates an additional efficiency penalty. Changes in the moisture levels of coal can also cause large changes in the boiler heat rate.

Increased moisture lowers the plant efficiency by raising the wet gas loss component of the boiler. Moisture in the coal is converted to steam in the combustion zone using a considerable amount of energy. Any additional moisture thus increases the quantity of coal needed for the boiler operation. The moisture content in coal fed to the boilers during the assessment was in the range of 15% - 16%, which is much higher than the recommended value of 10%. The stack gas temperature was approximately 200°C.

OPTIONS

At present, the company uses three coal-fired boilers in type of chain grate. In an effort to reduce heat losses, the Team recommended to reduce the moisture content of the coal. The option involves the installation of a metal-roofing storage place (200 m²), designed to contain approximately 350 tons of coal. Before being fed in the boiler, the coal must be stored in the storage area during at least seven days to reduce its surface moisture to approximately 10%.

Figure.1 The coal is exposed to rain and other climatic conditions



RESULTS

The implementation of this option required an investment of US\$ 6,349 involving costs of metal roofing, civil works and steel frames. The actual boiler efficiency increase is approximately 0.1% for each 1.0% decrease in moisture. Through a reduction of the coal moisture of 5%, the company was able to save approximately 59 tons coal per annum, which is currently worth \$1,375 at local commercial rates. This option has a simple payback period of 4.6 years.

Figure 2. The coal is stored in a storage place



Financial benefits

- Investment: US\$ 6,349
- Operating cost: US\$ 368
- Annual cost savings (3 boilers): US\$ 1,375
- Payback period (month): 4.6 years

Environmental benefits

- Annual coal savings (3 boilers): 59 tons
- Annual GHG emissions reduction: 148 tons CO₂ /year Table 1. Savings estimated through moisture reduction (coal storage). Emission factor: 2.51 tons CO₂/ton of coal

FOR MORE INFORMATION

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