



ASIAN CHEMICAL COMPANY LIMITED

Replacement of Inefficient and Unsafe Boiler with a New Boiler

SUMMARY OF THE OPTION

Asian Chemical Co Ltd is located in Bangpakong in Thailand and produces 6,000 tons per year of various copper solution products, namely copper sulfate, copper oxide, copper chloride and etching solution.

One of the two existing oil-fired boilers was 25 years old, unsafe, and caused a low average efficiency of both boilers of 70%. The company purchased a new boiler to replace the 25-years old boiler. Investment costs were US\$ 55,000. Annual cost savings from 38,000 liters fuel oil reductions was US\$ 7,600. The payback period was about seven years. GHG emission reductions were 114 tCO₂ per year. Despite the fact that this option was expensive and with long payback period, the option was approved because it was good for energy use, costs, safety and the environment.

KEY WORDS

Chemicals, Thailand, Boilers and Thermic Fluid Heaters

OBSERVATIONS

Of the two existing oil-fired boilers, one of the boilers was 25 years old. The average efficiency of both the boilers was 70%. The fuel consumption increased due to the deteriorated condition of the boiler. In addition, the boiler posed a safety risk to staff if an explosion would take place.

OPTIONS

The company proposed a plan to replace the ageing boiler to improve the overall system efficiency. This option was combined with the installation of an insulated storage tank for collecting and reusing 80°C condensate as boiler pre-heated feed water (*see other case study*). The installation of a new boiler was approved because it was good for energy use, costs, safety and the environment.

RESULTS

The results of the installation of the new boiler were promising. The efficiency of the new boiler was 85% and the overall efficiency of the company's steam generation system (i.e. calculated via overall performances of two boilers) was also increased. Consequently, the company's annual fuel oil consumption (i.e. consumed by two boilers) and CO₂ emission were reduced significantly as shown below.

Financial benefits

- Investment costs: US\$ 55,000 for purchasing and installing the new boiler
- Annual operating costs: included in routine maintenance tasks
- Annual cost savings: US\$ 7,600 (38,000 liters/year X US\$ 0.2/liter)
- Payback period: 7.2 years



Environmental benefits

- Annual fuel oil savings: 38,000 liters or 1209 GJ, calculated as follows:
 - 38,000 liters X 9,500 kCal/liter X 80% boiler efficiency
 - 288,800,000 kCal/year
 - 288,800,000 X 4.1868 kJ/kCal
 - 1,209,147,840 kJ/year
 - 1,209 GJ/year
- Annual GHG emission reduction: 114 tons CO₂ (38,000 liters/1000 X 3 tons CO₂/1,000 liters)

Other benefits

- Safer work place due to reduced risk of explosion or other accident involving the boiler
- Improved staff efficiency because less time is needed for maintenance and repair

FOR MORE INFORMATION

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