ATTACHMENT 546

BOILER ECONOMISERS AND AIR PREHEATERS GRAPHICAL PRESENTATION

Compiled by

AFREPREN/FWD

COGEN FOR AFRICA PROJECT

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1 Introduction
Boilers and steam systems are very common sources of heat for a wide range of industrial plants and can account for 20-60% of their total energy costs. Improving the efficiency of boilers through minor adjustments such as installing economizers and air-preheaters are two key methods of increasing the efficiency of boilers. In turn, this saves on energy bills and reduce the emission of greenhouse gases into the atmosphere. Saving on energy bills means more financial resources available for a factory or company which can be used for expansion, diversification or simply translation into direct profits.

Figure 1: Economizer in a coal fired boiler
2  Economizers
An economizer is a heat exchanger that recovers heat from the boiler flue gases to heat the boiler makeup water. When installing an economizer onto a boiler, the feed water or the return water is pumped through the heat exchanger tubes and absorbs the heat from the hot flue gas.

![Image of the MaxiMizer Economizer Heat Transfer Process]

Figure 2: Boiler economizer

2.1  Types of economizers
- Non condensing economizer
- Condensing economizer
2.2 Non condensing economizer

Figure 3: Piping in an economizer

Figure 4: Victory energy non condensing economizer
2.3 Condensing economizer

Figure 5: Condensing economizer

Figure 6: Condensing economizer systems
3 Air-preheaters

An air pre-heater is an air-to-air heat exchanger that heats the boiler combustion air using the recovered heat from exit flue gases of a boiler.

![Schematic of an Air-preheater](image)

*Figure 7: Schematic of an Air-preheater*

3.1 Types of air preheaters

- Tubular type air preheater
- Regenerative type air preheater
3.2 Tubular type air preheaters

Figure 8: ThermoZ welded plate air preheater

Figure 9: ThermoZ air preheater
Figure 10: Heat pipe air preheater

Figure 11: Corten Steel Tubular air preheater
3.3 Regenerative type air preheater

Figure 12: Illustration of regenerative APH

Figure 13: Installing a regenerative type air preheater
Figure 14: SPX Air Preheater