



# BEEF PROCESSING PLANT CASE STUDY

## WATER & ENERGY SOLUTIONS

redefining efficiency since 1969



### Project Overview

A beef processing plant has recently partnered with Kemco Systems to recover heat exhaust from its facility's water-sanitization boilers. Priding itself on a sustainable mindset and strict operational standards, the beef processing company reached out to Kemco through a channel partner. This company was seeking updated equipment to continue production of the highest-quality products while also meeting economical needs.

An industry leader since 1969, Kemco Systems designs custom water systems built to the highest standards of excellence. Kemco Systems offers outstanding quality, exceptional reliability and top value for energy dollars. The beef processing plant chose Kemco Systems over competitors due to its high energy savings and efficient designs.

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First, Kemco's field engineers performed an on-site plant and process evaluation to create an accurate installation blueprint. The site evaluation included determining which equipment would be best suited to improve overall system efficiency. During this evaluation, factors such as sizing and technical specifications are assessed to ensure operational standards would be met post-installation.



## Recent Concerns

Before updating their process with the help of Kemco Systems, the beef processing plant's originally required a large boiler to properly heat water for sanitation purposes. The boiler was approaching the end of its lifespan, prompting the facility to search for boiler replacement solutions. This search led them to Kemco's direct contact water heater. Unlike traditional boilers, a direct contact water heater utilizes thermal heat energy, decreasing the amount of heat required for effective water sanitation.

## Why Choose Kemco's Stack Economizer

Kemco's stack economizer is designed to be an energy savings solution recovering heat that would otherwise be lost from boiler stacks. Typical gas-fired boilers lose 20% or more of consumed energy from their exhaust. This loss can mean every dollar spent on fueling a boiler system only delivers 65 to 70 cents of useful heat after transmission losses.

Because the Kemco stack economizer will recover nearly 100% of the heat going up in stack, one year of fuel savings may be enough to pay for the cost of the system. This rapid return on investment exceeds other conventional economizer equipment available on the market today.

## Results

When supplied with the 350°F exhaust from five boilers with 5072 HP operating load and 20% excess air, the Kemco stack economizer recovers sufficient energy to produce a closed heating loop. This loop will supply 135°F water to the fresh-water heat exchanger at a flow rate of 829 GPM. The boiler exhaust is designed to be returned to the atmosphere at 85 °F. Based on an average operating rate of 5072 HP, the stack economizer is designed to heat 829 GPM from 65°F to 135°F. This recovered energy is equivalent to 29 million BTU per hour. When compared to a hot water heating system with a 65% system efficiency, the recovery is equivalent to 44,365 FT<sup>3</sup> of gas per hour. Operating at this rate for 168 hours per week, 50 weeks per year and a gas cost of \$4.00 per 1000 FT<sup>3</sup>, the recovered heat has a value of \$1,490,664 per year.

**OPERATING RATE OF KEMCO STACK ECONOMIZER**



**OPERATING EFFICIENCY of STACK ECONOMIZER**



**NATURAL GAS COST:**

\$4.00 per 1000 Ft<sup>3</sup>



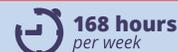
**GALLONS PER MINUTE:**

829

**HEATING WATER FROM**

65°F - 135°F

**OPERATING HOURS:**



**TOTAL ANNUAL SAVINGS:**

\$1,490,664 PER YEAR