



Benz Air Engineering Engineering Steam Efficiency

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The following is a case study of a tomato processing plant located in Woodland, California. The facility produces canned tomato products. The steam boiler plant provides steam for process loads. The boiler plant contains five high-pressure steam boilers. Our case study is the retrofit for Boiler #6, Trane-Murray, water-tube boiler of 150,000 lb. per hour rated capacity (capacity is limited to less than 100,000 lb. per hour before the retrofit); 150 psig steam, currently operating at 82.1% boiler efficiency.



Boiler # 6 - Canning Tomato's

The following equipment was identified to optimize boiler efficiency through a comprehensive boiler plant retrofit. Boiler plant optimization takes into consideration the processes involved when evaluating steam load and heat recovery options. The energy efficiency measures for Boiler #6 were:

- 1) Boiler Plant Feed-water Heat Recovery & De-aerator Control Upgrades
- 2) Steam Turbine to Electric Feed-water Pump Conversion with a VFD, to eliminate steam venting
- 3) Combustion Air Inlet Pre-heater, Low Excess Air Burner with Parallel Positioning Control & Fan VFD, and SCR NOx Emissions Control

Estimated Annual Savings

Natural Gas Energy Savings (therms)	
\$440,563	
Utility Cost Savings	\$430,411
Rebate	\$496,009

In less than one year a California tomato processing plant was able to meet mandated emission levels of 6 ppm, qualify for an energy rebate and lower fuel costs.

Annual Greenhouse Gas Reductions

Metric Tones p/yr of CO₂: 2,380

The Greenhouse reduction is equivalent to ONE of the following:

515 Passenger cars not being driven for one year

306 Household's electricity use per year

61,026 Number of tree seedlings grown for 10 years

801 Tons of waste recycled instead of land filled

271,072 Gallons of gasoline

20 Acres of forest preserved from deforestation

The technology, the savings, the lower emissions the results have been proven