

ENERGY PROJECT CASE STUDY

BOILER EFFICIENCY IMPROVEMENT

Financials

- ◆ Total Turnkey Installed Cost: \$160,000
- ◆ Annual Energy Cost Savings: \$57,500
- ◆ Simple Energy Funded Capital Payback: 2.78 year
- ◆ Average Project IRR: 35%
- ◆ CO2 Equivalent Reduction : 225 tCO₂e
(Natl. Avg. Emission Rate)

Description of Facility

- ◆ Food Processing
- ◆ Production, packaging, warehouse, and offices
- ◆ Facility utilizes a central boiler plant to provide steam and hot water for process heating and building heating



System Description

- ◆ One 800 HP natural gas fired steam boilers plus one older natural gas fired back up boiler
- ◆ Load can normally be carried on the 800 HP boiler but it requires full capacity of boiler
- ◆ Process uses steam for heating product and pasteurization
- ◆ Steam to hot water heat exchangers are use to generate hot water for clean up

System Opportunities/Issues

- ◆ Optimization of the boiler operation and combustion efficiency
- ◆ Installation of economizer in boiler flue gas exhaust to recover heat
- ◆ Install VFD on combustion air fan to improve efficiency
- ◆ Boiler stack support required use of horizontal economizer, physical room available and access was very tight
- ◆ Boiler combustion fan was at limit for supplying pressure and air flow

Project Description

- ◆ Installed new digital controls on 800 HP boiler to allow use of O₂ trim for tuning
- ◆ Installed new boiler economizer to recover flue gas heat to preheat boiler feedwater
- ◆ Installed new fan wheel and VFD on combustion air fan to increase air flow
- ◆ Retuned boiler combustion system for optimized operation

Project Benefits

- ◆ New more efficient boiler controls and heat recovery equipment
- ◆ Optimized and more efficient operation of the boiler operation
- ◆ Reduction in energy usage
- ◆ Reduction in O&M costs and better overall operation of the boiler system



Company Overview

Solution Dynamics is focused on providing our clients with high value services to assist them with the evaluation, development, and implementation of utility related cost reduction strategies and measures. These strategies include taking into account issues such as energy cost savings, sustainability, Green House Gas (GHG) impacts/carbon footprint, and reliability. Solution Dynamics looks at facilities as a whole to evaluate both demand side and supply side strategies and solutions. The principals of the company bring over 60 years of experience in the energy industry to our clients. This depth of experience allows Solution Dynamics to operate efficiently and effectively to derive value.

Solution Dynamics works closely with our clients to look at all aspects of their energy related costs. This includes; how production processes utilize energy and other utilities, the operation and maintenance costs, which fuel is being utilized, what utility rate structures are being used, is there equipment in need of replacement, what opportunities are there for low cost and capital based improvements, and what are financial and environmental benefits. Solution Dynamics develops and implements cost reduction strategies and measures that are specifically tailored to meet the individual needs of each facility. Energy supply opportunities provide reduced costs, while demand side opportunities include both technology and operational improvements to reduce energy use and cost. This also translates into benefits that go beyond simple energy cost reduction that include newer equipment, increased reliability, improved process control, reduction in GHG impacts and the potential generation of carbon credits.

Solution Dynamics has several established programs and as a company we take on the risk of successful performance to achieve results. Solution Dynamics has unique, high value, programs that have been developed to meet our client's requirements. These programs combine the ability to identify and implement both Low Cost High Value operational types of savings along with more traditional capital based savings. We also have supply side programs that guarantee performance to eliminate the risk of our clients.

Services Provided

Solution Dynamics specializes in the development and delivery of utility and energy consuming equipment related cost reduction opportunities and can deliver them in an efficient manner. Services provided by Solution Dynamics include:

1. Identification of high value cost reduction opportunities
2. Evaluation & development of energy strategies
3. Utility rate analysis
4. Project scope development
5. Project financing assistance
6. Detailed cost and savings analysis for professional quantification of project value
7. Development of measurement and verification plans
8. Project development for Construction
9. Turnkey project management, implementation, and commissioning of cost savings opportunities

Results

Solution Dynamics has a very strong and sustained track record of being able to successfully develop and implement cost reduction opportunities for our clients. We excel in identifying opportunities, many of them high value, which other companies typically miss. When reasonable economic criteria are utilized energy cost reductions that range between 5% to 25% of a facilities energy cost.

Energy Systems Experience

Solution Dynamics is experienced in a wide range of commercial and industrial facilities and energy consuming systems. Typical systems include: Boiler & Steam systems, Chilled water systems, Cooling towers, Compressed air, Lighting, HVAC for plants and offices, Building automation controls, Ammonia refrigeration systems, Variable speed drives, Efficient motors, Co-generation & Combined Heat & Power Systems, Heat recovery, Metering systems, Measurement and Verification protocol, and other types of energy, water, wastewater, industrial gasses and related utility systems.