

ENERGY PROJECT CASE STUDY

BOILER CONDENSING ECONOMIZER

Financials

- ◆ Total Turnkey Installed Cost: \$317,000
- ◆ Annual Energy Cost Savings: \$118,000
- ◆ Simple Energy Funded Capital Payback: 2.7 year
- ◆ Average Project IRR: 36%
- ◆ CO2 Equivalent Reduction : 848 tCO2e (Natl Avg Emsn Rate)

Description of Facility

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



System Description

- ◆ Two 500 HP natural gas fired steam boilers
- ◆ Summer operation requires one boiler, winter operation requires two boilers to be operating
- ◆ Process uses steam for heating and for some direct injection
- ◆ Building hot water heating is provided by steam to hot water heat exchangers

System Opportunities/Issues

- ◆ Optimization of the boiler sequencing and operation
- ◆ Installation of condensing economizer in boiler flue gas exhaust to recover heat
- ◆ Interface with Building Automation System for better system control

Project Description

- ◆ Installed new digital controls on boilers to provide optimized control and sequencing and interface to BAS
- ◆ Installed new fully condensing boiler economizer to recover flue gas heat along with associated pumping equipment
- ◆ Installed new heat exchanger to heat cold DI water and generate hot DI water
- ◆ Implemented new heat exchanger to preheat supply water to RO system

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.