

ENERGY PROJECT CASE STUDY

DIRECT FIRED HEATING SYSTEM

Financials

- ◆ Total Turnkey Installed Cost: \$964,000
- ◆ Annual Energy Cost Savings: \$613,000
- ◆ Chemical and Water Cost Savings: \$55,250
- ◆ Simple Energy Based Payback: 1.45 years
- ◆ Average Project IRR: 45%
- ◆ Estimated Labor Savings: \$250,000
- ◆ Simple Payback with Labor: 1.0 years

Description of Facility

- ◆ Manufacturing facility, glass industry, 565,000 sq. ft.
- ◆ Production areas, administrative offices, warehouse area
- ◆ Facility utilizes older boilers to produce steam to provide heating for facility in addition to serving some process load



System Description

- ◆ Two older 34,000 lb/hr steam boilers with limited turndown capability
- ◆ Steam distribution system with potential future piping issues
- ◆ Condensate return around 60%
- ◆ Non functional boiler economizers
- ◆ No existing ability to control steam heaters other than turning on and off seasonally
- ◆ Insufficient heating in some areas which caused employee complaints

System Opportunities/Issues

- ◆ Existing boilers were older and were not operating efficiently
- ◆ Existing boilers were in need of repair
- ◆ Portions of steam distribution system would need piping replaced in future
- ◆ Overall the steam system was not operating efficiently
- ◆ The operation of the boilers required boiler operators 24 hours per day, 7 days per week

Project Description

- ◆ Installed 13 new direct fired natural gas make up air and heating units to provide facility heat
- ◆ Each heating unit was installed with controls to operate unit based on temperature requirements
- ◆ Installed new gas lines as needed to serve new units
- ◆ Shut down boilers
- ◆ Note that there were also some other modifications made to accommodate process heating requirements that provided additional savings and incurred additional cost that also achieved attractive economic returns.

Project Benefits

- ◆ Energy Cost savings, chemical and water savings, and labor savings
- ◆ Installation of new efficient equipment and retirement of old equipment
- ◆ Elimination of future cost for replacement of steam piping
- ◆ Increased control of temperature which increase comfort levels of employees