

ENERGY PROJECT CASE STUDY

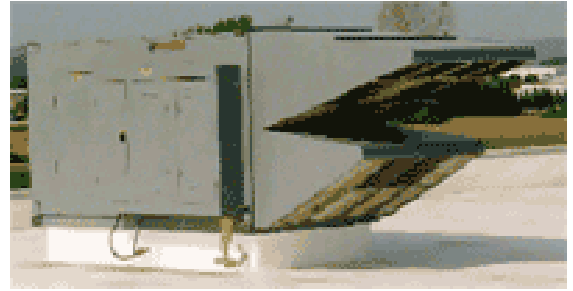
HEATING INFRASTRUCTURE IMPROVEMENTS

Financials

- ◆ Total Turnkey Installed Cost: \$1,564,000
- ◆ Annual Energy Cost Savings: \$813,000
- ◆ Chemical and Water Cost Savings: \$55,250
- ◆ Estimated Labor Savings: \$250,000
- ◆ Average Project IRR: 67%
- ◆ Simple Payback with Labor: 1.47 years

Description of Facility

- ◆ Manufacturing facility, glass industry, 565,000 sq. ft.
- ◆ Production areas, administrative offices, warehouse area
- ◆ Facility utilized older boilers to produce steam to provide heating for facility and process loads



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%
- ◆ Old boiler economizers that were not working
- ◆ No existing ability to control steam heaters other than turning on and off seasonally
- ◆ Insufficient heating in some areas which caused employee complaints
- ◆ Process heating required boilers to be in operation in summer for small load

System Opportunities/Issues

- ◆ Existing boilers were not operating efficiently and would require some repair
- ◆ Process load was much smaller than heating load but vital to facility operation
- ◆ Portions of steam distribution system would need piping replaced in future
- ◆ The operation of the boilers required boiler operators 24 hours per day, 7 days per week

Project Description

- ◆ Installed 22 new direct fired natural gas make up air and heating units with controls to provide facility heat
- ◆ Installed new natural gas and electric heating for remote process loads
- ◆ Installed new smaller boilers and auxiliary equipment to serve process load and improved distribution system
- ◆ Installed new heating and cooling for office areas and some remote steam loads
- ◆ Installed 33 new natural gas and electric unit heaters in areas where direct fired units could be used
- ◆ Installed new gas meters to monitor usage

Project Benefits

- ◆ Improved overall efficiency of various systems that previously utilized steam
- ◆ 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 increased employee comfort levels
- ◆ Provided better load matching of process heating requirements