

ENERGY PROJECT CASE STUDY

CHILLED WATER SYSTEM

Financials

- ◆ Total Turnkey Installed Cost: \$755,601
- ◆ Equipment Replacement Capital: \$250,000
- ◆ Net Energy Savings Funded Capital: \$505,601
- ◆ Annual Energy Cost Savings: \$133,020
- ◆ Simple Energy Funded Capital Payback: 3.8 year
- ◆ Average Project IRR: 22%

Description of Facility

- ◆ Manufacturing facility, injection molding, 410,000 sq. ft.
- ◆ Production areas, administrative offices, warehouse area
- ◆ Facility utilizes a combination of a central plant and distributed roof top air conditioning units for process and space cooling



System Description

- ◆ Four water-cooled chillers totaling 1470 tons capacity
- ◆ Primary/Secondary pumping configuration
- ◆ Four cooling towers with common headers
- ◆ System utilized manual control
- ◆ System provide chilled water for process and HVAC

System Opportunities/Issues

- ◆ Existing system had some operational and equipment problems and was operated manually
- ◆ Out of the four chillers installed in the system, one had a failed compressor and one was leaking refrigerant
- ◆ The older chillers were inefficient and the controls, piping, and pumping were not optimal
- ◆ The project replaced equipment that was past its useful life, improved the efficiency and operation of the system, and lowered the O&M costs of the system.

Project Description

- ◆ Reconfigured the piping and pumping to operate more efficiently
- ◆ Installed new 500 ton chiller which was almost twice as efficient
- ◆ Installed new pumping and VFD on pump motors
- ◆ Installed a plate & frame heat exchanger as a water side economizer
- ◆ Integrated plant operations into a new control system that was being installed as a separate project.

Project Benefits

- ◆ New 500 ton chiller, chilled water pumps, pump motor variable speed drives, AND plate and frame heat exchanger
- ◆ Reconfiguration of system pumping
- ◆ Optimization of operation of the system
- ◆ Reduction in energy usage