

## CASE STUDY

# CHEMICAL PROCESSING/ EXTRUSION

### Client/Facility Type - Chemical Processing/Extrusion

The client produces non-edible cellulosic and plastic casings and specialty plastic bags used to prepare and package processed meat products. The plant operates 24 hours per day, 7 days per week. Energy expenses are approximately \$3.6 million annually which include electricity and natural gas.

### Energy/Utility Audit Process

Four energy professionals conducted a comprehensive site visit and corresponding energy/utility savings assessment. The following were evaluated to identify potential savings opportunities:

- Energy/utility tariffs
- Available energy efficiency incentives/rebates
- Plant layout, function and operating characteristics
- Review of all manufacturing processes
- Compressed air systems
- Process heating & cooling systems
- Chillers
- Cooling Towers
- Steam
- Exhaust, ventilation and make-up air systems
- On-site water and waste water treatment
- Lighting
- Electric motors & drives
- Power factor
- HVAC equipment & systems
- Demand control & management

Potential energy/utility savings opportunities were identified. The details provided for each measure included (i) scope of work, (ii) capital cost, (iii) energy, utility and operating savings and (iv) project payback period.

### Findings

Upon conducting the detailed energy audit, the following savings opportunities were identified:

- **Compressed Air System**
  - Install pressure flow controller
  - Add a control storage receiver
- **Process Cooling**
  - Recover heat from the cooling towers serving the process chillers to pre-heat boiler feed water
  - Replace the chiller that provides cold process water
- **Process Heating**
  - Sequence the operation of the boilers to minimize boiler run time
  - Install VFD's on the boiler draft fans and feedwater pumps
  - Install condensate return lines from the outside steam heated storage tanks
- **Water/Wastewater Treatment**
  - Install new pump with VDF drive on deep water well
  - Install VFDs on effluent water pumps and lift station pumps
- **Process Water**
  - Install VFDs on hot well pumps
- **Power Factor Correction**
  - Install PFC equipment to increase the power factor

### Client Benefits

Implementation of the energy/utility conservation measures delivers a 10% reduction in annual energy costs, with a 2.2 year payback (without chiller replacement) and a reduction in annual carbon emissions.

