

CASE STUDY: INDUSTRIAL REFRIGERATION SYSTEM

SYSTEM TYPE: Ammonia Refrigeration

PROJECT FINANCIALS

- Total Turnkey Installed Cost: \$ 466,000
- Annual Energy Cost Savings: \$ 253,000
- Simple Energy Funded Capital Payback: 1.8 years
- Average Project IRR: 54%
- CO2 Equivalent Reduction : 2,625 tCO2e (Natl. Avg. Emission Rate)

ICE CREAM & FROZEN NOVELTY Facility Achieves \$250,000/year in Energy Savings with Refrigeration System Improvement

System Description

- Ammonia refrigeration system running 4 distinct suction levels; - 65 °F, - 50 °F, -30° F, and + 5° F.
- System has 30 reciprocating and rotary screw compressors varying in size from 50 to 500 horsepower and 8 evaporative condensers.

System Opportunities

- Compressor and condenser sequencing performed manually in old engine room.
- Condensing head pressures maintained at 150 psig min to avoid compressor trip outs.
- Problematic and inefficient blast freezer operations.
- Excessive flood back of liquid refrigerant

Project Description

- Install a master sequencing control system to enable optimal control of compressors and condenser staging and to allow tighter control over suction pressures.
- Retrofit several existing condensers with variable speed drives.
- Convert existing blast freezer fans to variable speed driven control with premium efficiency motors enabling increased production and reduced heat load within the blast freezer.

Project Benefits

- \$88,000 in annual energy saving by implementing low cost modifications to allow head pressures to safely operate below 120 #.
- Rerouted suction line to second intercooler where excessive liquid can be used effectively thereby eliminating a continuous false load on the system and savings approximately \$96,500 per year.
- Developed comprehensive Measurement and Verification (M&V) plan to document savings.
- Energy savings from implementing developed measures at over 25% with the added benefit of enhancements to plant productivity.

Plant Profile

- High Volume Ice Cream & Frozen Novelty Plant
- Approximately 5,000 hp of on-line compressors
- Multiple blast freezer operations
- Sweet water and pasteurizing systems
- Ammonia system divided amongst two separate engine rooms

Key Benefits

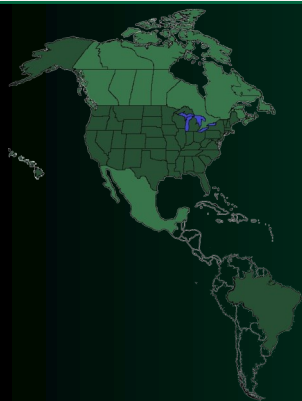
Cost Savings	\$ 253,000 per year
Carbon Reductions	2,625 tCO ₂ e (Natl. Avg. Emission Rate)
Payback	1.8 Years
Project IRR	54%

Financial Data

Investment	\$466,000
System	Compressors, Condensers, Blast Freezers
Life Expectancy	N/A
Incentives/Rebates	N/A
Payback Period	1.8 Years



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