Cascade Energy®

COMPANY-WIDE SAVINGS OF OVER $450,000/YR

Cascade Energy teams up with Henningsen Cold Storage Company to reduce their energy usage by over 1.1 million kWh/year, equaling more than $51,000 annual savings (based on 1996 rates).

CASE STUDY

Headquartered in Hillsboro, Oregon, Henningsen Cold Storage Co. is a full-service, public refrigerated warehousing company with more than 42 million cubic feet of frozen and refrigerated warehouse space in six states.

Efficiency From the Ground Up

During the summer of 1995, planning was nearly complete on a new cold-storage facility in Gresham, Oregon when Cascade Energy. was asked to recommend cost-effective energy efficiency measures. Cascade's unique approach to energy efficiency has ensured this 50,000-square-foot facility, providing food-storage and blast-freezing services to customers, is still an outstanding example of best practices in energy-efficient industrial refrigeration at a minimal operating cost.

Corporate Commitment and Energy Goal

The Henningsen family has been in the cold-storage business since 1923. The family has a long-standing commitment to employing energy efficiency strategies to fully recognize the benefits of life-cycle costing and comprehensive solutions.

According to Paul Henningsen, great-grandson of the company's founder, and VP of corporate development, the company goal for this new facility was to provide high-quality at a fraction of typical operating cost. So when Cascade met with the Henningsen team and saw the existing leadership already had a strong commitment to energy efficiency, the necessary resources were already in place for long-term energy efficiency strategy.

Monitoring and Benchmarking

Before launching into suggested best practices, Cascade and the Henningsen team developed a "baseline" design that included standard facility design, equipment, and controls. This was used as the basis for evaluating alternate design options and equipment suggested by Cascade during the design phase. Cascade later compared this baseline to a new system design that featured state-of-the-art equipment and controls, along with extra insulation and efficient lighting to forecast expected improvements in energy performance.

The new control system at the Gresham facility continuously monitors and stores data for all refrigeration operating parameters. This information is easily accessible in custom, on-the-fly reports and can be electronically exported for offline analysis. This detailed, long-term data can be extremely valuable in identifying and evaluating future opportunities, and in generating sophisticated, highly accurate models of

HENNINGSEN COLD STORAGE CO.

www.henningsen.com

BENEFITS

- Reduced energy cost
- Less wear on equipment
- Improved temperature control
- Better understanding of system performance

Incremental Installation Cost: $410,000

PGE Incentive: ~$70,000

ENERGY SAVINGS

1,140,000 kWh per year

42% of base energy use

Energy Cost Savings: $51,000 /yr (1996 rates)

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potential energy projects.

Capital Investments

Cascade's design-phase analysis and evaluation yielded a system design with these features:

- **Increased insulation**
- **Fast-acting freezer doors**
- **Automatic bi-level lighting fixtures**
- **Efficient condenser and evaporator selection**
- **Variable speed fan control**
- **Diversely sized screw compressors**
- **Variable speed trim compressor**
- **Thermosiphon compressor cooling**
- **Premium-efficiency motors**
- **Computer control system**

The original energy-efficient system design of the Gresham facility proved its worth to the company's bottom line, so when Henningsen more than doubled the size of their facility in 1998, efficient design, equipment, and controls were again specified, reducing annual operating costs by an additional $30,000.

Energy Savings – 42% Reduction

After a rigorous commissioning and verification process, annual energy savings of 1,140,000 kWh, worth $51,000, were achieved – a 42 percent reduction compared to the baseline design. Implementation cost was partially offset by incentives from the serving utility and by state tax credits. With these incentives, the affective payback period was about four years.

At the time, Paul Henningsen said "This project reduces our power bill and improves our bottom line, and since we know more about what's going on in our facility, we make better decisions. My advice is that since power rates never seem to get cheaper, installing efficient equipment will help you offset likely increases."

These words proved to be prophetic. The Henningsen team's foresight was rewarded when energy rates surged upward in 2000 and have continued to climb since then, increasing the return on their investment.

Company-Wide Continuous Energy Improvement

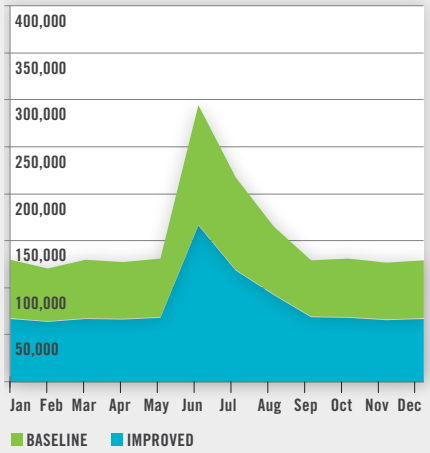
Facility Tune-up In addition to the work done at the Gresham facility, Cascade has provided tune-ups at both the Portland and Forest Grove facilities. Henningsen has implemented the action items identified by Cascade and continues to implement similar action items at many of their other facilities, yielding thousands of dollars in operating cost savings annually.

Innovation The Henningsen-Cascade partnership has provided the opportunity to investigate and implement several leading-edge technologies. For example, Cascade installed special apparatus to gather research data on hot-gas defrost. Henningsen and Cascade also implemented an innovative floor heating system using compressor oil.

Coaching As the relationship has evolved, Cascade has provided support to all levels in the Henningsen organization, from Corporate Managers to engine-room operators. Cascade has provided operational and maintenance coaching to Henningsens' engineers and refrigeration operators to ensure energy efficiency is maximized.

Engineering Follow-up Cascade has conducted several dozen follow-up engineering studies for Henningsen, including scoping and evaluating projects, and verifying post-implementation savings. All told, Cascade has helped identify roughly 13 million kWh per year in cost-effective energy saving opportunities across all Henningsen facilities. Over half of these projects have been installed to date (~8 million kWh) and Henningsen is realizing electricity savings of $450,000 per year as a result.

ENERGY USE COMPARISON kWh



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Start Building Your Energy Management Strategy Today!

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