



Virco: Industrial Energy Assessment Finds Potential Savings from Education and Commercial Furniture

ASSESSMENT DATE: OCTOBER 2, 2001

BENEFITS:

- Identified potential annual energy cost savings of \$158,117
- Recommendations will reduce total energy usage by 12.4% per year
- Can achieve paybacks ranging from 0 to 0.9 years
- Nine recommendations were made to reduce energy usage and minimizing waste

APPLICATIONS:

"I was amazed at the opportunities presented to us. The report has made an impact on our energy use and expenses. It is pleasing to have such expensive professional service free of charge."

- Virco Manufacturing Corporation

Summary

The assistance of San Diego State University's Industrial Assessment Center was solicited to perform an energy assessment at the Virco Manufacturing Corporation plant. Opportunities for saving electricity were identified through the control of energy consumption in the compressed air system. Ideas for saving energy involved reducing the compressed air pressure, and turning off an idle compressor. Also, the facility can minimize waste by selling or donating sawdust and scrap wood from production. The assessment team concluded that the implementation of these assessment recommendations would result in savings of over \$158K. Further results from this assessment are highlighted throughout the case study.

Company Background

The company considered manufactures educational and commercial furniture in a 560,000 square foot building. The process includes welding, powder coating, wood laminating, and cutting the raw material before it is packaged and shipped to the customer. The total energy budget for the plant is approximately \$1.27 million per year, the bulk of which is electricity usage and the remainder natural gas consumption.

Assessment Approach

A team of faculty, staff and students from San Diego State University's Industrial Assessment Center performed an assessment of a furniture manufacturer in the fall of 2001. The assessment was led by Center Director, Asfaw Beyene.

Energy Conservation Awareness

The assessment team identified energy conservation awareness practices for the employees at the facility as a cost-effective way to significantly reduce energy consumption. Employees are encouraged to reduce compressed air pressure, air leaks, and eliminate unnecessary uses of compressed air. Also recommended were changing forklifts to off- peak hours in order to avoid peak demand charge, and turn off or shut down energy-consuming components that are not being used.



Compressed Air Systems

Compressed air requires significant amounts of energy to operate, subsequently resulting in higher costs. The following measures, all of which were implemented by the company, can be taken to ensure reduced energy usage and more efficient operations:

- The team found that the compressed air system was losing substantial air with small leaks throughout the plant. An aggressive program to locate and fix the leaks was started and will save more than \$25K with an almost immediate payback.
- Reducing the pressure of the facility's compressors to a lower setpoint both decreased energy consumption with a payback of less than a year.
- Turning off a large compressor which consumes about 25% of its power while idling.
- Using Air Knives in lieu of costly compressed air also results in savings.

Waste Minimization

In addition to energy saving recommendations, the team observed a significant amount of waste at the facility. Disposal can be very costly; therefore the team recommended the following methods to reduce the facility's waste:

- Donate or sell the sawdust resulting from production. The sawdust can be donated as compost to a neighboring facility thereby reducing the disposal cost and resulting in savings of over \$20K.
- Donate or sell scrap wood to another industrial facility. The wood has a high disposal cost therefore resulting in a minimum savings of over \$60K.

Results

Table 1 shows the annual cost savings that would accrue at the facility if the energy conservation opportunities identified in the assessment are implemented. Based on these results, the facility can reduce its energy usage by over 1,800 MMBtu. These reductions will consequently reduce natural gas, electrical usage, and electrical demand cost by a total of \$158K.

Projects Identified

Opportunities for reducing energy consumption that were identified during the assessment are described in the following table:

Table 1. Opportunities at Virco Facility

Recommended Action	Annual Resource Savings	Annual Cost Savings	Implementation Cost	Payback (months)
Reduce Compressed Air Pressure	629 MMBtu	\$3,921	\$ 0	0
Reduce Compressed Air Leaks	566 MMBtu	\$25,082	\$1,720	1
Install Occupancy Sensors	49 MMBtu	1,764	\$1,200	8
Turn Off Compressor	273 MMBtu	\$20,269	\$0	0
Change Forklifts Off Peak Hours to Avoid Peak Charge	0 MMBtu	6,906	\$0	0
Turn Equipment Off When Not Needed	272 MMBtu	\$9,714	\$1,600	2
Eliminate Unnecessary Use of Compressed Air	19 MMBtu	\$3,641	\$ 0	0
Sell or Donate Sawdust	0 MMBtu	\$22,140	\$2,000	1
Sell or Donate Wood	0 MMBtu	\$64,680	\$0	0
Totals	1,808 MMBTU/yr	\$158,117	\$6,520	1

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