VPI Corporation: Industrial Energy Assessment Helps Manufacturer Start Saving $7,000 in Less Than a Year

Summary
The University of Wisconsin–Milwaukee’s Industrial Assessment Center (IAC) performed an energy audit at VPI Corporation’s sheet products facility in Sheboygan Falls, Wisconsin, that is saving the company almost $7,000 per year in energy costs. The IAC, sponsored by the U.S. Department of Energy (DOE) Industrial Technologies Program (ITP), is one of 26 across the nation in which faculty and students provide eligible small- and medium-sized manufacturers with no-cost energy assessments. This assessment project was sponsored by ITP and The Society of the Plastics Industry, Inc. (SPI), a DOE Allied Partner.

The assessment team identified several opportunities for saving electricity, including installing liquid pressure amplification systems for chillers, using more energy-efficient lighting and motor belts, and achieving better control of the compressed air system. The team also found that scheduling forklift-charging tasks during off-peak hours would reduce overall energy demand.

Company Background
VPI’s facility in Sheboygan Falls manufacturers medical, commercial, and lenticular signage. It is a division of VPI Corporation, which manufactures rubber, vinyl, and plastic products for a variety of industries, including flooring and related products. The Sheboygan Falls plant generates approximately $40 million in sales annually and processes about 48 million pounds of polyester, polystyrene, and polyethylene plastics. The assessed facility measures 73,000 square feet; the production area covers 66,000 square feet. At the time of the assessment, production consumed more than 13 million kWh of electricity and about 2,300 MMBtu of natural gas annually, for a total energy cost of almost $667,000.

Assessment Approach
An assessment team consisting of students and a director from the University of Wisconsin–Milwaukee IAC assessed this facility on July 24, 2003. Team members met with plant personnel on the site, toured the facility, and collected data. After they reviewed potential energy-saving opportunities, they presented their findings to plant managers. The assessment was led by IAC Director Dr. Umesh Saxena.

Results
VPI implemented two of the six recommendations made by the assessment team. The facility’s staff also modified two other recommendations, using similar energy-
saving practices and equipment to save energy and costs. For example, staff at VPI decided not to install a flow controller on the compressed air system, as the assessment team had recommended, to better regulate and reduce pressure. Instead, they reduced the compressor’s discharge pressure to match the recommended pressure listed in the report, thus making it work more efficiently. They also decided not to implement a recommendation to install synchronous belts on the 15 vacuum pump motors used to convey raw material to the extruder lines. Instead, they eliminated the 15 pump motors altogether and replaced them with a more efficient, centralized system.

The table below shows the annual cost savings at the VPI Sheboygan Falls facility that result from implementing some of the assessment team’s recommendations. Energy conservation projects that were implemented will reduce electrical usage by more than 146,000 kWh annually, in turn reducing electrical demand by about 410 kW-months per year (kW-mo/yr)\(^1\).

<table>
<thead>
<tr>
<th>Project Category/Recommendation</th>
<th>Annual Resource Savings</th>
<th>Annual Cost Savings</th>
<th>Implementation Cost</th>
<th>Payback Period</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Process Supply</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use outside air for compressor</td>
<td>146,507 kWh</td>
<td>$5,138</td>
<td>$1,240</td>
<td>3 months</td>
</tr>
<tr>
<td></td>
<td>158.8 kW-mo/yr</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Motor</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Charge forklift trucks during off-peak hours</td>
<td>252 kW-mo/yr</td>
<td>$1,657</td>
<td>$1,000</td>
<td>8 months</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>146,507 kWh/yr</td>
<td>$6,795</td>
<td>$2,240</td>
<td></td>
</tr>
<tr>
<td></td>
<td>410.8 kW-mo/yr</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^1\) kW-months per year represents total kW savings per year, based on kW savings per month.

---

**A Strong Energy Portfolio for a Strong America**

Energy efficiency and clean, renewable energy will mean a stronger economy, a cleaner environment, and greater energy independence for America.


**Project Partners:**
- VPI, LLC
  Sheet Products Division
  Sheboygan Falls, WI
- The Society of the Plastics Industry, Inc.
  Washington, DC

**For Additional Information:**
- Industrial Technologies Program
  Energy Efficiency and Renewable Energy
  U.S. Department of Energy
  Washington, DC
- EERE Information Center
  1-877-EERE-INF (1-877-337-3463)
  www.eere.energy.gov
- Center for Advanced Energy Systems
  640 Bartholomew Road
  Piscataway, NJ 08854
  732-445-5540
  www.caes.rutgers.edu

DOE/GO-102005-2170
September 2005