



Energy Efficiency Pays for Itself:

How a Woodworking
Operation Upgraded
with **Zero** Out of Pocket Cost.



Did You Know?

Energy can represent over 70% of a compressor's lifecycle cost and generating compressed air can account for more than 40% of a plant's total electricity bill.

The moment you walk into a high end retail establishment, class-A office space, or luxury hotel, the scene for your experience has been set by the interior architecture. Its design conveys a certain image and projects a particular style. It even makes you feel a certain way.

Modern Woodcrafts LLC of Plainville, Connecticut, creates finely crafted architectural interiors for retail, institutional, corporate and hospitality environments. For more than 50 years, the company's skilled craftsmen have applied imagination, experience and pride to create stunning visual presentations and spaces where people feel comfortable, productive and confident.

"Nothing we build is off the shelf," says Joe Legere, Vice President Operations at Modern Woodcrafts. "Everything is built to order. Fundamentally we are a full service woodworking company, but our expertise extends beyond woods and specialty veneers to include glass, metal, fiberglass, lighting – anything that is part of a building's interior architecture. Our customers are at the high end of the market. They demand the best and we build it."



Investing in Energy Efficiency: a Textbook Case

Modern Woodcrafts has been operating at the same location since the 1960's. Having always invested in quality from the start, the old adage of "if it's not broken, don't fix it" applied.

"When equipment is doing its job, it doesn't get attention," according to Marlon Contreras, Connecticut Sales Manager for Atlas Copco Compressors LLC. "Air compressors are a perfect example. Improvements in compressor technology have been so profound in recent years that an upgrade can pay for itself quickly through reduced energy cost."

Identifying the Opportunity

"Atlas Copco had been providing compressor service for Modern Woodcrafts," Contreras explains. "Gary Martino, our service technician, knew from working on their compressor that they were interested in upgrading to Variable Speed Drive technology so I contacted Joe Legere, the Vice President of Operations, to discuss energy saving ideas."

To see what kind of potential savings were involved, Contreras recommended performing an MBox energy study to generate a load profile. Analysis of data from a week of continuous monitoring of air demand and production showed that a 40 horsepower Variable Speed Drive compressor would provide the high quality air required and reduce energy consumption by about \$12,000 per year.

By involving Modern Woodcrafts' energy supplier, Connecticut Light and Power, Contreras was able to secure an energy efficiency rebate for installing the Variable Speed Drive compressor. The project would pay for itself in nine months and thereafter the monthly



energy savings would go straight to the bottom line. That would have been a successful project by itself, but Joe Legere was so impressed by potential energy savings that he decided a new air compressor would be just the beginning.

Contreras had just the resources to help. “I’m on the Board of Directors of the Connecticut Chapter of the Association for Energy Engineers,” Contreras explains. “Our members come from all different kinds of businesses and we network on ways to promote energy efficiency. Given Atlas Copco’s global focus on energy efficiency, it’s a perfect fit for me. I talked to a member whose company, Efficient Lighting & Maintenance, spearheads integrated energy efficiency projects. I

presented my findings from Modern Woodcrafts and introduced their people to Joe Legere.”

Tackling multiple energy efficiency upgrades at once made the project even more feasible since Connecticut Light and Power was willing to provide larger rebates for multiple upgrades.

“I had known about Variable Speed Drive technology for several years,” says Legere, “and not upgrading our air compressor was essentially a funding issue. I didn’t realize until I talked to Marlon Contreras that by working with our power supplier we could do the upgrade with net zero out of pocket cost. Once he explained how much I could benefit by upgrading the air compressor, I decided to upgrade our dust collection, lighting and air makeup systems, too. Marlon understood the rebate system and knew how to bring together the people required to make it happen. As soon as we qualified for all the rebates and financing, the upgrades were installed and running within four months.”

Modern Woodcrafts’ facility covers approximately 65,000 s/f, with 55,000 s/f devoted to manufacturing and 10,000 s/f of office space. Joe Legere’s plan for energy efficiency upgrades involved systems throughout the facility.



Modern Woodcrafts installed thermostat lockouts for rooftop units and programmable thermostats with automatic setbacks in every perimeter office. Now no one can forget to turn down the heat.

Those Upgrades Specifically Made to the Compressed Air System Included:

Variable Speed Drive (VSD): Contreras recommended a 40 hp Atlas Copco GA30VSD-FF air compressor with a built in dryer. Atlas Copco VSD air compressors precisely match the output of compressed air automatically and continuously to meet changing demand. This saves on energy costs because compressed air is only produced as required. In contrast, Modern Woodcrafts' old compressor operated essentially at top speed, consuming more energy than required to meet demand.

Automation: The compressor is programmed to start up automatically in the morning about 15 minutes before the work day starts. When production begins, the whole system is pressurized and ready to go. During the day the unit cycles up or down automatically according to demand. If demand drops sufficiently, it idles itself. After the work day is done, it shuts down automatically.

Soft Start: Atlas Copco VSD compressors use soft start technology to reduce power spikes when the compressor is turned on. Instead of going from off to full amp draw all at once, a soft start ramps up current gradually over several seconds. This reduces the electrical demand charges from the power supplier.

"The amount of energy wasted in industrial settings is astounding," says Marlon Contreras, Connecticut Sales Manager for Atlas Copco Compressors LLC. "For many companies this hasn't been an issue because there's always been sufficient profit to cover the expense. But with energy costs rising and competition growing more intense, more companies are looking into projects to drive down energy costs and finding the savings are worth the investment. Payback periods can be short, even shorter with power company rebate programs. Low interest loans can be set up so monthly payments equal monthly energy savings, resulting in no net out of pocket cost. When the loan is paid off, often in a matter of months, all the savings go straight to the bottom line."





Heat Recovery: Modern Woodcrafts previously recovered heat from the old compressor to warm the warehouse. (Compressing any gas gives off heat, and an air compressor generates approximately 2,500 btu per horsepower.) Since the old compressor was so noisy, the compressor room door was kept closed. A distribution fan moved warm air via ductwork to the warehouse. Because the new Atlas Copco compressor is so quiet, the door to the compressor room is now left open and warm air moves directly into the warehouse. With no need to run the distribution fan, power consumption is further reduced.

Backup: The old compressor was retained for backup. “Even if it’s not our equipment, and even if it’s not up to today’s energy efficiency standards, we encourage customers to keep a serviceable air compressor online as a backup,” says Contreras. “It will run only occasionally, such as when the new compressor is temporarily offline for service. For an operation that relies so much on compressed air, having backup provides an important productivity benefit. It beats being without air.”

Dust Collection System

In a woodworking environment, dust is continually created as wooden work pieces are sawn, cut and sanded. Modern Woodcrafts has a dust collection system that uses negative pressure generated by a fan and duct system to remove the dust from where it is created and

send it to a hopper where it collected for recycling. The existing dust collection system, in place since the 1960s, was either on or off (but typically on) throughout the work day. It was upgraded with microprocessor controls that operate on a variable speed principle. When demand for dust collection is created, the system turns on automatically, self-adjusts to meet the need, then idles and shuts down automatically.

Air Handling System

Modern Woodcrafts applies finishes in three spray booths at 50,000 CFM. The air-assisted airless system uses compressed air to pressurize a pump that forces the finish out to the nozzle. No air is mixed with the finish. This reduces overspray and consumption while creating a superior finish. To provide proper ventilation for the room, makeup air is added to keep room pressure just slightly positive. The upgrade to the air handling system includes sensors that detect when a booth is operational and direct the system to provide makeup air in the precise volume required to account for air exhausted. As a result, the volume of makeup air introduced has been significantly reduced. During cold weather makeup air has to be heated, so reducing volume also reduces heating requirements.



“We are seeing signs that things are getting better in the economy,” says Joe Legere, VP Operations at Modern Woodcrafts LLC. “The Variable Speed Drive air compressor and Variable Speed Drive technology we’ve installed for our dust collection system will help us ramp up production and keep energy costs down.”

Lighting Upgrades

Modern Woodcrafts installed energy efficient lighting facility wide. In addition, sensors were installed in office, production and warehouse spaces to detect the presence of people and turn lights on and off automatically as needed. Windows in perimeter rooms provide natural light and Legere is evaluating the potential cost savings of adding skylights in a centrally located production room where there are no windows.

An exciting part of Modern Woodcrafts’ community focus is an internship program for local high school students. The company is training the next generation of exemplary craftsmen within a green manufacturing environment.

Project Investment

Total investment in Modern Woodcrafts’ energy efficiency project was approximately \$130,000. The entire investment was financed with a low interest loan provided by Connecticut Light and Power. The loan was amortized so monthly payments equal the monthly savings in energy costs. In 2½ years when the loan is paid in full, 15,000 kw/h in monthly energy savings will go to the bottom line.

Outcomes

“The ROI on this project is incredible,” Legere concludes. “It’s absolutely a no-brainer. Power consumption facility wide is down by 15,000 kw/h every month. We are out of pocket for nothing and when the loan is paid off that 15,000 kw/h per month savings will be going right in our pocket.”



For more information about Modern Woodcrafts please visit:

www.modernwoodcrafts.com