

Associated Industries of Missouri

Your Voice

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Magazine

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**AIM'S 2011
LEGISLATIVE PRIORITIES TO
RESTORE PROSPERITY IN MISSOURI**

**MEMBER SPOTLIGHTS:
AIM MEMBERS PUT MISSOURIANS
BACK TO WORK**



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Industries
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Energy Audits: Dollars and Sense Solutions

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It takes a lot of energy to operate a manufacturing plant! Just think of the energy used for heating, lights, office equipment, plus the large amount necessary to operate the heavy machinery used to make a seemingly infinite variety of products.

Energy is a critical resource necessary for manufacturing companies to create family friendly jobs with good pay and benefits and to generate economic growth. And, when the economy grows, it supports the American dreams of home ownership, education for our children and a secure retirement.

There are many types of energy that fuel American manufacturing. One that we don't always think of is human energy...the creativity, innovation, entrepreneurship, optimism and plain hard work that have been the hallmark of American manufacturing for decades and that remains our greatest strength today.

Most often, however, when we think of energy, our first thoughts are of natural gas and electricity. This is common because most manufacturing companies require an abundant and uninterrupted supply to keep their

equipment operating smoothly. Energy has become an increasingly large component of the bottom line for most manufacturing companies. Regardless of government action (or inaction), the cost of energy is going to continue to rise in the foreseeable future.

Research has shown that many manufacturing companies, which are highly skilled at controlling cost throughout their operations, are doing much less to control their energy use and the costs associated with it. In fact, in last year's Next Generation Manufacturing Study, more than 91 percent of the respondents said that their annual reduction in energy used per unit of production was less than 10 percent. And, equally alarming, less than 20 percent said that they had any regular monitoring or review system to measure gains in energy efficiency and the resulting return on investment.

To address this lack of measurement and low level of improvement, Missouri Enterprise, one of the Manufacturing Extension Partnership Centers that sponsored the study, has partnered with several organizations, including Missouri University of

Science and Technology, the U.S. Department of Energy, the Environmental Protection Agency, the Missouri Departments of Natural Resources, Agriculture, Economic Development, Conservation, the Missouri Environmental Improvement, Energy Reduction Authority and utility companies and cooperatives to offer a comprehensive range of energy assessments.

Incidentally, some of these organizations have programs to assist companies with retrofits based on energy assessment recommendations.

A comprehensive and revealing energy assessment is the perfect way to initiate efforts to control energy use and reduce costs because as all manufacturers know, *if you can't measure it, you can't improve it.*

What Is A Missouri Enterprise Energy Assessment?

Missouri Enterprise and its partners offer ASHRE (American Society of Heating, Refrigeration and Air Conditioning Engineers) Level I,



II and III energy assessments. These assessments provide an in-depth evaluation of the energy (electricity and natural gas) used in specific areas. They include, but are not limited to:

- Lighting
- HVAC
- Air compressors
- Boilers
- Refrigeration equipment
- Motors
- CNC machines
- Welding equipment

Who Needs An Energy Assessment?

Jerry Spaulding of Eaton Corporation, writing on the *Highbeam Research* Web Site, says manufacturers of all sizes can benefit from an energy assessment.

“Rising energy cost and federal/state regulation on consumption make an evaluation of energy usage a valuable practice that can factor into a company’s strategic business and sustainability planning. Given the amount of energy that manufactures consume, an energy assessment is a prudent investment as opposed to a discretionary expense – especially in these challenging economic times. Factories designed and built when energy was less expensive focused on productivity to the exclusion of energy efficiency; while today’s new manufacturing plant designs feature state-of-the-art energy efficiency. Virtually all factories more than a few years old consume more energy than their operations require,” he says.

If you cannot accurately answer these five questions, an energy assessment will help you establish

a baseline and will provide a set of recommendations for improvements (with accurate estimates of the return on investment you can anticipate).

1. How much energy (electricity and/or natural gas) are you consuming monthly and annually?
2. How much energy does each piece of your equipment (including motors, HVAC systems, air compressors, ovens, boilers, lighting and others) use?
3. What opportunities to reduce energy use and cost are you missing and what return on investment can you expect from them?
4. What new technologies can help you operate your facility more efficiently and economically?
5. Is energy efficiency an integral part of your company’s overall environmental management system?

How Do Level I, II, and III Assessments Differ?

The fundamental difference between each level of assessment or the determination of which level best suits a company is based primarily on these factors:

1. The size of the company
2. Its location
3. Its products
4. Its plans for future growth

Examples of Energy Savings Opportunities

Previous Missouri Enterprise energy assessments have yielded significant opportunities for

manufacturing companies to reduce energy consumption and realize significant bottom-line cost savings. Here are some examples of the recommendations that have been generated.

- Install premium efficient electrical motors on a replacement basis;
- Reduce operating pressure of air compressors;
- Install variable frequency drives on cooling tower pump motors;
- Replace standard V-belts with high efficiency cogged V-belts;
- Install ground coupled heat pump chillers to provide heating/cooling;
- Install architectural wind turbines on roofs;
- Replace metal Halide fixtures with 8-lamp fluorescent lamp fixtures with sensors;
- Install solar PV powered LED lighting for outside staging areas.

In each case, the above recommendation was presented with a list of replacement equipment, a cost estimate for implementation and for return on investment (in both dollars and investment recovery time). Also with each case, every kWh and Btu saved contributed to a cleaner environment, but equally importantly, every one saved had a positive impact on the company’s profitability and financial stability...one of those often promised, but rarely delivered Win-Win’s.

For information about how an **energy assessment** will benefit your company, contact Jimmy Story at 800-956-2682 or at:

jstory@missourienterprise.org.

<p>The average effective electric cost including consumption and demand is calculated to be:</p> <p>$(\\$1,005,392.90 + \\$87,251.88) / 11,498,400 \text{ kWh}$ $= \\$0.095/\text{kWh}$</p> <p>The average effective natural gas price is calculated to be:</p> <p>$(\\$ 649,946.81 / 94,874 \text{ MMBtu})$ $= \\$6.85/\text{MMBtu}$</p>	<ol style="list-style-type: none"> 1. <u>Reduce Operating Pressure of Air Compressors</u> 2. <u>Install Fluorescent High-Bay Occupancy Sensors for 6 Lamp T5</u> 3. <u>Delamping - Removal of lamps, lamp holders, ballasts, 8 ft T12</u> 4. <u>Replace Standard V-Belts with High Efficiency Cogged V-Belts</u> 5. <u>Install Premium Efficient Electric Motors on a Replacement Basis</u> 6. <u>Install Fabric Air Duct for Heat Recovery from Air Compressors</u> 7. <u>Install Outside Air Inlet Duct to Air Compressor Filters</u> 8. <u>Install Compressed Air Storage Receivers</u> 9. <u>Install Fabric Air Duct after Removing Numerous Air Fans</u> 										
	Category	1*	2	3	4	5	6	7	8	9	Total
Electricity Savings [kWh/yr]	n/a	68,482	192,170	19,212	30,698	-	19,517	68,482	100,720	499,281 kWh/yr	
Electricity Rate [\$/kWh]	0.095	0.095	0.095	0.095	0.095	-	0.095	0.095	0.095		
Natural Gas Savings [MMBtu/yr]	-	-	-	-	-	100	-	-	-	100 MMBtu/yr	
Natural Gas Rate [\$/MMBtu]	-	-	-	-	-	6.85	-	-	-		
Annual Energy Cost Savings [\$/yr]	n/a	6,505	18,256	1,825	2,916	685	1854	6,505	9,567	\$48,113/yr	
Implementation Cost [\$]	n/a	600	27,400	840	0**	800	1,560	6,300	24,000	\$61,500	
Simple Payback [months]	n/a	2	18	6	0**	14	11	12	30	16	
<p>*Opportunity 1 is based on a replacement basis when a motor fails and is replaced with Premium motor</p> <p>** Because of the extended life, the life cycle cost savings results in an effective instantaneous payback.</p>											

A Missouri Enterprise energy assessment will include a variety of charts like this one to illustrate the potential savings and payback times of energy reduction recommendations.

About the Author:

For more than 25 years, Jimmy Story has helped organizations with energy conservation, waste reduction and total quality management systems in both the public and private sectors. He has worked both domestically and internationally. He has been certified as an ISO 14000 Lead Auditor, an Environmental Auditor and for Hazardous Material and Hazardous Waste Management/Handling.

About Missouri Enterprise:

Missouri Enterprise operates the state's only program that provides direct services, including a unique combination of "hands-on" assistance and highly individualized coaching and mentoring, to existing small and medium size manufacturing companies. The Missouri Enterprise professional staff serves clients as "trusted advisors" who assist Missouri manufacturers in critical decision

making and with quick access to industry state-of-the-art industry best practices. Missouri Enterprise clients regularly realize top line growth and bottom line profitability as well as increases in customer satisfaction, quality and material and labor savings.