

MANAGEMENTSIDE

Motor efficiency goes straight to the bottom line

Energy is on the minds of people all across the nation. The growing demand for energy and the blow from recent hurricanes to domestic oil and gas supplies have spurred escalating costs, and impacts are being felt throughout all sectors of the economy. To keep higher energy costs from dampening profitability, now more than ever is the time for industry's key-decision makers and facility managers to execute energy-saving strategies in their plant facilities. Motor management is an excellent place to start.

According to the U.S. Department of Energy, greater attention to motor system optimization can reduce motor energy costs by up to 18%. As companies are exploring ways to cut electricity bills and increase profits, many are discovering that implementing a comprehensive energy management plan is a fundamental tactic to confront soaring costs. Making permanent changes by improving energy efficiency can have a dramatic and lasting impact on the bottom-line. Having a motor management plan is one effective component of the overall strategy.

Motor efficiency is even more important today because of the rising cost of electricity. The national average for industrial electricity prices were 10% to 30% higher in October 2005 than in 2000. Those numbers could vary, with regional differences depending on the fuel mix used to generate electricity in each region of the country. Figure 1 represents a cross-section of states in the U.S., illustrating a steady increase in electricity costs.

Although electricity costs have not spiked as dramatically as oil and natural gas costs, the volatility in the energy market and uncertainty of energy supplies overall is driving the need for greater energy-efficient changes in plant operations. Even small percentage increases in electricity equate to a significant jump in costs for plant facilities running motors — often tens, hundreds or more — and other equipment almost continually.

With so many competing priorities, plant managers often struggle to find the resources to manage motor efficiency. Historically, new motor purchases have been driven by



By Ilene Mason and Wendy McTyre

Consortium for Energy Efficiency

price and by the urgency to get failed motors repaired and back into service as quickly as possible. For this reason, motor-related energy costs have received little attention.

Motor efficiency garners savings

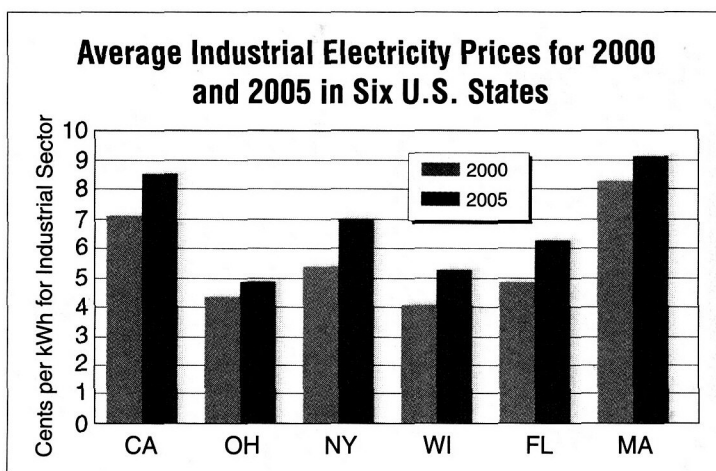
Those mindsets are about to change. Even President Bush is calling for consumers and businesses to increase conservation efforts in an attempt to curtail an energy crisis. Out of necessity, more

industrial facility managers will need to reassess their plant's energy usage just to stay competitive and out of the red. As reported on its corporate news home page, Dow Chemical announced aggressive cost-cutting measures. The company is focusing more on energy efficiency and conservation and even shutting down some inefficient plants in North America.

Some manufacturers are discovering that replacing inefficient motors with premium efficient motors equates to significant cost savings over the life of the motor, not to mention the additional benefits of reduced downtime and increased productivity and reliability. With between 70,000 and 90,000 motors at one campus alone, it was critical that Eastman Kodak move towards improved energy efficiency. In one area, they replaced inefficient motors with more efficient models, which resulted in a savings of \$200,000. Based on a predetermined motor plan, other unique motors were repaired under best practice guidelines as defined by the Electrical Apparatus Service Association, (EASA) as reported in a studies done by the New York State Energy Research and Development Authority.

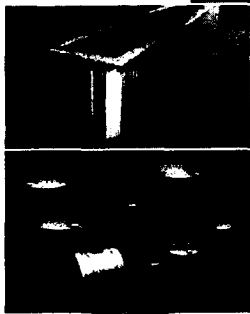
According to the DOE, electric motor systems account for almost 70% of the electricity consumed by the manufacturing

sector. Motor energy costs can exceed \$1 million annually in large industrial plants, and in steel plants, energy costs can exceed \$6 million. Even though these numbers are associated with larger facilities, what cannot be ignored is the potential for even small to medium-sized plants to benefit greatly from initiating motor management strategies. In a study conducted by the Northwest Energy Efficiency Alliance,



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Woodgrain Millwork in Fruitland, ID ultimately plans to use NEMA Premium motors as the majority of its motor fleet. So far, the company is saving \$8,250 annually and has reduced downtime costs following the replacement of seven motors with premium-efficiency models.

Proven success of motor management

Not having a motor management plan in place can lead to hasty decision-making when motor failure occurs, resulting in higher operational costs. In contrast, a sound motor management plan helps ensure that decisions will be both quick and cost-effective. Corning is another company that has recognized the benefits of implementing a motor-management plan. It was estimated that at three of its plant facilities, energy savings of about \$48,212 a year, or \$482,210 over 10 years, would be realized by implementing a motor-management plan.

Successful motor management programs are based on some fundamental principles. The building blocks of effective

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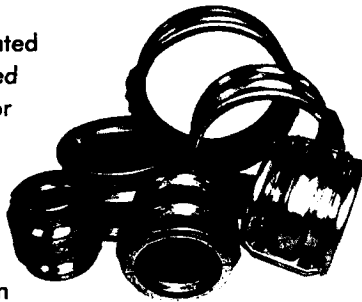
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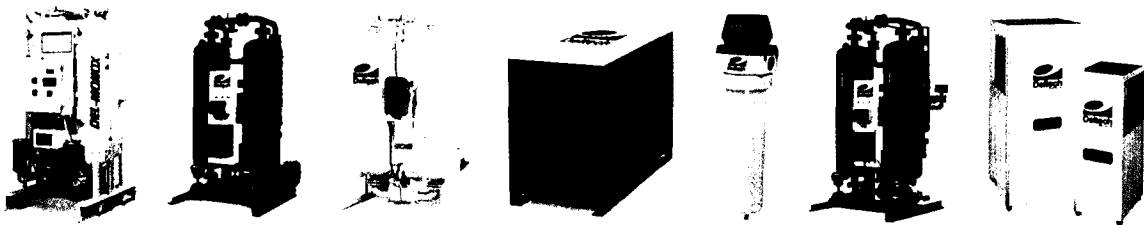
- A motor survey and tracking program
- Guidelines for proactive repair/replace decisions
- A spare-motor inventory in preparation for motor failure
- Purchasing and repair specifications
- Predictive and preventative maintenance programs

These principles, along with clear steps for implementation, are laid out in the Motor Planning Kit, one of the many resources developed by the Motor Decisions Matter campaign. Many organizations have chosen to phase in selected parts of a plan over time while others implement a more wide-ranging plan all at once. Each step above will jump-start the plant facility towards improved energy-efficiency, thus generating increased savings.

Industrial facility managers are usually astounded to learn that only about 5% of the lifetime cost of the motor represents the purchase price, installation and repair costs. Shockingly, electricity accounts for the remaining 95%, as illustrated in Figure 2.

Take for example a \$4,000 purchase price for a 75 hp motor running at full load for 6,000 hours per year. Over its ten year life, that same motor would cost approximately \$220,000 to run. Because many motors operate nearly non-stop, even small increases in efficiency can yield enormous savings. Just by increasing the efficiency 1%, that same motor could reap a savings of \$2,800 over its 10 year life. A plant facility that has as lit-

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tle as 100 of these motors could benefit from a \$280,000 savings, directly translating lower electricity bills into higher profits

Get started to start saving

Although rising energy costs show no signs of slowing down, it's not too late to reign in those accelerating electricity bills. Here are a few suggested steps to get you started:

Motor management resources

Motor Decisions Matter is a national public-awareness campaign sponsored by motor manufacturers, NEMA, EASA and other trade associations, electric utilities, the U.S. Environmental Protection Agency and the Department of Energy. Managed by the Consortium for Energy Efficiency (CEE), MDM promotes energy efficiency by encouraging commercial and industrial facility managers to use sound motor management as a tool to cut energy costs and increase productivity. It seeks to inform executives and other top-level decision makers about the potential bottom-line savings, and decreased plant downtime associated with sound motor planning and the purchase of NEMA Premium motors.

Motor Planning Kits, case studies, the current list of MDM Sponsors, additional tools and resources are available at www.motorsmatter.org.



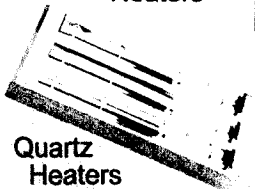
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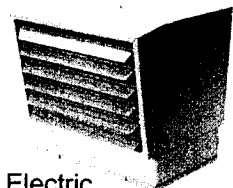


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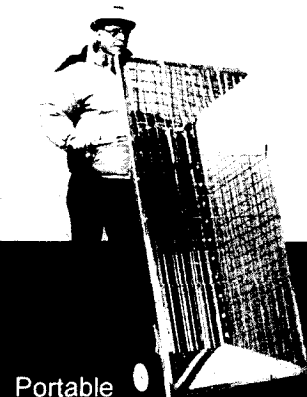


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- Call your motor service representative to discuss a motor management plan

- Contact your local utility service provider to inquire about potential incentive programs for implementing motor-saving strategies

- Get in touch with a local motor expert, who can also be a tremendous resource in discussing motor repair and replace strategies

Companies that embrace the long-term vision of energy-efficient business practices by making sustainable and permanent changes are the same companies that will recognize the impact of energy performance on share holder value and corporate profits. Implementation of a motor management plan is a means to that end.

Ilene Mason and Wendy McTyre are with the Boston based Consortium for Energy Efficiency. CEE, a nonprofit public benefits corporation, develops initiatives for its North American members to promote the manufacture and purchase of energy-efficient products and services. Mason is an industrial program manager and manages the Motor Decisions Matter campaign on behalf of the diverse sponsorship as listed above. Mason also manages CEE's Premium-Efficiency Motors and Motor Systems Initiatives. Wendy McTyre is the communications associate for the Motor Decisions Matter campaign. Please contact McTyre for any inquiries about the article, or for any questions or comments about the MDM campaign. She can be reached at wmctyre@cee1.org.

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