

Energizing The Bottom Line

TO WIN IN TOUGH ECONOMIC TIMES, SELECT PUMP TECHNOLOGIES
THAT CONSUME LESS ENERGY WHILE MAINTAINING CAPACITY

By Thomas L. Stone



The Challenge

It's a fact of life: the world runs on energy. It's also a certainty that you will be assessed a charge for acquiring and consuming that energy—and those charges are always in danger of rising precipitously, whether through increased demand, global market forces or possible legislation. That's why, for example, parents have been telling their children for years to turn off lights they are not using and automobile manufacturers are constantly looking for ways to improve gasoline mileage. These rising costs have also driven a relentless search for more efficient, alternative sources of energy such as wind power, solar power and biofuels.

In the industrial and manufacturing sector, making the most of energy and its efficient use is a never-ending challenge that must be confronted on a minute-by-minute basis, 365 days of

the year. In fact, according to the United States Department of Energy's Office of Energy Efficiency and Renewable Energy (EERE), the industrial sector consumes 33.6% of all of the energy used in the United States. And various reports state that pumps—which are the second-most widely used machines in the world after motors—account for anywhere between 27% and 33% of the total electricity used in the industrial sector.

With that in mind—and taking into account the limitations of energy usage that were mandated by legislation such as the U.S.' Energy Policy Act of 2005—corporate energy conservation has moved front-of-mind throughout the global industrial sector. The enhanced awareness of energy use and its management

has grown into a movement identified as “Corporate Energy Management” (CEM). CEM has been defined as “sets of actions that move accountability for energy outcomes to the upper levels of a firm, in the process removing the bulk of energy-usage issues from the purview of plant managers and engineers.”

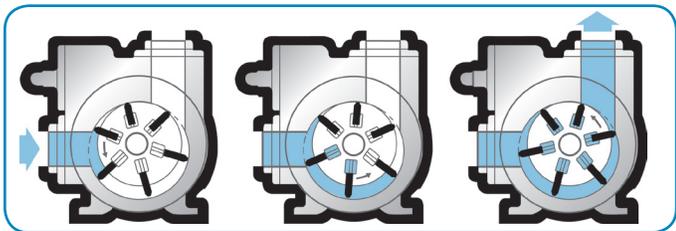
This definition means that energy-efficiency and savings in the industrial sector is now a marriage of many areas of business activity, including some that have not been traditionally concerned with energy management, such as accounting and marketing. The success of a CEM program, therefore, depends on the union between technology and management. Technology alone cannot achieve optimal savings, but when coupled with operations/maintenance principles and management systems, significant savings can be realized.

In this, the second installment of the Pump Solutions Group’s (PSG™) “Production Stimulus Guide” series of white papers—with a theme of “Energizing the Bottom Line: Select Pump Technologies That Consume Less Energy While Maintaining Capacity”—PSG will offer specific examples of how the pumping technologies offered by its operating companies can help reign in and control energy costs.

The Solution

PSG’s six companies are industry leaders in the manufacture of all types of pumping technologies—from air-operated double-diaphragm (AODD) pumps to sliding-vane pumps and eccentric disc pumps to centrifugal pumps. In addition to a wide array of operational efficiencies, many of these pumping technologies have been designed to have a major positive impact on energy savings. For instance:

■ **Sliding-Vane Technology** — Invented by Robert Blackmer in 1899 as an alternative to the gear-pump technology that was prevalent at the time, sliding-vane technology has continued to set the standard in the ensuing years for his eponymous company. Blackmer®, Grand Rapids, MI, sliding-vane pumps are designed with vanes that move into or out of slots in the pump rotor. This design allows the pump to continuously adjust for wear, meaning that no energy-robbing “slip” will occur and pump speed



will not need to be increased over time. The feature makes sliding vane pumps inherent energy-savers. Comparatively, gear pumps wear constantly, which results in an increased possibility of slip and a compensating increase in operating speed, leading to increased wear and energy loss.

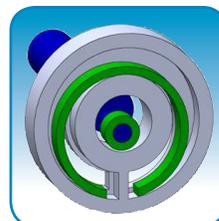
■ **Motor Speed Vane Pumps** — The next stage in the continued development of Blackmer’s sliding-vane technology, its line of ProVane® Motor Speed Vane Pumps feature a Hydrodynamic Journal Bearing, which reduces shaft/bearing contact and minimizes friction, leading to higher mechanical efficiency and energy savings. The Hydrodynamic Journal Bearing, which forms a unique fluid boundary and eliminates metal-to-metal contact between the shaft and bearings, maintains optimum bearing characteristics under a wide range of operating conditions, making the ProVane a smart choice for the energy-conscious manufacturer.



■ **Pro-Flo X™ Air Distribution System** — Developed by PSG’s Wilden® Pump & Engineering Co. for use with its world-renowned air-operated double-diaphragm (AODD) pumping technology, the Pro-Flo X Air Distribution System (ADS) has been designed to offer operational flexibility in multiple liquid-transfer and -handling applications. The ADS incorporates an Efficiency Management System (EMS™) that optimizes the ADS for the actual parameters required for the operation, regardless of pump size. This results in lower energy usage and costs while offering higher performance, lower operational costs and performance flexibility that exceeds industry standards.



■ **Eccentric Disc Technology** — Developed in France and offered by Mouvex®, Eccentric Disc pumps have been designed to feature a wide array of benefits that make them very energy-efficient. Among these are the ability to pump low- and high-viscosity products; self-priming with strong suction power; ability to run dry; low-shear operation; outstanding volumetric efficiency; and low linear speed. Because of these features, Eccentric Disc pumps are able



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Glenn Gibisch, Executive Vice President and COO of Seeler Industries' 3 Rivers Terminal, next to one of the many Blackmer sliding vane pumps that helped the facility double capacity while maintaining existing electricity expenses.

Production Stimulus Case Study:

Seeler Industries

Joliet, IL

Operated by Seeler Industries, the 3 Rivers Terminal is a growing-for-hire facility located on 123 acres in Joliet, IL. In this capacity, the terminal provides storage, transfer and packaging services to the chemical industry for both bulk liquids and dry chemicals in truck and rail quantities, along with drum, tote, bag and package-filling services for a wide array of customers.

To keep this operation running smoothly and efficiently, Glenn Gibisch, Executive Vice President and COO of the 3 Rivers Terminal, relies on a number of pumping technologies, chief among them sliding-vane and centrifugal technology from Blackmer®, air-operated double-diaphragm (AODD) technology from Wilden® and eccentric-disc technology from Mouvex®, all of which are members of the Pump Solutions Group (PSG™). The benefits of incorporating these technologies are more than just operational, however; they are also economical, especially as they relate to energy costs.

A specific instance comes in the form of Seeler's electricity costs. Before switching to Blackmer sliding vane pumps for the purpose of loading and unloading chemicals throughout the facility, Gibisch had noticed that the terminal's utility bills were beginning to skyrocket. Despite recent increases in electricity rates, the facility's monthly electric bills have stayed roughly the same. Gibisch shudders to think what those costs would be if the terminal was not relying on the increased efficiency of sliding vane pumps.

"While our other outdated pumps were becoming a drain on the terminal's efficiency and bottom line, the unique performance of the Blackmer pump only serves to enhance our operations," said Gibisch. "We're doing twice as much work in volume, but our electric bill has stayed the same, even with the increase in electric rates. Again, that's a tribute to the Blackmer pumps and their efficiency."



Glenn Gibisch next to the Wilden Advanced™ Series pump, the only AODD pump technology remaining on the facility grounds. While other outdated AODD pumps were becoming a drain on the terminal's efficiency and bottom line, the unique performance of the Wilden AODD enhance Seeler's operations.

For the entire case study, please visit the links below:

<http://www.blackmer.com/MC/ProcART090202.pdf>

<http://www.blackmer.com/MC/ProcART090601.pdf>

<http://www.blackmer.com/MC/ProcART090602.pdf>

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to sustain high efficiency levels over time, making them more energy-efficient than lobe pumps, with some studies indicating a 30% to 40% increase in efficiency over lobe styles, whose design means a loss of performance with wear and requires speed adjustments to maintain volumetric efficiency.

■ **E-Series Technology** — Developed by

Almatec®, Kamp-Lintfort, Germany, the E-Series is a line of air-operated plastic diaphragm pumps that emphasize economics, efficiency and ecology. Constructed with solid housings, E-Series pumps reduce inner flow resistance by optimizing flow pattern and cross sections, which leads to increased efficiency. In practice, this means an increase in maximum flow and a decrease in air consumption at a given flow. Less air consumption translates to lower energy use. Moreover, the innovative ring-tightening structure of the pump housing results in a more robust design with less chance of product leakage or loss.



Conclusion

Both the U.S. Department of Energy's Industrial Technologies Program ("Save Energy Now") and the Hydraulic Institute ("Pump Systems Matter") have developed individual programs that offer tips on how to make industrial plants operate more efficiently and profitably by identifying the best ways to reduce energy use. Among their suggestions are using energy assessments to pinpoint opportunities where energy and money can be saved. Both have identified the optimization of pumping systems as a way to meet these stricter energy-use standards.

The pumping technologies developed and perfected by the companies of the Pump Solutions Group have been designed to not only offer the operational efficiencies that manufacturers demand and desire, but to also do it in the most energy-efficient manner possible. With pressures to get energy budgets and expenses in check, savvy manufacturers are more readily incorporating the precepts of Corporate Energy Management and oftentimes this means turning to the companies of PSG—the acknowledged experts in creating flow and saving energy—for the solutions to their energy-saving needs.

Thomas L. Stone is the Director of Marketing for Blackmer®, an operating company within the Pump Solutions Group (PSG™). He can be reached at stone@blackmer.com. In addition to Blackmer, PSG is comprised of Wilden®, Griswold™, Neptune™, Almatec® and Mouvex®. You can find more information on PSG and each operating company at www.pumpsq.com.



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www.griswoldpump.com

World Headquarters

Pump Solutions Group (PSG™)
1461 Ford Street, Suite 205
Redlands, CA 92313-5607 USA