



Becoming more energy productive within the industrial sector

can spur job creation and cost savings. Midwestern companies are not just leaders in utilizing cutting-edge solutions and technology, but they are also the manufacturers of the new, efficient equipment that firms around the world are demanding in their efforts to be more energy productive.

This series will highlight those initiatives and companies that are leading the nation in energy productivity.

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REVITALIZING THE MIDWEST THROUGH
INDUSTRIAL ENERGY PRODUCTIVITY

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Didion Milling: Maximizing Ethanol's Potential

A KERNEL OF CORN IS PACKED WITH POTENTIAL. The hull is a pest-resistant source of dietary fiber. The germ is rich in corn oil and polyunsaturated fats. The kernel's endosperm provides starch, which can be either a food source or fermented to create ethanol. Wisconsin-based Didion Milling is maximizing the potential of corn for both food and fuel.

"The typical ethanol plant takes the whole kernel of corn and makes ethanol out of that," says Tonya Umbarger, public relations manager at Didion. "We're taking the best pieces of that kernel and using it for human consumption. We're fractioning out the starchy part of the corn kernel, and sending it across the street to our ethanol plant."

Just as Didion realizes the full potential of corn, it is striving to realize its full potential for energy productivity. "We're always trying to maximize the kernel of corn, and we're trying to reduce our energy consumption because ethanol is so energy-intensive," explains Umbarger. "We're doing everything we can right now to become the most energy efficient ethanol plant."

As Didion has grown, so has its energy needs. In 2010, Didion used 58.9 million kWh of electricity (enough to power over 5,000 homes for a year) and 10.5 million therms of natural gas (roughly equivalent to 350,000 kWh). When it comes to ethanol, Didion was not as energy efficient as the national average, requiring 11 percent more natural gas and 16 percent more electricity.

To improve its energy productivity, including its water recycling, Didion is employing a number of practices. "Our energy bills are in excess of \$6 million," explains John Didion, co-founder and Chief Executive Officer of Didion. "Any energy savings we can provide to our process is going to have a huge impact on our bottom line."

MANAGING ENERGY. In 2009, Didion committed to reducing its energy consumption by 25 percent over 10 years. As a result of this pledge, the U.S. Department of Energy (DOE) recognized the firm as a Better Buildings, Better Plants Partner. Thanks to a \$5.5 million DOE grant, Didion's ethanol plant in Cambria added two new fermentation tanks to extend fermentation time in order to convert more of the corn starch into ethanol. The more starch that is converted prior to drying, the less natural gas and electricity Didion uses.

Didion also improved the efficiency of its dryer system, allowing it to run at optimal capacity for fewer hours than it had previously—also saving energy. Didion has also developed a proprietary method for improving water evaporation and distillation. "Separating water from ethanol is the most energy-intensive operation in an ethanol plant, so the ability to increase efficiencies in this process can greatly enhance the overall energy consumption in the plant," says Umbarger. "This subsequently reduced the amount of energy per gallon of ethanol

distilled." Didion added a heat recovery system to its distillation process to capture wasted heat and recycle it.

Didion has also worked to cut back on its water consumption—by 129,000 gallons per day. A closed-loop water recycling system was put into place, saving energy because the recycled water doesn't require as much heating as fresh water. Recycled water meets 90 percent of Didion's production needs.

Energy intensity reductions will also come with improvements in its internal process. The company is working with Georgia Tech for certification of an energy management system. This system will help track and report



energy consumption as well as provide training to employees to use less energy and increase their awareness of consumption.

Didion's energy efficiency efforts have been recognized by the Wisconsin Sustainable Business Council's Green Master Program, which awarded Didion "Green Professional" certification. "We're expecting to hit our 25 percent goal this year with these processes in place," said Umbarger. "With the incorporation of these new energy efficiency projects, we believe we are one of the most efficient ethanol facilities in the U.S. Considering our water recycling efforts, our corn fractionation system, and our energy reduction projects, we have one of the lowest-carbon-footprint ethanol facilities in the U.S."

As Didion celebrates its 40th anniversary this year, its leaders say that energy efficiency and conservation remain kernels of the firm's success. "In the commodity processing business, in order to be sustainable, we must continue to shave our costs," remarks Didion. "It has always been about staying in business to maintain employment for our staff and provide great products and services to our customers—and a tremendous positive to the environment."

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