

Effective Energy Management Starts With Knowing Readily Available Resources

By Alison McKeachie*

Many Americans are now used to turning off the water while brushing their teeth, flipping the lights off when leaving a room, and throwing plastic, cardboard and glass into the recycling bin. One reason we continue these behaviors is we see an immediate benefit - using less saves money.

The plant floor is no different. Small-scale sustainable practices are commonplace in the dairy processing plant today, including recycling, choosing compact fluorescent or LED lights over incandescent bulbs and recycling or reusing process by-products, such as utilizing whey protein as a food ingredient.

As energy prices climb, associated costs will also continue to grow. Utilities make up a large percentage of a plant's operating costs and processors are finding that an energy management program is a key component to reducing overhead costs and remaining competitive and sustainable in today's marketplace.

In our work to increase the energy efficiency of dairy manufacturing processes and reduce greenhouse gasses, we have found that plant managers agree that an energy management program requires not only a long-term commitment, but a holistic perspective. It begins with a 360-degree analysis of the plant operations and a hard look at the costs throughout the useful life of equipment as well as technological resources and innovations being developed throughout a variety of manufacturing industries.

Taking a systematic approach to energy-saving opportunities is when the most impressive results are seen, creating synergy and multiple benefits across economic, environmental and safety initiatives, especially if expert resources and tools are fully utilized.

There are numerous resources available - many at no cost - that

collectively offer guidance in every step of an energy management program, from information gathering and allocating financial resources to implementation, measuring and monitoring.

From Partnerships Come Opportunities

One resource for dairy processors is the Dairy Processor Carbon Reduction through Energy Efficiency (D-CREE) project team at the Innovation Center for US Dairy.

Energy efficiency measures do more than just reduce utility bills. Several measures prolong the useful life of expensive capital assets, and others can increase productivity and reduce waste.

The D-CREE program is one of 12 projects identified by the Innovation Center for US Dairy sustainability initiative that aims to help reduce greenhouse gas (GHG) emissions and increase business value across the dairy industry. The sustainability initiative is engaging all segments of the value chain to collectively reduce GHG emissions of fluid milk by 25 percent by 2020.

D-CREE's goal is to increase the adoption of energy efficiency best practices in milk processing plants. The project team is already creating and publishing validated case studies on best practices and developing plant-specific benchmarking and modeling tools to assess energy use, costs and GHG emissions.

Many energy efficiency techniques for fluid milk processing are applicable to other dairy products, so D-CREE's tools, case studies and other content will showcase oppor-

tunities that can be applied industry-wide. One way D-CREE is sharing findings is through webinars.

More than 100 processors took advantage of a series of four webinars this summer that discussed how to begin an energy management program; shared essential tools; and offered advice on budgeting, financing and operationalizing for long-term success.

One of the key messages was that processors need to know where they stand before they can begin to improve. This involves benchmarking, an evaluation that sets a baseline to measure success and progress.

Benefits of an energy audit

Whether taking advantage of in-house expertise or hiring an energy efficiency consultant, energy audits evaluate all systems in a processing plant to calculate how and where energy is used.

Once this calculation is made, processors can find opportunities to increase energy efficiency, determine potential upgrades and the applicability of emergent technologies, as well as conduct simple payback calculations to facilitate the implementation of cost-saving measures as quickly and effectively as possible.

Sometimes a relatively minor repair can produce remarkable energy savings. Take a high-volume ice cream and novelty frozen goods processor in Ohio, for example. The processor sought to upgrade its refrigeration systems to reduce overall energy use, reduce electrical demand and improve productivity through its spiral blast freezer.

After conducting an energy audit, the processor found the refrigeration system's condenser and compressor controls to be outdated, causing fluctuating suction pressures. In addition, high volumes of liquid refrigeration were flooding back, resulting in approximately 195 horsepower worth of added false load on the system, which cost an estimated \$73,800 per year in added electrical consumption.

• See *Energy Management*, p. 26

FROM OUR ARCHIVES

50 YEARS AGO

Aug. 7, 1959: **St. Paul, MN**—S.T. Coulter has been named head of the newly formed department of dairy industries in the Institute of Agriculture at the University of Minnesota. This department, to be located in the recently completed dairy industries building, is responsible for teaching, research and public service in dairy manufacturing and bacteriology.

Washington—Congress has failed completely to cope with the farm surplus problem, which is growing worse by the day, said Rep. Broomfield (D-MI) this week. He said the cost of storing and handling some \$12 billion worth of surplus crops would reach \$4 million a day by 1963 "unless steps are taken to stop overproduction."

25 YEARS AGO

Aug. 10, 1984: **Chicago**—The National Cheese Institute has compiled a data bank of sodium information of several domestic cheeses, and will notify the industry if data indicates a change. The sodium information can be used by anyone wishing to label a cheese and conforms to the applicable FDA standard of identity. Neither sodium labeling nor nutrition labeling are mandatory for cheese.

Sugarcreek, OH—The Ohio Swiss Cheese Association here recently announced winners of the Swiss Cheese Contest at the Ohio State Fair, the second of five contests held throughout the year to determine the Grand Champion and Reserve Champion cheese maker of Ohio. First place went to Ed Steiner, Jr., of Ed F. Steiner, Inc., Baltic.

10 YEARS AGO

Aug. 6, 1999: **West Allis, WI**—Phil Lindemann of Pine River Pre-Pack, Inc., Newton, WI, was named Wisconsin's Grand Master Cheese Maker during the Wisconsin State Fair Governor's Sweepstake Auction here this week. Lindemann's entry of Horseradish Cold Pack won the award in the Cold Pack class with a score of 99.40.

Washington—The US Senate this week decided not to include an amendment to extend the Northeast Interstate Dairy Compact in the agricultural appropriations legislation it was considering. This demonstrates that legislation to expand dairy compacts will not pass, said IDFA's Connie Tipton.

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The overall system upgrade increased control of the system and reduced energy use by 25 percent, an annual reduction of 3.4 million kWh, translating to \$259,000 in annual utility cost savings. In particular, the processor was able to identify a savings of more than \$100,000 per year by investing less than \$1,000 to modify an oil-cooling liquid injector on the major system compressor, eliminating a longstanding barrier to engine room head pressure reduction.

When considering the amount of money saved on the Ohio plant's refrigeration system, one can imagine the potential opportunities for energy and cost saving available elsewhere. Once an energy audit is conducted and a general strategy is in place with short- and long-term goals, processors can effectively utilize in-house expertise and set the stage for taking targeted advantage of outside experts and the experiences of others to gain momentum.

At the click of a mouse

Sophisticated and helpful resources and references can be accessed instantly through the Internet, in particular through US Department of Energy (USDOE) websites and

affiliates. Check out these online tracking, efficiency analysis, saving programs that are available at little to no cost.

ENERGY STAR - Plants that partner with ENERGY STAR for their corporate energy management program can utilize tools from the website that will provide efficacy in scope and cost of an energy management program and help processors bring the ENERGY STAR Challenge to their communities, or help them communicate their successes to the public.

AIRMaster+ - Using plant-specific data, AIRMaster+ evaluates supply-side operational costs for various compressed air system profiles. The program estimates savings to be gained and payback periods from selected energy efficiency measures. Average savings identified for food processing facilities is 4.3 million kWh/year, or \$83,435. This software tool is available for download from the USDOE Energy Efficiency and Renewable Resources Web site.

MotorMaster+ - An energy efficient motor selection and management tool, MotorMaster+ is a database of more than 20,000 operating and spare motors from 14 manufacturers. The program identifies inefficient or oversized facility motors, and calculates the savings available at 26 participating universities in the US to provide in-depth assessments of a plant site, including logs, grounds, services and manufacturing operations.

USDOE Industrial Assessment Center (IAC) - IAC facilities are started on the right track in energy and utility management, but also can help ensure better results. Together, processors specific recommendations with related estimates of costs, performance and payback times.

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Based on answers to 26 questions on steam system operations, SSAT provides a score for a processor's current system, as well as individual opportunities for improvement, and a comparison of the system to similar facilities. Average savings identified for food processing facilities is 56.7 million Btu/year, or \$712,396. This software tool is available for download from the USDOE Energy Efficiency and Renewable Resources website.

Database of State Incentives for Renewables & Efficiency (DSIRE) - DSIRE is an open access database that reports on every financial incentive and regulatory policy on the state, federal, utility and local territories. The project is funded by the USDOE and is available at the North Carolina State University Solar Center website.

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Energy efficiency measures do more than just reduce utility bills.

Whether it is online or in person, connecting with resources and utilizing information already available can not only help a processor get started on the right track in energy and utility management, but also can help ensure better results. Together, the dairy industry can help identify critical control points for energy management and best methods for improving efficiency and profit opportunities.

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The D-CREE project team is actively collecting energy management stories from dairy processors and will continue to share them with the industry, as well as be a resource for all energy efficiency matters on the plant floor. If you would like to see the case studies or share your story, e-mail dcreed@rosedmi.com



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Innovation Center for US Dairy provides a forum for the dairy industry to work together pre-competitively to address barriers and opportunities to foster innovation and increase sales. For more information, contact: innovation-center@rosedmi.com



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