

SOUTH MOUNTAIN CREAMERY

A Dairy Farm Case Study

Mathias Ag Program

The operation the Sowers family runs in Middletown, Maryland is not just another dairy. Hailing “the return of the milkman,” South Mountain Creamery is Maryland’s first on-site dairy processing plant. Since 2001, it has bottled its own milk and delivers to more than 8,000 customers weekly in Baltimore, Washington, D.C., Arlington, and other locales. The dairy’s commitment to sustainability is evident in its goal of using only its own resources to power its operation by 2015—through installation of a methane digester, soybean press, wind turbines, solar energy, geothermal loops, and a biodiesel plant. In addition to developing renewable energy sources, the farm looks for ways to reduce its energy needs.

South Mountain Creamery spends about \$14,000 each year on electric energy for three large, trailer-type container freezers and a cooler. These outdoor units operate year-round and account for a sizeable portion of the dairy’s annual electric consumption. When General Manager Peter Lee learned of a new grant opportunity through the Kathleen A.P. Mathias Agriculture Energy Efficiency Program, he sought funding to help pay for the following refrigeration upgrades:

Replacement compressors and accessories for the container freezer and cooler units provide a substantial efficiency improvement. With exposure to the elements, the existing compressors degraded in performance over the years, while newer compressors offer higher standards of efficiency.



New compressor controls improve the energy-efficient operation of the freezers and cooler. While the original compressors operate all the time, the new, solid-state controls will help modulate the head pressure of the refrigerant based on outside weather conditions. The result is less stress on the compressors, lower energy use and prolonged equipment life due to reduced operational hours.



Condenser fan motor replacement—replacement of the standard electric fan motors associated with these freezers and cooler with high efficiency motors—results in fans that run more efficiently, consume less energy and deliver operational savings through longer life.



Defrost controls optimize defrost operation cycles and reduce defrost energy usage significantly.



As shown in Table 1, these measures are estimated to save South Mountain Creamery \$5,407 annually in electric costs.

Table 1: Implemented Efficiency Measures and Associated Savings

Recommended Measure	Electric Savings (kWh)	Estimated Annual Energy Cost Savings	Installed Cost	Estimated Payback in Years
Refrigeration Upgrades* a. Compressor Replacement Replace three compressors for two container freezer units and one container cooler unit with high efficiency units and accessories required for proper installation. b. Compressor Controls Install new, solid-state controllers for energy-efficient operation of the new compressors. c. Condenser Fan Motor Replacement Replace six standard efficiency condenser fan motors with high efficiency motors. d. Defrost Controls Provide defrost controls to optimize defrost operation. <i>*Costs and savings include all upgrades combined.</i>	52,393	\$5,407	\$49,189	9.1

The Sowers look forward to the completion of these equipment upgrades in the summer of 2013. “We are using this project, among others, to decrease our public energy needs, our carbon footprint, and to take a big step forward toward our goal of being totally green by 2015,” said Ben Sowers.

By slicing South Mountain’s refrigeration-related energy costs by more than a third, these measures indeed constitute a big step forward—one that other refrigeration-intensive businesses can emulate with similarly impressive results.