

## CASE STUDY—LIGHTING • WASHER EXTRACTOR

### Farm Energy Audit Program (FEAP)

U. S. Dairy Sustainability  
Commitment



#### Quick Facts

- *Electronic ballasts in fluorescent lamps have many benefits over older magnetic ballasts: less noise, minimal flickering, better color rendering, more light per watt, cooler operation and lower energy use.*
- *Incandescent light bulbs convert only 10 percent of the energy they use to light. Compact fluorescent lamps (CFLs), cold cathode fluorescent lamps (CCFLs), or T-8 and T-5 fluorescent lamps deliver the same light using less electricity.*
- *Energy Star®-qualified washers use 40 percent less energy than standard washers. They also save water — most full-size Energy Star® washers use 18 to 25 gallons of water compared with 40 gallons used by a standard washing machine.*

Source: EnSave, Inc.

#### Tools and resources

- *Federal incentives may be available through the USDA's Renewable Energy & Energy Efficiency Program (Section 9006 of the Farm Bill), now called the Rural Energy for America Program. Visit [www.rurdev.usda.gov/rbs/farbill/index.html](http://www.rurdev.usda.gov/rbs/farbill/index.html).*
- *Some audit programs offer reimbursements and energy savings incentives if recommendations are implemented. Check with EnSave about opportunities available in your area.*
- *To find an Energy Star®-qualified washer, look for the Energy Star® label or review a complete list at [www.energystar.gov](http://www.energystar.gov).*

## Oregon dairy finds ways to balance initial costs and long-term energy savings

While it's clear that implementing energy-saving upgrades saves money in the long term, most businesses must also consider the up-front investment required for new equipment and installation. Louie Kazemier at Rickreall Dairy was committed to making smart changes for sustainability as well as utility cost savings — so he began looking for ways to offset initial investment costs. While attending the Harvesting Clean Energy Conference in Portland, Ore., he learned that energy efficiency experts from EnSave, Inc., were offering a discounted energy audit as part of an Oregon auditor education program. This allowed him to stretch his upgrade budget dollars while helping him to set priorities and plan for the future.

Kazemier began working with EnSave in April 2008 to complete an energy audit of his 1,850-cow operation. After the comprehensive energy assessment, he selected two areas — the lighting systems and the laundry facility — where the greatest energy reductions could be made, and that offered federal and state grant and incentive programs to offset upgrade costs. Working with the USDA and the Energy Trust of Oregon, he was able to secure the grants that made the upgrades possible.

#### Best practice: Install efficient fluorescent lighting

Relatively simple changes to operationwide systems like lighting can yield significant energy savings. At Rickreall Dairy, upgrading lighting saved approximately 214,850 kWh in one year, translating to a savings of \$1,100 per month in utility costs.

Kazemier replaced fixtures throughout the main barn, milking parlor, calf barn, weaning area, commodity barn, bathroom, equipment room, laundry and parlor breezeway. Old 400W metal halide fixtures were replaced with T-5 high-output fluorescent fixtures, and T-12 fluorescent lamps with magnetic ballasts were replaced with T-8 fluorescent lamps with electronic ballasts. The new lights generate more light per watt, run cooler and use less energy. They also generate less noise, an added benefit for the comfort of people and livestock at Rickreall Dairy.

#### Best practice: Replace old washer with Energy Star® washer extractor

Dairies require clean environments and sanitary conditions — at Rickreall Dairy, they wash at least 10 loads per day to clean 4,000 rags used to wash the cows' teats. By switching to an Energy Star-qualified washer extractor with a 40-lb. capacity, Rickreall Dairy was able to save approximately 874 therms in natural gas in a year, saving an estimated \$1,100 in costs. Because the new machine extracts more of the water during the spin cycle, the dairy saves even more energy by reducing drying time. The more efficient washer extractor also uses less water, for additional utility cost savings.

## Key benefits

**Energy savings** — The combination of upgrades at Rickreall Dairy has produced annual energy savings of \$13,337, based on a reduction of 214,850 kWh of electricity use at a cost of \$0.057 per kWh and a savings of 874 therms of natural gas at \$1.248 per therm.

**Payback** — The dairy will realize a complete payback in approximately five years. This figure includes energy savings plus a USDA Section 9006 grant of \$23,067 (25 percent of lighting and washer costs) as well as an incentive from Energy Trust of Oregon of \$29,783 for the lighting system upgrade.\*

**Greenhouse gas (GHG) reduction** — The savings in electricity and natural gas use from the improvements is equivalent to 364 lbs NO<sub>x</sub>, 281 lbs SO<sub>2</sub>, and 214,404 lbs CO<sub>2</sub> per year. This equals the amount of CO<sub>2</sub> emissions from consuming 11,039 gallons of gasoline.

Sources: EPA power profiler, <http://www.epa.gov/cleanenergy/energy-and-you/how-clean.html> and <http://www.epa.gov/ttn/chief/ap42/ch01/final/c01s04.pdf>; EPA Greenhouse Gas Equivalency Calculator ([www.epa.gov/solar/energy-resources/calculator.html](http://www.epa.gov/solar/energy-resources/calculator.html)).

## Industry workshop leads to affordable upgrades.

### Challenge area: Finding ways to offset upgrade costs for long-term energy savings.

With a production volume of 42.6 million pounds of fluid milk annually, Rickreall Dairy is a busy, robust operation. Kazemier chose to upgrade lighting and laundry systems because they offered the significant energy and utility cost savings as well as federal and state incentives to offset upgrade costs. By attending industry workshops and working with EnSave, Kazemier was able to get the information he needed to make the most cost-effective upgrades for his operation with long-term environmental and cost benefits.

### Dairy profile: Rickreall Dairy

Rickreall Dairy is a 1,850-cow dairy located in Rickreall, Ore. Owner Louie Kazemier has a history of innovative approaches to sustainable operations, including installation of a methane digester system in 2005 that helps recycle manure into a source of power for his dairy. He is committed to making energy efficiency a priority with future upgrades, and will continue to seek incentives and partnerships to make those upgrades a cost-effective part of his business practice.

### Financial information.

<b>Investment</b>	Approximately \$120,000
<b>System includes</b>	T-5 high-output fluorescent lamps T-8 fluorescent lamps with electronic ballasts Energy Star®-qualified washer extractor with 40-lb. capacity
<b>Offsetting incentives</b>	\$23,067 USDA Section 9006 grant for 25 percent of lighting and washer cost. \$29,783 Energy Trust of Oregon incentive for lighting upgrades.**
<b>Payback period</b>	Approximately five years, including incentives and annual energy savings of 214,850 kWh at an estimated cost of \$0.057/kWh and 874 therms of natural gas at an estimated cost of \$1.248 per therm.

\*Energy cost savings were calculated at the time of project completion, based upon the regional cost of energy for the farm's location. Energy costs may fluctuate over time and by geographic region.

\*\*State and federal incentives will vary by farm.

The Farm Energy Audit Program (FEAP) identifies effective agricultural energy efficiency programs, educates the dairy industry on the benefit of energy audits, and helps dairy producers access resources and incentives to complete an energy audit. FEAP is one of 12 projects identified by the Innovation Center for U.S. Dairy sustainability initiative that aims to help reduce greenhouse gas emissions and increase business value across the dairy industry.

This is one of a series of validated case studies that has been proven to be economically viable for dairy producers. Together, these case studies help identify energy efficiency opportunities and best management methods for improving efficiency and lowering costs. For more information about the program or to join our mailing list, e-mail [innovationcenter@rosedmi.com](mailto:innovationcenter@rosedmi.com).

The Innovation Center for U.S. Dairy aligns the collective resources of the dairy industry to offer consumers nutritious dairy products and ingredients, and promote the health of people, communities, the planet and the industry.