

MILKING THE SAVINGS OF ENERGY EFFICIENCY

With the goal of making their family farm more energy efficient, two brothers decided to take advantage of a rebate program, helping them cut costs and conserve energy.

\$7,900
PROJECT COST

\$3,387
REBATE CHECK

Two-year
PAYBACK

17,000 per year
PROJECTED KWH SAVINGS

1.97 Kw
DEMAND SAVINGS



Their story: A family farm run by two brothers in rural Minnesota hosts a 12-unit flat barn walk-through parlor, allowing them to milk anywhere from 90-100 cows each day.

Their goal: Initially, the brothers had their sights set on simply being more energy efficient on the farm. Because of Minnesota legislation transitioning utilities from a spending requirement to an energy savings program, the brothers were able to take advantage of a rebate program to help them conserve energy and cut costs, while helping their utility meet state mandates.

The solution and results: Just five days after receiving a proposal from Franklin Energy based on a detailed energy audit, the brothers installed both a plate heat exchanger and heat recovery system (pre-heater).

The heater produces free hot water from the waste heat generated by the refrigeration compressors. The system also heats well water in a separately insulated storage tank, which feeds to the existing water heater. As a result, the water entering the existing water heater ends up being 120-140 degrees instead of the previous 52 degrees of ground water. Reducing the amount of energy required to heat water to the desired 180 degrees, the available amount of hot water for washing increases and the cost of producing it is lowered.

The heat exchanger uses well water during milking to cool the milk to 30-40 degrees before it enters the bulk tank. This water can then be stored and fed to cows. It can also be re-pressurized and used to rinse cups and cattle waterers or used for washing parlor or milk house equipment. The heat exchanger can cut refrigeration system operating time by 50 percent, simply by precooling the milk.



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We can't change the low milk price, but we can change our input cost. And with this system, we're increasing our bottom line and helping the environment at the same time by using less energy. It's a win-win. —Farm Owner
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HIGH EFFICIENCY GRAIN DRYER INSTALLATION PAYS OFF

A family's outdated grain dryer system was inefficient, so they looked to their utility's agricultural energy efficiency program for a solution.

55%

APPROXIMATE ANNUAL ENERGY SAVINGS

\$44,000/year

ANNUAL COST SAVINGS

3.9 years

PROJECT PAYBACK WITH INCENTIVES



Their story: A farming family in Michigan learned that their outdated grain dryer system was leading to inefficiency and decreased profits, so they turned to their utility for a solution.

Their goal: The family wanted to explore ways to cut electricity and gas costs through participation in their utility's agricultural energy efficiency program. Their energy auditor began by evaluating the efficiency of their existing gas-powered, continuous flow grain dryer system. Because of its high operation cost, the grain dryer was being underutilized, which was resulting in field losses during wet periods. Without sufficient drying, the final products' moisture content was too high, which was ultimately decreasing profits.

The solution and results: The family decided to make several energy upgrades, the most significant of which was a new and highly efficient continuous flow tower drying system. With its computerized digital controls and sophisticated heat recovery and cooling process, it geared the farm up for energy savings and improvements to their bottom line. The family also added grain silo capacity, rewired most of their auxiliary electrical systems, and upgraded several auxiliary electrical motors to energy efficient motors during the project.

- The new dryer increased grain drying capacity 45%, from 1,650 bushels/hour to 2,386 bushels/hour.
- Corn moisture content decreased 31%.
- The dryer allows longer retention times and more uniform drying of the product.
- The higher efficiency dryer reduced field losses due to delayed harvests.

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We had a great experience working with program staff, and most importantly, capturing energy savings. We have mentioned it to other farmers in the area. This program is exactly what Michigan needs.” –Farm Owner

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The energy savings are based on a volume flow rate of 450,000 bushels of grain per year.

FINDING EFFICIENCIES IN THE BARN

When a dairy farm in Wisconsin realized the efficiency of their milking process wasn't ideal, Franklin Energy helped them explore cost-cutting and energy-saving options.



\$990

REBATE AMOUNT

\$1,350

ENERGY SAVINGS PER YEAR

Their story: Founded in 1936, this Wisconsin-based family farm produces milk, cheese and butter for the consumer market. The 219-acre farm milks over 100 cows daily, a process which requires a large amount of energy.

Their goal: To update their current inefficient milking process—which involved rotating cows through a stanchion barn—to a more efficient process to help save energy and reduce costs.

The solution and results: A Franklin Energy auditor with extensive agricultural experience conducted an energy efficiency assessment, testing the equipment and run time. They analyzed the data and generated an on-site summary, with several custom energy-saving recommendations. After reviewing the proposal with the energy auditor, the farm owners decided to add variable speed drives to the existing vacuum pump and receiver jar. They also installed a swing parlor in the existing stanchion barn to improve operations and energy consumption. As a result, the farmers received \$990 in incentives from their local utility and saved \$1,350 per year in energy costs.



CULTIVATING SAVINGS THROUGH EFFICIENCY

Learning about energy efficiency on paper can be helpful, but farm walk-throughs can take personalized savings to the next level.



12,509 kWh

ANNUAL ELECTRICITY SAVINGS

\$875

ANNUAL COST SAVINGS

Their story: A 400-acre family farm in Wisconsin milks about 100 cows per day.

Their goal: The farm owner, who has always been conscious about saving energy on the farm, attended a meeting sponsored by his utility to learn more about extended daylighting. There, he received a surprise presentation on their Agricultural Program. After speaking with Franklin Energy's agriculture expert that night, he decided to conduct a walk-through assessment of the farm that week.

The solution and results: The farm owners had previously retrofitted the lighting throughout the farm to increase energy efficiency, but two additional recommendations came out of the walk-through.

1. Replace the 20-year-old single speed vacuum pump on the milking machine with a variable speed unit.
2. Install a water-cooled plate cooler.

Each solution led to considerable savings. The variable speed unit is projected to save 4,409 kWh of electricity and reduce energy costs by \$308 per year. And the plate cooler is projected to save 8,100 kWh of electricity, reducing energy costs by \$567 each year.

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I noticed a difference right away. The compressor on the milk storage tank runs at least three hours less each day than it used to. —Farm Owner

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