

Plainville Farm - Efficiency & Savings

These days, managing energy costs is as much a part of farming as navigating wild weather. High energy prices (23-56% higher in New England than the national average) can adversely effect a farm's bottom line and longevity. However, many farms are rising to the challenge. Across the state, farmers are looking at ways they can save energy through energy efficiency, reducing their bills in the short term, and setting the stage for renewable energy generation in the future.

One Hadley farm has made energy savings a priority - Plainville Farm, run by Wally Czajkowski. Plainville is a diversified vegetable farm, growing a variety of produce including cabbage, green beans, and numerous types of squash. They require a large work space for vegetable washing and sorting and plenty of cooling, which is housed in a large packing shed and storage facility. The bustling, large lighted space and ample refrigeration contribute to Plainville's high electricity costs.

Through his most recent round of efficiency upgrades, Czajkowski was able to shave over \$5000 per year from his electric bills. **"It was one of the easiest things I've ever done"** said Wally, "It cost me nothing to save money".

Czajkowski's experience is not unique; farmers across the state are reducing their energy costs by replacing inefficient equipment and using better management practices. But his story helps demonstrate the resources available to farmers and highlights some of the straightforward ways farms can save energy.

This summer, Plainville Farm reduced their electricity consumption by over 38,000 kWh per year. The resulting environmental benefit is huge - about **28 tons of CO2** - or the same as pulling 5 passenger cars off the road. The economic impact is just as impressive - **a savings of \$5,300 each year** in electricity costs.

With generous financial support through a variety of incentive programs, energy efficiency upgrades can quickly reduce farm energy costs, sometimes with very **short payback** periods (in Plainville's case, **about 1 year**).



Inside the packing shed at Plainville Farm.



Overhead lighting was replaced with shorter, more efficient lamps.

Lighting upgrades

Many of the lights in the main barn at Plainville were outdated fluorescents called T-12s. As of July 2012, replacements lamps for T-12 fixtures were discontinued by manufacturers, so the upgrade to more efficient T-8 lights was timely. LED lamps replaced incandescent lights in both walk-in coolers, a great option because they don't expend as much heat as other bulbs, and easily operate in extreme temperatures. LED lighting can also be a good choice for exterior lighting.

Refrigeration upgrades

Czajkowski installed cooler door heater controls, which limit use of door heaters based on the humidity level. He also installed the recommended efficient evaporator fan motors. They turn off a portion of the evaporator fan while the compressor is not working to save energy.



LED lighting in the cooler.



Cooler lighting and fan motor replacements.

Additionally, he installed thermostat controls, which help maintain a consistent temperature and determine when the compressor runs, eliminating unnecessary use. These controls contributed the biggest savings – over \$1,600 per year.

In addition to the refrigeration upgrades, Czajkowski had the chance to perform some routine maintenance that will result in energy savings. He cleaned the inside of the condenser fan housing with a power washer, allowing more efficient air exchange. Next year, he is considering exploring heat reclaim off of his compressor, and possible renewable sources of heating and cooling for the packing shed operations.

| Measure | Before Upgrade | After Upgrade | Annual Savings (in kWh) | Annual Savings (in dollars) |
|---------------------------------|----------------------------------|-------------------------|----------------------------|--------------------------------|
| Cooler Lighting | 60 watt incandescent lights (13) | 8 watt LED lights (13) | 1,055 kWh | \$137.15 |
| Thermostat controls | No controls | 3 controls | 11,754 kWh | \$1528.02 |
| Efficient evaporator fan motors | Existing fan motors (13) | 13 efficient fan motors | 6,695 kWh | \$870.35 |
| Overhead Lighting | 228 watt 8 ft. T-12 (31) | 95 watt 4 ft. T-8 (31) | 12,006 kWh | \$1560.78 |



Submersible well pump controls.

Variable speed well pump

Irrigation management is important during summer as hot and dry as this year. At Czajkowski's new well, a variable speed pump was installed as part of the submersible well pump. Because water needs at Plainville are diverse, drip irrigation sometimes, and sprinklers at others- the flow rate varies a lot. That makes the well a good candidate for a variable speed pump. This type of pump adjusts to maintain pressure as needed, instead of running at full capacity full time – resulting in an estimated 70% energy savings over fixed speed pumps.

The process

Improving energy efficiency begins with an on-farm energy assessment. Auditors are contracted to work with farmers to determine current energy use and identify possible savings based on past bills, equipment run times and other factors. The farm is then provided with a list of recommendations, and estimated installation costs and incentives are matched with each measure.

Czajkowski was qualified to receive incentives toward his project, just for being a public utility rate-payer. Customers of public utility companies (like WMECO, National Grid, and NSTAR), including farm businesses, pay into conservation funds and therefore have access to energy conservation programs.

The MA Farm Energy Program also offers financial incentives for energy saving upgrades, up to \$5,000 based on the amount of energy saved, which dovetail nicely with utility incentive programs. Plainville received utility incentives equaling 67% of the total cost. The remaining expense was further reduced through MFEP incentives. At Plainville, **91% of upgrade costs were paid for with utility and MFEP incentives.** The remaining 9% will be paid for over the next year through a financing program with WMECO.

Czajkowski enthusiastically praised how “painless” the process was. “They came on our days off and worked from 5:30 a.m. until 6:30 p.m. to finish up the work”. He was impressed at how little the upgrades interrupted the farm schedule in the middle of their busiest season.

Through a combination the energy improvements Plainville Farm has made throughout the years and their plans for more in the future, Plainville Farm shows how to follow a step-by-step plan toward a smarter approach to energy and a stronger farm.



Close up of variable speed pump control.

Interested in making efficiency upgrades like those at Plainville Farm? Here's how to get started:

- Request a public utility audit by contacting your electric or gas provider. For a listing of who to talk to at your utility, visit our [audits and assessments page](#).
- If you are not a public utility customer, call us for information on how to begin your project.
- Get financial support for your efficiency project with MFEP incentives - give us a call or fill our [online request](#).