Massachusetts Farm Energy Program
Conservation ~ Efficiency ~ Renewables

Live Wire

A Quarterly Newsletter of the Mass Farm Energy Program
Published by Berkshire-Pioneer Resource Conservation & Development Area

December 2007 Volume 1

$400,000 in federal and state funds awarded to launch Massachusetts Farm Energy Program

AMHERST, Mass. (August 30, 2007) – Some $400,000 in federal and state funding will soon help Massachusetts farmers with energy efficiency and renewable energy efforts. A Massachusetts Farm Energy Program will be developed with funding from the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) and the Massachusetts Department of Agricultural Resources (MDAR).

"The Massachusetts Farm Energy Program is the first-ever federal-state collaborative energy initiative to be administered on a local level in the commonwealth," said Christine S. Clarke, State Conservationist for NRCS in Massachusetts. "At a time when farmers are being hit hard with skyrocketing energy bills, this program will help them save thousands of dollars a year through energy efficiency and alternative and renewable energy sources. The project also aims to reduce over 500 metric tons of CO2 emissions."

For complete press release go to: http://www.ma.nrcs.usda.gov/news/news_CIG_2007_energy.html

BOSTON – Secretary of Energy and Environmental Affairs Ian Bowles today announced a Massachusetts Farm Energy Program that will provide Bay State farmers with energy audits and offer incentives for on-farm conservation and renewable energy projects across the Commonwealth.

"The new Massachusetts Farm Energy Program will pursue two key goals of the Executive Office of Energy and Environmental Affairs – strengthening the financial condition of Massachusetts farms and boosting clean power and energy efficiency in all sectors of the economy," Secretary Bowles said.

For complete press release go to: http://www.mass.gov/envir/press/pressreleases/083007_farm_energy.pdf

Program Objectives

- Increase participation in the MA Farm Energy Discount Program
- Increase farmer participation in both electric and gas public utility energy conservation and efficiency programs
- Increase farmer participation in the MA Technology Collaborative's Renewable Energy Initiatives
- Increase farmer applications to the USDA-Rural Development's Energy Efficiency and Renewable Energy programs
- Provide assistance for obtaining energy audits, renewable energy assessments, and incentives to farmers
- Document best management practices for Farm Energy Systems for use in future federal and state cost-share programs

The Program in a Nutshell

The new Massachusetts Farm Energy Program was established as a two-year statewide collaborative effort, bringing together federal, state, industry, and private support to streamline technical and financial assistance available to Massachusetts farmers for reducing their energy demand, increasing their profits, and reducing greenhouse gas emissions. **The MFEP recognizes energy conservation and efficiency measures as the most effective ways to reduce on-farm energy costs on almost all farms throughout the Commonwealth. The program also recognizes that renewable energy projects are important to long term sustainability for some farms.** The MFEP will augment existing conservation, energy efficiency, and renewable energy programs, and provide services to farmers that do not have access to existing programs.

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Interested in the MFEP? Contact us!

Berkshire-Pioneer RC&D is currently developing a web page for the Massachusetts Farm Energy Program, which will be available in January. We have begun compiling a list of interested farmers and will distribute program information by email, web pages, electronic quarterly newsletters, through farm agency staff, trade shows, partner publications, and of course, one-on-one whenever possible. Please provide your email address by contacting Darlene Monds or Ann Gibson by email or phone at (413) 256-1607.

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The Collaboration...

The collaboration between the utility industry, government, and a statewide farm support group will maximize resources and insure no duplication of efforts. Initial meetings began in October and November in an effort to design and develop the Massachusetts Farm Energy Program (MFEP). Core members from MDAR, NRCS, Berkshire-Pioneer RC&D, and Patriot RC&D met to formulate planning criteria and program guidelines.

A Technical Advisory Group was formed, comprised of the core members plus all the organizations within the state currently providing energy efficiency and renewable energy programs. This group, considered partners of the MFEP, met at the Massachusetts Technology Collaborative facility in Westborough, MA for a day of dialogue in an effort to integrate the new farm program with existing energy services and incentives. Participants were extremely interested in the program and engaged in the process. The feedback from this group is essential to developing the program. Efforts to develop the MFEP continue on a daily basis with anticipation to reach out to farmers in the first quarter of 2008.

MFEP Partners

Massachusetts Dept. of Agricultural Resources (MDAR)
USDA-Natural Resources Conservation Service (NRCS)
Berkshire-Pioneer Resource Conservation & Development Area, Inc. (Berkshire-Pioneer RC&D)
Patriot Resource Conservation & Development Council, Inc. (Patriot RC&D)
Massachusetts Farm Bureau
Massachusetts Technology Collaborative (MTC)
EOEEA-MA Division of Energy Resources (MDER)
USDA-Rural Development (RD)
NSTAR
National Grid / Keyspan
Western Massachusetts Electric Company (WMECO)
Cape Light Compact
Fitchburg Gas & Electric
Massachusetts Municipal Wholesale Electric Company (MMWEC)
Berkshire Gas
Baystate Gas

What you can do to start saving money and prepare for the MFEP -- *at no cost to you!*

1. **Get signed up and annually renew your application for the MA Farm Energy Discount program** - Subject to certification by the MDAR, persons or corporations determined to be principally and substantially engaged in the business of production agriculture or farming for an ultimate commercial purpose may, upon written application, be eligible for a ***ten percent discount on electric & gas rates.***. A two-page application is available at http://www.mass.gov/agr/admin/farmenergy.htm or contact Linda Demirjian, Office Manager, DAR, at (617) 626-1703.
2. **Non municipal customers - Request an energy audit and incentive information** from your investor owned electric & gas utility companies. Don't wait - a new funding year is approaching and you are competing with the commercial sector.
3. **Municipal utility customers – Contact your provider(s)** because you may have access to a fee for service energy audit.
4. **Provide your email address to Berkshire-Pioneer RC&D** – Berkshire-Pioneer RC&D has begun compiling a list of interested farmers and will be distributing program information via the Internet. An on-line questionnaire is also available to collect baseline information that will assist in developing the program . The questionnaire is available at MDAR's website at http://www.mass.gov/agr/programs/energy/index.htm and click on "Energy Information Survey Form". It does require you to provide energy end use data. It is a fillable form that you can download, use Microsoft Word to fill it, and **return it to Berkshire-Pioneer RC&D** as an attachment to an email. (A web-based version of this will be available in January when the MFEP webpage is on-line.)

Timeline & Anticipated Services to Farmers

Program development began October 1 and is expected to continue into the first half of 2008. Following is an estimate of what and when we anticipate program implementation.

Technical assistance, marketing, & outreach for existing programs: NOW

Application period – First quarter 2008

Assistance in grant proposal writing services for USDA-RD energy programs: First quarter 2008

Assistance in obtaining energy audits, renewable energy assessments, & financial incentives: Second quarter 2008

Eligibility criteria to participate

Although the program partners are committed to providing technical assistance to all farmers, the program's core members will establish the eligibility criteria for services funded by this program based on NRCS and MDAR requirements, Technical Advisory Group recommendations, and guidance from all the partners. The goal of the program is for implementation of 50% of recommended measures and so the criteria must reflect a high level of commitment for implementation.

FEATURE

Energy Measures that Matter

Lighting may be a "No cost, Low cost" Conservation Measure

Lighting savings are of course specific to the actual fixtures being removed and installed. For compact fluorescent (CFL), the energy savings can be 75%, e.g. a 27 watt CFL produces a lumen output approximately equivalent to a 100 watt incandescent bulb. An additional benefit is longer bulb life of 10,000 hours vs. 1,000 hours for an incandescent. The energy savings from new technology four foot fluorescent as compared to older fluorescent technology would be 20 to 40%, but the expense of fixture replacement or retrofit of the bulbs and ballast to the existing fixture is a factor. Lighting efficiency improvements should be prioritized by annual hours of use. **This energy conservation measure may truly be a "no cost, low cost" practice that can save as much as 10% in electricity cost.**

Western Massachusetts Electric & Berkshire Gas Assist Allard Farm

Allard Farms in Hadley has been a family farm since 1935, according to owner Wayne Goulet. He currently grows 500 acres of corn, 100 of which is silage, 200 acres of hay, and he milks 110 registered Brown Swiss cows. Plagued with worn out equipment and high energy bills, Wayne decided it was time to upgrade his dairy operation. Since the summer, Wayne has replaced the automated take offs, vacuum pump, furnace, hot water heater, and much of the incandescent lighting. These upgrades were done without any down time.

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Energy Measures that Matter

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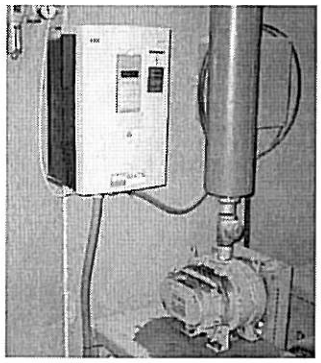
Variable Speed Drives for Dairy Operations

A variable speed motor control on the milking vacuum pump was recently installed. This energy conservation measure is estimated to reduce their energy use by about 7,500 kilowatt-hours per year and also will reduce their peak demand by about 5 kilowatts per month; these energy savings are valued at approximately $1,400.00 annually. Robert Dvorchik of the **Western Massachusetts Electric Company (WMECO)** provided technical assistance to identify this conservation opportunity, and WMECO provided 25% incentive for the cost of the project.

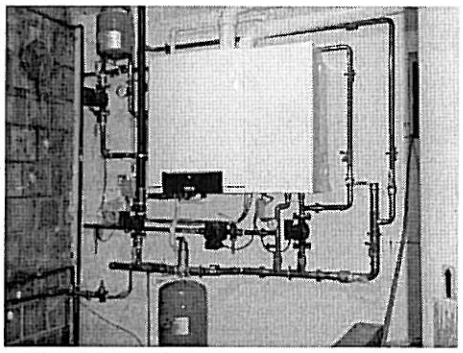


Variable speed drive

The vacuum pump is a crucial part of every milking system which provides the mechanical energy to remove milk from the cow and send it to a holding tank; after each milking the vacuum pump moves water and sanitizing agents through the entire system. A milking system consists of one or more electric motors (usually 5 to 15 horsepower) that drive a vacuum pump, vacuum line piping, and the milking units which an operator manually attaches to each cow's udders. Virtually all conventional milking systems, even those recently installed, are intentionally oversized to deal with the highest anticipated vacuum capacity which occurs only when a milking unit accidentally drops off or is kicked of by the cow.

To deal with this scenario, the standard system intentionally admits outside air into the system at almost all times, which requires electric energy to draw this intentional excess air through and then discharge it from the system without accomplishing any useful work. The vacuum pump motor is run fully loaded at the constant speed of the horsepower rating of the motor, for the entire time it takes to milk all cows and then wash the system.

A variable frequency drive motor control continuously varies the speed of the electric motor to precisely match the actual vacuum need; as energy use is directly proportional to motor speed, the potential energy savings are significant. Since either two or three milkings are done in a 24 hour period, the total run time of vacuum pump motors could average 7 to 10 hours per day. Since dairy cows have chosen not to observe religious or secular holidays, 365 days per year multiplied by the average motor run time per day is the appropriate figure to use in the calculation of energy use.



New high efficiency gas fired furnace

Cost for variable speed drives vary with motor horsepower size, with recent projects ranging from $5,000 to $8,000. Cost substantially increases if the age and condition of the existing vacuum pump determines that the drive should not be installed on the existing pump and a new vacuum pump and motor is needed. Variable speed drives for milking systems have qualified for substantial cost sharing incentive payments (% depends on the program funding) under the energy conservation programs administered by WMECO. Each application is individually evaluated, and must meet an eligibility cost-effectiveness test of lifetime electric energy savings as compared to the total cost. Also, if the existing vacuum pump motors are at the tail end of their useful life, this could be an opportunity to upgrade to a premium efficiency motor, which would provide additional modest energy savings and qualify for an additional incentive payment.

Milking system variable frequency drives present a conservation opportunity which should be investigated for every dairy farm. Other typical opportunities appropriate for farms are lighting efficiency improvements, premium efficiency motors, plate coolers to pre-cool milk prior to mechanical cooling, heat recovery from refrigeration to pre-heat wash water, and zero energy stock waterers to replace electrically heated waterers. Each of these options can be evaluated for cost sharing conservation incentive payments from WMECO (and other investor owned utilities), as can virtually any other conservation opportunity that saves electric energy.

An ancient oil fired furnace was used to provide hot water and forced hot air heat at about 70-75% efficiency. Wayne invested his Dairy Relief funds into a new high efficiency gas furnace plus a booster furnace (to increase the water temperature from 160 to 180 degrees). In addition, he installed a new hot water tank that has two coils – one heated by gas and one that will eventually be heated by the sun when photovoltaics are installed. **Berkshire Gas** provided about $1000 incentives toward the total cost of the installed furnace, estimated at $25,000.

Wayne's next projects include figuring his cost savings and payback periods for all the energy conservation and efficiency measures installed to date, and determining how best to utilize all the space that is now available where the old furnace and duct work once stood. Then he plans to install a precooler for the milk and photovoltaics to heat the water.