



## Dairy Energy Efficiency-Farmer Presentation Outline

The intent of this lesson is to provide information and skills to the attendees who have an interest in Energy Efficiency on their Dairy Farm as a means to reduce their farm energy costs.

Slides 1 through 3: Introduction. The presenter introduces self and points out that while the topic is a bit complicated, it will be worth their while in so far as their understanding of which equipment uses the most energy and how to estimate potential energy savings. Slide 3 outlines the content of the module and the topics included.

Slides 4 and 5: Define energy efficiency and energy conservation with examples of each.

Slide 6: Depicts some of the larger energy uses on the dairy farm.

Slides 7 and 8: Lists the top opportunities for energy efficiency improvement often found on the dairy farm.

Slides 9 through 13: Introduce the Variable Speed Drive (VSD) (aka variable frequency drive (VFD)) and its ability to control electric motors such that the motors only operate as fast and as much as needed to perform the needed amount of work. Slide 9 contains an image of a small VSD. Slide 13 addresses vacuum pump and milk pump applications and points out the relationship between speed changes and energy savings.

Slides 14 and 15: Further develop the variables used in the example calculation which shows a simple payback period.

Slide 16: A VSD that might be used to control a 7.5 horsepower vacuum pump, including its cost.

Slides 17 and 18: Introduce barn ventilation and cooling with a description of typical efficiencies for some ventilation equipment. Generally the larger the fan diameter, the more efficient it is.

Slides 19 and 20: Describe high volume, low speed fans in more detail along with some of the benefits derived from their use.

Slide 21: Addresses the fan affinity law and depicts how changes in volume affect the amount of energy used by the fan.

Slide 22: An image of large fans in a barn.

Slide 23: A graphic of lighting efficiencies.

Slide 24: Describes some considerations regarding lighting upgrades.

Slide 25: Engine block heaters, a typical concern when operating diesel powered farm equipment.

Slides 26 and 27: Describes keeping track of energy use so that meaningful comparisons can be made among various energy sources on the farm. Some effort is required just to know how much energy is actually used and therefore what savings may accrue from a change in energy source.

Slide 28: Introduces the USDA Energy Estimator. Fuel changes and efficiency improvements.

Slides 29 through 36: Step by step through the estimator starting with sample existing farm conditions, finally arriving at estimated energy savings derived from the proposed improvements.

Slide 37: Is the summary that restates the goals of the module.

Slide 38: A placeholder for questions.

This project supported by the Northeast Sustainable Agriculture Research and Education (SARE) program. SARE is a program of the National Institute of Food and Agriculture, U.S. Department of Agriculture. Significant efforts have been made to ensure the accuracy of the material in this report, but errors do occasionally occur, and variations in system performance are to be expected from location to location and from year to year.

Any mention of brand names or models in this report is intended to be of an educational nature only, and does not imply any endorsement for or against the product.

The organizations participating in this project are committed to equal access to programs, facilities, admission and employment for all persons.

