



Modifying Energy Buying Habits—ASP Presentation Outline

The intent of this lesson is to provide information and skills to the attendees who have demonstrated an interest in comparing energy source costs 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 may seem complicated; it is mostly about getting all the energy sources and their costs into common units. There may be savings to be enjoyed if the attendees are willing to crunch the numbers. Slide 3 outlines the content of the module and the topics covered.

Slides 4 and 5: Typical large energy consuming operations on the farm. Slide 5 emphasizes that heating water with electricity is usually the most expensive option. It also points out that electric motors and lighting can only use electricity as the energy source.

Slides 6 through 8: Other fuels that should be considered for heating applications. Slide 8 introduces the renewable/non-renewable energy concept with fuels listed as renewable or non-renewable.

Slide 9: Energy content of the eight fuels listed on the back of the ENERGY Selector. It is important to know the energy content of these fuels so that the cost per Btu can be addressed and calculated later in the presentation.

Slide 10: Energy value of a therm. This unit is used in some locations when selling natural gas. This is important because the ENERGY Selector uses \$ per therm as its natural gas unit. There are about 10 therms per MCF (thousand cubic feet). Hence, a therm costs at about one tenth of an MCF. A therm is an energy value. An MCF is a unit of volume. Since the heating content of natural gas is about 1,000 Btu per cubic foot (ft^3) and a therm is a unit of energy (100,000 Btus), a therm is approximately equal to the energy in 100 ft^3 of natural gas.

Slides 11 through 14: The Energy Selector in more detail with excerpts from the Selector enhanced with arrows for clarification.

Slide 15: The concept of fuel switching and estimating the benefits and costs of making a change in energy source.

Slides 16 through 21: Price information on potential alternate energy sources for use in later comparisons and calculations.

Slides 22 and 23 Calculation methods to find the energy in various units of various fuels (natural gas, fuel oil and wood pellets) to familiarize the student with the units and methods for more calculations to come, including simple payback.

Slide 24 through 26: Introduce wood pellet technology in more than one form so that the technology's existence as an alternative is well established.

Slide 27: Basic calculation of energy use in millions of Btus, regardless of energy source. Keep in mind: Btu is British thermal unit; MBtu is thousand British thermal units and MMBtu is million British thermal units.

Slides 28 and 29: Calculation of water heating energy use using the usual engineering quantities: annual heated water use, specific heat of water, required temperature rise of the water, water density, and energy content of propane.

Slide 30: Summary calculation of the price per Btu for five fuels. These prices are then used in a classroom worksheet comparing natural gas, wood pellets, and fuel oil. Prices change. Note that the \$3.30 per gallon of propane from EIA in March 2014. The price at a local farm store on January 8, 2015 was \$2.69 per gallon, an 18% decrease.

Slides 31 and 32: Seasonal and longer term pricing.

Slide 33: Brief summary reiterating that calculating the annual cost of various energy sources and knowing the approximate costs to accommodate a fuel source change can help you minimize energy costs.

Slide 34: 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.

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