



Activity Worksheet—Estimated Fuel Savings from Gas Boilers

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BACKGROUND INFORMATION

Consider the following two natural gas boilers:

Boiler 1:

Input Gas Fuel Content	205	MBtu/hr
Heating Capacity	189	MBtu/hr
AFUE	95.7	%
Nominal Efficiency		%
Annual Fuel Use		Therms
Seasonal Fuel Use		Therms

Boiler 2:

Input Gas Fuel Content	225	MBtu/hr
Heating Capacity	184	MBtu/hr
AFUE	81.3	%
Nominal Efficiency		%
Annual Fuel Use		Therms
Seasonal Fuel Use		Therms

Annual Savings: _____ therms

Seasonal Savings: _____ therms

EXERCISES

Complete the table using the following steps:

1. Calculate *Nominal Efficiency* for both boilers by dividing *Heating Capacity* by *Input Gas Fuel Content*. Note that *Nominal Efficiency* is different than AFUE.

2. Calculate *Annual Fuel Use* assuming that the boiler runs at full output for 1,300 hours a year. Multiply the *Input Gas Fuel Content* by the hours of operation, and divide by 100 to convert from MBtu to Therms.
3. Calculate *Seasonal Fuel Use* for a situation in which the boiler is only used in spring to heat a greenhouse. Assume fuel use for 250 hours of operation (seasonal use).
4. Calculate annual savings as the difference between the fuel use for Boiler 2 and the fuel use for Boiler 1.
5. Calculate seasonal savings as the difference between *Seasonal Fuel Use* for Boiler 2 and *Seasonal Fuel Use* for Boiler 1.

Note: Because AFUE is intended to estimate annual fuel savings, it may not be a reliable indicator of potential energy use in seasonal applications. It may also be a less accurate estimate of fuel use in circumstances that differ significantly from the standard conditions used for calculating AFUE, such as extremely cold environments. Because payback period depends on fuel savings, the less that the equipment is used, the less incentive there is to spend additional money on energy saving technologies.

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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