



United States Department of Agriculture
Natural Resources Conservation Service

CSP Job Sheet E-3

ENERGY MANAGEMENT ENHANCEMENT

February 2006

NEBRASKA

Name: _____

The Conservation Security Program (CSP) offers a limited number of enhancement payments as incentives to reward or encourage on-farm energy conservation and management. These enhancements are available once the applicant qualifies for CSP by meeting the program’s entry requirements for soil and water quality.

This information will help landowners and managers determine if they are eligible for the offered payment(s) for energy enhancement activities.

Energy Use Reduction (5%, 10%, & 20%)

Payment = \$100.00 / Year for a 5% energy use reduction; \$200.00 / Year for a 10% energy use reduction; \$500.00 / Year for a 20% energy use reduction.

Required Elements:

- Reduction from baseline energy use rates of 5 percent, 10 percent, and 20 percent of total British Thermal Units (Btus) consumed on the farm or ranch
- An energy audit of the farm or ranch must have been completed to verify baseline energy use.
- “Btu Conversion Charts,” and associated documentation on the referenced job sheet must be completed
- Some of the qualifying energy use reduction methods include:
 - Switching from gasoline powered to more fuel efficient diesel powered engines,
 - Using energy saving methods for drying and irrigating crops,
 - Replacing old machinery with more energy-efficient equipment,
 - Insulating farm buildings to reduce energy needed for heating or cooling,
 - Switching to energy efficient irrigation systems.

Energy consumption in agriculture grew steadily during the 1960s and 1970s, peaking in 1978, due to increased mechanization, use of confinement housing and expanding farm size. High energy prices during the 1970s and 1990s caused farmers and ranchers to find ways to reduce their energy costs—agricultural consumption was reduced by 41 percent from 1978 to 1998. This was primarily accomplished by reducing energy use or taking actions to use energy more efficiently while still achieving the same outcome.

Opportunities for energy conservation are available in almost every application or operation on the farm or ranch. Energy conservation can be achieved from simple management changes, such as shifting energy consuming irrigation to hours of low evapotranspiration or conscientiously completing scheduled maintenance so that systems work at optimal levels¹.

The advantages of energy conservation include reducing air pollutants, reducing global greenhouse gas emissions, reducing dependence on petroleum based products, and slowing escalation of energy costs due to lower demand. The USDA is promoting energy efficiency and conservation through the CSP so that farmers and ranchers can effectively respond to energy price and availability fluctuations and achieve environmental benefits.

The CSP provides an annual payment for energy reduction to applicants who enroll in the program. The payment is based on reduction rates of 5 percent, 10 percent, and 20 percent of total British Thermal Units (Btu's)² consumed on the farm or ranch. A companion Job Sheet, "Btu Conversion Charts," also is available from NRCS field offices to assist with converting a variety of energy measurement units into Btu's.

Documentation Required:

Receipts documenting average annual energy reduction compared with the established baseline.

Energy Reduction (in Btu's) Records

Date	Fuel Type	Baseline Usage from Energy Audit (by common fuel measurements and Btu's)	New Energy Consumption (by common fuel measurements and Btu's)	Total Btu's Saved	Total Energy Savings
August 10, 2004	Natural Gas	80,000 cubic feet	67,716,000	14,364,000	17.5%
		Btu's	Btu's		

Energy Reduction (in Btu's) Records

Date	Fuel Type	Baseline Usage from Energy Audit (by common fuel measurements and Btu's)	New Energy Consumption (by common fuel measurements and Btu's)	Total Btu's Saved	Total Energy Savings

Btu Conversion Tables

The British thermal unit is an English unit of measurement equal to the amount of heat required to raise the temperature of one pound of water at its maximum density by 1°F. One Btu is approximately equivalent to following 251.9 calories or 0.0002928 kilowatt-hours.

The following record-keeping and tables are provided to assist producers in keeping track of their energy reductions and converting all fuel sources to Btu's. An energy audit must be completed to establish baseline usage prior to claiming energy reduction enhancement payments.

The Btu content of common energy units follow:

- 1 gallon of gasoline = 124,000 Btu
- 1 gallon of heating oil = 139,000 Btu
- 1 gallon of diesel fuel = 139,000 Btu
- 1 barrel of residual fuel oil = 6,287,000 Btu
- 1 cubic foot of natural gas = 1,026 Btu
- 1 gallon of propane = 91,000 Btu
- 1 kilowatt-hour of electricity = 3,412 Btu

An Example:

You are using a natural gas furnace to heat an un-insulated shop building used for repairing equipment and implements. For the past three years, you used about 80,000 cubic feet of natural gas each year to heat the space. Last year you insulated the walls and roof and your records show that you only used 46,000 cubic feet. You may be entitled to an energy enhancement payment under CSP. To determine how much energy is saved, you should convert the natural gas into Btu's, as follows:

Natural Gas Consumption	Cubic Feet		Btu's	Energy Reduction
Pre-insulation	80,000	X 1,026 Btu per cu. ft.	= 82,080,000	
				14,364,000 Btu's
Post-insulation	66,000	X 1,026 Btu per cu. ft.	= 67,716,000	
17.5% Energy Reduction (Qualifies for 10% enhancement payment - \$250.00)				

Certification:

I certify that I have reduced my consumption of energy of (circle one) 5 percent, 10 percent, or 20 percent of total British Thermal Units (Btu's)².

Name: _____ Date: _____

¹ Reliable, Affordable, and Environmentally Sound Energy for America's Future, Report of the National Energy Policy Development Group, Office of the White House, 2002

² A British thermal unit is the amount of heat required to raise the temperature of one pound of water one degree Fahrenheit at sea level.