

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD
FARMSTEAD ENERGY IMPROVEMENT

(No.)

CODE 374

DEFINITION

Development and implementation of improvements to reduce or improve the energy efficiency of on-farm energy use.

PURPOSE

This practice may be applied as part of a conservation management system to reduce energy use.

CONDITIONS WHERE PRACTICE APPLIES

The practice applies to non-residential structures and energy using systems where reducing energy use is the identified goal.

CRITERIA

General Criteria Applicable to All Purposes

Implement recommendations for components of a current energy audit performed in accordance with the American Society of Agricultural and Biological Engineers (ASABE) Standard S612, Performing On-farm Energy Audits.

Where required, certify that the replacement or retrofit system and related components or devices meet or exceed currently applicable federal, state, and local standards and guidelines. Components of major activities by farm enterprises defined in ASABE S612 shall meet the appropriate NRCS or industry standard, such as:

1. NRCS Conservation Practice Standard, Pumping Plant (Code 533);

2. NRCS Conservation Practice Standard, Combustion System Improvement (Code 372);
3. Heating Ventilating and Air Conditioning (HVAC) per American Society of Heating, Refrigerating and Air Conditioning Engineers Standard 90.1-2010;
4. Ventilation fans per ASABE EP 566.1;
5. Greenhouse HVAC per ASABE EP406.4;
6. Motor efficiency per National Electrical Manufacturers Association MG 1-2009, Rev. 2010.

CONSIDERATIONS

Energy conservation and energy efficiency improvements should consider greenhouse gas emissions and ambient air pollutants. Methods may be implemented to account for greenhouse gas emissions credits, if applicable. Actual greenhouse gas emission reductions would require separate documentation.

In order to reduce energy imported onto a farm, consider possible use of renewable energy resources.

Plan progressive implementation of energy measures with ranking metrics such as life-cycle energy savings, payback period, or cost-effectiveness, etc., based on the landowner's goals and objectives.

PLANS AND SPECIFICATIONS

Plans and specifications for this practice shall be prepared in accordance with the previously listed criteria. Plans and specifications shall contain sufficient detail to ensure successful implementation of this practice and may be recorded in narrative form, on job sheets, or other approved forms. Documentation shall be in accordance with the section "Supporting Data and Documentation" in this standard.

The following shall be included in the farm energy improvement plan:

An energy audit developed by a qualified technical service provider and accepted by NRCS.

OPERATION AND MAINTENANCE

An Operation and Management (O&M) plan shall be prepared and is the responsibility of the client to implement. Appropriate job sheets may serve as the management plan, as well as supporting documentation, and shall be reviewed with and provided to the client.

Replacement or retrofit systems and related components or devices shall be operated and maintained in accordance with the manufacturer's recommendations.

Record Keeping

Maintain records to document the implementation of energy improvements. Retain and update records for a minimum of five years from the beginning of operation of measure implementation. Recommended records to be retained include:

1. Monthly utility bills, fuel purchases, and yield of agricultural commodities;
2. Documentation of maintenance conducted on the replacement or retrofitted system and related components or devices;

SUPPORTING DATA AND DOCUMENTATION

The following is a list of the minimum data

and documentation to be recorded in the case file:

1. An energy audit developed by a qualified technical service provider and accepted by NRCS;
2. Assistance notes. The notes shall include dates of site visits, name or initials of the person who made the visit, specifics as to alternatives discussed, decisions made, and by whom;
3. Completed copy of the appropriate job sheet(s) or other approved form.
4. Documentation that the work has been completed in accordance with the recommendations of the energy audit and NRCS practice standards; such as, photographs, materials and work invoices.

REFERENCES

1. American Society of Agricultural and Biological Engineers. 2003. *Heating, ventilating and cooling greenhouses*. ANSI/ASAE EP406.4 JAN2003 (R2008). ASABE, St. Joseph, MI.
2. American Society of Agricultural and Biological Engineers. 2008. *Guidelines for selection of energy efficient agricultural ventilation fans*. ASAE EP566.1 AUG 2008. ASABE, St. Joseph, MI.
3. American Society of Agricultural and Biological Engineers. 2009. *Performing On-Farm Energy Audits*. ANSI/ASABE S612 JUL2009. ASABE, St. Joseph, MI.
4. American Society of Heating, Refrigerating and Air Conditioning Engineers. 2010. *Energy standard for buildings except low-rise residential buildings*. ANSI/ASHRAE/IES, Standard 90.1. ASHRAE, Atlanta, GA.
5. National Electric Manufacturing Association. 2006. *Motors and generators*. NEMA MG1 – 2009 (R2010). Rosslyn, VA.