

Farmstead Energy Improvement (No.) 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:

- NRCS Conservation Practice Standard, Pumping Plant (Code 533)
- NRCS Conservation Practice Standard, Combustion System Improvement (Code 372)
- Heating Ventilating and Air Conditioning (HVAC) per American Society of Heating,

Refrigerating and Air Conditioning Engineers Standard 90.1-2010

- Ventilation fans per ASABE EP 566.1
- Greenhouse HVAC per ASABE EP406.4
- 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 to implement the energy conservation and efficiency measures shall be in accordance with this standard and describe the requirements for properly installing the practice to achieve its intended purpose. Plans and specifications shall:

- include written specifications that describe the site specific details of installation.
- identify and describe the existing system and related components or devices.
- identify and describe the replacement or retrofit system and/or related components or devices.
- document system energy usage and resulting potential energy savings from the implementation of this practice.
- include a plan view showing the location of the measures in relationship to other structures or natural features where appropriate.
- detail drawings of the measures and appurtenances, such as piping, inlet and outlet connections, mounting, foundations, and other structural components where appropriate.

Support data documentation requirements are as follows:

- Inventory and evaluation records
 - Assistance notes or special report
- Survey notes, where applicable
 - Design survey
 - Construction layout survey
 - Construction check survey
- Design records
 - Physical data, functional requirements and site constraints, where applicable
 - Soils/subsurface investigation report, where applicable
- Design and quantity calculations
- Construction drawings/specifications with:
 - Location map
 - “Designed by” and “Checked by” names or initials
 - Approval signature
 - Job class designation
 - Initials from preconstruction conference
 - As-built notes
- Construction inspection records
 - Assistance notes or separate inspection records
 - Construction approval signature
- Record of any variances approved, where applicable
- Record of approvals of in-field changes affecting function and/or job class, where applicable.

Audits. ANSI/ASABE S612 JUL2009. ASABE, St. Joseph, MI.

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.

National Electric Manufacturing Association. 2006. Motors and generators. NEMA MG1 – 2009 (R2010). Rosslyn, VA

OPERATION AND MAINTENANCE

An Operation and Maintenance (O&M) plan shall be developed for this practice. The O&M plan shall be consistent with the purposes of the practice, its intended life, safety requirements, and the criteria for the design.

REFERENCES

American Society of Agricultural and Biological Engineers. 2003. Heating, ventilating and cooling greenhouses. ANSI/ASAE EP406.4 JAN2003 (R2008). ASABE, St. Joseph, MI.

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.

American Society of Agricultural and Biological Engineers. 2009. Performing On-Farm Energy