

Farmstead Energy Improvement (374) Requirement Sheet

2012 Environmental Quality Incentives Program (EQIP)

Tennessee

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

Eligibility: Non-residential structures and energy using systems where reducing energy use is the identified goal.

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

Requirements: Equipment and material installed for this practice shall be in conformance with the energy audit completed through Conservation Activity 122, Conservation Activity 124, and/or ASABE Standard S612, Performing On-Farm Energy Audits.

Other items include:

- Work performed shall conform to all applicable standards, codes, laws and regulations.
- Satisfy Plan and Specification requirements set forth in Practice Standard 374, January 2012.
- Comply with NRCS-TN Specification 374, January 2012. (See attached Specification 374)

The following Farmstead Energy Improvement scenarios are offered under the 2012 Environmental Quality Incentives Program (EQIP).

<u>Scenario</u>	<u>Description</u>
Building Envelope, Insulation Attic (SF)	<i>Resource Concern:</i> The primary resource concern to be addressed is inefficient energy use in equipment and facilities - "Building Envelope". <i>Existing Conditions:</i> An on-farm energy audit for a poultry house has identified an inefficient building envelope with limited attic insulation. <i>Improved Conditions:</i> A more effective and efficient building envelope can be created through addition of, or increased, attic insulation. <i>Typical Scenario:</i> A typical scenario is the installation of a minimum 4-in depth of cellulose insulation in the drop-down ceiling attic for one poultry house. The increased insulation reduces seasonal heat loss and heat gain which reduces the respective need for heating and cooling equipment to operate. Reduced operation reduces energy use as evidenced in the energy audit. Appropriate ventilation is provided (per the energy audit). The unit basis of payment in this scenario is SF (square feet). Alternate types of insulation can be used as evidenced in the energy audit. Associated practices/activities: 122-AgEMP - HQ, 124-AgEMP - Landscape, and other activities within 374-Farmstead Energy Improvement.
Building Envelope-Sealant (Ea House)	This scenario includes the interior sealing of the exterior walls at the footer plate, eaves, ridge cap, and gable ends. This scenario is for a poultry house with an open ceiling or truss-work, in other words, without a drop-down ceiling. Sealing will be performed by a professional contractor spraying the areas with an approved sealant for poultry production facilities. Sealant is not merely spray foam from a can. The unit basis of payment in this scenario is one house. Associated practices may be 122-Ag Energy Audit-Headquarters. The principle resource concern addressed is Inefficient Energy Use.

<p>Building Envelope-Sealant for Drop-Down Ceiling (Ea House)</p>	<p>This scenario includes the interior sealing of the exterior walls at the footer plate, eaves, and gable ends. This scenario is for a poultry house with a drop-down ceiling. Sealing will be performed by a professional contractor spraying the areas with an approved sealant for poultry production facilities. Sealant is not merely spray foam from a can. The unit basis of payment in this scenario is one house. Associated practices may be 122-Ag Energy Audit-Headquarters. The principle resource concern addressed is Inefficient Energy Use.</p>
<p>Heating, Radiant Systems (kBtu/hr)</p>	<p><u>Resource Concern:</u> The primary resource concern to be addressed is inefficient energy use in equipment and facilities - "Heating". <u>Existing Conditions:</u> Inefficient heat distribution equipment, such as conventional "pancake" brood heaters have been identified by an on-farm energy audit. The Pancake brooder, mounted at a low installation height, primarily warms the air. They provide a one-to-two foot perimeter at desired temperatures around each brooder. A large number of brooders are required to cover a significant percent of floor space. As the warmed air naturally rises it loses effectiveness for poultry on the ground. <u>Improved Conditions:</u> Radiant tube heaters primarily warm objects within a direct line of sight (similar to the sun or an open fire). Air temperature is of relatively little importance for radiant heating systems to be effective. As a result, radiant systems are typically installed 5' or more above the floor level. This height extends the distribution of the radiant heat over a larger area than is possible with pancake style heaters. A roughly 16' diameter radiant heat zone heats over twice that of a conventional pancake brooder. Amount and sources of reduced energy use will be as evidenced in the energy audit. <u>Typical Scenario:</u> Replace 28 "pancake" brood heaters in a poultry house with 6 Radiant Tube Heaters. Replacement will require the materials and labor to remove existing heating system, re-plumb gas lines, cables and wench system to retrofit new radiant tube heaters, and miscellaneous items to complete the installation. Actual number, placement, and heating capacity of radiant tube heaters will be as evidenced in the energy audit, designed by a qualified engineer or installer, and may need to be verified by the field representative of the integrator. Typical heater capacity is 125,000 Btu/hour. Alternate acceptable radiant heating systems can include radiant brooders and quad radiant systems as evidenced by the energy audit. Associated practices/activities: 122-AgEMP - HQ and other activities within 374-Farmstead Energy Improvement.</p>
<p>Lighting, CFL (Ea Lamp)</p>	<p><u>Resource Concern:</u> The primary resource concern to be addressed is inefficient energy use in equipment and facilities - "Lighting". <u>Existing Conditions:</u> An inefficient lighting system such as one using incandescent lamps has been identified by an on-farm energy audit. <u>Improved Conditions:</u> More efficient lighting is provided by Compact Fluorescent Lamps (CFLs) in order to reduce energy use as evidenced by the energy audit. <u>Typical Scenario:</u> A typical scenario is to install Dimmable CFLs to replace incandescent lamps on a one-for-one basis. Light fixtures do not have to be replaced. A typical poultry house has 48 fixtures. CFL requirements: minimum 8 Watt, 4100 Kelvin, dimmable, grow-out bulb; industrial grade; suitably protected from dirt accumulation. In high humidity environments or areas subject to wash down, gasket or weatherproof housings are required to prevent corrosion and premature failure. Use of CFLs to replace less efficient lighting can be used for any type of operation as evidenced by the energy audit. Associated practices/activities: 122-AgEMP - HQ, 124-AgEMP - Landscape, and other activities within 374-Farmstead Energy Improvement.</p>
<p>Attic Inlets (Each)</p>	<p><u>Resource Concern:</u> The primary resource concern to be addressed is inefficient energy use in equipment and facilities - "Heating." <u>Existing Conditions:</u> An on-farm energy audit of a poultry house has identified an inefficient heating system. <u>Improved Conditions:</u> Use of gravity or machine actuated attic inlets in poultry houses that have drop ceilings which will allow the transfer of solar heat created in the attic space into the house at the appropriate times which will reduce the amount of heating fuel used. <u>Typical Scenario:</u> A system of attic inlets is installed to draw in solar heat from the attic space of a poultry house; the new system promotes efficient use of available solar heat. In a typical 16,000 square foot poultry house, 10 to 15 attic inlets (depending on model CFM's) are needed along with the control system (if actuated inlets are used). Actual number, placement, and capacity of the attic inlets will be as evidenced in the energy audit, designed by a qualified engineer or installer, and may need to be verified by the field representative of the integrator. Cost is based on least cost alternative for gravity inlets. Associated practices/activities: 122-AgEMP - HQ, 124-AgEMP - Landscape, and other activities within 374-Farmstead Energy Improvement.</p>

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE SPECIFICATION
FARMSTEAD ENERGY IMPROVEMENT
CODE 374**

1. SCOPE

This specification sets forth requirements of needed to meet the Farmstead Energy Improvement standard.

2. EQUIPMENT AND MATERIAL

Equipment and material installed for this practice shall be in conformance with the energy audit completed through Conservation Activity Plan 122 and/or ASABE Standard S612, Performing On-farm Energy Audits.

3. INSTALLATION

Installation shall conform to all applicable codes, laws and regulations.

4. SUBMITTALS

The Producer or Installer shall furnish the NRCS written certification from the manufacturer that furnished equipment and materials conform to the requirements of this specification and energy audit.

The Producer or Installer shall certify that the installation of all furnished equipment and material meets all codes, laws and regulations.

The Installer or Vendor shall furnish warranty certifications, spare parts lists, service bulletins/manuals, and instructions covering the operation and maintenance of the furnished equipment to Producer.

5. OPERATION AND MAINTENANCE

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

The following records will be kept, retained and updated for a minimum of five years from the beginning of operation of the installed new, replacement, or retrofitted system.

- Types and amounts of fuel used (gallons of fuel or BTU equivalents) in the system(s), or electricity used (kilowatt hours) for higher efficiency or on farm electrical generation that has replaced an existing system.
- Documentation of maintenance conducted on the new, replacement, or retrofitted system and related components or devices.

6. INSPECTION OF RECORDS

NRCS shall have the right to inspect the installed equipment and material throughout the life of this practice. For five years< NRCS shall have the right to review and inspect Producer records as outlined in Section 5, above.

NATURAL RESOURCES CONSERVATION SERVICE

Tennessee

OPERATION AND MAINTENANCE REQUIREMENTS

FARMSTEAD ENERGY IMPROVEMENT

CODE 374

Land Owner/Operator _____

County _____ SWCD _____ Farm/Tract No. _____

Prepared By _____ Date _____

OPERATION AND MAINTENANCE ITEMS

Properly operated and maintained farmstead energy improvements are an asset to the farm. This practice is used for the development and implementation of improvements to reduce, or improve the energy efficiency of, on-farm energy use. Estimated life span of this installation is at least 10 years. The life of the energy improvement practice can be assured and usually increased by developing and carrying out a systematic operation and maintenance program.

This practice will require periodic maintenance and may also require operational items to maintain satisfactory performance. Your operation and maintenance program requirements include:

- Replacement or retrofit systems and related components or devices shall be operated and maintained in accordance with the manufacturer’s recommendations.
- 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:
 - monthly utility bills, fuel purchases, and yield of agricultural commodities.
 - documentation of maintenance conducted on the replacement, or retrofitted system and related components or devices.

Additional Operation and Maintenance Requirements Specific to this Plan: _____
