Agricultural Energy Management Plan - Headquarters Criteria
Conservation Activity Plan Practice Code (122) (No.)

1.Definition

An Agricultural Energy Management Plan- Headquarters (AgEMP) is a detailed documentation of energy consuming components and practices of the current operation, the previous year's on- farm energy consumption, and the strategy by which the producer will explore and address their on-farm energy conservation concerns, objectives, and opportunities.

2. AgEMP Headquarters Criteria:

This section establishes the minimum criteria to be addressed in the development of an AgEMP for Headquarters.

A. General Criteria: An AgEMP - Headquarters shall be developed by a certified Technical Service Provider (TSP). In accordance with Section 1240 (A) of the 2008 Farm Bill, the Environmental Quality Incentives Program (EQIP) provides funding support through contracts with eligible producers to obtain services of certified TSPs for development of an AgEMP- Headquarters. The TSP proficiency criteria required to develop an AgEMP - Headquarters for an EQIP eligible producer is located on the TSP registry (TechReg) web site at: http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/technical/tsp

B. Criteria for Specific Elements of an AgEMP:

1. **The AgEMP - Headquarters** will meet the Type 2 on-farm energy audit minimum criteria established in the ***ANSI/ASABE S612 July2009 Performing On-farm Energy Audits*** standard, hereafter referred to as the industry standard.

2. **Background and Site Information** – The AgEMP will provide a narrative for:

   a. Name of producer

   b. Facility location(s)

   c. Type and size of the operation (e.g., description of the poultry, dairy, or swine, etc. as well as production levels, and any unusual factors that affect energy use)

   d. Producer concerns, objectives, opportunities, and overall management scheme for the enterprise (i.e., description of why the producer wants an on-farm energy audit and their specific objectives)

3. **Documentation of Baseline Current Energy Use**: The AgEMP will provide comprehensive documentation of the current energy resources (e.g., electricity, natural gas, etc.) used for all of a producers farming enterprises, respective total current energy usage, and total cost data. This will also be broken down by major activity per month over the past annual cycle. The evaluation of current energy use shall address major activities listed in (but not limited to) the industry standard associated with the processing and storage of agricultural commodities, feeding, housing, processing of farm animals, and animal products. Current energy use for engine driven equipment used in the cultivation, protection, and harvesting of agricultural commodities will also be evaluated as applicable. A comprehensive summary of all of the above items will be presented by energy resource. In addition to the above comprehensive farm energy baseline, the AgEMP will document the major activities associated with each of the individual farm enterprises:

a. Components/details of the major activities, as appropriate, and primary equipment:

- Manufacturer of equipment,
- Equipment component factory ratings (hp, efficiency, BTU input and BTU output)
- Management use efficiencies (eg. manual/automatic systems)

b. Annual energy use

NOTE: If a major activity is not applicable to the farm enterprise or the major activity has no opportunities for improved energy use, the report needs to state this.

4. **Recommended Measures/Conservation Practices**: The AgEMP will provide appropriate energy savings for each major activity (including a comparison to the baseline energy use) that reduces energy use and addresses the energy management needs for the agricultural operation (see ASABE S612 Table 1).

a. The Recommended Measures for energy improvement are to be presented.
b. Estimated energy savings are to be presented. Energy savings shall be documented for the major activities at the farm headquarters as kWh, joules, gallons, etc. and shall also be converted to a common measure of millions of British Thermal Units (mBTU).
c. Estimated installed cost and energy cost savings in years are to be presented
d. Simple payback period (in years) shall be documented for each of the recommended energy improvement measures.
e. Estimated emissions reductions (specific estimates for CO_2, N_2O, CH_4, SO_2, and NO_X) are to be provided for each recommended energy improvement/measure.
f. The plan may include, but is not limited to, the conservation practices listed below:
    - Farmstead Energy Improvement (374)
    - Irrigation System, Micro-irrigation (441)
    - Irrigation System, Sprinkler (442)
    - Irrigation Water Management (449)
    - Pumping Plant (533)

g. The plan may include, but is not limited to the following recommended energy improvement measures: Lamps, timers, sensors, fans, control systems, variable drives, compressors, motors, insulation, heaters, waterers, evaporator/chillers, planting, tilling, harvesting, engine driven equipment. (Refer to Table 1 in the ASABE S612 industry standard, for more information on the components listed for each of the major energy activity categories)

5. **Summary Reporting of Recommended Measures**: The following table and its format must be provided at the beginning of the AgEMP report. The summary table (shown below) will contain each of the various recommended measures, prioritized according to pay-back period.

a. Estimated reduction in energy use (electricity, propane, other), estimated energy savings, estimated installation cost, estimated energy cost savings, estimated greenhouse gases and air pollutant co-benefits will be provided for each energy improvement/recommended measure.

b. The Payback in Years column determines the sequence in which recommended measures are to be listed in the Summary Table. This sequence can be used to provide guidance on

the recommended sequence of implementation, from shortest time of payback to longest time of payback.

c. Recommended measures with payback periods exceeding 10 years may be presented in the body of the report but shall not be included in the Summary of Recommendations.

d. Guidance on how to calculate the estimated greenhouse gases and estimated air pollutant co-benefit is provided in Appendix A.

SUMMARY OF RECOMMENDATIONS

Table 1 below contains a summary of the recommended energy improvement measures for a poultry operation. Energy efficient equipment lowers costs by performing the same or more work with less energy.

Table 1. Summary of Estimated Annual Energy Efficiency Improvements

	Estimated Reduction in Energy Use				Estimated Costs, Savings, Payback, and Prioritization for Implementation			Environmental Benefits				
								Greenhouse Gases			Air Pollutant Co-Benefits2/	
Recommended Measure	Electric Savings (kWh)	Propane Savings (Gal)	Other 3/	Energy Savings 1/ (mBTU)	Installed Cost [a]	Energy Cost Savings [b]	Payback in Years [a / b]	Estimated CO2 (lbs)	Estimated N2O (lbs)	Estimated CH4 (lbs)	Estimated SO2 (lbs)	Estimated NOx (lbs)
Example: Lighting	25,210			86	$1,740	$2,094	0.8	30,988	0.562		0.038	0.020
Example: Seal Air Leaks		477		44	$1,500	$809	1.9	5,962	0.043		0.000	0.003
Example: Insulate Brood Curtain		98		9	$450	$167	2.7	1,226	0.009		0.000	0.001
Example: Exposed Foundation Wall Insulation		383		35	$5,621	$651	8.6	4,788	0.034		0.000	0.002
Example: Curtain to Solid Insulated Sidewalls		444		41	$7,168	$754	9.5	5,550	0.040		0.000	0.003
Totals	**25,210**	**1,402**		**21**	**$16,478**	**$4,475**	**3.7**	**48,514**	**0.688**		**0.038**	**0.029**

Table 1 Notes:

1) The estimated energy and cost savings are approximate values provided from an actual on-farm energy audit. A portion of the benefits for some of the improvements offset the benefits of others; for example, insulating side walls will actually seal up some of the air leaks and reduce the heat load in the winter.
2) SO_2 and NOx are ambient air contaminants; CO_2 is a green house gas.
3) Other: Gasoline, Diesel fuel, Natural Gas

Energy Savings as a percent of total energy usage will also be presented for each energy type as shown in Table 2 below.

Table 2. Energy Savings of Recommendations

Fuel	Current Usage	MBtu Usage	Savings	MBtu	% Savings
Electricity (KWh)	135,920	464	1,903	6	1.4%
Natural Gas (ccf)	4,214	430	0	0	0
Totals		894		6	0.7%

6. **References**: The AgEMP shall include technical documentation of sources used for the Headquarters AgEMP. Include the actual documents or web sites that contain the technical documentation useful for the producer such as:
   a. fact sheets
   b. product information
   c. recommendations and or comparisons of specific products
   d. journal articles
   e. manufacturer product information sheets, etc.

7. **Definitions:**

   a. Energy: Fuels (propane, diesel, natural gas, etc.) and electricity used to perform stationary farm and ranch activities.

   b. On-Farm Energy Auditor: A person who has the technical qualifications to perform an agricultural energy audit.

   c. Energy Type: The type of fuel (liquid or gas), electricity, etc. used to perform farm and ranch activities.

   d. Current Energy Usage: The annual usage of energy (electricity, natural gas, other fuels, etc.) for stationary farm or ranch operations.

8. **Deliverables for the Client – a hardcopy of the AgEMP shall include:**

   a. An Agricultural Energy Management Plan Checklist with all items checked that are contained in the Plan report.

   b. The Cover page of the AgEMP will contain the following:
      - Name and address of Producer and TSP,
      - Date AgEMP was performed,
      - Signature blocks for the TSP and producer, and
      - Signature and date block for the NRCS Field Office concurrence.

9. **Deliverables for NRCS Field Office:**

   Complete Hardcopy and Electronic copy (MS Word) of the completed AgEMP Headquarters.

APPENDIX A

ENVIRONMENTAL BENEFITS

Guidance on how to determine values for greenhouse gases and air pollutant co-benefits environmental benefits.

In order to estimate the environmental benefits associated with estimated energy savings, NRCS has developed a Quick Energy calculator that transforms energy saving measures for fuels and electricity into atmospheric emission reductions. The Quick Energy Tool relies on EPA's state- level aggregated emission factors for electricity, to generate estimates of emissions savings for electricity. The Quick Energy Tool relies on the EPA Energy Information Agency's emission factors for liquid and gaseous fuels, to generate estimates of emissions savings for liquid and gaseous fuels.

The Web link to the NRCS COMET Quick Energy Calculator for converting Energy Savings into Emissions Reductions is located at: http://www.comet2.colostate.edu/