Agricultural Energy Management Plan Criteria
Practice/Activity Code (122) (No.)

1. Definition

An Agricultural Energy Management Plan (AgEMP) contains the strategy by which the producer will explore and address his/her on-farm energy problems and opportunities.

2. AgEMP Criteria:

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

A. General Criteria

1. An Environmental Evaluation (EE) (CPA 52) is to be prepared for all activity plans to demonstrate NRCS compliance with the National Environmental Policy Act, National Historic Preservation Act, Endangered Species Act, Environmental Justice, Air Quality, and other designated environmental concerns and environmental laws. The environmental effects from the activity plans on environmental resource concerns should be clearly documented on the EE (CPA-52 form). The following is abbreviated guidance for preparation of the EE:

    a. Planners and TSPs should follow the EE guidance delineated in the National Environmental Compliance Handbook.

    b. The EE describes the existing conditions for all applicable resource concerns.

    c. The EE will assess the resources potentially impacted by the no action, proposed action and any reasonable alternatives.

    d. Guide sheets will accompany the EE, as needed, to provide information on how to assess and deal with special environmental concerns.

    e. The findings section of the EE is to identify whether NRCS has determined based on the analysis of the EE: (1) that a site specific environmental assessment (EA) or an environmental impact statement (EIS) should be prepared based on the significance of potential impacts, or (2) the EE can be tiered to a state, regional, or national programmatic EA or EIS because the proposed effects have been sufficiently analyzed in a state, regional, national programmatic EA or EIS.

    f. TSP and planners are required to complete NRCS' Level I Environmental Compliance training prior to prepare any EE CPA 52.

2. An AgEMP shall be developed by certified Technical Service Providers (TSPs). In accordance with Section 1240 (A), the Environmental Quality Incentive Program (EQIP) program provides funding support through contracts with eligible producers to obtain services of certified TSPs for development of AgEMP. The specific TSP criteria required for AgEMP development is located on the TSP registry (TechReg) web site at: http://techreg.usda.gov/

B. The AgEMP plan shall address and document the following elements:

1. Background and site information;
2. Energy audit for the Headquarters' Operation and the Landscape (Working Lands);
3. Energy conservation practices planned;
4. Reference documents.

C. AgEMP Element Specific Criteria

1. Each of the AgEMP elements will address specific criteria. The degree to which these elements are addressed in the development and implementation of a site-specific AgEMP is determined by the General Criteria in Section A and the specific criteria provided for each element of the AgEMP identified below.
2. Background and Site Information - This element provides a brief description of:
   a. Name of producer
   b. Facility location(s) and mailing address
   c. Type and size of the operation
   d. Resource Concerns and Special Environmental Concerns: Extract from State's current CPA-52, Environmental Evaluation Worksheet—in National Environmental Compliance Handbook—includes benchmark conditions for all resource concerns and special environmental concerns (e.g. soil, water, air, plants, animals, and social and economic concerns. This is just a checklist and the level of resolution for inventory of these resource concerns may vary depending upon the nature, size, and intensity of possible positive and negative effects to these resources.
   e. Producer concerns
3. On-farm Energy Audit: This element determines and documents current energy usage, over the past annual cycle, and provides cost-effective alternatives and recommendations for energy conservation of each farm enterprise. A field crop system and livestock production system on the same farm would be considered two separate enterprises. The evaluation of energy conservation activities shall include energy used in the cultivation, protection, harvesting, processing and storage of agricultural crops and in the feeding, housing, and processing of farm animals and animal products, and wildlife enhancement activities.
4. Definitions:
   a. Energy: Fuels (purchased propane, diesel and natural gas) and electricity used to perform stationary farm and ranch activities. This definition includes renewable energy sources.
   b. Energy Management: Optimization of energy use on farms and ranches to minimize non-renewable energy consumption.

c. Certified Energy Auditor: A person who has the technical qualifications to perform an agricultural energy audit.

d. Energy Source: The type of fuel (liquid or gas), electricity or renewable power used to perform farm and ranch activities.

e. Current Energy Usage: The annual usage of grid electricity and/or natural gas and purchased fuels (liquid or gas) for stationary farm or ranch operations.

f. Carbon Footprint: The total annual (net) emissions of greenhouse gases caused directly and indirectly by a farm or ranch operation and expressed in equivalent tons of Carbon Dioxide (CO2) per year.

5. Criteria for Headquarters Energy Audit - The Energy Audit is to be tailored to the individual farm and should cover the primary energy users such as irrigation pumping, heating and cooling of livestock production facilities, manure collection and transfer, grain drying and similar common on-farm activities.
   a. Current energy usage – describe activity and primary equipment involved with each headquarters operation.
   b. Recommended energy improvements and estimated cost.
   c. Expected energy savings from these improvements and estimated payback period in years.
   d. Document the type of energy resource used and current energy consumption by each major activity at the farm headquarters.
   e. Describe components of the major activities:
      - Manufacturer
      - Equipment component factory ratings (HP, efficiency, BTU use)
      - Management use efficiencies (ex. manual/automatic controls)
      - Estimated annual energy use
   f. Summary of energy use by energy resource
   g. Assessment - Alternatives Development
   h. Describe the planned energy saving actions
   i. Document energy savings for the major activities at the farm headquarters as BTU's, KW hours, etc. Document a simple payback period (in years) for the proposed changes.

6. NRCS Landscape (cropland, pastureland, forestland, etc.) farm energy audit content is an energy audit that is designed to (a) estimate energy use associated with current farming/ranching operations and (b) identify energy savings associated with alternative management activities. The Audit shall address energy use for the following elements (as applicable):
   a. Cropland field equipment operations - estimate energy use associated with the current field equipment operations (Compare in common units):
      - Field equipment operations

- Embedded energy in synthetic nitrogen used
- Irrigation
- Pasture management
- Forest operations

b. Specific Criteria: The Audit will address specific criteria for each element as identified below:

1) Cropland field equipment operations - Estimate energy use associated with current field equipment operations:

   - Tillage
   - Planting
   - Harvesting
   - Manure application
   - Application of inorganic soil amendments and pesticides

2) Identify potential energy savings associated with alternative activities. As a minimum the analysis will address the following, as appropriate. Each item will be expressed in comparison to the existing situation with total savings expressed in common units:

   - Number and type of field operations
   - Trips to the field
   - Trips across the field
   - Precision farming practices
   - Equipment maintenance and calibration
   - Size of tractor relative to implement

3) Embedded energy in synthetic fertilizer, especially nitrogen. Estimate indirect energy use associated with synthetic fertilizer used in the operation. Identify potential indirect energy savings associated with alternative management activities. Analysis may include, for example:

- Presence of a professionally developed nutrient management plan that reduces the amount of fertilizers applied and minimizes losses.
- Potential adjustments to crop rotation such that the amount of nutrients is reduced by optimizing residual nutrient supplies to subsequent crop.
- Precision application techniques that minimize agrichemical needs and optimize the effectiveness of the chemicals used.

4) Irrigation: Estimate energy used in current irrigation system and identify energy savings associated with alternative equipment and management activities. Analysis may include, for example:
   - System type
   - System pressure
   - Irrigation water management techniques
   - Pumping plant evaluation
   - System maintenance
5) Pasture management: Estimate direct energy used in pasture management for example watering facilities and pasture maintenance/renovation and identify energy savings associated with alternative management and equipment. Examples include:
   - Impact of grazing management on reseeding requirements
   - Hauling distance for water/feed vs. water facility development
   - Other
6) Forest operations: Estimate current energy use associated with the forest management/harvest system and identifies energy savings associated with alternative management and equipment. Analysis might include (but not be limited to):
   - Forest trails and landings
   - Types of equipment used
   - Identify potential energy savings in other land uses associated with windbreaks/shelterbelts
   - Other

7. Conservation plan (record of decisions) *(Utilizing Customer Service Toolkit – Plug-In or MsWord Document)* conservation practices to address the energy management needs for the "AgEMP". The record of decisions shall include the planned practice, schedule for implementation, and site specific specifications to apply the conservation practice. The site specific specifications can be on an NRCS Jobsheet available for the conservation practice or in a narrative form for the non-engineering type practices. Planned engineering type practices shall

include the conservation practice, schedule of implementation, and identified on the plan map. The plan may include, but are not limited to the conservation practices listed below:

(a) Brush Management (314)

(b) Conservation Crop Rotation (328)

(c) Cover Crop (340)

(d) Conservation Cover (327)

(e) Fence (382)

(f) Herbaceous Weed Control (315)

(g) Irrigation System, Microirrigation (441)

(h) Irrigation Water Management (449)

(i) Land Smoothing (466)

(j) Mulching (484)

(k) Nutrient Management (590)

(l) Pasture and Hayland Planting (512)

(m) Integrated Pest Management (595)

(n) Pipeline (516)

(o) Prescribed Grazing (528)

(p) Residue and Tillage Management, Mulch Till (345)

(q) Residue Management, No Till/Strip Till/Direct Seed (329)

(r) Residue Management, Seasonal (344)

(s) Stripcropping (585)

(t) Terrace (600)

(u) Watering Facility (614)

(v) Windbreak/Shelter Belt Establishment (380)

8. References: This element lists the technical documentation sources used for the AgEMP and may include the actual documents or web sites that contain the technical documentation useful for the producer.

9. **Deliverables for the Client – a hardcopy of the plan that includes:**
   - Cover page – name, address, phone of client and TSP; Total Acres of the Plan, signature blocks for the TSP, producer, and a signature block for the NRCS acceptance.
   - Soils map and appropriate land use soil descriptions

- The completed energy audit report will include the following sections:
  a. Summary of the facility's location, production level, any unusual factors that affect energy use, and any energy efficiency measures already in use.
  b. Summary of the site's energy use over one year, broken down by type of usage and month.
  c. Summary of how much money the producer would save if the recommended measures were included, and how much money the producer would lose if no action were taken.
  d. A list of recommended measures to reduce energy use including their annual energy (kWh, propane, fuel oil, BTU,…) savings and an estimated payback in years.
  e. A narrative summary of the recommendations made through the audit including description of technology, how the technology would affect the site, and how much energy would be saved annually by installing the equipment.
- Resource assessment results (wind and water erosion, water availability, soil fertility, and others that may be needed)
- For management practices. The planned practices and the site specific specifications on how each practice will be applied; when the practice will be applied, and the extent (acres or number) that will be applied.
- For engineering/structural practices. The planned practice when it will be applied and extent, and located on the conservation plan map.

3. **Deliverables for NRCS Field Office:**
   - Complete Hardcopy and Electronic copy of the producer's plan (MsWord copy).
   - Digital Conservation Plan Map with fields, features, and structural practices located.
   - Digital Soils Map.
   - Completed CPA 52 and appropriate worksheets.

Tools Needed

In addition to the completion of On-farm Energy Audit standard, one or more tools are needed to evaluate energy associated with tillage, agrichemicals, irrigation, pasture management and forest operations. Some tools already exist or can be made functional with minimal effort. Others will need to be developed.

Tools Available to Support the Landscape Audit

Audit Element	Tools Available or	Tool output	Already existing?

	needed		
Field Equipment Operation	• RUSLE2 • Cropland Energy Estimator (CLE). • Size of tractor relative to implement(s) used	• Fuel or BTU use per acre • Table to identify ideal tractor size for specific implements based on ASABE equipment standard	• Yes (RUSLE2 and CLE) • No
Embedded Energy in Agrichemicals	• CLE • CLE upgrade	Embedded energy in agrichemicals applied. (Current tool does not automatically adjust for management changes)	• Yes • (Upgrade needed)
Irrigation	• Energy Self-Assessment • CLE Upgrade	Fuel or Btu use per acre	• Yes • (Upgrade needed

*CLE = Cropland Energy Estimator