Agriculture Energy Management Plan, Landscape Criteria - Practice/Activity Code (124) (No.)

1. Definition

A Landscape Agricultural Energy Management Plan (Landscape AgEMP) contains the strategy by which the producer will explore and address producer/grower on-farm energy savings and opportunities on the working land (crop, forest, pasture, range). A Landscape Agricultural Energy Plan conservation activity plan must:

- Meet NRCS quality criteria for soil erosion, water quantity, energy, and other identified resource concerns;
- Comply with federal, state, tribal, and local laws, regulations and permit requirements; and
- Satisfy the operator's objectives.

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

Tools Needed:
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.

Tools Available to Support the Landscape Energy Assessment

Audit Element	Tools Available or needed	Tool output
Field Equipment Operation	• RUSLE2 and WEPS • Cropland Energy Estimating Tool • Variable Frequency Drive Tool	Fuel or BTU use per acre
Embedded Energy in Nitrogen	• Factor = 20,000 BTU's per pound of synthetic nitrogen reduced.	
Irrigation	• Energy Self-Assessment • Energy Estimator Irrigation http://ipat.sc.egov.usda.gov/	Fuel or Btu use per acre

2. Landscape AgEMP Criteria:

A. This section establishes the minimum criteria to be addressed in the development of Landscape Agricultural Energy Plan developed by a certified Technical Service Provider (TSP).

B. The Completed "Landscape Agricultural Energy Plan (124)" template that includes the following required items:

Background and Site Information Element

- Name of owner/operator;
- Farm location and mailing address;
- Soils Map and soil map units descriptions using the Web Soil Survey http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm as a minimum printout the Soil Report > AOI Inventory> Map Unit Descriptions
- Digital Conservation plan map with;
  1. Streams, surface waters, surface drainage, wetlands on or adjacent to site
  2. Property lines
  3. Field Boundaries, name/number, acres, and land use
  4. Map scale
  5. Structural Practices Located on Map
  6. Legend
  7. Grower Name, County, State
- Total acres of the plan;
- Resource evaluations for soil erosion, water quantity, and other local concerns identified.
- Landscape Agricultural Energy Resource Assessment: This element determines and documents current energy usage, over the past annual cycle. The evaluation of energy conservation activities shall include energy used in the cultivation, irrigation, production, protection, and harvesting of agricultural/forest crops. The Landscape AgEMP 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 under current management and with the planned treatment applied. (Compare in common units):
     - Field equipment operations that involve equipment passing over the field(s) (cultivation, planting, harvest, manure application, etc.) (use RUSLE2 or WEPS to estimate energy use)
     - Embedded energy in synthetic nitrogen used (20,000 BTU's per pound of synthetic nitrogen).
     - Growing/producing legume nitrogen for crops - energy saved by using less synthetically produced nitrogen

- Irrigation energy required (system type, pressures, management techniques, pumping plant management, system maintenance)

b. Pasture field equipment operations and potential use of legumes

- Pasture management (feed and water hauling, management to reduce irrigation, fertilization, or mowing)
- Field operations (mowing, spreading manure or fertilizer, etc.)
- Changes in species composition (growing/producing legume nitrogen for crops energy saved by using less synthetically produced nitrogen, or conserving irrigation water)
- Irrigation energy required (system type, pressures, management techniques, pumping plant management, system maintenance)
- Pumping livestock water

c. Forest field / harvest operations

- Forest operations and management (forest trails and landings, identified potential energy savings in other land uses associated with windbreaks/shelterbelts)

d. Range field equipment and management

- Forage operation and management
- Pumping livestock water

- Planned conservation practices to address soil erosion, water quantity, energy, and other local resource or human concerns.
- Typical Practice Standards for the Landscape Agricultural Energy Management Plan:

a) Document the planned conservation practices. When any of the following practices are used in this plan, the site specific specifications shall be developed in the attached template, in a NRCS approved jobsheet, or separate plan.

- Brush Management (314)
- Conservation Crop Rotation (328)
- Cover Crop (340)
- Conservation Cover (327)
- Herbaceous Weed Control (315)
- Mulching (484)
- Pasture and Hayland Planting (512)
- Prescribed Grazing (528)
- Residue and Tillage Management, Mulch Till (345)
- Residue Management, No Till/Strip Till/Direct Seed (329)
- Residue Management, Ridge Till (346)

- Residue Management, Seasonal (344)
- Stripcropping (585)
- Windbreak/Shelter Belt Establishment (380)

b) For all other practices the practice shall be documented for the planned amount, the fields where the practice is to be applied, and the planned year of application. Below are some of the typical conservation practices that may be planned:

- Nutrient Management (590)
- Integrated Pest Management (595)
- Prescribed Grazing (528)
- Terrace (600)
- Water Harvesting Catchment (636)
- Pipeline (516)
- Irrigation System, Microirrigation (441)
- Irrigation Water Management (449)
- Land Smoothing (466)
- Watering Facility (614)
- Fence (382)
- Other engineering practices

C. References

- USDA Natural Resource Conservation Service National Agronomy Manual, http://directives.sc.egov.usda.gov/ Title 190,
- NRCS (State Field Office Technical Guide – FOTG) http://efotg.sc.egov.usda.gov//efotg_locator.aspx, Select State, Go to Section IV.

3. Deliverables for the Client – a hardcopy of the plan that includes:

- Complete Hardcopy of the client's plan (MsWord copy of the "Plan Template") with appropriate practice specifications (or jobsheets) for the planned practices as appropriate. **Optional**: If a Conservation Plug-in/Cplanner version is used the Conservation Plan Map, the Soils Map, and Planned Conservation Practices can be deleted from the Plan Template".
- Completed template for **Landscape Agricultural Energy Management Plan (124)**
- Soils Map and soil map units descriptions using the Web Soil Survey http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm as a minimum printout the Soil Report > AOI Inventory> Map Unit Descriptions
- Resource assessment results (wind and water erosion, water quantity, and others identified resource concerns that may be needed) – complete in the template or add printouts from assessment tool (RUSLE2 or WEPS)

- Landscape Agricultural Energy Resource Assessment (Where RUSLE2 or WEPS was used to estimate energy, the RUSLE2 or WEPS printouts for erosion can also be used to document energy before and after planned treatment). For irrigation add the printout for the Energy Estimator, Irrigation or other data showing before and after energy savings if a different irrigation energy estimator was used.
- For identified management practices listed in a) above; provide 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 practices listed in b) above; document when the practice will be applied and extent, the field where the practice will be applied, and, when appropriate, show location on the conservation plan map.
- Digital Conservation plan map with;

  a. Streams, surface waters, surface drainage, and wetlands on or adjacent to site
  b. Property lines
  c. Field boundaries, name/number, acres, and land use
  d. Map scale
  e. Structural practices located on Map
  f. Legend
  g. Grower name, county, state

4. Deliverables for NRCS Field Office:

- Complete Hardcopy and Electronic copy of the client's plan (MsWord copy of the "Plan Template") with appropriate practice specifications (or jobsheets) for the planned practices as appropriate. **Optional**: If a Conservation Plug-in/Cplanner version is used; the Conservation Plan Map, the Soils Map, and Planned Conservation Practices can be deleted from the Plan Template.
- Completed template for **Landscape Agricultural Energy Management Plan (124)**
- Soils Map and soil map units descriptions using the Web Soil Survey http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm as a minimum printout the Soil Report > AOI Inventory> Map Unit Descriptions
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- For identified management practices listed in a) above; provide 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 other practices listed in b) above; document when the practice will be applied and extent, the field where the practice will be applied, and, when appropriate, show location on the conservation plan map.
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  d. Map scale
  e. Location of structural practices
  f. Legend
  g. Grower name, county, state