

Agricultural Energy Design Plan Criteria Conservation Activity Plan Code (136) (No.)

I. Definition of an AgEDP

An Agricultural Energy Design Plan (AgEDP) is a plan that uses recommendations from an NRCS approved assessment or tool used to evaluate energy conservation opportunities and assists with the client's objective to improve energy efficiency. The Conservation Activity Plan, CAP 136, includes development of preliminary designs of NRCS conservation practices, obtaining client's design alternative selections, and computation of energy savings that result from implementation of the design alternatives. The CAP 136 also includes preparation of design reports and final design packages for all selected design alternatives. A complete CAP 136 includes designs that incorporate this criterion, compliance with all applicable NRCS state-adopted Conservation Practice Standards plus all tasks and deliverables described in the state's applicable Statement of Work "Design" section.

II. Definition of Terms

Conservation Practice Standard – A CPS is a document that establishes the minimum level of acceptable quality for designing, installing, operating, and maintaining conservation practices. ([Title 450, General Manual, "Technology", Part 401, Subpart A, Section 401.3C\(4\)](#)).

Statement of Work – A SOW for a CPS is a checklist of the minimum requirements (deliverables) for each step of the process to implement each conservation practice, including design, installation, checkout, and certification. ([450-GM-401.3C\(4\)](#)).

Certified Technical Service Provider – A TSP is a third-party who is registered in TechReg and eligible to provide services in the state, who has applied and meets the proficiency criteria located on the TSP website at: <http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/technical/tsp>.

III. AgEDP-Criteria

A. General Criteria

- A TSP certified through NRCS TechReg for the Energy – Reduce Use category and eligible to provide services in the state will develop the AgEDP.
- On-site visit(s) by the TSP are required, to meet with the client to adequately determine the client's selections and to support their objective to improve energy efficiency.
- CAP will include all energy related NRCS conservation practices and/or NRCS financial assistance payment schedule scenarios that were used in determining the payment scenario that was used to contract this CAP.
- State-specific CPS criteria and SOW tasks and deliverables are required and can be found in Field Office Technical Guide at: <https://efotg.sc.egov.usda.gov/#/> for the state in which the operation is located.
- Completion of work will be in accordance with [Title 210, National Engineering Manual](#), with special emphasis on Part 505, "Non-NRCS Engineering Services" Subparts A and B, and Part 511, "Design", Subparts A and B.

Conservation activity plans are reviewed periodically and updated if needed. Obtain the current version of this criteria, contact your Natural Resources Conservation Service [State Office](#) or visit the [Field Office Technical Guide](#).

B. Criteria for Specific Elements of an AgEDP

1. Cover Page and Signature Page

Provide a cover page with the following:

- a) Farm identification:
 - (1) Farm name, owner name, street address, and county/state.
 - (2) Primary phone number of the client.
 - (3) List of all practice and/or scenario designs included in this plan.
- b) TSP identification:
 - (1) Name, mailing address, email, primary phone number and TSP number.
 - (2) Names and credentials of all persons that perform substantive work to complete the AgEDP.
 - (3) TSP Certification statement:

A statement that the TSP services provided

 - (i) comply with all applicable Federal, State, Tribal, and local laws and requirements,
 - (ii) meet applicable NRCS standards, specifications, and program requirements,
 - (iii) are consistent with the conservation program goals and objectives, and
 - (iv) incorporate alternatives that are both cost effective and appropriate to address the resource issues. ([Title 440, Programs, Part 504, "Technical Service Provider Assistance", Subpart B, Section 504.11F](#))
 - (4) Signature of the TSP and date of signature.
- c) Client acceptance statement:
 - (1) A statement that the plans and specifications adequately represent existing conditions and the selected preliminary design alternatives, and the client understands and will abide with the operation and maintenance plans.
 - (2) Signature of the client and date the client received the plans.
- d) Block for NRCS reviewer acceptance (to be completed by NRCS).

2. Preliminary Designs

Provide documentation of the following:

- a) Include and update, when needed, results from a NRCS approved assessment or tool used to evaluate energy conservation opportunities and the client's conservation plan.
 - (1) Performance characteristics of existing equipment and systems affected by recommendations. For example, if a recommendation is to modify barn lights, include performance characteristics such as system load, light levels, and operating schedule of existing barn lights.
 - (2) Basis of existing equipment and system performance data (e.g., field measurement, original equipment manufacturer (OEM) specification, etc.) and describe any differences between reported and expected performance attributed to age, operation, maintenance of equipment or similar factors.
 - (3) Rationale for changes in equipment or systems capacity, if any, based on either:
 - (i) client's needs (e.g., meet integrator performance thresholds, align to recommended industry standards); or
 - (ii) to comply with CPS criteria.
 - (4) Energy conservation recommendations that can meet CPS criteria and will reduce energy use, improve energy efficiency and/or address the energy management concerns of the client's operation. NRCS conservation practices and financial assistance payment

schedule scenarios that may be used to assist with the implementation of the recommendations include:

- Farmstead Energy Improvement (Code 374),
 - Lighting System Improvement (Code 670),
 - Building Envelope Improvement (Code 672),
 - Combustion System Improvement (Code 372),
 - Pumping Plant (Code 533).
- b) Using the criteria in the applicable CPS and the client's needs, develop preliminary design alternatives for each practice and/or scenario contracted in this CAP.
- (1) If applicable, provide a variety of different conditions for the same recommendation. For example:
- Operation and maintenance changes of the existing equipment and facilities,
 - Adding equipment or components to reduce energy use or improve energy efficiency,
 - Replacement of existing equipment with more efficient equipment at the same output levels,
 - Replacement of existing equipment with more efficient equipment at increased or decreased output levels, or
 - Changing the types of equipment that result in reduced energy use or increased energy efficiency.
 - Additional practices or components required to mitigate operational output.
- (2) Estimate installation cost, in dollars, of each preliminary design alternative. Work includes developing preliminary layouts, determining feasibility of current infrastructure, determining performance specifications of proposed equipment, computing approximate quantities of all components, and estimating costs of equipment, materials, labor, permits, certifications, and related items required for installation and start-up of the system.
- (3) All preliminary design alternatives must be linked to improving energy efficiency. Component alternatives primarily related to increased production (without significant energy efficiency improvements) will not be included.
- (4) Determine the applicable NRCS financial assistance payment schedule scenario, quantity and payment rates for the implementation of each preliminary design.
- c) Present each preliminary design alternative to the client and obtain the client's selections. Document the selections and date received in the report.

3. Design Reports

Provide documentation of the following:

- a) Surveys, investigations and layouts for all components, materials, infrastructure, and structural considerations for each design, including facilitating practices or components that support the primary equipment or facility modification.
- b) Computations, analysis, and other items that support and ensure adherence to the CPS criteria and are needed to develop the plans and specifications.
- c) Engineer's estimate of each final design, including costs of components, materials, equipment, and labor required for demolition, relocation, installation, disposal and start-up; fees for disposal, permits, and certifications; charges for testing and other quality assurance activities; and all other costs associated with the implementation of each design.
- d) Quality assurance activities that are required during installation to ensure the equipment, materials, and installations meet the design intent, function properly, provide the computed energy savings, and can be certified as meeting the plans and specifications.
- e) Other information as required in the SOW, including but not limited to, practice purpose, list of permits, facilitating practices, and state required items that affect safety and other environmental concerns.
- f) Computed energy savings of each design using an appropriate baseline condition. The results may differ from previous energy audits or assessment tools as the baseline conditions may be different due to changes in the operation or changes in the output levels.
 - (1) Include assumptions made, calculations or methodologies used, and supporting references or information for energy savings or efficiency results.
 - (2) Include sufficient documentation to allow a third party to understand and evaluate the energy savings.
 - (3) Determine the estimated energy savings of each design, first in the common sale units (kWh, gallons, etc.) and then converted to energy units of millions of British thermal units (MMBtu).
- g) Present the results of energy savings using Table 1 with the headings shown. If energy efficiency improvements for one design require the implementation of a second design, indicate this in the table by using a single line.

Table 1. Summary of Energy Efficiency Improvements

NRCS CPS and scenario	Estimated Annual Reduction in Energy Use				
	Electric Savings (kWh)	Natural Gas Savings (ccf) ²	Propane Savings (gal)	Other ¹	Energy Savings (MMBTU)
Totals					

- 1) Use the *Other* column to aggregate any miscellaneous sources of energy.
 2) Unit of purchase.

- h) Determine the estimated annual reduction of emissions for each design.
- (1) NRCS has developed a Quick Energy calculator that can be used. The tool estimates air emission effects due to energy savings for fuels and electricity into atmospheric emission reductions. The tool relies on the US Energy Information Administration state-level aggregated emission factors for electricity, liquid and gaseous fuels to generate estimates of emission savings. The Weblink to the tool, NRCS COMET Quick Energy Calculator, is located at <http://cometfarm.nrel.colostate.edu/QuickEnergy>. If other methods are used, provide supporting documentation and references.
- (2) Present the results in Table 2.

Table 2: Estimated Annual Reduction of Emissions

Environmental Benefits ¹						
NRCS CPS and scenario	Energy Savings (MMBtu)	Greenhouse Gases ²			Air Pollutant Co-Benefits ²	
		Estimated CO ₂ (lbs.)	Estimated N ₂ O (lbs.)	Estimated CH ₄ (lbs.)	Estimated SO ₂ (lbs.)	Estimated NO _x (lbs.)
Totals:						

- 1) Environmental Benefits values may be calculated from <http://cometfarm.nrel.colostate.edu/QuickEnergy>.
 2) CO₂ is a green-house gas; SO₂ and NO_x are ambient air contaminants.

4. Plans and Specifications

Develop written plans and specifications for each design.

- a) Include, as a minimum, all items listed in each CPS “Plans and Specifications” section and the SOW “Design” section.
- b) Include both graphical and narrative descriptions of the work. Provide descriptive information on the quality of the completed work and the quantities of all materials required for completion of the work.
- c) A location map, plan view and written information are required. These items may be included in a single document where all specification information is included on the plans, or in multiple documents where the specifications are independent of the plans.
- d) Include the following certification on the plans, along with the seal and/or signature of the TSP: “To the best of my professional knowledge, judgment, and belief, these plans meet applicable NRCS standards.” ([Title 210, NEM, Part 505, “Non-NRCS Engineering Services”, Subpart B, Section 505.10\(3\)](#)).

5. Operation and Maintenance Plans

Prepare an operation and maintenance plan for each design that the client will use after implementation of the designs are complete.

- a) Include, as a minimum, all items listed in each CPS “Operation and Maintenance” section and the SOW “Design” section.
- b) Include requirements to obtain all applicable manufacturer installation guides, user manuals and warranty information.

IV. Deliverables

- A. Deliverables from the TSP to the client include two (2) complete hardcopies of the final plans and specifications, hardcopy and/or electronic copy of the O&M plans, and any other documentation requested by the client, including an electronic copy of the plans and specifications.
- B. Deliverables from the TSP for the NRCS case file include a complete electronic copy of the final AgEDP report, including all documentation and signatures as specified in the AgEDP criteria including design reports, plans and specifications, O&M plans, and TSP certifications. The preferred format is PDF, using software digital conversion rather than scanning. Digital signatures of the TSP and client are acceptable.
- C. The TSP must include the following certification on the final design and drawings for engineering practices: “To the best of my professional knowledge, judgment, and belief, these plans meet applicable NRCS standards.”