

**TECHNICAL REPORTS FOR PROJECTS WITH
TOTAL ELIGIBLE PROJECT COSTS GREATER THAN \$200,000**

The Technical Report for projects with total eligible project costs greater than \$200,000 (and for any other project that must submit a Technical Report under this appendix) must demonstrate that the project design, procurement, installation, startup, operation, and maintenance of the renewable energy system or energy efficiency improvement will operate or perform as specified over its design life in a reliable and a cost-effective manner. The Technical Report must also identify all necessary project agreements, demonstrate that those agreements will be in place, and that necessary project equipment and services are available over the design life. All technical information provided must follow the format specified in Sections 1 through 10 of this appendix. Supporting information may be submitted in other formats. Design drawings and process flowcharts are encouraged as exhibits. A discussion of each topic is not necessary if the topic is not applicable to the specific project. Questions identified in the Agency's technical review of the project must be answered to the Agency's satisfaction before the application will be approved. The applicant must submit the original technical report plus one copy to the Rural Development State Office. Renewable energy projects with total eligible project costs greater than \$400,000 and for energy efficiency improvement projects with total eligible project costs greater than \$200,000 require the services of a licensed professional engineer (PE) or team of PEs. Depending on the level of engineering required for the specific project or if necessary to ensure public safety, the services of a licensed PE or a team of licensed PEs may be required for smaller projects.

SECTION 10 - ENERGY EFFICIENCY IMPROVEMENT PROJECTS

Section 10. Energy Efficiency Improvements

The technical requirements specified in this section apply to projects that involve energy efficiency improvements, which are, as defined in § 4280.103, improvements to a facility, building, or process that reduces energy consumption. The system engineering for such projects must be performed by a qualified party or certified Professional Engineer.

- (a) Qualifications of project team. The energy efficiency project team is expected to consist of an energy auditor or other service provider, a project manager, an equipment supplier of major components, a project engineer, and a construction contractor or system installer. One individual or entity may serve more than one role. Authoritative evidence that project team service providers have the necessary professional credentials or relevant experience to perform the required services must be provided. Authoritative evidence that vendors of proprietary components can provide necessary equipment and spare parts for the system to operate over its design life must also be provided. The application must:
- (1) Discuss the qualifications of the various project team members, including any relevant certifications by recognized organizations;
 - (2) Describe qualifications or experience of the team as related to installation, service, operation and maintenance of the project;
 - (3) Provide a list of the same or similarly engineered projects designed, installed, or supplied by the team or by team members and currently operating. Provide references if available; and
 - (4) Discuss the manufacturers of major energy efficiency equipment being considered, including length of time in business.
- (b) Agreements, permits, and certifications. Identify all necessary agreements and permits required for the energy efficiency improvement(s) and the status and anticipated schedule for securing those agreements and permits, including the items specified in paragraphs (b)(1) through (4). The applicant must also submit a statement certifying that the

applicant will comply with all necessary agreements and permits for the energy efficiency improvement(s).

- (1) Identify building code, electrical code, and zoning issues and required permits, and the anticipated schedule for meeting those requirements and securing those permits.
 - (2) Identify available component warranties for the specific project location and size.
 - (3) Identify all environmental issues, including environmental compliance issues, associated with the project on Form RD 1940-20, "Request for Environmental Information," and in compliance with 7 CFR part 1940, subpart G, of this title.
 - (4) Submit a statement certifying that the project will be installed in accordance with applicable local, State, and national codes and regulations.
- (c) Energy assessment. Provide adequate and appropriate evidence of energy savings expected when the system is operated as designed.
- (1) Provide information on baseline energy usage (preferably including energy bills for at least 1 year), expected energy savings based on manufacturers specifications or other estimates, estimated dollars saved per year, and payback period in years (total investment cost equal to cumulative total dollars of energy savings). Calculation of energy savings should follow accepted methodology and practices. System interactions should be considered and discussed.
 - (2) For energy efficiency improvement projects with total eligible project costs greater than \$50,000, an energy audit is required. An energy audit is a written report by an independent, qualified party that documents current energy usage, recommended potential improvements and their costs, energy savings from these improvements, dollars saved per year, and simple payback period in years (total costs divided by annual dollars of energy savings). The methodology of the energy audit must meet professional and industry standards. The energy audit must cover the following:
 - (i) Situation report. Provide a narrative description of the facility or process, its energy system(s) and usage, and activity profile. Also include price per unit of energy (electricity, natural gas, propane, fuel oil, renewable energy, etc.,) paid by the customer on the date of the audit. Any energy conversion should be based on use rather than source.
 - (ii) Potential improvements. List specific information on all potential energy-saving opportunities and their costs.
 - (iii) Technical analysis. Give consideration to the interactions among the potential improvements and other energy systems:
 - (A) Estimate the annual energy and energy costs savings expected from each improvement identified in the potential project;
 - (B) Calculate all direct and attendant indirect costs of each improvement; and
 - (C) Rank potential improvements measures by cost effectiveness.
 - (iv) Potential improvement description. Provide a narrative summary of the potential improvement and its ability to provide needed benefits, including a discussion of non energy benefits such as project reliability and durability.
 - (A) Provide preliminary specifications for critical components.
 - (B) Provide preliminary drawings of project layout, including any related structural changes.
 - (C) Document baseline data compared to projected consumption, together with any explanatory notes. When appropriate, show before-and-after data in terms of consumption per unit of production, time or area. Include at least 1 year's bills for those energy sources/fuel types affected

by this project. Also submit utility rate schedules, if appropriate.

(D) Identify significant changes in future related operations and maintenance costs.

(E) Describe explicitly how outcomes will be measured.

- (3) For energy efficiency improvement projects with total eligible project costs equal to or less than \$50,000, an energy assessment or energy audit is required. If an energy (d) Design assessment is performed, provide adequate and appropriate evidence of energy savings expected when the system is operated as designed. If an energy audit is performed, it must follow the requirements specified in paragraph (c)(2)
- (d) Design and engineering. Provide authoritative evidence that the energy efficiency improvement(s) will be designed and engineered so as to meet its intended purpose, will ensure public safety, and will comply with applicable laws, regulations, agreements, permits, codes, and standards.
- (1) Energy efficiency improvement projects in excess of \$50,000 must be engineered by a qualified party. Systems must be engineered as a complete, integrated system with matched components.
- (2) For all energy efficiency improvement projects, identify and itemize major energy efficiency improvements, including associated project costs. Specifically delineate which costs of the project are directly associated with energy efficiency improvements. Describe the components, materials or systems to be installed and how they improve the energy efficiency of the process or facility being modified. Discuss passive improvements that reduce energy loads, such as improving the thermal efficiency of a storage facility, and active improvements that directly reduce energy consumption, such as replacing existing energy consuming equipment with high efficiency equipment, as separate topics. Discuss any anticipated synergy between active and passive improvements or other energy systems. Include in the discussion any change in on-site effluents, pollutants, or other by-products.
- (3) Identify possible suppliers and models of major pieces of equipment.
- (e) Project development schedule. Identify each significant task, its beginning and end, and its relationship to the time needed to initiate and carry the project through startup and shakedown. Provide a detailed description of the project timeline, including energy audit (if applicable), system and site design, permits and agreements, equipment procurement, and system installation from site preparation through startup and shakedown.
- (f) Project economic assessment. For projects whose total eligible costs are greater than \$50,000, provide an analysis of the proposed project to demonstrate its financial performance, including the calculation of simple payback. The analysis should include applicable investment incentives, productivity incentives, loans and grants, and expected energy offsets or sales on a monthly and annual basis. In addition, provide other information necessary to assess the project's cost effectiveness.
- (g) Equipment procurement. Demonstrate that equipment required for the energy efficiency improvement(s) is available and can be procured and delivered within the proposed project development schedule. Energy efficiency improvements may be constructed of components manufactured in more than one location. Provide a description of any unique equipment procurement issues such as scheduling and timing of component manufacture and delivery, ordering, warranties, shipping, receiving, and on-site storage or inventory. Provide a detailed description of equipment certification. Identify all the major equipment that is proprietary and justify how this unique equipment is needed to meet the requirements of the proposed design. Include a statement from the applicant certifying that "open and free" competition will be used for the procurement of project components in a manner consistent with the requirements of 7 CFR part 3015 of this title.

- (h) Equipment installation. Describe fully the management of and plan for installation of the energy efficiency improvement(s), identify specific issues associated with installation, provide details regarding the scheduling of major installation equipment needed for project discussion, and provide a description of the startup and shakedown specifications and process and the conditions required for startup and shakedown for each equipment item individually and for the system as a whole. Include in this discussion any unique concerns, such as the effects of energy efficiency improvements on system power quality. Include a statement from the applicant certifying that equipment installation will be made in accordance with all applicable safety and work rules.
- (i) Operations and maintenance. Identify the operations and maintenance requirements of the energy efficiency improvement(s) necessary for the energy efficiency improvement(s) to perform as designed over the design life. The application must:
 - (1) Provide information regarding component warranties and the availability of spare parts;
 - (2) Describe the routine operation and maintenance requirements of the proposed project, including maintenance schedules for the mechanical and electrical systems and system monitoring and control requirements;
 - (3) Provide information that supports expected design life of the improvement(s) and timing of major component replacement or rebuilds;
 - (4) Provide and discuss the risk management plan for handling large, potential failures of major components. Include in the discussion, costs and labor associated with the operation and maintenance of the improvement(s), and plans for in-sourcing or out-sourcing; and
 - (5) For owner maintained portions of the improvement(s), describe any unique knowledge, skills, or abilities needed for service operations or maintenance.
- (j) Dismantling and disposal of project components. Describe a plan for dismantling and disposing of project components and associated wastes at the end of their useful lives. Describe the budget for and any unique concerns associated with the dismantling and disposal of project components and their wastes.