

Preparing the ELCCA Report

Present the information gathered from the energy use simulation and economic analysis as an easy-to-reference report, using these standards:

- 8.5" x 11" paper, bound to lie flat when opened, and printed double-sided
- Include a table of contents and number all pages
- Label each section with tabs
- Label each alternative system used in the computer model

Report Contents and Instructions

I. Title Page

Date
Project name
Building owner
Analyst name, firm name and address

II. Table of Contents

List of Participants: Contact name, firm name, address, telephone and fax numbers for:
Building owner
Project architect
Owner's project manager
ELCCA Analyst
ELCCA Reviewer
Natural gas and electric utility representatives
Mechanical engineer
Electrical engineer
Lighting designer

III. Statement of Compliance

Provide a written declaration that the ELCCA report complies with the ELCCA guidelines, signed and stamped by a professional engineer. The project architect signs the statement, indicating that he/she has reviewed the report and discussed it with the owner.

IV. Executive Summary

Describe the overall project including how the building will be operated. Identify the energy systems (envelope, lighting, HVAC, controls, and domestic hot water) that are recommended for inclusion in the building design. The recommendations should be supported by the analysis in the subsequent report. If the recommended systems were **not** the lowest life-cycle cost, provide an explanation.

- A. For the recommended systems, provide estimates of the building's annual energy costs and maintenance costs (use R.S. *MEANS Facilities Maintenance and Repair Cost Data* and/or *The Whitestone Building Maintenance and Repair Cost Reference*). Break the costs into two categories: dollars per year (\$/yr) and dollars per square foot per year (\$/sf/yr.).
- B. Present two pie charts showing the recommended building's energy usage by “end use” and by “annual expenditure of energy dollars.” Devote individual “slices of the pies” to lighting, heating, cooling, fans, domestic hot water, and miscellaneous loads.
- C. Create a table summarizing the costs for each alternative studied in the ELCCA, including the renewable energy and High Performance alternatives. Identify each system and its initial construction/installation cost, annual fuel cost, annual maintenance cost, total life-cycle cost, and the Energy Usage Index (EUI) in units of /sf/yr.

V. Project Description

- Description of the site (elevation, orientation, shading, etc.)
- Basic facility description, especially non-energy systems
- Facility size, number of stories
- Occupancy schedules, both daily and annually
- Special facility considerations, e.g., noise control, aesthetics, and environmental concerns
- Anything out of the ordinary that might affect the facility's energy use.
- Description of available campus-wide energy sources
- For renovation and addition projects, describe the existing facility and its existing energy systems

VI. Simulation and Economic Assumptions

Energy Simulation (Model) Assumptions

Describe the modeling program and input assumptions. Provide the building occupancy schedule, lighting and HVAC schedules, heating/cooling set points, thermal mass, site shading, and control strategies used as inputs.

Economic Assumptions

- Provide the utility rate assumptions and include a copy of the current utility rate schedules. Indicate any qualifications that must be met before the project can be served under this rate schedule.
- Provide the following escalation rate assumptions: electricity price, fuel price, maintenance, replacement, and discount factor.
- Indicate building owner assumptions (staff maintenance experience and equipment preferences).

VII. Building Envelope

- Describe the recommended envelope components (roof, wall, glazing, doors, floors, etc.), indicating materials, insulation values, and variations from prescriptive levels.

- Describe the prescriptive envelope, and any other envelope alternatives analyzed.
- Show typical sections and U-factor calculations for all construction types being recommended.
- Describe assumptions used for infiltration and ventilation rates.
- If envelope alternatives are analyzed, for each alternative indicate the initial construction cost, projected annual maintenance costs, and estimated annual energy cost. Include lifecycle cost spreadsheets, energy simulation model with input changes highlighted, and output pages indicating estimated energy use.

VIII. Lighting Systems

- Describe the recommended system for each functional area of the building.
- Include the following information in tabular form for each functional area: room size, ceiling height, fixture type, ballast type, lamp type, number of lamps/fixture, number of fixtures/space, watts/fixture, and proposed lighting power density.
- Provide a typical fixture layout for each functional area.
- Describe daylighting zones, daylighting strategies, daylighting controls, and areas covered.
- Describe exterior lighting for the site. Provide fixture layout and fixture information.
- If lighting alternatives are analyzed, for each alternative indicate the initial construction cost, projected annual maintenance costs, and estimated annual energy cost. Include life-cycle cost spreadsheets and load calculations.

IX. Mechanical Systems

For each alternative system include system description, single-line diagram, system advantages, input assumptions, energy simulation output, annual energy and maintenance costs, construction costs and the life-cycle cost spreadsheet.

X. Renewable Energy System

Provide a description of the renewable energy system(s) analyzed. Include input assumptions, construction cost, maintenance cost, energy costs/savings, energy simulation output and/or engineering calculations, the life-cycle cost spreadsheets, and description of a base case for comparison.

XI. High Performance Building Alternative

For the High Performance Building alternative include system description, single-line diagram, system advantages, input assumptions, energy simulation output, annual energy and maintenance costs, construction costs, the life-cycle cost spreadsheet, the specific measures implemented to reach the energy savings goal, and a description of building components that affect the energy use. Also show the percent energy cost savings calculation described in Chapter 5 and show that it meets the energy savings goal.

XII. Control Systems

Describe the recommended building control system. Include systems to be controlled, control features, and monitoring capabilities. Include features intended to facilitate energy conservation such as a direct interface to the utility electrical meter. Describe controls used to ensure adequate and efficient ventilation. Also include a completed Controls Checklist. Describe economizer control strategy.

XIII. Domestic Hot Water (DHW)

Describe the recommended DHW system. If alternatives are analyzed, provide insulation levels, AFUE, controls, energy simulation output, and cost estimates (annual energy cost, maintenance cost, material & labor costs).

XIV. Other Energy Systems

Describe other energy systems that impact energy use of this facility as discussed in the Work Plan. If alternatives are analyzed, include energy analysis, cost estimates and ELCCA spreadsheets.

XV. Appendices

Include the following, at a minimum, clearly identified:

- A. Approved Work Plan and Controls Checklist
- B. Computer input and output summary reports for the Energy Cost Budget model and for each alternative
- C. Scaled floor plan showing the HVAC zones as modeled
- D. U-Factor calculation with typical section drawing
- E. Site plan including orientation