



Technical Energy Analysis Guidelines

Michigan Department of
Labor & Economic Growth

Energy Office

Rebuild Michigan TEA Webcast 2006



Overview

- TEA Guidelines – Key Areas
- Requirements and Calculations
- Recommendations

TEA Guidelines – Key Areas

- The analyst
- TEA definitions and objectives
- Report requirements
- Energy savings calculations
- Computer modeling
- Report review

TEA Analyst

must:

- be a licensed professional engineer or architect
- be an experienced energy analyst

TEA Objectives

- ✱ Provide customer with sufficiently detailed information.
- ✱ Identify all feasible no/low-cost O&Ms.
- ✱ Provide calculated baseline data.
- ✱ Provide sufficient information for the Energy Office engineer to review and verify energy savings calculations.

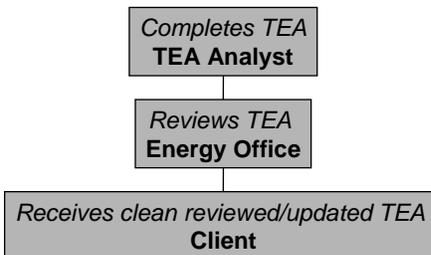
Comprehensive TEA

- ✱ Provides participant with a full energy analysis.
- ✱ Include measures which may require load analysis or computer modeling:
 - ▶ Boiler re-sizing & replacement,
 - ▶ Installation of a campus-wide EMS,
 - ▶ Replacement of mechanical cooling systems, and
 - ▶ HVAC ductwork replacement or repair.

Limited Component TEA

- ✱ Provides participant with a study for less complex building systems.
- ✱ Limited to simpler measures requiring straight forward savings calculations:
 - ▶ Lamp-for-lamp lighting replacement,
 - ▶ Simple HVAC controls and improvements,
 - ▶ Automated lighting controls, and
 - ▶ Same-size furnace or motor replacement.

The TEA Process





REPORT REQUIREMENTS



Required Sections

- Cover
- Table of Contents
- TEA Analyst Certification/Disclosure
- Executive Summary
- Building Description/Characteristics
- Building Fuel Cost Information
- Energy Use Profile
- No/Low Cost O&Ms
- Analysis of O&Ms/ECMs (Including all listed requirements)



Types of Operational and Maintenance (O&Ms) Changes or Energy Conservation Measures (ECMs)

All five areas **must** be addressed:

- ✱ Building Envelope
- ✱ Domestic Hot Water
- ✱ Power Plant
- ✱ HVAC
- ✱ Lighting



Presentation of O&Ms/ECMs

- ✱ Describe existing conditions;
- ✱ List quantity, type and location;
- ✱ Provide clear and thorough description;
- ✱ Discuss utility savings; and
- ✱ Include “*Detailed Description Form*”.



Cost Estimating Worksheet

(Appendix F)

✱ Detailed cost analysis:

- ▶ Break down total cost to implement O&M/ECM;
- ▶ Include any design, equipment, installation and disposal costs.
- ▶ Cite sources of cost estimates.



Energy Savings Calculations

Energy Savings Calculations

- ✱ Calculations must be clear and precise,
- ✱ Include formulas used,
- ✱ Provide units of measurement,
- ✱ State input parameters, and
- ✱ Provide original manual calculations.

Computer Modeling

Pre-approved software:

ASEAM

BLAST

DOE-2 (E-Quest)

TRACE

Carrier E 20 II

Computer Modeling

What to Include:

- Name and version of program used.
- Table showing comparison of baseline consumption to actual consumption ($\pm 10\%$).
- Input parameters for each ECM, with clear justification.
- Output summary for each ECM.

Payback

Aggregate simple payback of 8 years or less

Individual ECM paybacks can be over 8 years if the overall payback still meets this requirement.



Review of TEA Report

- ✿ To ensure a solid report that can support ECM financing.
- ✿ Independent review of energy savings.
- ✿ Energy Office may require revision of TEA report before it is sent to participant.



Scoring of the TEA Report

- ✿ 100 points possible (*refer to appendix G*).
- ✿ 75 points required
- ✿ Criteria not met may receive full or partial deductions.
- ✿ Poorly written or constructed reports may jeopardize your participation in this program.

Recommendations

Check **ALL** information

Most common errors found are simple mistakes with numbers, which can make substantial differences in the outcome of the calculations.

Recommendations

Meet Customer Needs

- ✱ If the customer wants something in their report that does not meet the payback requirement, include the information.
- ✱ Customer can request a different payback package.
- ✱ Additional items may be included that are not included in the payback calculation. (e.g. calculations for a new boiler)



Recommendations

Contact the Energy Office

- ✱ Clear up any questions you have prior to review.
- ✱ Good communication leads to a faster review process!



Conclusion

- ✱ Provide the participants with complete, detailed and easy to understand reports.
- ✱ Communication with the Energy Office throughout the process will ensure timely reviews of the reports.
- ✱ Provide the participants with all of the information they need to make their decision to *SAVE ENERGY!*



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