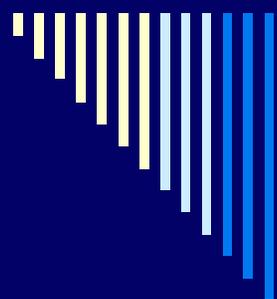


Technical Energy Analysis Guidelines

Nicholas Evans
**Michigan Department of
Energy, Labor & Economic Growth**

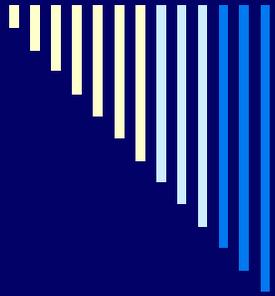
Bureau of Energy Systems

Rebuild Michigan TEA Webcast 2010



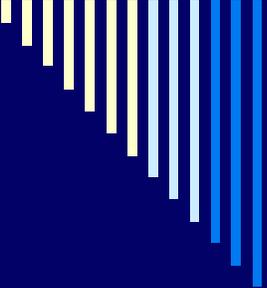
TEA Guidelines Overview

- TEA objectives and definitions
- The TEA analyst / firm
- Report requirements
- Energy savings calculations
- Computer modeling
- Report review
- Recommendations for meeting the customer's needs



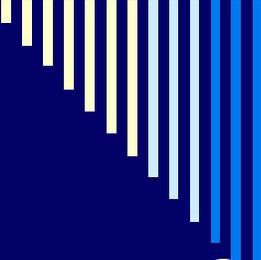
TEA Objectives

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



TEA Analyst / Firm Qualifications:

- Must be or have on staff, under contract, etc. a licensed professional engineer or architect
 - Must have at least five years of experience in energy analysis, or have someone on staff with that amount of experience
-



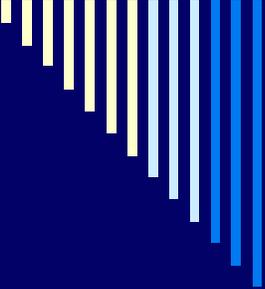
TEA Types

Comprehensive TEA

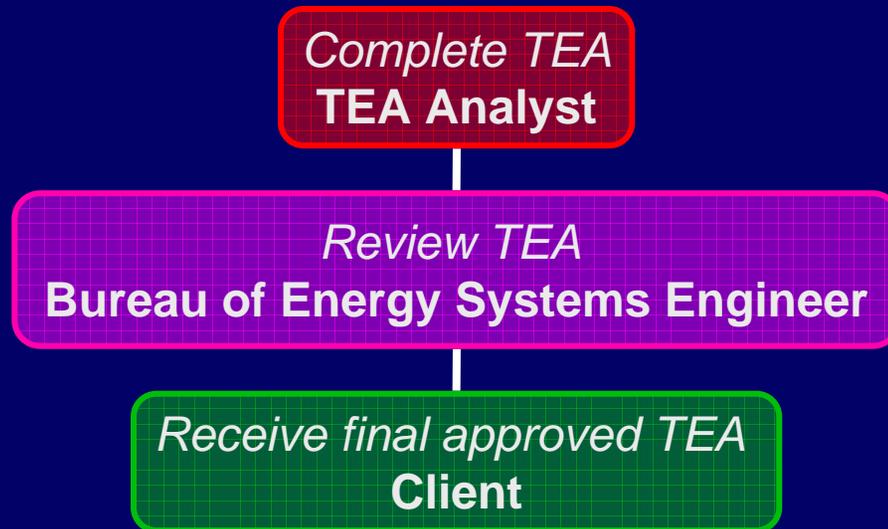
- Includes measures which may require load analysis or computer modeling

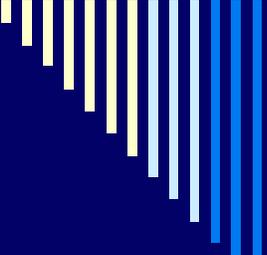
Limited Component

- Limited to simpler measures requiring straightforward savings calculations
-



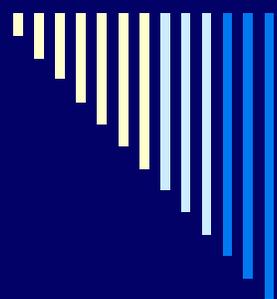
The TEA Process





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)
-



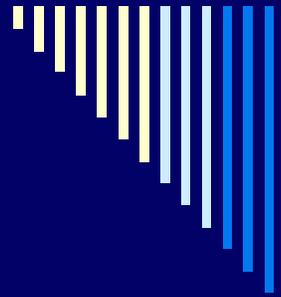
Presentation of O&Ms/ECMs

- Describe existing conditions, listing quantity, type and location
- Discuss energy and O&M savings in “*Appendix E: ECM Detailed Description Form*”
- Building Envelope, Domestic Hot Water, HVAC and lighting must be addressed



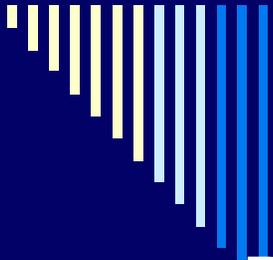
Presentation of O&Ms/ECMs (con'd)

- Detailed cost analysis using the Cost Estimating Worksheet (Appendix F)
 - ▶ 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 (if done manually)

- ❑ Calculations must be clear and precise
- ❑ Include formulas used
- ❑ Provide units of measurement
- ❑ State input parameters and assumptions.
- ❑ Verify calculations for accuracy.



Computer Modeling

□ Pre-approved software:

ASEAM

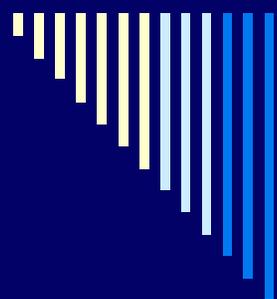
BLAST

DOE-2.2

TRACE 700

Carrier E 20 II

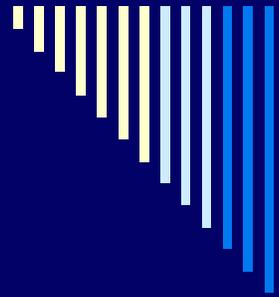
□ Other software may be used pending approval from the Bureau of Energy Systems engineer



Computer Modeling

What to Include:

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

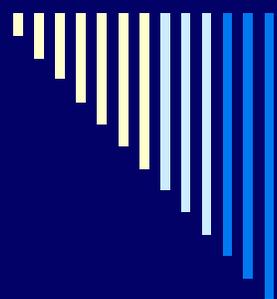


Payback

- Average simple payback of 8 years or less

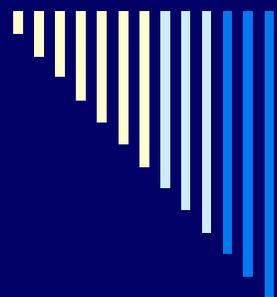
Individual ECM paybacks can be over 8 years if the overall project payback still meets this requirement

Alternative project(s) with a longer-than- 8 year payback can be included as well



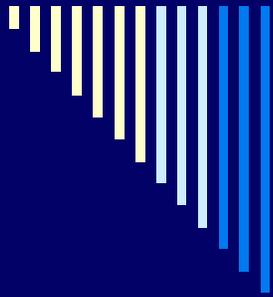
Reviewing and Scoring of the TEA Report

- ❑ The Bureau of Energy Systems will conduct a review of the report
- ❑ 100 points possible (*refer to Appendix G*)
- ❑ 75 points required for approval
- ❑ Criteria not met may receive full or partial deductions



Final Points

- Provide the participants with complete, detailed and easy to understand reports
- Communication with the Bureau of Energy Systems throughout the process will ensure timely reviews of the reports



For Assistance contact:

Nicholas Evans
Bureau of Energy Systems
Engineer
(517) 241-8235
evansn@michigan.gov

Program: www.michigan.gov/eormes
Bureau of Energy Systems:
www.michigan.gov/energyoffice
