

Investment Grade Audit Outline

Since an investment grade audit (IGA) is the technical and economic foundation for a project that must produce guaranteed energy savings, it typically provides more detail on existing consumption levels, operating hours, and utility costs than a traditional energy analysis. It establishes and defines consumption and cost baselines for all operating costs savings. It also provides a description of the analysis methods, data logger measurements, savings calculations, and all of the detailed technical and economic assumptions used to calculate savings. The IGA serves as the technical basis for project development and justifies the economic feasibility of the project to secure financing.

This level of energy audit involves assessing a building's energy cost and efficiency by analyzing energy bills and a detailed survey of the building, accompanied by the building operator. A breakdown of the energy use in the building should be provided, which often includes energy modeling (simulations). It identifies and provides a savings and cost analysis of all practical low-cost/no-cost and capital improvements measures that meet the owner's constraints and economic criteria. This cost and savings information is provided at a level of confidence high enough for major capital investment. It also includes a discussion of any effect on O&M procedures. It may also include a comprehensive life-cycle cost analysis (LCCA) as a decision-making tool.

An IGA should mirror the requirements of an ASHRAE Level III audit. The outline below is a suggested description of what should be included in the IGA:

- 1) Executive Summary
- 2) Relevant facilities description
 - a. Condition
 - i. System status
 - ii. Maintenance status
 - b. Occupants wants and needs from ESPC
- 3) Baseline of energy consumption
 - a. Analysis of utility bills, rate structures, meters
 - i. Graphed showing monthly trends to depict any anomalies
 - b. Complete analysis of energy usage, by fuel type, over 25-month period
 - c. Energy end uses, which show percent consumption per major system
 - d. Occupancy schedules
 - i. Days of the year, holidays, weekends
 - ii. Hours of the day, start, and stop
 - e. Occupancy comfort conditions (with appropriate air changes)
 - i. Range of temperatures for occupied times within the facilities
 - ii. Range of temperatures for unoccupied times within the facilities
 - iii. Range of temperatures for holiday shutdowns (as applicable)
 - iv. Times when these temperatures should be achieved
 - f. Number of occupants in spaces during baseline period
- 4) Proposed retrofits
 - a. Equipment installed, technologies applied, operations changed
 - i. Description of each retrofit and its benefit over existing condition
 - ii. Projected savings to be gained

1. Description of how the savings were calculated
 - a. Description if/how any system interactions were included
 2. Description of what will be measured to illustrate existing energy consumption
 3. Description of what will be measured to illustrate post-retrofit energy consumption
 - a. Which IPMVP is being followed
 4. List of assumptions made to complete the projection of savings
 5. Description of how this retrofit savings will be reconciled to the post-retrofit utility bills
 6. Description of what could affect the savings being achieved
 - a. Description of how the baseline will be adjusted to reflect the changes that occur and still prove that the savings of the retrofit are being accomplished
- iii. Unviable EEMs – Measures/retrofit reviewed but not considered feasible
- b. Post construction conditions
 - i. Energy end uses, which show percent consumption per major system
 - ii. Occupancy schedules
 1. Days of the year, holidays, weekends
 2. Hours of the day, start and stop
 - iii. Occupancy comfort conditions
 1. Occupied times
 2. Unoccupied times
 3. Maintenance and Holiday times
- 5) Firm Fixed Price
- a. Description of how obtained – validation that pricing lines up with the RFP methodologies
 - b. List of contents
 - i. Indication of any incentives/rebates that are being considered
 - c. Reasonable exclusions
 - d. Unreasonable exclusions
 - e. Description of how contingencies will be managed
 - i. Contingencies should always be shown separately as a portion of the price
 - f. Description of how allowances will be managed
- 6) Savings
- a. Roll up of all retrofit savings individually
 - b. Illustration of the interaction of savings between EEMs
 - c. Impact on utility rate structure, if any
 - d. Impact on utility bills anticipated
 - e. Consideration of future rate escalations, if any
 - i. Description of rate escalation impacts (both increase and decrease)
 1. Source for rate escalation “prediction”
 - f. Display of EEM savings projected
 - g. Display of per EEM maintenance savings projected

- i. How pre-construction costs were determined
 - ii. How post-construction costs are projected
 - h. Display of per EEM maintenance savings projected
 - i. How pre-construction costs were determined
 - ii. How post-construction costs are projected
 - i. Illustration of simple payback per measure
 - j. Illustration of simple payback for the project
- 7) Finance
 - a. Finance resources considered and investigated
 - i. Leases
 - ii. Bonds
 - iii. Incentives
 - iv. Grants
 - v. Other
 - b. Description of finance recommendations
 - i. Method of selecting final financial provider
 - 1. Qualifications as financial advisor
 - 2. Actual proforma indicating table of repayment from savings
 - a. Illustration of net effective rate (includes all costs; finance, legal, bond counsel, filing fees, etc.)
 - b. Level payments, balloon payments, seasonal payments (to meet with facility use)
 - c. Clearly illustrate all conditions, early payment options, penalties
 - d. Attach sample instrument
- 8) Construction
 - a. Implementation Plan
 - i. Includes text, schematics, equipment lists and specification, manufacture cut sheets
 - b. Gantt Chart
 - c. Unseen circumstances and how they will be managed
 - i. Hazardous materials
 - d. Commissioning Plan
 - e. Maintenance Checklist/Matrix
- 9) Risk, Responsibility, and Performance Matrix
 - a. Should list financial, operational, and performance risks, their potential impact, and responsibility to manage risk.
- 10) Measurement and Verification Reporting
 - a. Frequency and format
 - b. Reconciling to future utility bills
 - i. Explanation in primary math
- 11) Shortfall resolution plan
 - a. Primary dispute resolution
 - b. Secondary dispute resolution