



# NREL Job Task Analysis: Energy Auditor

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# **NREL Job Task Analysis–Energy Auditor**

## **Introduction**

A Job Task Analysis is a foundation for any valid credentialing program and helps identify the core knowledge areas, critical work functions, and/or skills typically found across a representative sampling of current practitioners or job incumbent workers. Empirical results from a job analysis provide examinees and the public with a valid, reliable, fair, and realistic assessment that reflects the skills, knowledge, and abilities required to competently perform a job.

In July of 2010, a group of 12 Subject Matter Experts (SMEs) met to perform the Job Task Analysis and to create an examination blueprint that would serve as the basis for the worker certification. A trained psychometrician facilitated the meeting and helped guide the development of these analyses. In the fall of 2010, an online survey was administered to validate the results of the JTA and to finalize the examination blueprint. More than 400 Energy Auditors from across the United States responded to the survey.

This report contains the Energy Auditor Specifications and a content outline. In addition, the attached Exam Blueprint builds on these specifications by providing the optimum percentage of exam questions that should be asked about each task.

## **Scope**

An Energy Auditor is a residential energy efficiency professional who evaluates the energy efficiency, health, and safety of a home, and conducts field measurements to identify areas for savings. The Energy Auditor produces this information as a report and makes recommendations to the customer. A committee of SMEs considered to be experts in the field created the Energy Auditor Job Task Analysis.

This document is intended to include all of the tasks an Energy Auditor may perform, as well as the knowledge, skills, and abilities required to do these tasks.

Please note that certification is not a license to practice. All certificants must comply with applicable federal, state, and local laws and regulations governing the profession.

## **Content**

- A Job Task Analysis for an Energy Auditor
- An Exam Blueprint for an Energy Auditor

## Energy Auditor Specifications and Content Outline

Job Description: An Energy Auditor is a building scientist who evaluates the energy efficiency and health & safety of a building and identifies areas for savings by gathering empirical data, conducting tests and using energy modeling software, in order to reduce the energy consumption, improve the safety, and increase the lifespan of a building; while improving the quality of life and comfort for building occupants.

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### Domains/Tasks

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#### **Domain 1: Demonstrating Professional Energy Auditor Conduct**

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**Task 1:** Establish client relations for an energy audit

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**Task 2:** Represent the program/agency/organization

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**Task 3:** Maintain professionalism

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#### **Domain II: Collecting information about the Building for an Energy Audit**

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**Task 1:** Document energy consumption

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**Task 2:** Document the building history

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**Task 3:** Conduct a physical/visual inspection

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**Task 4:** Collect appliance information

---

**Task 5:** Collect electrical base load data

---

**Task 6:** Collect building measurements

---

**Task 7:** Collect health and safety data

---

**Task 8:** Collect mechanical ventilation data

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**Task 9:** Identify building insulation (attic, walls and foundations)

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**Task 10:** Collect attic data

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**Task 11:** Collect wall data

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**Task 12:** Collect window data

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**Task 13:** Collect door data

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**Task 14:** Collect foundation data

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**Task 15:** Collect roof data

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#### **Domain III: Testing the Building For an Energy Audit**

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**Task 1:** Preparing for the test(s)

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**Task 2:** Evaluate the appliances

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**Task 3:** Conduct indoor air quality tests

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**Task 4:** Perform combustion safety and efficiency tests

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**Task 5:** Perform blower door tests

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**Task 6:** Perform HVAC distribution tests

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#### **Domain IV: Evaluating Collected Energy Audit Data**

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**Task 1:** Evaluate the health and safety of the building

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**Task 2:** Evaluate the durability/structural integrity of the building

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**Task 3:** Evaluate the HVAC system

---

**Task 4:** Evaluate the mechanical ventilation

---

**Task 5:** Evaluate energy use base loads

---

**Task 6:** Evaluate the foundation

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**Task 7:** Evaluate the walls

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**Task 8:** Evaluate the attic

---

**Task 9:** Evaluate the doors

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**Task 10:** Evaluate the windows

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**Task 11:** Enter the data into energy modeling software

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**Task 12:** Determine the work scope

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# Energy Auditor Content Outline

## DOMAIN 1: Demonstrating Professional Energy Auditor Conduct

### *Task 1: Establish client relations for an energy audit*

#### **Ability to:**

- Conduct client introductions
- Conduct client interviews
- Complete client questionnaires
- Explain the purposes of the visit
- Set the client expectations and responsibilities (pre and post audit)
- Establish the client plan of action
- Engage the client in the actual testing
- Sell the client services and/or packages
- Obtain client signatures on forms (lead forms, etc.)
- Serve as a liaison between the client and the contractors
- Ability to work independently

#### **Knowledge of:**

- Building science
- Codes of conduct
- Forms
- Funding sources/financing
- Health and safety issues
- Interviewing techniques
- The program

#### **Skill in:**

- Communication
- Listening
- Presenting information
- Time management

### *Task 2: Represent the program/agency/organization*

#### **Ability to:**

- Interface with crews and subcontractors
- Complete program/agency/organization reports

#### **Knowledge of:**

- Construction processes and techniques
- Program reports

#### **Skill in:**

- Communication

### *Task 3: Maintain professionalism*

#### **Ability to:**

- Complete continuing education
- Maintain certifications
- Acquire new certifications

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**Knowledge of:**

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- Appropriate dress for the situation
  - Certification requirements for energy auditors
  - Continuing education requirements for energy auditors
- 

**DOMAIN 2: Collecting Information About the Building for an Energy Audit**

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***Task 1: Document Energy Consumption***

---

**Ability to:**

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- Obtain 12 months of client utility bills
  - Obtain annual fuel delivery information (oil, propane, etc.)
- 

**Knowledge of:**

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- How to access utility information
  - Utility bill components
- 

**Skill in:**

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- Calculating
  - Basic Math
- 

***Task 2: Document the building history***

---

**Ability to:**

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- Determine the age of the original structure
  - Determine the age of any additions or improvements
  - Determine if the building has any historical significance
- 

**Knowledge of:**

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- How to access building permit history
  - How to access tax files
- 

***Task 3: Conduct a physical/visual inspection***

---

**Ability to:**

---

- Walk around the exterior of the building
  - Look for holes, chimneys, gutters, vent pipes, soffits, fascia, peeling paint, foundation integrity, areas of infiltration and exfiltration, exhaust fan penetrations, accesses, crawlspaces, roof vents, land grading, shading, orientation of the building, anomalies.
  - Walk around the interior of the building
  - Look for pest/vermin infestations, evidence of leaking or water damage, holes, chimneys, vent pipes, peeling paint, foundation integrity, areas of infiltration and exfiltration, exhaust fan penetrations, accesses, crawlspaces, roof vents, structural damage
  - Identify hidden rooms or spaces
  - Determine the exterior façade materials (siding, brick, etc.)
  - Identify issues that would interfere with or prevent tests
  - Identify hazardous materials in the building
  - Detect unusual odors
  - Identify health and safety issues (clutter, bleach stored next to a furnace, etc.)
  - Perform visual inspection of vented combustion appliance venting configuration
  - Detect unusual odors
  - Visually inspect adjacent and/or connected buildings for issues that impact or could be impacted by the audited building
-



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**Knowledge of:**

---

- General construction
  - Codes and standards adopted by the local jurisdiction
  - Combustion appliance venting procedures
  - Hazardous materials
  - Issues that pose a health and/or safety risk (clutter, bleach stored next to a furnace, animal feces, etc.)
  - NFPA 211
  - Situations that pose a health and/or safety risk
  - Effects of moisture
  - Sources of moisture
  - What to look for when conducting a physical/visual inspection
  - Photograph and document conditions
- 

**Skill in:**

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- Attention to detail
- 

***Task 4: Collect appliance information***

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**Ability to:**

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- Collect refrigerator/freezer tag data and documentation
  - Collect heating/cooling appliance tag data and documentation
  - Identify heating/cooling appliance fuel type
  - Collect domestic water heater tag data and documentation
  - Collect washer/drying tag data and documentation
  - Collect mechanical ventilation tag data and documentation
  - Collect dishwasher tag data and documentation
  - Collect shower head flow rates
  - Collect dehumidifier tag data and documentation
  - Collect stove/oven appliance tag data and documentation
  - Identify stoves/ovens appliance fuel type
  - Collect unvented space heater tag data and documentation
  - Identify other components related to the HVAC appliances (expansion tanks, fill valves, remote compressors, etc.)
  - Identify other components related to the domestic water heater appliance (storage tanks, mixing valves, etc.)
  - Identify safety features related to the HVAC and domestic water heater appliances
- 

**Knowledge of:**

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- Appliances
  - Codes and standards adopted by the local jurisdiction
  - Domestic water heater components and operation
  - Heating/cooling system operations
  - How to read a meter
  - How to read and interpret appliance tags
  - Mechanical ventilation equipment
  - Safety issues associated with domestic water heaters
  - Show head operations and flow rates
  - Various appliance fuel types
-

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**Skill in:**

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- Penmanship
  - Attention to detail
- 

***Task 5: Collect electrical base load data***

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**Ability to:**

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- Conduct a lighting audit
  - Count the number of people in the house
  - Determine if dishwasher is present
  - Determine if the domestic water is fuel fired or electric
  - Collect client lifestyle information (TV usage, Xboxes, etc.)
  - Meter the refrigerator
  - Look for additional usage sources (hot tubs, pool pumps, pool heaters, fish ponds, fountains, etc.)
  - Collect electrical system information (size, brand, etc.)
- 

**Knowledge of:**

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- Fuel fired versus electric domestic water heaters
  - How lifestyle affects energy consumption
  - How to analyze a utility bill
  - How to diagnose high electric/gas usage
  - Know to read an electric meter
  - Refrigerator gasket seal conditions
- 

**Skill in:**

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- Basic math
- 

***Task 6: Collect building measurements***

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**Ability to:**

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- Measure walls
  - Measure roofs
  - Measure windows
  - Measure doors
  - Measure perimeter
  - Measure radiators
  - Measure foundation height
  - Measure attic venting
  - Measure attic spaces
  - Measure area and volume of the building envelope
- 

**Knowledge of:**

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- How to calculate the area and volume of the building envelope
  - How to identify the pressure boundary
  - How to identify the thermal boundary
  - How to measure building components (doors, etc.)
  - Various building components
- 

**Skill in:**

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- Measuring
  - Attention to detail
  - Basic math
-

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**Task 7: Collect health and safety data**

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**Ability to:**

- Locate existing smoke/CO detectors
- Determine age of smoke/CO detectors
- Determine if smoke detectors/CO are hardwired or battery
- Verify clothes dryer is properly vented to exterior
- Verify all exhaust fans are properly vented to exterior
- Identify any existence of hazardous materials/conditions
- Identify knob and tube wiring
- Identify moisture issues (standing water, condensation, plumbing leaks, mold, etc).
- Identify electrical hazards (frayed wiring, open junction boxes, unkempt wires, overloaded circuits, etc.)
- Identify suspect asbestos
- Identify lead based paint hazards
- Identify propane fueled appliances
  
- Identify unvented combustion appliances
- Identify properly operating back draft damper

**Knowledge of:**

- Proper locations for smoke/CO detectors
- Venting requirements for appliances
- Conditions that signify moisture
- Domestic water heater safety
- Electrical hazards
- Hazardous materials
- Heating system safety
- How to determine if knob and tube wiring is active
- Issues and hazards associated with asbestos
- Issues and hazards associated with lead based paint
- Manufactured home water heater regulations
- Rules and regulations pertaining to lead and asbestos
- Smoke/CO detector operations

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**Task 8: Collect mechanical ventilation data**

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**Ability to:**

- Review manufacturer's specifications for exhaust fans
- Determine the volume of the affected space
- Determine the type of control
- Identify the size of the registers
- Determine condition of the ventilation ductwork / piping (pitch, insulation, size, material, elbows, length to run, etc.)
- Calculate volume

**Knowledge of:**

- The different controls and motors
- Types of ventilation materials
- Ventilation ductwork
- Ventilation standards and local codes

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**Task 9: Identify building insulation (attic, walls and foundation)**

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**Ability to:**

- Identify insulation type
- Identify insulation amount (thickness, etc.)
- Identify insulation condition
- Identify presence and placement of vapor retarder
- Identify location of insulation (exposure, aligned with pressure plane and thermal boundary, etc.)
- Identify areas of insulation opportunities
- Probe
- Work in confined spaces

**Knowledge of:**

- Building science
- Insulation effectiveness
- Insulation R-Values
- Insulation placement
- OSHA safety requirements

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**Task 10: Collect attic data**

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**Ability to:**

- Identify attic components
- Measure attic/roof cavities
- Measure attic areas
- Measure attic framing
- Determine existing ventilation (soffit, can, ridge, type and size, power ventilators, etc.)
- Identify sources/signs of water damage
- Identify infiltration points
- Identify point(s) of access
- Identify electrical hazards
- Identify pest/vermin infestations
- Determine structural integrity
- Identify whole house fan
- Determine attic uses
- Note the existence of a radiant barriers
- Identify existence of baffles
- Use ladders
- Work in confined spaces

**Knowledge of:**

- Attic components
- Electrical hazards
- General construction terms
- How to calculate the area and volume of building spaces
- Infiltration points
- Safety hazards in an attic (nails, rafters, heat exposure, etc.)
- Signs of water damage
- Signs of pest/vermin infestations

- 
- Thermography
  - Types of ladders based on the situation
  - Ventilation requirements
- 

***Task 11: Collect wall data***

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**Ability to:**

- Identify wall type (interior, exterior, components)
  - Identify framing method
  - Measure wall areas
  - Identify wall orientation
  - Identify cavity depth
  - Identify source and signs of any water damage
  - Identify infiltration points
  - Identify signs of pest/vermin infestation
  - Identify orientation using online mapping tools
  - Identify upper stories
  - Use a compass
- 

**Knowledge of:**

- General construction
  - Building science
  - Compass orientations
  - Infiltration points
  - Typical wall framing and components
  - Issues unique to framing methods (upper story band joists, angle bracing in post and beam framing, etc.)
- 

**Skills in:**

- Basic math
  - Logical thinking
- 

***Task 12: Collect window data***

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**Ability to:**

- Identify window type (jalousie, awning, single-hung, double hung, etc.)
  - Identify window frame type
  - Identify window glazing type
  - Identify exterior shading
  - Identify window operation/leakiness
  - Measure window area
  - Count number of windows
  - Identify window orientation
  - Identify general window conditions
- 

**Knowledge of:**

- Code requirements pertaining to window glazing (walkways, etc.)
  - OSHA safety requirements
  - SHPO requirements
  - Window construction, components and nomenclature
- 

***Task 13: Collect door data***

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**Ability to:**

- Identify door type and swing
-

- Measure door area
- Count number of doors
- Identify door conditions
- Identify condition of door sweep and weather stripping
- Identify door hardware condition

**Knowledge of:**

- Door components, hardware and nomenclature
- Door construction
- Door operation and adjustments

**Skill in:**

- Basic math

***Task 14: Collect foundation data***

**Ability to:**

- Identify foundation types (crawlspace, basement, or slab)
- Identify foundation materials
- Measure floor areas
- Identify infiltration points
- Measure exposed walls
- Measure thickness of foundations
- Identify sources and signs of moisture
- Identify points of access
- Identify electrical hazards
- Identify signs of pest/vermin infestations
- Determine structural integrity
- Identify special equipment (sump pumps, etc.)
- Measure the crawlspace ventilation
- Record the location of any plumbing pipes
- Work in confined spaces
- Measure

**Knowledge of:**

- General construction
- Basic Electricity
- Basic Plumbing
- Building science
- Codes and standards adopted by the local jurisdiction
- Crawlspace ventilation requirements
- Foundation construction materials and methods
- OSHA safety requirements
- Potential sources of moisture
- Signs of moisture
- Signs of pests/vermin
- Signs of structural hazards on foundations
- Structures typically found in foundations
- Types of foundations

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**Skill in:**

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- Observation
- 

***Task 15: Collect roof data***

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**Ability to:**

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- Identify roof conditions
  - Identify roof color
  - Identify roofing materials (90 lb paper, rubber, etc.)
  - Identify condition of parapet walls
  - Identify roof penetrations
  - Identify roof debris (garbage, old air conditioners, etc.)
  - Identify roof ventilation (passive vents)
  - Identify roof drainage
  - Identify roof pitch
  - Measure roof area
  - Note flashing condition
  - Identify roof access
  - Identify roof exposure and orientation
  - Identify roof insulation (flat roof with no cavity and with rigid insulation)
  - Work at heights
  - Determine roof pitch
  - Measure areas
- 

**Knowledge of:**

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- General construction
  - Insulation materials and methods
  - OSHA safety requirements
  - Roofing construction methods
  - Roofing materials
- 

**DOMAIN 3: Testing the Building for an Energy Audit**

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***Task 1: Preparing for the test(s)***

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**Ability to:**

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- Determine the test(s) to be performed
  - Inform the client of the test(s)
  - Gather the test tools/equipment
  - Prepare the building for testing based upon manufacturer's test equipment specifications
  - Comprehend manufacturer's specifications
  - Use test equipment
- 

**Knowledge of:**

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- Building diagnostic testing
  - Building science
  - Test equipment
  - Test protocols
- 

**Skill in:**

---

- Attention to detail
-

- 
- Communication
- 

***Task 2: Evaluate the appliances***

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**Ability to:**

- Inspect appliances for test accessibility
  - Plug appliances into the watt hour meter
  - Follow the manufacturer's guidelines for operation of the watt hour meter
  - Document findings with pictures/forms
  - Read and interpret a watt hour meter
  - Verify usage based on Association of Home Appliance Manufacturer's (AHAM) charts.
- 

**Knowledge of:**

- Electric appliance metering
  - Electric appliance safety
- 

***Task 3: Conduct indoor air quality tests***

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**Ability to:**

- Monitor the ambient CO tests throughout the building
  - Record the highest ambient CO reading
  - Source the CO
  - Determine if the reading exceeds any applicable action levels
  - Identify conditions that promote mold growth (high humidity, cold surface condensation, etc.)
  - Follow odors to find source of mildew
  - Visually identify presence of mold-like substance
  - Identify conditions that promote radon infiltration
  - Measure the flow of mechanical ventilation
  - Document findings with pictures/forms
  - Communicate meter results with clients
  - Remain calm under stressful situations
- 

**Knowledge of:**

- ASHRAE maximum allowable CO exposure for living areas
  - Carbon monoxide exposure symptoms
  - Conditions that promote mold growth
  - Conditions that promote radon infiltration
  - EPA action levels
  - How to measure mechanical ventilation
  - NIOSH recommended limit for occupational CO exposure
  - OSHA permissible exposure limits
- 

**Skill in:**

- Remaining dedicated to the cause
  - Detecting unusual odors
- 

***Task 4: Perform Combustion safety and efficiency tests***

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**Ability to:**

- Visually inspect the fuel supply lines
  - Test for leakage in the fuel supply pipes
  - Verify leaks with bubble solution
  - Perform combustion spillage tests
  - Perform draft tests (including worst case depressurization, scenario, etc.)
-



- Measure drafts
- Conduct combustion efficiency tests (CO<sub>2</sub>, Oxygen, stack temperature, etc.)
- Measure CO in combustion appliances (undiluted)
- Document findings with pictures/forms
- Identify various heating systems
- Work in confined spaces

**Knowledge of:**

- Back-draft test protocols.
- Building science
- Codes and standards adopted by local jurisdiction
- Combustion efficiency tests
- Fuel line leak testing techniques
- Heating system configurations
- How to conduct draft tests
- How to inspect fuel supply lines
- How to measure CO in appliances
- Nationally recognized combustion safety test protocols (BPI, Energy Outwest, Midwest Best Practices, etc.)
- Various venting methods
- Understanding of what is "worst case"

***Task 5: Perform blower door tests***

**Ability to:**

- Perform pre-blower door interior thermographic scan
- Perform pre-blower door exterior thermographic scan
- Follow manufacturer's specifications for conducting blower door tests
- Perform thermographic scan during the blower door operation
- Perform zone pressure diagnostics (ZPDs)
- Locate points of infiltration/exfiltration
- Document findings with pictures/forms
- Calculate the building tightness limits
- Interpret blower door results
- Locate points of infiltration/exfiltration

**Knowledge of:**

- Knowledge of advanced blower door diagnostics
- Knowledge of blower door testing procedures (pressurization, depressurization, etc.)
- Knowledge of how to assemble and operate a blower door
- Knowledge of how to evaluate zone pressures
- Knowledge of thermography
- Understanding of air sealing limits national standards (BTL, DTL, ACH, BAS, MVG, etc.)

**Skills in:**

- Basic math

***Task 6: Perform HVAC distribution tests***

**Ability to:**

- Perform forced air system distribution leakage test
- Verify with building occupants if there is adequate heat in the building

- Measure room temperatures
- Measure the temperatures of the hydronic radiators
- Perform air flow tests at the registers
- Measure temperature rise across heat exchangers
- Measure pressure drop across the coil
- Inspect hydronic distribution (high, low, valves, etc.)
- Measure hydronic distribution (radiators, fin tube, etc.)
- Perform pressure balancing rooms tests (ducted air systems)
- Document findings with pictures/forms
- Multi-task
- Work in confined spaces

**Knowledge of:**

- HVAC testing protocols
- Air flow
- How to measure hydronic distribution
- HVAC terminology
- Hydronic heating
- Manufacturer’s specifications for forced air distribution systems
- Distribution system design

**Skill in:**

- Communication
- Attention to detail

**DOMAIN 4: Evaluating Collected Energy Audit Data**

***Task 1: Evaluate the health and safety of the building***

**Ability to:**

- Review collected data to determine if there is health and safety concern
- Determine if health and safety issues can be addressed through an energy efficiency measure and therefore can fall within energy funding
- Determine the repairs
- Review the economics of the repairs to determine whether to repair or to defer

**Knowledge of:**

- How to deal with special circumstances (mold, lead, asbestos, etc.)
- Construction repair methods
- Costs associated with repairs
- Energy funding

**Skill in:**

- Basic math
- Cost estimating

***Task 2: Evaluate the durability/structural integrity of the building***

**Ability to:**

- Review collected data to determine if there is a durability/structural integrity issue
- Determine if the durability/structural integrity issues can be addressed through an energy efficiency measure and therefore can fall within energy funding
- Determine the durability/structural integrity repairs

- 
- Review the economics of the repairs to determine whether to repair or to defer
- 

**Knowledge of:**

- 
- Codes and standards adopted by local jurisdiction
  - Costs associated with structural repairs
  - Energy funding
  - Structural repair methods
- 

**Skill in:**

- 
- Basic math
  - Cost estimating
- 

***Task 3: Evaluate the HVAC system***

---

**Ability to:**

- 
- Review collected data to determine if there is a HVAC system issue
  - Evaluate the HVAC system for health and safety concerns
  - Evaluate HVAC sizing for potential replacement or upgrades (post shell retrofit)
  - Evaluate the distribution (add trunk lines, radiators, etc. to rooms as needed)
  - Evaluate fuel switching options
  - Evaluate the need to clean and tune versus replace
  - Evaluate the need for and supply of combustion air
  - Evaluate the HVAC for other issues that lead to replacement or upgrades (condition, age, efficiency, etc.)
  - Identify duct sealing/insulation and pipe insulation opportunities
  - Interpret software output
  - Perform load calculations
  - Use ACCA software
- 

**Knowledge of:**

- 
- ACCA manuals
  - BTU content of fuels
  - Energy funding
  - Heating/cooling system operations
  - How to size HVAC systems
  - HVAC load calculations
  - HVAC system repair, replacement or upgrade costs
  - Maximum allowable duct leakage
  - Safety requirements
- 

**Skill in:**

- 
- Basic math
  - Communication
  - Attention to detail
- 

***Task 4: Evaluate the mechanical ventilation***

---

**Ability to:**

- 
- Review collected data to determine mechanical ventilation issues
  - Compare flow with ventilation specifications
  - Compare blower door results against IAQ standards
  - Assess the need for and placement of additional mechanical ventilation
  - Assess the make-up air source and whether it needs to be filtered
  - Determine the mechanical ventilation repairs, replacement and/or addition
-

- 
- Review the economics of the repairs, replacements and/or additions to determine whether to proceed or to defer
- 
- Determine the type of controls needed
- 

**Knowledge of:**

- 
- Energy funding
- 
- IAQ standards
- 
- Mechanical ventilation controls
- 
- Types of ventilation
- 
- Ventilation flow
- 
- Ventilation sizing
- 

**Skill in:**

- 
- Basic math
- 

***Task 5: Evaluate energy use base loads***

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**Ability to:**

- 
- Review collected data to determine if replacements or upgrades will reduce energy consumption
- 
- Review energy efficient light bulbs for installation
- 
- Review refrigerator/freezer data for economics of replacement
- 
- Review domestic water heaters for economics of replacement or repair
- 
- Review domestic water heater pipe insulation opportunities
- 
- Review domestic water heater insulation opportunities
- 
- Review water saving opportunities (water saving shower heads, etc.)
- 
- Review domestic water heater thermostat setting
- 

**Knowledge of:**

- 
- Codes and standards adopted by local jurisdiction
- 
- Components of base loads
- 
- Energy funding
- 
- How to calculate base loads
- 
- Pipe insulation
- 

***Task 6: Evaluate the foundation***

---

**Ability to:**

- 
- Review collected data to determine foundation issues
- 
- Determine repairs needed
- 
- Review economics of repairs
- 
- Determine proper insulation location (floor or wall)
- 
- Evaluate crawlspace venting needs
- 
- Evaluate box sills insulation needs
- 
- Determine if perimeters need to be insulated
- 
- Identify type of insulation materials to be added
- 
- Calculate if adequate ventilation exists or should be added
- 
- Evaluate the need for vapor barrier
- 

**Knowledge of:**

- 
- Building science
- 
- Codes and standards adopted by local jurisdiction
- 
- Energy funding
- 
- Foundation construction techniques
-

- 
- Foundation crawlspace ventilation
  - Foundation insulation
  - Foundation types
  - Foundation vapor barriers
- 

***Task 7: Evaluate the walls***

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**Ability to:**

- Review collected data to determine wall issues
  - Evaluate repairs needed and structural integrity
  - Review the economics of repairs to determine whether to repair or defer
  - Determine proper insulation levels
  - Identify type of insulation materials to be added
  - Determine square footage of area to be insulated
  - Ensure pressure plane and thermal boundary align
  - Ensure the vapor retarder is appropriately placed
- 

**Knowledge of:**

- EPA and DOE lead and asbestos standards
  - Building science
  - Codes and standards adopted by local jurisdiction
  - Energy funding
  - Insulation types and appropriateness
  - Pressure planes and thermal boundaries
  - Typical wall structures
  - Vapor barriers in walls
- 

***Task 8: Evaluate the attic***

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**Ability to:**

- Review collected data to determine attic issues
  - Evaluate repairs needed and structural integrity
  - Review economic of repairs to determine whether to repair or defer
  - Review insulation location
  - Review insulation type
  - Evaluate whether insulation is appropriate for use
  - Ensure pressure plane and thermal boundary align (air sealing)
  - Ensure the vapor retarder is appropriately placed
  - Evaluate attic ventilation existing and required
  - Assess fire hazards (lighting cans, electrical, etc.)
  - Evaluate the need for service access
- 

**Knowledge of:**

- Attic construction and materials
  - Attic fire hazards
  - Attic types
  - Attic ventilation
  - Building science
  - Codes and standards adopted by local jurisdiction
  - Energy funding
  - Insulation types and appropriateness
-

- 
- Pressure planes and thermal boundaries
  - Vapor barriers
- 

***Task 9: Evaluate the doors***

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**Ability to:**

- Review collected data to determine door issues
  - Evaluate repairs needed and structural integrity (can frame support door replacement, etc.)
  - Review economic of repairs to determine whether to repair or replace
  - Evaluate the condition of storm doors (closers, etc.)
- 

**Knowledge of:**

- Codes and standards adopted by local jurisdiction
  - Door framing structures and processes
  - Door types
  - Energy funding
  - Glass types
- 

***Task 10: Evaluate the windows***

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**Ability to:**

- Review collected data to determine window issues
  - Evaluate repairs needed and structural integrity
  - Review economic of repairs to determine whether to repair or replace
  - Evaluate window components and performance
- 

**Knowledge of:**

- Building science
  - Codes and standards adopted by local jurisdiction
  - Energy funding
  - Window components
  - Window glazing
  - Window types
- 

***Task 11: Enter data into energy modeling software***

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**Ability to:**

- Gather all information and data pertaining to the audit
  - Enter the data into energy modeling software
  - Analyze the output from the software
  - Produce a cost and savings report
  - Use a computer
- 

**Knowledge of:**

- Basic construction terms
  - Building science
  - Various types of energy modeling software
- 

***Task 12: Determine the work scope***

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**Ability to:**

- Determine the health and safety measures
  - Determine the building durability measures
  - Determine the energy measures based on the SIR
  - Provide analysis reports (work order)
  - Create reports
-

- 
- Create work specifications
- 

**Knowledge of:**

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- Building science
  - Codes and standards adopted by local jurisdiction
  - Construction practices and terms
  - Energy modeling software
  - Program rules and standards
- 

**Skill in:**

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- Computer usage
-

## Energy Auditor Exam Blueprint

		<b>Duties and Tasks</b>	<b>Final</b>
<b>A</b>		<b>Demonstrating Professional Energy Auditor Conduct</b>	<b>5%</b>
	1	Establish client relations for an energy audit	2%
	2	Represent the program/agency/organization	2%
	3	Maintain professionalism	1%
<b>B</b>		<b>Collecting Information About The Building For An Energy Audit</b>	<b>30%</b>
	1	Document energy consumption	2%
	2	Document the building history	1%
	3	Conduct a physical/visual inspection	2%
	4	Collect appliance information	2%
	5	Collect electrical base load data	2%
	6	Collect building measurements	3%
	7	Collect health and safety data	2%
	8	Collect mechanical ventilation data	2%
	9	Identify building insulation (attic, walls and foundations)	2%
	10	Collect attic data	2%
	11	Collect wall data	2%
	12	Collect window data	2%
	13	Collect door data	2%
	14	Collect foundation data	2%
	15	Collect roof data	2%
<b>C</b>		<b>Testing The Building For an Energy Audit</b>	<b>40%</b>
	1	Preparing for the test(s)	5%
	2	Evaluate the appliances	4%
	3	Conduct indoor air quality tests	7%
	4	Perform combustion safety and efficiency tests	10%
	5	Perform blower door tests	10%
	6	Perform HVAC distribution tests	4%
<b>D</b>		<b>Evaluating Collected Energy Audit Data</b>	<b>25%</b>
	1	Evaluate the health and safety of the building	3%
	2	Evaluate the durability/structural integrity of the building	2%
	3	Evaluate the HVAC system	3%
	4	Evaluate the mechanical ventilation	2%
	5	Evaluate energy use base loads	2%
	6	Evaluate the foundation	2%
	7	Evaluate the walls	2%
	8	Evaluate the attic	2%
	9	Evaluate the doors	2%
	10	Evaluate the windows	2%
	11	Enter the data into energy modeling software	0%
	12	Determine the work scope	3%
			100%