Residential Energy Auditing
An Energy Audit generally consists of:

- A thorough inspection of the interior and exterior of the home using a holistic approach
  - Insulation levels
  - Air sealing opportunities
  - Mechanicals
  - Diagnostic and H&S data collection
  - Measurements
- Client education and... being educated by the homeowner
- Creating a computer model (TIPS, TREAT, EmpCALC)
- Development of a comprehensive work scope
A Good Energy Auditor is:

- Data Analyst
- Spec writer
- Production Manager
- Energy Coach
- Building Inspector
- Diagnostician
- Quality Control Inspector
Observation and Critical Thinking

Eyes, Ears, Nose and Brain
The House as a System

- PLUMBING STACK VENT
- BATHROOM FAN VENT
- ATTIC HATCH
- RECESSED LIGHTS
- ELECTRICAL OUTLET
- DRYER VENT
- CRAWL SPACE
- KITCHEN FAN VENT
- OUTDOOR FAUCET

Arrows indicate:
- Air leaking into the house
- Air leaking out of the house
Exterior Inspection
Where’s the envelope?
Special Considerations

Brick

Lead Based Paint
Transite siding may contain asbestos
Interior Inspection
Customer Interview
Client Questionnaire

NYS DIVISION OF HOUSING AND COMMUNITY RENEWAL
WEATHERIZATION ASSISTANCE PROGRAM
DHCR # 11

CLIENT QUESTIONNAIRE

Unit # __________________________ Building Address ____________________________

HEATING, HOT WATER

- How long have you lived here? ____________________________________________________________________________ [ ] Yes [ ] No
- Has the heating system been repaired or cleaned? ____________________________________________________________________________ [ ] Yes [ ] No
- Has any work been done to your heating system in the past 3 years? ____________________________________________________________________________ [ ] Yes [ ] No
- Do you use a separate space heater during the winter months? ____________________________________________________________________________ [ ] Yes [ ] No
- What fuel? ____________________________________________________________________________ [ ] Electric [ ] Natural Gas [ ] Other
- Do you have a working fireplace? ____________________________________________________________________________ [ ] Yes [ ] No
- How often is it used? ____________________________________________________________________________ [ ] Yes [ ] No
- When was the last time the chimney was cleaned? ____________________________________________________________________________ [ ] Yes [ ] No
- Do you use a wood stove? ____________________________________________________________________________ [ ] Yes [ ] No
- How much wood did you use during the last heating season? ____________________________________________________________________________ [ ] Yes [ ] No
- Did you use your cookstove for heat during the past winter? ____________________________________________________________________________ [ ] Yes [ ] No
- What type of heat is your cookstove? ____________________________________________________________________________ [ ] Yes [ ] No
- Does your home or common area ever get too cold? ____________________________________________________________________________ [ ] Yes [ ] No
- If yes, explain where ____________________________________________________________________________ [ ] Yes [ ] No
- Do you have any centrally heated areas? ____________________________________________________________________________ [ ] Yes [ ] No
- If yes, explain where ____________________________________________________________________________ [ ] Yes [ ] No
- When was the last time your heating system was cleaned and tuned? ____________________________________________________________________________ [ ] Yes [ ] No
- Do you change your furnace filter regularly? ____________________________________________________________________________ [ ] Yes [ ] No
- If yes, when was it done last? ____________________________________________________________________________ [ ] Yes [ ] No
- Do you have a humidifier? ____________________________________________________________________________ [ ] Yes [ ] No
- When is the highest setting? ____________________________________________________________________________ [ ] Yes [ ] No
- What is the lowest setting? ____________________________________________________________________________ [ ] Yes [ ] No
- Where is the thermostat located? ____________________________________________________________________________ [ ] Yes [ ] No
- Do you close off any rooms? ____________________________________________________________________________ [ ] Yes [ ] No
- Yes, which rooms? ____________________________________________________________________________ [ ] Yes [ ] No
- Do you have an air conditioner? ____________________________________________________________________________ [ ] Yes [ ] No
- If yes, what type? ____________________________________________________________________________ [ ] Yes [ ] No

HEALTH & SAFETY

- Do you or any member of your household suffer from frequent headaches, flu, colds or nausea during the heating season? ____________________________________________________________________________ [ ] Yes [ ] No
- Do you or any member of your household have medical problems that are made worse by high heat? ____________________________________________________________________________ [ ] Yes [ ] No
- If yes, what is the affected person’s condition and their doctor’s opinion about the problem? ____________________________________________________________________________ [ ] Yes [ ] No
- Is there any condensation build-up in your home? ____________________________________________________________________________ [ ] Yes [ ] No
- If yes, where? ____________________________________________________________________________ [ ] Yes [ ] No
- Is there mold or mildew in your home? ____________________________________________________________________________ [ ] Yes [ ] No
- Does your basement get wet during certain times of the year? ____________________________________________________________________________ [ ] Yes [ ] No
- If yes, where and when? ____________________________________________________________________________ [ ] Yes [ ] No
- Does ice form in your attic during the winter? ____________________________________________________________________________ [ ] Yes [ ] No
- Is there ice build-up on your roof during the winter? ____________________________________________________________________________ [ ] Yes [ ] No
- Does your roof leak? ____________________________________________________________________________ [ ] Yes [ ] No
- Has your home been certified as free from lead based paint? ____________________________________________________________________________ [ ] Yes [ ] No
- Has any member of your household been tested for lead exposure? ____________________________________________________________________________ [ ] Yes [ ] No
- What were the results? ____________________________________________________________________________ [ ] Yes [ ] No
- Did you receive the lead booklet called “? ” ____________________________________________________________________________ [ ] Yes [ ] No

INSPECTION COMMENTS OR CONCERNS NOTED BY AUDITOR

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Ventilation is becoming more and more important
The Basement
Venting disconnects are common
Dryer fire caused by plugged lint trap
The Attic
Diagnostic/Health and Safety Tests
Carbon Monoxide Testing - Ambient and in Oven
Gas Leak Detection
A small gas leak at the pilot burner control blows bubbles in the gas leak detector fluid. Auditor should call for repair.
CAZ Zone Depressurization

Make sure the exhaust gas is going up the chimney not dumping back into the house.
Combustion Analyzer
Steady State Efficiency Tests
Measuring chimney draft
Worst Case Draft
Blower Door

Blower Door Depressurization Test

- Air Drawn In by Fan
- Blower Door:
  - Door Panel
  - Fan
  - Gauges
- Fan Draws Air from House
- Calculate Leakage from House Pressure and Airflow Rate

May 2015
New York State Weatherization Directors Association
Digital Manometer
Infrared Camera
Education. Advocacy. Innovation.
Infrared Scanning

Infrared combined with a blower door is greater than the sum of its parts.
Computer Modeling
Computer modeling and the Savings to Investment Ratio (SIR)
The End Game is:

Work scope development that will provide the most energy and comfort benefit to the customer while ensuring safety.