



Greater Cincinnati Energy Alliance

Home Energy Assessment and Upgrade

Protocol for Existing Homes

1) Homeowner Account Creation with the Energy Alliance:

1. Homeowner goes to the Energy Alliance website (www.greatercea.org) and creates a homeowner account which then provides the homeowner a Confirmation Code which then populates into the participating-Home Performance Contractor's Green Energy Compass "Leads List"; the Home Performance Contractor then contacts the homeowner to schedule the Home Energy Assessment (Assessment), OR
2. Homeowner can directly contact the participating-Home Performance Contractor (HPC) who then will create a homeowner account in Green Energy Compass (Compass) on behalf of the homeowner. NOTE: the Energy Alliance conducts many outreach events where homeowners may manually signed up for an Assessment, therefore, the Energy Alliance will provide those leads via email to the HPC.
3. Homeowner may directly call the Energy Alliance to sign up. If the homeowner does not have a HPC preference, then, the Energy Alliance would "randomly" assign a participating-Energy Alliance HPC to the homeowner at which time the homeowner would directly contact the HPC.

NOTE: The HPC is responsible for verifying the homeowner's eligibility requirements including location in the 4-county Energy Alliance territory (see the Energy Alliance's Homeowner Eligibility Memo).

Note: In order to be a Home Performance Contractor a company must have a full time BPI/ BA on staff.

- 2) **Utility Data Entry:** during the homeowner's signup via the Energy Alliance's website, they have 2 options for supplying their utility bills:
1. Duke Energy's Online Services account number entry (see Instruction sheet for Duke Energy's On-Line Account creation), OR
 2. Manual entry of utility data from the homeowner's most recent bill (Note: if the homeowner selects the annual option for utility data, then the monthly input into Compass is REQUIRED by the HPC if the homeowner has resided in their home for the previous 12+ months; if the homeowner has not resided in the home for the previous 12 months, then ESTIMATED annual data is acceptable)
- 3) **Analysis of Energy Bills:** the Energy Alliance's Compass provides a "Homeowner Energy Usage Report" which shows the disaggregation of base load, heating, and cooling; in addition, the report shows where the home ranks on Energy Star's Home Energy Yardstick metric.
- 4) **Homeowner interview:**
- Should take place BEFORE beginning the on-site Assessment
 - Overview of the Assessment process & on-site diagnostic testing
 - Complaints & concerns – hot & cold rooms, drafts, moisture/mold, etc.
 - Structural & mechanical system history
- 5) **Preliminary exterior survey**
- General condition of structure
 - Drainage, gutter and roof issues
 - Take particular notice of all exterior venting, chimneys and flues. Record the general condition of each and the total number of each type.
- 6) **Record temperature prior to entering home for draft test (outside temp / 40-2.75)**
- Zero out CO meter and gas leak detector. Record ambient exterior CO baseline, prior to entering the home.
 - Test for gas leaks outside the home and test 100% of accessible gas lines on the inside. If detector indicates a gas leak, then do a bubble test to verify. If gas leaks are present, then the following actions should occur:
 1. The assessor should "tag" the location of the leak with a highly-visible colored tape
 2. The homeowner should be shown the location of the gas leaks
 3. The homeowner should be instructed to contact a licensed plumbing contractor to repair the leaks accordingly ("emergency" vs. standard business day service call should be explained)
- 7) **Combustion Appliance Zone (CAZ) testing**
- Check for combustible materials, VOCs, or other hazards
 - Turn the thermostat off and set all combustion equipment to pilot. Put car keys on DHW (so you remember to reset to on and restore set temp)
 - Set Home in "Winter Mode"

- Test 100% of interior gas lines for leaks. If detector indicates a gas leak, then do bubble test to verify. If gas leaks are present, follow the procedures as stated in #6 above.
- Measure base pressure in CAZ WRT outside (record base pressure)
- Worst case depressurization (turn on all exhaust ventilation systems, air handler, and position interior doors)
 1. Spillage test at the draft hood with smoke, mirror
 2. Draft vent pressures inside the vent WRT CAZ must be more negative than (outside air temp/40-2.75). Test at steady state or after 10 minutes. Compare to Acceptable Draft Test Range.
 3. Measure CO in undiluted flue gas directly in the appliance vent at steady state or after 10 minutes test for CO in each burner tube – record the highest number
- Combustion appliance testing: remove anything in oven & range areas and measure CO at steady state directly in the oven vent and ambient CO 6-12” above the burners. Per BPI standards, if the CO level reaches 100-300 ppm, then the homeowner should be instructed not to use the appliance until serviced by a qualified contractor. If CO level exceeds 300 ppm, then the assessment should immediately cease and the homeowner should be instructed to contact a qualified contractor to turn off the gas to the appliance and then have the appliance serviced to correct the problem.
- Efficiency testing (optional); however, the efficiency ratings must be recorded

8) **Mechanical Systems:** Heating & cooling, water heaters, appliances, etc.

- Look for water leaks or corrosion and inform homeowner
- Distribution system evaluation: all duct work should be air sealed with mastic and all ductwork outside the conditioned space air sealed & insulated.

9) **Comprehensive exterior survey**

- Photo of at least the front side of the house (for Hamilton Co. homes, can be the photo on auditor’s website); THIS MUST BE UPLOADED TO COMPASS FOR ASSESSMENT REIMBURSEMENT.
- Note any condition which indicates a lack of maintenance issue
- Draw basic plan of house, measure perimeter, heights of floors, and measure & label windows (for modeling and Manual J purposes)

10) **Structural inspection**

- Identify thermal & pressure boundaries
- Note major thermal bypasses
- Foundation type & integrity
- Insulation levels throughout house including attics and crawlspaces
- Note structural issues such as insect infestation, water damage, or mold

11) **Envelope leakage testing**

- Check for asbestos (on pipes or in old attic insulation; i.e., vermiculite) and peeling lead paint. If present, DO NOT perform a depressurization test until the above related issues are resolved.

- Remove air filter for testing (exception: for electronic air cleaners only the pre filter has to be removed) note: only if duct work is located in unconditioned space.
- Install blower door in exterior door open to the house with good air flow (direct to outside).
- When house in “winter mode” the blower door fan cover should be closed, then the base line pressure reading can be recorded with a manometer (house WRT outside).
- Remove blower door fan cover and depressurize house to -50 Pa WRT outside, if target pressure of 50 cannot be achieved, use “can’t reach 50” multiplier.
- Record CFM @50.
- Record ACH/N

12) Calculate Volume of Conditioned Space.

Use ASHRAE 62-89 to calculate minimum building airflow standard (BAS).

- Compare blower door CFM50 to the BAS. In addition, calculate and record ACHn. Then, make air sealing and/or mechanical ventilation recommendations. **NOTE: the Energy Alliance REQUIREMENT FOR MECHANICAL VENTILATION IS 70% OF BAS OR .25 OR LESS ACHn.** If the ACHn is .26-.35, then mechanical ventilation is RECOMMENDED by ASHRAE 62.89 (RECOMMENDED VS. REQUIRED)
- With blower door running, create pressure map of house and target air sealing & ventilation recommendations.
- Garage and house boundary evaluation (pressure & thermal)
- Other zonal pressures (optional; could be a diagnostic for a customer “cold room” complaint)
- Infrared imaging with blower door operating (optional, but if performed then the Energy Alliance-approved HPC must have completed, at a minimum, 2 day IR training course offered by a Certified IR Trainer that results in a Certified Residential Thermal Imaging Certification).

13) Lighting & Appliances

- Provide inventory of light bulbs including wattage and type of bulb (FYI: during homeowner survey the homeowner can be requested to complete this task to save time); recommend light bulb/fixture improvement options
- Provide appliance inventory and evaluate appliance age & efficiency ; if applicable, provide appliance improvement/replacement options

14) On-site Review with Homeowner

- Before leaving the home, verbally review with the homeowner any preliminary findings
- Health & safety issues
- Whole-house energy efficiency recommendations

15) **Assessment Report & Proposal:** Upload the required electronic data into Compass’s Surveyor so that the report and proposal can be imported into Compass; also, all other electronic documents for the Energy Alliance payment processing must be uploaded to Compass (see the Energy Alliance’s “Required Documentation for Reimbursement Process”)

16) **Report & Proposal Delivery to Homeowner:** Provide a written “Energy Alliance-standard” Report and Proposal to the homeowner within 3- 5 days of the Assessment

17) **Contractor Payment for the Assessment:** After all the required documentation is uploaded to Compass and approved, then the Energy Alliance will process the payment for the

assessment and mail to HPC within 5 business days after assessment payment is placed on contractor payment log. If the HPC does not upload all required documentation from the assessment properly into Compass within 60 days of the completed assessment, then the Energy Alliance reserves the right to refuse payment on the assessment.

18) **NOTE:** A Home Energy Upgrade is NOT to begin until the Energy Alliance has reviewed the Proposal to insure the recommended work scope meets the Energy Alliance guidelines. If the Upgrade project needs to be expedited due to being an “Emergency Equipment Replacement” or other similar reason, then contact the Energy Alliance directly so that the Assessment Approval process can be expedited.

HOME ENERGY UPGRADE BEGINS

HOME ENERGY UPGRADE PROCESS

- 1) Once all the Assessment documentation has been received and approved by the Energy Alliance via Compass. The HPC can proceed with scheduling the Upgrade project with the homeowner.
- 2) When the homeowner has signed a contract and the Home Energy Upgrade job is scheduled, then the following documents MUST be uploaded to Compass per the document "Required Documentation for the Reimbursement Process": City of Cincinnati Environmental Review (if applicable), copy of signed contract, completed Spec Sheet, Manual J calculations (if applicable), and Equipment/Product Verification Documentation (AHRI for HVAC equipment; Energy Star ratings, etc.)
- 3) When the Upgrade is scheduled, the HPC is responsible for entering the start and end date into the "Notes" section of Compass. Also, the HPC should inform the QA Inspector, when the final day of the Upgrade will occur so that he can schedule the on-site QA Inspection during the final day of the Upgrade (if on-site QA is applicable). If the QA Inspection does NOT occur the final day of the Upgrade, then the Energy Alliance will schedule the QA Inspection directly with the homeowner once all of the required documentation for the Upgrade is received as described below in #4.
- 4) Within 10 business days after the Upgrade is completed, all of the remaining required Upgrade documentation MUST be submitted to Compass: Home Energy Upgrade Completion Certificate and Test Out data entered into Surveyor Note: When adding the test out data into surveyor; go to the Building tab in surveyor, once there click the word "General and enter the actual job hours including any administrative hours, next go to the measurement section and enter Building Leakage Data @CFM50 from the test out, and any applicable CAZ data; also you must change the CFM infiltration information under the Improvements Tab. If there was any air leakage reduction.(then sync to Compass). Note: if an on-site QA Inspection is performed, then the QA Inspector will enter the QA results into Surveyor/Compass within 48 hours.
- 5) In Compass, when the HPC submits an Upgrade project and the job status is: "Submitted Job", then the Energy Alliance will review the required documentation and either approve the Upgrade, OR if the job is "rejected" by the Energy Alliance, then there will be specific reasons in the Compass "Notes" section indicating what needs to be corrected for the Upgrade to be approved.
- 6) Once the Upgrade is approved by the Energy Alliance, payment will be sent to the HPC within 7 business days of the job being entered into the Contract Payment log.
- 7) Once the Upgrade is completed and the test out and QA are done. The HPC has 30 days to successfully enter all data into Compass. If the data is not successfully uploaded within that period. The Energy Alliance reserves the right to withhold payment to HPC.

HOME ENERGY UPGRADE Quality Assurance (QA) Process

A) On-site Home Energy Assessments:

1. 100% for each NEW individual assessor within each company for at least the first 5 assessments.

B) On-site Home Energy Upgrade

* Goal is to have the QA Inspection performed during the HPC's final day of the Upgrade project so that the QA can be performed at the same time the HPC's Test Out is occurring, thus speeding up the payment process and not inconveniencing the homeowner *

1. 100% for the first 10 retrofits completed by a HPC
2. 25% for the next 15
3. 10% beginning with the 26th Upgrade
4. QA Inspection of all homes that have a failed spillage/co/draft test at the initial test in.

C) Desk Review of Home Energy Assessments:

1. For Assessments not having on-site QA, then 100% for current time.
2. If any exception is checked by the Assessor, then 100% desk review and approval is required.

D) Desk Review of Home Energy Upgrades:

1. For Upgrades not having an on-site QA, then 100% will be "Desk Reviewed" for the current time.

HOME ENERGY UPGRADE QA Points of Emphasis

1. Assure the installation of all measures required through the Energy Alliance's minimum standards.
2. Addressing the ventilation guidelines established by the Energy Alliance (required mechanical ventilation if .70 of BAS or <.25 ACHn)
3. That all "Other Qualifying Measures" are eligible per Energy Alliance guidelines.
4. Proper Installation of all Measures; refer to the "Saturn Energy Auditor Field Guide".
5. EVERY Upgrade MUST have Blower Door Test-Outs performed by the HPC and entered into Compass.
6. If any open combustion appliances are present, CAZ testing and Draft & Spillage tests are required.
7. Follow the BPI recommendations for CO Monitors (MUST be installed in homes with Gas Appliances or if an all-electric home, then the adjacent room to an attached garage).
8. Assure that the Spec Sheet matches the improvement measures installed during the Upgrade.