

Home Performance with Energy Star Program

Columbia, Missouri

The primary goal of Home Performance with Energy Star (HPwES) is to use a whole house approach addressing energy efficiency improvements. Building component interaction impacts the efficiency of the overall project. Prioritized comprehensive improvements help each home owner make an educated decision to obtain the best ROI. Average projected energy savings using this approach have been 25% per home.

A contractor delivery model is used to administer HPwES. Local Contractors have been Building Performance Institute (BPI) trained and certified and approved to offer comprehensive home audits (Home Performance Assessments). The list of contractors is available on request or can be found at the Columbia Power Partners or Boone Electric Cooperative websites.

Policy and Procedures for Home Performance

1. Customer eligibility
 - a. Water & Light and Boone Electric Cooperative residential **electric** customers - Home owners and landlords
 - i. Single family unattached homes
 - ii. Duplexes and condos with 3 major walls facing ambient or an attached garage and a minimum attic footprint of 900 sq ft
 - iii. Duplexes and condos with an attic footprint of 700-899 sq ft and 3 major walls facing ambient or an attached garage are eligible if a qualifying air conditioner or heat pump is installed as part of Home Performance with Energy Star
 - iv. Duplexes and condos with an attic footprint of 700-899 sq ft and 2 major walls facing ambient or an attached garage are eligible if over 2,100 sq ft of total living space is present
 1. Contact Boone Electric Cooperative for qualifying home information
 - v. Each location is eligible for HPwES every 10 years
 1. Homes may be eligible for HPwES prior to the 10 year minimum on a case by case basis. Approved homes will not be eligible for a second audit incentive.
 2. If approved, homes may not exceed the \$1200 HPwES rebate cap in a 10 year period
 - b. Utility usage history
 - i. Customers must supply electric or fossil fuel history for 1 year prior to the pre assessment if available
 1. This information is critical for tracking actual energy savings achieved
 - ii. Customers must supply electric or fossil fuel history for 1 year after energy improvements
 - c. Pre Assessments are eligible for rebates and/or incentives and assessment incentives for a 12 month period or until a Post Assessment has been completed, whichever comes first.
2. Home Performance Pre and Post Assessment – Data collection and customer recommendations
 - a. Must be performed by a Water & Light approved contractor
 - i. Same contractor must perform both
 - b. Utility usage history
 - i. Customers must supply electric or fossil fuel history for 1 year prior to the pre assessment if available
 1. This information is critical for tracking actual energy savings achieved
 - ii. Customers must supply electric or fossil fuel history for 1 year after energy improvements
 - c. Pre Assessments are eligible for rebates and/or incentives and assessment incentives for a 12 month period or until a Post Assessment has been completed, whichever comes first.

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3. Home Performance Rebates/Incentives and Assessment Incentives
 - a. Requires Home Performance Pre and Post Assessment
 - b. Pre assessment must be performed before any improvement is started
 - i. Any work done before the pre is not eligible for rebates, incentives or loans
 - c. Signed rebate/incentive application along with itemized invoices and mechanical permits (if applicable) are required to process each rebate
 - d. Home Performance rebate/incentive shall not exceed invoice total for each address
 - i. The cost incurred to the property owner for the assessment may be included in the invoice total for qualifying rebates/incentives.

4. Rebate or Incentive items and amounts
 - a. Attic insulation - Increased to R-50 minimum to qualify. Three different tiers are used based on pre R-value. Combined \$500 cap.
 - i. Pre 26 R-value or less rate is 1 cent per sq ft per R-value
 - ii. Pre 27 R-value or more rate is ½ cent per sq ft per R-value
 - iii. Encapsulated attic slope rate is 3 cents per sq ft per R-value
 1. Based on drill and fill or spray foam application
 - iv. R-50 is the rebate limit for post R-value

 - b. Wall insulation - \$500 cap
 - i. Rate is 3 cents per sq ft per R-value
 - ii. R-19 is the rebate limit for post R-value

 - c. Floor over unconditioned spaces - \$500 cap
 - i. Floor insulation must be R-19 minimum. Rate is 1 ½ cent per sq ft per R-value
 1. R-19 is the rebate limit for post R-value
 2. May not be combined with crawl space wall rebate in same space
 3. Drive under garage ceilings must be insulated to R-19 minimum to qualify for loan program
 - a. Recommend removing any duct registers connecting living spaces to garages

 - d. Crawl space wall – \$500 cap
 - i. Wall insulation must be at least R-10 with 6 mil vapor barrier. Rate is 5 cent per sq ft per R-value
 1. This is not a good option if ground water issues are present

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2. R-13 is the rebate limit for post R-value
 3. Must meet applicable codes
- e. Duct insulation - The maximum incentive is based on a slab home with 100% of the homes supply and return duct work being distributed in the attic - \$300 cap.
- i. Prorated by R-value and the percentage of the homes total system(s) located outside the building envelope.
 1. Return duct systems must have at least two distributed lines to qualify for full incentive
 2. Homes with one central return will be given a 10% credit toward incentive
 - ii. At least R-13 must be added to be eligible for incentive. Strongly suggest it equals attic insulation.
 1. Starting R-value must be R-12 or less to qualify.
 - iii. Other duct systems configurations are evaluated by the percentage of the total system that is outside the building envelope.
 1. For example, a slab home could have one central return completely inside the envelope while all supply lines were run through the attic space. This scenario would be 50% of the total system outside the envelope, for a \$150 incentive.
- f. Rim joist insulation - The maximum rebate is based on total exposed perimeter. \$20 cap
- i. Must be R-13 R-value. If foam is used R-10 is acceptable.
 - ii. Rim joists should be air sealed prior to installing insulation
 - iii. Prorated by percent of total exposed perimeter
- f. Air sealing – The incentive offered is \$84 per ACH reduction. The incentive cap is \$420 for envelope and \$300 for ductwork.
- i. Envelope air sealing. Must achieve 0.5 ACH50 or 0.05 ACHn to receive prorated incentive.
 1. Requires pre and post blower door assessment test to quantify reductions
 2. Home footprint shall not change during HPWES in order to qualify for air sealing incentive
 - ii. Duct sealing – Must achieve 50 CFM reduction to receive prorated incentive. The incentive offered is \$50 per 100 CFM reduction
 1. Requires pre and post duct blaster test to quantify reductions
- g. Windows and doors - Rate is \$100 per opening. \$500 cap
- i. Must be 0.30 U-value or lower and low E for windows
 - ii. Documentation from the manufacturer or the efficiency sticker is required for verification.
- h. Heat pump - Rate is \$200 per location

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- i. Must be 15 SEER minimum and heat at least 50% of conditioned space. Air conditioning, Heating and Refrigeration Institute verification is required for rebate
- ii. Must pass final mechanical inspection to qualify

Approved Contractor Requirements

1. Activity
 - a. HP Contractor must report to the Program a minimum of ten completed jobs per year, to remain on the approved list
2. Certification – BPI Building Analyst
 - a. Employ at least one BPI certified building analyst professional
 - b. Building analyst must be on site while the pre and post HPA are performed
 - i. Only certified building analyst may conduct blower door and combustion testing
 - c. Prior to being added to the approved contractor list, BPI certified auditors must complete CWL mentoring process
3. Equipment - Have in possession or available the following equipment while performing the HPA.
 - a. Blower door
 - b. Blower door software
 - c. Diagnostic smoke
 - d. Combustion analyzer
 - i. Including NOx filter
 - ii. Must be capable of reading CO air free
 - e. Gas leak detector
 - f. Ambient CO monitor
4. Equipment calibration
 - a. Properly maintain all diagnostic test equipment, including calibration according to manufacturers recommended calibration schedules. Calibration records for diagnostic testing instruments will be made available to CWL upon request.
5. Brand use – Only authorized while HPwES partnership is valid
 - a. Use brand and logos in accordance with HPwES guidelines
 - b. Use of CWL logo requires review and approval.
6. Marketing
 - a. Properly represent your relationship to CWL. This relationship being that the approved contractor is a Home Performance Contractor, accredited by BPI and approved to participate in EPA's Home Performance with ENERGY STAR® Program. Consultants shall **not** represent themselves as working for CWL, DNR, EPA, or DOE.
 - b. Promote whole house approach
 - c. Educate customers about energy saving opportunities for appliance and lighting upgrades

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7. Job Reporting – Pre and Post Assessments
 - a. Respond to customer referrals within 48 hours
 - b. Use forms or procedure approved by CWL
 - c. Deliver reports to CWL and customer within two weeks of completion – preferably one week
 - d. The contractor that conducts the pre HPA will also conduct the post HPA, after improvements are completed
 - e. Pre and Post Assessments must be on file before rebates/incentives or loans can be processed
 - f. A post assessment may not take place until 15 business days after the pre assessment
 - g. Rebates/Incentives and invoices must be on file before post assessment can be processed
 - h. Use calculator and post form to verify projected savings
 - i. All eligible homes must be rated through the DOE Home Energy Score program

8. Suggest only recommendations approved by CWL & BEC and prioritize for each customer. The following are approved:
 - a. Air Sealing to building tightness limit if possible
 - b. Insulation
 - i. Attic Up to R-50 – Strongly suggest cellulose
 - ii. Crawl space to R-19 – Insulation must be in contact with floor decking. Suggest encapsulating insulation
 1. Or crawl space wall to R-10 min with 6 mil plastic vapor barrier covering exposed ground
- Not suggested if ground moisture issues are present
 - c. Ducts – min of R-13
 - d. Rim joist – min R-13. If foam is used R-10 is acceptable
 - e. Replace windows and doors if existing are single pane or beyond repair - Windows and doors must be 0.30 U-value or less and low E for windows
 - f. Replace furnace if older than 25 years
 - g. Replace condensing unit if older than 15 years
 - h. Suggest installing qualifying heat pump - Contact CWL or BEC for further information
 - i. Replace refrigerators, freezers and washing machines if older than 16 years
 - j. Suggest installing Carbon Monoxide (CO) alarms if not present
 - i. Required for any home with gas appliances or attached garages

9. Assessment Incentive - \$100 Pre - \$400 Post
 - a. Tier I Post >15% savings
 - i. Appliances located within thermal boundary - Standard CAZ testing must be performed during pre and post assessment, if applicable, to receive \$400 post incentive
 1. Homes with no CAZ testing will receive \$300 post incentive
 - b. Tier II Post > 15% savings

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- i. Appliances located in intermediate zones, zones potentially outside of thermal boundary, standalone 80% furnaces or draft induced water heaters – Natural condition CAZ testing must be performed during pre and post assessment, if applicable, to receive \$330 post incentive.
 1. Appliances must be tested for spillage and CO if applicable
- ii. Zonal pressure testing is required where natural drafting appliances are located in intermediate zones. This quantifies connectedness of CAZs potentially located outside of thermal boundary
 1. If the house to CAZ pressure is between -25 pa and -50 pa, perform Tier I CAZ test
- c. 15% savings are required to receive maximum post incentive
 - i. Less than 15% savings will receive a \$200 post incentive with Tier I CAZ testing
 - ii. Less than 15% savings will receive a \$130 post incentive with Tier II CAZ testing
 - iii. Less than 15% savings will receive a \$100 post incentive with no CAZ testing
- d. 7.5% or less savings will not receive a post audit assessment incentive
- e. Follow BPI recommendations for Combustion Safety Test Action Levels

10. Insurance

- a. Have, at minimum, general liability insurance in the amount of \$1,000,000
- b. Provide workers compensation in accordance with state requirements

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