

ATTACHMENT B

FY24 WHOLE HOME/BUILDING RESIDENTIAL RETROFITS PROJECT DESCRIPTION/SCOPE OF WORK

PROJECT DESCRIPTION

A whole home/building upgrade project includes the installation of cost-effective energy efficiency and weatherization measures for residential dwellings. For each dwelling included in the Project, Grantee must carry out a Building Performance Institute (BPI) energy audit on the residential home or building as outlined in the current [BPI Standards](#). Based on the audit results, Grantee shall pursue energy conservation measures which have a simple aggregate payback of 15 years or less (up to 18 years when the project includes a new heat pump installation) and result in decreased overall household energy costs.

DELIVERABLES

The deliverables included below will be designed, purchased, developed, and implemented by Grantee. Each of these deliverables shall include cost effective measures that directly contribute to energy savings or facilitate energy conservation behavioral practices in Maryland.

1. Eligible Project Sites

Grantee shall identify low-to-moderate income homes in the selected region that are eligible for energy efficiency upgrades.

- A. Except at the case-by-case discretion of MEA, for the purpose of this Grant, a home or residence shall:
 - 1) Be separately metered for utilities (electric/natural gas/propane/oil/water).
 - 2) Receive electricity service on a residential rate.
 - 3) Have the following characteristics:
 - i. Include at least a bedroom, bathroom, and kitchen facilities that are separate from other residences within the same building;
 - ii. Include an entry directly to a public street or public hallway; and,
 - iii. Have HVAC and hot water systems dedicated solely to the residence.
- B. To avoid duplication of materials or work, Grantee shall ensure that any home or residence receiving energy efficiency upgrades and weatherization services under the Grant has not received the same energy efficiency upgrades or the same weatherization measures proposed in the Grant through another program. An exception to this is homes receiving HVAC replacements, which must have been weatherized by this or a previous program within the last five years.

- C. Grantee shall provide personnel to comply with the reporting and invoicing requirements of this Grant.
- D. Each reimbursement request for Administrative costs or Indirect costs shall include supporting documentation detailing the work performed. For further details, refer to the [FY25 Funding Opportunity Announcement](#).

2. Residential Energy Audit Requirements

- A. Grantee shall provide cost effective energy efficiency upgrades, and weatherization services to the specified number of households in the target region.
- B. Each home receiving energy efficiency services under this Grant shall first undergo an energy audit, which shall include a visual inspection, a combustion safety test (if applicable), and a pre- and post-retrofit blower door test.
 - 1) All energy audits funded by the Grant shall be completed by a BPI certified Building Analyst (BA) and in accordance with BPI Standard 1100-T-2023 -Home Energy Auditing Standard, and BPI Standard 1200-S-2017 - Standard Practice for Basic Analysis of Buildings. (See current [BPI Standards](#)).
- C. Energy audits shall result in the development of cost-effective energy improvement packages. An energy efficiency upgrade is cost effective when the project, on a per home basis (i.e., all measures in aggregate) has a simple payback of 15 years or less, or 18 years or less for projects involving a new heat pump installation.
 - 1) Projects shall include weatherization of the building shell based upon audit recommendations, unless it can be demonstrated that the dwelling has been weatherized within the last 5 years.
 - 2) All building shell improvements shall be completed by a BPI-certified contractor or supervised by a BPI-certified auditor.
 - 3) Building shell improvements shall comply with current BPI Standards.
 - 4) In order to educate building occupants on the audit and upgrade process, the Auditor or Grantee shall clearly explain test results, recommended measures, and observations, including combustion safety, indoor air quality, mechanical ventilation, utility bill analysis, insulation, air sealing, health and safety recommendations/concerns, and other matters as necessary.
- D. Grantee shall report the primary heating fuel type used by each home that is included in the Project.
- E. The audit, installation of efficiency measures, and post installation diagnostics shall be performed consistent with the requirements of BPI Standards 1100 and 1200 and any failures addressed.

3. Residential Energy Efficiency and Weatherization Services

The following energy efficiency measures are eligible for reimbursement under the Grant when identified as “necessary and cost effective” in the applicable energy audit report and installed consistent with applicable BPI standards:

- A. Air sealing and insulating of the building shell:
 - 1) Attic insulation to at least R49, where possible, following best practices and allowing for space constraints. If R49 is not feasible due to space constraints, adding insulation to achieve a lower R value is acceptable.
 - 2) Basement or crawlspace insulation. Grantee shall report the pre/post R value, square footage, and location (wall or ceiling).
 - 3) Work shall be performed consistent with BPI Standard 1200 to quantify infiltration reduction and assess/correct any health and safety issues
- B. HVAC tune-up and repairs
 - 1) HVAC tune-ups may not exceed \$250 per home
 - 2) If replacement parts are required for simple HVAC system repairs to restore the HVAC system to a proper operating condition that improves system efficiency, up to an additional \$500 may be spent on parts for this purpose.
- C. HVAC filter replacement
- D. Duct sealing and/or insulation
- E. Water heater wrap for electric water heaters older than 2004 located in unheated spaces.
- F. Hot water pipe wrap with a minimum R-value of 3.
- G. ENERGY STAR certified appliance replacements to include new clothes washers, electric clothes dryers, dishwashers, window air conditioners, heat pump water heaters, freezers, and dehumidifiers
 - 1) Maximum Grant-eligible reimbursement for a refrigerator is \$1,000;
 - 2) To be reimbursed for an appliance replacement, the original appliance must have been functional within the last year;
 - 3) Installation of gas appliances is not eligible for reimbursement.
- H. Light bulb replacements with LEDs:
 - 1) MEA will reimburse up to twelve (12) LEDs maximum per home.
 - 2) CFL installation is prohibited.
 - 3) T12 to LED, T8 or T5 lighting replacements;
- I. Installation of low flow showerheads and/or faucet aerators. To facilitate maximum energy savings, MEA strongly recommends the installation of EPA’s Water Sense® low flow showerheads (2.0 gal/min maximum) and faucet aerators.
- J. HVAC Replacements: HVAC replacements may involve: 1) installing a new heat pump or A/C system to replace an existing heat pump, electric heating system, or A/C system, or 2) installing a new heat pump to replace or augment an existing fossil

fuel-fired space heating system (i.e., gas-fired furnace or boiler). Both types of replacements are addressed in this section.

- 1) Load Calculations: For all HVAC replacements, Manual J heating/cooling load calculations, or equivalent, shall be performed in accordance with the version of the International Energy Conservation Code (IECC) currently required in Maryland. Manual S should be used to properly select the appropriate equipment based on these loads.
- 2) Weatherization: Prior to adding or replacing an HVAC system in a residence, the residence shall be weatherized with respect to air sealing and attic insulation (through this program or as noted during inspection as having previously occurred). Weatherization must have been completed within the last five years.
- 3) Duct Leakage:
 - i. Duct sealing work shall include duct blaster leakage tests performed before and after completion of duct sealing. For each duct leakage test, the distribution efficiency shall be estimated based on the current [BPI Guidance on Estimating Distribution Efficiency](#) or a comparable method that quantifies the improvement in delivery efficiency.
 - ii. Ducts that leak to outside or affect health and safety shall be sealed with mastic or aerosol spray duct sealant and/or repaired.
 - iii. Accessible supply and return ducts in the attic shall be insulated to a minimum of R-8 (where \geq 3-inch diameter) and R-6 (where $<$ 3-inch diameter).
- 4) Pipe Insulation:
 - i. Existing or new refrigerant lines shall be insulated to a minimum of R-3.
 - ii. Piping insulation exposed to weather shall be protected from damage, including that caused by sunlight, moisture, equipment maintenance and wind.
- 5) New HVAC Equipment: Newly installed equipment must be an ENERGY STAR® certified heat pump (including mini-splits) or air conditioner. For Packaged Terminal Air Conditioner (PTAC) unit replacements that currently do not have ENERGY STAR® rating qualifications, PTAC replacements shall have an EER rating meeting the following minimum levels:

Capacity (Btu/hr)	Minimum EER
8,000 or less	11.8
8,001 – 10,500	11.4
10,501 – 13,500	10.7
13,501 or more	10.0

If these EER levels cannot be met due to the size of a replacement PTAC or PTHP, then the EER must be at least 10% greater than the IECC minimum value for replacements.

- 6) Heat Pump and A/C Installations Replacing Existing Electric HVAC Systems:
 - i. Replacement of the existing system is an acceptable measure when the existing heat pump or A/C has a SEER rating of 10 or less; or replacement has a simple payback of 15 years or less; or the entire project, inclusive of the HVAC replacement and other ECMs, has a simple payback of 18 years or less; or the heat pump does not retain its refrigerant charge and runs on emergency electric resistance heat.
- 7) Heat Pump Installations Replacing Fossil Fuel-Fired HVAC Systems:
 - i. Allowable system replacements for a dwelling unit include installation of a high efficiency electric heat pump to replace a furnace or boiler fired by gas, propane, or heating oil; or the installation of a high efficiency electric heat pump to meet part of the heating load while retaining a furnace or boiler fired by gas, propane, or heating oil to provide backup heating. The existing furnace or boiler must be less than 10 years old
 - ii. An energy audit shall show the proposed fuel switching HVAC measure is cost effective and results in energy savings and energy cost savings for the resident when measured in aggregate with other recommended measures.
 - iii. Heat pump installations to replace (or supplement) existing fossil fuel-fired HVAC systems are eligible if:
 1. The entire whole house retrofit package results in a Simple Payback of 18 years or less;
 2. The dwelling's electric service is upgraded per applicable building codes to address the new load, if necessary, including compliance with the jurisdiction's permitting and inspection requirements;
 3. Any combustion safety issues created by the removal of the furnace/boiler are addressed consistent with BPI Standards 1100 and 1200.
 4. Combustion safety testing per BPI Standards 1100 and 1200 is conducted for any existing furnace or boiler systems which are retained for backup heating;
 - iv. If an electric service upgrade (i.e., electrical panel upgrade) is necessary to facilitate the new heat pump installation, projects shall also upgrade the electric service of the dwelling unit to provide capacity for a future Level 2 Electric Vehicle (EV) charging circuit at the electrical panel only, in order to enable future vehicle energy efficiency measures. Circuit breakers or empty breaker slots installed

for future EV charging must be labeled accordingly. Wiring from the panel to a future charging station is not required, nor is this an eligible cost. This requirement is only applicable to single-family dwellings with a parking spot on the property that is part of, or adjacent to, the building.

- v. If an electric service upgrade is necessary to facilitate the new heat pump installation, an additional amount of up to \$3,000 is available exclusively dedicated for upgrades to a dwelling's electrical service. This same amount also covers any electric service upgrades needed for the installation of a heat pump water heater. The electric services upgrades are separate from the incidental repairs outlined below.

8) Reporting Requirements:

- i. Grantee shall note and report the following attributes of the existing HVAC system being replaced in the Monthly Report:

1. Heating equipment type (i.e. electric baseboard; ASHP; furnace; Mini-split);
2. Fuel type and energy source;
3. Design heating load from Manual J calculation
4. Portion of heating load being met by the new heat pump unit.
5. Heating unit capacity in BTUh
6. Heating equipment efficiency in HSPF;
7. Heating equipment age or closest estimate in years;
8. Design cooling load from Manual J calculation
9. Cooling unit capacity in BTUh
10. Cooling equipment efficiency in SEER;
11. Cooling equipment age or closest estimate in years;
12. Any additional grantee comments pertaining to HVAC replacements such as reasons for downsizing equipment, etc.
13. If a furnace or boiler is transitioned into a dual fuel heating system, this must also be noted along with the control settings (switchover temperature) being used to select the furnace/boiler or the heat pump for heating.

K. Heat Pump Water Heater Installation to Replace Fossil Fuel-Fired Water Heaters.

This is an acceptable measure if each of the following conditions is met:

- a. The comprehensive whole-house retrofit package results in a Simple Payback of 18 years or less;
- b. The installed heat pump water heater is ENERGY STAR certified;
- c. The dwelling's electric service is upgraded per applicable building codes to address the new load, if necessary, including compliance with the jurisdiction's permitting and inspection requirements; and,
- d. Any combustion safety issues created by the removal of the gas/propane water heater are addressed consistent with BPI Standards 1100 and 1200.

If an electric service upgrade is necessary to facilitate the new heat pump water heater installation, an additional amount of up to \$3,000 is available exclusively dedicated for upgrades to a dwelling's electrical service. This same amount also covers any electric service upgrades needed for the installation of heat pump for space heating. The electric services upgrades are separate from the incidental repairs outlined below.

- L. Additional Energy Efficiency Measures
 - a. Additional energy efficiency measures or locations may be approved on a case by case at the complete and sole discretion of MEA.
 - b. MEA approval for any additional energy measure or location shall be in writing by the assigned MEA program manager.

4. Cost Limits and Additional Requirements

- A. MEA Cost Limits: The cost of MEA's contribution to the energy efficiency upgrade is capped at a set dollar value, depending on the extent of the work scope. For further details, refer to the [FY25 Funding Opportunity Announcement](#).
- B. Any energy efficiency upgrade work scope estimated to exceed these spending limits must be approved in advance by the MEA program manager.
- C. MEA will not allow a charge for an upgrade that solely includes HVAC.
- D. Incidental/ Health and Safety Repairs: Incidental repairs required to correct health and safety issues identified through the energy audit may be performed as long as the total cost of the materials and labor associated with incidental repairs charged to MEA does not exceed a cost of \$1,500 per home. For further details, refer to the [FY25 Funding Opportunity Announcement](#).
- E. Upon request by MEA, Grantee shall provide a list of all homes, buildings, and residences upgraded using funds from this Grant.