EmPower New York Electric Reduction Measures and Criteria

All measures must be installer per the Materials & Installations Guidelines.

LED Lighting and Candelabra LEDs

1. Criteria for replacement
    a. Must meet all conditions in the Lighting Policy located in Section 6 of the Contractor Resource Manual.
    b. Socket is functional, and no hazardous conditions exist.
    c. Fixture is on participating household's utility meter/bill.
    d. Contractor may install and charge for up to 16 LEDs, or 15 LEDs and one LED nightlight. Candelabra LEDs for chandeliers are not included in this limit.

2. General Procedures for all lighting
    a. Contractor must install, or assist household in installation of all lighting provided by the Contractor at the time of the audit.
    b. Contractor must install lighting of comparable or higher luminescence. Care must be taken that adequate lighting is provided to households with visual impairments.
    c. Care must be taken to ensure that the color rendition of the installed bulbs is acceptable to the family and appropriate for their needs.
    d. All replaced incandescent bulbs must be removed from the premises and disposed of properly. Any damaged lightbulbs must be disposed of properly.
    e. During the lighting installation, the Contractor should also look for opportunities to downsize existing lighting, such as reducing the number of bulbs used.

3. Procedures--LED Lighting
    a. All LEDs must be ENERGY STAR compliant.

4. Procedures--Candelabra LEDs
    a. The chandelier must be in use for an average of three or more hours per day.
    b. The household must be willing to accept the appearance of the bulb.

Refrigerator and Freezer Replacement

1. Criteria for replacement
    a. Pre-existing refrigerator must be at least ten years old.
    b. SIR is 1.1 or greater. In the case of WAP-coordinated projects, WAP criteria for replacement may be followed.
    c. Household agrees to give up the old appliance in exchange for the new one.
    d. The owner of the appliance provides signed permission for the replacement.
    e. Circuit must be safe.
    f. The appliance is under a rent-to-own contract and most of the payments are still outstanding (requirement for a SIR of 1.1 is waived.)
    g. Icemaker installations or other accessories are not available through EmPower.
    h. Side-by-side refrigerators and bottom freezer units may only be installed in Special Needs situations, such as wheelchair bound households who have difficulty reaching upper compartments of appliances.
    i. Ice makers and water taps are not funded by EmPower. In situations where they exist, please notify the household that they will not be provided. Please note the presence of

active ice makers or water taps on the appliance application. Also note whether there is a water line to the current appliance and whether the line has a shut-off valve.

2. Evaluation of appliance energy use
    a. The primary tool for evaluating appliance energy usage is available at http://www.kouba-cavallo.com/refmods.htm.
    b. In order to get a good usage estimate, use of this database must be backed up by metering of the appliance, whenever possible.
    c. Refrigerators must be metered for at least one hour in the following situations:
        i. Make and model is not listed in the Calculator.
        ii. Appliance was bought used. Often in reconditioning old units, parts are interchanged in a way that diminishes efficiency.
        iii. Appliance is in a semi-conditioned space, such as a basement.
        iv. Unit is damaged or otherwise in poor condition.
    d. Metering must not be attempted if the Contractor's efforts to gain access to the plug for metering may result in damage to the home.
    e. When metering is not possible and the appliance is not listed in the Calculator, an auditor may propose replacement on the basis of evidence that the existing refrigerator is either over ten years old, or is in poor condition. Such situations must be documented with a digital photograph of the old refrigerator.
    f. Units kept in unheated areas such as garages or porches are unsuitable for replacement. Such locations must be noted on data collection forms. Please note that installation of new refrigerators and freezers into unconditioned spaces may void the product warrantee.

3. Metering guidelines
    a. If metering of refrigerators or freezers is included in the workscope, Contractor should install meter(s) as soon as possible after introduction and run meter for as long as possible in order to create the maximum length of meter run time.
    b. While the meter is running, the Contractor must return to the meter every 15 minutes to check the wattage in order to determine whether or not the refrigerator is in a defrost cycle. (Instructions on how to check wattage are typically included in meter instruction manuals.)
    c. If metering is performed on a warm day, metering results must be adjusted by 2.5% for every degree above the typical yearly temperature of the home. For example: If metering is done in a home where the typical yearly temperature is 70 degrees, and the temperature during the visit is 80 degrees (10 degrees above normal), the metering results should be reduced by 10 x 2.5%, or 25%.
    d. IMPORTANT NOTE: If the unit was unplugged for metering, make sure that the refrigerator is plugged in and functional before leaving the home. Generally, the refrigerator light is an easy way to verify that the unit has power.
    e. Units 10 years old or less will not be considered for replacement and do not need to be measured.

4. Procedures
    a. The Contractor must evaluate all refrigerators and freezers on premises.
    b. The Contractor must look for opportunities to:
        i. Downsize appliance
        ii. Unplug and remove a second appliance instead of replacing it
        iii. Replace two appliances with one larger refrigerator.
    c. The Contractor must evaluate the location of the refrigerator in relation to the following: stove and other heat sources; heating system ducts and radiators; freezer on sun porch;

etc. The Contractor must consider opportunities to relocate the refrigerator to a more appropriate location and discuss this with the household.

d. The Contractor must negotiate the appropriate appliance size for the family. As a general rule, a similar size as the current refrigerator is to be installed. Size may be determined in the following ways:
    i. Use of www.kouba-cavallo.com/refmods.htm.
    ii. Sticker on door
    iii. Size is sometimes a part of the model number
e. Measurement: measure in inches and multiply the length, width and depth of the freezer and refrigerator section interiors. Add the two totals, and divide this number by 1728.
f. Contractor must measure the space available for appliance installation and verify that recommended appliance will fit in terms of height, width and depth. It is important that care be taken to check the back of the cavity, because sometimes kitchen counters or walls may be irregular in dimension, and narrower in the back. Be sure to measure the depth and consider any obstacles that would interfere with the door opening all the way.
g. Contractor must check egress to ensure that appliance can be safely installed and note any obstacles for delivery. Issues regarding egress must be noted on the data collection forms.
h. All recommendations must be discussed with and accepted by the household. In situations where appliance replacement is determined by the Program Implementer, Contractor must make no commitment to the household regarding replacement but state that a recommendation is being made. It is important to emphasize that the old refrigerator must be given up in exchange for the new one, and that the old one is immediately decommissioned.
i. Replacement refrigerators must be ENERGY STAR® models.
j. All relevant refrigerator data must be filled out on Electric Reduction Audit Form. If a replacement is recommended, an Appliance Exchange Application must be filled out and signed, and an Appliance Q&A form left in the home. The Contractor must review the application with household and include hinge side, proposed replacement size, and other data.
k. Please be sure to instruct households who are to receive appliances that they must fill out and send in warranty cards. Caution them that failure to do so may void the warranty.

Hot Water Efficiency Upgrades (Temperature Adjustment, Pipe Insulation, Showerhead, and Timer for Electric Water Heaters)

1. Temperature adjustment
    a. Criteria
        i. Tested hot water temperature is greater than 120 degrees
        ii. The Household is amenable to temperature change
        iii. In the case of tenants, owner permission to perform minor measures, such as changing the hot water temperature, must be obtained.
    b. Procedure
        i. In the case of electric water heaters, the Contractor must first ensure that the circuit breaker to the water heater has been turned off.
        ii. Whenever possible, the household member participating in the audit should be present, shown how to make the adjustments and encouraged to perform the adjustment themselves.
        iii. In the case of electric hot water heaters, if the heater contains two heating elements, both heating elements must be adjusted.
        iv. In the case of natural gas or propane water heater, temperature settings are typically not identified on the dial. The Contractor must turn down the dial an estimated amount based on the original reading, and teach the household

member how to make further adjustments if necessary. It is helpful to mark the original setting with a marker to guide further adjustments.

v. In the case of electric water heater, the Contractor must ensure that the circuit breaker to the water heater has been turned back on after the adjustments have been completed.

2. Hot Water Pipe Insulation
   a. Criteria
      i. Water is heated by electricity or natural gas
      ii. A water heater change-out is not under consideration
      iii. Pipes are not currently insulated or are insulated poorly
      iv. No pipe leaks exist
      v. If the water heater has heat traps, insulation of the intake pipe is not required.
      vi. If the first foot of pipe insulation cannot be installed due to close proximity to the flue, pipe insulation must not be installed.
      vii. Pipes are not part of a tankless system.
   b. Procedures
      i. All installed pipe insulation should be of a size that is correct for the pipe: i.e., no exposed pipe due to using pipe insulation that is too small. Corners must be mitered and insulation secured with tape.
      ii. First 6 feet of hot water pipe and 3 feet of intake water pipe must be insulated.
      iii. Pipe insulation must be at least the thickness of the pipe diameter.
      iv. Combustible pipe insulation must not be installed within 6 inches of the flue.

3. Showerhead Replacement
   a. Criteria
      i. Water is heated by electricity or natural gas
      ii. Pre-existing showerhead has a flow rate greater than 3 gallons per minute (GPM)
      iii. Current showerhead is not required for medical reasons
      iv. Showerhead may be installed without causing damage to plumbing
      v. Showerhead is acceptable to household

   b. Procedures
      i. The Contractor must test the water flow. This can be done simply by using a gallon plastic jug with a hole cut out of the top that is large enough to fit the showerhead in. If the showerhead fills the jug in less than twenty seconds (i.e. has a flow rate of more than three gallons per minute) the showerhead is appropriate for replacement.
      ii. Plumbing tape should be used at joints.
      iii. Shower-massager or hand-shower models may be preferable, and can be inexpensive.
      iv. The new showerhead must have a flow rate in the range of 1.7-2.5 GPM.

4. Time-of-Use Timers for Electric Hot Water Tanks
   a. Criteria
      i. Water is heated by electricity
      ii. The household must have time of use (or on-peak/off-peak) rates. If time-of-use rates are in effect, or the Contractor must ensure that household is switched over to these rates as part of the process
      iii. Water tank must have an 80-gallon capacity or greater
      iv. Timer to be installed must have a battery backup

v. Written permission has been obtained by owner, and timer and rates must be acceptable to household
vi. Household must be willing and capable of adjusting the timer and replacing the batteries as needed

b. Procedures
i. Timer model must be reviewed and approved by Program Implementer
ii. Timer must be installed in accordance with all appropriate electrical codes
iii. Contractor must educate family on maintenance of timer.

Electric Water Heater Conversions

1. Criteria:
a. SIR of 1.1 or greater
b. High electricity consumption (greater than 10,000 KWh)
c. Household must be homeowner
d. House must not be for sale and household must indicate that they plan to stay in home
e. No flooding currently exists in basement and no evidence of a risk of future flooding.
f. If change-out to natural gas is being considered, natural gas must be in use in the home and available to an appropriate location for a water heater. Appropriate options for safe flue gas venting must be available.
g. Replacement of an electric water heater for another electric water heater will only be considered if day/night meter rates exist at the home, and a timer is being installed on the water heater. (In these cases, an 80-gallon tank is required.)
h. New natural gas water heater must have an energy usage rating of .63 or greater.
i. If the new water heater does not have integral heat traps, heat traps or u-shaped bends at least 12 inches high must be added to both the input and output pipes directly above the tank.

2. Procedures
j. Pre-existing conditions must be documented with digital photographs.
k. During the energy audit, the Contractor must inspect the water heater and evaluate draft considerations, such as size of flue, lining of chimney, and additional length of pipe required if relocation is necessary. If the Contractor is uncertain about technical aspects of retrofit decisions, the Contractor should notify the Program Implementer that further evaluation by a heating professional is necessary.
l. The Contractor must discuss option with the household and verify their interest in the retrofit. The household must be informed that, in a “fuel-switch” scenario, the electricity costs will go down, but the new water heater will increase the cost of the new fuel. It is important to inform the household that the electric reductions offset the increase in the new fuel costs. Data from EmPCalc or other instrumented audit tools can be helpful in this regard.
m. The Contractor must consult with the Program Implementer regarding the proposed change-out. This discussion should occur prior to sending Subcontractors to visit a home to provide estimates. Projected costs for repairs or replacements must include all necessary plumbing, venting, and structural costs associated with the change-out.
n. CAZ and gas leak testing must be completed as required by BPI.
o. Gas or oil hot water heating systems must meet venting codes of the National Fire Protection Association (NFPA) as applicable:
iv. NFPA 54: The National Fuel Gas Code
v. NFPA 31: Standard for the Installation of Oil-Burning Equipment
vi. NFPA211: Standard for Chimneys, Fireplaces, Vents, and Solid-Fuel Burning Appliances.

Electric Dryer Conversion to Natural Gas

1. Criteria
    a. Four or more people must live in home.
    b. Generally dryer usage must be 7 loads a week or greater.
    c. Natural gas must currently be in use in the home, with cost-effective availability of gas lines and venting.

2. Procedures
    a. The purpose of this measure is to reduce a household's energy costs. It is important to make clear to the household that the program is not a repair service.
    b. The Contractor must discuss conversion with household and verify their interest.
    c. Dryers that are installed through the program must have a sensor that turns off the dryer automatically when clothes are dry.
    d. The Contractor must evaluate the appropriateness of installation:
        vii. Location must allow dryer to be vented to the outside without an extensive dryer duct run.
        viii. Natural gas must be available to the location where the dryer is to be replaced.
        ix. If there are indications that the house is very tight, adding another combustion appliance may not be advisable. In these cases, Contractor should contact the Program Implementer and discuss the option of blower-door testing to ensure safe installation.
    e. Dryer installations must include aluminum vent ducts (not vinyl).
    f. CAZ and gas leak testing must be completed as required by BPI.

Other Electric Reduction Measures

1. In evaluating options for reducing energy use, it is important that the Contractor review household usage patterns to identify additional measures. Some examples are as follows:
    a. Opportunity to reduce or eliminate electric space heater use by enhancing or repairing the main heating system's distribution system, air sealing or insulating. NOTE: Use of electric space heaters may not be noted on the household's appliance sheet since households are sometimes reluctant to admit that they use them.
    b. Programmable thermostats may be installed on ER jobs in homes heated by electricity.
    c. A motion sensor light or time for a high-wattage outdoor light that is currently left on all night.
    d. Repairs to well pump systems that cycle continuously due to a leak in the system.
    e. Heat tape that runs continuously.
    f. Leaking hot water pipes or faucets.
    g. Occasionally, a Contractor may encounter a home that has been converted from a two family to a one family, but still retains two meters and two accounts. This means that the household is paying two basic service charges instead of one, and probably a higher overall cost per kWh than if the whole house was on one meter. In these situations, Contractor should explore the option of switching the house to one set of meters.
    h. Provide timers for TVs or other appliances left to run continuously.

2. All such measures must be reviewed and discussed with the Program Implementer.