Energy Efficiency for the Residential Sector

October 2014

The Residential Sector team strives to deliver program infrastructure and measures to meet the needs of BPA’s customer utilities and support residential energy efficiency activity in the Pacific Northwest. The residential sector includes a wide range of deemed measures in addition to building on regional collaboration and cross-agency opportunities.

This brochure is one way BPA works to help keep our customer utilities informed. Please visit the BPA Residential Energy Efficiency website for more detail and the BPA Implementation Manual for full measure specifications and documentation requirements.

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What’s new? What’s in the works? October 2014

BPA is always engaged in efforts to identify, assess and develop new opportunities from emerging technologies to new program models or infrastructure needs. Below is a summary of recent updates, changes and newly available resources.

Questions? Please just ask any member of the Residential team or your Energy Efficiency Representative.

Lighting, Showerheads, Appliances and Advanced Power Strips

- The RTF updated the CFL and LED measures. New measures with updated savings are posted to the BPA Residential Lighting webpage. No changes to payment at this time.
- BPA simplified delivery mechanisms for lighting, showerheads and advanced power strips.
- The Simple Steps, Smart Savings regional program is being re-competed with program enhancements requested by utilities. A new program model will be presented to utilities in November and ready for launch by April 2015.
- The Retail Sales Allocation Tool was updated for 2015, including updates for zip codes/household counts provided by utilities, new product categories and more stores.
- BPA is developing midstream/upstream retail appliance measures for April 2015.

Water Heating

- AirGenerate Heat Pump Water Heaters have been removed from the Qualified Products List for performance issues.

PTCS Effective Oct.1, 2014

- Air Source Heat Pumps are eligible as stand-alone measures.
- The PTCS site registry was successfully migrated from www.ptcsnw.com to https://ptcs.bpa.gov.
- PTCS Duct Sealing is eligible as a stand-alone measure.
- The payment for PTCS Duct Sealing was reduced to $200/$250.
- Prescriptive Duct Sealing is now an eligible measure with savings and payment matching PTCS.

Ductless Heat Pumps

- Effective Oct. 1, 2014, a new DHP measure for manufactured homes with zonal electric heat is available.

Weatherization Effective Oct.1, 2014

- All weatherization measures must be installed to the 2014 Residential Weatherization Specifications.
- The definition of electrically heated homes was expanded to include homes without permanently-installed electric heat where additional conditions can be met.
- A new measure for Prescriptive Air Sealing in attics and crawlspace is now available.
- Prescriptive Duct Sealing is now an eligible measure with savings and payment matching PTCS.
- New tools and resources are available on the BPA Residential Weatherization webpage.

Efficient New Homes

- Eight prototype High Performance Manufactured Homes were completed in 2014.
- New measures for NW Energy Star Homes for WA will be provided April 2015.
Appliances

Program Description
Many utilities have had years of successful program activity with ENERGY STAR® appliances. However, as ENERGY STAR standards rise and rebate amounts decrease, there is a need to create new program models that can reduce program delivery costs while still delivering value.

Target Customers and Benefits
ENERGY STAR appliances use less energy and water than standard appliances and have additional features. Key target customer groups include those seeking new appliances to replace an old or non-functioning appliance, those actively seeking efficient alternatives, and new home buyers.

Program Updates and Changes
- BPA expanded the Retail Sales Allocation Tool (RSAT) to facilitate bringing appliances into midstream programs to minimize customer documentation requirements.
- Work is underway to develop new program opportunities through Simple Steps, Smart Savings. Contact your EER for more information.

Program Delivery
BPA supports utility-run appliance offerings in the following ways:
- Track upcoming changes in ENERGY STAR Appliance specifications
- Maintain Total Resource Cost effective (TRC) measures with BPA payment
- Provide access to regional marketing opportunities
- Maintain Qualified Products Lists on the BPA Appliance webpage and archived

Program Resources
Please see the BPA Appliance webpage for documents listed below.
- ENERGY STAR Clothes Washers Qualified Product List
- CEE Clothes Washer Qualified Product List (with Tiers)
- ENERGY STAR Refrigerators Qualified Product List
- CEE Refrigerator Qualified Product List (with Tiers)
- ENERGY STAR Freezers Qualified Product List

Marketing Resources
There are currently no marketing resources for this measure.

Program Contacts
For more information please contact David Murphy, Appliance and Lighting Program Manager at demurphy@bpa.gov.
Consumer Electronics

Program Description
Reducing plug loads from consumer electronics emerged as a new priority in 2008. In 2009, NEEA partnered with California utilities to identify and maximize upstream opportunities to promote more efficient televisions, leveraging manufacturer and retail resources to transform the efficient television market. As of March 2014, NEEA believes the television market has been transformed and is moving this initiative into the Long-Term Monitoring and Tracking phase of NEEA’s Initiative Lifecycle process.

Currently BPA supports a measure for Advanced Power Strips to help reduce energy waste in home entertainment equipment (TVs and peripherals). Additional opportunities for reducing energy consumption in consumer electronics are emerging.

Target Customers and Benefits
According to the Consumer Electronics Association, the average household owns 24 electronic products and this product segment may be responsible for as much as 15 percent of household electrical use. ENERGY STAR® labels can be found on a wide range of audio/visual equipment including TVs, soundbars, receivers, DVD and Blu-ray disc players. ENERGY STAR qualified set-top boxes are about 45 percent more efficient than conventional models.

Program Updates and Changes
• NEEA has moved their Television Initiative into the Long-Term Monitoring and Tracking phase of NEEA’s Initiative Lifecycle process
• BPA offers a measure for Advanced Power Strips targeting home entertainment centers
• Additional research is underway for new energy savings opportunities

Program Contacts
For more information please contact David Murphy, Appliance and Lighting Program Manager at demurphy@bpa.gov.
Lighting

Program Description
BPA works to ensure the Regional Technical Forum (RTF) is using the most accurate inputs for lighting savings and to assess the impacts of the Energy Independence and Security Act of 2007 (EISA). BPA also provides regional coordination of efficient lighting programs through the Simple Steps, Smart Savings™ program in collaboration with northwest public and investor-owned utilities.

Target Customers and Benefits
CFLs and LEDs use about 75% less energy than incandescents or halogen bulbs and produce much less heat, making them safer to operate. CFLs can last at least six times longer and LEDs can last more than ten times longer than an incandescent bulb. Target customers include all consumers, but particularly those with hard-to-reach lighting fixtures and consumers seeking efficient options.

Program Updates and Changes
• Effective Apr. 1, 2014, LEDs on the Lighting Design Lab LED lamp list became eligible for BPA payment.
• To improve the accuracy of lighting/showerhead allocations, BPA has updated the allocations for Simple Steps, Smart Savings using the Retail Sales Allocation Tool.
• Effective Apr. 1, 2015 new measures with updated savings will be available for CFLs and LEDs.

Program Delivery
• BPA maintains measures in a wide array of delivery mechanisms to support utility lighting programs.
• Simple Steps, Smart Savings is primarily a retail program, promoting CFLs, LEDs, fixtures and showerheads through merchandising, in-store education, and incentives. CLEAResult (formerly Fluid Market Strategies) provides regional program coordination for the retail component. Participating customers receive credit for savings achieved in their service territory. Customers may participate by either signing a contract directly with CLEAResult or by allocating ECA funds to the promotion through BPA.
• Simple Steps, Smart Savings also includes services for direct install, direct mail, and bulk purchasing of products to support utility programs interested in these other delivery mechanisms.

Lighting Facts Per Bulb

<table>
<thead>
<tr>
<th>Brightness</th>
<th>800 lumens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy Used</td>
<td>14 watts</td>
</tr>
</tbody>
</table>

Estimated Yearly Energy Cost $1.57
Based on 3 hrs/day, 11¢/kWh
Cost depends on rates and use

Life/Year 5.5 Years
Based on 3 hrs/day

Light Appearance
- Warm
- Cool 2,700 K

Contains Mercury
For more on cleanup and safe disposal, visit epa.gov/cfl
Program Resources

Please see the BPA Lighting webpage for documents listed below.

- Residential products promotion FAQs for utilities
- Simple Steps, Smart Savings™ partner site for utilities at www.partner.SimpleStepsNW.com
- ENERGY STAR® Lighting web page

Marketing Resources

- Materials can be found on the program website at www.SimpleStepsNW.com.
- EISA Messaging and Copy Library are available from your EER.

Program Contacts

For more information please contact David Murphy, Appliance and Lighting Program Manager at demurphy@bpa.gov.
Performance Tested Comfort Systems® (PTCS)

Program Description

Performance Tested Comfort Systems (PTCS) is a regional program designed to ensure that ducted heat pumps deliver the greatest energy savings and comfort possible. PTCS certified heat pump technicians install high efficiency heat pumps and address proper sizing, advanced controls and commissioning. PTCS and Prescriptive Duct Sealing identify leaks in a duct system and seals them with durable materials. Installations may be in single family new or existing construction, or existing manufactured homes with electric or non-electric auxiliary heating systems, as long as the electric heat pump is the primary heating system. To be considered a PTCS certified project, the work must be performed by a PTCS certified technician and must be entered into the PTCS online registry.

Target Customers and Benefits

The key target customers are seeking a replacement heating system or an upgrade to a more efficient system. Customer benefits of PTCS include:

- Reduced energy waste by as much as 20%
- Increased year-round comfort
- Improved air quality and reduction of air quality issues
- High quality of services provided by PTCS certified installers

Program Updates and Changes Effective Oct. 1, 2014

- Air Source Heat Pumps and Duct Sealing will be eligible as stand-alone measures
- PTCS Air Source Heat Pumps must be installed according to the “Air Source Heat Pump Installation Specification” dated June 11, 2013 (available in the Document Library online)
- The PTCS site registry web address will change from www.ptcsnw.com to https://ptcs.bpa.gov.
- PTCS duct sealing payment was reduced to $200 (manuf.) and $250 (new or existing single family)
- New measures for Prescriptive Duct Sealing are now available with savings/payment matching PTCS

Program Delivery

BPA supports utility-run PTCS heat pump and duct sealing programs in the following ways:

- Maintains Total Resource Cost (TRC) effective measures with BPA reimbursement
- Provides access to current specifications, lists of trained technician and trainers, and forms
- Maintains the PTCS online registry for measure tracking and compliance
- Coordinates Quality Assurance oversight for participating BPA utilities
- BPA will reimburse qualifying utilities on PTCS Quality Assurance programs. For more information please contact your EER.
Program Resources

Please see the BPA PTCS webpage for resources listed below.

- Fact Sheets and FAQs
- Lists of approved technicians and trainers
- Installation specifications
- Forms
- Instructions for entering projects into the PTCS Site Registry
- Equipment and technical reference materials

Marketing Resources

BPA provides customizable marketing templates for this measure category available at http://www.bpa.gov/energy/n/residential/Marketing_Toolkit/

Additional incentives

Oregon Department of Energy
http://www.oregon.gov/ENERGY/RESIDENTIAL/Pages/residential_energy_tax_credits.aspx

Additional state incentives may be found at http://dsireusa.org/

Program Contacts

For more information please contact the PTCS team at ResHVAC@bpa.gov or call toll free 1-800-941-3867.
Ductless Heat Pumps

Program Description
Ductless Heat Pumps (DHP) are inverter-driven, variable-speed systems that can ramp up or down to meet the heating or cooling needs of the home, even when outdoor temperatures fall below 0° F. Since DHPs do not distribute heating or cooling through ducting, a duct system is not required. Installation is relatively easy, with only a three-inch hole in the exterior wall to connect the indoor and outdoor components.

Target Customers and Benefits
DHPs are ideal for homes that have zonal electric heating systems or electric forced air furnaces. A ductless heat pump can work as the primary or supplemental heating system, calling the existing system into service less frequently.

Ductless heat pumps provide a range of benefits:

- Reduces energy use by 25-50% compared to electric resistance heat
- Comes standard with cooling functionality for year-round comfort
- Uses ultra quiet fans, eliminating noise common to other HVAC
- Has built-in air filters that results in improved indoor air quality
- Provides even, consistent heat, eliminating hot and cold spots common to baseboard heaters
- Are easy to install with minimal disruption to the home

Program Updates and Changes

Effective Oct. 1, 2014
- DHP measures for manufactured homes with zonal electric heat or plug in heaters as the primary source of heat were added.
Program Delivery
BPA supports utility-run ductless heat pump programs in the following ways:

- Conducts engineering analysis to determine new applications for technology
- Maintains Total Resource Cost (TRC) effective measures with BPA reimbursement
- Maintains and provides Qualified Products Lists for DHP
- Coordinates with the NEEA to provide contractor support and quality assurance

Program Resources
Please see the BPA DHP webpage for resources listed below.

- Links to the NW Ductless Heat Pump Project at http://goingductless.com/partners
- Qualified contractor list
- Qualified Products List
- DHP Installation forms

Marketing Resources
BPA provides customizable marketing templates for this measure category available at http://www.bpa.gov/energy/n/residential/Marketing_Toolkit/

NEEA provides customizable marketing templates on the NW Ductless Project Partner website at http://goingductless.com/partners

Program Contacts
For more information please contact Mark Johnson, DHP Program Manager at mejohnson@bpa.gov or 503-230-7669.
Weatherization

Program Description
Residential weatherization has been a key energy efficiency program for utilities for decades in the Pacific Northwest, providing durable energy savings often lasting the life of a home. Weatherization refers to the set of residential measures aimed at improving the thermal envelope and reducing unintended air leakage, improving the overall energy performance of a home.

Weatherization measures include:
- Attic, floor and wall insulation and prescriptive air sealing
- Prime window replacement (includes windows and patio doors)
- Insulated exterior doors
- Duct sealing (PTCS and Prescriptive)
- Whole House Air Sealing

Target Customers and Benefits
Key target customers are those with high energy bills or drafty, uncomfortable homes. Customer benefits include:
- Increased comfort, elimination of drafts and more even distribution of heating/cooling
- Lower energy bills
- Reduced infiltration of outdoor noise
- Better indoor air quality from improved ventilation and controlling humidity

Program Updates and Changes
Effective Oct. 1, 2014
- All weatherization measures must be installed to the 2014 Residential Weatherization Specifications.
- The definition of electrically heated homes was expanded to include homes without permanently-installed electric heat where additional conditions can be met.
- A new measure for Prescriptive Air Sealing in attics and crawlspaces is now available.
- Prescriptive Duct Sealing is now an eligible measure with savings and payment matching PTCS.
- New tools and resources are available on the BPA Residential Weatherization webpage.

The definition of electric heat has been expanded to accommodate specific situations. The new definition includes homes that are likely to be electrically heated in the future and homes that are heated by a non-permanent electric heat source. The expanded definition allows utilities to have more flexibility to accept or exclude certain homes.
Prescriptive Air Sealing is a new measure for attics and crawlspaces in single family homes. Instead of using a blower door, contractors follow a checklist of required sealing locations and requirements. Payment is based on the square footage of area sealed. Prescriptive Air Sealing is expected to be paired with attic and floor insulation measures. The Whole House Air Sealing measure is not affected.

Prescriptive Duct Sealing is a new measure available on October 1st, 2014. Contractors will perform activities similar to PTCS Duct Sealing, using mastic, sheet metal screws, and compression straps to secure and seal all accessible ducts, but with no requirement for a pre- or post-leakage test. Contractors must attend the online Prescriptive Duct Sealing orientation and projects must be entered into the online registry, and are subject to the same quality control requirements as PTCS duct sealing.

Program Delivery

BPA supports utility-run weatherization programs in the following ways:

- Maintains Total Resource Cost (TRC) effective measures with BPA reimbursement
- Develops program tools and resources to support utility weatherization programs

Program Resources

Please see the BPA Residential Weatherization webpage for resources listed below.

- The 2014 BPA Residential Weatherization Specifications
- The Residential Weatherization Best Practices Field Guide
- On-line trainings available at www.WxTrainingNW.com including:
  - Attic Insulation Preparation and Installation
  - Prescriptive Air Sealing
  - Wall, Underfloor, and Sloped Roof Insulation
  - Ventilation, Moisture, and Indoor Air Quality (IAQ)
  - Rigid and Spray Foam, Application Details
  - Prescriptive Duct Sealing
  - Window and Patio Door Selection and Installation
  - Sales Skills for Contractors
- Field Tools for contractors and utility staff, including:
  - Checklists
  - Passive attic ventilation calculator
  - Mechanical ventilation calculator
  - Sales communication tools
  - Indoor air quality pamphlet

Marketing Resources

BPA provides customizable marketing templates for weatherization, available at http://www.bpa.gov/energy/n/residential/Marketing_Toolkit/

Additional incentives

Additional state incentives may be found at http://dsireusa.org/

Program Contacts

For more information please contact Courtney Dale, Residential Weatherization Program Support at crdale@bpa.gov or call 503-230-3640, or Sarah F. Moore, Residential Sector Lead.
Heat Pump Water Heaters

Program Description
Heat Pump Water Heaters (HPWH) are as much as 50% more efficient than an electric storage water heater by using a heat pump to extract heat from supply air and transferring it at a higher temperature into the storage tank to heat the water.

Target Customers and Benefits
Target customers include consumers seeking to replace an old or non-functioning water heater, consumers actively seeking efficient alternatives, and new home buyers. HPWHs include features such as user-friendly digital temperature controls with vacation settings and options for operating modes and dehumidification of the area where the unit is installed.

Program Updates and Changes
- NEEA’s Smart Water Heat Initiative sponsors manufacturer and retail promotions. More information is available at http://smartwaterheat.org/partners/heat-pump-water-heaterutilities/upcoming-retail-promotions

Program Delivery
BPA supports utility-run water heater programs in the following ways:
- Collects data to move the measure from Provisional to Proven UES measure status at the RTF
- Tracks upcoming changes in Federal Standards of water heater efficiency
- Maintain Total Resource Cost (TRC) effective measures with BPA reimbursement
- Provide access to Qualified Products Lists and regional marketing opportunities

Program Resources
Please see the BPA Residential Heat Pump Water Heater webpage for resources listed below.
- Qualified Products Lists
- HPWH measure forms
- Links to manufacturer trainings

The information provided in these materials is meant to provide an broad overview of project resources and components. Refer to the Energy Efficiency Implementation Manual for a complete description of measures, incentives, specifications and requirements.
Marketing Resources
BPA provides customizable marketing templates for HPWHs, available at http://www.bpa.gov/energy/n/residential/Marketing_Toolkit/

Additional incentives
Additional federal and state incentives may be found at http://dsireusa.org/.

Program Contacts
For more information please contact David Murphy, Appliance and Lighting Program Manager at demurphy@bpa.gov.
Electric Storage Water Heaters

Program Description
While electric storage water heaters are a basic technology, there are still more efficient models within this product category that use less energy to heat water. Inefficient water heaters waste energy either through poor storage tank insulation or inefficient heating elements.

Target Customers and Benefits
A water heater that is more than ten years old is much less efficient than a current model and is a prime candidate for replacement. A high efficiency model will reduce energy waste and installing a new, efficient storage water heater is fast and easy. Key target customer groups include those seeking new appliances to replace an old or non-functioning appliance, those actively seeking efficient alternatives, and new home buyers.

Program Delivery
BPA supports utility-run water heater programs in the following ways:

- Tracks upcoming changes in Federal Standards of water heater efficiency
- Maintains Total Resource Cost (TRC) effective measures with BPA reimbursement
- Provides access to Qualified Products Lists and regional marketing opportunities

Program Resources
Please see the BPA Electric Storage Water Heater webpage for documents listed below.

- Electric Storage Water Heaters Qualified Product List (from AHRI)

Marketing Resources
BPA provides customizable marketing templates for water heaters, available at http://www.bpa.gov/energy/n/residential/Marketing_Toolkit/

Program Contacts
For more information please contact David Murphy, Appliance and Lighting Program Manager at demurphy@bpa.gov.
Showerheads

Program Description
Energy-saving showerheads save electricity by reducing the amount of water used and decreasing the amount of energy needed to heat the water. Energy-efficient showerheads have an output of 2.0 gallons per minute or less.

Target Customers and Benefits
Today’s showerheads are efficient without compromising on comfort and come in a wide range of styles. Using an efficient showerhead works with the water heater helping the existing supply of hot water last longer. Target customers include shoppers replacing showerheads or actively seeking efficient alternatives.

Program Updates and Changes
BPA has developed new retail point-of-purchase materials to raise awareness with shoppers on the range of energy-saving showerhead functions and styles available at www.partner.SimpleStepsNW.com

Program Delivery
BPA supports utility-run showerhead programs and a midstream retail markdown through the Simple Steps, Smart Savings promotion, implemented by CLEAResult.

Showerhead delivery options include retail markdown, mail by request, direct install or over-the-counter. Participating customers receive credit for savings achieved in their service territory. Customers may participate by either signing a contract directly with CLEAResult or by allocating ECA funds to the promotion through BPA.

Program Resources
Please see the BPA Showerhead webpage for documents listed below.

- Showerhead installation instructions

Marketing Resources
Materials supporting the Simple Steps, Smart Savings delivery channels can be found on the program partner webpages at http://partner.simplestepsnw.com/

Program Contacts
For more information please contact David Murphy, Appliance and Lighting Program Manager at demurphy@bpa.gov.
Energy Efficient New Home Construction

Program Description
BPA supports Energy Efficient New Homes in different shapes and sizes, from manufactured homes to site-built, single-family homes to multifamily construction.

Target Customer and Benefits

Manufactured Homes/NEEM: The Northwest Energy Efficient Manufactured (NEEM) home program includes in-factory quality assurance and tracking of NEEM-certified homes in the NEEM database. BPA supports this program, delivered by Northwest Energy Works (NEW).

Single family Homes: The Northwest ENERGY STAR® Homes program is a regional initiative to promote the construction of energy efficient homes using guidelines provided by the Environmental Protection Agency. Both ENERGY STAR and Built Green standards qualify. NEEA funds this program, delivered by CLEAResult.

Multifamily Homes: New residential multifamily construction can be made more efficient than code by following the NW ENERGY STAR Multifamily New Construction Specification. NEEA funds this program, delivered by CLEAResult.

Program Updates and Changes
• Eight High Performance Manufactured Home prototypes were constructed in 2014 to help factories learn how to re-tool their production lines for these new models
• Updated NW Energy Star Homes measures for Washington are expected by Apr. 1. 2015

Program Delivery
BPA supports utility-run new construction programs in the following ways:
• Maintains Total Resource Cost (TRC) effective measures with BPA reimbursement
• Conducts research and in-field testing of new building technologies and specifications

Program Resources
Please see the BPA Efficient Homes webpage for the resources listed below.
• Links to the Northwest Energy Efficient Manufactured Homes (NEEM) program
• Links to NW ENERGY STAR® Homes
• NW ENERGY STAR Multifamily New Construction Specification

Marketing Resources
Program marketing resources are available through www.EnergyStar.gov and NW ENERGY STAR Homes at www.northwestenergystar.com/

Program Contacts
For more information please contact Mark Johnson, New Homes Program Manager at mejohnson@bpa.gov or 503-230-7669.
Residential Marketing Toolkit

To help utilities and their trade allies reach out to customers, BPA has created a suite of marketing materials to promote residential energy efficiency upgrades including bill inserts, one sheets, advertisements, and HTML email templates. Customers can customize these tools to fit their needs. The BPA Residential Marketing Toolkit is located here: http://www.bpa.gov/energy/n/residential/Marketing_Toolkit/.

Please contact your Energy Efficiency Representative if you need any assistance.