BONNEVILLE POWER ADMINISTRATION

2020-2021

Implementation Manual

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Measure information effective Oct. 1, 2020.

TABLE OF CONTENTS

October 2019 Changes and Corrections Summary . . . . . **VI**

Rate Period Implementation Manual Revision Timeline . . . . . **XXX**

Definitions . . . . . **XXXI**

Section 1: Introduction **1**
1 Overview 1
1.2 Reliability 1
1.3 Cost Effectiveness 2
1.4 Payment 2
1.5 Policy for Measure Changes/Additions 3
1.6 Official Interpretations 3

Section 2: BPA Funding **4**
2.1 BPA Funding 4
2.1.1 Bilateral Funding 4
2.1.2 Rules for Pooling Organizations 5
2.1.3 Performance Payments 6
2.2 Funding Sources and Savings Allocation 8

Section 3: General Requirements **9**
3.1 Documentation Requirements 9
3.2 Reporting Requirements 9
3.3 Oversight and Evaluation Review Process 10
3.4 Third-Party-Operated Program Requirements 11

Section 4: Custom Projects **12**
4.1 Custom Projects Payment Rate 12
4.2 Custom Projects Special Funding 14
4.2.1 Progress Payments 14
4.3 Custom Projects Overview 14
4.3.1 Custom Projects Process Option Overview and Enrollment 14
4.3.2 Custom Projects General Requirements 15
4.4 Option 1 Custom Projects 16
4.4.1 Custom Project Proposal 16
4.4.2 Custom Project Completion Report 16
4.4.3 BPA Review 17
4.5 Option 2 Custom Projects 17
4.6 Custom Projects Documentation Requirements 18

Section 5: Custom Programs **19**
5.1 Custom Programs Payment Rate 19
5.2 Custom Programs Requirements 20
5.3 Custom Programs Approval and Modification Process 20
5.4 Custom Programs Documentation and Reporting Requirements 21

Section 6: Agricultural Sector 23
6.1 Payment Summary 23
6.2 Freeze Resistant Stock Water Tanks/Fountains 24
6.3 Thermostatically Controlled Outlets 25
6.4 Thermostatically Controlled Stock Tank De-icers 26
6.5 Transformer De-Energization 26
6.6 Irrigation Measures 27
6.6.1 Irrigation System Conversion: LESA/LEPA/MDI 27
6.6.2 Sprinkler Package Replacement 28
6.6.3 Irrigation System Conversion: MESA 28
6.6.4 Irrigation Hardware 29
6.7 Agricultural Pumps and VFDs 31
6.7.1 Irrigation Pump Testing and System Analysis (BPA-Qualified) 31
6.7.2 Variable Frequency Drive for Centrifugal Agricultural Pumps (BPA-Qualified) 32
6.7.3 Variable Frequency Drive for New Agricultural Pump Installations (BPA-Qualified) 33
6.7.4 Variable Frequency Drives in Agricultural Turbine Pump Applications (BPA-Qualified) 34
6.7.5 Agricultural New Pump Efficiency Upgrade (BPA-Qualified) 35
6.8 New Agricultural Construction 36
6.9 Other Agricultural Measures 36

Section 7: Commercial Sector 37
7.1 Payment Summary 37
7.2 Commercial Custom Projects - Retrofits and New Construction 39
7.3 Nonresidential Lighting 39
7.4 Commercial HVAC 44
7.4.1 Advanced Rooftop Unit Control (ARC) 44
7.4.2 Connected Thermostat 45
7.4.3 Ductless Heat Pump Retrofit and Upgrade (BPA-Qualified) 48
7.4.4 Air-Source Heat Pump Retrofit and Upgrade (BPA-Qualified) 50
7.4.5 Variable Refrigerant Flow System Retrofit (BPA-Qualified) 52
7.4.6 Variable Frequency Drive on Air Handling Unit Fan (VFD on AHU Fan) (BPA-Qualified) 54
7.5 Commercial Shell Measures 55
7.5.1 Commercial Insulation 55
7.5.2 Commercial Windows (BPA-Qualified) 56
7.6 Commercial Refrigeration 57
7.6.1 Anti-Sweat Heater (ASH) Controls 57
7.6.2 Walk-In or Display Case Evaporator Fan Motor – Shaded Pole to Electronically Commutated Motor (ECM) 58
7.6.3 Strip Curtains for Walk-In Coolers and Freezers 58
7.7 Commercial Kitchen and Food Service Equipment 60
7.7.1 Demand Controlled Kitchen Ventilation (BPA-Qualified) 60
7.7.2 Electric Commercial Steam Cookers 61
7.7.3 Hot Food Holding Cabinets 61
7.7.4 Electric Combination Ovens 62
7.7.5 Electric Convection Ovens 63
7.7.6 Commercial Electric Fryers 64
7.7.7 Pre-Rinse Spray Valves 65
7.8 Additional UES Offerings 66
7.8.1 ENERGY STAR Commercial Clothes Washers 66
7.8.2 Smart Power Strips 67
7.8.3 Commercial Showerheads 68
7.8.4 Generator Block Heaters (BPA-Qualified) 68
7.8.5 Vehicle Engine Block Heater Controls 69

Section 8: Federal Sector 71

Section 9: Industrial Sector 72
9.1 Payment Summary 72
9.2 Energy Smart Industrial 73
9.2.1 Energy Management: Energy Project Manager (Optional ESI Component) 74
9.2.2 Strategic Energy Management: Strategic Energy Management Projects (Optional ESI Component) 77
9.2.3 Industrial Custom Projects (Optional ESI Component): 80
9.2.4 Small Industrial Projects (Optional ESI Component) 81
9.2.5 BPA-Funded Technical Service Providers (Optional ESI Component) 81
9.3 Variable Frequency Drives (VFD) for Fans in Potato and Onion Storage Facilities 82
9.4 Small Compressed Air Systems 82
9.5 High Frequency Battery Charger Upgrade (BPA-Qualified) 83
9.6 Welder Upgrade (BPA-Qualified) 84
9.7 Water System Leak Abatement (BPA-Qualified) 85

Section 10: Residential Sector 87
10.1 Payment Summary 87
10.2 Lighting 89
10.2.1 ENERGY STAR Solid-State Lighting/Light-Emitting Diodes Lamps and Fixtures 89
10.2.2 TLEDs 92
10.3 Advanced Power Strips 93
10.3.1 Advanced Power Strips — Load Sensing (Home Entertainment Centers) 93
10.3.2 Advanced Power Strips — Infrared Sensing (Home Entertainment Centers) 94
10.3.3 Advanced Power Strips — PC Interaction Sensing (Personal Desktop Computers) 96
10.4 Appliances 98
10.5 Electric Water Heating 100
10.5.1 Showerheads 100
10.5.2 Thermostatic Shut-Off Valves (TSV) 101
10.5.3 Aerators 103
10.5.4 Unitary Heat Pump Water Heater 104
10.5.5 Split-System Heat Pump Water Heater 105
10.5.6 Pipe Insulation - Short and Whole House (BPA-Qualified) 106
~~10.6 BPA Simple Steps Smart Savings Retail Promotion . . . . . 107~~
10.6.1 Energy Saver Kits 109
10.7 Heating, Ventilation, Air Conditioning (HVAC) 112
10.7.1 Ductless and Ducted Mini-Split Heat Pumps 112
10.7.1.1 Ductless and Ducted Mini-Split Heat Pumps 112
10.7.1.2 Ductless Heat Pump Upgrade 114
10.7.2 HVAC — PTCS 116
10.7.2.1 PTCS Air Source Heat Pumps 116
10.7.2.2 PTCS Variable Speed Air Source Heat Pumps 119
10.7.2.3 PTCS Commissioning Controls and Sizing 122
10.7.2.4 PTCS Ground Source Heat Pumps 125
10.7.2.5 PTCS Duct Sealing 128
10.7.3 Prescriptive Duct Sealing 130
10.7.4 Air Source Heat Pump Conversion from Electric Forced-Air Furnace to Air Source Heat Pump (without PTCS) 132
10.7.5 Air Source Heat Pump Conversion from Electric Forced-Air Furnace to Variable Speed Air Source Heat Pump (without PTCS) 134
10.8 Thermostats 137
10.8.1 Line-Voltage Thermostats 137
10.8.2 Advanced Smart Thermostats (BPA-Qualified) 138
10.9 New Construction 140

10.9.1 New Northwest Energy Efficient Manufactured Housing (NEEM) . . . 140
10.9.2 Replacement of Pre-1976 Manufactured Home With New Northwest Energy Efficient Manufactured Housing (NEEM) Certified Home . . . 141
10.9.3 Single-Family New Construction Performance Path . . . 142
10.9.4 Montana House (v 2.0) . . . 144
10.9.5 BPA Energy Efficient New Multifamily Construction (BPA-Qualified) . . . 146
10.9.6 BPA Zero Energy Ready New Multifamily Construction (BPA-Qualified) . . . 147
10.10 Weatherization (Standard Income) . . . 149
10.10.1 Insulation . . . 150
10.10.2 Prime Window and Patio Door Replacement . . . 152
10.10.3 Low-E Storm Windows . . . 155
10.10.4 Exterior Insulated Doors (BPA-Qualified) . . . 156
10.10.5 Whole House Air Sealing and Testing . . . 157
10.10.6 Prescriptive Air Sealing . . . 158
10.10.7 Low-Income Energy Efficiency Measures . . . 158
10.11 Residential Custom Projects . . . 162

Section 11: Utility Distribution Sector . . . 163

Section 12: Multisector . . . 164
12.1 Payment Summary . . . 164
12.2 Processes . . . 164
12.2.1 COTR Request and Acknowledgment Procedure . . . 164
12.2.2 Measure Distribution Processes . . . 164
12.3 Multisector Measures and Initiatives . . . 166
12.3.1 Eligible Multisector Measure . . . 166
12.3.2 Green Motors Rewind Initiative . . . 166
12.3.3 Limited-Availability Emerging Technology Field Test Projects . . . 167

Section 13: Updates and Revisions . . . 168
13.1 Updates and Revisions Tables . . . 168
13.1.1 October 1, 2020 Updates and Revisions . . . 168
13.1.2 July 1, 2020 Off-cycle Updates and Revisions . . . 170
13.1.3 April 1, 2020 Updates and Revisions . . . 171
13.2 New Measures . . . 173
13.2.1 Agriculture . . . 173
13.2.2 Commercial . . . 173
13.2.2.1 Commercial Packaged Terminal Heat Pump (BPA Qualified) . . . 173
13.2.2.2 Commercial Heat Pump Water Heaters . . . 174
13.2.3 Industrial . . . 175
13.2.4 Utility Distribution . . . 175
13.2.4.1 Re-conductor & Transformer (RT) Calculator . . . 175
13.2.5 Residential . . . 176
13.2.5.1 Level 2 Electric Vehicle Chargers . . . 176
13.2.5.2 Behavioral Home Energy Reports (BPA Qualified) . . . 178
13.2.5.3 Duct Insulation . . . 179
13.2.5.4 Centrally Ducted Air Conditioners . . . 180
13.2.5.5 Residential Packaged Terminal Heat Pump (BPA Qualified) . . . 181
13.2.6 Multi-Sector . . . 182
13.3 Energy Efficiency Promotion Payment Rates . . . 182

Changes and Corrections Summary for the 2020-2021 Implementation Manual

The following changes are effective Oct. 1, 2019.

EFFECTIVE DATE (POSTED DATE)	LOCATION	DESCRIPTION	RATIONALE
General			
October 2019	0.0	Manufactured Home. A dwelling that is transportable in one or more sections, is built on a permanent chassis (with or without a permanent foundation), and its wheels are removed when it is set up on-site. This definition does not include travel trailers. A new manufactured home once sited with an occupancy permit qualifies for existing manufactured home incentives, but also qualifies for new manufactured home incentives (see NEEM 10.9.1) if the occupant is the first home occupant.	The definition has been modified to clarify that a new manufactured home is treated as an existing manufactured home once it is sited for occupancy.
October 2019	0.0	Third-party implementers are companies that BPA has contracted with to support acquisition of energy efficiency services and savings for BPA and BPA Customers. Third-party implementers are sometimes referred to as "program vendors" or Contractors.	Added a definition for Third-party operated programs to describe these companies.
October 2019	0.1	SEM Annual Savings Achieved is the verified incremental savings measured in each year of a two year performance period. • In Year 1 of the first performance period, or after the re-establishment of the SEM Baseline, it is measured as all savings achieved above the SEM Baseline. • In Year 2 of any performance period, it is measured as the savings achieved over the savings achieved in Year 1 of the performance period. • In Year 1 of subsequent performance periods (as a result of re-enrollment), it is measured as all savings achieved above Year 2 of the previous performance period. • Should there be zero or negative savings verified from prior year, SEM Annual Savings Achieved is zero. SEM Annual Savings Achieved is used to determine allowable Performance Payment.	Added definition to clarify the operation and reporting of the industrial SEM program
October 2019	0.2	SEM Baseline is the energy use established prior to enrollment in a SEM program. SEM Baseline can be reestablished after a significant operational change or at customer request as outlined in the ESI MT&R Reference Guide. Re-enrollment in additional two year performance periods resets the reference point for the purposes of calculating savings and payment, but does not change the SEM Baseline.	Added definition to clarify the operation and reporting of the industrial SEM program

EFFECTIVE DATE (POSTED DATE)	LOCATION	DESCRIPTION	RATIONALE
October 2019	0.3	Verified annual energy savings measured from establishment of SEM Baseline to current performance period year. SEM Cumulative Verified Savings is not used by BPA to calculate reportable savings or any payment, but will be provided to customers for their own reporting purposes.	Added definition to clarify the operation and reporting of the industrial SEM program
October 2019	0.4	SEM Participation Payment is the EEI payment made during each year of an SEM Performance Period. Payment is based on SEM Verified Savings.	Added definition to clarify the operation and reporting of the industrial SEM program
October 2019	0.5	Verified total energy savings measured from the start of the current performance period. SEM Verified Savings are calculated at the end of Year 1 and at the end of Year 2. • In Year 1 of the first performance period, it is measured as all savings achieved above the SEM Baseline. • In Year 2 of any performance period, it is measured as the savings achieved in Year 1 and adjusted for any additional savings achieved in Year 2. • In Year 1 of subsequent performance periods (as a result of re-enrollment), it is measured as all savings achieved above Year 2 of the previous performance period. • Should there be zero or negative savings verified from the start of the performance period, SEM Verified Savings achieved is zero. SEM Verified Savings is used to determine EEI incentive payment	Added definition to clarify the operation and reporting of the industrial SEM program
Funding			
October 2019	2.1.3	Added clarification that any performance payments claimed on savings achieved in Industrial SEM Programs would be based on SEM Annual Savings Achieved (i.e., incremental savings).	Provided clarification to reflect program intent.
October 2019	2.2	Effective Oct. 1, 2019, customers may no longer submit non-reportable savings in the same submission as reportable savings. Customers may continue to submit non-reportable savings to BPA in a separate submission.	This change increases efficiencies in invoice review and oversight activities.
General Requirements			
October 2019	3.2	The nonresidential lighting and custom project sections have the expiration date for each version of a calculator. Clarifying sentence added to the reporting timeline for measures: "For standard protocol measures, customers must use the calculator in effect at the time of submission."	Added this sentence to clarify that if the completion date is in a previous rate period, the reporting needs to be done on the calculator version in effect on the date of submission.

EFFECTIVE DATE (POSTED DATE)	LOCATION	DESCRIPTION	RATIONALE
October 2019	3.4	Third-Party Operated Program Requirements. This change updates the list of third-party programs: Energy Smart Industrial, Technical Service Providers, Simple Steps, Smart Savings Retail Promotion, PTCS, the Green Motors Rewind Initiative and Trade Ally Network NW.	This change reflects the program removal of Air Northwest and Northwest Trade Ally Network and adds Trade Ally Network NW and PTCS as Third-Party Programs.
Custom Projects			
October 2019	4.1	Payment Summary. Payment rates for select Commercial sector custom projects updated. Increased payment for Commercial HVAC custom projects by 15%; decreased payment for Nonresidential lighting custom projects to ensure consistency with Lighting Calculator 5.0 series.	Updated payment rates to reflect current rate period levels.
October 2019	4.3.1	Custom Projects Process Option Overview and Enrollment: Option 2: Updated language to clarify that implementation assistance is not available unless provided by third-party implementation contractors as part of a program that offers that service (e.g., Cascade Energy through Energy Smart Industrial or the Trade Ally Network NW).	Updated language for clarity and to reflect the third-party program name change from Northwest Trade Ally Network to Trade Ally Network NW.
October 2019	4.3.2	Custom Project General Requirements. The requirements for custom projects have been revised to include Nonresidential Lighting Projects. Note: Lighting projects submitted as custom projects must use a comprehensive M&V plan.	Added language to describe current requirements.
Custom Programs			
October 2019	5.0	Custom programs will be placed on hold for the Rate Period 2020-2021. During this time new submissions will not be accepted, however EE staff will continue to work with customers on existing custom programs.	Program is on hold to allow EE to work with customers and internal staff to evaluate the future of custom programs.
Agricultural Sector			
October 2019	6.0	The agricultural section has been renumbered due to the integration of new measures. These new measures were identified in section 13 of the April 2019 IM.	Renumbered to Integrate new measures, a standard step in IM development at the beginning of a new rate period.
October 2019	6.1	Payment Summary. Updated the table to reflect current measure offerings.	Updated the table to include new measures and changes to payment amounts for existing measures.
October 2019	6.5	Increased the payment for Transformer De-Energization from $0.025 to $0.03 per kWh of busbar savings.	Updated the table to reflect the current rate period payment. The current payment rate creates issues within the IS2.0 reporting system that are very difficult to fix. Increasing the payment eliminates the need for software changes.

EFFECTIVE DATE (POSTED DATE)	LOCATION	DESCRIPTION	RATIONALE
October 2019	6.6.3	New Measure: Irrigation System Conversion to MESA for center pivots and linear move systems	At the March 28, 2018 RTF meeting, the RTF approved significant updates to the Irrigation Hardware UES measure savings methodology, measure applications, savings, and costs. These changes, outlined in an RTF memo dated April 25, 2018, affected savings for most irrigation hardware measures.
October 2019	6.6.4	Irrigation Hardware. Modified the documentation requirements to simplify required information.	This change simplified documentation requirements.
October 2019	6.6.4	Irrigation Hardware. Updated the payment table to reflect current offerings.	Updated the table to reflect current measure offerings.
October 2019	6.6.4	Irrigation Hardware. Expired the following measures: New drop tube for low-pressure pivot sprinklers (minimum three feet length); New, gooseneck elbow for new drop tubes (to convert existing sprinkler equipment mounted on top of the pivot to low-pressure sprinkler package, LEPA or LESA); New multitrajectory sprays that replace impact sprinklers; New multitrajectory sprays that replace low-pressure sprinklers; New multiple configuration nozzles for low-pressure pivot sprinklers; Replace worn nozzle with new flow-controlling type nozzle for impact sprinklers; New nozzle for impact sprinkler, replacing existing worn nozzle of same flow rate or less; New, low-pressure regulators.	Eliminated measures deactivated by the RTF. At the March 28, 2018, RTF meeting, the RTF approved significant updates to the Irrigation Hardware UES measure savings methodology, measure applications, savings, and costs. These changes, outlined in an RTF memo dated April 25, 2018.
October 2019	6.6.4	Irrigation Hardware. Savings and payment decreased for the following measures: New, rotating type sprinklers that replace impact sprinklers; New rotating-type sprinklers that replace low-pressure models; Replace leaking impact sprinkler with rebuilt or new impact sprinkler.	At the March 28, 2018, RTF meeting, the RTF approved significant updates to the Irrigation Hardware UES measure savings methodology, measure applications, savings, and costs. These changes, outlined in an RTF memo dated April 25, 2018, affected savings for most irrigation hardware measures.
October 2019	6.6.4	Irrigation Hardware. Reduced savings for New nozzles for center pivot and lateral moves.	At the March 28, 2018, RTF meeting, the RTF approved significant updates to the Irrigation Hardware UES measure savings methodology, measure applications, savings, and costs. These changes, outlined in an RTF memo dated April 25, 2018, affected savings for most irrigation hardware measures.
October 2019	6.6.4	Irrigation Hardware. Increased the payment for replacing a leaking pipe section and riser cap gaskets or a portable mainline gasket from $2.75 to $4.00.	Increased payment since measure savings justify a higher incentive than was previously offered.
October 2019	6.6.4	Irrigation Hardware. Reduced savings and increased payment for Drain/Drain Gasket.	Increased payment since measure savings justify a higher incentive than was previously offered. At the March 28, 2018, RTF meeting, the RTF approved significant updates to the Irrigation Hardware UES measure savings methodology, measure applications, savings, and costs. These changes, outlined in an RTF memo dated April 25, 2018, affected savings for most irrigation hardware measures.

EFFECTIVE DATE (POSTED DATE)	LOCATION	DESCRIPTION	RATIONALE
October 2019	6.6.4	Irrigation Hardware. Savings will go up and payment increased for the following measures: Replace leaking center pivot base boot gasket with new gasket; Rebuild or replace leaking or malfunctioning leveler with new or rebuilt wheel line leveler; Pipe repair of leaking hand lines, wheel lines and portable mainline.	At the March 28, 2018, RTF meeting, the RTF approved significant updates to the Irrigation Hardware UES measure savings methodology, measure applications, savings, and costs. These changes, outlined in an RTF memo dated April 25, 2018, affected savings for most irrigation hardware measures.
October 2019	6.6.4	Irrigation Hardware. Updated the payment table for section 6.6.4 to include Tower/Span/ Pivot Flex Gaskets	At the March 28, 2018, RTF meeting, the RTF approved significant updates to the Irrigation Hardware UES measure savings methodology, measure applications, savings, and costs. These changes, outlined in an RTF memo dated April 25, 2018, affected savings for most irrigation hardware measures.
October 2019	6.7.4	Increased the payment for Variable Frequency Drives in New Agricultural Pump Installations, (BPA-Qualified) from $60/HP to $80/HP for Turbine pumps.	Updated payment to be consistent with the VFD measures added in October 2018.
Commercial Sector			
October 2019	7.0	Updated Commercial Sector definition for clarity and to reflect building types that align with RTF definitions and the commercial project information forms.	Updated language for clarity
October 2019	7.0	Added clarification regarding multisector applicability. Unless otherwise noted, all Commercial Sector measures are available for the commercial, industrial and agricultural sectors. Utilities shall report these measures as commercial when reporting to BPA.	Updated to clarify measure availability.
October 2019	7.0	Updated Documentation Requirements for Direct Install and By Request measures (7.7.7, 7.8.2, 7.8.3)	Simplifed documentation requirements.
October 2019	7.1	Payment Summary Table. Updating the table to reflect additional multisector offerings.	Updated the table to reflect updated offerings.
October 2019	7.10	Multisector Opportunities. Added three (3) new BPA-Qualified Measures to the list. - Battery Charger Upgrade, BPA-Qualified Measure - Welder Upgrade, BPA-Qualified Measure - Water System Leak Abatement, BPA-Qualified Measure	Updated the list to reflect current rate period offerings.
October 2019	7.3	Nonresidential Lighting. Restructured and renumbered section; updated implementation language to promote consistency and clarity. Updates include: Remove unecessary baseline tables; update Basis for Energy Savings for clarity; add clarification related to nonstandard measures, new construction projects, and 100% calculated projects. Updated “BPA Lighting Team” to “BPA”. Updated specific exterior HID measure explanation and wattage rounding options for clarity. Added clarification regarding Option 2 utility use of the BPA lighting calculator.	Renumbered and restructured this section to clearly and accurately convey implementation requirements.

EFFECTIVE DATE (POSTED DATE)	LOCATION	DESCRIPTION	RATIONALE
October 2019	7.3	Nonresidential Lighting. References to Lighting Calculator 3.3 have been removed.	Removed references to Lighting Calculator 3.3 retired on September 30, 2019
October 2019	7.3	Nonresidential Lighting. Removed the 'Lighting Calculator 4.0 and 5.0 Lighting Promotions' section.	There are no promotions planned at this time.
October 2019	7.3	Nonresidential Lighting. Requirements related to Custom lighting projects have been moved from this section to 4.0 Custom Projects.	Moved this information to the Custom Project section to reflect Custom Lighting project requirements.
October 2019	7.3	Nonresidential Lighting. Added new documentation for new construction projects. Nonresidential lighting new construction projects now require submittal of an invoice.	Added a project invoice requirement to ensure consistency in documentation requirements across nonresidential lighting projects.
October 2019	7.4.1	Advanced Rooftop Unit Control (ARC). BPA adopted this RTF approved measure. There is a payment for ARC Retrofit-Lite, and a payment for ARC Retrofit-Full. BPA will continue to maintain a QPL for this measure.	Updated the description and requirements to reflect the measure adopted by the RTF. This measure replaces the previous BPA-qualified measure (now expired).
October 2019	7.4.2	Connected Thermostat. This measure was approved by the RTF and replaces the previous BPA-qualified measure. Measure language has been updated and requirements include a PIF. The measure includes payments for: 1) the initial install and 2) verification of thermostat programming. BPA will continue to maintain a QPL for this measure.	Updated the description and requirements to reflect the measure adopted by the RTF. This measure replaces the previous BPA-qualified connected thermostat.
October 2019	7.4.3	Ductless Heat Pump Retrofit and Upgrade (BPA-Qualified). The Ductless Heat Pump Retrofit measure and the new Ductless Heat Pump Upgrade measure were combined into one set of measure requirements. Ductless Heat Pump Upgrades are for the following applications: 1) replaces an existing DHP with a more efficient DHP (e.g., replacing a code minimum DHP) or 2) is an efficient DHP installed as part of a building addition project, new construction project, or major renovation project.	Combined the measures and revised the name to simplify the IM and clarify the measure application.
October 2019	7.4.3	Ductless Heat Pump Retrofit and Upgrade (BPA-Qualified). BPA updated the efficiency specification based on the 75th percentile of performance for DHPs per the Air-Conditioning, Heating, and Refrigeration Institute (AHRI) database as of January 2019. Energy savings have increased. There is one minimum HSPF for mini-splits and non ducted DHPs (11.0 HSPF) but a lower HSPF for ducted applications (10.0 HSPF).	Updated efficiency specification and savings methodology as part of a periodic BPA- Qualified measure update.
October 2019	7.4.3	Ductless Heat Pump Retrofit and Upgrade (BPA-Qualified). The following application was removed: Even if the space was previously conditioned by an air source, ground source, or ductless heat pump that is no longer working, and the space is conditioned by backup zonal or forced-air electric-resistance heat, the application is still eligible for a DHP. This application is now eligible under the new DHP Upgrade (BPA-Qualified) measure.	Updated the measure to reflect which measure should be used for this specific application.

EFFECTIVE DATE (POSTED DATE)	LOCATION	DESCRIPTION	RATIONALE
October 2019	7.4.3	Ductless Heat Pump Retrofit and Upgrade (BPA-Qualified). DHP retrofit payment will increase from $800 to $1000 per ton. The upgrade payment will be $300.00 per ton.	Updated payment to reflect updated measure savings.
October 2019	7.4.4	Heat Pump Retrofit and Upgrade (BPA-Qualified). The Heat Pump Retrofit (formerly known as Heat Pump Conversion) measure and the new Heat Pump Upgrade measure were combined into one set of measure requirements. The Basis for Energy Savings was updated to reflect measure update. The efficiency specification is also now embedded into the IM and is not a stand alone document.	Combined the measures and revised the name to simplify the IM and clarify the measure application.
October 2019	7.4.4	Heat Pump Retrofit and Upgrade (BPA-Qualified). The Basis for Energy Savings has been updated for clarity and consistency.	Updated language to improve clarity.
October 2019	7.4.4	Heat Pump Retrofit and Upgrade (BPA-Qualified). BPA updated the efficiency requirements for heat pump retrofits and upgrades based on the 75th percentile of performance for air source heat pumps per the Air-Conditioning, Heating, and Refrigeration Institute (AHRI) database as of January 2019. Due to slightly higher efficiency requirements, energy savings will increase.	Updated efficiency specification and savings methodology as part of a periodic BPA-Qualified measure update.
October 2019	7.4.4	Heat Pump Retrofit and Upgrade (BPA-Qualified). BPA removed equipment size cap of 20 tons or less.	Removed requirement to streamline implementation.
October 2019	7.4.4	Heat Pump Retrofit and Upgrade (BPA-Qualified). The payment for retrofits increased from $500 per ton to $1,000 per ton. For upgrades: previously there were two different categories of payments, BPA will now pay a straight $150 per ton, which is a small reduction in payment.	Updated payment to reflect updated measure savings.
October 2019	7.4.5	Variable Refrigerant Flow System (BPA-Qualified). The Basis for Energy Savings was updated for clarity and consistency. The efficiency specification is now embedded into the IM and is not a stand alone document.	Updated language to improve clarity.
October 2019	7.4.5	Variable Refrigerant Flow System (BPA-Qualified). BPA updated the efficiency requirements based on the 75th percentile of performance for VRF per the Air-Conditioning, Heating, and Refrigeration Institute (AHRI) database as of January 2019.	Updated efficiency specification and savings methodology as part of a periodic BPA- Qualified measure update.
October 2019	7.4.5	Variable Refrigerant Flow System (BPA-Qualified). BPA removed the 100,000 square feet restriction on building size.	Removed requirement to streamline implementation.
October 2019	7.4.5	Variable Refrigerant Flow System (BPA-Qualified). The payment increased from $800.00 per ton to $1000 per ton.	Updated the savings methodology as part of a periodic BPA-Qualified measure update.
October 2019	7.4.6	Variable Frequency Drive on Air Handling Unit Fan. Updated the Basis for Energy Savings and Requirements and Specifications for clarity.	Updated language to improve clarity.

EFFECTIVE DATE (POSTED DATE)	LOCATION	DESCRIPTION	RATIONALE
October 2019	7.4.6	Variable Frequency Drive on Air Handling Unit Fan. BPA removed the precondition requirement related to minimum building operating hours, and the postcondition requirement for the VFD to trend historical data.	Removed requirements to streamline implementation and promote uptake.
October 2019	7.5.1	Commercial Insulation. Payments increased between 65-77% for insulation to align with EE 2020-21 Implementation Plan.	Increased payment to promote uptake of weatherization measures.
October 2019	7.5.2	Windows for Commercial Buildings. This measure has been renamed Commercial Windows.	Updated the measure name to be consistent with the UES measures list.
October 2019	7.5.2	Commercial Windows (BPA-Qualified). Payments for windows increased from $3-$6 per square foot to $9-$18 per square foot.	Increased payment to promote uptake of weatherization measures.
October 2019	7.6.1	Electric-resistance Water Heater (expired, previous measure location.) This RTF measure expired and was removed.	Removed RTF measure that expired in 2018.
October 2019	7.6.1	Anti-Sweat Heater (ASH) Controls. The Basis for Energy Savings was updated for clarity.	Updated language to improve clarity.
October 2019	7.6.2	Heat Pump Water Heater (former measure location.) This measure has expired as a commercial measure, but is still available as a Residential measure in commercial applications.	Removed the expired commercial measure. The measure is offered in the Residential section (10.5.3 Unitary Heat Pump Water Heater) and is available for Commercial applications.
October 2019	7.6.2	Walk-In or Display Case Evaporator Fan Motor – Shaded Pole to Electronically Commutated Motor (ECM). Updated to reflect that this measure does not apply to motors with fans less than 10 inches in diameter on walk-in coolers and freezers.	Updated Requirements and Specifications to improve clarity.
October 2019	7.6.3	Strip Curtains for Walk-In Coolers and Freezers. Updated Requirements and Specifications to clarify eligible applications.	"Updated language for clarity and to reflect eligible measure application.
October 2019	7.7.1	Demand Controlled Kitchen Ventilation (BPA-Qualified). A heading for Basis of Energy Savings has been added and the language updated for clarity. Clarified Requirements and Specifications to reflect eligible applications.	Updated language for clarity and to reflect eligible measure application.
October 2019	7.7.2	Commercial Refrigeration (expired, former measure number.) Floating Head Pressure Control on Single Compressor Systems. BPA retired this measure due to low uptake.	Retired this measure due to low uptake.
October 2019	7.7.2	Electric Commercial Steam Cookers. Added Basis for Energy Savings.	This information was previously missing.
October 2019	7.7.2	Electric Commercial Steam Cooker. The measure was aligned with the 2018 RTF measure update, which reduced the savings for this measure.	Updated to accurately reflect 2018 RTF measure update.

EFFECTIVE DATE (POSTED DATE)	LOCATION	DESCRIPTION	RATIONALE
October 2019	7.7.2	Electric Commercial Steam Cookers. The measure was aligned with the 2018 RTF measure update, which updated the ENERGY STAR specification from ENERGY STAR 1.0 to ENERGY STAR 1.2.	Updated to accurately reflect 2018 RTF measure update.
October 2019	7.7.2	Electric Commercial Steam Cooker. Only the 6 pan cooker measure option will be offered by BPA moving forward. The 3, 4, 5 and 10 pan cooker measures expired. The payment for a 6 pan cooker increased to $500 per pan.	Based on the 2018 RTF measure update, these measures have negative incremental cost and have been expired.
October 2019	7.7.3	Commercial Refrigeration. Compressor Head Cooling Fan - Shaded Pole to Electronically Commutated Motor (ECM) (expired, former measure location.) BPA retired this measure due to low uptake.	Retired this measure due to low uptake.
October 2019	7.7.3	Hot Food Holding Cabinets. Added Basis for Energy Savings.	This information was previously missing.
October 2019	7.7.3	Hot Food Holding Cabinets. The measure was aligned with the 2018 RTF measure update, which increased the savings for this measure and added a new measure for a double size cabinet.	Updated to accurately reflect 2018 RTF measure update.
October 2019	7.7.3	Hot Food Holding Cabinets. The measure was aligned with the 2018 RTF measure update, which changed the specification from ENERGY STAR 1.2 to ENERGY STAR 2.0.	Updated to accurately reflect 2018 RTF measure update.
October 2019	7.7.3	Hot Food Holding Cabinets. Payments updated to reflect increase in savings. Half size: Increased to $250/cabinet. Full size: Increased to $500/cabinet. Added new payment for Double size: $1,000/cabinet.	Updated to accurately reflect 2018 RTF measure update.
October 2019	7.7.4	Electric Combination Ovens. Added a Basis for Energy Savings.	This information was previously missing.
October 2019	7.7.4	Electric Combination Ovens. The measure was aligned with the 2018 RTF measure update, which reduced the savings for this measure. The payment will not change.	Updated to accurately reflect 2018 RTF measure update.
October 2019	7.7.4	Electric Combination Ovens. The measure was aligned with the 2018 RTF measure update, which changed the specification from ENERGY STAR 2.0 to ENERGY STAR 2.2.	Updated to accurately reflect 2018 RTF measure update.
October 2019	7.7.5	Commercial Refrigeration (expired, former measure location.) Walk-In Evaporator ECM Fan Speed Control - Constant to Variable. BPA retired this measure due to low uptake.	Retired this measure due to low uptake.
October 2019	7.7.5	Electric Convection Ovens. Added Basis for Energy Savings.	This information was previously missing.
October 2019	7.7.5	Electric Convection Ovens. The measure was aligned with the 2018 RTF measure update, which reduced the savings for this measure.	Updated to accurately reflect 2018 RTF measure update.

EFFECTIVE DATE (POSTED DATE)	LOCATION	DESCRIPTION	RATIONALE
October 2019	7.7.5	Electric Convection Ovens. The measure was aligned with the 2018 RTF measure update, which changed the specification from ENERGY STAR 2.0 to ENERGY STAR 2.2.	Updated to accurately reflect 2018 RTF measure update.
October 2019	7.7.5	Electric Convection Ovens. Payments updated to reflect differences in savings in oven sizes. Where previously it was $300 per oven for all ovens, it was updated as follows. Half oven: $200/oven. Full oven: $400/oven.	Updated to accurately reflect 2018 RTF measure update.
October 2019	7.7.6	Commercial Refrigeration. Door Gasket Replacement for Walk-In and Reach-In Coolers and Freezers (expired, former measure location.) BPA retired this measure due to low uptake.	Retired this measure due to low uptake.
October 2019	7.7.6	Commercial Electric Fryers. Added a Basis for Energy Savings.	This information was previously missing.
October 2019	7.7.6	Commercial Electric Fryers. The measure was aligned with the 2018 RTF measure update, which reduced the savings for this measure.	Updated to accurately reflect 2018 RTF measure update.
October 2019	7.7.6	Commercial Electric Fryers. The measure was aligned with the 2018 RTF measure update, which changed the specification from ENERGY STAR 2.0 to ENERGY STAR 3.0	Updated to accurately reflect 2018 RTF measure update.
October 2019	7.7.6	Commercial Electric Fryers. Small size fryers are no longer cost-effective and the measure was retired. Large vat size fryer payment decreased from $300 per fryer to $250 per fryer.	Updated to accurately reflect 2018 RTF measure update.
October 2019	7.7.7	Pre-Rinse Spray Wash Valves. Added Basis for Energy Savings.	This information was previously missing.
October 2019	7.7.7	Pre-Rinse Spray Wash Valves. The valve is required to be WaterSense qualified or have a minimum spray force of 4.0 ounces-force.	Moved this requirement from the Basis for Energy Savings section to the Requirement and Specifications.
October 2019	7.8.1	ENERGY STAR Commercial Clothes Washers. Updated the Basis for Energy Savings for clarity and clarified the Energy Star requirement.	Updated language for clarity and to reflect eligible measure application.
October 2019	7.8.2	Smart Power Strips. The measure language was updated to reflect the recently updated RTF measure which allows 3 types of load control: load sensing, motion sensing (occupancy), and timer.	Updated to accurately reflect updated RTF-approved measure.
October 2019	7.8.2	Smart Power Strips. The technical requirement that the smart power strip prevent false switching was removed.	Updated to accurately reflect updated RTF-approved measure.
October 2019	7.8.2	Smart Power Strips. Savings decreased to reflect recently updated RTF measure; no change in payment.	Updated to accurately reflect updated RTF-approved measure.
October 2019	7.8.3	Commercial Showerheads. Updated the Basis for Energy Savings for clarity.	Updated language for clarity and to reflect eligible measure application.

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October 2019	7.8.4	Generator Engine Block Heaters (BPA-Qualified). The Basis for Energy Savings was updated for clarity.	Updated language for clarity.
October 2019	7.8.5	Vehicle Engine Block Heater Controls. This measure has been approved by the RTF and is no longer BPA Qualified. Language has been updated to reflect RTF measure requirements. A PIF is required. The payment will be $200 per unit.	This measure is now RTF approved and replaces the previous BPA-qualified measure.
Industrial Sector			
October 2019	9.1	Payment Summary. Updated the Payment Summary table to include Strategic Energy Management and new BPA-Qualified Measures. Combined all other multisector opportunities into one line.	Updated the table to reflect current offerings.
October 2019	9.2.1	Energy Management: Energy Project Manager (Optional ESI Component). Restructured section to focus on energy management. Updated Requirements and Specifications for clarity and added payment capping language consistent with section 9.2.2.	Decoupled Energy Management & Strategic Energy Management ESI components. Updated language to improve clarity.
October 2019	9.2.2	Strategic Energy Management: Strategic Energy Management Projects (Optional ESI Component). Updated Basis of savings to clarify the application of terms specific to the Industrial SEM program.	Made changes to improve clarity of program implementation, savings reporting, and payment applicability.
October 2019	9.2.2	Strategic Energy Management: Strategic Energy Management Projects (Optional ESI Component). Updated Performance Period description to improve clarity and remove measure life table.	Made changes to improve clarity of program implementation.
October 2019	9.2.2	Strategic Energy Management: Strategic Energy Management Projects (Optional ESI Component). Updated Savings Reports to ensure alignment with definitions and SEM Calculator.	Made changes to improve clarity of program implementation, savings reporting, and payment applicability.
October 2019	9.2.2	Strategic Energy Management: Strategic Energy Management Projects (Optional ESI Component). Updated Savings Reports to ensure alignment with definitions and SEM Calculator.	Made changes to improve clarity of program implementation.
October 2019	9.2.2	Strategic Energy Management: Strategic Energy Management Projects (Optional ESI Component). Updated Enrollment and End-user Staffing table to reflect end user engagement recommendations and add Re-Enrollment requirement.	Changed requirement to recommendation since some facilities can not afford to send two employees to a training session. Re-enrollment language expounds on existing enrollment language.
October 2019	9.2.2	Strategic Energy Management: Strategic Energy Management Projects (Optional ESI Component). Component Implementation table removed and replaced with concise paragraph.	Made changes to improve clarity and to align with the SEM Requirements.

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October 2019	9.2.2	Strategic Energy Management: Strategic Energy Management Projects (Optional ESI Component). Updated the Savings Reports table to clarify M&V Protocol requirements language that relates to enrollment and rebaselining. Updated performance period requirement for clarity.	Made changes to improve clarity and to be consistent with change from "deemed" to UES.
October 2019	9.2.2	Strategic Energy Management: Strategic Energy Management Projects (Optional ESI Component). SEM Projects payment table updated to clearly show milestones and payments for Year 1, Year 2 and Re-Enrollment performance periods.	Updated table to improve clarity in areas previously identified by utiltities.
October 2019	9.2.3	Industrial Custom Projects (Optional ESI Component).Made Industrial Custom Projects its own Optional ESI Component to Energy Smart Industrial.	Made changes to be consistent with approach used for other sectors (Commercial and Agricultural).
October 2019	9.2.4	Small Industrial Projects (Optional ESI Component). Renamed section (previously called Trade Ally-delivered Small Industrial Measures (Optional ESI Component)) and updated Requirements and Specifications.	Made changes to improve clarity and to be consistent with ESI Program components.
October 2019	9.5	High Frequency Battery Charger Upgrade (BPA-Qualified). This measure is now available for Industrial, Commercial and Agricultural sectors.	Added new section to define a new non-Energy Smart Industrial measure.
October 2019	9.6	Welder Upgrade (BPA-Qualified). This measure is now available for Industrial, Commercial and Agricultural sectors.	Added new section to define a new non-Energy Smart Industrial measure.
October 2019	9.7	Water System Leak Abatement (BPA-Qualified). This measure is now available for Industrial, Commercial and Agricultural sectors.	Added new section to define a new non-Energy Smart Industrial measure.
Residential Sector			
October 2019	10.0	Residential Sector. The residential sector sections have been modified with non-substantive grammatical corrections, some information has been reordered for readability, and redundant and ambiguous language has been removed for clarity. These changes do not affect the substance of the sections.	Non-substantive changes were made in response to feedback during the IM review process to improve readability and clarity.
October 2019	10.1	Payment Summary. Updated the table to reflect current measures and payment amounts.	Updated the table to accurately list measures and payments.
October 2019	10.2.1	ENERGY STAR Solid-State Lighting/Light-Emitting Diodes Lamps and Fixtures. In the residential portions of the IM, all instances of the word bulbs were replaced with the word lamps.	Updated terminology to be consistent with industry practice.
October 2019	10.2.1	ENERGY STAR Solid-State Lighting/Light-Emitting Diodes Lamps and Fixtures. BPA has stopped using the Lighting Design lab (LDL) Qualified Lamps List to determine whether a lamp meets program requirements.	Removed the previous requirement to use the LDL lamps list. (The LDL no longer maintains a list of qualified products.)

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October 2019	10.2.1	ENERGY STAR Solid-State Lighting/Light-Emitting Diodes Lamps and Fixtures. Multiple lumen bins for certain categories have been replaced by a single lumen range. Lamps between 250 and 2600 lumens are eligible for incentives.	Modified the measures in response to RTF changes driven by a lack of mid and upper lumen bin products currently available in the market. BPA offers these lumen ranges as an option in order to respond to market changes.
October 2019	10.2.1	ENERGY STAR Solid-State Lighting/ Light-Emitting Diodes Lamps and Fixtures. Savings and payments have changed for most residential lighting measures. Savings decreased for most measures. Payments either decreased or were unchanged.	Updated the savings and payments to reflect RTF measure changes.
October 2019	10.3.2	Advanced Power Strips - Infrared Sensing (Home Entertainment Centers). Updated measure names to include the device control strategy. Discontinued use of Tier 2 nomenclature for Advanced Power Strips.	Updated language to be consistent with the Advanced Power Strip measure name effective April 1, 2019.
October 2019	10.3.2	Advanced Power Strips - Infrared Sensing (Home Entertainment Centers). For residential Infrared Sensing and PC Interaction Sensing Advanced Power Strips, savings decreased and payments have been reduced to zero. Utilities may continue to claim savings as a measure with zero payment.	Reduced incentives on Infrared Sensing and PC Interaction Sensing measures to zero dollars. Although the RTF has found that these measures are not cost effective, BPA is keeping these measures in order to collect information necessary for further evaluation.
October 2019	10.3.3	Advanced Power Strips - PC Interaction Sensing (Personal Desktop Computers). Updated measure names to include the device control strategy. Discontinued use of Tier 2 nomenclature for Advanced Power Strips.	Updated language to be consistent with the Advanced Power Strip measure name effective April 1, 2019.
October 2019	10.3.3	Advanced Power Strips - PC Interaction Sensing (Personal Desktop Computers). For residential Infrared Sensing and PC Interaction Sensing Advanced Power Strips, savings decreased and payments have been reduced to zero. Utilities may continue to claim savings as a measure with zero payment.	Reduced incentives on Infrared Sensing and PC Interaction Sensing measures to zero dollars. Although the RTF has found that these measures are not cost effective. BPA is keeping these measures in order to collect information necessary for further evaluation.
October 2019	10.4	Appliances - Clothes dryers. Increased savings for all measures except ENERGY STAR. Payment was increased for Tier 1. All other payments were unchanged.	Updated savings and payments to reflect RTF measure changes.
October 2019	10.4	Appliances - Clothes washers. Removed the minimum Integrated Modified Energy Factor (IMEF) requirement for ENERGY STAR top loading washers. Added a new requirement that top loading washers must be rated CEE Tier 1.	Updated the requirements to align with RTF changes.
October 2019	10.4	Appliances - Clothes washers. Clarification added to payment table for all measures.	Updated language to ensure availability of each measure option is clear.
October 2019	10.4	Appliances - Clothes washers. Replaced the Consortium for Energy Efficiency (CEE) Advanced/Tier 3 measure name with CEE Advanced Tier. IM language was changed to reflect the new CEE Tier methodology.	Updated language to reflect CEE Tier methodology.

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October 2019	10.4	Appliances - Clothes washers. Increased savings for all measures except CEE Advanced Tier gas water heater/electric dryer and Multifamily ENERGY STAR gas water heater/ gas dryer. Payments were increased or unchanged.	Updated the savings and payments to reflect RTF measure changes.
October 2019	10.4	Appliances - Clothes dryers. Updated the minimum and maximum UCEF values for each tier. Increased savings for all measures except ENERGY STAR. Increased payments for Tier 1 measures, all other payments are unchanged.	Adjusted the weightings to produce new tier boundaries in response to RTF updates. Updated the savings and payments to reflect these measure changes.
October 2019	10.5.1	Showerheads. Expired the "primary" and "secondary" showerhead measures. The "any" measure remains.	Simplified these measures to align with RTF updates.
October 2019	10.5.2	Thermostatic Shut Off Valves (TSV). Reduced savings for most measures. Increased savings for a few. Payments are unchanged.	Updated the savings to reflect RTF measure changes.
October 2019	10.5.4	Unitary Heat Pump Water Heater. Expired the Unitary Heat Pump Water Heater for Manufactured Homes measures. Renamed single family Unitary Heat Pump Water Heater measures to "Any Residential" to include manufactured homes. Added new Oregon- and Washington-specific retail Unitary Heat Pump Water Heater measure identifiers to the UES measure list. Split System Heat Pump Water Heater names are unchanged.	Updated measure structure to be consistent with RTF changes and to incorporate new measure identifiers.
October 2019	10.5.4	Unitary Heat Pump Water Heater. Clarified that only one HPWH may be incentivized per home.	Updated home definition to clarify eligibility of HPWH incentive.
October 2019	10.5.4	Unitary Heat Pump Water Heater. Updated Requirements and Specifications to include Commercial applications of this measure.	Updated to include Commercial applications previously available under section 7.6.2 Heat Pump Water Heater. The commercial measure expired on September 30, 2019.
October 2019	10.5.4	Unitary Heat Pump Water Heater. Reduced savings for HPWHs. Increased payments for Tier 2 and Tier 3 units. All other payments are unchanged.	Updated the savings to reflect RTF measure changes. Updated payments to respond to market factors impacting unit cost.
October 2019	10.5.5	Split-System Heat Pump Water Heater. Expired Split-System Heat Pump Water Heaters for Manufactured Homes measures.	Expired this measure to be consistent with RTF.
October 2019	10.5.5	Split-System Heat Pump Water Heater. Clarified that only one HPWH may be incentivized per home.	Updated home definition to clarify eligibility of HPWH incentive.
October 2019	10.5.5	Split-System Heat Pump Water Heater. Reduced savings and increased payments.	Updated the savings to reflect RTF measure changes. Updated payments to respond to market factors impacting unit cost.
October 2019	10.6	BPA Simple Steps, Smart Savings Retail Promotion. The current Simple Steps contract is scheduled to end in 2020. The program may not continue beyond that time. BPA will update customers when more information is available.	Updated program information to provide adequate notice of the potential expiration of the Simple Steps program.

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October 2019	10.7.1	Multiple Ductless Indoor Heads, Multiple Indoor Ducted Mini-Split Heat Pumps, Combination Indoor Head(s) and Ducted Mini-Split Heat Pump(s), and Homes with Multiple Outdoor Compressors - BPA-Qualified. This measure has been discontinued. Multi-head DHPs and DHPs with multiple outdoor compressors are reportable under measure 10.7.1.1 with corresponding energy savings and incentive payments. BPA recognizes only one DHP regardless of the number of outdoor or indoor units and requires that the outdoor compressor meet a minimum HSPF of 9.0.	Simplified measure to align HSPF requirement (9.0) and payments ($800) for DHPs with a single- or multi- head and systems with one or more outdoor compressor.
October 2019	10.7.1.1	Ductless and Ducted Mini-Split Heat Pump(s). BPA modified the measure name "Single Interior Head and Single Outdoor Compressor Ductless and Ducted Mini-Split Heat Pump(s)" to "Ductless and Ducted Mini-Split Heat Pump(s)."	Updated measure description of DHP requirements and payments.
October 2019	10.7.1.1	Ductless and Ducted Mini-Split Heat Pump(s). Clarification - Basis for Energy Savings updated to include ducted mini-splits.	Added clarification that the basis for energy savings was updated to include ducted mini-splits, incorporated by the RTF in 2017. No change to savings values.
October 2019	10.7.1.1	Ductless and Ducted Mini-Split Heat Pump(s). Energy savings and incentive payments decreased in existing single-family homes and both new and existing manufactured homes with Electric Forced-Air Furnaces. Incentive payments decreased to $800.	Updated energy savings and incentive payments to reflect reduced energy savings approved by the RTF.
October 2019	10.7.1.1	Ductless and Ducted Mini-Split Heat Pump(s). Only one ductless heat pump may be claimed per home, regardless of the home's sq. ft. A DHP may be claimed in addition to a PTCS or non-PTCS air source heat pump (ASHP) if installed in a home with more than 4,500 sq. ft.	Clarified that only one DHP may be claimed per home to ensure energy savings are not diluted.
October 2019	10.7.1.1	Ductless and Ducted Mini-Split Heat Pump(s). BPA no longer requires that DHPs be installed by a HVAC company listed on the Northwest Ductless Heat Pump Installer GoingDuctless.com website. DHPs must still be installed by a licensed contractor.	Removed the requirement that these measures be installed by companies listed on the GoingDuctless.com website. BPA no longer distinguishes between single-head and multi-head installations. The Northwest Ductless Heat Pump installer website promotes single-head applications of DHPs.
October 2019	10.7.1.1	Ductless and Ducted Mini-Split Heat Pump(s). The DHP must be installed by a licensed contractor. The customer must use the COTR Request and Acknowledgment Procedure to request payment for a partial self-install; these will only be considered when a contractor has installed the fittings and refrigerant.	Added clarification that DHP systems must be installed by a licensed contractor. A partial self-install or contractor-assisted install will only be considered when a contractor has installed the fittings and refrigerant.
October 2019	10.7.1.1	Ductless and Ducted Mini-Split Heat Pump(s). This measure now includes systems with multiple indoor heads and/or multiple outdoor compressors. BPA recognizes only one outdoor unit regardless of the number of outdoor or indoor units and requires that the outdoor compressor meet a minimum HSPF of 9.0.	Updated measure description of DHP requirements and payments.

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October 2019	10.7.1.1	Ductless and Ducted Mini-Split Heat Pump(s). BPA now offers access to the Northeast Energy Efficiency Partnership (NEEP) Cold Climate Specification List for air source heat pumps (including ductless heat pumps) that retain their efficiency at lower operating temperatures. This is an optional resource. Utilities are not required to utilize models on this list.	Increased measure support to address changing technology needs.
October 2019	10.7.1.1	Ductless and Ducted Mini-Split Heat Pump(s). In new single-family homes, DHP energy savings increased slightly in Oregon. Incentive payment in Oregon increased to $500.	Updated savings and payments reflect new energy savings approved by the RTF.
October 2019	10.7.1.1	Ductless and Ducted Mini-Split Heat Pump(s). In new single-family homes, DHP energy savings declined in Idaho, Montana, Nevada, Wyoming and California. Incentive payment in these states decreased to $500. This measure is not available for new single-family homes in Washington.	Updated savings and payments to reflect new energy savings adopted by the RTF.
October 2019	10.7.1.1	Ductless and Ducted Mini-Split Heat Pumps. At this time Variable Refrigerant Flow (VRF) technologies (also known as VRV) do not qualify for residential DHP measures.	Added clarification that VRF / VRV do not qualify as residential DHP measures.
October 2019	10.7.1.1	Ductless and Ducted Mini-Split Heat Pump(s). Mini-splits with a multi-position ducted indoor air handler should be invoiced as an air source heat pump.	Added clarification that mini-splits with a multi-position ducted indoor air handler function similar to a ducted air source heat pump should be invoiced as such to capture energy savings.
October 2019	10.7.1.1	Ductless and Ducted Mini-Split Heat Pump(s). In new single-family homes in Oregon, DHP installations require documentation that a high efficiency water heater is installed in order to qualify for incentive payment. This new requirement is included on the DHP Project Information Form, not within the IM.	Clarified requirements to qualify for a DHP incentives in Oregon. Oregon building code requires either a DHP or a high efficiency water heater in new single-family homes. BPA incentives can not be used to meet building code requirements. To qualify for a DHP incentive, utilities must document that a high efficiency water heater (Heat Pump Water Heater or natural gas/propane water heater with UEF 0.85) is installed in the home to satisfy building code. The water heater does not have to be installed at the same time as the DHP, nor does it need to be installed by the same contractor. A high efficiency water heater must simply be installed.
October 2019	10.7.1.2	Ductless Heat Pump Upgrade. At this time Variable Refrigerant Flow (VRF) technologies (also known as VRV) do not qualify for residential DHP measures.	Added clarification that VRF / VRV do not qualify as residential DHP measures.
October 2019	10.7.1.2	Ductless Heat Pump Upgrade. BPA now offers access to the Northeast Energy Efficiency Partnership (NEEP) Cold Climate Specification List for air source heat pumps (including ductless heat pumps) that retain their efficiency at lower operating temperatures. This is an optional resource. Utilities are not required to utilize models on this list.	Increased measure support to address changing technology needs.

EFFECTIVE DATE (POSTED DATE)	LOCATION	DESCRIPTION	RATIONALE
October 2019	10.7.1.2	Ductless Heat Pump Upgrade. The DHP must be installed by a licensed contractor. The customer must use the COTR Request and Acknowledgment Procedure to request payment for a partial self-install; these will only be considered when a contractor has installed the fittings and refrigerant.	Added clarification that DHP systems must be installed by a licensed contractor. A partial self-install or contractor-assisted install will only be considered when a contractor has installed the fittings and refrigerant.
October 2019	10.7.1.2	Ductless Heat Pump Upgrade. Only one ductless heat pump may be claimed per home, regardless of the home's sq. ft. A DHP may be claimed in addition to a PTCS or non-PTCS air source heat pump (ASHP) if installed in a home with more than 4,500 sq. ft.	Clarified that only one DHP may be claimed per home to ensure energy savings are not diluted.
October 2019	10.7.2	HVAC - PTCS. The PTCS Section 10.7.2.1 was reorganized for clarity. The previous version had 3 sections and the new version has five sections (ASHP, VSHP, CC&S, GSHP, and PTCS Duct Sealing). Prescriptive Duct Sealing was moved to a new separate section (10.7.3.)	Reorganized this section to support simplified documentation requirements.
October 2019	10.7.2.1	PTCS Air Source Heat Pumps. In single-family new construction, PTCS heat pump installations qualify for the upgrade measure only.	Added clarification: PTCS heat pump installations in single-family new construction qualify for the upgrade measure only (do not qualify for the conversion measure).
October 2019	10.7.2.1	PTCS Air Source Heat Pumps. Added clarification that a new manufactured home once sited with an occupancy permit qualifies for existing manufactured home incentives.	Added clarification that a new manufactured home is treated as an existing manufactured home once it is sited for occupancy.
October 2019	10.7.2.1	PTCS Air Source Heat Pumps. When replacing a PTCS Heat Pump that is no longer functioning with a new PTCS Heat Pump, the upgrade measure should be used.	Added clarification that for PTCS heat pumps, the baseline is the existing heat pump and the upgrade measure should be used. To be consistent across heat pump offerings for replacement of failed equipment, energy savings should be based upon a current practice baseline, not an existing conditions baseline.
October 2019	10.7.2.1	PTCS Air Source Heat Pumps. At this time Variable Refrigerant Flow (VRF) technologies (also known as VRV) do not qualify for the residential ASHP measure.	Added clarification that VRF / VRV do not qualify as residential air source heat pump measures.
October 2019	10.7.2.1	PTCS Air Source Heat Pumps. Homes under 4,500 sq ft qualify for only one heat pump payment. This may be one ducted (PTCS or non-PTCS) or one ductless heat pump, but not both. There are two exceptions to this rule:When the home has two entirely separate duct systems, the home is eligible for two ASHP payments but no more, even if there are more than two duct systems.When the home's duct work has not been extended to an addition, a DHP may be installed to service the area of the home that does not contain ducts. In this scenario, the home may be eligible for a ducted ASHP (PTCS or non-PTCS) and one DHP payment. Homes with greater than 4,500 square feet of heated floor area may qualify for up to two heat pump measures and no more, provided all other program requirements are met.	Added language to clarify the number of heat pump measures that may be claimed per home to ensure energy savings are not diluted.

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October 2019	10.7.2.2	PTCS Variable Speed Air Source Heat Pumps. In single-family new construction, PTCS heat pump installations qualify for the upgrade measure only.	Added clarification that PTCS heat pump installations in single-family new construction qualify for the upgrade measure only (do not qualify for the conversion measure).
October 2019	10.7.2.2	PTCS Variable Speed Air Source Heat Pumps. A new manufactured home once sited with an occupancy permit qualifies for existing manufactured home incentives.	Added clarification that a new manufactured home is treated as an existing manufactured home once it is sited for occupancy.
October 2019	10.7.2.2	PTCS Variable Speed Air Source Heat Pumps. When replacing an existing PTCS Variable Speed Air Source Heat Pump that is no longer functioning with a new PTCS Heat Pump, the upgrade measure should be used.	Added clarification that PTCS heat pump installations in single-family new construction qualify for the upgrade measure only (do not qualify for the conversion measure).
October 2019	10.7.2.2	PTCS Variable Speed Air Source Heat Pumps. To qualify, units must meet a minimum HSPF of at least 9.0.	Added HSPF requirement to Variable Speed Air Source Heat Pumps.
October 2019	10.7.2.2	PTCS Variable Speed Air Source Heat Pumps. The outdoor compressor must be variable speed, inverter-driven. A variable speed indoor air handler does not meet the requirements of this measure.	Added language to ensure the installed equipment meets the program requirement.
October 2019	10.7.2.2	PTCS Variable Speed Air Source Heat Pumps. At this time Variable Refrigerant Flow (VRF) technologies (also known as VRV) do not qualify for the residential VSHP measure.	Added clarification that VRF / VRV do not qualify as residential air source heat pump measures.
October 2019	10.7.2.2	PTCS Variable Speed Air Source Heat Pumps. Homes under 4,500 sq ft qualify for only one heat pump payment. This may be one ducted (PTCS or non-PTCS) or one ductless heat pump, but not both. There are two exceptions to this rule: 1. When the home has two entirely separate duct systems, the home is eligible for two ASHP payments but no more, even if there are more than two duct systems. 2. When the home's duct work has not been extended to an addition, a DHP may be installed to service the area of the home that does not contain ducts. In this scenario, the home may be eligible for a ducted ASHP (PTCS or non-PTCS) and one DHP payment. Homes with greater than 4,500 square feet of heated floor area may qualify for up to two heat pump measures and no more, provided all other program requirements are met.	Added language to clarify the number of heat pump measures that may be claimed per home to ensure energy savings are not diluted.
October 2019	10.7.2.2	PTCS Variable Speed Air Source Heat Pumps. BPA is offering access to the Northeast Energy Efficiency Partnership (NEEP) Cold Climate Specification List for air source heat pumps (including ductless heat pumps). This is an optional resource. Utilities are not required to utilize models on this List. This product list only applies to variable speed compressor technology.	Increased measure support to address changing technology needs.
October 2019	10.7.2.3	PTCS Commissioning, Controls and Sizing. A new manufactured home is treated as an existing manufactured home once it is sited for occupancy.	Added clarification that a new manufactured home is treated as an existing manufactured home once it is sited for occupancy.

EFFECTIVE DATE (POSTED DATE)	LOCATION	DESCRIPTION	RATIONALE
October 2019	10.7.2.3	PTCS Commissioning, Controls and Sizing. Homes under 4,500 sq ft qualify for only one heat pump payment. This may be one ducted (PTCS or non-PTCS) or one ductless heat pump, but not both. There are two exceptions to this rule: 1. When the home has two entirely separate duct systems, the home is eligible for two ASHP payments but no more, even if there are more than two duct systems. 2. When the home's duct work has not been extended to an addition, a DHP may be installed to service the area of the home that does not contain ducts. In this scenario, the home may be eligible for a ducted ASHP (PTCS or non- PTCS) and one DHP payment. Homes with greater than 4,500 square feet of heated floor area may qualify for up to two heat pump measures and no more, provided all other program requirements are met.	Added language to clarify the number of heat pump measures that may be claimed per home to ensure energy savings are not diluted.
October 2019	10.7.2.3	PTCS Commissioning, Controls and Sizing. BPA is offering access to the Northeast Energy Efficiency Partnership (NEEP) Cold Climate Specification List for air source heat pumps (including ductless heat pumps). This is an optional resource. Utilities are not required to utilize models on this List. This product list only applies to variable speed compressor technology.	Increased measure support to address changing technology needs.
October 2019	10.7.2.3	PTCS Commissioning, Controls and Sizing. At this time Variable Refrigerant Flow (VRF) technologies (also known as VRV) do not qualify for the residential air source heat pump measures.	Added clarification that VRF / VRV do not qualify as residential air source heat pump measures.
October 2019	10.7.2.4	PTCS Ground Source Heat Pumps. When installed in a new construction, single family home, the measure qualifies as an upgrade.	Added clarification: PTCS heat pump installations in single-family new construction qualify for the upgrade measure only (do not qualify for the conversion measure).
October 2019	10.7.2.4	PTCS Ground Source Heat Pumps. Clarified that the loop design documentation is not required for the "compressor only" replacement measure type. However, the heat load/loss calculation and balance point worksheet are still required.	Added clarification of documentation requirement for "compressor only" GSHP replacement measure.
October 2019	10.7.2.4	PTCS Ground Source Heat Pumps. Clarified that the payment for the "Compressor only" replacement is $500.	Added clarification of payment for compressor only replacement.
October 2019	10.7.2.5	PTCS Duct Sealing. Savings changes: Heating Zone 1 increased slightly, and Heating Zones 2 and 3 decreased slightly. Payments did not change.	Updated energy savings to be consistent with changes approved by the RTF.
October 2019	10.7.2.5	PTCS Duct Sealing. A new manufactured home once sited with an occupancy permit qualifies for existing manufactured home incentives.	Added clarification that a new manufactured home is treated as an existing manufactured home once it is sited for occupancy.

EFFECTIVE DATE (POSTED DATE)	LOCATION	DESCRIPTION	RATIONALE
October 2019	10.7.3	Prescriptive Duct Sealing. A new manufactured home once sited with an occupancy permit qualifies for existing manufactured home incentives.	Added clarification that a new manufactured home is treated as an existing manufactured home once it is sited for occupancy.
October 2019	10.7.3	Prescriptive Duct Sealing. BPA no longer requires that prescriptive duct sealing installation information be entered into the registry. Effective October 2019 utilities are only required to keep the Prescriptive Duct Sealing Installation Form in the customer file. However, PTCS Duct Sealing still requires the installation information to be entered into the registry.	Removed requirement that installation information be entered into the registry.
October 2019	10.7.3	Prescriptive Duct Sealing. Savings changes. Heating Zone 1 increased slightly, and Heating Zones 2 and 3 decreased slightly. Payments did not change.	Updated energy savings to be consistent with changes approved by the RTF.
October 2019	10.7.4	Air Source Heat Pump Conversion from Electric Forced-Air Furnace to Air Source Heat Pump (without PTCS). At this time Variable Refrigerant Flow (VRF) technologies (also known as VRV) do not qualify for the residential ASHP measure.	Added clarification that VRF / VRV do not qualify as residential air source heat pump measures.
October 2019	10.7.4	Air Source Heat Pump Conversion from Electric Forced-Air Furnace to Air Source Heat Pump (without PTCS). Homes under 4,500 sq ft qualify for only one heat pump payment. This may be one ducted (PTCS or non-PTCS) or one ductless heat pump, but not both. There are two exceptions to this rule: 1. When the home has two entirely separate duct systems, the home is eligible for two ASHP payments but no more, even if there are more than two duct systems. 2. When the home's duct work has not been extended to an addition, a DHP may be installed to service the area of the home that does not contain ducts. In this scenario, the home may be eligible for a ducted ASHP (PTCS or non-PTCS) and one DHP payment. Homes with greater than 4,500 square feet of heated floor area may qualify for up to two heat pump measures and no more, provided all other program requirements are met."	Added language to clarify the number of heat pump measures that may be claimed per home to ensure energy savings are not diluted.
October 2019	10.7.4	Air Source Heat Pumps Conversion from Electric Forced-Air Furnace to Air Source Heat Pump (without PTCS). Clarification was added that the required documentation needs to demonstrate that the measure requirements have been met (manufacturer, model number, type, size and quantity of equipment or product installed/used). This information can be listed on other submitted documentation and may not require a new document.	Added clarification regarding information that must be included on the submitted documentation.
October 2019	10.7.5	Air Source Heat Pump Conversion from Electric Forced-Air Furnace to Variable Speed Air Source Heat Pump (without PTCS). This section has been modified with non-substantive grammatical corrections and some information has been re-ordered.	Made non-substantive changes to improve readability.

EFFECTIVE DATE (POSTED DATE)	LOCATION	DESCRIPTION	RATIONALE
October 2019	10.7.5	Air Source Heat Pump Conversion from Electric Forced-Air Furnace to Variable Speed Air Source Heat Pump (without PTCS). The outdoor compressor must be variable speed, inverter-driven. A variable speed indoor air handler does not meet the requirements of this measure.	Added language to ensure the installed equipment meets the program requirements.
October 2019	10.7.5	Air Source Heat Pump Conversion from Electric Forced-Air Furnace to Variable Speed Air Source Heat Pump (without PTCS). At this time Variable Refrigerant Flow (VRF) technologies (also known as VRV) do not qualify for the residential ASHP measure.	Added clarification that VRF / VRV do not qualify as residential air source heat pump measures.
October 2019	10.7.5	Air Source Heat Pump Conversion from Electric Forced-Air Furnace to Variable Speed Air Source Heat Pump (without PTCS). Homes under 4,500 sq ft qualify for only one heat pump payment. This may be one ducted (PTCS or non-PTCS) or one ductless heat pump, but not both. There are two exceptions to this rule: 1. When the home has two entirely separate duct systems, the home is eligible for two ASHP payments but no more, even if there are more than two duct systems. 2. When the home's duct work has not been extended to an addition, a DHP may be installed to service the area of the home that does not contain ducts. In this scenario, the home may be eligible for a ducted ASHP (PTCS or non-PTCS) and one DHP payment. Homes with greater than 4,500 square feet of heated floor area may qualify for up to two heat pump measures and no more, provided all other program requirements are met.	Added language to clarify the number of heat pump measures that may be claimed per home to ensure energy savings are not diluted.
October 2019	10.7.5	Air Source Heat Pump Conversion from Electric Forced-Air Furnace to Variable Speed Air Source Heat Pump (without PTCS). Clarification was added that the required documentation needs to demonstrate that the measure requirements have been met (manufacturer, model number, type, size and quantity of equipment or product installed/ used). This information can be listed on other submitted documentation and may not require a new document.	Added clarification regarding information that must be included on the submitted documentation.
October 2019	10.7.5	Air Source Heat Pump Conversion from Electric Forced-Air Furnace to Variable Speed Air Source Heat Pump (without PTCS). BPA now offers access to the Northeast Energy Efficiency Partnership (NEEP) Cold Climate Specification List for air source heat pumps (including ductless heat pumps). This is an optional resource. Utilities are not required to utilize models on this List. This product list only applies to variable speed compressor technology.	Increased measure support to address changing technology needs.
October 2019	10.8.2	Advanced Smart Thermostats - BPA-Qualified. Added the term “advanced” to the measure name to clarify that the BPA specification is more stringent than a standard “smart thermostat” specification.	Added clarification to differentiate between smart thermostat types.

EFFECTIVE DATE (POSTED DATE)	LOCATION	DESCRIPTION	RATIONALE
October 2019	10.8.2	Advanced Smart Thermostats - BPA-Qualified. Added language from specification noting that occupancy detection must be set to "on."	Added specification requirement that was previously only included on the project information form.
October 2019	10.9	New Construction. Clarified that, for all Section 10.9 measures, stand alone measures can not be claimed in addition to whole home package measures except where explicitly stated as allowed.	Added clarification regarding allowed claims of stand alone measures and the whole home package measure.
October 2019	10.9	New Construction. Clarified that the permit date is the date to be used for determining base energy code for single family and multifamily new construction projects (sections 10.9.3, 10.9.4, 10.9.5 and 10.9.6)	Added clarification regarding base energy code to be used when determining above code energy savings.
October 2019	10.9.4	Montana House. BPA has adopted RTF changes to the Montana House measure including: 1. No longer having measure identifiers by cooling zone, 2. Collapsing vented and unvented crawlspace measures into a single measure, 3. Adding Montana House measures for Idaho, designated "Montana House - ID" to the UES measure list.	Made changes to align BPA with the RTF approved measure.
October 2019	10.10	Weatherization (Standard Income). BPA clarified that a wood furnace as a primary heating system does not need to be decommissioned and removed when accompanied by an electric heat system. However, a propane furnace as a primary heating system that accompanies an electric heat system must be removed and decommissioned in order to claim weatherization measures.	Made changes to reflect updated program requirements. These requirements ensure long-term energy savings from weatherization measures.
October 2019	10.10	Weatherization (Standard Income). Energy Savings in low-rise multifamily buildings increased slightly for Floor and Wall Insulation, Exterior Insulated Doors, single-pane Window and Patio Door Replacement and Low-E Storm Windows. Energy Savings in low-rise multifamily buildings decreased slightly for Attic Insulation and double-pane Window and Patio Door Replacement.	Updated savings to reflect RTF corrections of errors present in previous SEEM workbooks.
October 2019	10.10.1	Insulation. The sloped surface of an A-frame home (the entire roof structure) should be insulated and invoiced as an unvented attic.	Made changes to clarify program requirements. When insulating A-frame homes, refer to section 4.6 Unvented Attics in the BPA Residential Weatherization Specifications.
October 2019	10.10.1	Insulation. BPA increased incentive payments for attic, floor, and wall insulation in existing residential buildings (single-family, multi-family and manufactured homes), when reported with the “Any Electric” heat type. Utilities are able to report granular heating types (Electric FAF, Zonal, and Heat Pump), however incentive payments have not changed for these measures.	Increased insulation payments to incent acquisition of high value energy savings identified by the BPA Resource Program. At utility request, BPA is maintaining insulation measures reported with granular heat types and lower payments.

EFFECTIVE DATE (POSTED DATE)	LOCATION	DESCRIPTION	RATIONALE
October 2019	10.10.2	Prime Window and Patio Door Replacement. BPA increased incentive payments for prime window and patio door replacement in existing residential buildings (single-family, multi-family and manufactured homes), when reported with the "Any Electric" heat type. Utilities are able to report granular heating types (Electric FAF, Zonal and Heat Pump), however incentive payments have not changed for these measures. Please note: payments have not changed for 10.10.3 Low-E Storm Windows.	Increased prime window and patio door payments to incent acquisition of high value energy savings identified by the BPA Resource Program. At utility request, BPA is maintaining prime window and patio door measures reported with granular heat types and lower payments.
October 2019	10.10.3	Low-E Storm Windows. All Low-E Storm Windows must be ENERGY STAR certified to qualify for BPA incentives. The previous specification requirement and QPL is now discontinued. This does not result in any change to energy savings or payment amounts.	Updated in response to ENERGY STAR adoption of a national specification for Low-E Storm Windows. This change aligns BPA Low-E Storm window requirements with the ENERGY STAR certification to simplify program delivery.
October 2019	10.10.3	Low-E Storm Windows. A copy of the ENERGY STAR product list showing the product or the product information insert or packaging that includes the ENERGY STAR logo is required in the customer file.	Updated in response to ENERGY STAR adoption of a national specification for Low-E Storm Windows. This change aligns BPA Low-E Storm window requirements with the ENERGY STAR certification to simplify program delivery.
October 2019	10.10.4	Exterior Insulated Doors (BPA-Qualified). BPA published ENERGY STAR U-value requirements for exterior insulated doors. BPA allows utilities to provide documentation that doors meet U-value requirements in lieu of the ENERGY STAR certification. Utilities must document proof of qualifying product specifications or proof of the ENERGY STAR certification in the customer file. Exterior Insulated Doors must meet U-value requirements of ≤0.17 for opaque doors, ≤0.25 for doors with up to 50% glazing, and ≤0.30 for doors with greater than 50% glazing.	Added description of alternative ways to comply with Exterior Insulated Door specifications.
October 2019	10.10.7	Low-Income Energy Efficiency Measures. BPA updated this measure name from Low Income Weatherization, Ductless Heat Pumps and Duct Sealing to Low-Income Energy Efficiency Measures.	Changed the measure name to more accurately describe BPA's low income energy efficiency program.

EFFECTIVE DATE (POSTED DATE)	LOCATION	DESCRIPTION	RATIONALE
October 2019	10.10.7	Low Income Energy Efficiency Measures. For Low E Storm Windows, BPA requires a copy of the ENERGY STAR product list showing the product or the product information insert or packaging that includes the ENERGY STAR logo in the customer file.	Added description of documentation that utilities must maintain on qualifying products.
Multisector			
October 2019	12.1	Payment Summary. Updated the table to reflect current multisector offerings.	Updated to accurately identify eligible measures.
October 2019	12.2	The Measure Distribution Process section of the implementation manual has been reorganized to provide greater clarity and usability for customers. Additional measure distribution channels (e.g. coupon or instant rebate) have been broken out to better reflect implementation practice and provide clarity on which documents are required for compliance purposes.	As it was previously written section 12.2 was confusing and arguably contradictory.
October 2019	12.3.1	Eligible Multisector Measure. Updated the table to reflect three (3) new (Industrial) BPA-Qualified Measures: Battery Charger Upgrade, Welder Upgrade, and Water System Leak Abatement	Updated to accurately identify eligible measures.

Rate Period Implementation Manual Revision Timeline

MILESTONE	DUE DATE
Publish IM corrections, new measures, optional calculators, and removal of requirements.	April 1, 2020
Publish IM corrections, new measures, optional calculators, and removal of requirements.	Oct. 1, 2020
Publish 6-month notice of changes to existing measures and list of new measures.	April 1, 2021
Publish draft IM for internal and external review.	May 2021
All internal and external feedback due.	May 2021
Publish IM and UES Measure List.	Aug. 23, 2021
IM and UES Measure List effective.	Oct. 1, 2021

Definitions

DEFINITIONS AND ACRONYMS	
AHRI	Air-Conditioning Heating and Refrigeration Institute is a North American trade association of manufacturers of air conditioning, heating and commercial refrigeration equipment. AHRI performs political advocacy on behalf of its member industries, maintains technical standards, certifies products, shares data, conducts research and awards scholarships.
aMW	Average megawatt of electricity or the average measure of the total energy delivered in one year; 8,760,000 kilowatt-hours per year.
ANSI	American National Standards Institute administers, coordinates and promotes the United States public sectors' cooperative efforts to develop a consensus of standards and conformity assessment systems. ANSI accreditation signifies the procedures used by the standards' body — in connection with the development of American National Standards — meet the Institute's essential requirements for openness, balance, consensus and due process.
Available Implementation Budget	The amount available for BPA to purchase energy savings from a specific program participant at a given time, equal to the program participant's initial implementation budget, plus any applicable rollover amount, plus or minus any applicable implementation budget transfers, minus any applicable approved invoice payment amounts, as defined in the ECA.
B/C	Benefit/cost ratio. The B/C ratio equals the total benefits over the life of the project, divided by the installation costs.
Basis for Energy Savings	Detail of inputs, interactive effects and analysis to describe how the energy efficiency savings is estimated for Unit Energy Savings (UES) measures that are currently active on the BPA UES Measure List. (Note: Measures on the BPA UES Measure List may not yet reflect updated savings and assumptions from the RTF, due to BPA's notice requirements. They are provided to help readers understand how savings for UES measures are estimated or modeled. The Basis for Energy Savings supports, but does not replace or supersede, the BPA Requirements and Specifications.)
Bilateral Transfer	The transfer of implementation budget between customers.
BPA	Bonneville Power Administration is a nonprofit federal power marketing administration based in the Pacific Northwest. Although part of the U.S. Department of Energy, BPA is self-funding and covers its costs by selling its products and services. BPA markets wholesale electrical power from 31 federal hydroelectric projects in the Northwest, one nonfederal nuclear plant, and several small, non-federal power plants. BPA also operates and maintains about three-fourths of the high-voltage transmission in its service territory.
BPA-Qualified	A measure not approved by the RTF on which BPA is collecting data and performing analysis, with the eventual goal of securing RTF approval.
BPA Willingness to Pay	The maximum amount BPA will pay for a measure.
BTU	British thermal unit: A unit of energy equal to about 1,055 joules, which is the amount of energy needed to cool or heat one pound of water by 1 degree Fahrenheit.
Busbar Energy Savings	Energy that did not have to be produced at the generator, e.g., the site energy savings, plus any transmission and distribution losses, that would have occurred had the energy been generated. The site and busbar relationship depends upon the particular measure being implemented and its associated load shape. For UES measures, the site-to-busbar savings factor varies by measure. For site-specific calculators, the site-to-busbar savings factor currently in use is 1.09056 with the exception of all current versions of the BPA lighting calculator (see 7.3 Nonresidential Lighting) which use 1.07478. BPA provides payment for energy savings calculated from the busbar.
CEE	Consortium for Energy Efficiency is an EPA Climate Protection award-winning consortium of efficiency program administrators from the United States and Canada. Members work to unify program approaches across jurisdictions to increase the success of efficiency in markets.

DEFINITIONS AND ACRONYMS	
CBSA	Commercial Building Stock Assessment is a comprehensive assessment of energy efficiency that provides critical information about energy use in the Northwest's commercial buildings. The CBSA database includes more than 250 variables for each site, including building type and functional use, building size, building envelope details, fenestration, lighting and HVAC equipment.
Completed Unit	Properly installed and operating measures that have met the specifications and requirements set forth in the IM.
Conditioned Space (Residential)	Any residential building cavity or space that is directly heated and/or cooled by an HVAC system that provides conditioned air. It is typically a space inside the residence's thermal shell.
Conservation	Any reduction in electric power consumption as a result of increases in the efficiency of energy use, production or distribution, as defined in section 3(3) of the Northwest Power Act, and includes actual and planned conservation, as defined in the ECA.
COP	Coefficient of Performance: A ratio of useful heating or cooling provided to work required by a heatpump,refrigerator, or air conditioning system.
COTR	Contracting Officer's Technical Representative: A BPA employee who performs the management/oversight of the Energy Conservation Agreement (BPA/utility contract).
Customer	A utility or other regional entity that purchases power from BPA.
Custom Program	Energy-savings work performed under the IM's Custom Program section.
Custom Project	Energy-savings work performed under the IM's Custom Project section.
Custom Project Completion Report	A document submitted at the completion of a custom project (under Custom Project Process, Option 1) that includes information on project costs, verified energy savings and information on changes to the approved measurement and verification (M&V) plan.
Custom Project Proposal	A proposal for energy savings work made under the IM's Custom Project section (under Custom Project Process, Option 1).
CZ	Cooling Zone.
Deemed Measure	This definition has been changed to Unit Energy Savings (UES). Please see the definition below.
Desuperheater	A heat exchanger inside a geothermal heat pump that heats a home's hot water (this is in addition to water being heated with the home's water heater). The desuperheater, like a heat pump water heater, reduces the energy used to heat water.
DHP	Ductless Heat Pump: A UES measure performed under the IM's Commercial and Residential sections.
Dollar-for-Dollar Payment up to	A payment for the total cost of the installed measure, as long as the cost is less than the indicated cap.
DSM	Demand-Side Management: The strategies that focus on influencing when and how customers use electricity, with an emphasis on reducing or leveling load peaks. These include conservation measures and rate incentives for shifting peak loads; and energy storage schemes for reducing, redistributing, shifting or shaping electrical loads.
EASA	Electrical Apparatus Service Association, Inc., is an international trade organization of more than 1,900 electromechanical sales and service firms in 62 countries. Through its many engineering and educational programs, EASA provides members with a measure of keeping up-to-date materials, equipment and state-of-the-art technology.
ECA	Energy Conservation Agreement.
EEI	Energy Efficiency Incentive: The aggregate program cost established by BPA for purchasing energy savings from all program participants within a rate period, as defined in the ECA.
EER	Energy Efficiency Representative.

DEFINITIONS AND ACRONYMS	
EM&V	Evaluation, measurement and verification.
End User	The ultimate consumer of electricity.
Energy Savings	The amounts of conservation that BPA has determined to be attributable to measures implemented in a manner consistent with the ECA.
ENERGY STAR®	The registered name for a joint national energy efficiency program of the U.S. Environmental Protection Agency and the U.S. Department of Energy.
EPM	Energy Project Manager: A component of the Energy Smart Industrial Program. It can be an end-user employee or contractor who manages energy efficiency custom projects at an industrial facility.
ESI	Energy Smart Industrial: BPA's regional industrial program. Customers enroll via the COTR Request and Acknowledgment procedure, as outlined in the IM's Industrial Sector, section 9.2.
ESIP	Energy Smart Industrial Partner: A technical expert assigned to participating customers who is the single point of contact for coordinating ESI components and resources. They also assist with the development and implementation of industrial projects.
ESUE	Energy Smart Utility Efficiency program includes voltage optimization, a technique that improves the efficiency of the electrical grid by reducing voltage on the feeder lines running from substations to retail loads; and electrical distribution system improvements, which improve energy efficiency of the overall electrical distribution system.
Evaluation	Evaluation involves real-time and/or retrospective assessments of the performance and implementation of a program or measure.
Fiscal Year (FY)	BPA's fiscal year is from Oct. 1 through Sept. 30.
Fuel Switching	As determined by BPA, it is the switching from electric to nonelectric. Fuel switching is not eligible under BPA programs.
GPM	Gallons per minute, the flow-rate measure of showerheads.
HDD	Heating degree days: A measurement designed to reflect the demand for energy needed to prevent agricultural livestock watering tanks and fountains from freezing. It is derived from measurements of outside air temperature.
Horsepower (hp)	A unit of power measurement; 1 hp = 746 watts of electrical power.
HP	Heat pump.
HPWH	Heat pump water heater: A water heater manufactured with an integrated heat pump that heats water by transferring heat from ambient air via a refrigeration cycle. It does not include add-on units that modify an existing water heater.
HSPF	Heating seasonal performance factor: An air source heat pump efficiency term. HSPF is specifically used to measure the efficiency of air source heat pumps. The higher the HSPF, the higher the efficiency.
HVAC	Heating, ventilation and air conditioning.
HZ	Heating zone.
IEER	Integrated Energy Efficiency Ratio.
Implementation Period	The period of time covered by a customer's Energy Conservation Agreement.

DEFINITIONS AND ACRONYMS	
Improper Payment	Congress has defined "improper payment" to mean any payment made for an incorrect amount (including overpayments and underpayments) under statutory, contractual, administrative or other legally applicable requirements. It also includes any payment to an ineligible recipient, any payment for an ineligible good or service, any duplicate payment, any payment for a good or service not received (except for such payments where authorized by law) and any payment that does not account for credit for applicable discounts. BPA has an obligation to try and recover an improper payment.
Incremental Cost	Energy efficiency costs for work beyond that required by standard practice or code. May be the full cost of measures, especially in retrofit situations.
Initial Implementation Budget	The portion of an EEI established by BPA and effective at the beginning of a rate period to purchase energy savings from a specific program participant during that rate period, as defined in the ECA.
Invoice	A report of measures claimed and/or savings achieved under the IM. It may or may not include a request for payment.
kW	Kilowatt; 1,000 watts (units of electric power).
kWh	Kilowatt-hour; 1,000 watts of electric power supplied to or taken from an electric circuit over one hour.
LED	Light-emitting diode.
LEPA	Low-Energy Precision Agricultural: Low-energy precision agriculture for center pivot and linear move irrigation systems uses hoses that drag on the surface of the soil. This application reduces water evaporation, can provide more uniform water application, lower pressure requirements and reduce energy use.
LESA	Low-Elevation Sprinkler Application: The low-elevation sprinkler application for center pivot and lateral-move irrigation systems places the sprinkler within 3 feet of the soil surface.
Limited Change	A limited change refers to a type of correction made to Energy Efficiency's programmatic forms and calculators. These are changes that do not affect payment, savings or requirements. Examples include: administrative changes (e.g., language corrections, minor edits, fixing typos) and BPA's Energy Efficiency Management Team-approved changes. Such edits to the applicable documentation can be made at any time.
Low-Income	Low-income household eligibility is defined in the Federal Weatherization Assistance Program as 200 percent of poverty income levels. Approved statewide definitions substitute for federally established, low-income levels, if provided.
M&V	Measurement and verification: The process for quantifying savings delivered by an energy conservation measure (ECM) to demonstrate how much energy use was avoided. It enables the savings to be isolated and fairly evaluated.
Major Renovation	A renovation to an existing structure that requires a building permit, and where multiple systems are impacted while a structure is repurposed, expanded or repositioned.
Manufactured Home	A dwelling that is transportable in one or more sections, is built on a permanent chassis (with or without a permanent foundation), and its wheels are removed when it is set up on site. This definition does not include travel trailers. A new manufactured home once sited with an occupancy permit qualifies for existing manufactured home incentives, but also qualifies for new manufactured home incentives (see NEEM 10.9.1) if the occupant is the first home occupant.
Market Transformation	Working in a market to improve products and behaviors. For example, BPA collaborates with the Northwest Energy Efficiency Alliance (NEEA) for the achievement of market transformation, which entails working with manufacturers.

DEFINITIONS AND ACRONYMS	
Measure	Any material, equipment or activity identified in the IM that a program participant may install or implement within its service area to achieve conservation, as defined in the ECA. The term is used broadly in this document to mean one or more changes in system configuration, equipment specifications or operating practices to reduce electric power consumption. The reduction can be a result of increases in the efficiency of energy use, production or distribution. “Measure” covers all savings types, such as unit energy savings, calculators or custom projects.
Measurement	Readings taken to establish energy use or improvements in energy use, such as testing duct leakage or measuring loading factors and run time in factories. Large end users often measure to make sure that they are getting what they pay for or to better understand their system operations. BPA requires some level of measurement and verification for projects in which the payment is established by the energy savings achieved.
MESA	Mid Elevation Spray Application: A type of sprinkler application for center pivots and lateral move irrigation systems that place the sprinkler below the top of the span, generally between 5 and 7 feet off the soil surface.
Modular Home	A sectional, factory-built dwelling in the single-family home category, which is designed to be transported to the building site and affixed to a permanent foundation, with no chassis.
Momentum Savings	Cost-effective energy savings resulting from energy efficiency measures, which are above the Northwest Power and Conservation Council baseline and are not included in program savings.
MT&R	Monitoring, targeting and reporting, a technique (based on statistical process control) to monitor and control a system. For the purpose of the Energy Smart Industrial Program, “system” may be a whole facility or a subsystem within an industrial facility.
Multifamily Low-Rise	Five or more dwelling units within the same structure that is no more than three stories high.
Multifamily Mid/High-Rise	Five or more dwelling units within the same structure that is more than three stories high.
MW	Megawatt; 1,000,000 watts (units of electric power).
MWh	Megawatt-hour; 1 megawatt over the period of 1 hour.
NEEA	Northwest Energy Efficiency Alliance: An alliance of more than 140 Northwest utilities and energy efficiency organizations working on behalf of more than 13 million energy consumers. NEEA works to mobilize the market to view energy efficiency as the most cost-effective way to meet the region’s future energy needs. Through collaboration and pooling of resources, the region’s utilities and stakeholders have harnessed their collective influence to drive market adoption of energy efficiency products, services and practices for the benefit of utilities, consumers and the region.
NFRC	National Fenestration Rating Council: A nonprofit organization that establishes objective window, door and skylight energy-performance ratings to help consumers compare products and make informed purchase decisions in multiple ways.
NWPCC	Northwest Power and Conservation Council: A nonprofit entity authorized through the Northwest Power Act to develop and maintain a regional power plan, and a fish and wildlife program, to balance the Northwest’s environmental and energy needs. The Northwest Power and Conservation Council develops a 20-year regional power plan that is updated no less than every five years. BPA leverages the findings of the Power Plan to determines its energy savings goals. Also known as the Council.
Oversight	A contract management activity, designed to ensure that the government is getting what it pays for with some level of certainty.
Payment	A term representing monetary incentive levels for the installation of energy efficiency measures.
Performance Payment	The application of funds to cover internal customer administrative costs incurred in support of energy-savings activities described in this IM. All performance payments are intended to help cover the customer expenses associated with achieving conservation savings. This includes paying for conservation staff, printing marketing and education materials, providing enduser rebates, performing audits, assessing conservation potential and other activities.

DEFINITIONS AND ACRONYMS	
Primary Residential Heating System	A heating system that serves 50 percent or more of the conditioned living area of a residence.
Programmatic Savings	Energy savings paid for and directly attributed to BPA, utility and NEEA programs.
PTCS®	Performance Tested Comfort Systems: A certification for duct sealing and heat pump commissioning.
PTCS Commissioning, Controls and Sizing	Refers to the PTCS installation procedures of commissioning an air source heat pump or a variable speed heat pump. It guides the proper sizing of the unit, the refrigerant charge, the control of auxiliary heat, thermostat and air flow to ensure that the system is installed to operate efficiently. Also refers to the PTCS Commissioning, Controls and Sizing measure (CC&S), which includes heat pumps that meet federal minimum standards, but not the other remaining PTCS air source heat pump efficiency requirements. See PTCS in the Residential section.
PTHP	Packaged Terminal Heat Pump.
PTS	Performance Tracking System: An online tracking of real-time energy use (kW) to document the baseline and post tune-up energy use for ESI Program's Strategic Energy Management projects. It is also used to track any number of key variables to develop a meaningful, normalized energy use profile.
Qualified Applications List	A list of BPA installation applications for a specific technology that clarifies whether the installation application is approved for a BPA payment. For example, the commercial and residential DHP measures use this approach.
Qualified Product List	A list of products, such as equipment and appliances, that meet a specification for qualification.
Rate Period	A period of time during which a specific set of rates established by BPA pursuant to a rate-case process are in effect (currently two-year periods). Defined in BPA's Tiered Rate Methodology, as amended.
RTF	Regional Technical Forum: An advisory committee established in 1999 to develop standards to verify and evaluate energy conservation. Its committee members are experienced in conservation program planning, implementation and evaluation, and are appointed by the NWPCC.
RBSA	Residential Building Stock Assessment: A comprehensive survey of more than 1,850 sites across the Northwest, including more than 1,400 single-family homes. The RBSA was designed to develop a characterization of the residential sector that takes into account the diverse climates, building practices and fuel choices across the region.
RESNET	Residential Energy Services Network of Certified Raters: It uses the Home Energy Rating System (HERS) Index. The HERS Index score can be used to measure the energy efficiency performance of residential, single-family new construction. It is one of the means of certifying if a single-family home meets the Northwest ENERGY STAR Certified Homes standards.
Retail Program Delivery Mechanisms	Residential retail delivery mechanisms and program models include downstream incentives delivered directly to the end user, usually through a rebate; midstream incentives that go through the retailer; and upstream program activity that goes through the manufacturer.
RSAT	Retail Sales Allocation Tool: A tool for use in residential retail midstream and upstream programs where site information (i.e., home address) is not available. This tool provides evaluated, research-based percentage allocations for all Northwest utilities (public and investor-owned) for a select list of energy efficiency products in an easy-to-use, Excel-based tool. This tool is used by the Simple Steps, Smart Savings program and is available from an EER.
ROC	Refrigerator Operator Coaching: An Industrial Strategic Energy Management feature that provides classroom and webinar training, and on-site technical support. ROC is designed to help industrial sites with ammonia refrigeration systems general electrical energy savings, while getting the most out of their systems. The energy savings are calculated by site-specific energy models, following the M&V requirements addressed in the ESI MT&R Reference Guide.
Rollover Amount	The calculated amount of a program participant's remaining budget at the end of a given rate period that may carry forward to increase the amount of that program participant's available Implementation Budget for the following rate period. Rollover is calculated as up to 10 percent of their initial Implementation Budget or $50,000, whichever is greater.

DEFINITIONS AND ACRONYMS	
SEEM	Simplified Energy Enthalpy Model: A tool used by the RTF to model residential building energy use.
SEM Annual Savings Achieved	The verified incremental savings measured in each year of a two year performance period. • In Year 1 of the first performance period, or after the re-establishment of the SEM Baseline, it is measured as all savings achieved above the SEM Baseline. • In Year 2 of any performance period, it is measured as the savings achieved over the savings achieved in Year 1 of the performance period. • In Year 1 of subsequent performance periods (as a result of re-enrollment), it is measured as all savings achieved above Year 2 of the previous performance period. • Should there be zero or negative savings verified from prior year, SEM Annual Savings Achieved is zero. SEM Annual Savings Achieved is used to determine allowable Performance Payment.
SEM Baseline	Energy use established prior to enrollment in a SEM program. SEM Baseline can be reestablished after a significant operational change or at customer request as outlined in the ESI MT&R Reference Guide. Re-enrollment in additional two year performance periods resets the reference point for the purposes of calculating savings and payment, but does not change the SEM Baseline.
SEM Cumulative Verified Savings	Verified annual energy savings measured from establishment of SEM Baseline to current performance period year. SEM Cumulative Verified Savings is not used by BPA to calculate reportable savings or any payment, but will be provided to customers for their own reporting purposes.
SEM Participation Payment	EEI payment made during each year of an SEM Performance Period. Payment is based on SEM Verified Savings.
SEM Verified Savings	Verified total energy savings measured from the start of the current performance period. SEM Verified Savings are calculated at the end of Year 1 and at the end of Year 2. • In Year 1 of the first performance period, it is measured as all savings achieved above the SEM Baseline. • In Year 2 of any performance period, it is measured as the savings achieved in Year 1 and adjusted for any additional savings achieved in Year 2. • In Year 1 of subsequent performance periods (as a result of re-enrollment), it is measured as all savings achieved above Year 2 of the previous performance period. • Should there be zero or negative savings verified from the start of the performance period, SEM Verified Savings achieved is zero. SEM Verified Savings is used to determine EEI incentive payment
SEER	Seasonal Energy Efficiency Ratio.
Self-Funded	Energy savings for which a utility chooses not to seek a payment from BPA.
SEM	Strategic Energy Management: As defined by CEE's Minimum SEM Elements, a holistic approach to managing energy use to continuously improve energy performance, by achieving persistent energy and cost savings over the long term.
Single-Family	Fewer than five dwelling units within the same structure, including duplexes, triplexes, accessory dwelling units and modular homes. Townhouse homes that share walls, but do not vertically overlap, may be considered single-family, regardless of the number of units connected side by side. Accessory dwelling units with separate plumbing systems or separate HVAC systems qualify for applicable measures even if they are on the same electrical meter.
Site Energy Savings	The ascribed, deemed, calculated, estimated, evaluated or verified conservation in first-year, kilowatt-hours attributable to completed units.
Thermostats – Connected	Thermostats that have Wi-Fi or wireless capabilities to connect to the internet. They allow users to control HVAC functions to maintain zone temperatures using the internet, and offer online alerts, monitoring, programming and control from a remote location.
Thermostats – Line Voltage	Line-voltage thermostats are most commonly used for electric space heaters such as a baseboard or wall heater. If a line-voltage thermostat is used, system power (120 or 240 volts) is directly switched by the thermostat.

DEFINITIONS AND ACRONYMS	
Thermostats – Smart	Thermostats that can be Wi-Fi enabled with remote access, have programmable and/or learning-based scheduling, and can detect occupancy resulting in automatic HVAC reduction when a space is unoccupied.
Third-Party Implementer	Third-party implementers are companies that BPA has contracted with to support acquisition of energy efficiency services and savings for BPA and BPA Customers. Third-party implementers are sometimes referred to as program vendors, program contractors, or program partners.
TOCA	Tier One Cost Allocation: As prescribed by Tiered Rate Methodology, a billing determinant for applicable customer charges that is based annually on the lesser of the customer's Rate Period High Water Mark (RHWM), or the customer's forecast net requirement, which is calculated as a percentage of the total of RHWMs for all customers.
Ton	A ton is a measure of the cooling or heating capacity of an HVAC system. One ton is equal to 12,000 Btu per hour.
TRC	Total Resource Cost: A perspective of cost-effectiveness testing that includes all costs and benefits of a measure, regardless of who pays for or receives them. BPA uses the definition of the TRC test consistent with the Council.
Townhouse	Townhouse homes that share walls but do not vertically overlap (side-by-side and not stacked vertically) may be considered single-family homes.
TSP	Technical Service Provider: Consultants who perform technical services required to advance custom projects. Their expertise may include: efficiency firms (whose core business relates to supporting DSM); design/build firms (who provide design/build engineering services in addition to DSM support); or vendor firms.
Unassigned Account	The repository for unallocated funds and returned Energy Efficiency Incentive funds.
UES	Unit of Energy Savings: Measures where savings are estimated on a per-unit basis (e.g., savings per light bulb) for a typical baseline case to an efficient case scenario. UES measures have relatively small variation in savings that can be reliably forecast, formerly known as a Deemed Measure
Unique (Site) ID	An end user's unique identifier that may include an address, a field location, meter number, GPS coordinates or legal property description.
Unconditioned Space (Residential)	Any residential building cavity or space that is intentionally vented to the outside or is not heated and/or cooled by an HVAC system.
Unheated Buffer Space (Residential)	Any residential building cavity or space that is adjacent to the thermal boundary of the house and that has no positive heat supply under thermostatic control, such as garages and basements.
Utility	A public customer that purchases power from BPA.
VSHP	Variable Speed Heat Pump: A ducted heat pump manufactured with an inverter-driven motor that is capable of adjusting its output to meet the requested heating load (with performance similar to a DHP).
Verification	A process or procedure designed to produce evidence confirming the accuracy or truth of claims made to BPA, which may minimally involve obtaining and retaining documentation, or may require site inspection(s) of the measure(s).
VFD	Variable Frequency Drive: A type of adjustable-speed drive used in electromechanical drive systems. It controls AC motor speed and torque by varying the motor input frequency and voltage.
VRF	Variable Refrigeration Flow: Most often used in the Commercial Sector.
WEC	Wastewater Energy Coaching cohort: An Industrial Strategic Energy Management feature that provides on-site support and technical training focused on energy efficiency for municipal and industrial wastewater treatment facilities. It equips them with the tools to help them achieve measureable energy savings through low-cost operations and maintenance improvements.

DEFINITIONS AND ACRONYMS	
Whole Building Cost	As-built contracted cost including labor, design, measurement and verification, excluding land costs.
Working Day	Monday, Tuesday, Wednesday, Thursday and Friday, excluding federal holidays or other days federally designated to be nonworking days.
Zonal Electric Heating System	Nonducted, electric heating systems using thermostats to control individual heating units or groups of heaters (e.g., zones). They include radiant ceiling cable, fan-forced electric-resistance (wall, toe-kick, ceiling and exhaust fan combinations), electric baseboard and electric boiler/hot water (e.g., zonal electric hydronic) radiant systems.

Section 1: Introduction

Bonneville Power Administration pursues energy efficiency as a resource. This approach is stated in the 1980 Pacific Northwest Electric Power Planning and Conservation Act, and the Northwest Power and Conservation Council's Northwest Power Plan.

The Energy Conservation Agreement (ECA) is the contractual mechanism for BPA to meet its statutory obligations. Customers may request an ECA[1] by writing to their Energy Efficiency Representative. BPA shall review the request and, if accepted, will develop a draft ECA. BPA generally provides an opportunity for customer review. Once the ECA is final, the customer will receive a copy electronically.

The ECA, the Energy Efficiency Implementation Manual, or IM, and BPA's Energy Efficiency Reporting System (currently Interim System 2.0) provide the implementation requirements for reporting measures to BPA.

The IM relies on the framework specified in the Long-Term Regional Dialogue Final Policy[2] and the BPA Energy Efficiency Post-2011 Implementation Program. For additional guidance on the Post-2011 program, see BPA's website.

1.1 OVERVIEW

Based on BPA's Regional Dialogue policy, BPA commits to achieving the share of the Power Plan's regional energy efficiency target that represents BPA's public power customer load. BPA reports savings to its target from three major categories: programmatic, momentum and market transformation. The IM covers only programmatic savings that are reportable to BPA's targets.

Prior to inclusion in this IM, BPA conducts planning efforts to ensure that funds expended on the offerings and programs are prudent and are expected to meet stated objectives and outcomes. Programmatic offerings are considered reportable when they are reliable, cost effective and meet eligibility and documentation requirements. Reportable measures are eligible for the BPA payments outlined in this document. Unless otherwise noted or written preapproval has been provided by a contracting officer's technical representative (COTR), all equipment installed must be new to qualify for payment using a unit energy savings (UES) measure.

1.2 RELIABILITY

BPA has a responsibility to ensure the reliability of its energy-savings achievements. The Act specifically calls on BPA to pursue cost-effective energy efficiency that is "reliable and available at the time it is needed."3 For BPA's Energy Efficiency organization, ensuring reliability is not a single action at a single point in time. Instead it is an ongoing process that includes planning, implementing and using evaluation and oversight to make improvements.

Reliability varies by savings type: unit energy savings (UES), custom projects and calculators. Custom projects require site-specific measurement and verification (M&V) to support reliable savings estimates. BPA M&V Protocols[4] direct these activities and are the reference documents for reliable measurement and verification. For UES measures and calculators, measure specification and savings estimates must be approved by the Regional

[1] Occasionally, BPA may negotiate a nonstandard agreement with a customer that contains variations from IM requirements, but only when there is a benefit to BPA (such as a reduction in the payment or staff time spent administering the agreement).
[2] Bonneville Power Administration Long-Term Regional Dialogue Final Policy," pp. 30-31.
[3] Power Act language summarized.
[4] Protocols include: M&V Protocol Selection Guide; reference guides for sampling, regression and glossary; protocols on metering, indexing, engineering calculations with verification, energy modeling and existing building commissioning.

Organization of the IM

Section 1 contains general information about the IM.

Section 2 contains information specific to funding.

Section 3 contains general requirements for customers using BPA funding.

Section 4 contains information on the custom project process.

Section 5 contains information on the custom program processes.

Sections 6 through 12 contain information about specific sectors (Agricultural, Commercial, Federal, Industrial, Residential, Utility Distribution, and Multisector).

1.1 Overview. 1
1.2 Reliability 1
1.3 Cost-effectiveness. 2
1.4 Payment. 2
1.5 Policy for Measure Changes/ Additions 3
1.6 Official Interpretations 3

Supporting Content

Regional Dialogue Policy

BPA Energy Efficiency Post-2011 Implementation Program

NW Council Website

Technical Forum or meet the requirements to be "BPA-Qualified," described below.

The Regional Technical Forum reviews and approves costs, savings, lifetime and specifications for measures, which are based on the reliability standards in the RTF guidelines. BPA reviews RTF-approved measures and decides whether to adopt them into its program offerings. The primary and preferred path for BPA's measure and savings calculator development and maintenance is through RTF approval. The RTF has a well-developed public-review process, uniform quality standards and documentation, and the staff to conduct a review and to update UES measures.

To provide BPA and customers with additional UES measure flexibility, BPA may conduct an internal approval of costs, savings, lifetime and specifications; this is known as BPA-Qualified. It may only be used for structural purposes (e.g., to adjust specifications or granularity for a gap in offerings) or research purposes (e.g., to gain experience with new technology or improve savings estimates). BPA-Qualified measures are noted in the title of the measure. Documentation requirements may be higher for BPA-Qualified measures to support research efforts.

To assure portfolio-level reliability, impact evaluation is also required. Impact evaluations follow the RTF guidelines and are conducted on all savings types.

1.3 COST EFFECTIVENESS

BPA has a responsibility to ensure the cost effectiveness of its energy-savings achievements, as mandated in the Northwest Power Act.[5]

BPA maintains a cost-effective energy efficiency portfolio with an aggregate total resource cost (TRC) benefit-to-cost ratio greater than or equal to one (TRC > 1.0). To maintain a cost-effective portfolio, BPA maintains TRC > 1.0 in each of the major savings types: UES, custom and calculators. BPA does not require that every measure or project is cost effective; instead it uses a combination of cost-effectiveness thresholds and measure bundling to ensure overall cost effectiveness, while providing flexibility.

1.4 PAYMENT

When BPA determines the appropriate payments, it assesses cost characteristics relative to established metrics and considers other factors. The cost metrics reviewed for payment are: the incremental cost, the first-year cost and the levelized cost of the measure. First, payments are measured as a percentage of incremental cost and are capped based on savings-type policies (e.g., custom projects capped at 70% of incremental cost). Next, BPA reviews the first-year cost[6] with the goal of keeping each offering at or below the sector average cost goals. Finally, BPA compares the levelized cost of the payment against the Power Plan's avoided costs to ensure that BPA's payment does not exceed the resource value of the savings.

Other factors considered include: programmatic considerations, market maturity or conditions, payment influence and free ridership, TRC cost effectiveness and regional benefits.

[5] Power Act language summarized
[6] First-year cost is calculated as the ratio of the payment and first-year savings.

1.5 POLICY FOR MEASURE CHANGES/ ADDITIONS

BPA reserves the right to make changes to policies, procedures, measure eligibility, specifications and requirements.

On Oct. 1, 2015, the Change-Notice Policy was changed to reflect the "Revised Energy Efficiency Post-2011 Implementation Program." BPA has published the IM annually since Oct. 1, 2015, but is now publishing it every two years in tandem with the rate period that began Oct. 1, 2017. Changes that require notice will be announced the previous April in a separate changes document. BPA's new change-notice policy will be as follows:

CHANGES TAKING EFFECT IN THE OCTOBER BI-ANNUAL IM WITH SIX-MONTHS' NOTICE IN THE PRECEDING APRIL CHANGES DOCUMENT	CHANGES TAKING EFFECT IN OCTOBER AND IN THE APRIL CHANGES DOCUMENT WITHOUT NOTICE	CHANGES TAKING EFFECT AT ANY TIME WITHOUT NOTICE
Savings change: up or down	New measure	Corrections
Payment amount change: up or down	Optional calculators	Limited changes to calculators and forms
Adding or substituting a requirement	Removal of a requirement	
Expiration of a measure		

Note that changes are different from corrections. Corrections are introduced to fix ambiguous or incorrect language, or to align conflicting terms between BPA's rules (e.g., the IM, the ECA, standards of conduct, spreadsheets, calculators, outside specifications and the BPA Energy Efficiency Reporting System). A clarification is a type of correction. Corrections may be implemented at any time to provide immediate clarification and alignment to customers and BPA. Limited changes are corrections made to EE's supporting documents found in the IM Document Library that need to be implemented immediately. Off-cycle corrections (introduced outside of the April or October notice document) will be announced in the Updates/Revisions section at the end of the IM.

1.6 OFFICIAL INTERPRETATIONS

Only BPA Energy Efficiency's Contract Administration manager may issue interpretations, determinations and findings related to the IM, unless delegated to other BPA staff, such as the contracting officer's technical representative (COTR). Such interpretations, determinations and findings will be provided to the customer in writing. Only written statements (including email) by BPA officials acting within the scope of their authority are official BPA statements.

Supporting Content

Revised Energy Efficiency Post-2011 Implementation Program

Section 2: Funding

2.1 BPA Funding 4
2.1.1 Bilateral Funding 4
2.1.2 Rules for Pooling Organization . .5
2.1.3 Performance Payments 6
2.2 Funding Sources and Savings Allocation 8

2.1 BPA FUNDING

Pursuant to Section 6 of the Energy Conservation Agreement (ECA), BPA Energy Efficiency will pay customers for the costs of energy savings from in-region projects.[1]

This section discusses (1) bilateral funding, (2) pooling organizations, and (3) performance payments.

2.1.1 Bilateral Funding

Bilateral funds may be used for all BPA-funded measures, unless otherwise specified in the IM or ECA. Bilateral funding is administered through the customer's ECA and is referred to as the implementation budget (or, in certain instances, it is administered through a supplemental budget in a separate exhibit).

A customer's rate-period implementation budget is based on its Tier One Cost Allocation (TOCA). Customers may pursue budget changes under the ECA, per the terms of that agreement according to the parameters detailed below for budget redistribution, reduction and increase (from the Unassigned Account). Pursuant to Section 5(c) of the ECA, BPA shall not pay amounts in excess of the implementation budget.

The following section discusses: (1) Energy Efficiency Incentive (EEI) allocation; (2) Inter-Rate-Period Budget Flexibility (Rollover); (3) EEI redistribution; (4) EEI Budget Reduction; and (5) EEI increase from the Unassigned Account.

1. EEI Allocation

After the rate case final proposal is published, BPA will calculate the EEI allocation for each customer and deliver this information in a letter or similar document. BPA will revise the customer's ECA implementation budget to reflect the allocated funds, effective the first day of each rate period (i.e., Oct. 1), unless the customer indicates a different funding amount (not to exceed the EEI allocation) through the COTR Request and Acknowledgment Procedure. If the customer does not request a different funding amount, it commits to use or transfer its full EEI allocation for the acquisition of energy efficiency, per the requirements of the IM. EEI funds returned to BPA will be added to the Unassigned Account, which captures unclaimed EEI funds and unspent BPA programmatic funds.

2. Inter-Rate Period Budget Flexibility (Rollover)

Customers have the ability to move up to 10% of their initial implementation budget or $50,000, whichever is greater. The amount of funds remaining at the end of a given rate period, not to exceed the rollover cap, will be added to the customer's EEI budget for the following rate period (and will be added to the total implementation budget for the purpose of calculating performance payments). There is no requirement that rollover funding be tied to specific projects or programs

3. ECA Implementation Budget Redistribution (Bilateral Transfers and Pooling Organizations)

Customers may redistribute EEI funds among each other by forming a pooling organization or by sending a completed Bilateral Transfer Request and Attestation form (available in the IM Document Library) to

[1]BPA will not pay for projects that have been or will be funded in part/full by another BPA funding source.

Supporting Content

Bilateral Transfer Request and Attestation Form

BPA (email eedocs@bpa.gov). Approved bilateral transfers will result in ECA implementation budget revisions

Customers may authorize a third-party through a Bilateral Third-party Agreement (available in the IM Document Library) to request BPA to redistribute EEI funds on their behalf. If the third-party requesting a transfer has been authorized to act on behalf of both the donor and the recipient of funds, this request can be made with an email request without the need of a signed Bilateral Transfer Request and Attestation form. The email request must provide details of the transfer, including the effective date, dollar amount and associated utilities. In cases where the two customers do not have agreements with the same third-party, a signed Bilateral Transfer Request and Attestation form will be required. In all cases, requests should be made via email to eedocs@bpa.gov.

4. ECA Implementation Budget Reduction

Customers may reduce their implementation budget at any time by submitting a request through the COTR Request and Acknowledgment Procedure. BPA will revise the customer's ECA implementation budget to reflect the reduction, and the unallocated funds will be added to the Unassigned Account.

5. ECA Implementation Budget Increase from the Unassigned Account

BPA may increase customer implementation budgets (1) at months 6, 12 and 18 of the rate period; (2) on a monthly basis, beginning the 19th month of the rate period; or (3) at BPA's discretion as funding becomes available by distributing available EEI funds from the Unassigned Account. Customers will have 10 working days to request an implementation budget increase after BPA provides an accounting of available funds. If a customer's request is approved, funds will be allocated via a revision to the customer's ECA implementation budget.

To request an implementation budget increase from funds in the Unassigned Account, customers must submit to BPA (email eedocs@bpa.gov) the Unassigned Account Funding Request Template (available in the IM Document Library).

Customers that reduce their implementation budgets within the first 12 months of a rate period will receive second-priority access (behind BPA, which has first priority for allocations, if applicable) to the unassigned funds up to the amount reduced. The priority is based on the date the funds were released, and carries through that rate period and the one immediately following. Once the customer has recovered all the reduced funds, priority access is removed.

2.1.2 Rules for Pooling Organizations

A pooling organization is two or more customers combining BPA funds to implement cost-effective conservation. A customer may put all or a portion of its BPA funding toward a pool and withdraw under terms and conditions agreed to by the pool. Pool membership can expand or contract as determined by the pool, but pooling organizations must provide written notice to BPA at least 30 days prior to membership formation, changes or dissolution.

A pooling organization must appoint a legally authorized representative (such as a customer or separate entity) to assume nontransferable liability for the organization. BPA will fund a pooling organization only after it has reviewed and approved documentation of pool status (e.g., pooling organization agreement, bylaws, articles of incorporation) submitted by requesting customers. If the authorized representative is not a BPA customer with an existing ECA, BPA will offer an ECA for signature. Savings must be allocated to the individual customer where the savings are located.

2.1.3 Performance Payments

BPA highly recommends that customers use performance payments to support implementation costs in support of the IM's activities. Implementation costs may include (1) staff (direct labor and indirect overhead for the implementation and management of conservation activities); (2) marketing (market research, advertising, promotional material production and distribution); and (3) other operating costs and equipment (metering equipment, computer software/ hardware, training, travel and program development).

Performance payments are taken out of the customer's ECA implementation budget and are based on EEI-funded savings. Any SEM-related performance payment claimed shall be based on SEM Annual Savings Achieved (i.e., incremental savings); the payment shall not be based on SEM Verified Savings.

Effective July 1, 2020, BPA is increasing the Performance Payment rates for the remainder of the 2020-2021 Rate Period, through September 30, 2021.

The payment rate and cap depend on the customer's classification as small, rural, residential (SRR), or none of these (non-SRR), as defined in the chart below.[2]

SRR STATUS	DEFINITIONS	PAYMENT RATE $/KWH (EFFECTIVE OCT. 1, 2019 THROUGH JUNE 30, 2020)	PAYMENT RATE $/KWH (EFFECTIVE JULY 1, 2020 THROUGH SEPT. 30, 2021)
Small	The customer's forecast net requirement is less than 10 aMW	$0.08	$0.10
Rural	The customer has fewer than 10 customers per line mile according to the Low-Density Discount calculation	$0.08	$0.10
Residential	The customer's load is greater than 66% residential, according to U.S. Energy Information Administration data[3]	$0.08	$0.10
Non-SRR	The customer is not small, rural or residential	$0.04	$0.05

[2]BPA will notify customers of their rate period classification in the EEI allocation letter.
[3]BPA reserves the right to request additional documentation (such as an annual report) to verify a customer's load.

Customers may claim payment at a rate up to the rate in the table above. Effective October 1, 2021, customers may only be able to request a performance payment equal to or below the amount of the measure payment. The payment amount must be included on each invoice. If the performance payment is not claimed in an invoice or claimed only in part (e.g., at a rate less than the payment rate in the table above), then there is no opportunity to later collect money for the unclaimed payment. If the customer does not wish to claim a performance payment on invoices, it must submit the Performance Payment form (available in the Interim Solution 2.0 Files). BPA does not allow a performance payment to be claimed on self-funded activities.

The calculation of a performance payment is based on the program participant's initial implementation budget plus any applicable rollover amount, plus or minus any applicable implementation budget transfers (known collectively as the implementation budget). This calculated amount can vary over the course of the rate period. The total of all performance payments available at any given time is capped at 30% of the implementation budget for SRR customers and at 20% of the implementation budget for non-SRR customers.

If the customer or BPA makes a classification or calculation mistake, the SRR status change becomes effective immediately upon discovery of the mistake. When a mistake is discovered, corrections to invoices for over- or under-payments will address the full time period impacted, but not to exceed the statute of limitations (six years). Availability of historical invoice details may be limited due to availability within the reporting system of record.

Pooling organizations may claim performance payments up to the aggregate of each pool participant's allowance.

When funds are redistributed among customers (e.g., via a bilateral transfer), BPA may restrict the performance payment that can be claimed on the transferred funds.[4] An increase or decrease in a customer's EEI budget will result in a corresponding increase or decrease in their performance payment budget. If a customer transfers enough of its EEI budget so that its calculated performance payment budget becomes less than or equal to zero, the utility will not be required to repay prior payments, but no additional performance payment will be allowed[5] for the remainder of the rate period, unless the utility receives additional EEI funds.

[4]This restriction reduces the risk that BPA will overpay because performance payments are paid on a $/kWh basis, independent of payment amount (i.e., a customer could use all of its performance payment, receiving little payment, and then transfer its remaining implementation budget to another customer that similarly uses all of the performance payment).

[5]To claim less than the calculated performance payment, use the Performance Payment calculator located on the Interim Solutions 2.0 Files webpage.

2.2 FUNDING SOURCES AND SAVINGS ALLOCATION

When reporting savings to BPA, customers must select one or more of the following funding sources:

FUNDING SOURCE	BPA ENERGY EFFICIENCY REPORTING SYSTEM TITLE	DESCRIPTION
Implementation Budget	EEI	BPA payment in the form of EEI funding; ECA funded activities that are accepted by BPA
BPA-Accepted, Non-BPA Funds	Self-Funding	Activities generating energy savings for which a utility chooses not to seek payment from BPA[6]
Not-BPA-Accepted, Non-BPA Funds[7]	Non-Reportable	Non-BPA-funded activities that are not accepted by BPA.

Customers are credited for all savings (except non-reportable) that are achieved in their service territory. Savings may be allocated to either the EEI or the customer depending on the amount of BPA payment requested by the customer.

BPA PAYMENT AMOUNT REQUIRED	AVAILABLE APPLICATIONS	SAVINGS ALLOCATED TO EEI	SAVINGS ALLOCATED TO CUSTOMER
All	All	100%	0%
None	All	0%	100%
Partial	Custom Projects	EEI and self-funded savings are allocated in proportion to the EEI and self-funding shares of BPA's willingness to pay.	

[6]This includes, but is not limited to, 100% of industrial strategic energy management (SEM) verified energy savings for each reporting year (i.e., year one of the SEM engagement and each subsequent reporting year).

[7] Customers are allowed, but not required, to include non-reportable savings to BPA. BPA will not review the non-reportable data and customers will not be credited for the energy savings. Non-reportable savings must be reported separately.

Supporting Content

Interim Solution 2.0 Files

Section 3: General Requirements

3.1 Documentation Requirements 9
3.2 Reporting Requirements. 9
3.3 Oversight Review Process. 10
3.4 Third-Party Operated Program Requirements. 11

Supporting Content

BPA Customer Portal

Interim Solution 2.0 Files

Required Documents

UES Measure Upload Template

Performance Payment Form

Progress Payment Request Form

Option 1 Custom Project Calculator

RTF-approved Small Compressed Air Calculator

Track and Tune Calculator v6.2

High Performance Energy Management Calculator v6.2

Energy Management Calculators

Nonresidential Lighting Calculator

Option 2 Custom Project Calculator v3.13

File Naming Tool

Summarizer

3.1 DOCUMENTATION REQUIREMENTS

Each measure contains documentation requirements. All documentation must be retained in the customer's file (which may be in hard copy or electronic form) and certain documentation must be submitted to BPA via email to eedocs@bpa.gov or or sent through BPA's Energy Efficiency Reporting System.

Unless otherwise noted, utility-created forms can be substituted for forms provided by BPA to fulfill the stated documentation requirements. Utility created forms must contain at a minimum all fields found in the BPA-provided form in order to qualify as acceptable documentation.

Customers must retain required information for a minimum of four years after the measure has been invoiced through the reporting system. Information must be made available to BPA upon request.

If a customer agent or contractor was used for some or all of the measure development, implementation or verification, the customer must also retain documentation that IM requirements have been met.

3.2 REPORTING REQUIREMENTS

Reports (invoices) must include supporting documentation required by the IM. This documentation must prove that measures were available for implementation during the claimed period, were properly installed and are operating. BPA may reject measures that do not meet these requirements.

Should there be a disagreement regarding a report, BPA will work with the customer to correct errors and make agreed-upon revisions.

For each submitted report, customers must establish and maintain files and supporting documentation.

The files must clearly identify the corresponding invoice and meet the documentation requirements of the IM.

Until BPA Energy Efficiency procures a long-term reporting system, customers must use Interim Solution 2.0 (IS2.0), available through the BPA Customer Portal, to report energy efficiency achievements to BPA — with and without requests for payment. Customers may report any energy savings at any time, as long as the completion dates are in the current or previous rate period. For nonresidential lighting, customers must use the calculator in effect at the time of submission.

The following describes the reporting steps. All referenced documents are available in the IM Document Library or the Interim Solution 2.0 Files websites.

Gather invoice-package documents that may include, but are not limited to, the following:

- UES Measure Upload Template (Use this to report specific measures that have been completed. Look up the specific reference number that applies to the end user's situation in the UES Measure List posted to the Interim Solution 2.0 Files website.)
- Performance Payment Form (Only if requesting less than the total available performance payment on an invoice.)
- Progress Payment Request Form (Only if requesting custom project progress payments.)

- Calculators
    - Option 1 Custom Project Calculator (After COTR approval of project completion report, one calculator file for each COTR-approved completed project.)
    - Option 2 Custom Project Calculator (Available for bulk reporting of multiple projects; can be found as an Additional Document in the Energy Efficiency section of the BPA Customer Portal for eligible Option 2 customers.)
    - RTF-Approved Small Compressed Air Calculator
    - Energy Management Calculator (Energy Project Manager, Track and Tune, and High-Performance Energy Management)
    - Lighting Calculator
    - Custom Program Calculator

Use the File Naming Tool to name all invoice package documents. Improperly named documents will not be processed by the system and may result in the customer having to resubmit the entire invoice package.

Use the Summarizer Tool (optional) to estimate the total invoice package payment and savings. This tool can also give preliminary indications of potential invoice package errors and warnings.

Upload invoice package documents (named using the File Naming Tool) to the BPA Energy Efficiency Reporting System.

BPA will review the submitted documents and create an invoice report showing the amount to be paid. BPA will work with the customer to resolve any errors in the invoice package and will determine the acceptable payment for measures reported.

3.3 OVERSIGHT AND EVALUATION REVIEW PROCESS

As a part of the oversight review process, BPA reserves the right to ~~shall~~ (1) perform end-user site and record reviews, and (2) conduct impact and process evaluations.

Site and Record Reviews

BPA may conduct oversight inspections of all measures, contact end users to verify reported measures, monitor or review the customer's procedures and records, conduct site visits to verify claimed energy savings and oversee implementation. The number, timing and extent of inspections is decided by BPA and coordinated with the customer. BPA shall normally provide written notice not less than 30 days prior to an inspection and inspections will occur at BPA expense. BPA may contact appropriate federal, state or local jurisdictions regarding health, safety or environmental matters related to any activity under this IM.

If, at any time, BPA finds noncompliance with the requirements of the IM or the customer's ECA, it may make adjustments to the customer's invoices and/or payments to achieve compliance.

Impact and Process Evaluations

BPA may evaluate measures to assess the amount, cost effectiveness and reliability of conservation. BPA will determine the timing, frequency and type of evaluations with input from the customers on the evaluation plan.

BPA may also require customers to provide billing data and contact information for participants. If so, billing data must be linked to the reported measure (e.g., through a unique identification) to allow BPA to assess savings by measure.

BPA and/or regional participants will pay for evaluations initiated by BPA. In some cases, another party will manage the evaluation on behalf of BPA. BPA

recognizes that customers participating in the evaluation provide some resource/cost, but the cost is not eligible for BPA payment.

When reporting savings for evaluation, customers should not apply realization rates to individual measure savings estimates in order to avoid embedded realization rates. BPA's recommended best practice is to apply realization rates to the total savings for a portfolio, rather than to the individual measure savings data.

3.4 THIRD-PARTY OPERATED PROGRAM REQUIREMENTS

It is unlikely, but unforeseeable contract circumstances could result in the termination or change of third-party-operated programs without prior notice. If BPA is forced to change a third-party-operated program, BPA will strive to minimize disruptions to delivery of program services through an alternate third-party provider or with BPA's own staff resources. BPA will give customers as much notice as possible if there are terminations or changes, and it will work with customers to wrap up and/or transition any work in progress.

The following programs are operated by third parties: Energy Smart Industrial, Trade Ally Network Northwest, Technical Service Providers, Simple Steps, Smart Savings Retail Promotion and the Green Motors Rewind Initiative.

Section 4: Custom Projects

4.1 Custom Projects Payment Rate . . . 12
4.2 Custom Projects Special Funding .14
4.2.1 Progress Payments 14
4.3 Custom Projects Overview 14
4.3.1 Custom Projects Process Option Overview and Enrollment 14
4.3.2 Custom Projects General Requirements. 15
4.4 Option 1 Custom Projects 16
4.4.1 Custom Project Proposal 16
4.4.2 Custom Project Completion Report 16
4.4.3 BPA Review 16
4.5 Option 2 Custom Projects 17
4.6 Custom Projects Documentation Requirements. 18

4.1 CUSTOM PROJECTS PAYMENT RATE

Effective Oct. 1, 2018, Option 1 customers must use Custom Project Calculator Version 4.12 or later for new custom projects. Effective Oct. 1, 2018, BPA will no longer accept any previous versions.

CUSTOM PROJECT CALCULATOR OPTION 1 VERSION	EFFECTIVE DATE	RETIREMENT DATE	NO LONGER ACCEPTED IN IS2.0
1.1	Dec. 6, 2012	Dec. 31, 2015	Oct. 1, 2017
1.2	April 1, 2013	Dec. 31, 2015	Oct. 1, 2017
1.3	Oct. 1, 2013	Dec. 31, 2015	Oct. 1, 2017
1.4	Jan. 9, 2014	Dec. 31, 2015	Oct. 1, 2017
2.0	July 14, 2014	Dec. 31, 2015	Oct. 1, 2017
2.1	Oct. 1, 2014	Dec. 31, 2015	Oct. 1, 2017
2.2	Dec. 30, 2014	Dec. 31, 2015	Oct. 1, 2017
3.0	June 1, 2015	Dec. 31, 2015	Oct. 1, 2017
3.1	Oct. 1, 2015	Oct. 1, 2017	Oct. 1, 2017
3.2	Jan. 7, 2016	Oct. 1, 2017	Oct. 1, 2017
4.0	Oct. 1, 2016	Oct. 1, 2017	Oct. 1, 2017
4.1	Oct. 1, 2017	Nov. 14, 2017	Nov. 14, 2017
4.11	Nov. 14, 2017	March 8, 2018	Oct. 1, 2018
4.12	March 8, 2018	Oct. 1, 2018	To Be Determined
4.13	Oct. 1, 2018	To Be Determined	To Be Determined

In most instances of site-specific calculations (Option 1 Custom Project Calculators, Option 2 Custom Project Calculators, Lighting Calculators, etc.), the current site-to-busbar savings factor being used is 1.09056; however, the BPA lighting calculator uses 1.07478.

BPA's willingness to pay for a custom project is equal to the lesser of (1) the BPA payment rate ($/kWh), or (2) the project cost cap.

The applicable BPA payment rate ($/kWh) is the rate in place when the custom project proposal was approved or the project start date if no custom project proposal was submitted. The BPA payment rate is calculated according to the table below:

Custom Projects Payment Table

PROJECT TYPE	MEASURES LIFE (YEARS)	SECTOR	PAYMENT RATE ($/KWH)
Nonresidential Lighting	All	Agricultural Commercial Industrial	$0.13
Retrofit Construction (Excluding Nonresidential Lighting)	1	All	$0.03
	2–3	Commercial — HVAC End Use	$0.06
		All Other End Uses	$0.05
	4-19	Agricultural Industrial Utility Distribution	$0.25
		Commercial — HVAC End Use	$0.23
		Commercial— All Other End Uses Residential	$0.20
	20+	Commercial — HVAC End Use	$0.40
		All Other End Uses	$0.35
New Construction and Major Renovation (Excluding Nonresidential Lighting)	1	All	$0.03
	2–3	Commercial — HVAC End Use	$0.06
		All Other End Uses	$0.05
	4–19	Agricultural Residential	$0.27
		Commercial — HVAC End Use	$0.31
		Commercial Sector — All Other End Uses	$0.27
		Industrial Utility Distribution	$0.25
	20+	Agricultural Industrial Residential	$0.35
		Commercial — HVAC End Use	$0.40
		Commercial — All Other End Uses	$0.35
		Utility Distribution	$0.25
New Construction	45+	Residential	$0.45

Project cost cap: Payment for all sectors is capped at 70% of the incremental project cost. If incremental cost data is not available for commercial new-construction projects, incremental cost may be calculated as 2.86 percent of the whole building.

Customers may request less than the BPA's willingness to pay and will receive partial self-funding credit, as discussed in Section 2.2: Funding Sources and Savings Allocation.

Customers must pass through the entire BPA payment received to their end users if the payment is for a progress payment.

4.2 CUSTOM PROJECTS SPECIAL FUNDING

All utilities are eligible to request special funding (e.g., progress payments).[1]

4.2.1 Progress Payments

BPA will retire Progress Payments effective October 1, 2021. Section 4.2.1 Progress Payments and the Progress Payment calculator will be retired.

Customers requesting progress payments must use the Progress Payment Calculator to request approval. The customer must request progress payments in the proposal, and the request must include a schedule with estimated progress payments that coincide with incurred costs and measurable milestones.

Progress payments will be made after project milestones are achieved and verified, in accordance with the BPA-approved Custom Project Proposal. The customer must document project milestone achievements (e.g., ordered, delivered or installed equipment) prior to receiving a progress payment.

The full progress payment amount paid by BPA must be passed through to the end user, and the customer must retain proof of payment. Customers will be required to repay BPA if the project is not completed within six months of the expected completion date (the expected completion date may be revised with BPA approval).

To qualify for progress payments, the project must have the following attributes:

- The time period from the BPA Custom Project Proposal approval date to the completion report submittal date meets or exceeds 12 months.
- The amount of each progress payment is $100,000 or greater.
- The estimated incentive for the project is $250,000 or greater.
- The sum of the progress payments does not exceed the lower of (a) 70 percent of actual expenditures of the project incurred, up to the date of the progress payment invoice to BPA, or (b) 50 percent of the estimated total project incentive.

For projects seeking the use of progress payments, the Custom Project Proposal and completion report must be approved prior to submission of the completion report into the BPA Energy Efficiency Reporting System. There is no required minimum time between the date of BPA's acceptance of a Custom Project Proposal and the date of completion report submission.

4.3 CUSTOM PROJECTS OVERVIEW

4.3.1 Custom Projects Process Option Overview and Enrollment

There are two paths available for custom projects: Option 1 and Option 2.

Customers, by default, are enrolled in Option 1, but may elect Option 2 by using the COTR Request and Acknowledgment Procedure at the start of each rate period. They must submit/renew their application no later than Sept. 1, preceding the new rate period.

A request to follow the Option 2 path must include the customer's proposed custom project-delivery approach (including, but not limited to, documentation of rules, processes and staffing capability) to meet the custom project requirements. The request must also provide any internal M&V protocols used for custom projects for BPA review. BPA may request additional information before notifying the customer of its approval/disapproval of Option 2 status. Option 2 customers may switch to Option

[1] Option 2 customers may request progress payments for a project only if they use the Option 1 Custom Project Process to secure BPA's approval.
[2] Customers wishing to return to Option 1 at the start of a new rate period must submit their request no later than Sept. 1, immediately preceding the new rate period.

Supporting Content

IM Document Library

Required Documents

Option 1 Custom Project Calculator

COTR Request and Acknowledgment Procedure

IM Document Library

BPA M&V Protocol Documentation

1 through the COTR Request and Acknowledgment Procedure (1) for any reason at the start of a new rate period[2], or (2) if customer circumstances change, making Option 2 unworkable.

Option 1: BPA manages the project performance and cost-effectiveness of the bundle of energy savings from Option 1 custom projects. Option 1 customers may request technical support from BPA or BPA program implementers (i.e., Energy Smart Industrial) to develop projects and complete M&V regardless of the size of the project, or the requirement for review and comment.

Option 2: Customers manage the project performance and cost-effectiveness of the bundle of energy savings from their custom projects. The customer conducts all aspects of M&V and custom project quality control (e.g., project proposal and project completion documentation review) internally. Technical assistance is available in relation to IM clarifications and consultations regarding M&V methods and protocols, as they apply to a single project or the customer's portfolio of projects. Project-implementation assistance is not available unless provided by third-party implementation contractors as part of a program (e.g., Cascade Energy through Energy Smart Industrial, or Trade Ally Network Northwest). Option 2 customers that request special BPA funding (such as progress payments, or those performing Limited-Availability Emerging Technology Field Test projects) must follow the Option 1 Custom Project Process.

4.3.2 Custom Projects General Requirements

1. It must not result in fuel switching.
2. The measures must be designed to result in improvements in the energy efficiency of electricity distribution or use, and must have a savings life of at least one year.
3. Custom projects are limited to one sector each.
4. Unit Energy Savings (UES) measures and calculated projects may be included in custom projects, on their own or in a project with other measures/projects, but must either (1) be included in the custom project M&V and not use the UES/calculated savings value; or (2) be reported separately through the UES/calculated path and the savings must not be included in the custom project savings.
5. Option 1 Custom Projects must meet the following B/C ratio requirements:
    - If the project savings are 200,000 kWh or less, no cost-effectiveness screen is applied.
    - If the project savings are over 200,000 kWh, and the project has a BPA-approved proposal, the proposal must demonstrate that the project has a B/C ratio ≥ 0.5 based on proposed costs and savings. No additional screen will be applied at the completion report.
    - If the project savings are over 200,000 kWh, and the project does not have a BPA-approved proposal, the completion report must demonstrate that the project has a B/C ratio ≥ 0.5.
6. Option 2 Custom Projects must have a minimum B/C ratio of 1.0 at the invoice level, based on verified costs and savings, when invoiced.
7. Any nonresidential lighting project (See 7.3 Nonresidential Lighting) may be submitted as a custom project. Nonresidential lighting projects submitted by Option 1 customers as custom projects must

use an M&V plan per the BPA M&V Protocol Selection Guide and are not eligible to use a BPA engineering calculation with verification plan. Nonresidential lighting projects submitted by Option 2 customers must follow Option 2 custom project requirements.

8. The BPA M&V Protocol Selection Guide (available in the IM Document Library) for custom projects must be used to select an appropriate M&V plan and be documented in the customer file. The implemented plan will be either (1) engineering calculations with a verification plan, or (2) a comprehensive M&V plan.

   Engineering calculations with a verification plan
   Detailed guidance on preparing engineering calculations with a verification plan is included in the BPA Engineering Calculations with Verification Protocol. As directed in the BPA M&V Protocol Selection Guide, engineering calculations with a verification plan may be used for projects with an expected annual energy savings of less than 200,000 kWh per year, which qualify under the BPA Engineering Calculations with Verification Protocol.

   Comprehensive M&V Plan
   Detailed guidance on preparing a comprehensive M&V plan is in the BPA M&V Protocols and Guidelines.

4.4 OPTION 1 CUSTOM PROJECTS

4.4.1 Custom Project Proposal

Option 1 Custom Project Proposals (a component of the Option 1 Custom Project Calculator) are not required unless the customer is applying for Progress Payments, or is performing a Limited-Availability Emerging Technology Field Test project.

Customers may, but are not required to, submit proposals to manage (1) energy-savings risks (i.e., if BPA approves the M&V plan at the proposal stage, and the M&V is carried out as stated in the plan, then BPA will accept the savings) and (2) cost-effectiveness risks (i.e., customers can secure assurance of project eligibility based on proposed values, rather than on completion report values). The customer may submit the Option 1 Custom Project Calculator to BPA via email to eedocs@bpa.gov. with the following tabs completed: Project Information, Proposal and Measure Input (all fields are labeled “required for proposals”).

When a proposal is approved, BPA will notify the customer and email the approved Option 1 Custom Project Calculator to the customer with the BPA-assigned project ID. This file must be saved and used by the customer for submittal of the completion report.

4.4.2 Custom Project Completion Report

Option 1 customers must submit a completion report (located in BPA’s Option 1 Custom Project Calculator) to BPA via email to eedocs@bpa.gov. It must include the following completed documents: project information, measure input and any supporting documentation for all custom projects.

When a completion report is approved, BPA shall notify the customer and email the approved Option 1 Custom Project Calculator to the customer. The customer must submit the BPA-approved calculator in the BPA Energy Efficiency Reporting System when requesting payment or reporting self-funding.

Note: Option 1 customers electing to submit non-reportable projects must do so using the Option 2 Custom Project Calculator.

Supporting Content

BPA M&V Protocol Documents

Required Documents

Option 1 Customer Project Calculator

4.4.3 BPA Review

Within 10 business days of receiving an Option 1 Custom Project Proposal or completion report, BPA will review the proposal or report and either (1) accept the submittal, (2) return the submittal for modification and resubmittal, or (3) reject the submittal. BPA determination of acceptability of a completion report is based on the following criteria:

a. Whether the Option 1 Custom Project Calculator and supporting documentation contain all required information;

b. Whether the project meets all the requirements; and

c. Whether verified energy savings are reliable (i.e., M&V was implemented per the approved M&V plan or M&V was appropriate for the project and consistent with BPA M&V Protocols).

For Option 1 projects without BPA-approved proposals and insufficient M&V, BPA will work with customers to adjust completion report savings, where appropriate and feasible. If it is not possible to make appropriate adjustments, the project will be rejected and will be ineligible for reporting to BPA.

4.5 OPTION 2 CUSTOM PROJECTS

For Option 2 projects, BPA does not require or review proposals or completion reports. Option 2 customers may apply for special BPA funding such as Progress Payments using the Custom Project Proposal Process for Option 1 custom projects. If special BPA funding is approved, the projects are treated the same as Option 1 projects and must meet all requirements of Option 1 custom projects.

For all Option 2 projects, the customer must review and approve the completion report prior to customer submission of savings into the BPA Energy Efficiency Reporting System. The completion report itself does not need to be submitted to BPA, but it must be retained by the customer for oversight and evaluation. The completion report should also contain any information on additional quality control conducted on the project. To receive payment for a custom project, the customer must submit the Option 2 Custom Project Calculator through the BPA Energy Efficiency Reporting System.

BPA may reject Option 2 projects that do not (1) have a completion report that contains all required information and demonstrates that the project is consistent with the custom project requirements, and (2) have verified energy savings that are reliable (i.e., M&V was implemented per the approved M&V plan or M&V was appropriate for the project and consistent with BPA M&V Protocols).

4.6 CUSTOM PROJECTS DOCUMENTATION REQUIREMENTS

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY-EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
Option 1 Custom Projects			
Option 1 Custom Project Calculator (Send to BPA for completion report review with all supporting documentation, including associated lighting calculator being used for estimates if applicable. Submit to the BPA Energy Efficiency Reporting System after approval of the project completion report, when requesting BPA payment or reporting self-funding).	X	X	X
Option 2 Custom Projects			
Option 2 Custom Project Calculator	X		X
Responsible entity implementing M&V plan, M&V plan, pre- and post-measurement data, assumptions, and any modeled or calculated data used to determine energy savings			X
Project documentation including, at a minimum: Basic project information; baseline conditions; efficient measure conditions; description of M&V procedures used for the project (e.g., protocol used for estimating savings; calculations used; metering equipment and sampling) and deviations from planned M&V; M&V report and/or detailed savings model; name of M&V protocol used; verified savings and documentation showing how the projected non-energy benefits and operations and maintenance costs were calculated (if applicable); verified costs, including invoices; and delivery inspection report/date			X

Section 5: Custom Programs

5.1 Custom Programs Payment Rate . .19
5.2 Custom Programs Requirements 20
5.3 Custom Programs Approval and Modification Process 20
5.4 Custom Programs Documentation and Reporting Requirements 21

Custom programs are on hold for the 2020–2021 Rate Period. During this time new submissions will not be accepted; However, Energy Efficiency staff will continue to work with customers on existing custom programs. To qualify as an existing custom program, a program proposal must have been submitted on or before September 30, 2019.

Custom programs are a combination of similar projects, measures and/or end users that have the same measurement and verification (M&V) or evaluation plan across the entire program. The scope of a custom program is multiple installations that may include one or more measures, or sectors,[1] and that may occur at one or more end-user sites.

5.1 CUSTOM PROGRAMS PAYMENT RATE

The total BPA willingness to pay for an Evaluated Custom Program, or project within an M&V Custom Program, is equal to the lesser of (1) the BPA payment rate ($/kWh), or (2) the project cost cap.

The applicable BPA payment rate ($/kWh) is the rate in place at the time of Evaluated Custom Program approval or the start date for a project within an M&V Custom Program. BPA payment rate is calculated according to the table below:

PROGRAM MEASURE TYPE	MEASURE LIFE (YEARS)	SECTOR	PAYMENT RATE ($/kWh)
Nonresidential Lighting	All	Agricultural Commercial Industrial	$0.13
Retrofit Construction (excluding Nonresidential Lighting)	1	All	$0.025
	2–3	All	$0.05
	4–19	Agricultural Industrial Utility Distribution	$0.25
		Commercial Residential	$0.20
	20+	All	$0.35
New Construction and Major Renovation (excluding Nonresidential Lighting)	1	All	$0.025
	2–3	All	$0.05
	4–19	Agricultural Commercial Residential	$0.27
		Industrial Utility Distribution	$0.25
	20+	Agricultural Commercial Industrial Residential	$0.35
		Utility Distribution	$0.25
New Construction	45+	Residential	$0.45

[1]Savings must be reported separately for each sector.

Payment for all sectors is capped at 70% of the incremental cost. Eligible costs include measure costs (incremental measure costs, operations and maintenance costs) and program costs (implementation, evaluation and M&V).

Customers may request less than the BPA willingness to pay and will receive partial self-funding credit, as discussed in Section 2.2: Funding Sources and Savings Allocation.

5.2 CUSTOM PROGRAMS REQUIREMENTS

Supporting Content

BPA M&V Protocol Documents

Both Option 1 and Option 2 customers are eligible for custom programs, and both must meet the same requirements and follow the same process with BPA. Option 2 customers must use the custom program path when the BPA M&V Protocols are insufficient to provide direction, including use of an impact evaluation to estimate savings or where the M&V protocols do not cover a specific measure/application/method.

Custom Programs must meet the following criteria:

- Not result in fuel switching; and
- Contain only measures with a savings life of one year or more.

UES measures and calculated projects may be included in custom programs on their own, or in a program with other measures/projects. However, they must (1) be included in the custom program M&V or evaluation, and not use the UES/calculated savings value, or (2) be reported through the UES/calculated path and be netted out from the custom program savings.

There are two types of custom programs:

1. M&V Custom Program: Savings are estimated for individual sites based on M&V methodologies. M&V methods are based on the BPA M&V Protocol Selection Guide.

   M&V Custom Programs must be total resource cost-effective (TRC>1.0) at a calculator level.

2. Evaluated Custom Program: Savings estimation follows an impact evaluation plan, which may include a census or sample of the participants. Evaluation methods are known and tested for the specific measure/application. Evaluations must be, at a minimum, consistent with RTF Guidelines Section 5 (Impact Evaluation).

   Evaluated Custom Programs must be cost-effective at the program level (impact evaluation level) with TRC of 1.0 or greater, based on verified costs and savings at the time of completion report and invoicing.

5.3 CUSTOM PROGRAMS APPROVAL AND MODIFICATION PROCESS

Supporting Content

Custom Project Calculator

Custom Program Calculator

The customer must secure BPA's approval of its custom program or any modifications (including cancellation) to it (e.g., new measures, measure exclusion and M&V approach change).

Custom Program proposals must, at a minimum, contain the following information:

- Basic program information, including:
  - Program name;
  - Contact information: customer name and proposer contact information; and
  - Program summary: existing system and proposed system descriptions.

- Documentation of baseline conditions.
- A site-specific M&V plan or impact evaluation plan.
- Proposed measure costs and savings.
- Proposed program costs.
- Estimated project-level cost-effectiveness.
- For M&V Custom Program, completion report submission requirements (e.g., approved reports prior to submission for all projects, some projects or no projects).

The customer's request for approval must be sent to BPA eedocs@bpa.gov by submitting a Custom Program Calculator available in the IM Document Library.

The customer may cease its custom program participation at any time using the COTR Request and Acknowledgment Procedure. BPA shall have no obligation for costs incurred for unreported savings.

Evaluation requirements differ for Evaluated and M&V Custom Programs, *but each evaluation plan must be customer-funded, unless otherwise directed by BPA*.

BPA may ask the customer clarifying questions during the approval process. Within 10 working days of the receipt of all documents (as listed below), BPA will email the customer with its decision or a time frame for a decision.

5.4 CUSTOM PROGRAMS DOCUMENTATION AND REPORTING REQUIREMENTS

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
Custom Program Calculator	X	X	X
Evaluation Plan		X	X
Evaluation Report for completed evaluated program		X	X
Completion reports for M&V Custom Program projects, as defined in the proposal		X	X
For M&V Custom Programs, documentation of basic project information, baseline conditions, efficient measure conditions, description of M&V procedures used for the project (e.g., protocol used for estimating savings, calculations used, metering equipment, sampling) and deviations from planned M&V, detailed savings model including calculations and raw data if applicable, verified savings			X

Savings may be reported from projects that were completed prior to proposal approval, as long as those savings meet the savings estimation and reporting requirements.

The reporting requirements differ depending on whether the custom program is (1) M&V, or (2) evaluated.

1. M&V Custom Program

   The customer must conduct M&V in accordance with its approved M&V plan, and must document the type and quantity of measures installed.

   Completed projects may be submitted for payment using the Custom Program Calculator for each project (including measure-specific results) no later than the reporting period immediately following project completion (i.e., when the project is installed and energy savings measured according to its M&V plan). The calculator will estimate the payment, consistent with the start date of each individual project.

   BPA will define M&V Custom Program completion report requirements at the proposal stage. Prior to customer submission in the BPA Energy Efficiency Reporting System, BPA must approve the completion report to ensure alignment with the requirements given at proposal.

2. Evaluated Custom Program

   Prior to reporting in the BPA Energy Efficiency Reporting System, the customer must submit a completed Custom Program Calculator and an evaluation report consistent with the previously approved evaluation plan.

   Payment is based on evaluated savings per the evaluation report.

   Upon conclusion of the program and approval of the final Custom Program Calculator and evaluation report, the COTR will direct the customer how to report the program savings to BPA.

Section 6: Agricultural Sector

Please check the changes and corrections summary to see if revisions were made to any of the measures in this sector.

The Agricultural Sector includes electric energy used (1) by a farm or business where the primary purpose is applying water for food production or vegetation growth (e.g., pumping and irrigation), and (2) by a ranch or aquaculture (aquafarming) business where the primary business is breeding or raising domestic livestock, poultry, game animals, fish, oysters, etc.

Storing and processing farm products, including the homogenizing, dehydrating and bottling of milk and its derivatives, is considered industrial. Dairies and milk storage at a milking facility are considered agricultural. A facility may have a mix of both agricultural and industrial measures at the same location (e.g., a winery operation with a processing facility where the vineyard irrigation is considered agricultural and the grape-processing facility is considered industrial).

Unless otherwise noted, all Agricultural Sector measures are available for the Agricultural Sector, as well as the Commercial and Industrial sectors where applicable. Utilities shall report these measures as Agricultural when reporting to BPA.

6.1 PAYMENT SUMMARY*	
MEASURE CATEGORY	**PAYMENT**
6.2 Freeze-Resistant Stock Water Tanks/Fountains	$140-$225 per tank or fountain
6.3 Thermostatically Controlled Outlets	$14 per outlet
6.4 Thermostatically Controlled Stock Tanks	$52 per stock tank
6.5 Transformer De-Energization	$0.03 per kWh
6.6 Irrigation Measures	
6.6.1 Irrigation System Conversions: LESA/LEPA/MDI	$12 per drop
6.6.2 Sprinkler Package Replacements	$3-$12 per drop
6.6.3 Irrigation System Conversions: MESA	$10 per drop
6.6.4 Irrigation Hardware	$1-$275 per measure
6.7 Agricultural Pumps and VFDs	
6.7.1 Irrigation Pump Testing and System Analysis	$50-$300 per test or analysis
6.7.2 Variable Frequency Drives for Centrifugal Agricultural Pumps (BPA-Qualified)	$50 per horsepower
6.7.3 Variable Frequency Drives in Agricultural Turbine Pump Applications (BPA-Qualified)	$80 per horsepower
6.7.4 Variable Frequency Drive for New Agriculture Pump Efficiency Installations (BPA-Qualified)	$50 per horsepower (New Centrifugal Pump) $80 per horsepower (New Turbine Pump)

6.1 Payment Summary 23
6.2 Freeze Resistant Stock Water Tanks/ Fountains 24
6.3 Thermostatically Controlled Outlets25
6.4 Thermostatically Controlled Stock Tank De-icers 26
6.5 Transformer De-Energization . . . 26
6.6 Irrigation Measures 27
6.6.1 Irrigation System Conversion: LESA/ LEPA/MDI 27
6.6.2 Sprinkler Package Replacement 28
6.6.3 Irrigation System Conversion: MESA 28
6.6.4 Irrigation Hardware 29
6.7 Agricultural Pumps and VFDs 31
6.7.1 Irrigation Pump Testing and System Analysis (BPA-Qualified) 31
6.7.2 Variable Frequency Drive for Centrifugal Agricultural Pumps (BPA-Qualified) 32
6.7.3 Variable Frequency Drives in Agricultural Turbine Pump Applications (BPA-Qualified) 33
6.7.4 Variable Frequency Drive for New Agricultural Pump Installations (BPA-Qualified) 34
6.7.5 Agricultural New Pump Efficiency Upgrade (BPA-Qualified) 35
6.8 New Agricultural Construction . . 36
6.9 Other Agricultural Measures 36

Supporting Content

IM Document Library

Interim Solution 2.0 Files

BPA-Qualified and Provisional UES Input Sheet

Variable Frequency Drive Calculators for Irrigation Applications

6.1 PAYMENT SUMMARY*	
MEASURE CATEGORY	**PAYMENT**
6.7.5 Agricultural New Pump Efficiency Upgrade (BPA-Qualified)	$50 per horsepower
Custom Projects	
6.8 New Agricultural Construction	See the Custom Projects Payment Table
6.9 Other Agricultural Measures	See the Custom Projects Payment Table
Additional Multisector Opportunities	
Some Industrial and Commercial Sector measures may be applicable to Agricultural projects. Measures eligible for installation in multiple sectors are identified where applicable in the body of the IM in the primary sector.	

* The payment levels described in this table provide a summary only. Complete details of the payment levels and associated requirements may be found in the corresponding text of the IM. Please see the Table of Contents

6.2 FREEZE-RESISTANT STOCK WATER TANKS/ FOUNTAINS

Basis for Energy Savings

The baseline for freeze-resistant tanks/fountains that replace a tank heated with an electrically resistive element is called the electrically heated tank consumption estimate. The efficient case is zero electric heating. Savings are calculated by taking the difference between the baseline and efficient case. The annual consumption from a submersible electric resistant tank heater is estimated by using monitored results from site metering studies. Baseline consumption is adjusted from the metering period to the full heating season using heating degree days (HDD) as a scaling factor. Savings are computed for each of the primary heating zones (HZ) by using the weighted average number of HDD of each heating zone. Electric-resistance stock water tank heaters must be removed or permanently disabled. The new tank/fountain must be sized in accordance with manufacturer's specifications for the type and number of animals where it will be used, and the water supply must be hard-piped underground and stubbed up into the insulated portion of the fountain.

More information can be found on the Regional Technical Forum (RTF) website.

Requirements and Specifications

Freeze-resistant stock water tanks/fountains are available as a measure in heating zones 1, 2 and 3. The new freeze-resistant stock water tanks/ fountains must meet all of the following qualifications:

- New (i.e., not home- or kit-made).
- Enclosed, fully foam or dead-air-space insulated, with the opening completely sealed ~~in impact-resistant polyurethane.~~
- Possess elliptical or flap closures that tip easily so animals can drink without resistance.
- Contain no electric heat.
- Possess a minimum five-year manufacturer defect warranty.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information including unique site ID and address (e.g., field location, farm name, meter number, GPS coordinates or legal property description)	X		X
Proof of manufacturer defect warranty of at least five years			X
Equipment or contractor invoice is to include: Manufacturer; model number; type or size of equipment or product installed/used; quantity; order/purchase date; and cost			X

Payment

MEASURE CATEGORY	PAYMENT
HZ 1	$140 per tank/fountain
HZ 2	$165 per tank/fountain
HZ 3	$225 per tank/fountain

6.3 THERMOSTATICALLY CONTROLLED OUTLETS

Basis for Energy Savings

This measure requires the addition of a thermostatically controlled outlet or controller to control the heating load in a pump house or utility shed to prevent piping and other equipment from freezing. The base case for this measure is an electric-resistance heater operating in a pump house or utility room to provide freeze protection to piping and other equipment. The more efficient case for this measure adds thermostatically controlled outlets that provide power in specific temperature bands. The thermostatically controlled outlet shall be able to turn on when the building ambient temperature is below 35 degrees Fahrenheit, and shall stop providing power at a temperature no higher than 50 degrees Fahrenheit.

Requirements and Specifications

This measure is available to all sectors, but it must be reported under the Agricultural program. Thermostatically controlled outlet should turn on to prevent freezing conditions and turn off at temperatures no higher than 50 degrees Fahrenheit. Only one outlet per pump house or utility room is eligible.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information including unique site ID and address (e.g., field location, meter number, GPS coordinates, farm name or legal property description)	X		X
Equipment or contractor invoice is to include: Manufacturer; model number; type or size of equipment or product installed/used; quantity; order/purchase date; and cost			X

Payment

MEASURE CATEGORY	PAYMENT
Thermostatically Controlled Outlet	$14 per outlet

6.4 THERMOSTATICALLY CONTROLLED STOCK TANK DE-ICERS

Basis for Energy Savings

This measure is for the installation of a stock tank de-icer that is thermostatically controlled. The base case for this measure is an uncontrolled stock tank de-icer. This includes, but is not limited to, floating, submersible and drain-plug de-icers. The efficient case is a stock tank de-icer that is thermostatically controlled to prevent both freezing and continuous operation in non-freezing conditions.

Requirements and Specifications

This measure is available to all sectors, but it must be reported under the Agricultural program. The de-icer must be thermostatically controlled to prevent freezing and to prevent continuous operation after the threat of freezing has passed. Only one thermostatically controlled tank de-icer per tank is eligible.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information including unique site ID and address (e.g., field location, meter number, GPS coordinates, farm name or legal property description)	X		X
Equipment or contractor invoice is to include: Manufacturer; model number; type or size of equipment or product installed/used; quantity; order/purchase date; and cost			X

Payment

MEASURE CATEGORY	PAYMENT
Thermostatically Controlled Stock Tank De-icer	$52 per stock tank de-icer

6.5 TRANSFORMER DE-ENERGIZATION

Basis for Energy Savings

Transformer de-energization is disconnecting a transformer and downstream loads from the utility power supply during extended periods of agricultural inactivity and reconnecting prior to the irrigation season start-up. The base case for this measure assumes that irrigation loads are seasonal and the utility transformers serving the pump station are left energized all year. These energized transformers consume energy even when not serving any irrigation load. The efficient case is to de-energize the transformers during the non-irrigation season.

More information can be found on the Regional Technical Forum's (RTF) website.

Requirements and Specifications

Transformer de-energization is eligible for systems that serve only an agricultural load.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
Complete the Transformer De-Energization Worksheet (Available in the IM Document Library.		X	X

Payment

MEASURE CATEGORY	PAYMENT
Transformer De-Energization	$0.03 per kWh

6.6 IRRIGATION MEASURES

6.6.1 Irrigation System Conversion: LESA/LEPA/MDI

Basis for Energy Savings

The base case for this measure is for a new or existing center-pivot or linear-move system with high-pressure sprinklers on top or a Mid Elevation Sprinkler Application (MESA) configuration. High pressure means an irrigation system that delivers 35 psi to the critical sprinkler. The efficient case for this measure converts the system, or portion of the system, to Low Energy Precision Agriculture (LEPA), Low Elevation Spray Application (LESA), or Mobile Drip Irrigation (MDI). This measure was approved as a planning measure at the RTF on March 28, 2018.

Requirements and Specifications

This measure requires conversion of a new or existing center-pivot or linear-move system, or a portion of the system, from high-pressure sprinklers on top or MESA to LESA, LEPA or MDI configuration, including one gooseneck and drop tube, a low pressure regulator, sprinkler assembly and nozzle, or drip tubing per drop. This measure may be combined with sprinkler package replacement measures, but may not be combined with any other irrigation hardware measures.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information including unique site ID and address (e.g., field location, meter number, GPS coordinates, farm name or legal property description)	X		X
Equipment or contractor invoice is to include: Type or size of equipment or product installed/used; quantity; order/purchase date; and cost			X
Completed Project Information Form for Irrigation System Conversions (available in the IM Document Library.)		X	X

Payment

MEASURE CATEGORY	PAYMENT
A system, or portion of system, converted to LEPA/LESA/MDI	$12 per drop

6.6.2 SPRINKLER PACKAGE REPLACEMENT

Basis for Energy Savings

Savings estimates are based on the retrofit installation of sprinkler packages as a maintenance measure, the replacement of leaky components or as part of an entire system upgrade.

The efficient case improves the application efficiency, and the energy savings is based on a weighted average of the RTF-approved, region-specific energy savings for each measure. These measures were approved March 28, 2018, and are outlined in an RTF memo posted online and dated April 25, 2018.

Requirements and Specifications

This measure is a retrofit replacement sprinkler package, either for maintenance or as part of an irrigation system conversion, for center-pivot or lateral-move systems. There are three types of eligible packages. The LESA/LEPA/MDI sprinkler package and the MESA sprinkler package include a low-pressure regulator, nozzle, and rotating or multi-trajectory sprinkler. The High-Pressure Sprinkler Package includes a nozzle and an impact sprinkler.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information including unique site ID and address (e.g., field location, meter number, GPS coordinates, farm name or legal property description)	X		X
Equipment or contractor invoice is to include: Type or size of equipment or product installed/used; quantity; order/purchase date; and cost			X

Payment

MEASURE CATEGORY	PAYMENT
High-Pressure Sprinkler Package.	$12 per package
MESA Sprinkler Package.	$6 per package
LESA/LEPA/MDI ~~Spinkler~~ Package.	$3 per package

6.6.3 IRRIGATION SYSTEM CONVERSION: MESA

Basis for Energy Savings

The base case for this measure is for an existing center-pivot or linear-move system in a high-pressure configuration. The efficient case for this measure converts the center-pivot or linear-move system, or a portion of the system, to a Mid Elevation Sprinkler Application (MESA) configuration. This measure was approved at the RTF on March 28, 2018.

Requirements and Specifications

This measure requires conversion of an existing center pivot or linear move system from a high-pressure to a MESA configuration, including one gooseneck and drop tube per drop. This measure may be combined with sprinkler package replacement measures, but may not be combined with any other irrigation hardware measures.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information including unique site ID and address (e.g., field location, meter number, GPS coordinates, farm name or legal property description)	X		X
Equipment or contractor invoice is to include: Type or size of equipment or product installed/used; quantity; order/purchase date; and cost			X

Payment

MEASURE CATEGORY	PAYMENT
A system, or portion of a system, converted from high pressure to MESA	$10 per drop

6.6.4 IRRIGATION HARDWARE

Basis for Energy Savings

The base case is an inefficient, pressurized irrigation system with potential for improvements in application efficiency. The efficient case improves the application efficiency, and the energy savings is based on a weighted average of the RTF-approved energy savings for each measure. The RTF-approved energy savings was based on regional location (irrigation system run-time and water-pumping lift are the primary drivers) and identified improvements in overall application efficiency and leak reduction. BPA has simplified each Unit of Energy Savings (UES) offering.

More information can be found on the RTF website.

Requirements and Specifications

Irrigation hardware measures each have specific requirements, as provided below:

- Replace leaking impact sprinkler with new or rebuilt impact sprinkler: Eligible systems include wheel-lines, hand-lines, lateral moves and center pivots. Brass impact sprinklers shall be rebuilt by an established repair shop and shall meet or exceed manufacturer's specifications. Limited to two units per sprinkled acre for solid set sprinklers.
- Replace Nozzle: Eligible systems include wheel-lines or hand-lines.
- Upgrade impact sprinkler to rotating type sprinkler: Eligible systems include wheel-lines, hand-lines, lateral moves and center pivots. Limited to two units per sprinkled acre for solid set sprinklers.
- Upgrade low-pressure sprinklers to rotating type sprinklers: Eligible systems include center pivots or lateral moves. Limited to two units per sprinkled acre for solid-set sprinklers.

- Replace leaking drain gaskets with new gaskets: Eligible systems include wheel-lines, hand-lines, lateral moves and center pivots.
- Replace Thunderbird wheel line hubs: Eligible for wheel-line systems.
- Replace leaking base boot gasket with new gasket: Eligible systems include center pivots or lateral moves.
- Repair leaking pipes: Eligible systems include wheel-lines, hand-lines and portable mainline systems.
- Rebuild or replace leaking or malfunctioning leveler with new or rebuilt leveler: Eligible for wheel-line systems.
- Replace tower/span/pivot-flex gasket: Eligible systems include center pivots or lateral moves.
- Replace pipe section gasket: Eligible systems include wheel-lines, hand-lines or portable main-lines, including mainline riser cap gaskets or portable mainline section gaskets.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information including unique site ID and address (e.g., field location, meter number, GPS coordinates, farm name, or legal property description)	X		X
Equipment or contractor invoice showing type of equipment or product installed/used; quantity; the order/purchase date; and cost			X

Payment

MEASURE CATEGORY	PAYMENT
Replace leaking impact sprinkler with new or rebuilt impact sprinkler	$1 per sprinkler
Replace nozzle	$3 per nozzle
Upgrade impact sprinkler to rotating type sprinkler	$1 per sprinkler
Replace pipe section gasket	$4 per gasket
Upgrade low-pressure sprinklers to rotating type sprinklers	$1 per sprinkler
Replace leaking drain gaskets with new gaskets	$3 per drain
Replace Thunderbird wheel-line hubs	$7 per hub
Replace leaking base boot gasket with new gasket	$275 per pivot
Repair leaking pipes	$12 per pipe section
Rebuild or replace leaking or malfunctioning leveler with new or rebuilt leveler	$1 per leveler
Replace tower/span/pivot-flex gasket	$2 per gasket

6.7 AGRICULTURAL PUMPS AND VFDS

6.7.1 Irrigation Pump Testing and System Analysis (BPA-Qualified)

Basis for Energy Savings

This BPA-Qualified measure is intended to help the irrigator determine irrigation system health and identify potential energy-efficiency improvements. Ideally, the pump test will be performed on systems that are inefficient as determined by the Irrigation Pump Testing and System Analysis BPA Screening Tool (available in the IM Document Library). The results of the pump test could be used in developing the custom project proposal. There is no energy savings associated with this reimbursement.

Requirements and Specifications

- The irrigation pump must be electrically powered, 20 horsepower or greater and must not have been tested through BPA-sponsored pump testing services within the past five years.
- The irrigation pump must have been in operation for the two previous years.
- The irrigation pump test must be performed by an individual possessing pump testing knowledge and experience.
- Customers and qualified vendors must use the Irrigation Pump Testing and System Analysis BPA Screening Tool (available in the IM Document Library) to limit the amount of dry holes (i.e., pump tests that do not result in a BPA-approved custom project).
- The customer may choose from the following tests:
    - Simple System Evaluation: Measure pump discharge pressure and evaluate the condition of the sprinkler nozzles.
    - Simple System Irrigation Pump Test (e.g., open discharge): Perform irrigation pump test.
    - Irrigation Pump Test and System Analysis: Perform irrigation pump test and evaluate mainlines and critical sprinklers.
- Customers must deliver printed recommendation reports to the end user.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information including unique site ID and address (e.g., field location, pump number, GPS coordinates, farm name or legal property description)	X		X
Electronic or hard copies of the completed Irrigation Pump Testing and System Analysis BPA Screening Tool, irrigation pump test and recommendation report (available in the IM Document Library.)			X
Complete the "Agricultural Irrigation Pump Testing and System Analysis" tab in the BPA-Qualified and Provisionally Deemed Input Sheet (available in the "other documents" section of the IM Document Library.)		X	X

Payment

MEASURE CATEGORY	PAYMENT
Simple System Evaluation	$50 per evaluation
Simple System Irrigation Pump Test (e.g., open discharge)	$100 per test
Irrigation Pump Test and System Analysis, 400 acres or less	$200 per test and analysis
Irrigation Pump Test and System Analysis, over 400 acres	$300 per test and analysis
Irrigation Pump Test and System Analysis, Complex Pumping System (over than 400 acres with multiple operating pumps)	$200 per main pump plus $50 per booster pump

6.7.2 VARIABLE FREQUENCY DRIVE FOR CENTRIFUGAL AGRICULTURAL PUMPS (BPA-QUALIFIED)

Basis for Energy Savings

The base case for this measure is a centrifugal-style pump used for irrigation purposes, which operates at a fixed speed but has a variation of flow or head requirements. The more efficient case for this measure would have a variable frequency drive (VFD) to better match pump performance to system requirements. BPA has collected data from custom project completion reports to determine energy savings, but is collecting additional data on these upgrades to help support the RTF analysis of this measure.

BPA recommends that all new VFD installations meet the IEEE 519 harmonics standard. This measure provides an annual energy savings of 10% of the calculated annual energy usage of the centrifugal pump.

Requirements and Specifications

This measure requires the addition of a VFD to an existing, fixed-speed, centrifugal-style irrigation pump. This measure applies to pumping operations that deliver, distribute or transport irrigation water with qualifying VFDs from 20 to 500 horsepower. Eligible installations are limited to pumps with substantial variation in head pressure requirements (20% variation or more).

Customers must use the Agricultural Centrifugal Pump Deemed Savings Tool to estimate savings (available in the IM Document Library).

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information including unique site ID and address (e.g., field location, meter number, GPS coordinates, farm name or legal property description)	X		X
Equipment or contractor invoice is to include: Manufacturer; model number; type or size of equipment or product installed/used; quantity, order/purchase date; and cost			X
Complete the Centrifugal Pump Applications VFD Deemed Savings Tool (2018) (available in the IM Document Library).		X	X
~~Pump performance curve (available from the pump manufacturer)~~		~~X~~	~~X~~

Payment

MEASURE CATEGORY	PAYMENT
Centrifugal Pump VFD	$50 per nameplate horsepower

6.7.3 VARIABLE FREQUENCY DRIVES IN AGRICULTURAL TURBINE PUMP APPLICATIONS (BPA-QUALIFIED)

Basis for Energy Savings

The base case for this measure is a turbine-style pump used for irrigation purposes, which operates at a fixed speed but has a variation of flow or head requirements. The efficient case for this measure would have a variable frequency drive (VFD) to better match pump performance to system requirements.

BPA is collecting data on these retrofits to support the RTF analysis of this measure. BPA recommends that all new VFD installations meet the IEEE 519 standard. This measure provides an annual energy savings of 20% of the average of the previous three operating years' annual energy usage of the pump.

Requirements and Specifications

This measure applies to pumping operations that deliver, distribute or transport irrigation water with qualifying VFDs from 20 to 500 horsepower. Eligible installations are limited to turbine pumps with substantial variation in flow rates (20% variation or more) or discharge pressure requirements (10% variation or more).

Customers must use the Variable Frequency Drives in Agricultural Turbine Pump Applications – VFD Calculator to estimate savings (available in the IM Document Library).

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information including unique site ID and address (e.g., field location, meter number, GPS coordinates, farm name or legal property description)	X		X
Equipment or contractor invoice is to include: Manufacturer; model number; type or size of equipment or product installed/used; quantity; order/purchase date; and cost			X
Complete the Turbine Pump VFD Deemed Savings Tool (2018) (available in the IM Document Library).		X	X
~~Pump performance curve (available from the pump manufacturer)~~		~~X~~	~~X~~

Payment

MEASURE CATEGORY	PAYMENT
VFD in Agricultural turbine pump	$80 per nameplate horsepower

6.7.4 VARIABLE FREQUENCY DRIVE FOR NEW AGRICULTURAL PUMP INSTALLATIONS (BPA QUALIFIED)

Basis for Energy Savings

The base case for this measure is a turbine- or centrifugal-style pump used for irrigation purposes, which operates at a fixed speed but has a variation of flow or head requirements. The efficient case for this measure would have a variable frequency drive (VFD) to better match pump performance to system requirements. BPA has collected data from custom project completion reports to determine energy savings, but is collecting additional data on these upgrades to support the RTF analysis of this measure. BPA recommends that all new VFD installations meet the IEEE 519 harmonics standard. This measure provides an annual energy savings of 20% of the estimated annual energy usage for turbine pumps and savings of 10% for centrifugal pumps.

Requirements and Specifications

This measure requires the addition of a VFD to a new turbine- or centrifugal-style irrigation pump. This measure applies to new pumping plants that deliver, distribute or transport irrigation water with qualifying VFDs from 20 to 500 horsepower.

Eligible installations are limited to pumps designed for substantial variation in flow rates (20% variation or more for turbine pumps) or discharge pressure requirements (10% variation or more for turbine pumps, or 20% variation or more for centrifugal pumps).

Customers must use the New Construction Turbine or Centrifugal Pump VFD Savings Tool to estimate savings (available in the IM Document Library).

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information including unique site ID and address (e.g., field location, meter number, GPS coordinates, farm name or legal property description)	X		X
Equipment or contractor invoice is to include: Manufacturer; model number; type or size of equipment or product installed/used; quantity; order/purchase date; and cost			X
Complete the New Construction Turbine or Centrifugal Pump VFD Deemed Savings Tool (2018) (available in the IM Document Library).		X	X
~~Pump performance curve (available from the pump manufacturer)~~		~~X~~	~~X~~

Payment

MEASURE CATEGORY	PAYMENT
New Turbine pump VFD	$80 per nameplate horsepower
New Centrifugal pump VFD	$50 per nameplate horsepower

6.7.5 AGRICULTURAL NEW PUMP EFFICIENCY UPGRADE (BPA-QUALIFIED)

Basis for Energy Savings

The base case for this measure is a turbine- or centrifugal-style pump that is used for irrigation purposes. On a few custom projects, it has been observed that routine rebuilding of pumps can lead to thin impellers that are inefficient or can fail, or with other system changes is operating outside the optimum performance area of the pump curve. BPA has collected data from custom project completion reports to determine energy savings, but will be collecting additional data on these new pumps to support the BPA and RTF analysis of this measure. BPA assumes that the pumps will be at least 10 years old and have been rebuilt a number of times, and that a new pump will be more efficient.

Requirements and Specifications

This measure is installation of a new (e.g., newly manufactured) turbine- or centrifugal-style irrigation pump to replace an existing pump. This measure applies to pumping operations that deliver, distribute or transport irrigation water. The pump must range from 20 to 500 horsepower. The existing pump being replaced must be centrifugal, turbine or submersible turbine. The new replacement pump must have the same or lower horsepower rating, unless it is coupled with a VFD. A change from a turbine pump to a centrifugal pump or centrifugal to a turbine is allowable. This measure may be used alone, or in combination with the retrofit measures Variable Frequency Drive for Centrifugal Agricultural Pumps or Variable Frequency Drive for Turbine Agricultural Pumps. If there is no nameplate, contact your Energy Efficiency engineer to help you convert utility kW readings to horsepower.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information including unique site ID and address (e.g., field location, meter number, GPS coordinates, farm name or legal property description)	X		X
Equipment or contractor invoice is to include: Manufacturer; model number; type or size of equipment or product installed/used; quantity; order/purchase date; and cost			X
Complete the Agricultural Pump Efficiency Upgrade PIF (available in the IM Document Library).		X	X
Pump performance curve (available from the pump manufacturer).		X	X

Payment

MEASURE CATEGORY	PAYMENT
Agricultural New Pump Efficiency	$50 per nameplate horsepower

6.8 NEW AGRICULTURAL CONSTRUCTION

Basis for Energy Savings

The base case and efficient case are determined through the custom project process.

Requirements and Specifications

New agricultural construction projects must be submitted as custom projects. Standardized M&V protocols must be provided for certain measures prior to project implementation

Documentation Requirements

See the Custom Projects Documentation Requirements.

Payment

See the Custom Projects Payment Table.

6.9 OTHER AGRICULTURAL MEASURES

Requirements and Specifications

The following measures must be submitted as custom projects:

- Low-pressure conversion with associated pump work.
- Change to 40-foot spacing on hand and wheel lines to enable conversion.
- Turf irrigation applications in landscaping, golf courses, government and municipalities, and other areas (including standard sprinkler measures, motor/pumping/VFD controls and weather-station-driven irrigation scheduling).
- Nursery and greenhouse project improvements in irrigation, air handling, temperature and humidity controls for facilities using less than 1 aMW (if usage is above 1 aMW, projects at the facility are considered industrial).

Documentation Requirements

See the Custom Projects Documentation Requirements.

Payment

See the Custom Projects Payment Table.

Section 7: Commercial Sector

Please check the changes and corrections summary to see if revisions were made to any of the measures in this sector.

The Commercial Sector includes electrical energy used in service-providing, nonmanufacturing businesses and building facilities. These business types include federal, state and local governments, as well as other private and public organizations. The Commercial Sector building types include: office, retail, grocery, food service, lodging, hospital/healthcare, assembly, residential care, and educational institutions.

Unless otherwise noted, all Commercial Sector measures are available for the Commercial Sector, as well as the Industrial and Agricultural sectors where applicable. Utilities shall report these measures as Commercial when reporting to BPA.

7.1 PAYMENT SUMMARY*	
PROGRAM COMPONENT OR MEASURE	**PAYMENT**
7.2 Commercial Custom Projects—Retrofits and New Construction	See the 4.1 Custom Projects Payment Rate
7.3 Nonresidential Lighting	See 7.3 Nonresidential Lighting Payment Table and Program Offerings section of Lighting Calculator
7.4 Commercial HVAC	
7.4.1 Advanced Rooftop Unit Control (ARC)	$100 per ton (ARC Retrofit - Lite) $200 per ton (ARC Retrofit - Full)
7.4.2 Connected Thermostat	$150 per connected thermostat (Initial Install) $50 per connected thermostat (Verification)
7.4.3 Ductless Heat Pump Retrofit and Upgrade (BPA-Qualified)	$1,000 per ton (Retrofit) $300 per ton (Upgrade)
7.4.4 Air-Source Heat Pump Retrofit and Upgrade (BPA-Qualified)	$1,000 per ton (Retrofit) $150 per ton (Upgrade)
7.4.5 Variable Refrigerant Flow System Retrofit (BPA-Qualified)	$1,000 per ton
7.4.6 Variable Frequency Drive on Air Handling Unit Fan (BPA-Qualified)	$300 per horsepower
7.5 Commercial Shell Measures	
7.5.1 Commercial Insulation (BPA-Qualified)	$0.75-$2.10 per square foot
7.5.2 Commercial Windows (BPA-Qualified)	$9 per square foot of window replaced (Heating Zone 1) $18 per square foot of window replaced (Heating Zone 2) $18 per square foot of window replaced (Heating Zone 3)

7.1 Payment Summary 37
7.2 Commercial Custom Projects - Retrofits and New Construction 39
7.3 Nonresidential Lighting. 39
7.4 Commercial HVAC 44
7.4.1 Advanced Rooftop Unit Control (ARC). 44
7.4.2 Connected Thermostat 45
7.4.3 Ductless Heat Pump Retrofit and Upgrade (BPA-Qualified). 48
7.4.4 Air-Source Heat Pump Retrofit and Upgrade (BPA-Qualified). 50
7.4.5 Variable Refrigerant Flow System Retrofit (BPA-Qualified) 52
7.4.6 Variable Frequency Drive on Air Handling Unit Fan (VFD on AHU Fan) (BPA-Qualified) 54
7.5 Commercial Shell Measures 55
7.5.1 Commercial Insulation 55
7.5.2 Commercial Windows (BPA-Qualified) 56
7.6 Commercial Refrigeration. 57
7.6.1 Anti-Sweat Heater (ASH) Controls57
7.6.2 Walk-In or Display Case Evaporator Fan Motor – Shaded Pole to Electronically Commutated Motor (ECM) 58
7.6.3 Strip Curtains for Walk-In Coolers and Freezers. 58
7.7 Commercial Kitchen and Food Service Equipment 60
7.7.1 Demand Controlled Kitchen Ventilation (BPA-Qualified). 60
7.7.2 Electric Commercial Steam Cookers 61
7.7.3 Hot Food Holding Cabinets 61
7.7.4 Electric Combination Ovens. . . . 62
7.7.5 Electric Convection Ovens 63
7.7.6 Commercial Electric Fryers 64
7.7.7 Pre-Rinse Spray Valves 65
7.8 Additional UES Offering 66
7.8.1 ENERGY STAR Commercial Clothes Washers 66
7.8.2 Smart Power Strips 67
7.8.3 Commercial Showerheads 68
7.8.4 Generator Block Heaters (BPA-Qualified) 68
7.8.5 Vehicle Engine Block Heater Controls 69

7.1 PAYMENT SUMMARY*	
PROGRAM COMPONENT OR MEASURE	**PAYMENT**
7.6 Commercial Refrigeration	
7.6.1 Anti-Sweat Heater (ASH) Controls	$40 per linear foot of case
7.6.2 Walk-In or Display Case Evaporator Fan Motors-Shaded Pole to Electronically Commutated Motor (ECM)	$55 per motor (ECM on Display Case) $140 per motor (ECM on Walk-In Cooler or Freezer)
7.6.3 Strip Curtains for Walk-In Coolers and Freezers	$9 per square foot of doorway
7.7 Commercial Kitchen and Food Service Equipment	
7.7.1 Demand Controlled Kitchen Ventilation (BPA-Qualified)	$200-$400 per fan horsepower
7.7.2 Electric Commercial Steam Cookers	$500 per pan (6 pan cooker)
7.7.3 Hot Food Holding Cabinets	$250 per cabinet (Half Size) $500 per cabinet (Full Size) $1,000 per cabinet (Double Size)
7.7.4 Electric Combination Ovens	$500 per oven (5-15 pan oven or 16-20 pan oven)
7.7.5 Electric Convection Ovens	$200 per oven (Half size) $400 per oven (Full size)
7.7.6 Commercial Electric Fryers	$250 per fryer
7.7.7 Pre-Rinse Spray Wash Valves	$100 per spray valve
7.8 Additional UES Offerings	
7.8.1 ENERGY STAR Commercial Clothes Washers	$25-$125 per washer
7.8.2 Smart Power Strips	$15 per strip
7.8.3 Commercial Showerheads	$8 per showerhead (By Request) $11 per showerhead (Direct Install)
7.8.4 Generator Engine Block Heaters (BPA-Qualified)	$200 per unit (Size <3 kW) $1,500 per unit (Size ≥3 kW)
7.8.5 Vehicle Engine Block Heater Controls	$200 per unit
Additional Multisector Opportunities	
Some Agricultural, Industrial, or Residential measures may be applicable to Commercial projects. Measures eligible for installation in multiple sectors are identified where applicable in the body of the IM in the primary sector.	

* The payment levels described in this table are a summary. Complete details of the payment levels and associated requirements may be found in the corresponding text of the IM. Please see the Table of Contents

7.2 COMMERCIAL CUSTOM PROJECTS – RETROFITS AND NEW CONSTRUCTION

Many Commercial Sector energy efficiency opportunities are complex. They involve site-specific installations, and there may be interactive effects between energy-consuming systems in a building. These opportunities include, but are not limited to: new construction, HVAC, shell measures, existing building commissioning, strategic energy management, and, in rare circumstances, lighting projects.

Requirements and Specifications

Custom projects must follow all requirements per 4.0 Custom Projects.

Documentation Requirements

See 4.0 Custom Projects.

Payment

See 4.1 Custom Projects Payment Rate.

7.3 NONRESIDENTIAL LIGHTING

Basis for Energy Savings

Site-specific calculators are used to determine energy savings when there is too much variability in the range of savings associated with a given technology and/or application. In the case of nonresidential lighting, the unique hours of operation by space use type and the wide variety of building types and applications require the use of a site-specific BPA lighting calculator instead of a suite of lighting UES measures.

BPA's lighting calculator seeks to align with the Regional Technical Forum (RTF) Nonresidential Lighting Protocol around such factors as baseline determination, control savings fractions and HVAC interactive effects. These factors are built into the lighting calculator, so the user only needs to enter information specific to the project, such as hours of operation by space, existing technology, and proposed technology. Information about baselines and interactive effects are documented within the lighting calculator.

The lighting calculator additionally generates utility and customer project reports, which provide a summary of all energy savings values.

More information on the RTF nonresidential lighting protocol can be found on the Regional Technical Forum website.

Requirements and Specifications

Nonresidential Lighting measures are available via a BPA lighting calculator for the following:

1. Retrofit lighting projects and new construction projects.
2. Projects within commercial, industrial and agricultural sectors.
3. The only eligible residential application using these measures applies to retrofits of existing High-Intensity Discharge (HID) lighting (metal halide, high-pressure sodium, low-pressure sodium and mercury vapor) in exterior applications. Customers shall report this measure as commercial when reporting to BPA.

A. Lighting Calculator Versions

Option 1 customers must use an eligible BPA lighting calculator. Option 2 customers may, but are not required to, use a BPA lighting calculator.

Required Documents

Nonresidential Lighting Calculators

The table below shows the planned effective dates and retirement dates for lighting calculators that are in use. BPA will periodically release new lighting calculators with improved functionality and other changes necessary to respond to an evolving lighting market. New lighting calculators may be released and retirement dates may be modified due to BPA business requirements. Customers will be informed no less than six months in advance of any new lighting calculator release or adjustment to retirement dates.

LIGHTING CALCULATOR SERIES NAME	CALCULATOR VERSION	EFFECTIVE DATE	LIGHTING CALCULATOR RETIREMENT DATE*
LIGHTING CALCULATOR SERIES 4	LC 4.0	October 1, 2017	Dec, 31, 2019
LIGHTING CALCULATOR SERIES 5	LC 5.0	April 1, 2019	Dec. 31, 2021
	LC 5.1	TBD	TBD

*"Lighting Calculator Retirement Date" is defined as the last date that customers may submit a completed lighting calculator to BPA.

B. Measure Types and Approval Procedures

The lighting calculator includes two types of measures: deemed and calculated, and which are submitted as projects, as outlined below:

1. Deemed Lighting Measures

Deemed lighting measures have been pre-approved by BPA and do not require review by BPA. Available deemed lighting measures are in the Program Offerings section of the lighting calculator.

2. Calculated Lighting Measures

If a proposed measure is not on the Deemed Measure List, it may be submitted as a calculated lighting measure. No BPA approval is required for decommissioning, fixture increase or auto-calculated measures; for these measures, the lighting calculator will automatically apply a calculated payment.

Calculated measures must achieve a minimum payment of at least $5 and a net energy savings of at least 10% per measure, as determined by the lighting calculator. The lighting calculator offers four types of calculated lighting measures, defined as follows:

a. Decommissioning: The number of proposed fixtures is less than the number of existing fixtures.

b. Fixture Increase: The number of proposed fixtures is greater than the number of existing fixtures..

c. Auto-Calculated: The lighting calculator offers Signage and LED Linear measures with an auto-calculated incentive.

d. Nonstandard: The measure is not deemed, decommissioning, fixture increase or auto-calculated. For these measures, approval by BPA is required using the following procedure:.

1. To request a nonstandard measure, the user should select the "nonstandard" option from the Measure Type drop-down menu.
2. The lighting calculator will highlight the measure in red to indicate the measure is nonstandard and requires BPA approval.
3. The customer sends the lighting calculator and any applicable product documentation requested by BPA such as cut sheets, product specification sheets or third-party tests (e.g., LM-79) to lighting@bpa.gov for review and acceptance.

4. BPA will review the nonstandard measures and notify the customer whether the measures were accepted. Once the measures are accepted, the red highlighting will disappear. No further documentation is required for nonstandard measures.

5. The following types of measures may, at the Customer's discretion, be submitted to BPA for review as a nonstandard measure using the procedure noted above:

   - Measures with hours of operation of at least 18 hours per day/ seven days per week or 6,570 total annual hours.
   - Measures that earn a lower incentive as a nonstandard measure compared to the deemed measure incentive.

As the lighting market continues to evolve, new wattage options may emerge that are not included in the lighting calculator drop-down menus. In the event the lighting calculator does not include an option for the exact proposed wattage, a Customer may choose one of two options:

1. Round the selected wattage in the lighting calculator to the nearest available value in the drop-down menu. Customers may not round more than 10 watts; or

2. Ensure the "nonstandard" option is selected in the Measure Type drop-down menu, and manually enter the exact wattage. Note that this option requires the measure be submitted to BPA for review as a nonstandard measure using the procedure noted above.

C. Project Types and Requirements

The lighting calculator includes two types of projects: (1) new construction and (2) retrofit. Requirements and specifications are shown below.

1. New Construction Projects

a. Eligibility

A nonresidential lighting project is considered new construction under any of the following conditions:

1. The facility or exterior lighting system is newly constructed.

2. The facility is a newly constructed addition to an existing facility.

3. There is a change in occupancy type as part of the lighting project (e.g., the occupancy type changes from retail to office, or library to retail, etc.).

4. The project is considered a major renovation for reasons other than lighting. A project is considered a major renovation whenever a whole building permit is required. In other words, if the only reason building energy codes are triggered is the lighting project itself, the project may be classified as a retrofit. However, if the project encompasses any other major building systems, such as HVAC, the project shall be considered new construction.

b. Requirements and Specifications

1. New Construction projects must achieve at least a 20% kWh reduction from the lighting power allowance, as determined by the lighting calculator.

2. Customers with new construction projects with hours of operation differing from what is available in the lighting calculator may provide the specific hours of operation to BPA at lighting@bpa.gov, and request that the lighting calculator for that particular project be updated.

3. Enter the lighting power allowance (i.e., the total watts allowed) into the lighting calculator as determined by one of the following:
    - Applicable code compliance form; or
    - Calculation using applicable state or local energy code (when using energy code to determine lighting power allowance, users may apply either the whole-building approach or the sum of the space-by-space approach); or
    - When a code compliance form is not available or a project is exempt from code, the lighting power allowance may be determined by using a common practice calculation. Common practice refers to the lighting technology and wattage commonly associated with a particular building type and/or application.
4. Enter the proposed lighting power (i.e., total proposed watts) into the lighting calculator as determined by either:
    - Applicable code compliance form; or
    - Calculation of total installed watts.
5. For nonresidential new construction lighting projects, the incremental project cost must be entered into the Estimated Project Cost field of the lighting calculator. Nonresidential new construction lighting project incremental cost is defined as the difference in cost of materials between what must be installed to meet code (fixtures, lamps and/or controls), and what is actually being installed. This excludes all other lighting-related project costs (e.g. labor). Incremental cost may be documented by using one of two methods:
    - Provide detailed documentation that shows the project-specific incremental cost for the lighting project materials; or
    - Calculate incremental cost as 25% of the cost of the installed lighting project materials.

2. Retrofit Projects for Existing Buildings

a. Eligibility

1. Nonresidential lighting projects that do not meet the criteria for new construction are eligible as retrofit projects.
2. Batch projects are a type of retrofit that targets a specific technology and application type across a customer service territory (such as streetlights or area lights).
    - Batch lighting projects may be submitted in a single lighting calculator and may include multiple measures.

b. Requirements and Specifications

1. Project must achieve at least a 25% kWh reduction, as determined by the lighting calculator.
2. For calculated measures, the minimum payment to the end user is $5 per measure, and the fully adjusted savings, as determined by the lighting calculator, must be at least 10% per measure.
3. Projects saving 200,000 kWh or more, as determined by the lighting calculator, may, at the customer's discretion, be submitted to BPA at lighting@bpa.gov to request the project be converted to a 100% calculated incentive.

4. Batch retrofit projects have the following additional requirements:
    - The location of individual installations shall be documented using one of the following available methods:
        - The customer may enter the site addresses in the "notes" section of the Measures tab for each measure within a lighting calculator; or
        - The customer may create a separate spreadsheet, to be kept in its customer file, which documents the site address for each installation site.
    - For measures in batch lighting projects which do not have a physical address, the nearest intersection, utility pole identifier or geographic coordinates may be submitted as documentation.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
New Construction Lighting Projects			
Completed lighting calculator	X		X
Product or contractor invoice showing: 1. Product order or purchase date 2. Installed cost			X
1. An applicable code compliance form that documents the lighting power allowance and proposed lighting power; or, if not available: 2. A document showing the calculated lighting power allowance using applicable code and the proposed lighting power; or, if exempt from code: 3. A document showing the calculated lighting power allowance using common practice and the proposed lighting power.			X
Retrofit Lighting Projects			
Completed lighting calculator.	X		X
Product or contractor invoice showing: 1. Product order or purchase date 2. Installed cost			X
For batch retrofit projects: Documentation of individual installation location, either in the "notes" section of the lighting calculator or in a separate customer-generated spreadsheet.			X

Payment

LIGHTING CALCULATOR SERIES NAME	PAYMENT
Lighting Calculator 4 Series	See Program Offerings section of Lighting Calculator
Lighting Calculator 5 Series	See Program Offerings section of Lighting Calculator

7.4 COMMERCIAL HVAC

7.4.1 Advanced Rooftop Unit Control (ARC)

Basis for Energy Savings

Advanced Rooftop Control (ARC) retrofits add a variable frequency drive (VFD) and controls to existing, constant-speed HVAC rooftop unit (RTU) supply fans. Energy savings are predominantly achieved by reducing the operation of the supply fan. For this reason, the measure applies to both electric and gas systems. For the purposes of this measure, there are two types of ARCs, defined as follows:

ARC Retrofit – Lite

ARC-Lite products add one of the following equipment options to the existing RTU:

- A VFD and controller for variable speed fan operation; or
- A multispeed motor and controller for multispeed fan operation.

ARC Retrofit – Full

Full-ARC products add one of the following equipment options to the existing RTU:

- A VFD and controller for variable speed fan operation; or
- A multispeed motor and controller for multispeed fan operation.

Full-ARC products also add a controller with all of the following enabled:

- Digital, integrated economizer control with either differential dry-bulb, or differential enthalpy with fixed dry-bulb high-limit shutoff; and
- Demand Control Ventilation with proportional control, based on CO2 sensor reading.

More detailed information is available on the Regional Technical Forum (RTF) Unit Energy Savings (UES) Measures webpage.

Requirements and Specifications

- This measure is available for retrofits only.
- ARC projects are not eligible for a Connected Thermostat payment. See Section 7.4.2 for Connected Thermostats.

Preconditions:

- RTU heating fuel type may be electric or gas.
- Existing RTU has the following characteristics:
  - A cooling capacity equal to or greater than five tons;
  - A unitary system (split systems are not eligible); and
  - A constant-speed supply fan (RTUs with variable speed fans are not eligible).

Post-conditions:

- Be installed on an existing rooftop unit; and
- Be listed on the ARC Qualified Products List (QPL) in the IM Document Library.

Required Documents

Advanced Rooftop Control Qualified Products List

Advanced Rooftop Control Project Information Form

If a product or combination of products meets a definition listed in the Basis for Energy Savings, but is not on the Qualified Products List, please use the COTR Request and Acknowledgement Procedure for approval to use the product.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information including unique site ID and address.	X		X
Equipment or contractor invoice showing: 1. Equipment order or purchase date 2. Installed cost			X
Completed Advanced Rooftop Unit Control (ARC) Project Information Form			X

Payment

Project reporting to BPA is based on whole tons of outdoor cooling capacity and shall be calculated at a project level using one of the following methods:

1. Sum the tons from all retrofitted RTUs installed and then round to the nearest whole ton; or
2. Round each individual retrofitted RTU to the nearest whole ton, then sum all rounded tons.

Two methods are provided in order to accommodate different types of equipment configurations and capacities.

MEASURE CATEGORY	PAYMENT
ARC Retrofit – Lite	$100 per ton
ARC Retrofit – Full	$200 per ton

7.4.2 Connected Thermostat

Basis for Energy Savings

Connected thermostats save energy by controlling HVAC usage in single-zone HVAC systems. These thermostats connect to the internet and have features that include online alerts, monitoring and programming and/or control. Energy savings are associated with reduced heating and fan energy, primarily through scheduled temperature setbacks and setting the fan to auto mode during unoccupied hours.

Although the thermostat capabilities are an important part of realizing energy savings, correct programming and subsequent verification of these features help ensure persistence of energy savings.

While a connected thermostat product may include additional features as noted above, for the purpose of this measure, connected thermostat products are defined as meeting all of the following specifications:

1. Capable of being connected to the web.
2. Support multiple temperature set-back schedules.

Required Documents

Connected Thermostat Project Information Form

Connected Thermostat Qualified Products List

3. Support fan-mode scheduling (continuous-on versus auto mode).
4. Support limited-duration overrides (e.g., reverts to programming after 24 hours).
5. Automatically restore programmed settings after power outage.
6. Support multiple cooling stages.

More detailed information is available on the Regional Technical Forum (RTF) Unit Energy Savings (UES) Measures webpage.

Requirements and Specifications

- This measure is available for retrofits only.
- This measure is not eligible for lodging, 24/7 occupancy, or semi-conditioned spaces.
- Connected Thermostat projects are not eligible for an ARC payment. See Section 7.4.1 for Advanced Rooftop Unit Control (ARC).
- This measure provides for both initial installation and verification of programming for eligible connected thermostats and cannot be used for enabling feature sets on existing thermostats.
- A building is eligible to receive payments for more than one thermostat.

Preconditions:

- Heating fuel type of system to be controlled by new thermostat may be electric or gas; and
- The existing thermostat is not web-enabled.

Post-conditions:

Initial Install:

- The installed thermostat controls an existing HVAC supply fan and serves a single zone. "Invisible zones" are permitted (e.g., separate rooftop units serving different portions of a large retail space).
- The installed connected thermostat must be listed on the Connected Thermostat Qualified Products List (QPL) in the IM Document Library.
- The thermostat must be programmed as follows:
    1. Thermostat is connected to the web.
    2. Temperature setback is used for unoccupied hours (heating and/or cooling, as applicable).
    3. Fan schedule uses auto mode for unoccupied hours (e.g., during unoccupied hours or holidays, the fan will only run when there is a demand for heating or cooling).
    4. Override duration set to three hours or less.
    5. For heat pumps, auxiliary resistance heat lock-out is enabled with appropriate temperature set point.
    6. In cases where two or more systems serve spaces that are not separated by physical barriers (e.g., "invisible zones"), simultaneous heating and cooling is eliminated (e.g. by having identical temperature set points and schedules with appropriate dead-bands, or through having network-coordinated controls).

Verification:

A thermostat is eligible for programming verification payments as follows:

1. The thermostat received a payment for the initial install and was installed after Oct. 1, 2019.
2. The thermostat is eligible for up to four verification payments within two years of the initial install.
3. A verification payment can be claimed in same year as the initial install, provided verification takes place at least three months after the initial install.
4. The thermostat is programmed to meet the initial install programming requirements as described above under Initial Install Post-Conditions.
5. The thermostat is eligible for a verification payment twice within one calendar year. Verification may not be less than three months apart.
6. Verification must occur in different seasons (e.g., one in summer and one in winter, or one in fall and one in spring). Verification may not be less than three months apart.
7. Verification is not required to be conducted at regular intervals. The thermostat is eligible for a verification payment even if there has been a gap in verification activities.
8. There is no restriction on who can complete verification.

If a connected thermostat product meets the product definition listed in the Basis for Energy Savings, but is not on the Qualified Products List, please use the COTR Request and Acknowledgement Procedure for approval to use the product.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
Initial Install			
End-user identifying information including unique site ID and address.	X		X
Equipment or contractor invoice showing: 1. Equipment order or purchase date 2. Installed cost			X
Completed Connected Thermostat Initial Install Project Information Form			X
Verification			
End-user identifying information including unique site ID and address.	X		X
If completed by contractor, provide contractor invoice showing: 1. Service date 2. Installed cost			X
Completed Connected Thermostat Verification Project Information Form			X

Payment

MEASURE CATEGORY	PAYMENT
Connected Thermostat – Initial Install	$150 per connected thermostat
Connected Thermostat – Verification	$50 per connected thermostat

7.4.3 Ductless Heat Pump Retrofit and Upgrade (BPA-Qualified)

Basis for Energy Savings

Ductless Heat Pumps (DHPs, also commonly referred to as mini-splits) save energy using variable speed compressors to continuously match the heating and cooling load and avoid the on/off cycling of conventional heating systems. DHPs eliminate over-cooling and over-heating of spaces that is common with central air systems. By moving heat instead of creating it, DHPs are two to three times more efficient than electric-resistance heaters.

A DHP Retrofit replaces the existing zonal or forced-air electric-resistance heating system with a DHP.

A DHP Upgrade either: 1) replaces an existing DHP with a more efficient DHP (e.g., replacing a code minimum DHP); or 2) is an efficient DHP installed as part of a building addition project, new construction project or major renovation project.

For the purposes of this measure, DHP equipment types are defined as follows:

- Mini-Split: Systems that have a single outdoor compressor and one or more indoor heads. Multi-head (or multi-zone) systems are considered mini-splits as long as they are served by a single outdoor compressor.
- Non-ducted: An indoor unit which directly heats or cools air within the conditioned space without attached distribution ductwork. The following types of indoor units are considered non-ducted: Wall-mounted, Floor-mounted, Ceiling Suspended, and Ceiling Cassette (standard and compact).
- Ducted: An indoor unit which heats or cools air within the conditioned space through the use of distribution ductwork. Though ducted indoor units can be ceiling-suspended, they are typically ceiling-concealed and consist of short duct runs serving multiple zones from the single indoor unit.
- Mixed: A combination of ducted and non-ducted indoor units served by a single outdoor section.

Energy savings were calculated based on analysis of a sampling of heat pump projects completed in BPA territory with the BPA heat pump calculator tool, and which included a whole building billing analysis.

- For DHP Retrofits, the base case heating system is an electric-resistance heating system. The base case cooling system is a 2015 Washington code-compliant cooling system for the purposes of calculating savings above the baseline.
- For DHP Upgrades, the base case is a 2015 Washington code-compliant heat pump for both the cooling and heating savings analysis.
- For both DHP Retrofits and Upgrades, the efficient case used to calculate energy savings is based on an anticipated average project installation representing the 88th percentile of efficiency.

Required Documents

Ductless Heat Pump Qualified Products List

Ductless Heat Pump Project Information Form

Efficiency requirements listed below are based on the 75th percentile of performance for ductless heat pumps per the Air-Conditioning, Heating, and Refrigeration Institute (AHRI) as of January 2019.

Requirements and Specifications

- These measures cannot be used to retrofit packaged terminal air conditioning (PTAC) units.

Preconditions – DHP Retrofit:

- The space is conditioned by zonal or forced-air, electric-resistance heat as the primary heating source. No other heating sources are eligible.

Preconditions – DHP Upgrade:

- The space is conditioned by an operational or failed DHP; or
- The space is part of a building addition, new construction, or major renovation project

Post-conditions:

- The installed DHP must be listed on the DHP Qualified Products List (QPL) located in the IM Document Library; and
- The DHP outdoor condenser must meet BPA's efficiency requirements per the table below.
- The efficiency requirements apply to both single and multi-head systems.

INDOOR UNIT TYPE	EFFICIENCY REQUIREMENT
Mini-Split or Non-Ducted	11.0 HSPF
Ducted or Mixed	10.0 HSPF

As of April 1, 2018, this measure utilizes a Qualified Applications List to document installation applications that are not addressed directly in the Implementation Manual but which were approved or disapproved by BPA following the publication of this document.

Eligible products are listed on the DHP Qualified Products List (QPL) in the IM Document Library. If a product meets the requirement, but is not on the QPL, please use the COTR Request and Acknowledgement Procedure for approval to use the product.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information including unique site ID and address.	X		X
Equipment or contractor invoice showing: 1. Equipment order or purchase date 2. Installed cost			X
Completed Ductless Heat Pump Project Information Form .			X

Payment

Project reporting to BPA is based on whole tons of outdoor cooling capacity and shall be calculated at a project level using one of the following methods:

1. Sum the outdoor unit cooling capacity from all DHPs installed, then round to the nearest whole ton; or
2. Round the outdoor unit cooling capacity of each individual outdoor unit to the nearest whole ton, then sum all rounded tons.

The two methods are provided to accommodate different types of equipment configurations and capacities.

MEASURE CATEGORY	PAYMENT
Ductless Heat Pump – Retrofit	$1,000 per ton
Ductless Heat Pump – Upgrade	$300 per ton

7.4.4 Air-Source Heat Pump Retrofit and Upgrade (BPA-Qualified)

Basis for Energy Savings

An Air-Source Heat Pump Retrofit replaces an existing electric-resistance heating system with an efficient electric air source heat pump (e.g., adds an electric air source heat pump to a system where one did not previously exist).

An Air-Source Heat Pump Upgrade either: 1) replaces an existing electric air source heat pump with a more efficient electric air source heat pump (e.g., replacing a code minimum heat pump that meets BPA's heat pump efficiency requirements); or 2) is an efficient electric air source heat pump installed as part of a building addition project, new construction project or major renovation project.

Energy savings were calculated based on analysis of a sampling of heat pump projects completed in BPA territory with the BPA heat pump calculator tool, and which included a whole building billing analysis.

- For Heat Pump Retrofits, the base case heating system is an electric-resistance heating system. The base case cooling system is a 2015 Washington code-compliant cooling system for the purposes of calculating savings above the baseline.
- For Heat Pump Upgrades, the base case is a 2015 Washington code-compliant heat pump for both the cooling and heating savings analysis.
- For both Heat Pump Retrofits and Upgrades, the efficient case used to calculate energy savings is based on an anticipated average project installation representing the 88th percentile of efficiency.

Efficiency requirements listed below are based on the 75th percentile of performance for air source heat pumps per the Air-Conditioning, Heating, and Refrigeration Institute (AHRI) as of January 2019.

Requirements and Specifications

- These measures cannot be used to retrofit packaged terminal air conditioning (PTAC) units.

Preconditions – Heat Pump Retrofit:

- The space is conditioned by zonal or forced-air, electric-resistance heat as the primary heating source. No other heating sources are eligible.

Preconditions – Heat Pump Upgrade:

- The space is conditioned by an operational or failed air source heat pump; or

Required Documents

Heat Pump Upgrade Project Information Form

- The space is part of a building addition, new construction, or a major renovation project.

Post-conditions:

The installed heat pump must:

- Be an air-to-air heat pump;
- Have an AHRI certificate of product rating; and
- Meet BPA's efficiency requirements for both heating and cooling per the table below:

EQUIPMENT SIZE (COOLING CAPACITY; BTU/H)	MODE	SUB-CATEGORY OR RATING CONDITION	EFFICIENCY REQUIREMENT
< 65,000	Cooling	Split System and Single Package	16.0 SEER
	Heating	Split System	9.0 HSPF
		Single Package	8.8 HSPF
≥ 65,000 and < 135,000	Cooling	Split System and Single Package	14.0 IEER
	Heating	47°F db/43°F wb Outdoor Air	3.5 COP
		17°F db/15°F wb Outdoor Air	2.4 COP
≥ 135,000	Cooling	Split System and Single Package	12.5 IEER
	Heating	47°F db/43°F wb Outdoor Air	3.4 COP
		17°F db/15°F wb Outdoor Air	2.4 COP

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information including unique site ID and address.	X		X
Equipment or contractor invoice showing: 1. Equipment order or purchase date 2. Installed cost			X
AHRI Certificate documenting the efficiency requirements have been met.			X
Completed Air-Source Heat Pump Project Information Form			X

Payment

Project reporting to BPA is based on whole tons of outdoor cooling capacity and shall be calculated at a project level using one of the following methods:

1. Sum the tons from all heat pumps installed, then round to the nearest whole ton; or
2. Round each individual heat pump to the nearest whole ton, then sum all rounded tons.

The two methods are provided to accommodate different types of equipment configurations and capacities.

MEASURE CATEGORY	PAYMENT
Air-Source Heat Pump – Retrofit	$1,000 per ton
Air-Source Heat Pump – Upgrade	$150 per ton

7.4.5 Variable Refrigerant Flow System Retrofit (BPA-Qualified)

Basis for Energy Savings

Variable Refrigerant Flow (VRF) heat pumps have similar applications as Ductless Heat Pumps (DHP), though they are more commonly used for multi-zone commercial HVAC applications and are available in larger tonnages. A VRF system cools or heats a space more efficiently than standard systems by moving variable amounts of refrigerant through a piping system to each space independently. Compared with other heat pump systems, VRF systems save energy with better part-load performance, zone control and heat recovery options.

Energy savings were calculated based on analysis of a sampling of heat pump projects completed in BPA territory with the BPA heat pump calculator tool, and which included a whole building billing analysis.

- For VRF Retrofits, the base case heating system is an electric-resistance heating system. The base case cooling system is a 2015 Washington code-compliant cooling system for the purposes of calculating savings above the baseline.
- For VRF Retrofits, the efficient case used to calculate energy savings is based on an anticipated average project installation representing the 88th percentile of efficiency.

Efficiency requirements listed below are based on the 75th percentile of performance for variable refrigerant flow equipment per the Air-Conditioning, Heating, and Refrigeration Institute (AHRI) as of January 2019.

Requirements and Specifications

- This measure applies to retrofits only.

Preconditions:

- The space is conditioned by zonal or forced-air, electric-resistance heat as the primary heating source. No other heating sources are eligible.

Post-conditions:

The installed VRF system must:

- Have an AHRI certificate of product rating.
- Meet BPA's efficiency requirements for both heating and cooling per the table below.

The installed VRF system is eligible even if it operates in tandem with a ventilation system that uses any fuel for heating ventilation air.

Required Documents

Variable Refrigerant Flow Project Information Form

EQUIPMENT SIZE (COOLING CAPACITY; BTU/H)	MODE	SUB-CATEGORY OR RATING CONDITION	EFFICIENCY REQUIREMENT
< 65,000	Cooling	VRF Multi-split System	21.0 SEER
	Heating	VRF Multi-split System	11.0 HSPF
≥ 65,000 and < 135,000	Cooling	VRF Multi-split System (with or without heat recovery)	12.0 EER and 23.0 IEER
	Heating	VRF Multi-split system 47ºF db/43ºF wb outdoor air	3.7 COP
		17ºF db/15ºF wb outdoor air	2.27 COP
≥135,000 and <240,000	Cooling	VRF Multi-split System (with or without heat recovery)	10.7 EER and 20.5 IEER
	Heating	VRF Multi-split System 47ºF db/43ºF wb outdoor air	3.5 COP
		17ºF db/15ºF wb outdoor air	2.16 COP
≥240,000	Cooling	VRF Multi-split System (with or without heat recovery)	9.8 EER and 18.9 IEER
	Heating	VRF Multi-split System 47ºF db/43ºF wb outdoor air	3.5 COP
		17ºF db/15ºF wb outdoor air	2.16 COP

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information including unique site ID and address.	X		X
Equipment or contractor invoice showing: 1. Equipment order or purchase date 2. Installed cost			X
AHRI Certificate documenting the efficiency requirements have been met.			X
Completed Variable Refrigerant Flow (VRF) Project Information Form			X

Payment

Project reporting to BPA is based on whole tons of outdoor cooling capacity and shall be calculated at a project level using one of the following methods:

1. Sum the outdoor unit cooling capacity from all VRF systems installed, then round to the nearest whole ton; or
2. Round the outdoor unit cooling capacity of each individual VRF system to the nearest whole ton, then sum all rounded tons.

These two methods are provided in order to accommodate different types of equipment configurations and capacities.

MEASURE CATEGORY	PAYMENT
Variable Refrigerant Flow System Retrofit (BPA-Qualified)	$1,000 per ton

7.4.6 Variable Frequency Drive on Air Handling Unit Fan (VFD on AHU Fan) (BPA-Qualified)

Required Documents

Variable Frequency Drive on Air Handling Unit Fan Project Information Form

Basis for Energy Savings

A variable frequency drive (VFD) on an air handling unit (AHU) fan adds a VFD on a single-speed AHU. A typical building application for a VFD on an AHU fan is a multistory facility, such as a hospital, school or office building. These types of HVAC systems are typically located in the building's mechanical room, and not on the roof.

With this technology, the VFD varies the speed of the fan to meet the conditions of the air handling system. As the fan motor slows down, it draws less power than at constant speed, resulting in energy savings.

Energy savings are based on BPA's analysis of historical custom project installations completed between 2011 and 2016.

Requirements and Specifications

- This measure applies to retrofits only.

Preconditions:

- Building heating fuel type may be either electric or gas;
- VFD must be installed on existing AHU single-speed fan.

Post-conditions:

- Retrofit adds a VFD to control the fan with variable-speed operation;
- Any existing AHU throttling or bypass devices (e.g., inlet guide vanes, dampers, etc.) must be removed or permanently disabled.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information including unique site ID and address.	X		X
Equipment or contractor invoice showing: 1. Equipment order or purchase date 2. Installed cost			X
Completed VFD on AHU Fan Project Information Form			X

Payment

Project reporting to BPA is based on whole horsepower and shall be calculated at a project level using one of the following two methods:

1. Sum the horsepower for all VFDs installed, then round to the nearest whole horsepower; or
2. Round the horsepower for each individual VFD to the nearest whole horsepower, then sum all rounded horsepower amounts.

These two methods are provided in order to accommodate different types of equipment configurations and capacities.

MEASURE CATEGORY	PAYMENT
Variable Frequency Drive on Air Handling Unit Fan (BPA-Qualified)	$300 per horsepower

7.5 COMMERCIAL SHELL MEASURES

7.5.1 Commercial Insulation

Basis for Energy Savings

The base case used to calculate energy efficiency savings for commercial insulation is based on precondition wall, roof and attic levels with very little (defined as R-0 to R-5) insulation value. The efficient case used to calculate savings is based on wall, roof and attic insulation value ranges that are shown in the payment table below. Energy savings are dependent on the building type, heating zone and heating system types.

Attic insulation is defined by insulation that is installed in the attic crawl space, typically on a horizontal surface. Roof insulation is defined by insulation that is installed in direct contact with the building's roof, typically a flat or slightly pitched surface.

Requirements and Specifications

- This measure applies to retrofits only.

Preconditions:

- The building is electrically heated; and
- The existing insulation value is between R-0 and R-5.

Post-condition:

- Installation of insulation in wall or attic/roof spaces per the levels shown in the Payment table below.
- Installation of insulation in floor or crawl spaces is not eligible.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information including unique site ID and address.	X		X
Product or contractor invoice showing: 1. Product order or purchase date 2. Installed cost			X
Completed Commercial Insulation Project Information Form			X

Payment

MEASURE CATEGORY	PAYMENT		
LOCATION AND R VALUE	HEATING ZONE 1	HEATING ZONE 2	HEATING ZONE 3
Attic/roof insulation payment per square foot:			
≤R-5 to R-19	$1.35	$1.75	$2.00
≤R-5 to R-30	$1.40	$1.85	$2.05
≤R-5 to R-49	$1.50	$1.95	$2.10
Wall insulation payment per square foot:			
≤R-5 to R-11	$0.75	$1.00	$1.15
≤R-5 to R-19	$1.00	$1.25	$1.40

Required Documents

Commercial Insulation Project Information Form

7.5.2 Commercial Windows (BPA-Qualified)

Basis for Energy Savings

Savings estimates for commercial windows are based on an analysis of efficient windows in small commercial buildings. Energy savings vary by heating zone and heating system type.

Requirements and Specifications

- This measure applies to retrofits only.

Preconditions:

This measure is eligible in commercial buildings with the following characteristics:

- Electrically heated;
- A total floor area under 20,000 square feet; and
- Pre-existing windows that are single-pane, single-pane with storms, or double-paned metal-frame windows.

Post-conditions:

- Installation of replacement window assemblies that have a National Fenestration Rating Council-rated U-value of 0.30 or lower.

Required Documents

Commercial Windows Project Information Form

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information including unique site ID and address.	X		X
Product or contractor invoice showing: 1. Product order or purchase date 2. Installed cost			X
Completed Commercial Window Project Information Form			X

Payment

MEASURE CATEGORY	PAYMENT
HEATING ZONE 1	$9 per square foot of window replaced
HEATING ZONE 2	$18 per square foot of window replaced
HEATING ZONE 3	$18 per square foot of window replaced

7.6 COMMERCIAL REFRIGERATION

7.6.1 Anti-Sweat Heater (ASH) Controls

Basis for Energy Savings

Anti-sweat heater (ASH) controls reduce the energy consumption of anti-sweat heaters on reach-in doors. This measure applies to cooler and freezer reach-in glass door cases in a commercial building.

This measure only applies to technologies that reduce energy consumption of anti-sweat heaters based on sensing humidity. It does not apply to doors equipped with low/no anti-sweat heat.

More detailed information is available on the Regional Technical Forum (RTF) Unit Energy Savings (UES) Measures webpage.

Requirements and Specifications

- This measure is applicable to retrofits and new construction.

Preconditions:

- Cooler Case: Any uncontrolled ASH that uses greater than 0.20 amps/ft. of case (door rail, glass and/or frame heating element combined); or
- Freezer Case: Any uncontrolled ASH that uses greater than 0.39 amps/ft. of case (door rail, glass and/or frame heating element combined).

Post-conditions:

- Cooler Case: Installation of a controller with settings that reduce the ASH run time by at least 50%. Includes any heating element in a door rail, glass and/or frame; or
- Freezer Case: Installation of a controller that reduces the ASH run time by at least 50%. Includes any heating element in a door rail, glass and/or frame.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information including unique site ID and address.	X		X
Product or contractor invoice showing: 1. Product order or purchase date 2. Installed cost			X
Product Specification Sheet (also referred to as cut sheet) that documents product name and model number.			X

Payment

MEASURE CATEGORY	PAYMENT
Anti-Sweat Heater (ASH) Controls – Freezer	$40 per linear foot of case
Anti-Sweat Heater (ASH) Controls – Cooler	$40 per linear foot of case

7.6.2 Walk-In or Display Case Evaporator Fan Motor – Shaded Pole to Electronically Commutated Motor (ECM)

Basis for Energy Savings

This measure is for existing, shaded pole evaporator fan motors in refrigerated reach-in display cases, walk-in coolers and walk-in freezers that are replaced by electronically commutated motors (ECMs).

More detailed information is available on the Regional Technical Forum (RTF) Unit Energy Savings (UES) Measures webpage.

Requirements and Specifications

- This measure applies to retrofits only.
- For walk-in coolers and freezers: Motors must have fans that are 10 inches in diameter or larger.
- For refrigerated display cases: All fan sizes are eligible.

Precondition:

- Shaded pole evaporator motor in a refrigerated display case, walk-in cooler or freezer.

Post-condition:

- Replace a shaded pole evaporator fan motor with an ECM.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information including unique site ID and address.	X		X
Product or contractor invoice showing: 1. Product order or purchase date 2. Installed cost			X
Product Specification Sheet (also referred to as cut sheet) that documents product name and model number.			X

Payment

MEASURE CATEGORY	PAYMENT
ECM on Display Case	$55 per motor
ECM on Walk-In Cooler or Freezer, ≤ 23 Watts	$140 per motor
ECM on Walk-In Cooler or Freezer, > 23 Watts	$140 per motor

7.6.3 Strip Curtains for Walk-In Coolers and Freezers

Basis for Energy Savings

Strip curtains and plastic doors on walk-ins keep cool air from escaping, and warm air from entering the unit. This measure is for the installation of new strip curtains or plastic swinging doors on qualifying walk-in cooler and freezer doorways.

More detailed information is available on the Regional Technical Forum (RTF) Unit Energy Savings (UES) Measures webpage.

Requirements and Specifications

- This measure applies to retrofits only.

Preconditions:

- Eligible applications include grocery walk-in freezers and coolers, convenience store walk-in freezers and restaurant walk-in freezers where there are no existing curtains or plastic doors.
- The following applications are not eligible: Walk-in freezers located inside of walk-in coolers; walk-in coolers in restaurants, drug or convenience stores; replacement of existing strip curtains; or strip curtains on display cases.

Post-conditions:

- Installation of strip curtains or swinging doors ≥ 0.06-inches thick; and
- Low-temperature strip curtains or doors must be used on low-temperature applications.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information including unique site ID and address.	X		X
Product or contractor invoice showing: 1. Product order or purchase date 2. Installed cost			X
Product Specification Sheet (also referred to as cut sheet) that documents product name and model number.			X

Payment

MEASURE CATEGORY	PAYMENT
Strip Curtains for Walk-in Coolers and Freezers	$9 per square foot of doorway

7.7 COMMERCIAL KITCHEN AND FOOD SERVICE EQUIPMENT

7.7.1 Demand Controlled Kitchen Ventilation (BPA-Qualified)

Basis for Energy Savings

Demand-controlled kitchen ventilation (DCKV) automatically reduces kitchen hood and make-up air fan speed during times of low activity or demand. Energy savings are achieved as a result of reduced fan power and reduced make-up air heating requirements.

Requirements and Specifications

- This measure applies to retrofits and new construction.

Preconditions:

- For existing applications, the ventilation system has a constant-speed exhaust fan.
- For new construction applications, there are no preconditions.

Post-conditions:

Installed demand-controlled kitchen ventilation equipment that:

- Controls the primary ventilation and make-up air units in the zone; and
- Utilizes one or more control sensors to modify the fan speeds.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information including unique site ID and address.	X		X
Equipment or contractor invoice showing: 1. Equipment order or purchase date 2. Installed cost			X
Completed Demand Controlled Kitchen Ventilation Project Information Form			X

Payment

MEASURE CATEGORY	PAYMENT
Demand Controlled Kitchen Ventilation- New or Retrofit- One control sensor	$200 per fan horsepower
Demand Controlled Kitchen Ventilation- New or Retrofit- Multiple control sensors	$400 per fan horsepower

Required Documents

Demand Controlled Kitchen Ventilation Project Information Form

7.7.2 Electric Commercial Steam Cookers

Basis for Energy Savings

Savings for electric commercial steam cookers occur from (1) reduced idle energy consumption from improved insulation and gaskets, and (2) the use of connectionless or closed-system design. Additional benefits include up to 90% water reduction for connectionless models.

More detailed information is available on the Regional Technical Forum (RTF) Unit Energy Savings (UES) Measures webpage.

Requirements and Specifications

- This measure applies to both retrofits and new construction.
- Installed equipment must be minimum ENERGY STAR v1.2 qualified.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information including unique site ID and address.	X		X
Product or contractor invoice showing: 1. Product order or purchase date 2. Installed cost			X
A copy of the ENERGY STAR product list showing the product or the product information insert or packaging that includes the ENERGY STAR logo. In the event that ENERGY STAR specifications change from the specifications in place in October 2019, BPA will accept pre-existing models that were ENERGY STAR-Qualified at the time they were manufactured.			X

Payment

MEASURE CATEGORY	PAYMENT
Electric Commercial Steam Cooker - 6 pan	$500 per pan

7.7.3 Hot Food Holding Cabinets

Basis for Energy Savings

Savings for hot food holding cabinets occur from reduced idle energy consumption due to improved thermal characteristics and may include other advanced features such as auto-door closers and magnetic door gaskets. ENERGY STAR defines the following equipment sizes:

- Half Size: < 13 cu. ft.
- Full Size: ≥ 13 and < 28 cu. ft.
- Double Size: ≥ 28 cu. ft.

More detailed information is available on the Regional Technical Forum (RTF) Unit Energy Savings (UES) Measures webpage.

Requirements and Specifications

- This measure applies to both retrofits and new construction.
- Installed equipment must be minimum ENERGY STAR v2.0-qualified.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information including unique site ID and address.	X		X
Product or contractor invoice showing: 1. Product order or purchase date 2. Installed cost			X
A copy of the ENERGY STAR product list showing the product or the product information insert or packaging that includes the ENERGY STAR logo. In the event that ENERGY STAR specifications change from the specifications in place in October 2019, BPA will accept pre-existing models that were ENERGY STAR-Qualified at the time they were manufactured.			X

Payment

MEASURE CATEGORY	PAYMENT
Hot Food Holding Cabinet – Half Size	$250 per cabinet
Hot Food Holding Cabinet – Full Size	$500 per cabinet
Hot Food Holding Cabinet – Double Size	$1,000 per cabinet

7.7.4 Electric Combination Ovens

Basis for Energy Savings

Combination ovens provide three functions: convection, steam and combination cooking. In the convection mode, the oven circulates dry heat – suitable for pastries and breads. The steam mode injects water into the oven to poach fish, rice and vegetables. In the combination mode, both dry heat and steam are used to maintain exact humidity levels. Savings occur from (1) reduced idle energy consumption from improved insulation and gaskets, and (2) the use of infrared heating.

More detailed information is available on the Regional Technical Forum (RTF) Unit Energy Savings (UES) Measures webpage.

Requirements and Specifications

- This measure applies to both retrofits and new construction.
- Installed equipment must be minimum ENERGY STAR v2.2-qualified.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information including unique site ID and address.	X		X
Product or contractor invoice showing: 1. Product order or purchase date 2. Installed cost			X
A copy of the ENERGY STAR product list showing the product or the product information insert or packaging that includes the ENERGY STAR logo. In the event that ENERGY STAR specifications change from the specifications in place in October 2019, BPA will accept pre-existing models that were ENERGY STAR-Qualified at the time they were manufactured.			X

Payment

MEASURE CATEGORY	PAYMENT
Electric Combination Oven – 5-15 pan oven	$500 per oven
Electric Combination Oven – 16-20 pan oven	$500 per oven

7.7.5 Electric Convection Ovens

Convection ovens use fans to circulate hot air within the cabinet. Savings occur from (1) reduced idle energy consumption from improved insulation and gaskets, and (2) the use of infrared heating. Convection oven sizes are defined as follows:

- Half Size: 18″ x 13″ x 1″ pan size
- Full Size: 18″ x 26″ x 1″ pan size

More detailed information is available on the Regional Technical Forum (RTF) Unit Energy Savings (UES) Measures webpage.

Requirements and Specifications

- This measure applies to both retrofits and new construction.
- Installed equipment must be minimum ENERGY STAR v2.2-qualified.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information including unique site ID and address.	X		X
Product or contractor invoice showing: 1. Product order or purchase date 2. Installed cost			X
A copy of the ENERGY STAR product list showing the product or the product information insert or packaging that includes the ENERGY STAR logo. In the event that ENERGY STAR specifications change from the specifications in place in October 2019, BPA will accept pre-existing models that were ENERGY STAR-Qualified at the time they were manufactured.			X

Payment

MEASURE CATEGORY	PAYMENT
Electric Convection Oven - Half	$200 per oven
Electric Convection Oven - Full	$400 per oven

7.7.6 Commercial Electric Fryers

Basis for Energy Savings

Fryers are used to deep-fry food. Savings occur from (1) reduced idle energy consumption from improved insulation, (2) more accurate thermostats and, (3) advanced heater and heat exchanger design. Additional user benefits may also include continuous production capacity, higher pound-per-hour production rates, and improved oil conservation and management enabled by quicker recovery times. There are multiple sizes of electric fryers. A Large Vat Size is defined as a fryer with a vat that measures between 18 inches and 24 inches wide, and a shortening capacity of greater than 50 pounds.

More detailed information is available on the Regional Technical Forum (RTF) Unit Energy Savings (UES) Measures webpage.

Requirements and Specifications

- This measure applies to both retrofits and new construction.
- Installed equipment must be minimum ENERGY STAR v3.0-qualified.
- This measure is available for large-vat-size electric fryers only.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information including unique site ID and address.	X		X
Product or contractor invoice showing: 1. Product order or purchase date 2. Installed cost			X
A copy of the ENERGY STAR product list showing the product or the product information insert or packaging that includes the ENERGY STAR logo. In the event that ENERGY STAR specifications change from the specifications in place in October 2019, BPA will accept pre-existing models that were ENERGY STAR-Qualified at the time they were manufactured.			X

Payment

MEASURE CATEGORY	PAYMENT
Electric Fryer – Large Vat	$250 per fryer

7.7.7 Pre-Rinse Spray Valves

Basis for Energy Savings

This measure is for the installation of reduced flow pre-rinse spray valves in commercial kitchens. Savings are achieved as a result of reduced hot water use.

More detailed information is available on the Regional Technical Forum (RTF) Unit Energy Savings (UES) Measures webpage.

Requirements and Specifications

- This measure applies to retrofits only.

Preconditions:

- The pre-rinse spray valve must use hot water heated with an electric water heater.

Post-conditions:

- Valve must be EPA WaterSense-qualified or have a minimum spray force of 4.0 ounces-force; and
- A new spray valve with a maximum flow rate of one gallon per minute.

Documentation Requirements

Pre-rinse spray valves are available through the following channels:

- By Request
- Direct Install

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
See Measure Distribution Process (Section 12.2) for documentation requirements for each channel listed above			X Unless otherwise specified in section 12.2

Payment

MEASURE CATEGORY	PAYMENT
Pre-Rinse Spray Wash Valve	$100 per spray valve

7.8 ADDITIONAL UES OFFERINGS

7.8.1 ENERGY STAR Commercial Clothes Washers

Basis for Energy Savings

Energy savings assumes that the volume of water used is for commercial purposes, such as laundry in laundromats or the service industry. Savings vary by fuel used for water heating and drying.

More detailed information is available on the Regional Technical Forum (RTF) Unit Energy Savings (UES) Measures webpage.

Requirements and Specifications

- This measure applies to both retrofits and new construction.

Preconditions:

Eligible existing equipment to be replaced includes:

- Electric or gas water heating; and
- Electric or gas drying.

Post-conditions:

- Installed equipment must be minimum ENERGY STAR v2.2-qualified.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information including unique site ID and address.	X		X
Product or contractor invoice showing: 1. Product order or purchase date 2. Installed cost			X
A copy of the ENERGY STAR product list showing the product or the product information insert or packaging that includes the ENERGY STAR logo. In the event that ENERGY STAR specifications change from the specifications in place in October 2019, BPA will accept pre-existing models that were ENERGY STAR-Qualified at the time they were manufactured.			X

Payment

MEASURE CATEGORY	PAYMENT
Clothes Washer - Electric Water Heater/Electric Dryer	$125 per washer
Clothes Washer - Electric Water Heater/Gas Dryer	$100 per washer
Clothes Washer - Gas Water Heater/Electric Dryer	$75 per washer
Clothes Washer - Gas Water Heater/Gas Dryer	$25 per washer

7.8.2 Smart Power Strips

Basis for Energy Savings

The base case used to calculate energy savings for commercial smart power strips are commercial office-related plug-loads that remain on even when not in use.

Energy savings assume that smart power strips are used in accordance with the manufacturer's instructions on equipment not previously controlled by a smart power strip.

More detailed information is available on the Regional Technical Forum (RTF) Unit Energy Savings (UES) Measures webpage.

Requirements and Specifications

- This measure applies to both retrofits and new construction.

Preconditions:

- No smart power strip was in place.

Post-conditions:

- Power strip turns off power to control office equipment not in use.
- Control mechanism may be any of the following:
  - Load sensor (controlled outlets power down when idle power level is detected in the master outlet); or
  - Motion sensor (controlled outlets powered down when no motion has been detected in the area for a set period of time); or
  - Timer (controlled outlets powered down for user-programmed periods of the day).

Documentation Requirements

Smart Power Strips are available through the following channels:

- By Request
- Direct Install

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
See Measure Distribution Process (Section 12.2) for documentation requirements for each channel listed above.			X Unless otherwise specified in section 12.2

Payment

MEASURE CATEGORY	PAYMENT
Smart Power Strip	$15 per strip

Required Documents

Commercial Sector Measure Distribution Documentation Form

7.8.3 Commercial Showerheads

Required Documents

Commercial Sector Measure Distribution Documentation Form

Requirements and Specifications

Savings for commercial showerheads vary based on gallons per minute, fuel used for water heating, type of commercial building and distribution method (direct install or by request). Common applications include fitness centers, hospitality buildings (hotels/motels), health care facilities (including hospitals) and small commercial facilities (including office showers).

More detailed information is available on the Regional Technical Forum (RTF) Unit Energy Savings (UES) Measures webpage.

Requirements and Specifications

- This measure is available for retrofits only

Preconditions:

- Any commercial building; and
- Any water-heating type.

Post-conditions:

- Showerhead must have a rated flow of 2.0 gallons (or fewer) per minute.

Documentation Requirements

Commercial showerheads are available through the following channels:

- By Request
- Direct Install

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
See Measure Distribution Process (Section 12.2) for documentation requirements for each channel listed above.			X Unless otherwise specified in section 12.2

Payment

MEASURE CATEGORY	PAYMENT
Commercial Showerheads, By Request	$8 per showerhead
Commercial Showerheads, Direct Install	$11 per showerhead

7.8.4 Generator Block Heaters (BPA-Qualified)

Required Documents

Generator Block Heater Project Information Form

Basis for Energy Savings

The following two generator block heater sizes were used to calculate energy savings:

- Less than three kW; and
- Greater than or equal to three kW.

The generator engine block heater base case used to calculate energy savings is thermosiphon heaters, which are electric-resistance heaters

without a pump. The efficient case used forced-circulation heaters, which are electric-resistance heaters with a pump. The measure savings for the two block heater sizes are based on weighted averages of the base and efficient case energy usage from a BPA emerging technology pilot. The pilot found that in addition to energy savings, forced-circulation heaters provide better overall block temperature control and reduce extreme temperature swings, possibly extending hose lifetimes, reducing maintenance costs and improving generator reliability. Savings vary by size of heater.

Requirements and Specifications

- Retrofit of existing installations and new equipment are both eligible.

Preconditions:

- The forced-circulation generator engine block heater must replace a thermosiphon, electric-resistance block heater or be a new block heater; and
- The generator or engine must be stationary and fixed.

Post-condition:

- Installed generator engine block heaters must be forced-circulation heaters.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information including unique site ID and address.	X		X
Equipment or contractor invoice showing: 1. Equipment order or purchase date 2. Installed cost			X
Completed Generator Block Heater Project Information Form			X

Payment

MEASURE CATEGORY	PAYMENT
Generator Engine Block Heater - Size <3 kW	$200 per unit
Generator Engine Block Heater - Size ≥3 kW	$1,500 per unit

7.8.5 Vehicle Engine Block Heater Controls

Basis for Energy Savings

Vehicle engine block heater controls use a combination of temperature sensing and heater cycling to save energy. Studies confirmed energy savings for all heating zones associated with controls that keep block heaters off when the ambient air temperature is above the temperature setting, and deliver only as much heat as necessary when the temperature drops below the setting. Savings assume the factory-default temperature setting. Good candidates include any vehicle that uses block heaters during cold months.

More detailed information is available on the Regional Technical Forum (RTF) Unit Energy Savings (UES) Measures webpage.

Required Documents

Generator Block Heater Project Information Form

Requirements and Specifications

- Retrofit of existing installations and new equipment are both eligible.

Preconditions:

- Wall outlet must be a single uncontrolled outlet with one or two plugs.
- Large centralized wall plug systems designed for many vehicles are not eligible.
- Systems that are portable, such as extension cord models, are not eligible.

Post-conditions:

Installation of a vehicle engine block heater control that is:

- A hard-wired outlet or engine-mounted type;
- Thermostatically-controlled; and
- Compatible with 110-volt, single-phase resistance immersion heaters.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information including unique site ID and address.	X		X
Equipment or contractor invoice showing: 1. Equipment order or purchase date 2. Installed cost			X

Payment

MEASURE CATEGORY	PAYMENT
Vehicle Engine Block Heater Controls	$200 per unit

Section 8: Federal Sector

Unlike other sectors, the Federal Sector does not have a unique set of measures. Rather, this sector incorporates the offerings of all other sectors. As such, a federal project is any energy efficiency project (available elsewhere in this IM) installed in a qualifying federal facility.

A qualifying federal facility is one that meets the following requirements:

1. The site is (a) owned or leased by the federal government or (b) uses electric energy paid for by the federal government;
2. The site is (a) utility served; or (b) direct served:
   - Utility served: The site uses electricity purchased from a BPA customer.
   - Direct served: The site uses electricity purchased directly from BPA.

Federal projects must follow the requirements of the section under which they are offered. Customers must report new projects under "federal," and customers, rather than BPA, must provide incentive payments to end users.

Section 9: Industrial Sector

9.1 Payment Summary 72
9.2 Energy Smart Industrial 73
9.2.1 Energy Management: Energy Project Manager (Optional ESI Component) . .74
9.2.2 Strategic Energy Management: Strategic Energy Management Projects (Optional ESI Component). 77
9.2.3 Industrial Custom Projects (Optional ESI Component): 80
9.2.4 Small Industrial Projects (Optional ESI Component). 81
9.2.5 BPA-Funded Technical Service Providers (Optional ESI Component) .81
9.3 Variable Frequency Drives for Fans in Potato and Onion Storage Facilities . 82
9.4 Small Compressed Air Systems . . 82
9.5 High Frequency Battery Charger Upgrade (BPA-Qualified). 83
9.6 Welder Upgrade (BPA-Qualified). 84
9.7 Water System Leak Abatement (BPA-Qualified) 85

Please check the changes and corrections summary to see if revisions were made to any of the measures in this sector.

The BPA Energy Efficiency Industrial Sector includes Energy Smart Industrial (ESI) and Multisector opportunities. Without ESI enrollment, industrial custom project incentives and technical services must be customer-funded, as BPA funding is available only for Multisector measures and initiatives.

The Industrial Sector includes electrical energy used by fixed pieces of equipment, buildings or complexes to produce, manufacture or store goods in connection with, or as part of, any process or system. This includes those related to food production, transportation, and rail infrastructure.[1]

These processes and systems also include, but are not limited to: Electric distribution system hardware, voltage optimization, water/wastewater production and treatment, and data centers/server farms.[2] In general, Industrial Sector activities must not devote the majority of energy use within a facility to nonprocess-related HVAC or potable hot water.

Unless otherwise noted, all Industrial Sector measures are available for the Commercial and Agricultural sectors, where applicable. Utilities shall report these measures as Industrial when reporting to BPA.

9.1 PAYMENT SUMMARY*	
PROGRAM COMPONENT OR MEASURE	**PAYMENT**
9.2 Energy Smart Industrial	
9.2.1 Energy Project Manager	See the Payment section of this offering
9.2.2 Strategic Energy Management Projects	See the Payment section of this offering
9.2.3 Industrial Custom Projects	See the Payment section of this offering
9.2.4 Small Industrial Projects	See the Payment section of this offering
9.2.5 BPA-Funded Technical Service Providers (TSP)	Not applicable
Other Industrial Measures	
9.3 Variable Frequency Drives for Fans in Potato and Onion Storage Facilities	$200 per horsepower
9.4 Small Compressed Air Systems	See the Payment section of this offering
9.5 High Frequency Battery Charger Upgrade (BPA-Qualified)	See the Payment section of this offering
9.6 Welder Upgrade (BPA-Qualified)	See the Payment section of this offering
9.7 Water System Leak Abatement (BPA-Qualified)	See the Payment section of this offering

9.1 PAYMENT SUMMARY*	
PROGRAM COMPONENT OR MEASURE	**PAYMENT**
Additional Multisector Opportunities	
Some Commercial and Agricultural Sector measures may be applicable to Industrial Sector projects. Measures eligible for installation in multiple sectors are identified where applicable in the body of the IM in the primary applicable sector.	

* The payment levels described in this table provide a summary only. Complete details of the payment levels and associated requirements may be found in the corresponding text of the IM. Please see the Table of Contents.

[1] This does not include loading dock systems or facilities associated with the Commercial Sector.

[2] This does not include Commercial Sector data centers/server farms, such as those integrated into a commercial building that serve the information technology needs of the business.

9.2 ENERGY SMART INDUSTRIAL

Customers must enroll in the ESI Program to receive BPA funding for custom project incentives and technical services.

The bulk of industrial program offerings are located in ESI, which is managed by a third-party contractor (ESI program partner). ESI participants are assigned an ESI Partner (ESIP) and are offered the following program components:

- Energy Management: Energy Project Managers
- Strategic Energy Management: Strategic Energy Management Projects
- Industrial Custom Projects
- Small Industrial Projects
- Technical Service Providers (TSP)

Requirements and Specifications

1. Enrollment: A customer must request enrollment in ESI using the COTR Request and Acknowledgment Procedure. BPA acceptance of the request is discretionary.
2. ESI program partner: The customer must meet with the ESI program partner (in person or over the phone) to outline its intended level of program engagement and end user communication expectations for the ESI program partner. The customer may engage the ESI program partner on any other pertinent topic, including the customer's industrial load, savings goals and desired program component rollout. The ESI program partner will email an acknowledgment to the customer documenting the decisions made during the meeting.
3. ESIP: An Energy Smart Industrial Partner (ESIP) (provided by the ESI program partner) is assigned to the customer and is the single point of contact to help customers understand and implement ESI. The customer ultimately determines the level of ESIP engagement, but, generally, the ESIP performs the following:
    - Serves as an industrial technical resource to customers;
    - Works closely with the customer to develop an action plan for its end users;
    - Manages and reviews technical work products, including technical analysis of custom project submittals; and
    - Helps the customer identify custom projects and secure BPA approval.

Supporting Content

Nonresidential Lighting Program

COTR Request & Acknowledgment Procedure

Industrial Lighting Specialists (Nonresidential Lighting Program) are also available:

Lighting specialists can help industries save energy and increase profitability by providing a variety of services, including:

- Perform and deliver lighting audits
- Review lighting design and installation proposals
- Offer guidance on the best lighting technology for an industry's specific application
- Complete the BPA Lighting Calculator

BPA's Trade Ally Network Northwest is a community of lighting distributors, electrical contractors, and manufacturers who play a critical role in the market adoption of efficient lighting technologies, as well as develop and implement industrial lighting projects.

Please see Commercial section 7.3 Nonresidential Lighting for specific requirements and specifications, documentation requirements, etc.

9.2.1 Energy Management: Energy Project Manager (Optional ESI Component)

Effective October 1, 2021, the Energy Project Manager offering will be retired. BPA will release a new Energy Project Manager measure at that time.

The Energy Project Manager uses a structured process to help industrial customers overcome the lack of staffing resources by providing co-funding and support. BPA will co-fund EPMs, end user employees or contractors who manage energy efficiency custom projects at the end users' facilities. If applicable, EPMs may manage Strategic Energy Management (SEM) projects and Unit of Energy Savings (UES) lighting at the end users' facilities.

Required Documents

EPM Calculator

ESI HUB

Requirements and Specifications

Required documents to be submitted by the customer to BPA in support of ESI Energy Management efforts must be sent to eedocs@bpa.gov as an email attachment or by including a secure link from the online ESI HUB. A customer may request EPM co-funding by sending the EPM agreement between itself and the end user to eedocs@bpa.gov. The agreement must, at a minimum, identify an energy-savings goal of at least 1,000,000 kWh of verifiable annual busbar energy savings per year, and specify the end user's obligation to employ a qualified EPM.

Year 1 commencement date is the date the final of the following actions have occurred: (1) the customer submits the EPM agreement to eedocs@bpa.gov as an email attachment or by including a secure link from the ESI HUB; (2) an EPM is hired or designated by the end user; and (3) BPA approves the EPM. The customer must ensure that the end user meets the following requirements:

- The end user must hire or designate an EPM to identify, evaluate and implement industrial electrical energy efficiency projects (e.g., SEM and UES lighting). The EPM must be familiar with, and have experience in, industrial electric energy efficiency and the end user's type of business.
- The EPM must manage electrical energy efficiency projects that deliver 1,000,000 kWh or greater in verifiable annual busbar energy savings within one year of the commencement date (but is allowed up to 18 months). These savings must be verified, i.e., the savings must be reportable to and approved by BPA.
- The end user may replace the EPM; however, the customer must inform BPA in writing within 30 days of replacement, and the replacement EPM must meet the requirements of this IM.

- No later than 90 days after the commencement date, the EPM must submit the EPM Comprehensive Plan to the customer and BPA to eedocs@bpa.gov as an email attachment or by including a secure link from the ESI HUB. They must be approved by BPA and include, at a minimum, the following:
    - Projected verifiable annual busbar energy savings (at least 1,000,000 kWh). Eligible project status shall precede completion of post-project measurement and verification (M&V) on the commencement date;
    - Name of the EPM;
    - Total annual cost of the EPM, which includes base salary, benefits and associated direct costs (e.g., travel and training[3]), if known;[4]
    - Itemized summary of planned electrical-energy projects (including participation in SEM[5]) that will make up the verifiable annual busbar energy savings, including estimates of the energy savings, cost savings and implementation costs;
    - Schedule for project development, implementation and completion; and
    - Project implementation schedule showing energy savings or energy-savings progress expected at (a) six months after the commencement date, and (b) over the life of the plan.
- The EPM must submit status reports to the customer and BPA to eedocs@bpa.gov as an email attachment or by including a secure link from the ESI HUB. It must describe (1) the energy savings achieved and projected; and (2) projects completed, in process, or planned. Status reports are due no later than six months and also one year from the commencement date.
- No later than six months after the commencement date, the end user must achieve, to BPA's satisfaction, the six-month verified annual busbar energy savings or energy-savings progress described in the six-month status update section of the EPM Comprehensive Plan. Examples include BPA-approved custom project proposals (Option 1), customer-approved custom projects (Option 2), or in-progress SEM projects. If energy-savings achievements differ significantly from savings predictions, BPA may revise the savings goal and use the revised goal for payment calculations.
- Upon completion of the EPM agreement, the customer may elect to extend the agreement for an additional 12–18 months by sending the EPM agreement between the customer and end user to eedocs@bpa.gov as an email attachment or by including a secure link from the ESI HUB. The EPM agreement must, at a minimum, identify an additional energy-savings goal of at least 1,000,000 kWh of verifiable annual busbar energy savings and the end user's obligation to employ a qualified EPM. The customer must repeat the same process for the ensuing contract period, including creating a new EPM Comprehensive Plan.
- A customer must send a request to BPA (email eedocs@bpa.gov) for consideration of BPA directly contracting with its end user to provide EPM co-funding. The request must include the following:
    - Documentation of the direct contract qualification, either because (1) the customer is prevented by charter or policy from contracting with its end users; or (2) the EPM will be assigned to multiple facilities served by multiple customers;

[3]EPM training costs must be pre-approved by BPA based on the customer's budget, EPM costs and the relevancy of the training. EPM costs include only qualifying costs incurred between the EPM commencement date and the date of the last project in the EPM Comprehensive Plan as approved by BPA. BPA will not pay customers for EPM time in a custom or SEM project if it was included in the EPM Comprehensive Plan.
[4]The total EPM co-funding amount may not exceed the total annual EPM costs as specified in the EPM Comprehensive Plan. Documentation of actual EPM costs must accompany the final EPM Status Report, which precedes the final payment. Where an EPM term is less than 12 months, the eligible EPM costs must be based on pay records from the period between the EPM commencement date and BPA acceptance of the final project. A
customer may include a performance incentive as a portion of the EPM's salary.
[5]SEM project first-year savings and subsequent years' incremental savings may be applied toward the EPM savings goal.

- End-user information (name, address and contact information); and
- The allocated amount must be capped at the lesser of: (1) $0.025 per kWh of the energy-savings goal; (2) the total annual cost of the EPMs as described in the EPM Comprehensive Plan not to exceed (NTE) $250,000 per EPMs contracted; or (3) an amount specified in the EPM agreement.

- If a customer's request is approved, BPA will (1) reduce the customer's ECA implementation budget by the allocated amount, (2) hold the funds to pay the EPM payment to the end user, and (3) execute a contract with the end user to pay for an EPM. The allocation may not be changed without approval from BPA, the customer and the end user. At the end of the EPM contract period, if the customer's allocation exceeds the amount BPA paid the end user, the remaining budget will be returned to the customer's ECA implementation budget.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV OR FAX 1-866-535-7955	CUSTOMER FILE
Executed EPM Agreement Between Customer and End User		X	X
EPM Comprehensive Plan and Status Reports		X	X
EPM Calculator (available in the Interim Solutions 2.0 Files)	X		X

Payment

To receive payment, the customer must invoice BPA once it reaches the milestones in the chart below. If the customer elects to renew the EPMs for an additional period, the payment schedule repeats with the first payment starting with payment number two. Customers are not obligated to return money already received.

Use the EPM Calculator (available in the Interim Solutions 2.0 Files to calculate payment amounts.

FOR ANY PAYMENT, THE CUSTOMER MAY SELECT A SMALLER PAYMENT CAP THAN SPECIFIED BELOW (I.E., SELECT A PAYMENT SMALLER THAN THE CALCULATED PAYMENT).		
PAYMENT NO.	FUNDING AMOUNT	MILESTONE
1	$25,000[i]	Commencement date
2	1/3 of the funding[ii] less previous payments	BPA approves the EPM Comprehensive Plan
3	2/3 of the funding[ii] less previous payments	End user achieves, to BPA's satisfaction, the six-month energy savings, or energy-savings progress described in the project implementation schedule of the EPM Comprehensive Plan
4	The lesser of: (1) $0.025 per kWh of verified busbar energy savings; (2) the total annual cost of the EPMs as described in the EPM Comprehensive Plan, NTE $250,000 per EPMs contracted; or (3) an amount specified within the EPM agreement, less previous payments	End user meets, exceeds or fails to meet (as certified by BPA) the EPM Comprehensive Plan projected verified energy savings

[i] Payment number one is issued in the first year of an EPM engagement to address initial recruiting and placement costs. In subsequent years of the engagement, the payment schedule begins with payment number two. Funding beyond this payment will not be provided unless the verified energy-savings goal or actual savings achieved is greater than 1,000,000 kWh.
[ii] Funding is based on the lesser of (1) $0.025 per kWh of the verified energy-savings goal; (2) the total annual cost of the EPMs as described in the EPM Comprehensive Plan, NTE $250,000 per EPMs contracted; or (3) an amount specified within the EPM agreement.

9.2.2 Strategic Energy Management: Strategic Energy Management Projects (Optional ESI Component)

SEM Projects are an optional component of the ESI Program. SEM is designed to acquire energy savings by improving facilities' energy intensity through custom projects, and operations and maintenance improvement.

Basis for Savings

Strategic Energy Management (SEM) Projects are an optional component of the ESI Program. SEM is designed to acquire energy savings over the course of a two year performance period by improving facilities' energy intensity through custom projects, and operations and maintenance improvement. SEM participants are enrolled in two-year performance periods. The customer may enroll end-users in consecutive performance periods.

The following definitions and terms are applicable to SEM program savings measurement and reporting:

SEM Baseline

Energy use established prior to enrollment in a SEM program. SEM Baseline can be reestablished after a significant operational change or at customer request as outlined in the ESI MT&R Reference Guide. Re-enrollment in additional two year performance periods resets the reference point for the purposes of calculating savings and payment, but does not change the SEM Baseline.

SEM Annual Savings Achieved

The verified incremental savings measured in each year of a two year performance period.

- In Year 1 of the first performance period, or after the re-establishment of the SEM Baseline, it is measured as all savings achieved above the SEM Baseline.
- In Year 2 of any performance period, it is measured as the savings achieved over the savings achieved in Year 1 of the performance period.
- In Year 1 of subsequent performance periods (as a result of re-enrollment), it is measured as all savings achieved above Year 2 of the previous performance period.
- Should there be zero or negative savings verified from prior year, SEM Annual Savings Achieved is zero.

SEM Annual Savings Achieved is used to determine allowable Performance Payment.

SEM Verified Savings

Verified total energy savings measured from the start of the current performance period. SEM Verified Savings are calculated at the end of Year 1 and at the end of Year 2.

- In Year 1 of the first performance period, it is measured as all savings achieved above the SEM Baseline.
- In Year 2 of any performance period, it is measured as the savings achieved in Year 1 and adjusted for any additional savings achieved in Year 2.
- In Year 1 of subsequent performance periods (as a result of re-enrollment), it is measured as all savings achieved above Year 2 of the previous performance period.
- Should there be zero or negative savings verified from the start of the performance period, SEM Verified Savings achieved is zero.

SEM Verified Savings is used to determine EEI incentive payment

Required Documents

ESI MT&R Reference Guide

Strategic Energy Management Calculator

SEM Cumulative Verified Savings

Verified annual energy savings measured from establishment of SEM Baseline to current performance period year. SEM Cumulative Verified Savings is not used by BPA to calculate reportable savings or any payment from BPA, but will be provided to customers for their own reporting purposes.

Requirements and Specifications

Required documents to be submitted by the customer to BPA in support of SEM Projects must be sent to eedocs@bpa.gov as an email attachment or by including a secure link from the online ESI HUB. Option 1 and Option 2 customers must follow the measurement and verification requirements addressed in the current ESI Monitoring, Targeting and Reporting Reference Guide (available in the IM Document Library). The tables below describe the requirements for (1) enrollment and staffing; (2) performance period; (3) component implementation; and (4) SEM savings reports.

Enrollment and End User Staffing

To enroll in the SEM component, a customer must meet these enrollment requirements and ensure that end user staffing requirements have also been met, as outlined below:

ACTIVITY	REQUIREMENT
Enroll	Send a SEM enrollment agreement to eedocs@bpa.gov as an email attachment or by including a secure link from the ESI HUB
End user appoints Energy Champion	The Energy Champion is a key contact person for the energy- management continuous-improvement process, who implements energy efficiency measures
End user appoints executive sponsor	The executive sponsor is the management-level supporter of the energy management system
End user engagement	Attend energy management training Classroom and on-site training develops the end user's energy management system. End users must present their energy efficiency implementation. BPA recommends two employees attend training sessions during the performance period. The length and frequency of the training sessions will vary based on the type of engagement (e.g., formerly High Performance Energy Management (HPEM), Track &Tune, Refrigerator Operator Coaching and Small Industrial HPEM) or Implement action items Tune-up site or subsystem through no-cost or low-cost operations and maintenance (O&M) action items
Re-Enrollment	Send an executed/amended SEM enrollment agreement to eedocs@bpa.gov as an email attachment or by including a secure link from the ESI HUB

Performance Period

SEM participants are enrolled in two-year performance periods. The customer may enroll end-users in consecutive performance periods. Customers can claim up to the full SEM Verified Savings for each reporting year (i.e., year 1 of the SEM engagement and again in each subsequent reporting year).

Component Implementation

SEM generates energy savings by using continuous-improvement practices to identify and implement energy efficiency measures. To develop SEM savings, implementation may include site-specific and/or group training. Examples of on-site engagements include Energy Management Assessments, energy team coaching and technical support identifying efficiency opportunities. Group training includes participation in peer network group-training workshops.

Optional – Performance Tracking System

	PERFORMANCE TRACKING SYSTEM (PTS)
Description	The PTS is metering hardware and/or electric-energy data collection software that tracks key variables to develop a meaningful, normalized energy-use profile The PTS is installed and owned by the end user and is eligible for BPA co-funding
Requirements	1. Collect key process energy-performance indicators sufficient to predict energy consumption, or track performance at a facility or system level 2. Provide data frequently to measure changes in energy performance
PTS Design Approval	Prior to installing the PTS, BPA approval may be requested by the customer to ensure collected baseline data will be useful for M&V, or otherwise serve to promote project implementation
Verification	Prior to beginning implementation activities, BPA will verify the PTS and collected baseline data sufficiently models baseline energy consumption

Savings Reports

	REQUIREMENT
M&V Protocol	Both Option 1 and Option 2 customers must calculate Verified SEM Savings following the M&V prescribed in the current ESI Monitoring, Targeting & Reporting Reference Guide (available in the IM Document Library)
	SEM savings do not include energy savings from other ESI program components or BPA programs (e.g., custom projects or UES measure projects)
	SEM Verified Savings are relative to the SEM Baseline or the savings achieved in year two of the previous performance period. If re-baselining was necessitated by the current ESI Monitoring, Targeting & Reporting Reference Guide or customer request it will reset the SEM Baseline.
Performance Period	The SEM performance period starts: 1. No earlier than the SEM kick-off workshop or tune-up event, whichever is applicable 2. No later than the date determined by BPA and the customer For re-enrolled SEM participants, a continuous performance period is recommended, or customers may opt to delay the start of the performance period
Annual Completion Reports	Customers are required to send an annual Completion Report documenting energy savings over the previous year to eedocs@bpa.gov as an email attachment or by including a secure link from the ESI HUB. The annual Completion Report documents SEM Annual Savings Achieved, energy efficiency measures implemented, SEM systems and practices implemented, and optional: Energy efficiency measure implementation costs (invoices).

Documentation Requirements

DOCUMENTATION DESCRIPTION	DUE DATE	RETENTION/SUBMITTAL LOCATIONS		
		BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
Signed Customer/End user Agreement (secure link or file)	Prior to requesting first payment		X	X
PTS Design Proposal (secure link or file) — Optional	Prior to installation of PTS		X	
PTS Installation Invoice, Design Proposal and Verification Report (secure link)	Prior to requesting PTS payment		X	X
Annual Completion Report (secure link)	Prior to annual payments		X	X
SEM Calculator (secure link)	Prior to annual payments	X		X
PTS Maintenance Invoice (secure link)	Prior to annual payments		X	X

Payment

The customer may invoice BPA when the end-user reaches the milestones in the chart below. Use the SEM Calculator (available in the IM Document Library) to calculate all SEM Participation Payment amounts.

FOR ANY PAYMENT, THE CUSTOMER MAY SELECT A SMALLER PAYMENT CAP THAN SPECIFIED BELOW (I.E., SELECT A PAYMENT SMALLER THAN THE CALCULATED PAYMENT).			
MILESTONE	**PAYMENT**		
	YEAR 1	**YEAR 2**	**RE-ENROLLMENT PERIOD**
End user purchases and installs PTS (could be prior to the SEM enrollment agreement and start of performance period). Frequency: PTS setup funding may be used once per two-year enrollment period.	>4 Million kWh system baseline Lesser of the following: • Documented PTS costs $0.0025 per kWh of estimated annual energy consumption • $50,000 <4 Million kWh system baseline Lesser of the following: • Documented PTS costs • $10,000		
BPA approves annual Completion Report.	SEM Participation Payment will be made as follows No cost documentation $0.025 per kWh of SEM Verified Savings Supporting cost documentation provided Lesser of the following: • $0.075 per kWh of SEM Verified Savings • 70 percent of documented action-item costs	SEM Participation Payment will be made as follows No cost documentation $0.025 per kWh of SEM Verified Savings Supporting cost documentation Provided Lesser of the following: • $0.075 per kWh of SEM Verified Savings • 70 percent of documented action item costs	SEM Participation Payment will be made as follows If Previous energy baseline still valid or adjusted: $0.025 per kWh of SEM Verified Savings If Re-baselining (per current ESI Monitoring, Targeting & Reporting Reference Guide) of Energy Model to period preceding re-enrollment: $0.025 per kWh of SEM Verified Savings or End user may also choose to provide supporting cost documentation to be eligible for the lesser of $0.075/kWh or 70% of documented action-item costs
BPA approves annual PTS Maintenance Payment	Lesser of the following: • Documented PTS costs • $10,000		

9.2.3 Industrial Custom Projects (Optional ESI Component)

The end user must design and construct energy efficiency projects and is encouraged to solicit bids for such work.

The customer may receive assistance during the custom project process. The following chart demonstrates the party responsible for each step:

CUSTOM PROJECT PROCESS STEPS	RESPONSIBLE PARTY	
	OPTION 1	**OPTION 2**
Develop an M&V plan	ESIP, TSP or Customer	ESIP, TSP or Customer
Prepare Option 1 Custom Project. Proposal documents (optional)	ESIP or Customer	n/a
Submit Option 1 Custom Project Proposal documents (optional)	Customer	n/a
Review Option 1 Custom Project Proposal Documents, if submitted	BPA ESI engineer, ESI program partner, Quality Control engineer and COTR	n/a
Provide Technical Advice to Customer	ESIP	ESIP
Develop Custom Project Results Data	ESIP, TSP or Customer	ESIP, TSP or Customer

CUSTOM PROJECT PROCESS STEPS	RESPONSIBLE PARTY	
	OPTION 1	OPTION 2
Prepare Custom Project Completion Report documentation	ESIP or Customer	ESIP or Customer
Submit Custom Project Completion Report documentation to BPA	Customer	Customer
Review Custom Project Completion Report documentation	BPA ESI engineer, ESI program partner, Quality Control engineer and COTR	Customer, see Section 4.5

Requirements and Specifications

See section 4.3.2 Custom Projects General Requirements

Documentation Requirements

See section 4.6 Custom Projects Documentation Requirements.

Payment

MEASURE CATEGORY	PAYMENT
Industrial Custom Projects	Lesser of $0.25 per kWh or 70% of project cost

9.2.4 Small Industrial Projects (Optional ESI Component)

Small Industrial (SI) Projects provide a cost-effective approach for managing custom projects with a limited scope and repeatable analysis method. SI Projects often involve trade-ally support, and annual energy savings are typically less than 200,000 kWh.

Simplified analysis tools may be available to assist with project development.

Projects of this size justify a simple, streamlined analytical approach, including M&V, due to the small scale of energy savings and incentive. An ESIP is closely involved with SI Projects.

Requirements and Specifications

See section 4.3.2 Custom Projects General Requirements

Documentation Requirements

See section 4.6 Custom Projects Documentation Requirements.

Payment

MEASURE CATEGORY	PAYMENT
Small Industrial Projects	Lesser of $0.25 per kWh or 70% of project cost

9.2.5 BPA-Funded Technical Service Providers (Optional ESI Component)

BPA funding, through the ESI program partner, is available for eligible technical services necessary to develop and complete custom projects and SEM projects.

TSP consultants can be utilized for scoping, project assessments, completion reports (M&V), SEM training and miscellaneous consulting.

BPA funding of technical services is based on the cost-effectiveness of the proposal and the likelihood that the end user will implement it.

Required Documents

EPM Calculator

ESI MT&R Reference Guide

ESI HUB

Strategic Energy Management Calculator

Payment

BPA funds the TSP consultants through the ESI program partner contract.

MEASURE CATEGORY	PAYMENT
TSP	No payment ($0)

9.3 VARIABLE FREQUENCY DRIVES (VFD) FOR FANS IN POTATO AND ONION STORAGE FACILITIES

Basis for Energy Savings

The base case used to calculate this measure is a fixed-speed fan that is used to blow air at 100% airflow, year-round. The efficient case would have a variable speed drive to better match the airflow necessary for winter season performance.

Requirements and Specifications

Ventilation fan VFD installations in potato and onion storage facilities have a UES of 1,193 kWh per horsepower. BPA recommends that all new VFD installations meet the IEEE 519 standard.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information including unique site ID and address (e.g., field location, meter number, GPS coordinates, farm name or legal property description)	X		X
Equipment or contractor invoice showing: • Equipment manufacturer • Equipment model number • Size (horsepower) and quantity installed or used • Order or purchase date • Installed cost			X

Payment

To calculate the payment, the customer will add the total fan VFD horsepower installed on a per-building basis.

MEASURE CATEGORY	PAYMENT
VFD for Fans in Potato and Onion Storage Facilities	$200 per horsepower

9.4 SMALL COMPRESSED AIR SYSTEMS

Basis for Energy Savings

The base case for this measure is an air compressor that operates at a fixed speed, with some variation in compressed airflow requirements. The efficient case would have a variable frequency drive to better match compressor performance to compressed air-system requirements.

Required Documents

RTF-Approved Small Compressed Air Savings Calculator

Requirements and Specifications

- VFDs applied to a single air compressor or installation of cycling refrigerated air dryers of 75 horsepower or less must use the RTF-approved Small, Compressed Air Savings Calculator (available in the Interim Solutions 2.0 Files).
- Each VFD compressor must be submitted as an individual project (i.e., compressors may not be combined or divided).
  - The calculator will determine energy savings

This measure is available for the agricultural, commercial and industrial sectors. Utilities shall report this measure to the applicable sector when reporting to BPA.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
Equipment or contractor invoice showing: • Equipment manufacturer • Equipment model number • Size (horsepower) and quantity installed or used • Order or purchase date • Installed cost			X
Completed RTF-approved Small Compressed Air Savings Calculator (available in the Interim Solutions 2.0 Files).	X		X

Payment

MEASURE CATEGORY	PAYMENT
Small Compressed Air Systems	Lesser of $0.25 per kWh or 70% of project cost

9.5 HIGH FREQUENCY BATTERY CHARGER UPGRADE (BPA-QUALIFIED)

Basis for Energy Savings

The base case for this measure is an existing, transformer-based (ferroresonant or silicon-controlled rectifier) battery charger that is commonly used to charge indoor equipment such as fork trucks and lifting equipment. The efficient case would be a new, high frequency, inverter-based battery charger that requires far less standby power and improves the AC to DC conversion efficiency.

The Battery Charger Calculator estimates energy savings based on user-entered inputs of energy per charge and charges per year for the baseline and retrofit cases.

BPA will collect data on these retrofits to help support Regional Technical Forum analysis.

Requirements and Specifications

- New construction projects are not eligible
- This measure does not apply to small, household-type chargers for products such as cell phones, toothbrushes or power tools
- This measure applies to the retrofit of existing ferroresonant or silicon-controlled rectifier (SCR) chargers

Required Documents

Battery Charger Calculator

- Installation of a new, high frequency inverter-based battery charger, with rated input power of more than 2 kW and that uses 10W or less of standby power
- ~~BPA recommends the power conversion efficiency be no less than 89%~~
- Customers must use the current version of the Battery Charger Calculator (available in the IM Document Library) to calculate savings and associated incentives
- Energy savings and incentive amounts must be entered manually into the BPA UES Measure Upload Template (available on the Interim Solutions 2.0 Files) in the calculator results fields and uploaded onto the BPA EE Reporting System
- The Battery Charger Calculator and electronic copies of the invoice(s) must be submitted to eedocs@bpa.gov for program oversight

This measure is available for the agricultural, commercial and industrial sectors. Utilities shall report this measure to the applicable sector when reporting to BPA.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
Equipment or contractor invoice showing: • ~~Equipment manufacturer~~ • ~~Equipment model number~~ • ~~Size (horsepower) and quantity installed or used~~ • Order or purchase date • Installed cost		X	X
Completed Battery Charger Calculator (available in the IM Document Library).		X	X

Payment

MEASURE CATEGORY	PAYMENT
High Frequency Battery Charger Upgrade	Lesser of $0.25 per kWh or 70 percent project cost

9.6 WELDER UPGRADE (BPA-QUALIFIED)

Required Documents

Welder Upgrade Calculator

Basis for Energy Savings

The base case is an existing transformer-based welder that is used for manufacturing and repair operations. The efficient case is an inverter-based welder. The majority of the savings comes from a reduction in standby power. Energy savings will be calculated based on equipment data and site operational data for the baseline and retrofit cases.

The Welder Upgrade Calculator estimates energy savings based on user-entered inputs of operational data and specific equipment information including standby power and the power used during the welding process. From this information the baseline and retrofit energy use is calculated.

BPA will collect data on these retrofits to help support Regional Technical Forum analysis.

Requirements and Specifications

- New construction projects are not eligible
- Installation of an inverter-based welder retrofit rated for a minimum of 200

amps

- Customers must use current version of the Welder Upgrade Calculator (available in the IM Document Library) to calculate savings and associated incentives
- Energy savings and incentive amounts must be entered manually into the BPA UES Measure Upload Template (available on the Interim Solutions 2.0 File) in the calculator results fields and uploaded onto the BPA EE Reporting System
- The Welder Upgrade Calculator and electronic copies of the invoice(s) must be submitted to eedocs@bpa.gov for program oversight

This measure is available for agricultural, commercial and industrial sectors. Utilities shall report this measure to the applicable sector when reporting to BPA.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
Equipment or contractor invoice showing: • ~~Equipment manufacturer~~ • ~~Equipment model number~~ • ~~Size (horsepower) and quantity installed or used~~ • Order or purchase date • Installed cost		X	X
Completed Welder Upgrade Calculator (available in the IM Document Library).		X	X

Payment

MEASURE CATEGORY	PAYMENT
Welder Upgrade	Lesser of $0.25 per kWh or 70 percent project cost

9.7 WATER SYSTEM LEAK ABATEMENT (BPA-QUALIFIED)

Required Documents

Leak Abatement Tool

Basis for Energy Savings

The base case is a large water distribution system, such as municipal water district, golf course or irrigation distribution system (not above-ground sprinklers). The efficient case proactively addresses losses using leak-detection system surveys. An audit must be conducted to detect leaks, and they must be repaired in accordance with the American Water Works Association's (AWWA) methodology.

BPA will collect data on these retrofits to help support Regional Technical Forum analysis.

Requirements and Specifications

- Visible or known water-line breaks or leaks are not eligible
- This measure involves surveys to identify and repair leaks using ultrasonic sound checks or other specialized equipment
    - These surveys are typically conducted by specialty companies, but may be conducted by water system staff.
- Savings are calculated using the Leak Abatement Tool that is based on the AWWA's methodology which calculates the rate of water loss from

various leaks

  - Energy and Water production data will be collected from the pumping system providing water to the leak location, to arrive at the energy intensity (kWh per gallon pumped)
  - Energy savings will be estimated by multiplying the energy intensity by the annualized volume of the leaks repaired (determined by the pipe diameter, system pressure and energy used to distribute the water in the system)

- Customers must use the current version of the Leak Abatement Tool (available in the IM Document Library) to calculate savings and associated incentives
- Energy savings and incentive amounts must be entered manually into the BPA UES Measure Upload Template (available on the Interim Solutions 2.0 Files) in the calculator results fields and uploaded onto the BPA EE Reporting System
- The Leak Abatement Tool and electronic copies of the invoice(s) must be submitted to eedocs@bpa.gov for program oversight

This measure is available for the agricultural, commercial and industrial sectors. Utilities shall report this measure to the applicable sector when reporting to BPA.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
Equipment or contractor invoice showing: • ~~Equipment manufacturer~~ • ~~Equipment model number~~ • ~~Size (horsepower) and quantity installed or used~~ • Order or purchase date • Installed cost		X	X
Completed Leak Abatement Tool (available in the IM Document Library).		X	X

Payment

MEASURE CATEGORY	PAYMENT
Water System Leak Abatement	Lesser of $0.25 per kWh or 70% of project cost

Section 10: Residential Sector

Please check the changes and corrections summary to see if revisions were made to any of the measures in this sector.

The Residential Sector includes electrical energy used in a residential setting* (e.g., single-family residences, multifamily structures and manufactured homes). Multifamily housing that is three stories or fewer above ground is a multifamily low-rise. Multifamily housing that is four stories or more above ground is a multifamily mid/high-rise. For central heating in multifamily mid/high-rise buildings and common area lighting in all multifamily buildings, refer to the appropriate commercial measure. Excluded from the Residential Sector are temporary residences such as hotels, motels, nursing homes, dorms and other generally temporary quarters, which are commercial building types.

**Installations of high-intensity discharge lighting in residential settings must be reported as Commercial Sector measures. See the Nonresidential Lighting Program.*

10.1 PAYMENT SUMMARY*	
PROGRAM COMPONENT OR MEASURE	**PAYMENT**
10.2 Lighting	
10.2.1 LED Lamps	$0.75–$9/LED
10.2.1 LED Fixtures	$1–$9/fixture
10.2.2 TLEDs	$3–$5/TLED
10.3 Advanced Power Strips	
10.3.1 Advanced Power Strips: Load Sensing (Home Entertainment Centers)	$15–25/unit
10.3.2 Advanced Power Strips: Infrared Sensing (Home Entertainment Centers)	$0/unit
10.3.3 Advanced Power Strips: PC Interaction Sensing (Personal Desktop Computers)	$0/unit
10.4 Appliances (New)	
ENERGY STAR® Clothes Washers	$15–$100/washer
ENERGY STAR® Clothes Dryers	$50–$175/dryer
10.5 Electric Water Heating	
10.5.1 Showerheads	$15–$23/unit
10.5.2 Thermostatic Shut-Off Valves	$14–$23/unit
10.5.3 Aerators	$3–$8/unit
10.5.4 Unitary Heat Pump Water Heaters	$300–$600/water heater
10.5.5 Split System Heat Pump Water Heaters	$800/water heater
10.5.6 Pipe Insulation	$5–$25/unit
~~**10.6 Simple Steps**~~	
~~BPA Simple Steps, Smart Savings Retail Promotion~~	~~See the payment section of this measure~~

10.1 Payment Summary 87
10.2 Lighting 89
10.2.1 ENERGY STAR Solid-State Lighting/Light-Emitting Diodes Lamps and Fixtures. 89
10.2.2 TLEDs 92
10.3 Advanced Power Strips 93
10.3.1 Advanced Power Strips — Load Sensing (Home Entertainment Centers)93
10.3.2 Advanced Power Strips — Infrared Sensing (Home Entertainment Centers)94
10.3.3 Advanced Power Strips — PC Interaction Sensing (Personal Desktop Computers). 96
10.4 Appliances 98
10.5 Electric Water Heating 100
10.5.1 Showerheads. 100
10.5.2 Thermostatic Shut-Off Valves (TSV) 101
10.5.3 Aerators. 104
10.5.4 Unitary Heat Pump Water Heater104
10.5.5 Split-System Heat Pump Water Heater 105
10.5.6 Pipe Insulation - Short and Whole House (BPA-Qualified) 106
10.6 BPA Simple Steps Smart Savings Retail Promotion 107
10.6.1 Energy Saver Kits 109
10.7 Heating, Ventilation, Air Conditioning (HVAC) 112
10.7.1 Ductless and Ducted Mini-Split Heat Pump(s) 112
10.7.1.1 Ductless and Ducted Mini-Split Heat Pump(s). 112
10.7.1.2 Ductless Heat Pump Upgrade114
10.7.2 HVAC — PTCS 116
10.7.2.1 PTCS Air Source Heat Pumps116
10.7.2.2 PTCS Variable Speed Air Source Heat Pumpss 119
10.7.2.3 PTCS Commissioning Controls and Sizing. 122
10.7.2.4 PTCS Ground Source Heat Pumps 125
10.7.2.5 PTCS Duct Sealing 128
10.7.3 Prescriptive Duct Sealing 130
10.7.4 Air Source Heat Pump Conversion from Electric Forced-Air Furnace to Air Source Heat Pump (without PTCS) . .132
10.7.5 Air Source Heat Pump Conversion from Electric Forced-Air Furnace to Variable Speed Air Source Heat Pump (without PTCS). 134
10.8 Thermostats. 137
10.8.1 Line-Voltage Thermostats 137
10.8.2 Advanced Smart Thermostats (BPA-Qualified) 138
10.9 New Construction. 140

10.1 PAYMENT SUMMARY*	
PROGRAM COMPONENT OR MEASURE	**PAYMENT**
10.6.1 Energy Saver Kits	
10.6.1 Energy Saver Kits	See the payment section of this measure
10.7 Heating, Ventilation, Air Conditioning (HVAC) Measures	
10.7.1 Ductless and Ducted Mini-Split Heat Pumps	See the payment section of this measure
10.7.2–10.7.5 Ducted Systems	See the payment section of this measure
10.8 Thermostats	
10.8.1 Line Voltage Thermostats	$18/unit
10.8.2 Smart Thermostats	$100-$125/unit
10.9 New Construction	
10.9.1 NEEM 1.1 Manufactured Homes	$1,200/home
10.9.1 NEEM 2.0 Manufactured Homes	$1,400/home
10.9.2 Manufactured Home Replacement	$2,200-$2,500/home
10.9.3 Single-family New Construction Performance Path	Varies based on measures installed
10.9.4 Montana House	See the payment section of this measure
10.9.5 Energy Efficient New Multifamily Construction	See the payment section of this measure
10.9.6 Zero Energy Ready New Multifamily Construction	See the payment section of this measure
10.10 Weatherization (Standard Income)	
10.10.1 Insulation	See the Unit Energy Savings (UES) Measure List in the IM Document Library
10.10.2 Prime Window and Patio Door Replacement	$2–$16/square foot
10.10.3 Low-E Storm Windows	$2/square foot
10.10.4 Exterior Insulated Doors	$40/door
10.10.5–10.10.6 Whole House Air Sealing and Testing	See the UES Measure List in the IM Document Library.
10.10.7 Weatherization (Low-Income)	
Low-income weatherization, ductless heat pumps, air source heat pumps, heat pump water heaters, duct sealing, and smart thermostats	See the payment section of this measure

** The payment levels described in this table provide a summary only. Complete details of the payment levels and associated requirements may be found in the corresponding text of the manual. Please see the Table of Contents.*

10.9.1 New Northwest Energy Efficient Manufactured Housing (NEEM) . . . 140

10.9.2 Replacement of Pre-1976 Manufactured Home with New Northwest Energy Efficient Manufactured Housing (NEEM) Certified Home. 141

10.9.3 Single-Family New Construction Performance Path 142

10.9.4 Montana House (v 2.0). 144

10.9.5 BPA Energy Efficient New Multifamily Construction (BPAQualified) 146

10.9.6 BPA Zero Energy Ready New Multifamily Construction (BPAQualified) 147

10.10 Weatherization (Standard Income) 149

10.10.1 Insulation. 150

10.10.2 Prime Window and Patio Door Replacement. 152

10.10.3 Low-E Storm Windows. 155

10.10.4 Exterior Insulated Doors (BPA-Qualified) 156

10.10.5 Whole House Air Sealing and Testing. 157

10.10.6 Prescriptive Air Sealing 158

10.10.7 Low-Income Energy Efficiency Measures 159

10.11 Residential Custom Projects . . .162

10.2 LIGHTING

10.2.1 ENERGY STAR Solid-State Lighting/Light-Emitting Diodes Lamps and Fixtures

Basis for Energy Savings

The base case for LEDs factors in current socket saturation and Energy Independence and Security Act (EISA) compliance, and uses a weighted average of incandescent, halogen and CFL lamps.

Savings estimates also include deductions for the storage factor, HVAC interactions and assumptions on hours of use. The storage factor attempts to predict if any lamps went into storage rather than into an available socket. For example, Direct Install has no storage factor, Retail has a low storage factor, and By Request or Mailed Non-Request have the highest storage factors. HVAC interaction accounts for the increased heating load requirement from more efficient lamps producing less heat. Hours of use are estimates taken from a California study conducted by Keuring van Elektrotechnische Materialen te Arnhem (KEMA).

BPA documentation requirements consider these factors. More detailed information is available on the RTF's UES Measures webpage.

Requirements and Specifications

These measures are available for all types of residential buildings (single-family, manufactured and multifamily).

LED lamps are available through the following channels:

- Retail
- By Request
- Mailed Non-Request
- Direct Install

Mailed Non-Request lamps are limited to four LEDs per household per fiscal year.

LED fixtures are available through the following channels:

- Retail
- Direct Install

Please note: Items distributed in any distribution channel through Simple Steps or a successor BPA program will have separate refnos from those used for utility run programs.

Direct Install measures are also categorized by the RTF using the Residential Building Stock Assessment as Exterior, Moderate/High-Use Interior or Low-Use Interior. Use the following table to select the proper measure for Direct Install lamps.

LED fixtures must be ENERGY STAR-Qualified at the time of purchase, with corresponding measures on the UES Measure List in the IM Document Library.

Supporting Content

Measure Distribution Processes

UES Measure List

RBSA ROOM TYPE	RTF CATEGORY
• Exterior	Exterior
• Bedroom • Dining Room • Family Room • Garage • Kitchen • Laundry Room • Living Room • Master Bedroom	Moderate and High-Use Interior
• Bathroom • Closet • Hall • Office • Other	Low-Use Interior

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
A copy of the ENERGY STAR product list showing the product or the product information insert or packaging, which includes the ENERGY STAR logo. In the event that ENERGY STAR specifications change, BPA will accept pre-existing models that were ENERGY STAR-Qualified at the time they were manufactured.			X
Please see Measure Distribution Processes (Section 12.2) for Documentation Requirements for each channel listed above			X

Payment

TYPE	LUMENS	RETAIL	BY REQUEST	MAILED NON-REQUEST	DIRECT INSTALL
		PAYMENT LEVELS FOR EACH DELIVERY CHANNEL APPLY TO BOTH BPA RUN PROGRAMS (SUCH AS SIMPLE STEPS) AND UTILITY OPERATED PROGRAMS.			
LED Decorative and Minibase*	250–2600	$3	$4	$4	$7
LED General Purpose and Dimmable, Three-Way (Omnidirectional)*	250–1049	$0.75	$4	$4	$7
LED General Purpose and Dimmable, Three-Way (Omnidirectional)*	1050–1489	$2	$5	$5	$7
LED General Purpose and Dimmable, Three-Way (Omnidirectional)*	1490–2600	$2	$5	$5	$7
LED Globe	250–2600	$1.50	$5	$5	$7
LED Reflectors and Outdoor (Directional, includes R, PAR, BR, MR)*	250–1049	$1	$4	$4	$9
LED Reflectors and Outdoor (Directional, includes R, PAR, BR, MR)*	1050–1489	$1	$4	$4	$9
LED Reflectors and Outdoor (Directional, includes R, PAR, BR, MR)*	1490–2600	$3	$5	$4	$9

TYPE	LUMENS	RETAIL	BY REQUEST	MAILED NON-REQUEST	DIRECT INSTALL
		PAYMENT LEVELS FOR EACH DELIVERY CHANNEL APPLY TO BOTH BPA RUN PROGRAMS (SUCH AS SIMPLE STEPS) AND UTILITY OPERATED PROGRAMS.			
Bi-Pin Multifaceted Reflector (MR)	250–499	$2	n/a	n/a	$5
Bi-Pin Multifaceted Reflector (MR)	500–999	$3	n/a	n/a	$5
Bi-Pin Non-Multifaceted Reflector (Non MR)	250–499	$3	n/a	n/a	$5
Bi-Pin Non-Multifaceted Reflector (Non MR)	500–999	$4	n/a	n/a	$5
LED Downlight (Retrofit Kit) Kit Fixture	0–499	$1	n/a	n/a	$7
LED Downlight (Retrofit Kit) Kit Fixture	500–1999	$1	n/a	n/a	$7
LED Downlight (Retrofit Kit) Kit Fixture	2000–7999	$3	n/a	n/a	$7
LED Decorative Ceiling Flush Mount Fixture	0–499	$2	n/a	n/a	$7
LED Decorative Ceiling Flush Mount Fixture	500–1999	$2	n/a	n/a	$7
LED Decorative Ceiling Flush Mount Fixture	2000–7999	$4	n/a	n/a	$7
LED Track Light Fixture	0–499	$2	n/a	n/a	$7
LED Track Light Fixture	500–1999	$3	n/a	n/a	$7
LED Track Light Fixture	2000–7999	$4	n/a	n/a	$7
LED Exterior Porch Light Fixture	0–499	$1	n/a	n/a	$7
LED Exterior Porch Light Fixture	500–1999	$2	n/a	n/a	$7
LED Exterior Porch Light Fixture	2000–7999	$5	n/a	n/a	$7
LED Exterior Security Fixture	0–499	$2	n/a	n/a	$9
LED Exterior Security Fixture	500–1999	$4	n/a	n/a	$9
LED Exterior Security Fixture	2000–7999	$6	n/a	n/a	$9
Bathroom Vanity Fixture	0–499	$3.50	n/a	n/a	$7
Bathroom Vanity Fixture	500–1999	$3.50	n/a	n/a	$7
Bathroom Vanity Fixture	2000–7999	$8	n/a	n/a	$7

*Savings are determined by LED lamp type and lumen categories. See the UES Measure List in the IS2.0 files page for details.

Additional Information

Measures that can be distributed By Request may be distributed at events such as trade shows, annual meetings or community events after asking attendees a question such as, "Would you like to try an efficient LED?" By Request may also be used to supplement Direct Install if there are fixtures that an installer is unable to retrofit with an efficient lamp, such as an antique lamp.

Program support materials, including BPA lighting materials, use the terms bulb and lamp interchangeably. They are intended to mean the same thing.

10.2.2 TLEDs

Basis for Energy Savings

The base case used to calculate energy efficiency savings for the BPA residential tubular light emitting diode (TLED) lamp measures is a T8 linear fluorescent lamp, with an RBSA-weighted average hours of use based on the location distribution of T8 lamps found in RBSA homes.

Savings estimates also include HVAC interactions and assumptions on hours of use. HVAC interaction accounts for the increased heating load requirement from more efficient lamps producing less heat. Hours of use are estimates taken from the 2011 RBSA metering study.

Use the following table to select the proper measure for Direct Install TLED lamps.

RBSA ROOM TYPE	RTF CATEGORY
• Exterior	Exterior
• Bedroom • Dining Room • Family Room • Garage • Kitchen • Laundry Room • Living Room • Master Bedroom	Moderate and High-Use Interior
• Bathroom • Closet • Hall • Office • Other	Low-Use Interior

Requirements and Specifications

This measure is available for all types of residential buildings (single-family, manufactured and multifamily).

TLEDs are available through the following channels:

- Retail
- Direct Install

Please note: Items distributed in any distribution channel through Simple Steps or a successor BPA program will have separate refnos from those used for utility run programs.

TLEDs must meet the Design Lights Consortium's standard of 100 lumens per watt and be on the the Design Lights Consortium's Qualified Product List.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
See Measure Distribution Processes (Section 12.2) for Documentation Requirements for each channel listed above			X

Payment

TYPE	LUMENS	RETAIL	BY REQUEST	MAILED NON-REQUEST	DIRECT INSTALL
		PAYMENT LEVELS FOR EACH DELIVERY CHANNEL APPLY TO BOTH BPA RUN PROGRAMS (SUCH AS SIMPLE STEPS) AND UTILITY OPERATED PROGRAMS.			
TLED	1000–1999	$3	n/a	n/a	$4
TLED	2000–3999	$3	n/a	n/a	$5

10.3 ADVANCED POWER STRIPS

10.3.1 Advanced Power Strips — Load Sensing (Home Entertainment Centers)

These measures are also referred to as Tier 1 Advanced Power Strips. BPA, however, uses the Load Sensing (Home Entertainment Centers) name.

Basis for Energy Savings

The base case used to calculate energy efficiency savings for the BPA Residential Load Sensing Advanced Power Strip (APS) measures is the estimated annual electric usage of home entertainment centers and their peripheral audiovisual (AV) devices. It is based on RTF analysis which uses several relevant metering studies from 2016–2018 to estimate savings. Efficient case savings include the reduction of loads from master/peripheral load sensing strips that are capable of shutting off power to controlled devices when not in use. Other inputs include the prevalence of different peripherals (DVD, VCR, video games, stereo, speakers, etc.) and each peripheral's hours of use.

These measures are currently deemed as planning measures by the RTF Guidelines, requiring the completion of a research plan to provide more data on the inputs.

BPA documentation requirements consider these factors. More detailed information is available on the RTF's UES Measures webpage.

Requirements and Specifications

This measure is available for all types of residential home entertainment centers only (a TV with any combination of peripherals).

Advanced Power Strips — Load Sensing (Home Entertainment Centers) measures are available through the following channels:

- Retail
- By Request
- Direct Install

Please note: Items distributed in any distribution channel through a BPA program (e.g., Simple Steps) will have separate refnos from those used for utility run programs. When an installer is unable to install the APS, the APS may be left with the homeowner and claimed as a "By Request" measure.

Qualified products can be found on the Advanced Power Strip Qualified Products List (if a customer believes a product should be on the list, and is not, the customer should use the COTR Request and Acknowledgment Procedure to request approval to use the product).

Supporting Content

Advanced Power Strip Qualified Products List

COTR Request and Acknowledgment Procedure

Measure Distribution Multisector

Load Sensing Home Entertainment Advanced Power Strips must meet the following qualifications:

- Load sensing
- Consume less than 1W of energy;
- One-year warranty and any length warranty for connected devices;
- Surge protection to 740 joules;
- UL1449-listed or BPA approved equivalent;
- Rated for 15 amps; and
- Resettable circuit breaker

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
See Measure Distribution Processes (Section 12.2) for Documentation Requirements for each channel listed above			X

Payment

MEASURE	RETAIL	BY REQUEST	MAILED NON-REQUEST	DIRECT INSTALL
	PAYMENT LEVELS FOR EACH DELIVERY CHANNEL APPLY TO BOTH BPA RUN PROGRAMS (SUCH AS SIMPLE STEPS) AND UTILITY OPERATED PROGRAMS.			
Advanced Power Strip —Load Sensing (Home Entertainment Centers)	$15	$20	n/a	$25

Additional Information

Measures that can be distributed By Request may be distributed at events such as trade shows, annual meetings or community events after asking attendees a question such as, "Would you like to try a load sensing advanced power strip on your home entertainment center?"

10.3.2 Advanced Power Strips — Infrared Sensing (Home Entertainment Centers)

These measures are also referred to as Tier 2 Advanced Power Strips. BPA, however, uses the Infrared Sensing (Home Entertainment Centers) name.

Basis for Energy Savings

The base case used to calculate energy efficiency savings for the BPA Residential Infrared Sensing Advanced Power Strip (APS) for Home Entertainment Center measures is the estimated annual electric usage of home entertainment centers and their peripheral audiovisual (AV) devices. It is based on RTF analysis which uses several relevant metering studies from 2016–2018 to estimate savings. Efficient case savings include the reduction of loads from master/peripheral Infrared Sensing (IR) strips that are capable of shutting off power to controlled devices when not in use. Other inputs include the prevalence of different peripherals (DVD, VCR, video games, stereo, speakers, etc.) and each peripheral's hours of use.

Supporting Content

Advanced Power Strip Qualified Products List

COTR Request and Acknowledgment Procedure

Measure Distribution Multisector

These measures are currently deemed as planning measures by the RTF Guidelines, requiring the completion of a research plan to provide more data on the inputs.

BPA documentation requirements consider these factors. More detailed information is available on the RTF's UES Measures webpage.

Requirements and Specifications

This measure is available for all types of residential home entertainment centers only (a TV with any combination of peripherals).

Advanced Power Strips — Infrared Sensing (Home Entertainment Centers) measures are available through the following channels:

- Retail
- By Request
- Direct Install

Please note: Items distributed in any distribution channel through a BPA program (e.g., Simple Steps) will have separate refnos from those used for utility run programs.

When an installer is unable to install the APS, the APS may be left with the homeowner and claimed as a "By Request" measure.

Qualified products can be found on the Advanced Power Strip Qualified Products List (if a customer believes a product should be on the list, and is not, the customer should use the COTR Request and Acknowledgment Procedure to request approval to use the product).

Infared Sensing Home Entertainment Advanced Power Strips must meet the following qualifications:

- Infrared remote sensing;
- Consume less than 1W of energy;
- One-year warranty and any length warranty for connected devices;
- Surge protection to 740 joules;
- UL1449-listed or BPA approved equivalent;
- Rated for 15 amps; and
- Resettable circuit breaker

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
See Measure Distribution Processes (Section 12.2) for Documentation Requirements for each channel listed above			X

Payment

MEASURE	RETAIL	BY REQUEST	MAILED NON-REQUEST	DIRECT INSTALL
	PAYMENT LEVELS FOR EACH DELIVERY CHANNEL APPLY TO BOTH BPA RUN PROGRAMS (SUCH AS SIMPLE STEPS) AND UTILITY OPERATED PROGRAMS.			
Home Entertainment Center Advanced Power Strip	$0	$0	n/a	$0

Additional Information

Measures that can be distributed By Request may be distributed at events such as trade shows, annual meetings or community events after asking attendees a question such as, "Would you like to try an advanced power strip on your home entertainment center?"

Utilities may claim Infrared Sensing Advanced Power Strip measures with zero payment.

Infrared Sensing Advanced Power Strip products may have additional, optional layers of control over IR including occupancy sensing and connectivity.

10.3.3 Advanced Power Strips — PC Interaction Sensing (Personal Desktop Computers)

These measures are also referred to as Tier 2 Advanced Power Strips. BPA, however, uses the PC Interaction Sensing (Personal Desktop Computers) name.

Basis for Energy Savings

The base case used to calculate energy efficiency savings for the BPA Residential PC Interaction Sensing Advanced Power Strip for Personal Desktop Computer measures is the estimated annual electric usage of home personal computers and selected peripheral devices. It is based on RTF analysis which uses a metering study from 2018 to estimate savings. Efficient case savings include the reduction of loads from master/peripheral PC Interaction Sensing strips that are capable of shutting off power to controlled devices when not in use. Other inputs include the prevalence of different peripherals (keyboard, mouse, speakers, etc.) and each peripheral's hours of use.

These measures are currently deemed as planning measures by the RTF Guidelines, requiring the completion of a research plan to provide more data on the inputs.

BPA documentation requirements consider these factors. More detailed information is available on the RTF's UES Measures webpage.

Requirements and Specifications

This measure is available for all types of residential desktop computers only; laptop applications do not qualify.

Advanced Power Strips — PC Interaction Sensing (Personal Desktop Computers) measures are available through the following channels

- Retail
- By Request
- Direct Install

Supporting Content

Advanced Power Strip Qualified Products List

COTR Request and Acknowledgment Procedure

Measure Distribution Multisector

Please note: Items distributed in any distribution channel through a BPA program (e.g., Simple Steps) will have separate refnos from those used for utility run programs.

When an installer is unable to install the APS, the APS may be left with the homeowner and claimed as a "By Request" measure.

Qualified products are on the Advanced Power Strip Qualified Products List (if a customer believes a product should be on the list, and is not, the customer should use the COTR Request and Acknowledgment Procedure to request approval to use the product).

Personal Desktop Computer Advanced Power Strips must meet the following qualifications:

- PC Interaction sensing;
- Consume less than 1W of energy;
- One-year warranty and any length warranty for connected devices;
- Surge protection to 740 joules;
- UL1449-listed or BPA approved equivalent;
- Rated for 15 amps; and
- Resettable circuit breaker

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
See Measure Distribution Processes (Section 12.2) for Documentation Requirements for each channel listed above			X

Payment

MEASURE	RETAIL	BY REQUEST	MAILED NON-REQUEST	DIRECT INSTALL
	PAYMENT LEVELS FOR EACH DELIVERY CHANNEL APPLY TO BOTH BPA RUN PROGRAMS (SUCH AS SIMPLE STEPS) AND UTILITY OPERATED PROGRAMS.			
PC Interaction Sensing Advanced Power Strip	$0	$0	n/a	$0

Additional Information

Measures that can be distributed By Request may be distributed at events such as trade shows, annual meetings or community events after asking attendees a question such as, "Would you like to try an advanced power strip on your home desktop computer?"

Utilities may claim PC Interaction Sensing Advanced Power Strip measures with zero payment.

10.4 APPLIANCES

Basis for Energy Savings

The base case used to calculate energy efficiency savings for new appliance measures is the average annual energy consumption of appliances meeting the Federal Standard. If a standard has been updated recently, BPA examines the potential prevalence of equipment not meeting the standard remaining in the marketplace. Energy savings are calculated as the difference between the annual energy consumption of the baseline case and the energy efficient case.

Clothes washers have additional characteristics for savings based on the associated water heater fuel type (for their use of heated water) and dryer fuel type (for the electric savings on drying time). Note: A slight deduction of dryer savings for the very small percentage of more efficient electric dryers was included in the last update to the clothes washer measure.

Clothes dryers have additional characteristics for the efficient case, depending on the efficiency level of the new equipment from electric-resistance to a heat pump dryer, and whether the dryer is vented or ventless. The savings for dryers are discounted by the portion of savings assigned to clothes washers.

BPA documentation requirements consider these factors. More detailed information is available on the RTF's UES Measures webpage.

Requirements and Specifications

These measures are available for all types of residential buildings (single-family, manufactured, multifamily, and multifamily common areas).

Clothes washers and electric clothes dryer measures are available through the following channels:

- Retail
- By Request
- Direct Install

Please note: Items distributed in any distribution channel through a BPA program (e.g., Simple Steps) will have separate refnos from those used for utility run programs.

- Clothes washers must be ENERGY STAR-Qualified and top loaders must be rated CEE Tier 1 or above.
- Clothes dryers must be electric and ENERGY STAR-Qualified. BPA measures include three different tiers of clothes dryers. BPA tiers are provided on the BPA Clothes Dryer Qualified Product List on the BPA Energy Efficiency ENERGY STAR Appliances webpage.

As ENERGY STAR specifications change, BPA will continue to accept pre-existing models that were ENERGY STAR-Qualified at the time they were manufactured. A copy of the product information insert or packaging that includes the ENERGY STAR logo and the model number can be used to document qualification.

Current and archived ENERGY STAR-Qualified appliance lists may be found on the BPA Energy Efficiency ENERGY STAR Appliances webpage.

The "any" appliance measures assume a weighted average of reported measures. Utilities that report appliances using the tiered measures should not also use the "any" measures on the same invoice submitted to BPA. Utilities may switch to the "any" measures if reporting to the tier-specific measures delivers little benefit.

Supporting Content

Measure Distribution Processes

RTF Unit Energy Savings (UES) Measures

Qualified Products Lists

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
A copy of the ENERGY STAR product list showing the product or the product information insert or packaging that includes the ENERGY STAR logo. In the event that ENERGY STAR specifications change, BPA will accept pre-existing models that were ENERGY STAR-Qualified at the time they were manufactured, or a copy of the BPA-Qualified Product List showing the product if applicable.			X
Documentation of water heater fuel and clothes dryer fuel (applies to clothes washers only, if claiming measures with fuel-specific savings). Customers who are able to document the absence of natural gas within their service territory (through a statement or map provided by the public utilities commission or equivalent regulatory body) may claim clothes washer electric domestic hot water heater/electric dryer without the verification of water heater or dryer fuel type.			X
Please See Measure Distribution Processes (Section 12.2) for Documentation Requirements for each channel listed above			X

Payment

MEASURE CATEGORY	PAYMENT (ALL DISTRIBUTION CHANNELS)
Any Front-load ENERGY STAR Clothes Washer (gas water heater/electric dryer)	$15
Any Front-Load ENERGY STAR Clothes Washer (electric water heater/electric or gas water heater)	$35
Any Top-Load ENERGY STAR Clothes Washer CEE Tier 1+ (electric water heater/electric or gas dryer)	$35
Any Front-Load ENERGY STAR Clothes Washer (any water heater/any dryer)	$30
Any Top-Load ENERGY STAR Clothes Washer CEE Tier 1+ (any water heater/any dryer)	$30
ENERGY STAR Clothes Washer — CEE Tier 1 (gas water heater/electric dryer)	$15
ENERGY STAR Clothes Washer — CEE Tier 1 (electric water heater/electric or gas dryer)	$35
ENERGY STAR Clothes Washer — CEE Tier 1 (any water heater/any dryer)	$30
ENERGY STAR Clothes Washer — CEE Tier 2 (gas water heater/electric dryer)	$20
ENERGY STAR Clothes Washer — CEE Tier 2 (electric water heater/electric or gas dryer)	$45
ENERGY STAR Clothes Washer — CEE Tier 2 (any water heater/any dryer)	$40
ENERGY STAR Clothes Washer — CEE Advanced (gas water heater/electric dryer)	$25
ENERGY STAR Clothes Washer — CEE Advanced (electric water heater/electric or gas dryer)	$50
ENERGY STAR Clothes Washer — CEE Advanced (any water heater/any dryer)	$45
Any ENERGY STAR Electric Clothes Dryer	$50

MEASURE CATEGORY	PAYMENT (ALL DISTRIBUTION CHANNELS)
ENERGY STAR Electric Clothes Dryer — BPA Tier 1	$75
ENERGY STAR Electric Clothes Dryer — BPA Tier 2	$125
ENERGY STAR Electric Clothes Dryer — BPA Tier 3	$175
ENERGY STAR Clothes Washer Multifamily Common Area (electric water heater/electric dryer)	$100
ENERGY STAR Clothes Washer Multifamily Common Area (electric water heater/gas dryer)	$50
ENERGY STAR Clothes Washer Multifamily Common Area (gas water heater/gas dryer)	$25
ENERGY STAR Clothes Washer Multifamily Common Area (gas water heater/electric dryer)	$50

10.5 ELECTRIC WATER HEATING

10.5.1 Showerheads

Basis for Energy Savings

The base case used to calculate energy efficiency savings for the current BPA residential showerhead measures is the RTF current practice baseline. Savings from the efficient replacement are based on the nominal flow rates of 2.0, 1.75 and 1.5-gallons per minute (GPM) showerheads for all types of residences. Savings inputs also include an average for the number of persons per residence type and the number of showers per day.

The fuel type impacts water heating savings. Because of this, Direct Install measures contain precise savings estimates as the fuel type can be identified. Retail measures are averaged across all fuel types as the fuel type is unknown. For all measures, the shower type is restricted to "any" in order to collapse shower location. BPA documentation requirements consider these factors. More detailed information is available on the RTF's Unit Energy Savings (UES) Measures webpage.

Requirements and Specifications

These measures are available for all types of residential buildings (single-family, manufactured and multifamily).

Showerhead measures are available through the following channels:

- Retail
- By Request
- Direct Install

Please note: Items distributed in any distribution channel through a BPA program (e.g., Simple Steps) will have separate refnos from those used for utility run programs.

Showerheads must have a GPM flow rate of 2.0 or less.

By Request and Direct Install showerheads are limited to two showerheads per residence.

Supporting Content

Measure Distribution Processes

RTF Unit Energy Savings (UES) Measures

Direct Install showerheads are only eligible in homes with electric water heaters.

By Request claims must document water heater fuel type, if using fuel specific measures.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
Fuel source documentation (By Request or Direct Install if using fuel specific measures)			X
See Measure Distribution Processes (Section 12.2) for Documentation Requirements for each channel listed above			X

Payment

MEASURE	RETAIL	BY REQUEST	MAILED NON-REQUEST	DIRECT INSTALL
	PAYMENT LEVELS FOR EACH DELIVERY CHANNEL APPLY TO BOTH BPA RUN PROGRAMS (SUCH AS SIMPLE STEPS) AND UTILITY OPERATED PROGRAMS.			
All Showerhead measures	$15	$15	n/a	$23

Additional Information

Measures that can be distributed By Request may be distributed at events such as trade shows, annual meetings or community events after asking attendees a question such as, "Would you like to try an efficient showerhead?" If for any reason the homeowner refuses the contractor-installed measure, the installer can default to By Request.

10.5.2 Thermostatic Shut-Off Valves (TSV)

Basis for Energy Savings

Electric savings are the result of avoided behavioral waste of hot water. Savings inputs also include the number of showers per person, per year, and people per household per shower. These devices may be installed by themselves or in conjunction with an efficient, lower-GPM showerhead.

A thermostatic shut-off valve (TSV) is a device installed between a shower arm and the showerhead fixture. It places a hold on water flow once it reaches 95 degrees Farenheit (35 Celsius) to reduce hot water waste while waiting for water warm-up. Products reduce the showerhead's flow to a trickle when a water temperature of 95 degrees Farenheit (35 Celsius) or greater reaches the fixture. The reduced trickle continues until normal flow is restored manually. Once restored, water flows at its normal rate until being shut off. The unit automatically resets itself for the next use.

The fuel type impacts water heating savings. Because of this, Direct Install and By Request measures contain precise savings estimates as the fuel type can be identified. Retail measures are averaged across all fuel types as the fuel type is unknown.

Savings assume that installations adhere to manufacturer recommendations

Supporting Content

Thermostatic Shut-Off Valves (TSVs) Qualified Products List

Measure Distribution Processes

RTF Unit Energy Savings (UES) Measures

for minimum static water pressure. For example, many units are recommended to have a minimum of 30 PSI water pressure.

BPA documentation requirements consider these factors. More detailed information is available on the RTF's UES Measures webpage.

Requirements and Specifications

These measures are available for all types of residential buildings (single-family, manufactured and multifamily).

TSV measures are available through the following channels:

- Retail
- By Request
- Direct Install

Please note: Items distributed in any distribution channel through a BPA program (e.g., Simple Steps) will have separate refnos from those used for utility run programs.

By Request claims must document water heater fuel type, if using fuel-specific measures.

Direct Install TSVs are only eligible in homes with electric water heaters.

There are two TSVs available as measures; one is stand-alone, and the other is a combination unit with an efficient showerhead built in.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
Fuel source documentation (By Request and Direct Install if using fuel specific measures)			X
See Measure Distribution Processes (Section 12.2) for Documentation Requirements for each channel listed above			X

Payment

TYPE	RETAIL	BY REQUEST	MAILED NON-REQUEST	DIRECT INSTALL
	PAYMENT LEVELS FOR EACH DELIVERY CHANNEL APPLY TO BOTH BPA RUN PROGRAMS (SUCH AS SIMPLE STEPS) AND UTILITY OPERATED PROGRAMS.			
TSV — valve only	$14	$17	n/a	$20
TSV — valve with efficient showerhead	$17	$20	n/a	$23

Additional Information

Measures that can be distributed By Request may be distributed at events such as trade shows, annual meetings or community events after asking attendees a question such as, "Would you like to try a thermostatic shut-off valve?" If for any reason the homeowner refuses the contractor-installed measure, the installer can default to By Request.

10.5.3 Aerators

Basis for Energy Savings

The base case used to calculate energy efficiency savings for the current BPA residential faucet aerator measures is the RTF current practice baseline. The definition of each unit in this measure and subsequent energy savings from the efficient replacement for all types of residences is based on two installed aerators. BPA's aerator measure includes two aerators for each unit that can be reported: one for the kitchen and one for the bathroom. The nominal flow rates are 1.0 gallons per minute (GPM) for bathroom faucet aerators and 1.5 GPM for kitchen faucet aerators.

The fuel type impacts water heating savings. Because of this, Direct Install measures contain precise savings estimates as the fuel type can be identified. The By Request measures are averaged across all fuel types and faucet location for greater simplicity. BPA documentation requirements consider these factors. More detailed information is available on the RTF's UES Measures webpage.

Requirements and Specifications

This measure is available for all types of residential homes.

Aerator measures are available through the following channels:

- By Request
- Direct Install

Please note: Items distributed in any distribution channel through a BPA program (e.g., Simple Steps) will have separate refnos from those used for utility run programs.

By Request aerators are restricted to "any water heater" fuel type and must be requested either directly or as part of a kit.

Direct Install aerators are only eligible in homes with electric water heaters, and the water heater fuel type must be documented.

- A single measure reported to BPA includes two aerators. These aerators must be rated for the following flows: 1.0 GPM or less for bathroom faucets.
- 1.5 GPM or less for kitchen faucets.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
Fuel source documentation (Direct Install only)			X
See Measure Distribution Processes (Section 12.2) for Documentation Requirements for each channel listed above			X

Supporting Content

Measure Distribution Processes

RTF Unit Energy Savings (UES) Measures

Payment

MEASURE	RETAIL	BY REQUEST	MAILED NON-REQUEST	DIRECT INSTALL
	PAYMENT LEVELS FOR EACH DELIVERY CHANNEL APPLY TO BOTH BPA RUN PROGRAMS (SUCH AS SIMPLE STEPS) AND UTILITY OPERATED PROGRAMS.			
Aerators (two per unit)	n/a	$3/unit	n/a	$8/unit

Additional Information

Measures eligible for By Request may be distributed at events such as trade shows, annual meetings or community events after asking attendees a question such as, "Would you like to try efficient faucet aerators?" If for any reason the homeowner refuses the contractor-installed measure and wants to install the measure themselves, these measures should be claimed as By Request.

10.5.4 Unitary Heat Pump Water Heater

Unitary heat pump water heaters combine the tank and compressor in a single unit.

Basis for Energy Savings

The base case used to calculate energy efficiency savings for new Heat Pump Water Heaters (HPWHs) is the average annual energy consumption of electric water heaters meeting the RTF's current practice baseline. If a standard has been updated recently, BPA examines the potential prevalence of equipment not meeting the standard remaining in the marketplace.

Energy savings are calculated as the difference between the annual energy consumption of the base case and the energy efficient case of the HPWH. Additional factors include draw profiles (water consumption) and interaction with the home HVAC system.

BPA documentation requirements consider these factors. More detailed information is available on the RTF's UES Measures webpage.

In existing homes, the Unitary HPWH must replace an electric storage water heater on a one-to-one basis.

Unitary HPWHs must be (1) listed on BPA's HPWH Qualified Products List; and (2) installed according to manufacturer's specifications. (If a customer believes a product should be on the list, and it is not, the customer should use the COTR Request & Acknowledgment Procedure to request approval to use the product.)

A maximum of one Unitary HPWH measure may be claimed per home. Accessory dwelling units with separate plumbing systems qualify for this measure even if they are on the same electrical meter.

Requirements and Specifications

These measures are available for new and existing single-family homes and manufactured homes. This measure is also applicable to commercial sector installations.

Unitary HPWH measures are available through the following channels:

- Retail
- Standard Rebate

Please note: Items distributed in any distribution channel through a BPA program (e.g., Simple Steps) will have separate refnos from those used for utility run programs.

Required Documents

HPWH Qualified Products List

Supporting Content

Installation training

COTR Request & Acknowledgment Procedure

Measure Distribution Processes

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
See Measure Distribution Processes (Section 12.2) for Documentation Requirements for each channel listed above			X

Payment

MEASURE	PAYMENT (ALL DISTRIBUTION CHANNELS)
Unitary HPWH Tier 1 — Any size tank	$300
Unitary HPWH Tier 2 — Any size tank	$600
Unitary HPWH Tier 3 — Any size tank	$600

10.5.5 Split-System Heat Pump Water Heater

Split-system Heat Pump Water Heaters have interior storage tanks and outdoor compressors installed outside the house.

Basis for Energy Savings

The base case used to calculate energy efficiency savings for new Heat Pump Water Heaters (HPWHs) is the average annual energy consumption of electric water heaters meeting the RTF's current practice baseline. If a standard has been updated recently, BPA examines the potential prevalence of equipment not meeting the standard remaining in the marketplace.

Energy savings are calculated as the difference between the annual energy consumption of the base case and the energy efficient case of the HPWH. Additional factors include draw profiles (water consumption) and interaction with the home HVAC system.

The RTF recently reviewed savings assumptions associated with ducting HPWHs. There was no savings benefit from ducting Tier 2 HPWH.

Split-System HPWHs must meet the following qualifications:

- Listed on BPA's HPWH Qualified Products List;
- Installed according to manufacturer's specifications;
- All water or refrigerant lines connecting the tank and outdoor units shall be insulated with minimum R-4;
- If domestic hot water pipes outdoors are freeze-protected with heat cable, the cable shall be installed per manufacturer's instructions, underneath the insulation, and shall be thermostatically controlled to prevent the tape from operating above 38 degrees Farenheit;
- No resistance heating is allowed (except heat tape for freeze protection); and
- System plumbed with a thermal mixing valve, which is equipped with internal check valves on the hot and cold water lines connecting to it.
- If a customer believes a product should be on the list, and it is not, the customer should use the COTR Request and Acknowledgment Procedure to request approval to use the product.
- A maximum of one Split-System HPWH measure may be claimed per home. Accessory dwelling units with separate plumbing systems or separate HVAC systems qualify for applicable measures even if they are on the same electrical meter.

Required Documents

HPWH Qualified Products List

Supporting Content

Installation training

COTR Request & Acknowledgment Procedure

Measure Distribution Processes

BPA documentation requirements consider these factors. More detailed information is available on the RTF's UES Measures webpage.

Requirements and Specifications

These measures are available for new and existing single-family homes and manufactured homes. This measure is also applicable to commercial sector installations.

Split System Heat Pump Water Heater measures are available through the following channels:

- Retail
- Standard Rebate

Please note: Items distributed in any distribution channel through a BPA program (e.g., Simple Steps) will have separate refnos from those used for utility run programs.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
See Measure Distribution Processes (Section 12.2) for Documentation Requirements for each channel listed above			X

Payment

TANK SIZE	PAYMENT (ALL DISTRIBUTION CHANNELS)
Split-System Heat Pump Water Heater — Any size tank	$800

10.5.6 Pipe Insulation Short and Whole House (BPA-Qualified)

Basis for Energy Savings

The base case used to calculate energy efficiency savings for Short and Whole House pipe insulation are both uninsulated hot and cold water pipes connected to an electric water heater. Energy savings are calculated on the reduction of standby losses in the pipes, reducing warm-up times from cold starts, a reduction in tank thermostat set point and savings from wastewater treatment (resulting from reducing the amount of water wasted from cold starts). Energy savings are provided for two measures: Short: insulating the first 6 feet of both hot and cold water pipes; and Whole House: insulating all accessible water pipes. BPA documentation requirements for this BPA-Qualified measure consider these factors.

Requirements and Specifications

This measure is available for single-family, manufactured and multifamily low-rise buildings with an electric water heater. This measure is not available for multifamily mid/high-rise buildings.

The Short and Whole House pipe insulation measures may only be rebated by the utility and are not available to be claimed as Retail, By Request, Mailed Nonrequest or Direct Install.

Customers may claim only one measure per water heater.

The Whole House insulation measure requires that insulation must be installed on all accessible hot water pipes. If hot water pipes (trunk and branch lines) are already covered with floor or attic insulation, the project is not eligible.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information, including unique site ID, address, and water heater fuel type			X
Equipment or contractor invoice showing: 1. Order or purchase date 2. Installed cost			X
Documentation that measure requirements have been met (manufacturer, model number, type, size and quantity of equipment or product installed or used).			X

Payment

MEASURE CATEGORY	PAYMENT
Pipe Insulation Short wrap (3-6 foot minimum, hot and cold water pipes)	$5
Whole House (trunk lines and all exposed hot water pipe)	$25

Additional Information

- Hot and cold pipes should be insulated with a minimum of R-3 closed-cell, foam insulation for at least the first 3 feet past the water heater and, if accessible, up to 6 feet adjacent to the water heater
- Insulation material, jackets or facing, and adhesive (if used) should have a flame spread/smoke density rating in accordance with ASTM E-84
- Pipe insulation should not cover pressure-relief valves, handles, safety drain valves or any other safety control device
- All pipe elbows and joints should be mitered to ensure coverage at the same thickness as straight runs
- Pipe insulation should be secured with twine, corrosion resistant wire or plastic compression ties every 12 inches and within 3 inches of the ends

~~10.6 BPA SIMPLE STEPS, SMART SAVINGS RETAIL PROMOTION~~

~~Basis for Energy Savings~~

~~The basis for energy savings for measures promoted in the Simple Steps, Smart Savings promotion is found in each of the measure sections for the corresponding measures.~~

~~Requirements and Specifications~~

~~The BPA Simple Steps, Smart Savings retail promotion is implemented by a third-party Simple Steps contractor. Current contact information may be found on the Residential Lighting webpage. The contractor provides regional coordination of the delivery of retail linear fluorescent fixtures, LED lamps and fixtures, tubular LED lamps, home entertainment center advanced power strips, personal desktop advanced power strips, clothes washers and clothes dryers, showerheads, thermostatic shut-off valves, unitary heat pump water heaters and split-system heat pump water heaters.~~

Supporting Content

Simple Steps, Smart Savings ECA Implementation Budget Release Form

Residential Lighting Website

COTR Request and Acknowledgment Procedure

~~Other Retail measures may be added at the request of the utilities. The program also offers bulk purchase, direct mail and Direct Install delivery options.~~

~~The Retail Sales Allocation Tool (RSAT) is used to allocate program savings to customers. Participating customers receive credit for savings achieved in their service territory. Customers may participate by either signing a contract directly with the contractor or by allocating Energy Conservation Agreement (ECA) funds to the promotion through BPA.~~

~~The Simple Steps, Smart Savings program results in energy efficiency savings that are distributed among the utility participants using the RSAT. In addition, because the program model requires a commitment to all sales of efficient products in active stores (including those that would be attributed to nonparticipating utilities), the program acquires savings from these unclaimed sales. These nonparticipating/unclaimed sales are reported by BPA for credit toward regional self-funding goals to be consistent with the IM requirements and utility ECA agreements.~~

~~To limit volatility in nonparticipating utility savings while preserving the flexibility of participating in Simple Steps, the retroactive purchase of nonparticipating/unclaimed sales by a new program participant will be limited to the current quarter within which the customer joins. For more information on joining the program, contact your EER.~~

PARTICIPATION OPTION	REQUIREMENTS
~~Signing a contract directly with the Simple Steps contractor~~	~~Customers must sign a Promotion Services Agreement with the contractor and pay the contractor directly for sales under that agreement.~~ ~~Interested customers must contact the contractor. Contact information is available on the Residential Lighting webpage. Customers may use any funding source available under this option and may invoice BPA for eligible measures.~~
~~Allocating ECA funds to the promotion through BPA~~	~~Customers must send BPA (1) a completed Simple Steps, Smart Savings ECA Implementation Budget Release Form (available in the IM Document Library); and (2) a sales projection provided by the contractor. It must be sent by email at eedocs@bpa.gov.~~ ~~Customers must commit to a funding period of a minimum of six months, or be approved for participation by the contractor. The funding period may not exceed the rate period.~~ ~~BPA reduces the customer's ECA implementation budget by the allocated amount in the budget release form and pays the contractor for program incentives using these funds.~~ ~~BPA tracks savings and the contractor sends the customer monthly savings reports.~~ ~~If actual sales are below the sales projection at the midpoint of the customer's selected funding period, BPA, the contractor and the customer may work together to recommend corrective action. If sales are still below the sales projection at the third quarter of the funding period, at the customer's request, BPA will return the unused funds to the ECA implementation budget. If allocated funds have not been spent at the conclusion of the rate period, they will be returned to the customer's ECA implementation budget.~~ ~~If actual sales are above the sales projection at the midpoint or at the third quarter of the customer's funding period, the customer may elect to add funds by submitting a new budget release form. If no funds are added, work in the customer's service territory may be subject to curtailment.~~ ~~If the contractor fails to deliver according to its projection, the customer may terminate participation with 30 days' notice to BPA using the COTR Request and Acknowledgment Procedure.~~

~~Documentation Requirements~~

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
~~Simple Steps or contractor invoice showing:~~ ~~1. Order or purchase date~~ ~~2. Cost for sales in service territory~~			~~X~~
~~Documentation that the measure requirements have been met (e.g., manufacturer, model number, type, size and quantity of equipment or product installed/used)~~			

~~Payment~~

~~Customers are paid according to the established payment levels noted in each of the measure sections for the corresponding measures.~~

~~Additional Information~~

~~The current Simple Steps contract is scheduled to end on September 30, 2020. The program may not continue beyond that time. BPA will update customers when more information is available.~~

~~Program support materials, including materials for the Simple Steps program use the terms bulb and lamp interchangeably. They are intended to mean the same thing.~~

10.6.1 Energy Saver Kits

Basis for Energy Savings

The base case used to calculate energy efficiency savings for the BPA Residential Energy Saver Kits measures are explained in each measure section relevant to the component. The aggregate of the total components in the kit make up the measure savings.

These measures are an aggregate of the individual RTF UES measures for each kit component. More detailed information on energy-savings assumptions is available on the RTF's Unit Energy Savings (UES) Measures webpage.

Supporting Content

RTF Unit Energy Savings (UES) Measures

MEASURE	KIT COMPONENTS
Energy Saver Kit 1	4 LED (ENERGY STAR A-Lamps)
Energy Saver Kit 2	8 LED (ENERGY STAR A-Lamps)
Energy Saver Kit 3	4 LED (ENERGY STAR A-Lamps), Load Sensing Advanced Power Strip
Energy Saver Kit 4	8 LED (ENERGY STAR A-Lamps), Load Sensing Advanced Power Strip
Energy Saver Kit 5	4 LED (ENERGY STAR A-Lamps), 1 Showerhead, 2 Bath Aerator, 1 Kitchen Aerator
Energy Saver Kit 6	8 LED (ENERGY STAR A-Lamps), 1 Showerhead, 2 Bath Aerator, 1 Kitchen Aerator
Energy Saver Kit 7	4 LED (ENERGY STAR A-Lamps), Thermostatic Shut-Off Valve/Showerhead combo, 2 Bath Aerator, 1 Kitchen Aerator
Energy Saver Kit 8	8 LED (ENERGY STAR A-Lamps), Thermostatic Shut-Off Valve/Showerhead combo, 2 Bath Aerator, 1 Kitchen Aerator

MEASURE	KIT COMPONENTS
Energy Saver Kit 9	4 LED (ENERGY STAR A-Lamps), Load Sensing Advanced Power Strip, 1 Showerhead, 2 Bath Aerator, 1 Kitchen Aerator
Energy Saver Kit 10	8 LED (ENERGY STAR A-Lamps), Load Sensing Advanced Power Strip, 1 Showerhead, 2 Bath Aerator, 1 Kitchen Aerator
Energy Saver Kit 11	4 LED (ENERGY STAR A-Lamps), Load Sensing Advanced Power Strip, Thermostatic Shut-Off Valve/Showerhead combo, 2 Bath Aerator, 1 Kitchen Aerator
Energy Saver Kit 12	8 LED (ENERGY STAR A-Lamps), Load Sensing Advanced Power Strip, Thermostatic Shut-Off Valve/Showerhead combo, 2 Bath Aerator, 1 Kitchen Aerator

Requirements and Specifications

This measure is available for all types of residential homes (single-family, manufactured and multifamily).

Energy Saver Kits are available through the following channels:

- By Request

Kits other than the configurations listed here created out of individual refnos for each component continue to be available through Simple Steps or assembly by utilities or their vendors.

Participation in the Simple Steps program is not required to order kits. Utilities can use the Simple Steps infrastructure to order kits, or purchase the kits through other vendors. The Simple Steps infrastructure is dependent on a third-party program contract, and as such may not be available during an entire rate period.

Please note: Items distributed in any distribution channel through Simple Steps or a successor BPA program will have separate refnos from those used for utility run programs.

Energy Saver Kits must meet the following qualifications:

- Lamps must be ENERGY STAR qualified.
- Individual products must meet the requirements outlined in their sections in the current IM.
- Limited to one kit type per household.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
See Measure Distribution Processes (Section 12.2) for Documentation Requirements for each channel listed above			X

Payment

MEASURE	BY REQUEST
	PAYMENT LEVELS FOR EACH DELIVERY CHANNEL APPLY TO BOTH BPA RUN PROGRAMS (SUCH AS SIMPLE STEPS) AND UTILITY OPERATED PROGRAMS.
Energy Saver Kit 1: 4 LED	$10
Energy Saver Kit 2: 8 LED	$21
Energy Saver Kit 3: 4 LED, Load Sensing Advanced Power Strip	$27
Energy Saver Kit 4: 8 LED, Load Sensing Advanced Power Strip	$38
Energy Saver Kit 5: 4 LED, 1 Showerhead, 2 Bath Aerator, 1 Kitchen Aerator	$35
Energy Saver Kit 6: 8 LED, 1 Showerhead, 2 Bath Aerator, 1 Kitchen Aerator	$60
Energy Saver Kit 7: 4 LED, Thermostatic Shut-Off Valve/Showerhead combo, 2 Bath Aerator, 1 Kitchen Aerator	$40
Energy Saver Kit 8: 8 LED, Thermostatic Shut-Off Valve/Showerhead combo, 2 Bath Aerator, 1 Kitchen Aerator	$65
Energy Saver Kit 9: 4 LED, Load Sensing Advanced Power Strip, 1 Showerhead, 2 Bath Aerator, 1 Kitchen Aerator	$50
Energy Saver Kit 10: 8 LED, Load Sensing Advanced Power Strip, 1 Showerhead, 2 Bath Aerator, 1 Kitchen Aerator	$70
Energy Saver Kit 11: 4 LED, Load Sensing Advanced Power Strip, Thermostatic Shut-Off Valve/ Showerhead combo, 2 Bath Aerator, 1 Kitchen Aerator	$65
Energy Saver Kit 12: 8 LED, Load Sensing Advanced Power Strip, Thermostatic Shut-Off Valve/ Showerhead combo, 2 Bath Aerator, 1 Kitchen Aerator	$85

Additional Information

Measures that can be distributed By Request may be distributed at events such as trade shows, annual meetings or community events after asking attendees a question such as, "Would you like to try an Energy Saver Kit?"

10.7 HEATING, VENTILATION, AIR CONDITIONING (HVAC)

10.7.1 Ductless and Ducted Mini-Split Heat Pump(s)

10.7.1.1 Ductless and Ducted Mini-Split Heat Pump(s)

Basis for Energy Savings

The base case (pre-existing state) used to calculate energy efficiency savings for Ductless and Ducted Mini-Split Heat Pumps (DHP) in existing homes is single-family and manufactured homes with electrical zonal or electric forced-air furnace HVAC. The base case (pre-existing state) used to calculate energy efficiency savings for DHP in new, single-family homes is single-family homes with electric zonal HVAC. The base case (pre-existing state) used to calculate energy efficiency savings for DHP in new manufactured homes is new manufactured homes with electric forced-air furnace HVAC. The calculation of energy efficiency savings for DHP utilized multiple runs of the Simplified Energy Enthalpy Model (SEEM) simulation engine, calibrated with results from a study of the performance of DHPs in actual homes, in combination with Prototype House Weightings, to generate heating energy use for baseline and efficient cases for each heating system type and heating zone within the analysis. The basis for energy savings for ducted mini-splits is based on the SEEM model with adjustments made to:

- System capacity from the SEEM DHP default size of 1.5, up to 2.5 tons;
- SEEM modeling used to approximate the performance in a multi-head system; and
- DHP input power curve.

Assumptions were made to the fraction of heating load provided by the DHP versus auxiliary resistance heat.

BPA documentation requirements consider these factors. More detailed information is available on the RTF's Unit Energy Savings (UES) Measures webpage.

Ductless and Ducted Mini-Split Heat Pump: Eligibility Table

PRIMARY RESIDENTIAL HEATING SYSTEM	HOME TYPE				
	SINGLE-FAMILY: EXISTING	SINGLE-FAMILY: NEW (EXCEPT WA)*	MANUFACTURED: EXISTING	MANUFACTURED: NEW	MULTIFAMILY: EXISTING
Electric Forced-Air Furnace	Eligible	Eligible (use new construction Reference Number)	Eligible	Treat as manufactured existing once located on site for occupancy	Not eligible
Ducted Heat Pump	Not eligible***		Not eligible		
Ductless Mini-Split Heat Pump	See DHP Upgrade 10.7.1.2		See DHP Upgrade 10.7.1.2		
Zonal (Electric)**	Eligible		Eligible		
Wood	Not eligible***		Not eligible		
Oil/Propane/Gas					
None existing					

* New single-family homes in all states except Washington. This measure is not available in new construction in Washington.
**Zonal includes zonal hydronic systems. For electric hydronic upgrades, claim as zonal if heat distribution is through in-floor radiant or wall radiators, and claim as an existing forced-air furnace if distribution is through a duct system.
***Existing single-family residential additions where the primary electric or nonelectric system's duct work has not been extended to the addition and/or where the current heating source in the addition is electric zonal are eligible for a DHP. Otherwise this measure is not available.

Required Documents

DHP Qualified Product List

Supporting Content

RTF Unit Energy Savings (UES) Measures

COTR Request & Acknowledgment Procedure

Best Practices for Installing Ductless Heat Pumps

Qualified Applications List

NEEP Cold Climate Website

Requirements and Specifications

This measure is for ductless or ducted mini-split heat pumps in homes supplied by one or more outdoor compressors when the previous heating system was electric zonal heat or an electric forced-air furnace (for homes with a previously installed ductless heat pump, see 10.7.1.2 Ductless Heat Pump Upgrade). This measure is for configurations with: (a) single or multiple ductless indoor heads; (b) single or multiple ducted indoor heads; (c) combination of ductless and ducted indoor head(s); or (d) multiple ductless indoor heads, multiple ducted indoor head(s), or combination indoor head(s) and multiple outdoor compressors.

Ducted Mini-Split does not include whole-home centrally ducted systems; see sections 10.7.2.1 or 10.7.2.2 for Performance Tested Comfort Systems (PTCS) Air Source Heat Pumps or 10.7.4 and 10.7.5 for Air Source Heat Pump Conversions (without PTCS) for further information on whole-home centrally ducted systems.

Qualifying applications for existing homes include:

- Existing homes where plug-in electric heaters are the primary heating system in the home qualify for DHP Payment. Determine if a weather-related heating signature exists that demonstrates electric-resistance heating use.
- Single-family residential additions where the primary electric or nonelectric system's duct work has not been extended to the addition and/or where the current heating source in the addition is electric zonal.

Qualifying equipment/installation requirements:

- Heating seasonal performance factor (HSPF): DHPs or Ducted Mini-Split must be a split-system heat pump employing an inverter-driven outdoor compressor, with inverter-driven or variable-speed indoor blower, rated with a minimum of **9.0 HSPF**.
- DHPs or Ducted Mini-Split must be listed on BPA's DHP Qualified Product List or Northeast Energy Efficiency Partnership (NEEP) Cold Climate Specification List. If a customer believes a product should be on BPA's Qualified Product List, and it is not, the customer should use the COTR Request and Acknowledgment Procedure.
- DHPs must be installed on a dedicated electrical circuit, according to manufacturer's specifications and the Best Practices for Installing Ductless Heat Pumps Guide.
- Only one DHP may be claimed per home, regardless of the number of outdoor or indoor units installed, and regardless of the home's square footage. For homes 4,500 sq. ft or larger, the home is also eligible for a PTCS or non-PTCS air source heat pump (ASHP) incentive.
- For DHPs in new single-family homes, BPA incentives may not be used to meet building code requirements.
- The DHP must be installed by a licensed contractor. The customer must use the COTR Request and Acknowledgment Procedure to consider payment for a partial self-install; these will only be considered when a contractor has installed the fittings and refrigerant.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information including unique site ID and address	X		X
Equipment or contractor invoice showing: 1. The order or purchase date 2. Cost			X
Documentation that measure requirements have been met (e.g., manufacturer, model number, type, size and quantity of equipment or product installed or used)			X
Completed Ductless Heat Pump Project Installation Form (or other forms that contain the same information) available in the IM Document Library.			X

Payment

MEASURE CATEGORY	PAYMENT
Existing single-family homes: Zonal electric heat precondition	$800
Existing single-family homes: Electric forced-air furnace precondition	$800
Existing manufactured homes: Zonal electric heat precondition (including new manufactured homes once on site for occupancy)	$800
Existing manufactured homes: Electric forced-air furnace precondition (including new manufacturd homes once on site for occupancy)	$800
New single-family homes in all states except Washington	$500

Additional Information

- At this time Variable Refrigerant Flow (VRF) technologies (also known as VRV) do not qualify for the residential DHP measure. BPA understands that the cost and energy savings for VRFs differ significantly from a standard residential DHP configuration.
- ~~Mini-splits with a multi-position ducted indoor air handler should be invoiced as an air source heat pump even when the air handler and ductless heads are served by the same outdoor compressor.~~
- Existing homes with electric forced air furnaces are eligble for PTCS or Prescriptive Duct Sealing.

10.7.1.2 Ductless Heat Pump Upgrade

Basis for Energy Savings

The calculation of energy efficiency savings for DHPs utilized multiple runs of the SEEM simulation engine, calibrated with results from a study of the performance of DHPs in actual homes, in combination with Prototype House Weightings, to generate heating energy use for baseline and efficient cases for each heating system type and heating zone within the analysis.

Ductless Heat Pump Upgrade: Eligibility Table

PRIMARY RESIDENTIAL HEATING SYSTEM	HOME TYPE				
	SINGLE-FAMILY: EXISTING	SINGLE-FAMILY: NEW	MANUFACTURED: EXISTING	MANUFACTURED: NEW	MULTIFAMILY: EXISTING
Electric Forced-Air Furnace	Not eligible	Not eligible	Not eligible	Treat as manufactured existing once located on site for occupancy	Not eligible
Ducted Heat Pump					
Ductless Mini-Split Heat Pump	Eligible		Eligible		
Zonal (Electric)	Not eligible		Not eligible		
Wood					
Oil/Propane/Gas					
None existing					

Requirements and Specifications

Measure includes upgrading an existing DHP for existing single-family and manufactured homes in all states.

- DHP must be a split-system heat pump employing an inverter-driven outdoor compressor, with inverter-driven or variable speed indoor blower(s), rated with a minimum of **11.0 HSPF or greater**.
- DHP must be listed on BPA's DHP Qualified Product List or Northeast Energy Efficiency Partnership (NEEP) Cold Climate Specification List. If a customer believes a product should be on BPA's Qualified Product List, and it is not, the customer should use the COTR Request and Acknowledgment Procedure.
- Ductless heat pump must be installed on a dedicated electrical circuit, according to manufacturer's specifications and the Best Practices for Installing Ductless Heat Pumps Guide.
- The DHP must be installed by a licensed contractor. The customer must use the COTR Request and Acknowledgment Procedure to consider payment for a partial self-install; these will only be considered when a contractor has installed the fittings and refrigerant.
- Only one DHP may be claimed per home, regardless of the number of outdoor or indoor units installed, and regardless of the home's square footage. For homes 4,500 sq. ft or larger, the home is also eligible for a PTCS or non-PTCS air source heat pump (ASHP) incentive.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information including unique site ID and address.	X		X
Equipment or contractor invoice showing: 1. Order or purchase date 2. Cost			X
Documenation that measure requirements have been met (e.g., manufacturer, model number, type, size and quantity of product installed or used)			X
Completed Ductless Heat Pump Project Installation Form (or other forms that contain the same information) available in the IM Document Library.			X

Payment

MEASURE CATEGORY	PAYMENT
DHP Upgrade: Existing Single-family and Manufactured Homes: Ductless heat pump precondition	$100

Additional Information

- ~~Mini-splits with a multi-position ducted indoor air handler should be invoiced as an air source heat pump even when the air handler and ductless heads are served by the same outdoor compressor.~~
- At this time, Variable Refrigerant Flow (VRF) technologies (also known as VRV) do not qualify for the residential DHP measure. BPA understands that the cost and energy savings for VRFs differ significantly from a standard residential DHP configuration.

10.7.2 HVAC PTCS

This section covers:

10.7.2.1 Air Source Heat Pumps

10.7.2.2 Variable Speed Heat Pumps;

10.7.2.3 Commissioning, Controls and Sizing;

10.7.2.4 Ground-Source Heat Pumps; and

10.7.2.5 PTCS Duct Sealing

10.7.2.1 PTCS Air Source Heat Pumps

Basis for Energy Savings

The base case (pre-existing state) used to calculate energy efficiency savings for air source heat pump upgrades are the heat pumps determined by RTF data to be current practice (8.5 HSPF and 14.0 SEER). The base case (pre-existing state) for air source heat pump conversions is an electric forced-air furnace (with or without central air conditioning). The base case (pre-existing state) for air source heat pump upgrades include nonelectric heating savings represented as a cost savings.

Required Documents

PTCS Heat Pump and Central Air Conditioner Sizing Calculator

Supporting Content

IM Document Library

PTCS Air Source Heat Pump Form

PTCS Air Source Heat Pump Specifications

PTCS Online Registry

PTCS Program Requirements

Residential HVAC Website

RTF Unit Energy Savings (UES) Measures

Energy savings are calculated using multiple runs of the calibrated SEEM simulation engine in combination with the prototype house weightings. This is in order to generate heating energy use for baseline and efficient cases for each heating system type and heating zone within the analysis, for the efficient case of 9.0 HSPF/14.0 SEER. Savings for the efficient case include a Performance Tested Comfort Systems (PTCS) installation with commissioning, controls and sizing.

BPA documentation requirements consider these factors. More detailed information is available on the RTF's Unit Energy Savings (UES) Measures webpage.

PTCS Air Source Heat Pumps: Eligibility Table

PRIMARY RESIDENTIAL HEATING SYSTEM	HOME TYPE				
	SINGLE-FAMILY: EXISTING	SINGLE-FAMILY: NEW	MANUFACTURED: EXISTING	MANUFACTURED: NEW	MULTIFAMILY: EXISTING
Electric Forced-Air Furnace*	Conversion	Upgrade	Conversion	Treat as manufactured existing once located on site for occupancy	Not eligible
Ducted Heat Pump**	Upgrade		Upgrade		
Ductless Mini-Split Heat Pump	Upgrade		Upgrade		
Zonal (Electric)***	Upgrade		Upgrade		
Wood	Upgrade		Upgrade		
Oil/Propane/Gas	Upgrade		Upgrade		
None existing	Upgrade		Upgrade		

*If home is hydronically heated, an electric water heater serving a forced-air hydronic coil is considered equivalent to an electric furnace.
**Replacing a PTCS ducted air source heat pump that is no longer functioning with a new PTCS certified heat pump would qualify for an upgrade.
***Zonal is including zonal hydronic systems that do not utilize a duct system for distribution.

Requirements and Specifications

Measures include PTCS air source heat pump upgrades and conversions.

- Rated as having at least 9.0 HSPF and 14 SEER (for ducted systems with an HSPF below 9.0, see section 10.7.2.3);
- Equipment must be AHRI-tested and certified; manufacturer claims of "equivalent to AHRI-certified equipment" will not be accepted;
- PTCS work must be performed by a PTCS technician listed in the online site registry and certified according to the PTCS Program Requirements;
- Commissioned and installed according to the current PTCS Air Source Heat Pump Specifications available in the IM Document Library;
- Eligible installations must be entered in the online site registry

Applicable to whole-home centrally ducted systems (for ducted mini-split heat pumps (DHPs), see section 10.7.1; for PTCS Variable Speed Heat Pumps, see section 10.7.2.2).

At this time, VRF technologies (also known as VRV) do not qualify for the residential PTCS Air Source Heat Pump measure. BPA understands that the cost and energy savings for VRFs differ significantly from a standard residential PTCS Air Source Heat Pump configuration.

Applicable Home Types:

- New construction single-family;
- Existing construction single-family;
- Existing manufactured homes (including new manufactured homes once on site for occupancy)

Heat Pump Upgrade applies to the following situations:

- Replacing an existing heat pump;
- Installing an air source heat pump in single-family new construction;
- Installing an air source heat pump in an existing single-family or existing manufactured home without any previously existing primary heating system;
- Adding a heat pump to a nonelectric heating system (i.e., gas, oil, propane or wood);
- Upgrading from zonal (including zonal hydronic systems that do not utilize a duct system for distribution) to air source heat pump;
- Replacing a ductless mini-split heat pump;
- Replacing a PTCS air source heat pump that is no longer functioning with a new PTCS-certified heat pump

All upgrades can be claimed as Any Electric or Non-Electric Heating System.

Heat Pump Conversion applies to the following situations:

- Converting an electric forced-air furnace to a high-efficiency heat pump;
- Converting from a hydronically heated system with an electric resistance water heat serving a forced air hydronic coil

PTCS forms and specifications are available in the IM Document Library and on the BPA Residential HVAC webpage.

Homes with less than 4,500 square feet of heated floor area may qualify for only one heat pump payment. This may be one ducted (PTCS or non-PTCS) or one ductless heat pump, but not both. There are two exceptions to this rule:

1. When the home has two entirely separate duct systems, the home is eligible for two air source heat pump payments but no more, even if there are more than two duct systems;
2. When the home's ductwork has not been extended to an addition, a DHP may be installed to service the area of the home that does not contain ducts. In this scenario, the home may be eligible for a ducted air source heat pump (PTCS or non-PTCS) and one DHP payment.

Homes with greater than 4,500 square feet of heated floor area may qualify for up to two heat pump measures and no more, provided all other program requirements are met.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	SITE REGISTRY	CUSTOMER FILE
End-user identifying information including unique site ID and address	X		X
PTCS site registry measure ID	X	X	
Equipment or contractor invoice showing: 1. Order or purchase date 2. Installed cost			X
Documentation that measure requirements have been met (manufacturer, model number, type, size and quantity of equipment or product installed or used)			X
Proof that the required forms for the claimed measure have been accepted in the PTCS site registry of certified systems		X	
Installation Information, one of the following is required: • PTCS Registry Installation Report; or • PTCS Air Source Heat Pump Form (handwritten form located in the IM Document Library.); or • CheckMe!® Heat Pump Protocol Data Entry Form for PTCS Summer and Winter			X
Technician documentation used to determine size of the heat pump per PTCS specifications, one of the following is required: • PTCS Heat Pump and Central Air Conditioner Sizing Calculator in the IM Document Library; or • A heat load/heat loss calculation and associated balance point worksheet (i.e., a calculator, graph or chart)			X

Payment

MEASURE CATEGORY	PAYMENT
Heat Pump Upgrade to Air Source Heat Pump	$500
Heat Pump Conversion from Electric Forced-Air Furnace to Air Source Heat Pump	$1,400

Additional Information

PTCS air source heat pumps are subject to quality assurance inspection by a BPA-approved quality assurance inspector.

10.7.2.2 PTCS Variable Speed Air Source Heat Pumps

Basis for Energy Savings

The base case (pre-existing state) used to calculate energy efficiency savings for variable speed heat pump upgrades are the heat pumps determined by RTF data to be current practice (8.5 HSPF and 14.0 SEER). The base case (pre-existing state) for variable speed heat pump conversions is an electric

Required Documents

PTCS Heat Pump and Central Air Conditioner Sizing Calculator

Supporting Content

IM Document Library

NEEP Cold Climate Website

PTCS Air Source Heat Pump Form

PTCS Air Source Heat Pump Specification

PTCS Online Registry

PTCS Program Requirements

Residential HVAC Website

RTF Unit Energy Savings (UES) Measures

forced-air furnace (with or without central air conditioning). The base case (pre-existing state) for variable speed heat pump upgrade includes nonelectric heating savings represented as a cost savings.

Energy savings are calculated using multiple runs of the calibrated SEEM simulation engine in combination with the prototype house weightings. This is in order to generate heating energy use for baseline and efficient cases for each heating system type and heating zone within the analysis, for the efficient case of 9.0 HSPF/14.0 SEER. Savings for the efficient case includes a Performance Tested Comfort Systems (PTCS) installation with commissioning, controls and sizing.

BPA documentation requirements consider these factors. More detailed information is available on the RTF's UES Measures webpage.

PTCS Variable Speed Heat Pumps: Eligibility Table

PRIMARY RESIDENTIAL HEATING SYSTEM	HOME TYPE				
	SINGLE-FAMILY: EXISTING	SINGLE-FAMILY: NEW	MANUFACTURED: EXISTING	MANUFACTURED: NEW	MULTIFAMILY: EXISTING
Electric Forced-Air Furnace*	Conversion	Upgrade	Conversion	Treat as manufactured existing once located on site for occupancy	Not eligible
Ducted Heat Pump**	Upgrade		Upgrade		
Ductless Mini-Split Heat Pump	Upgrade		Upgrade		
Zonal (Electric)***	Upgrade		Upgrade		
Wood	Upgrade		Upgrade		
Oil/Propane/Gas	Upgrade		Upgrade		
None existing	Upgrade		Upgrade		

*If home is hyrdonically heated, an electric water heater serving a forced-air hydronic coil is considered equivalent to an electric furnace.
**Replacing a PTCS variable speed heat pump that is no longer functioning with a new PTCS certified heat pump would qualify for an upgrade.
***Zonal includes zonal hydronic systems that do not utilize a duct system for distribution.

Requirements and Specifications

Measures include PTCS variable speed heat pump upgrades and conversions.

- Rated as having at least 9.0 HSPF and 14 SEER (for ducted systems with an HSPF below 9.0, see section 10.7.2.3);
- Equipment must be AHRI-tested and certified; manufacturer claims of "equivalent to AHRI certified equipment" will not be accepted;
- Outdoor compressor must be variable speed or inverter-driven;
- PTCS work must be performed by a PTCS technician listed in the online site registry and certified according to the PTCS Program Requirements;
- Commissioned and installed according to the current PTCS Air Source Heat Pump Specifications available in the IM Document Library;
- Eligible installations must be entered in the online site registry.

Applicable to whole home centrally ducted systems (for ducted mini-split heat pumps, see section 10.7.1; for non-variable speed PTCS Air Source Heat Pumps, see section 10.7.2.1).

At this time, Variable Refrigerant Flow (VRF) technologies (also known as VRV) do not qualify for the residential PTCS Variable Speed Air Source Heat Pump measure. BPA understands that the cost and energy savings for VRFs differ significantly from a standard residential PTCS Variable Speed Air Source Heat Pump configuration.

Applicable Home Types:

- New construction single-family;
- Existing construction single-family;
- Existing manufactured homes (including new manufactured homes once on site for occupancy).

Variable Speed Heat Pump Upgrade applies to the following situations:

- Replacing an existing heat pump;
- Installing a variable speed heat pump in single-family new construction (only the upgrade measure applies);
- Installing a variable speed heat pump in an existing single-family or existing manufactured home (including new manufactured homes once on site for occupancy) without any previously existing primary heating system;
- Adding a variable speed heat pump to a nonelectric heating system (i.e., gas, oil, propane or wood);
- Upgrading from zonal (including zonal hydronic systems that do not utilize a duct system for distribution) to air source heat pump;
- Replacing a PTCS variable speed heat pump that is no longer functioning with a PTCS heat pump;
- Replacing a ductless mini-split heat pump

All upgrades can be claimed as Any Electric or Non-Electric Heating System.

Variable Speed Heat Pump Conversion applies to the following situations:

- Converting an electric forced-air furnace to a high-efficiency variable speed heat pump.
- Converting from a hydronically heated system with an electric resistance water heat serving a forced air hydronic coil.

PTCS forms and specifications are available in the IM Document Library and on the BPA Residential HVAC webpage.

Homes with less than 4,500 square feet of heated floor area may qualify for only one heat pump payment. This may be one ducted (PTCS or non-PTCS) or one ductless heat pump, but not both. There are two exceptions to this rule:

1. When the home has two entirely separate duct systems, the home is eligible for two air source heat pump payments but no more, even if there are more than two duct systems.
2. When the home's ductwork has not been extended to an addition, a DHP may be installed to service the area of the home that does not contain ducts. In this scenario, the home may be eligible for a ducted air source heat pump (PTCS or non-PTCS) and one DHP payment.

Homes with greater than 4,500 square feet of heated floor area qualify for up to two heat pump measures and no more, provided all other program requirements are met.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	SITE REGISTRY	CUSTOMER FILE
End-user identifying information including unique site ID and address.	X		X
PTCS site registry measure ID.	X	X	
Equipment or contractor invoice showing: 1. Order or purchase date 2. Installed cost			X
Documentation that measure requirements have been met (manufacturer, model number, type, size, and quantity of equipment or product installed or used)			X
Proof that the required form(s) for the claimed measure have been accepted in the PTCS site registry of certified systems.		X	
Installation Information, one of the following is required: • PTCS Registry Installation Report; or • PTCS Air Source Heat Pump Form (handwritten form located in the IM Document Library); or • CheckMe!® Heat Pump Protocol Data Entry Form for PTCS Summer and Winter			X
Technician documentation used to determine size of the heat pump per PTCS specifications, one of the following is required: • PTCS Heat Pump and Central Air Conditioner Sizing Calculator available in the IM Document Library, or; • A heat load/heat loss calculation and associated balance point worksheet (i.e. a calculator, graph, or chart)			X

Payment

MEASURE CATEGORY	PAYMENT
Heat Pump Upgrade to Variable Speed Heat Pump	$700
Heat Pump Conversion from Electric Forced-Air Furnace to Variable Speed Heat Pump	$1,600

Additional Information

PTCS variable speed heat pumps are subject to a quality assurance inspection by a BPA-approved quality assurance inspector.

Access is available to the Northeast Energy Efficiency Partnership (NEEP) Cold Climate Specification List for air source heat pumps (including ductless heat pumps). This is an optional resource. Utilities are not required to utilize models on this list for program implementation.

See section 10.7.2.1 for information about PTCS Air Source Heat Pumps.

10.7.2.3 PTCS Commissioning, Controls and Sizing

Basis for Energy Savings

The base case (pre-existing state) used to calculate energy efficiency savings for PTCS commissioning, controls and sizing is determined by RTF data to be current practice (8.5 HSPF and 14.0 SEER). The base case (pre-existing state) for PTCS commissioning, controls and sizing is an electric forced-air furnace (with or without central air conditioning). The base case (pre-existing state) for PTCS commissioning, controls and sizing includes nonelectric heating savings represented as a cost savings.

Required Documents

PTCS Heat Pump and Central Air Conditioner Sizing Calculator

Supporting Content

IM Document Library

NEEP Cold Climate Website

PTCS Air Source Heat Pump Form

PTCS Air Source Heat Pump Specifications

PTCS Program Requirements

PTCS Online Registry

Residential HVAC Website

RTF Unit Energy Savings (UES) Measures

Energy savings are calculated using multiple runs of the calibrated SEEM simulation engine in combination with the prototype house weightings. This is in order to generate heating energy use for baseline and efficient cases for each heating system type and heating zone within the analysis, for the efficient case of current code minimum HSPF and SEER. Savings for the efficient case includes a PTCS installation with commissioning, controls and sizing.

BPA documentation requirements consider these factors. More detailed information is available on the RTF's UES Measures webpage.

PTCS Commissioning, Controls and Sizing for Heat Pumps with an HSPF below 9.0: Eligibility Table

PRIMARY RESIDENTIAL HEATING SYSTEM	HOME TYPE				
	SINGLE-FAMILY: EXISTING	SINGLE-FAMILY: NEW	MANUFACTURED: EXISTING	MANUFACTURED: NEW	MULTIFAMILY: EXISTING
Electric Forced-Air Furnace*	Eligible	Eligible	Eligible	Treat as manufactured existing once located on site for occupancy	Not eligible
Ducted Heat Pump	Eligible		Eligible		
Ductless Mini-Split Heat Pump	Eligible		Eligible		
Zonal (Electric)**	Eligible		Eligible		
Wood	Eligible		Eligible		
Oil/Propane/Gas	Eligible		Eligible		
None existing	Eligible		Eligible		

*If home is hydronically heated, an electric water heater serving a forced-air hydronic coil is considered equivalent to an electric furnace.
**Zonal includes zonal hydronic systems that do not utilize a duct system for distribution.

Requirements and Specifications

- Any new ducted air source and variable speed heat pumps;
- Rated as having an HSPF below 9.0 that meets the federal minimum standard. (For systems with an HSPF of 9.0 or above, see sections 10.7.2.1 and 10.7.2.2);
- Equipment must be AHRI-tested and certified; manufacturer claims of "equivalent to AHRI certified equipment" will not be accepted;
- PTCS work must be performed by a PTCS technician listed in the online site registry and certified according technician to the PTCS Program Requirements;
- Commissioned and installed according to the current PTCS Air Source Heat Pump Installation Specification available in the IM Document Library;
- Eligible installations must be entered in the online site registry;
- Cannot be claimed in combination with any other heat pump measure

Applicable to whole-home centrally ducted systems (for ducted mini-splits, see section 10.7.1).

At this time, VRF technologies (also known as VRV) do not qualify for the residential PTCS Air Source Heat Pump measure. BPA understands that the cost and energy savings for VRFs differ significantly from a standard residential PTCS Air Source Heat Pump configuration.

Applicable Home Types:

- New construction single-family;
- Existing construction single-family;
- Existing manufactured homes (including new manufactured homes once on site for occupancy)

Commissioning, Controls and Sizing (for air source and variable speed heat pumps) applies to commissioning any new air source heat pump with an HSPF below 9.0 when replacing any heating system type, adding an air source heat pump to an existing single-family or existing manufactured home without any previously existing primary heating system, or installing a new heat pump in single-family new construction.

PTCS forms and specifications are available in the IM Document Library and on the BPA Residential HVAC webpage.

Homes with less than 4,500 square feet of heated floor area may qualify for only one heat pump payment. This may be one ducted (PTCS or non-PTCS) or one ductless heat pump, but not both. There are two exceptions to this rule:

1. When the home has two entirely separate duct systems, the home is eligible for two air source heat pump payments but no more, even if there are more than two duct systems;
2. When the home's ductwork has not been extended to an addition, a DHP may be installed to service the area of the home that does not contain ducts. In this scenario, the home may be eligible for a ducted air source heat pump (PTCS or non-PTCS) and one DHP payment.

Homes with greater than 4,500 square feet of heated floor area qualify for up to two heat pump measures and no more, provided all other program requirements are met.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	SITE REGISTRY	CUSTOMER FILE
End-user identifying information including unique site ID and address.	X		X
PTCS site registry measure ID.	X	X	
Equipment or contractor invoice showing: 1. Order or purchase date 2. Installed cost			X
Documentation that measure requirements have been met (manufacturer, model number, type, size and quantity of equipment or product installed or used)			X
Proof that the required form(s) for the claimed measure have been accepted in the PTCS site registry of certified systems.		X	
Installation Information, one of the following is required: • PTCS Registry Installation Report; or • PTCS Air Source Heat Pump Form (handwritten form located in the IM Document Library); or • CheckMe!® Heat Pump Protocol Data Entry Form for PTCS Summer and Winter			X

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	SITE REGISTRY	CUSTOMER FILE
Technician documentation used to determine size of the heat pump per PTCS specifications, one of the following is required: • PTCS Heat Pump and Central Air Conditioner Sizing Calculator available in the IM Document Library, or; • A heat load/heat loss calculation and associated balance point worksheet (i.e. a calculator, graph, or chart)			X

Payment

MEASURE CATEGORY	PAYMENT
Commissioning, Controls and Sizing	$300

Additional Information

PTCS commissioning, controls and sizing installations are subject to quality assurance inspection by a BPA-approved quality assurance inspector.

Beginning Oct. 1, 2019, BPA will begin offering access to the Northeast Energy Efficiency Partnership (NEEP) Cold Climate Specification List for variable speed air source heat pumps (including ductless heat pumps) that retain their efficiency at lower operating temperatures. This is an optional resource. Utilities will not be required to utilize models on this list.

10.7.2.4 PTCS Ground Source Heat Pumps

Basis for Energy Savings

The base case (pre-existing state) used to calculate energy efficiency savings for ground source heat pump upgrades are the heat pumps determined by RTF data to be current practice (8.5 HSPF and 14.0 SEER). The base cases (pre-existing state) for ground source heat pump conversions are an electric forced-air furnace (with or without central air conditioning).

Energy savings are calculated using multiple runs of the calibrated SEEM simulation engine, in combination with the prototype house weightings. This generates heating energy use for baseline and efficient cases for each heating system type and heating zone within the analysis, for the efficient case of an ENERGY STAR Ground Source Heat Pump. Additional savings are added in the case of a desuperheater. Savings for the efficient case includes a PTCS and International Ground Source Heat Pump Association (IGSHPA) installation with commissioning, controls and sizing.

BPA documentation requirements consider these factors. More detailed information is available on the RTF's UES Measures webpage.

Supporting Content

PTCS Closed Loop Ground Source Heat Pump Specifications

PTCS Open Loop Ground Source Heat Pump Specifications

PTCS Online Registry

PTCS Program Requirements

Residential HVAC Website

RTF Unit Energy Savings (UES) Measures

PTCS Ground-Source Heat Pumps*: Eligibility Table

PRIMARY RESIDENTIAL HEATING SYSTEM	HOME TYPE				
	SINGLE-FAMILY: EXISTING HZ2 & 3 ONLY	SINGLE-FAMILY: NEW	MANUFACTURED: EXISTING	MANUFACTURED: NEW	MULTIFAMILY: EXISTING
Electric Forced-Air Furnace	Conversion	Upgrade	Not eligible	Not eligible	Not eligible
Ducted Heat Pump	Upgrade				
Ductless Mini-Split Heat Pump	Upgrade				
Zonal (Electric)	Conversion: Boiler, Forced-Air Hydronic Heating, or Zonal Radiant Heating Upgrade: Zonal Electric				
Wood	Upgrade				
Oil/Propane/Gas	Upgrade				
None existing	Upgrade				

*Projects that replace only the compressor portion of an existing ground source heat pump system may be eligible for an upgrade measure. See details under Requirements and Specifications.

Requirements and Specifications

Measures include PTCS ground source heat pump upgrades or conversions with or without a de-superheater and must meet the following requirements and specifications:

- Systems must be ENERGY STAR-Qualified as determined by the PTCS call center personnel;
- PTCS work must be performed by a PTCS technician(s) listed in the online site registry and certified according to the PTCS Program Requirements and IGSHPA. Multiple technicians may be employed to meet these certification requirements, but they must have been present during the installation to qualify;
- Commissioned and Installed according to the IGSHPA specifications available at the time of installation and one of the two Ground Source Heat Pump Specifications listed below, which are available in the IM Document Library:
    - Closed-loop ground source heat pumps installed according to the current Ground Source Closed Loop Heat Pump System Installation Standards;
    - Open-loop ground source heat pumps installed according to the current PTCS Ground Water Source Open Loop Heat Pump Installation Specification
- Eligible installations must be entered in the online site registry;

- All system components must be newly installed. The replacement of an existing ground source heat pump thermal exchange loop does not qualify for an incentive.

Applicable home types in heating zones (HZ) 2 and 3 only:

- New construction single-family;
- Existing construction single-family

Ground Source Heat Pump Upgrade applies to the following situations:

- Replacing an existing air source heat pump;
- Replacing zonal electric;
- Replacing a ductless heat pump (considered a zonal system);
- Replacing a nonelectric heating system (i.e. gas, oil or propane);
- Replacing the compressor portion only (compressor portion includes the compressor, a heat exchanger, expansion and reversing valves, piping connections and control connections) of an existing ground source heat pump system is eligible for an upgrade measure when the compressor portion is ENERGY STAR-Qualified and the measure is claimed using the ground source heat pump compressor portion only upgrade measure in the UES Measure List;
- Installing a ground source heat pump in a new construction single-family home;
- Installing a ground source heat pump in an existing single-family home (HZ 2 & 3) without any previously existing primary heating system

Ground Source Heat Pump Conversion applies to the following situations:

- Replacing an electric furnace;
- Replacing an electric boiler used for forced-air hydronic heating or zonal radiant heat

Ground source heat pump forms and specifications are available in the IM Document Library and on the BPA Residential HVAC webpage.

Only one ground source heat pump per home qualifies for BPA payment, provided all other program requirements are met. Ground source heat pumps may be connected to hydronic heating systems in residential end-use applications if all PTCS and IGSHPA specifications are met.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	SITE REGISTRY	CUSTOMER FILE
End-user identifying information including unique site ID and address.	X		X
PTCS site registry measure ID.	X	X	
Equipment/contractor invoice showing: 1. Order or purchase date 2. Installed cost			X
Documentation that measure requirements have been met (manufacturer, model number, type, size and quantity of equipment or product installed or used)			X

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	SITE REGISTRY	CUSTOMER FILE
Proof that the required forms for the claimed measure have been accepted in the PTCS site registry of certified systems		X	
Installation Information, the following is required: • PTCS Ground Source Heat Pump Form (handwritten form located in the IM Document Library)			X
Technician documentation used to determine size of heat pump per PTCS specifications, the following are required • Heat load/heat loss calculation; and • Balance point worksheet (i.e. a calculator, graph or chart); and • Loop-design documentation Note: Loop design documentation is not required for compressor only installations.			X

Payment

MEASURE CATEGORY	PAYMENT
Ground Source Heat Pump Upgrade (Compressor Only Replacement)	$500
Ground Source Heat Pump Upgrade or Conversion without Desuperheater	$3,000
Ground Source Heat Pump Upgrade or Conversion with Desuperheater	$3,500

Additional Information

PTCS ground source heat pumps are subject to quality assurance inspection by a BPA-approved quality assurance inspector.

10.7.2.5 PTCS Duct Sealing

Basis for Energy Savings

Multiple runs of the calibrated SEEM simulation engine are used in combination with the prototype house weightings. This generates heating energy use for baseline and efficient cases for each heating system type and heating zone, within the analysis for the PTCS duct sealing measure. Primary parameters are the key SEEM inputs and factors in differences in average duct leakage to the exterior of the home with variations for basement, crawlspace and/or slab homes, as provided by the RBSA.

BPA documentation requirements consider these factors. More detailed information is available on the RTF's UES Measures webpage.

Supporting Content

PTCS Duct Sealing Form

PTCS Duct Sealing Specifications

PTCS Online Registry

PTCS Program Requirements

RTF Unit Energy Savings (UES) Measures

PTCS Duct Sealing: Eligibility Table

PRIMARY RESIDENTIAL HEATING SYSTEM	HOME TYPE				
	SINGLE-FAMILY: EXISTING	SINGLE-FAMILY: NEW (EXCEPT WA)*	MANUFACTURED: EXISTING	MANUFACTURED: NEW	MULTIFAMILY: EXISTING
Electric Forced-Air Furnace	Eligible	Not eligible	Eligible	Treat as manufactured existing once located on site for occupancy	Not eligible
Ducted Heat Pump	Eligible		Eligible		
Ductless Mini-Split Heat Pump	Eligible*		Eligible*		
Zonal (Electric)	Eligible		Eligible		
Wood	Not eligible		Not eligible		
Oil/Propane/Gas					
None existing					

*With ducts that are connected to electric heat

Requirements and Specifications

- Ducts must be connected to electric heat;
- Sealed according to the current PTCS Duct Sealing Specification available in the IM Document Library. See section 10.7.3 for more information about Prescriptive Duct Sealing
- PTCS work must be performed by a PTCS technician listed in the online site registry and certified according to the PTCS Program Requirements;
- Eligible installations must be entered in the online site registry

Applicable home types:

- Existing construction single-family
- Existing manufactured homes (including new manufactured homes once on site for occupancy)

The PTCS Duct Sealing form and specification are available in the IM Document Library and on the BPA Residential HVAC webpage.

Homes with two independent, electrically-heated duct systems may claim up to two duct sealing measures provided that all other program requirements are met.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	SITE REGISTRY	CUSTOMER FILE
End-user identifying information including unique site ID and address.	X		X
PTCS site registry measure ID.	X	X	

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	SITE REGISTRY	CUSTOMER FILE
Equipment/contractor invoice showing: 1. Order or purchase date 2. Installed cost			X
Proof that the required forms for the claimed measure have been accepted in the PTCS site registry of certified systems		X	
Installation Information, the following is required: • PTCS Registry Installation Report; or • PTCS Duct Sealing Form (handwritten form located in the IM Document Library)			X

Payment

MEASURE CATEGORY	PAYMENT
PTCS Duct Sealing, Existing Manufactured Homes (including new manufactured homes once on site for occupancy)	$200
PTCS Duct Sealing, Existing Single-family Homes	$250

Additional Information

PTCS duct sealing is subject to quality assurance inspection by a BPA-approved quality assurance inspector.

Refer to section 10.7.3 for information about Prescriptive Duct Sealing.

10.7.3 Prescriptive Duct Sealing

Basis for Energy Savings

Multiple runs of the calibrated SEEM simulation engine are used in combination with the prototype house weightings. This generates heating energy use for baseline and efficient cases for each heating system type and heating zone, within the analysis for the prescriptive duct sealing measure. Primary parameters are the key SEEM inputs and factors in differences in average duct leakage to the exterior of the home with variations for basement, crawlspace and/or slab homes, as provided by the RBSA.

BPA documentation requirements consider these factors. More detailed information is available on the RTF's UES Measures webpage.

Supporting Content

IM Document Library

Prescriptive Duct Sealing Specifications

PTCS Online Registry

PTCS Program Requirements

RTF Unit Energy Savings (UES) Measures

Prescriptive Duct Sealing: Eligibility Table

PRIMARY RESIDENTIAL HEATING SYSTEM	HOME TYPE				
	SINGLE-FAMILY: EXISTING	SINGLE-FAMILY: NEW	MANUFACTURED: EXISTING	MANUFACTURED: NEW	MULTIFAMILY: EXISTING
Electric Forced-Air Furnace	Eligible	Not eligible	Eligible	Treat as manufactured existing once located on site for occupancy	Not eligible
Ducted Heat Pump	Eligible		Eligible		
Ductless Mini-Split Heat Pump	Eligible*		Eligible*		
Zonal (Electric)	Eligible		Eligible		
Wood	Not eligible		Not eligible		
Oil/Propane/Gas					
None existing					

*With ducts that are connected to electric heat

Requirements and Specifications

- Ducts must be connected to electric heat;
- Sealed according to the current Prescriptive Duct Sealing Specification available in the IM Document Library. See section 10.7.2.5 for more information about PTCS Duct Sealing.
- Work must be performed by a Prescriptive Duct Sealing technician either listed in the online site registry or a pre-approved utility certification program, and performed according to the Prescriptive Duct Sealing Program Requirements. Utilities must request pre-approval through the COTR request and acknowledger procedure

Applicable home types:

- Existing construction single-family
- Existing manufactured homes (including new manufactured homes once on site for occupancy)

The Prescriptive duct sealing Form and specification is available in the IM Document Library and on the BPA Residential HVAC webpage.

Homes with two independent, electrically-heated duct systems may claim up to two duct sealing measures provided that all other program requirements are met.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	SITE REGISTRY	CUSTOMER FILE
End-user identifying information including unique site ID and address.	X		X

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	SITE REGISTRY	CUSTOMER FILE
Equipment/contractor invoice showing: 1. Order or purchase date 2. Installed cost			X
Installation Information, including one of the following: • Completed Prescriptive Duct Sealing Form (handwritten form located in the IM Document Library); or • If the job was entered into the PTCS Site Registry, the Registry Installation Report printed and stored in the file			X

Payment

MEASURE CATEGORY	PAYMENT
Prescriptive Duct Sealing, Existing Manufactured Homes (including new manufactured homes once on site for occupancy)	$200
Prescriptive Duct Sealing, Existing Single-family Homes	$250

Additional Information

Prescriptive duct sealing is subject to quality assurance inspection by a BPA-approved quality assurance (QA) inspector.

The prescriptive duct sealing measure utilizes some of the PTCS infrastructure, including training and QA inspections. See section 10.7.2.5 for more information about PTCS Duct Sealing.

10.7.4 Air Source Heat Pump Conversion from Electric Forced-Air Furnace to Air Source Heat Pump (without PTCS)

Basis for Energy Savings

The base case (pre-existing state) for air source heat pump conversions are an electric forced-air furnace (with or without central air conditioning).

Energy savings are calculated using multiple runs of the calibrated SEEM simulation engine in combination with the prototype house weightings. This is in order to generate heating energy use for baseline and efficient cases for each heating system type and heating zone within the analysis, for the efficient case of 9.0 HSPF and 14.0 SEER.

BPA documentation requirements consider these factors. More detailed information is available on the RTF's UES Measures webpage.

Required Documents

Air Source Heat Pump Conversion Form (Without PTCS)

AHRI Certificate

Supporting Content

RTF Unit Energy Savings (UES) Measures

Accessing the AHRI Certificate: Quick Guide

Air Source Heat Pump Conversion from Electric Forced-Air Furnace (without PTCS): Eligibility Table

PRIMARY RESIDENTIAL HEATING SYSTEM	HOME TYPE				
	SINGLE-FAMILY: EXISTING	SINGLE-FAMILY: NEW	MANUFACTURED: EXISTING	MANUFACTURED: NEW	MULTIFAMILY: EXISTING
Electric Forced-Air Furnace	Conversion	Not eligible	Conversion	Treat as manufactured existing once located on site for occupancy	Not eligible
Ducted Heat Pump	Not eligible		Not eligible	Not eligible	
Ductless Mini-Split Heat Pump					
Zonal (Electric)					
Wood					
Oil/Propane/Gas					
None existing					

Requirements and Specifications

- This measure is available for existing single-family and existing manufactured homes with whole-home centrally ducted systems. For ducted mini-splits, see section 10.7.1.
- This measure is a conversion from an electric forced-air furnace to a high-efficiency ducted heat pump without installing to PTCS specifications.
- New heat pumps must be rated as having at least 9.0 HSPF and 14 SEER.
- Equipment must be AHRI-tested and certified; manufacturer claims of "equivalent to AHRI certified equipment" will not be accepted.

Customers may not claim payments for this measure and PTCS Air Source Heat Pumps for the same equipment.

At this time, VRF technologies (also known as VRV) do not qualify for the residential Conversion from Electric Forced-Air Furnace to Air Source Heat Pump (without PTCS) measure. BPA understands that the cost and energy savings for VRFs differ significantly from a standard residential Conversion from Electric Forced-Air Furnace to Air Source Heat Pump (without PTCS) configuration.

Homes with less than 4,500 square feet of heated floor area may qualify for only one heat pump payment. This may be one ducted (PTCS or non-PTCS) or one ductless heat pump, but not both. There are two exceptions to this rule:

1. When the home has two entirely separate duct systems, the home is eligible for two air source heat pump payments but no more, even if there are more than two duct systems;
2. When the home's ductwork has not been extended to an addition, a DHP may be installed to service the area of the home that does not contain ducts. In this scenario, the home may be eligible for a ducted air source heat pump (PTCS or non-PTCS) and one DHP payment.

Homes with greater than 4,500 square feet of heated floor area qualify for up to two heat pump measures and no more, provided all other program requirements are met.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EE DOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information including unique site ID and address.	X		X
Equipment/contractor invoice showing: 1. Order or purchase date 2. Installed cost			X
Documentation that measure requirements have been met (manufacturer, model number, type, size and quantity of equipment or product installed or used)			X
AHRI Certificate documenting a minimum of 9.0 HSPF and 14 SEER			X
~~Completed Air Source Heat Pump Conversion Form (without PTCS)~~			~~X~~

Payment

MEASURE CATEGORY	PAYMENT
Heat Pump Conversion from Electric Forced-Air Furnace to Air Source Heat Pump	$800

Additional Information

This measure is for air source heat pumps installations that do not follow the PTCS installation specification. Air source heat pumps installed according to PTCS installation specifications and requirements qualify for higher energy savings and payments. For PTCS air source heat pumps and PTCS variable speed air source heat pumps, please refer to sections 10.7.2.1 and 10.7.2.2.

Homes with zonal heating must utilize section 10.7.2.1 for PTCS air source heat pumps and section 10.7.2.2 for PTCS variable speed air source heat pumps.

PTCS or Prescriptive Duct Sealing may be completed and claimed in addition to this measure; however duct sealing is not required for completion of this measure.

10.7.5 Air Source Heat Pump Conversion from Electric Forced-Air Furnace to Variable Speed Air Source Heat Pump (without PTCS)

Basis for Energy Savings

The base case (pre-existing state) for air source heat pumps conversions are an electric forced-air furnace (with or without central air conditioning).

Energy savings are calculated using multiple runs of the calibrated SEEM simulation engine in combination with the prototype house weightings. This is in order to generate heating energy use for baseline and efficient cases for each heating system type and heating zone within the analysis, for the efficient case of 9.0 HSPF and 14.0 SEER.

BPA documentation requirements consider these factors. More detailed information is available on the RTF's Unit Energy Savings (UES) Measures webpage.

Required Documents

AHRI Certificate

Air Source Heat Pump Conversion Form (Without PTCS)

Supporting Content

Identifying Variable Speed Heat Pumps: Quick Guide

RTF Unit Energy Savings (UES) Measures

Accessing the AHRI Certificate

NEEP Cold Climate Website

Variable Speed Air Source Heat Pump Conversion from Electric Forced-Air Furnace (without PTCS): Eligibility Table

PRIMARY RESIDENTIAL HEATING SYSTEM	HOME TYPE				
	SINGLE-FAMILY: EXISTING	SINGLE-FAMILY: NEW	MANUFACTURED: EXISTING	MANUFACTURED: NEW	MULTIFAMILY: EXISTING
Electric Forced-Air Furnace	Conversion	Not eligible	Conversion	Treat as manufactured existing once located on site for occupancy	Not eligible
Ducted Heat Pump	Not eligible		Not eligible	Not eligible	
Ductless Mini-Split Heat Pump					
Zonal (Electric)					
Wood					
Oil/Propane/Gas					
None existing					

Requirements and Specifications

- This measure is available for existing single-family and existing manufactured homes with whole-home centrally ducted systems. For ducted mini-splits, see section 10.7.1.
- This measure is a conversion from an electric forced-air furnace to a high-efficiency ducted variable speed heat pump without installing to PTCS specifications.
- New heat pumps must be rated as having at least 9.0 HSPF and 14 SEER.
- Equipment must be AHRI-tested and certified; manufacturer claims of "equivalent to AHRI certified equipment" will not be accepted.
- The outdoor compressor must be variable speed or inverter-driven and documentation must be provided demonstrating that.

Customers may not claim payments for this measure and PTCS Air Source Heat Pumps for the same equipment.

At this time, VRF technologies (also known as VRV) do not qualify for the residential Conversion from Electric Forced-Air Furnace to Variable Speed Air Source Heat Pump (without PTCS) measure. BPA understands that the cost and energy savings for VRFs differ significantly from a standard residential Conversion from Electric Forced-Air Furnace to Variable Speed Air Source Heat Pump (without PTCS) configuration.

Homes with less than 4,500 square feet of heated floor area may qualify for only one heat pump payment. This may be one ducted (PTCS or non-PTCS) or one ductless heat pump, but not both. There are two exceptions to this rule:

1. When the home has two entirely separate duct systems, the home is eligible for two air source heat pump payments but no more, even if there are more than two duct systems.
2. When the home's ductwork has not been extended to an addition, a DHP may be installed to service the area of the home that does not contain ducts. In this scenario, the home may be eligible for a ducted air source heat pump (PTCS or non-PTCS) and one DHP payment.

Homes with greater than 4,500 square feet of heated floor area qualify for up to two heat pump measures and no more, provided all other program requirements are met.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EE DOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information including unique site ID and address.	X		X
Equipment/contractor invoice showing: 1. Order or purchase date 2. Installed cost			X
Documentation that measure requirements have been met (manufacturer, model number, type, size and quantity of equipment or product installed or used)			X
AHRI Certificate documenting a minimum of 9.0 HSPF and 14 SEER			X
Manufacturer documentation that the outdoor compressor includes variable speed or inverter-driven technology (e.g., specification sheet or brochure that documents the model has a variable speed or inverter driven compressor)			X
~~Completed Air Source Heat Pump Conversion Form (without PTCS)~~			~~X~~

Payment

MEASURE CATEGORY	PAYMENT
Heat Pump Conversion from Electric Forced-Air Furnace to Variable Speed Heat Pump	$1,000

Additional Information

This measure is for variable speed air source heat pump installations that do not follow the PTCS installation specification. Variable speed air source heat pumps installed according to PTCS installation specifications and requirements qualify for higher energy savings and payments. Please refer to section 10.7.2.1 for PTCS air source heat pumps and section 10.7.2.2 for PTCS variable speed air source heat pumps.

Homes with zonal heating must utilize section 10.7.2.1 for PTCS air source heat pumps and section 10.7.2.2 for PTCS variable speed air source heat pumps.

Access is available to the Northeast Energy Efficiency Partnership (NEEP) Cold Climate Specification List for air source heat pumps (including ductless heat pumps). This is an optional resource. Utilities are not required to utilize models on this list for program implementation.

For installations without a variable speed outdoor compressor or air source heat pumps where it cannot be confirmed that the outdoor compressor is variable speed, please refer to 10.7.4, Air Source Heat Pump Conversion from Electric Forced-Air Furnace to Air Source Heat Pump (without PTCS).

PTCS or Prescriptive Duct Sealing may be completed and claimed in addition to this measure; however, duct sealing is not required for completion of this measure.

10.8 THERMOSTATS

10.8.1 Line-Voltage Thermostats

Basis for Energy Savings

The base case (pre-existing state) is a home with electric-resistance zonal heat (baseboards or wall heaters) with line-voltage, bi-metal thermostats. The energy savings for line-voltage thermostats uses a weighted average of heating loads multiplied by a percent reduction of heating load. This savings arises from the line-voltage thermostats maintaining temperature closer to the set temperature on the dial (smaller hysteresis) than do older, bi-metal thermostats. The hysteresis, also known as dead band, refers to the temperature difference range between a thermostat coming on and shutting off.

BPA documentation requirements consider these factors. More detailed information is available on the RTF's Unit Energy Savings (UES) Measures webpage.

Requirements and Specifications

This measure is claimed on a per- thermostat basis and is available for existing and new single-family and multifamily low-rise and mid-/high-rise homes. Customers must replace thermostats in existing, electrically heated single-family or multifamily homes with line-voltage electronic thermostats.

All thermostats must meet the following requirements:

- Have a digital display
- Be electronically line-voltage type
- Have a thermistor temperature sensing element that is accurate to within 1.5 degrees or better
- Be UL- or CSA-listed for use with their application (i.e., fan-forced, baseboard, wall or ceiling radiant)

In addition, line voltage thermostats that are programmable must maintain temperature and program settings during power failures, and have a temporary override feature.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information including unique site ID and address.	X		X
Equipment or contractor invoice showing: • Equipment order or purchase date • Cost			X
Documentation of model number and quantity of equipment			X

Supporting Content

RTF Unit Energy Savings (UES) Measures

Payment

Payments are per thermostat unit as listed in the table below:

MEASURE CATEGORY	PAYMENT
All Heating Zones: Existing single-family and multifamily	$18/unit

10.8.2 Advanced Smart Thermostats — BPA-Qualified

Basis for Energy Savings

The base case used to calculate energy efficiency savings for advanced smart thermostats are single-family, manufactured and multifamily homes with existing forced-air furnaces, or air and ground source heat pumps. The calculation of energy efficiency savings for smart thermostats utilized multiple runs of the Simplified Energy Enthalpy Model (SEEM) simulation engine, calibrated with results from a study of the performance of advanced smart thermostats in actual homes. It was combined with prototype house weightings to generate heating energy use for baseline and efficient cases for each heating system type and heating zone within the analysis.

BPA does not recommend smart thermostats be installed to control variable speed heat pumps as savings and compatibility are at this point uncertain.

BPA documentation requirements consider these factors. More detailed information is available on the RTF's UES Measures webpage.

Requirements and Specifications

Measures include smart thermostats for homes with electric forced-air furnace, air source heat pumps and ground source heat pumps as their primary system.

Advanced Smart thermostat measures are available through the following channels:

- Retail
- By Request
- Coupon or Instant Discount
- Direct Install
- Standard Rebate Payment

Please note: Items distributed in any distribution channel through Simple Steps or a successor BPA program will have separate refnos from those used for utility run programs.

These measures are available for existing and new construction single-family, manufactured, multifamily low-rise and multifamily mid/high-rise homes. Advanced smart thermostats (other than those claimed through the direct install distribution channel) can be installed by any individual. Advanced smart thermostats claimed through the direct install channel must meet installation requirements as listed in the Multisector Chapter.

Qualifying advanced smart thermostats must:

- Be listed on BPA's Smart Thermostat Qualified Products List;
- Have occupancy detection set to "on"; and
- Be set to the geographic location where the thermostat is located

Required Documents

Smart Thermostat Project Information Form

Supporting Content

RTF Unit Energy Savings (UES) Measures

BPA's Smart Thermostat Qualified Products List

Measure Distribution Log

In addition to the requirements above, thermostats controlling air source heat pumps must be programmed to recognize the existing heat pump system.

Thermostats that control cooling-only systems or dual-fuel heating systems (gas furnace and electric heat pump) are not eligible for an incentive.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
Completed Smart Thermostat Project information form for By Request, Direct Install and Standard Rebate Delivery Channels only. (Note, not required for Simple Steps, Coupon/ Instant Discount or Utility Retail channels)			X
See Measure distribution process (Section 12.2) for documentation requirements for each channel listed above			X

Payment

One smart thermostat per qualifying heating system with a limit of two per household, as listed in the table below:

MEASURE CATEGORY	RETAIL	BY REQUEST	COUPON OR INSTANT DISCOUNT	DIRECT INSTALL	STANDARD REBATE PAYMENT
	PAYMENT LEVELS FOR EACH DELIVERY CHANNEL APPLY TO BOTH BPA RUN PROGRAMS (SUCH AS SIMPLE STEPS) AND UTILITY OPERATED PROGRAMS.				
Advanced Smart Thermostat	$100	$100	$100	$125	$100

10.9 NEW CONSTRUCTION

10.9.1 New Northwest Energy Efficient Manufactured Housing (NEEM)

Basis for Energy Savings

The base case (pre-existing state) is a current manufactured home built in the Pacific Northwest, which tend to be slightly better than HUD code. The base case considers individual components including envelope, HVAC, lighting, appliances and water heating. Energy savings for a new, NEEM manufactured home are based on multiple analyses using the Simplified Energy Enthalpy Model (SEEM) simulation engine for baseline and efficient cases for a weighted average of five cities (to represent the Northwest). This is based on a prototype and heating/cooling system type for single prototype square footage. The output of this analysis is then divided into three heating/cooling zones, based on a weighted average of SEEM run results for the five locales. The SEEM model also accounts for interaction with the lighting power reduction of this measure.

BPA documentation requirements consider these factors. More detailed information is available on the RTF's UES Measures webpage.

Requirements and Specifications

Manufactured homes must be electrically heated, new and certified by the Northwest Energy Efficient Manufactured Housing Program (NEEM).

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information including unique site ID and address.	X		X
NEEM 1.1 or 2.0 certificate of compliance.			X

Payment

MEASURE CATEGORY	PAYMENT
NEEM 1.1 All Heating Zones	$1,200 per home
NEEM 2.0 All Heating Zones	$1,400 per home

Additional Information

New NEEM 1.1 or 2.0 Home payments are available for NEEM 1.1 and 2.0 versions.

Beginning in 2018, NEEM marketing materials will be updated to refer to NEEM 1.1 as ENERGY STAR and NEEM 2.0 as ENERGY STAR with NEEM+. Certification documents for both efficiency levels will continue to display the NEEM 1.1 or NEEM 2.0 nomenclature necessary for BPA compliance and reporting. However, market-facing materials may use the ENERGY STAR or ENERGY STAR with NEEM+ designation.

NEEM has an online tracking and certification system operated by Northwest Energy Works. Contact Northwest Energy Works at (888) 370-3277, ext. 102, for current information.

Supporting Content

RTF Unit Energy Savings (UES) Measures

Northwest Energy Efficient Manufactured Housing Website

10.9.2 Replacement of Pre-1976 Manufactured Home with New Northwest Energy Efficient Manufactured Housing (NEEM) Certified Home

Basis for Energy Savings

The base case (pre-existing state) is a manufactured home built before the 1976 HUD Manufactured Housing Code. Energy consumption estimates for the pre-1976 home are based on Residential Building Stock Assessment (RBSA) data and individual components including envelope, HVAC, lighting, appliances and water heating. Energy savings for a New Northwest Energy Efficient Manufactured Housing (NEEM) Manufactured Home are based on multiple analyses using the SEEM simulation engine for baseline and efficient cases for a weighted average of five cities (to represent the Northwest) based on prototype and heating/cooling system type for single prototype square footage. Output of this analysis is then divided into three heating/cooling zones based on a weighted average of SEEM run results for the five locales. The SEEM model also accounts for interaction with the lighting power reduction of this measure. Total energy savings is based on the difference between the estimated energy use of the pre-1976 home and the new NEEM 1.1 or NEEM 2.0 home. BPA documentation requirements consider these factors. More detailed information is available on the RTF's webpage.

Requirements and Specifications

Existing manufactured homes must have been built prior to 1976, be electrically heated and be occupied as a residence. The existing pre-1976 home must be decommissioned and disposed of and cannot be used as a dwelling unit once the new NEEM home is sited.

Replacement manufactured homes must be electrically heated, new and certified by the Northwest Energy Efficient Manufactured Housing (NEEM) program as a New NEEM 1.1 or 2.0 Home.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information including unique site ID and address.	X		X
NEEM 1.0 or 2.0 certificate of compliance.			X
Completed BPA Manufactured Home Replacement Project Documentation Form.			X

Payment

BPA will pay for replacement of a pre-1976 manufactured home with a new NEEM Certified Home on a per-replacement home basis.

MEASURE CATEGORY	PAYMENT
Replacement of Pre-1976 Manufactured Home with an electrically heated new NEEM 1.1 home. All heating zones.	$2,200 per home
Replacement of Pre-1976 Manufactured Home with an electrically heated new NEEM 2.0 home. All heating zones.	$2,500 per home

Required Documents

BPA manufactured Home Replacement Project Information Form

Supporting Content

RTF Unit Energy Savings (UES) Measures

Northwest Energy Efficient Manufactured Housing Website

Customers may claim high efficiency heating and thermostat measures in addition to this measure, but may not claim residential UES measures that could be found within the NEEM 1.1 or NEEM 2.0 specifications.

NEEM has an online tracking and certification system operated by Northwest Energy Works. Contact Northwest Energy Works (888) 370-3277, ext. 102, for current information.

Additional Information

Manufactured home replacement often occurs through the collaborative efforts of many organizations and is often not directly led by utilities or their agents. Customers may replace Pre-1976 Manufactured Homes with a new NEEM Certified Home themselves, or through a third-party, but must retain responsibility for compliance with measure requirements.

In addition to NEEM 1.1 and 2.0, and Replacement of Pre-1976 Manufactured Home with a New NEEM Certified Home, the following are available as alternative stand-alone measures in New Manufactured Homes. For requirements, specifications and payment levels, see the referenced section. Stand-alone measures may not be claimed in addition to NEEM 1.1 or 2.0 with the exception of high efficiency heating and thermostat measures.

ADDITIONAL MEASURES AVAILABLE FOR NEW MANUFACTURED HOMES	LOCATION IN IMPLEMEMTATION MANUAL
Residential Lighting Fixtures	10.2
Residential Lighting	10.2
Clothes Washers	10.4
Clothes Dryers	10.4
Showerheads	10.5.1
Thermostatic Shut-Off Valves	10.5.2
Aerators	10.5.3
Heat Pump Water Heaters: All Tiers	10.5.4, 10.5.5
Ductless Heat Pumps	10.7.1
Air Source Heat Pumps	10.7.2.1 - 10.7.2.3, 10.7.4, 10.7.5
Some Types of Thermostats (see thermostat section for details)	10.8

10.9.3 Single-Family New Construction Performance Path

Basis for Energy Savings

The base case (pre-existing state) is a code minimum home for Idaho, Montana, Oregon or Washington. Energy savings for the Single-Family New Construction Performance Path is based on RTF-Approved New Homes Standard Protocol. BPA requirements also integrate the NW Modeling Requirements and RTF Unit Energy Savings (UES) Measures through the AXIS Database.

When state energy codes are updated, base case homes for each state will be updated, which may result in a reduction in potential energy savings and payment.

Required Documents

Axis Database generated Performance Path Calculator Summary Report

Supporting Content

RTF Unit Energy Savings (UES) Measures

Performance Path Website

The Single-Family New Construction Performance Path utilizes REM/Rate, RTF UES Measures, and the NEEA-maintained AXIS database to compare the modeled energy consumption of a new home to the modeled energy consumption of a typical code-built home. This will allow a customer to request a payment based on the energy savings of the new home, compared to the code home. Calculations are performed by the AXIS database, which provides a report with required documentation to customers.

Requirements and Specifications

Homes must be new, single-family homes. Individual dwelling units in buildings that meet the BPA definition of single-family, which contain more than one dwelling unit, must be modeled separately and will receive a payment for each individual dwelling unit. This measure is available for all heating zones in all states.

Homes must be modeled in REM/Rate according to the NW Modeling Requirements, and uploaded to the AXIS database for calculation and addition of energy savings from RTF UES measures.

In order to qualify for payment, the total combined energy savings of the home as reported in AXIS must be a minimum of 10% more efficient than the code-built reference home.

The AXIS-reported energy savings must be documented through the Performance Path Calculator Summary Report, and the savings and associated payment from the calculator must be entered manually into the BPA UES Measure Upload Template in the calculator results fields.

Customers may not request payments for individual UES Measures, or the Montana House Specification and the Single-Family New Construction Performance Path in the same new home.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information, including unique site ID and address	X		X
AXIS database generated Performance Path Calculator Summary Report			X

Payment

BPA shall pay for Single-Family New Construction Performance Path on a kilowatt-hour-saved basis according to the table below:

ENERGY SAVINGS CATEGORY	PAYMENT PER KWH SAVED
Shell Upgrades, including Windows	$0.45
HVAC and Water Heating Upgrades	$0.27
Appliance Upgrades	$0.27
Lighting Upgrades, including Fixtures, Showerheads and Smart Thermostats	$0.10

Additional Information

For the Single-Family New Construction Performance Path, the permit date is the date to be used to determine code compliance for construction.

The Performance Path Calculator Summary Report is generated by the AXIS database that has fields similar to the BPA UES Measure Upload Template and contains specific reporting information necessary for savings reliability as well as additional information necessary for measure evaluation. AXIS-generated energy savings must be entered manually into the "Calculator Results" columns within the BPA UES Measure Upload Template. Please contact NEEA for more information on accessing the Summary Report. For more information on how to access this report, visit betterbuiltnw.com.

This measure is supported by NEEA. For assistance or questions on REM/Rate, becoming a rater or AXIS, visit betterbuiltnw.com.

10.9.4 Montana House (v 2.0)

Basis for Energy Savings

The base case (pre-existing state) is a code-minimum home for Montana. Energy savings for the Montana House is based on the upgrades over a code-minimum home based on the Montana House v 2.0 Program Specifications (RTF, 2015). It was modeled through multiple runs with the SEEM simulation engine for baseline and efficient cases for homes with and without basements. SEEM analysis was performed for each foundation type, and takes into account the interaction with lighting and ventilation components. Upgrades to HVAC efficiency are additive for the Montana House new construction measures.

BPA documentation requirements consider these factors. More detailed information is available on the RTF's UES Measures webpage.

Requirements and Specifications

Homes must be new, electrically heated and compliant with the Montana House v 2.0 specification (available in the IM Document Library). This measure is available only for single-family new construction homes built in Montana, and Heating Zones 2 and 3 in Idaho, Wyoming and Nevada.

Air Source Heat Pump, Variable Speed Heat Pump, Ground Source Heat Pumps (with or without desuperheater), Ductless Heat Pumps and Commissioning and Controls may be combined with the shell upgrade measures for the Montana House. See the appropriate measure section for requirements. Note that the Commissioning, Controls and Sizing measures may not be claimed in combination with any other heat pump measure.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information including unique site ID and address.	X		X
New Home Details including: • HVAC system details (type of equipment, ventilation system and specific measures installed including rated CFM) • Foundation type • Home square footage			X

Supporting Content

Montana House v2.0 Specifications

RTF Unit Energy Savings (UES) Measures

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
Documentation Report of inspections performed by the customer, including any substantial findings and documentation of any corrective actions taken			X
Documentation Requirements for HVAC options per the Ducted Systems section			X

Payment

BPA shall pay for the Montana House as indicated below. Air Source Heat Pump, Variable Speed Heat Pump, Ground Source Heat Pumps (with or without desuperheaters), Commissioning, and Controls and Sizing payments can be combined with the shell upgrade payment. To report heating measures, report stand-alone measures and use stand-alone measure reference numbers. Heating measures must follow the requirements and specifications in the appropriate section above.

MEASURE CATEGORY	PAYMENT
Montana House Shell Upgrade	$1,500
Montana House Shell Upgrade (with Ground Source Heat Pump).	$500

For the Montana House, the permit date is the date to be used to determine code compliance for construction.

In addition to the Single-Family New Construction Performance Path and Montana House, the following measures are available as alternative stand-alone measures in New, Single-Family Homes. For requirements and specifications and payment levels, see the referenced section. Stand-alone measures may not be claimed in addition to the Single-Family New Construction Performance Path or Montana House.

ADDITIONAL MEASURES AVAILABLE FOR NEW, SINGLE-FAMILY CONSTRUCTION	LOCATION IN IM
Residential Lighting Fixtures	10.2
Residential Lighting	10.2
Clothes Washers	10.4
Clothes Dryers	10.4
Showerheads	10.5
Thermostatic Shut-Off Valves	10.5.2
Aerators	10.5.3
Heat Pump Water Heaters: All tiers	10.5.4, 10.5.5
Ductless Heat Pumps (ID, MT, OR only)	10.7.1

ADDITIONAL MEASURES AVAILABLE FOR NEW, SINGLE-FAMILY CONSTRUCTION	LOCATION IN IM
HVAC Ducted Systems (including Air Source Heat Pumps and Ground Source Heat Pumps)	10.7.2
Some Types of Thermostats (see thermostat section for details)	10.8

10.9.5 BPA Energy Efficient New Multifamily Construction (BPA-Qualified)

Basis for Energy Savings

The base case (pre-existing state) is a representative sample of dwelling units built to the 2015 Washington Energy Code. Energy savings for this measure is based on SEEM analysis of efficiency improvements needed to exceed the code by at least 10% resulting in a dwelling unit that is a minimum of 10% more efficient than code. Energy savings for each state is adjusted for the applicable state code and climate zones. This model takes into account interaction with lighting and ventilation components, and whole house energy savings specific to electric components.

Requirements and Specifications

BPA maintains a Qualified Programs List of certification programs and pathways that qualify for BPA Energy Efficient New Multifamily Construction payments, which have been pre-approved by BPA as reliably achieving a minimum of 10 percent energy savings over the 2015 Washington Energy Code. When state energy codes are updated, certification programs that no longer achieve 10% energy savings over the new energy code will be removed from the Qualified Programs List. Programs and pathways must be on the Qualified Programs List in order to qualify for this payment, and remain a minimum of 10% above Washington Energy Code to remain on the List for any state.

This measure is for individual dwelling units in new, multifamily low-rise and mid/high-rise construction in all states. Not all certifications and pathways on the BPA Energy Efficient New Multifamily Construction Qualified Programs List may be utilized for both low-rise and mid/high-rise multifamily construction. Consult the individual certification program or pathway requirements to determine each program's eligibility. Customers may claim one incentive per dwelling unit. For BPA Energy Efficient New Multifamily Construction, the permit date is the date to be used to determine code compliance for construction.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information including unique site ID and address	X		X
Certificate documenting that the individual dwelling unit meets or exceeds the requirements of a certification listed on the BPA Energy Efficient New Multifamily Construction Qualified Programs List			X
Completed New Multifamily Construction Project Information Form			X

Required Documents

New Multifamily Construction Project Information Form

Supporting Content

New Multifamily Construction Qualified Programs List

Requirements for Inclusion on Multifamily Qualified Products List

Payment

MEASURE CATEGORY	PAYMENT PER DWELLING UNIT
BPA Energy Efficient New Multifamily Construction, all electric	Washington $350; All Other states $450

10.9.6 BPA Zero Energy Ready New Multifamily Construction (BPA-Qualified)

Basis for Energy Savings

The base case (pre-existing state) is a representative sample of dwelling units built to the 2015 Washington Energy Code. Energy savings for this measure is based on SEEM analysis of efficiency improvements needed to exceed the code by at least 25% resulting in a dwelling unit that is a minimum of 25% more efficient than code. Energy savings for each state is adjusted for the applicable state code and climate zones. This model takes into account interaction with lighting and ventilation components, and whole house energy savings specific to electric components.

Requirements and Specifications

BPA maintains a Qualified Programs List of certification programs and pathways that qualify for BPA Zero Energy Ready New Multifamily Construction payments, which have been pre-approved by BPA as reliably achieving a minimum of 25% energy savings over the 2015 Washington Energy Code. When state energy codes are updated, certification programs that no longer achieve 25% energy savings over the new energy code will be removed from the Qualified Programs List. Programs and pathways must be on the Qualified Programs List in order to qualify for this payment and remain a minimum of 25% above Washington Energy Code to remain on the List for any state.

This measure is for individual dwelling units in new, multifamily low-rise and mid/high-rise construction in all states. Not all certifications and pathways on the BPA Zero Energy Ready New Multifamily Construction Qualified Programs List may be utilized for both low-rise and mid/high-rise multifamily construction. Consult the individual certification program or pathway requirements to determine each program's eligibility. Customers may claim one incentive per dwelling unit. For BPA Zero Energy Ready Multifamily Construction the permit date is the date to be used to determine code compliance for construction.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information including unique site ID and address.	X		X
Certificate documenting that the individual dwelling unit meets or exceeds the requirements of a certification listed on the BPA Zero Energy Ready New Multifamily Construction Qualified Programs List			X
Completed New Multifamily Construction Project Information Form			X

Required Documents

New Multifamily Construction Project Information Form

Supporting Content

New Multifamily Construction Qualified Programs List

Requirements for Inclusion on Multifamily Qualified Products List

Payment

MEASURE CATEGORY	PAYMENT PER DWELLING UNIT
BPA Zero Energy Ready, Multifamily Construction, all electric	Washington $900; All other states $1,100

Additional Information

In addition to the Energy Efficient New Multifamily Construction and BPA Zero Energy Ready New Multifamily Construction measures, the following are available as alternate stand-alone measures in New, Multifamily Construction. For requirements, specifications and payment levels, see the referenced section. Stand-alone measures are not available in addition to Energy Efficient New Multifamily Construction or BPA Zero Energy Ready New Multifamily Construction measures.

ADDITIONAL MEASURES AVAILABLE FOR NEW, MULTIFAMILY CONSTRUCTION	LOCATION IN IM
Residential Lighting Fixtures	10.2
Residential Lighting	10.2
Clothes Washers	10.4
Clothes Dryers	10.4
Showerheads	10.5.1
Thermostatic Shut-Off Valves	10.5.2
Aerators	10.5.3

10.10 WEATHERIZATION (STANDARD INCOME)

Weatherization Eligibility Table

PRIMARY RESIDENTIAL HEATING SYSTEM	HOME TYPE				
	SINGLE-FAMILY: EXISTING	SINGLE-FAMILY: NEW	MANUFACTURED: EXISTING*	MANUFACTURED: NEW	MULTIFAMILY: EXISTING*
Electric Forced-Air Furnace	Eligible	Not eligible	Eligible	Not eligible	Eligible
Ducted Heat Pump	Eligible		Eligible		Eligible
Ductless Mini-Split Heat Pump	Eligible		Eligible		Eligible
Zonal (Electric)	Eligible		Eligible		Eligible
Wood or Pellet	Eligible when accompanied by any electric heating system		Eligible when accompanied by any electric heating system		Eligible when accompanied by any electric heating system
Oil/Gas/Propane	Eligible as supplementary heat for a heat pump system. Eligible if accompanied by an electric heat system, however, the nonelectric heating system must be decommissioned.		Eligible as supplementary heat for a heat pump system. Eligible if accompanied by an electric heat system, however, the nonelectric heating system must be decommissioned		Eligible as supplementary heat for a heat pump system. Eligible if accompanied by an electric heat system, however, the nonelectric heating system must be decommissioned
None existing	Not eligible		Not eligible		Not eligible

*Note: Not all weatherization measures are available in manufactured homes and/or both low-rise and mid/high-rise multifamily housing. Refer to individual measure sections for more detail.

For the purposes of section 10.10 and associated weatherization measures, an electric heating system includes an air source heat pump, ground source heat pump, electric forced-air furnace, ductless or ducted mini-split heat pump, zonal electric-resistance heat or plug-in space heaters.

Weatherization measures include insulation, prime window replacement, Low-E storm windows, exterior insulated doors and air sealing. All weatherization measures in single-family and manufactured homes must be installed according to the 2016 BPA Residential Weatherization Specifications in the IM Document Library.

Weatherization measures must be installed in homes with an electric heating system as the primary system (serving 50% or more of the conditioned living area of a residence) or the homes must have one of the following as an existing heating system:

1. A permanently installed electric heating system with either a wood stove, pellet stove, fireplace, fireplace insert (wood or pellet) or wood furnace

Supporting Content

2016 BPA Residential Weatherization Specifications

IM Document Library

RTF Unit Energy Savings (UES) Measures

Interim Solution 2.0 Files - UES Measure List

Optional Weatherization Data Collection Form

2. A wood or pellet stove with no other nonelectric space heating system, accompanied by the current usage of plug-in electric space heaters

3. An electric heat pump system integrated with a nonelectric heating system (e.g., natural gas, propane or wood supplementary/backup system)

4. An electric heat system and a separate nonelectric space heating system (i.e., oil, natural gas or propane furnace) with the entire functional or nonfunctional nonelectric space heating system decommissioned, removed, all penetrations sealed and all fuel (electric, gas or oil) connections to the decommissioned heating system disconnected. System equipment includes furnace, air-handler, fuel lines and fuel tanks (abated in compliance with local code). If, however, construction limitations prevent the removal of the entire nonelectric system (or other portions of the space heating equipment), then the remainder of the system must be decommissioned, removed, all penetrations sealed and all fuel (electric, gas or oil) connections to the decommissioned heating system disconnected.

10.10.1 Insulation

Basis for Energy Savings

The base case (pre-existing state) is defined as a range of R-values for a building component before insulation is installed. The efficient case for insulation measures is defined as meeting a minimum insulation R-value in that building component. Energy savings for insulation measures are estimated using SEEM, an energy modeling software calibrated to real world energy consumption using prototype homes representative of Northwest construction, assuming that all other weatherization measures have been installed in the home. "Any Electric Heat" measures are a weighted average of homes with an electric furnace, electric zonal or a heat pump based on the RBSA. Savings are reduced by the percentage of heat supplied by supplemental fuels for an average home.

BPA documentation requirements consider these factors. More detailed information is available on the RTF's UES Measures webpage.

Requirements and Specifications

Insulation measures in single-family and manufactured homes must be installed according to the 2016 BPA Residential Weatherization Specifications found in the IM Document Library. Final installed R-values for a reportable measure must meet the required final R-value at a minimum, unless a physical barrier prevents the full depth of insulation from being installed.

Note that the sloped surface of an A-frame home (the entire roof structure) must be insulated and invoiced as an unvented attic (see section 4.6 Unvented Attics in the BPA Residential Weatherization Specifications).

HOME TYPE	INSULATION	OBSERVED EXISTING INSULATION RANGE	MEASURE STARTING R-VALUE	MEASURE ENDING R-VALUE
Single-Family	Attic	R-0 to R-7	R-0	R-38 or R-49
		R-8 to R-11	R-11	R-38 or R-49
		R-12 to R-19	R-19	R-38 or R-49
		R-20 to R-30	R-30	R-38 or R-49
		R-31 to R-38	R-38	R-49
	Floor	R-0 to R-11*	R-0	R-19, R-25, or R-30
		R-12* to R-19	R-19	R-30
	Wall	No insulation present	R-0	R-11
Manufactured Home	Attic	R-0 to R-7	R-0	R-22 or maximum possible
		R-0 to R-11	R-0	R-30 or maximum possible
		R-12 to R-17	R-11	R-30 or maximum possible
	Floor	R-0 to R-7	R-0	~~R-11,~~ R-22 or maximum possible
		R-8 to R-11	R-11	R-22 or maximum possible
Multifamily Low-Rise	Attic	R-0 to R-11*	R-0	R-19, R-38, or R-49
		R-12* to R-19	R-19	R-38 or R-49
		R-20 to R-38	R-38	R-49
	Floor	R-0 to R-11*	R-0	R-19 or R-30
		R-12* to R-19	R-19	R-30
	Wall	No insulation present	R-0	R-11
Multifamily Mid-/ High-Rise	Attic	R-0 to R-5	R-0	R-19
	Attic	R-0 to R-5	R-0	R-49
	Wall	R-0 to R-5	R-0	R-11
	Wall	R-0 to R-5	R-0	R-19

*Precondition definitions were modified for consistency across building types, where possible.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information, including unique site ID and address.	X		X
Equipment or contractor invoice showing: 1. Order or purchase date 2. Cost			X
Documentation that the measure requirements have been met (e.g., manufacturer, model number, type, size and quantity of equipment or product installed or used)			X
Documentation of pre- and post-insulation R-values, and square footage of installed insulation			X
Description of home type (single-family, multifamily or manufactured)			X
Description of primary heating type			X

Payment

Payments and busbar energy savings for specific measures are available in the UES Measure List in the Interim Solution 2.0 Files. Payments are available for HVAC-specific primary heat types or by reporting Any Electric Heat.

Additional Information

The Any Electric Heat measures assume a weighted average of reported measures. Utilities that report single-family insulation to the Any Electric measures should not also use the HVAC-specific measures on the same invoice submitted to BPA. Utilities may switch to Any Electric if reporting to the HVAC-specific measures delivers little benefit or they would like to claim higher payments.

10.10.2 Prime Window and Patio Door Replacement

Basis for Energy Savings

The base case (pre-existing state) is a single-pane window or patio door with any frame type, or a double-pane window or patio door with a metal frame. The efficient case for prime window replacement measures is the U-factor for the efficient replacement window. Energy savings for prime window replacement measures are estimated using SEEM, an energy modeling software calibrated to real world energy consumption using prototype homes representative of Northwest construction, assuming that all other weatherization measures have been installed in the home. "Any Electric Heat" measures are a weighted average of homes with an electric furnace, electric zonal or a heat pump based on the RBSA. Savings are reduced by the percentage of heat supplied by supplemental fuels for an average home.

BPA documentation requirements consider these factors. More detailed information is available on the RTF's UES Measures webpage.

Supporting Content

Optional Windows Calculator

Optional Weatherization Data Collection Form

Requirements and Specifications

- Pre-existing windows and patio doors must be: (1) single-pane with/without storms, any frame type (e.g., metal, wood or vinyl) or (2) double-pane, metal frame only.
- The weighted average of replacement windows must have a National Fenestration Rating Council (NFRC) minimum U-value of 0.30 or 0.22 for windows, and 0.35 or 0.30 for patio doors.
- ~~Multifamily mid/high-rise buildings are not eligible for patio door replacement.~~
- Window and patio door measures in single-family and manufactured homes must be installed according to the 2016 BPA Residential Weatherization Specifications found in the IM Document Library.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information, including unique site ID and address.	X		X
Equipment or contractor invoice showing: 1. Order or purchase date 2. Cost			X
Documentation that the measure requirements have been met (e.g., manufacturer, model number, type, size and quantity of equipment or product installed or used)			X
NRFC stickers or other verification of U-value			X
Documentation of: • Number and square footage of windows or patio doors replaced • Pre-condition (frame type, i.e., wood, metal, single or double-pane) • Post-condition U-value			X
Description of home (single-family, multifamily or manufactured)			X
Description of primary heating type			X

BPA maintains an optional windows project information form that documents windows requirements on a single page. Use of the form is optional. The form is available in the IM Document Library.

Payment

PAYMENT (PER SQUARE FOOT)				
Single-Family	Single-pane window, any frame type or double-pane window, metal frame type.	0.30	Any Electric	$6
			EFAF	$4
			Zonal/DHP	$3
			Ducted HP	$2
	Single-pane patio door, any frame type or double-pane patio door, metal frame type.	0.35	Any Electric	$6
			EFAF	$4
			Zonal/DHP	$3
			Ducted HP	$2
	Single-pane window, any frame type or double-pane window, metal frame type.	0.22	Any Electric	$8
			EFAF	$5
			Zonal/DHP	$4
			Ducted HP	$3
	Single-pane patio door, any frame type or double-pane patio door, metal frame type.	0.30	Any Electric	$8
			EFAF	$5
			Zonal/DHP	$4
			Ducted HP	$3
Manufactured	Single-pane window, any frame type or double-pane window, metal frame type.	0.30	Any Electric	$6
	Single-pane patio door, any frame type or double-pane patio door, metal frame type.	0.35	Any Electric	$6
	Single-pane window, any frame type or double-pane window, metal frame type.	0.22	Any Electric	$8
	Single-pane patio door, any frame type or double-pane patio door, metal frame type.	0.30	Any Electric	$8
Multifamily	Single-pane window, any frame type or double-pane window, metal frame type.	0.30	Any Electric	$12
	Single-pane patio door, any frame type or double-pane patio door, metal frame type.	0.35	Any Electric	$12
	Single-pane window, any frame type or double-pane window, metal frame type.	0.22	Any Electric	$16
	Single-pane patio door, any frame type or double-pane patio door, metal frame type.	0.30	Any Electric	$16
Multifamily Mid-/ High-Rise	Single-pane window, any frame type or double-pane window, metal frame type.	0.30	Any Electric	$6–$12

Additional Information

The Any Electric Heat measures assume a weighted average of reported measures. Utilities who report single-family windows to the Any Electric measures should not also use the HVAC-specific measures on the same invoice submitted to BPA. Utilities may switch to Any Electric if reporting to the HVAC-specific measures delivers little benefit or they would like to claim higher payments.

Rough opening sizes (used for the purposes of estimates) for windows and patio doors are often 105 – 110% of actual window order dimensions. As a result, the square footage provided by contractors for cost estimates may overestimate the actual window square footage. BPA allows up to 10% variance between rough opening sizes and total final invoiced window dimensions to account for variability. For assistance calculating window measurements please utilize the Optional Windows Calculator or Windows Worksheet on page 2 of the Optional Weatherization Data Collection Form.

10.10.3 Low-E Storm Windows

Basis for Energy Savings

The base case (pre-existing state) is a single-pane window with any frame type, or a double-pane window with a metal frame without existing storm windows. The efficient case for the replacement Low-E storm and prime window system is the combined U-factor for the combined storm window and pre-existing window. ENERGY STAR certified storm windows must meet the emissivity, solar transmittance (Tsol), and air leakage requirements based on climate zone. Energy savings for Low-E storm window installation measures are estimated using SEEM, an energy modeling software calibrated to real world energy consumption using prototype homes representative of Northwest construction. More detailed information is available on the RTF's UES Measures webpage.

Requirements and Specifications

This measure is not available for mid/high-rise multifamily buildings.

Pre-existing windows must be either (1) single-pane, any frame type (e.g., metal, wood or vinyl) without existing storm windows; or (2) double-pane, metal frame only without existing storm windows. The new Low-E storm window must be an ENERGY STAR certified product.

The Low-E storm window must have the same opening type as the existing prime window (i.e., single/double hung, casement, slider, etc.) to facilitate summertime ventilation and egress. If installed with an existing metal frame window, the storm window frame must not be in direct contact with the metal frame (attach using framing lumber or furring strips). The Low-E storm window must be installed per manufacturer's specification, fastened by screws, not designed for seasonal removal, and with the Low-E coating facing toward the home's interior.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information, including unique site ID and address.	X		X
Equipment or contractor invoice showing: 1. Order or purchase date 2. Cost			X
Documentation that the measure requirements have been met (e.g., manufacturer, model number, type, size and quantity of equipment or product installed or used)			X

Supporting Content

ENERGY STAR Certified Storm Windows

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
A copy of the ENERGY STAR product list showing the product or the product information insert or packaging that includes the ENERGY STAR logo. (In the event that ENERGY STAR specifications change, BPA will accept pre-existing models that were ENERGY STAR-Qualified at the time they were manufactured.)			X
Documentation of: • Number and square footage of storm windows installed; and • Pre-condition (frame type, i.e., wood, metal, single or double pane)			X
Description of home (single-family, multifamily low-rise or manufactured)			X

Payment

MEASURE CATEGORY	PAYMENT
ENERGY STAR certified Low-E Storm Window Single-pane any frame type, or double-pane metal frame	$2 per Square Foot

Additional Information

Installing Low-E storm windows with windows of the same opening type can be difficult when the prime window is a casement or awning style. For these prime window types, installation of a new prime window may be preferable over the addition of a Low-E storm window.

10.10.4 Exterior Insulated Doors (BPA-Qualified)

Basis for Energy Savings

The base case (pre-existing state) is a substandard exterior door, such as one that does not contain an insulating material or one where the weather stripping has degraded by at least 50%. The efficient case for an Insulated Exterior Door is a prehung, ENERGY STAR door. Energy savings come from the improvement to the building envelope and the reduction of infiltration. BPA documentation requirements consider these factors for this BPA-Qualified measure.

Requirements and Specifications

This measure is not available for multifamily mid/high-rise.

The door must be a pre-hung, ENERGY STAR-Qualified door, include replacement of the threshold, and replace an uninsulated or otherwise substandard (from a thermal perspective) exterior door.

If the door is not ENERGY STAR certified, or the ENERGY STAR list is not accessible, utilities may comply by documenting that the door meets ENERGY STAR specifications:

Supporting Content

ENERGY STAR Residential Doors

EXTERIOR INSULATED DOORS		
GLAZING LEVEL	U-FACTOR	SOLAR HEAT GAIN COEFFICIENT
Opaque	≤ 0.17	No Rating
≤ ½-Lite	≤ 0.25	≤ 0.25
>½-Lite	≤ 0.30	≤ 0.40

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information, including unique site ID and address.	X		X
Equipment or contractor invoice showing: 1. Order or purchase date 2. Cost			X
Documentation that the measure requirements have been met (e.g., manufacturer, model number, type, size and quantity of equipment or product installed or used)			X
A copy of the ENERGY STAR product list showing the product or the product information insert or packaging that includes the ENERGY STAR logo. (In the event that ENERGY STAR specifications change, BPA will accept pre-existing models that were ENERGY STAR-Qualified at the time they were manufactured.). If the door is not ENERGY STAR certified, or the ENERGY STAR list is not accessible, utilities may comply by documenting that the door meets ENERGY STAR specifications documented above.			X
Documentation of the doors replaced and pre- and post-conditions			X
Description of home (single-family, multifamily low-rise or manufactured)			X

Payment

MEASURE CATEGORY	PAYMENT
Exterior Insulated Doors	$40 per door

10.10.5 Whole House Air Sealing and Testing

Basis for Energy Savings

Whole House Air Sealing is an incremental improvement in leakage of a home, measured with a blower door. Energy savings for Whole House Air Sealing are estimated using SEEM, an energy modeling software calibrated to real world energy consumption, assuming all other weatherization measures have been installed in the home. "Any Electric Heat" measures are a weighted average of homes with an electric furnace, electric zonal or a heat pump based on the RBSA. Savings are reduced by the percentage of heat supplied by supplemental fuels for an average home.

BPA documentation requirements consider these factors. More detailed information is available on the RTF's UES Measures webpage.

Requirements and Specifications

This measure is not available in multifamily homes.

Whole house air sealing requires the use of a blower door to measure and identify air leakage locations in the home. Mechanical ventilation may be required.

If Performance Tested Comfort System (PTCS) duct sealing is performed at the same time as air sealing, the baseline blower door CFM50 reading for the whole house air sealing and testing measure must be taken with all the supply and return duct registers temporarily sealed off, so that house air leakage can be measured independently from duct leakage.

If combustion appliances are present (e.g., fireplace, wood or gas stove, gas range, gas water heater), a UL- or CUL-approved carbon monoxide detector must be present or be installed.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information, including unique site ID and address.	X		X
Equipment or contractor invoice showing: 1. Order or purchase date 2. Cost			X
Documentation that the measure requirements have been met (e.g., manufacturer, model number, type, size and quantity of equipment or product installed or used)			X
Documentation of the following conditions are required: • Pre- and post-conditions CFM (CFM at 50 Pascals) • Total square footage of the pressure zone tested and sealed (typically this is the conditioned, interior space heated floor area of the home) • Building volume • Notes on mechanical ventilation requirement • Age and description of home type (single-family or manufactured)			X
A description of primary heating type			X

Payment

BPA payment is based on the reduction in air infiltration per reduction in CFM50, rounded to the nearest whole number. Payments and busbar energy savings are available in the UES Measure List in the Interim Solution 2.0 Files.

Total Payment = Quantity x Payment

Quantity = Difference between pre-and-post CFM50

10.10.6 Prescriptive Air Sealing

Basis for Energy Savings

Prescriptive Air Sealing is an incremental improvement in the leakage of a home. Leakage reductions are based on the attic or crawlspace portion of an average Whole House Air Sealing project. Energy savings for Prescriptive Air Sealing are estimated using SEEM, an energy modeling software calibrated to real world energy consumption, assuming that all other weatherization measures have been installed in the home. "Any Electric Heat" measures are a weighted average of homes with an electric furnace, electric zonal or a heat pump based on the RBSA. Savings are reduced by the percentage of heat supplied by supplemental fuels for an average home.

BPA documentation requirements consider these factors. More detailed information is available on the RTF's UES Measures webpage.

Requirements and Specifications

This measure is not available for multifamily or manufactured homes.

Prescriptive air sealing must be performed according to the BPA Residential Weatherization Specifications in the IM Document Library.

If combustion appliances are present (e.g., fireplace, wood or gas stove, gas range, gas water heater), a UL- or CUL-approved carbon monoxide detector must be present or be installed.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS			
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	PTCS SITE REGISTRY	CUSTOMER FILE
End-user identifying information, including unique site ID and address.	X			X
Contractor invoice showing: 1. Order or purchase date 2. Cost				X
Documentation that the measure requirements have been met (e.g., manufacturer, model number, type, size and quantity of product installed or used)				X
Documentation of square footage of area air sealed (attic and/or crawlspace) and the age of home				X

Payment

Payments and busbar energy savings are available in the UES Measure List in Interim Solutions 2.0 Files are based on the square footage of the area where prescriptive air sealing is performed.

10.10.7 Low-Income Energy Efficiency Measures

Low-income household eligibility is defined in the Federal Weatherization Assistance Program as 200 percent of the poverty income levels. Approved, statewide eligibility definitions may substitute for federally established low-income levels, if provided.

At least 50% of households in two-, three- and four-unit dwellings must income qualify (one household in a two-unit dwelling, two households in a three-unit dwelling, two households in a four-unit dwelling) in order for the weatherization of the entire building to qualify for low-income payments. Utilities, however, may set more stringent requirements at their discretion.

For multifamily properties with five or more units, a minimum of 50% of the households must income qualify in order for the weatherization of the entire building or complex to qualify for low-income payments. Utilities, however, may set more stringent requirements at their discretion.

Customers shall retain documentation of the total number of individuals in the household and proof that the end user's income eligibility was reviewed from a verifiable source. Verifiable refers to any documentation that can be verified by another source, such as a pay stub, copies of IRS form 1040, Section 8 eligibility, certification by a CAP agency, certification by LIHEAP administrator, etc.

Customers may use the eligible measures listed below to run low-income weatherization programs themselves, through an implementation firm or Community Action Agency, but must retain responsibility for and control over the program.

Basis for Energy Savings

The basis for energy savings for measures can be found in each of the measure sections above for the corresponding measures.

Requirements and Specifications

All existing housing types (single-family, manufactured and multifamily) are eligible for low-income measures, although not all measures are applicable to each housing type. See the table below for available measures.

Low-income weatherization measures include insulation, prime windows and patio doors, Low-E storm windows, exterior insulated doors, ductless and air source heat pumps, heat pump water heating, smart thermostats, PTCS or prescriptive duct sealing and whole house air sealing. Requirements and specifications for each measure can be found in each of the measure sections above for the corresponding measures. When a BPA-Qualified products list applies to the measure, the technology must be on the BPA-Qualified products list to qualify for payment.

All weatherization measures in single-family and manufactured homes must be installed according to the 2016 BPA Residential Weatherization Specifications in the IM Document Library and follow the specification, requirements and documentation requirements as listed under the appropriate sections (Standard Income) above.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS			
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	PTCS SITE REGISTRY	CUSTOMER FILE
End-user identifying information, including unique site ID and address	X			X
Documentation of total number of individuals in the household, and documentation that the end user's income eligibility was reviewed from a verifiable source (e.g., paystub, Section 8 voucher, etc.).				X
Equipment or contractor invoice showing: 1. Order or purchase date 2. Cost of installed measures 3. Cost of any related repairs				X
Documentation that the measure requirements have been met (e.g., manufacturer, model number, type, size and quantity of equipment or product installed or used)				X
Description of home type (single-family, multifamily low-rise, multifamily mid/high-rise or manufactured)				X
Insulation (if installed): square feet and pre- and post-R-value documentation				X
Prime window or patio door: • Number and square footage of windows or patio doors replaced • Pre-condition (frame type, i.e., wood, metal, single or double-pane) • NFRC stickers or other verification of U-values				X
Exterior insulated doors: Documentation of number of doors replaced and pre- and post-conditions				X

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS			
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	PTCS SITE REGISTRY	CUSTOMER FILE
Low-E Storm Window: A copy of the ENERGY STAR product list showing the product or the product information insert or packaging that includes the ENERGY STAR logo				X
Ductless Heat Pumps: DHP Project Installation Form				X
PTCS or Prescriptive Duct Sealing Form (handwritten form completed by technician)				X
PTCS/prescriptive duct sealing information entered into the PTCS Site Registry			X	X
PTCS site registry measure ID			X	X
Smart Thermostat Project Information Form				X

Payment

BPA allows customers to report costs directly attributable to the installation of the measure as eligible for dollar-for-dollar payment (except as noted in the table below, not to exceed 100% of the actual cost). This includes any cost incurred for meeting requirements and specifications (e.g.,verification of income, attic and crawl space ventilation, removal of knob and tube wiring and underfloor moisture barriers).

Customers may also report costs related to repair work that is directly associated with the installation of the measure required for health and safety, or to ensure the efficacy of the measure (e.g., replace rotting wood in window frame, or repair a hole in the roof). Repair costs must be documented on contractor invoices and reported separately.

Customers may combine funding sources within a residence, but may not combine funding from multiple BPA sources for the same measure.

HOME TYPE	LOW-INCOME QUALIFYING MEASURE	INSTALLED MEASURE COST PAYMENT - DOLLAR-FOR-DOLLAR (EXCEPT AS NOTED)	REPAIR COST PAYMENT - DOLLAR-FOR-DOLLAR (EXAMPLES PROVIDED)
Single-Family	Attic Insulation (up to R-49)	Dollar-for-dollar	Examples include: Repair roof leak, rebuild external entrance covering and fix hole in siding
	Floor Insulation (up to R-30)	Dollar-for-dollar	
	Wall Insulation (up to R-11)	Dollar-for-dollar	
	Prime Window	Dollar-for-dollar, not to exceed $20/square foot	Examples include: Address dry rot in window framing, replace rotten threshold and repair cracked header
	Low-E Storm Window	Dollar-for-dollar, not to exceed $10/square foot	
	Patio Door	Dollar-for-dollar, not to exceed $20/square foot	
	Exterior Insulated Door	Dollar-for-dollar, not to exceed $400/door	
	Whole House Air Sealing	Dollar-for-dollar	Examples include: Reframe attic access hatch and repair pull-down stairs
	Prescriptive Air Sealing	Dollar-for-dollar	
	PTCS/Prescriptive Duct Sealing	Dollar-for-dollar, not to exceed $500	Examples include: Replace rusted duct work and repair broken filter slot
	Ductless or Ducted Mini-Split Heat Pump(s) or Ductless Heat Pump Upgrade	Dollar-for-dollar, not to exceed $3,800	Examples include: Improve structural support for interior head
	PTCS Heat Pump Upgrade or PTCS Heat Pump Conversion	Dollar-for-dollar, not to exceed $3,800	Examples include: Repair to damaged siding at connection point
	Tier 1 Heat Pump Water Heater	Dollar-for-dollar, not to exceed $1,360	Examples include: Replacement of plumbing connections at water heater
	Tier 2 or 3 Heat Pump Water Heater	Dollar-for-dollar, not to exceed $1,700	Examples include: Replacement of plumbing connections at water heater
	BPA Approved Smart Thermostat	Dollar-for-dollar, not to exceed $400	No repair costs allowed for this measure

HOME TYPE	LOW-INCOME QUALIFYING MEASURE	INSTALLED MEASURE COST PAYMENT - DOLLAR-FOR-DOLLAR (EXCEPT AS NOTED)	REPAIR COST PAYMENT - DOLLAR-FOR-DOLLAR (EXAMPLES PROVIDED)
Multifamily Low-Rise	Attic Insulation (up to R-49)	Dollar-for-dollar	Examples include: Repair roof leak, rebuild external entrance covering and fix hole in siding
	Floor Insulation (up to R-30)	Dollar-for-dollar	
	Wall Insulation (up to R-19)	Dollar-for-dollar	
	Prime Window	Dollar-for-dollar, not to exceed $20/square foot	Examples include: Address dry rot in window framing, replace rotten threshold and repair cracked header
	Low-E Storm Window	Dollar-for-dollar, not to exceed $10/ square foot	
	Patio Door	Dollar-for-dollar, not to exceed $20/square foot	
	Exterior Insulated Door	Dollar-for-dollar, not to exceed $400/door	
	BPA Approved Smart Thermostat	Dollar-for-dollar, not to exceed $400/door	No repair costs allowed for this measure
Multifamily Mid/High-Rise	Attic Insulation (up to R-49)	Dollar-for-dollar	Examples include: Repair roof leak, rebuild external entrance covering and fix hole in siding
	Wall Insulation (up to R-19)	Dollar-for-dollar	Examples include: Repair roof leak, rebuild external entrance covering and fix hole in siding
	Prime Window	Dollar-for-dollar, not to exceed $20/square foot	Examples include: Address dry rot in window framing, replace rotten threshold and repair cracked header
	BPA Approved Smart Thermostat	Dollar-for-dollar, not to exceed $400	No repair costs allowed for this measure
Manufactured	Attic Insulation (up to R-30)	Dollar-for-dollar	Examples include: Repair roof leak, rebuild external entrance covering
	Floor Insulation (up to R-22)	Dollar-for-dollar	
	Prime Window	Dollar-for-dollar, not to exceed $20/square foot	Examples include: Address dry rot in window framing, replace rotten threshold and repair cracked header
	Low-E Storm Window	Dollar-for-dollar, not to exceed $10/ square foot	
	Patio Door	Dollar-for-dollar, not to exceed $20/square foot	
	Exterior Insulated Door	Dollar-for-dollar, not to exceed $400/door	
	Whole House Air Sealing	Dollar-for-dollar	Examples include: Install whole house ventilation fan
	PTCS and Prescriptive Duct Sealing	Dollar-for-dollar, not to exceed $500	Examples include: Replace rusted ductwork and repair broken filter slot
	Ductless or Ducted Mini-Split Heat Pump(s) or Ductless Heat Pump Upgrade	Dollar-for-dollar, not to exceed $3,800/DHP	Examples include: Improve structural support for interior head
	PTCS Heat Pump Upgrade or PTCS Heat Pump Conversion	Dollar-for-dollar, not to exceed $3,800	Examples include: replacement of circuit breaker
	Tier 1 Heat Pump Water Heater	Dollar-for-dollar, not to exceed $1,360	Examples include: Replacement of plumbing connections at water heater
	Tier 2 or 3 Heat Pump Water Heater	Dollar-for-dollar, not to exceed $1,700	Examples include: Replacement of plumbing connections at water heater
	BPA Approved Smart Thermostat	Dollar-for-dollar, not to exceed $400	No repair costs allowed for this measure

10.11 RESIDENTIAL CUSTOM PROJECTS

Requirements and Specifications

Residential custom projects may be submitted using the custom projects process.

Documentation Requirements

See the Custom Projects Documentation Requirements.

Payment

See the Custom Projects Payment Table.

Section 11: Utility Distribution Sector

BPA acquires Utility Distribution Sector energy savings through Energy Smart Utility Efficiency (ESUE), which includes Voltage Optimization (VO) and Electrical Distribution System Improvements (SI). VO is a technique for improving the efficiency of the electrical grid by reducing voltage on the feeder lines running from substations to retail loads, while SI improves the energy efficiency of the electrical distribution system.

Customers may submit VO and SI as custom projects and may combine SI and VO in one custom project when SI increases the amount of voltage that can be reduced or improves the monitoring of reduced voltage. Customers submitting re-conductor and transformer measures may use the new RT Calculator (see Section 13.2.4.1).

11.1 UTILITY DISTRIBUTION PROJECTS

Requirements and Specifications

The requirements of VO and SI are discussed below:

1. Voltage Optimization
   BPA developed the Simplified Voltage Optimization Measurement & Verification Protocol (M&V), available in the IM Document Library to assist utilities with implementing VO projects. In developing the project M&V plan, the customer has the option to use a custom M&V plan or the Simplified Protocol. The Simplified Protocol requires analytics from load-flow studies and is based on Regional Technical Forum (RTF) guidelines and focuses on residential and small commercial end-use loads, and requires that specific system stability thresholds be met prior to lowering service voltages.
2. Electrical Distribution System Improvements
   SI may include the following measures:
   - Power transformer replacement;
   - Service conductor replacement;
   - Higher distribution primary voltage, including insulator additions and replacement;
   - Transformer load management (replacement of improperly sized transformers for loss improvements);
   - Balancing loads and phases;
   - Adding parallel feeders;
   - Operation improvement (recognition and phase balancing);
   - Power factor improvement to reduce line losses;
   - Volt-Amperes-Reactive (Reactive Power) Management;
   - Fixed and switched capacitors; and
   - Service distribution transformer:
     - Replacing an existing or proposed transformer with a higher-efficiency transformer;
     - Multiple transformers versus a single transformer based on system analysis; and
     - Voltage management.

Documentation Requirements

For custom projects, see the Custom Projects Documentation Requirements. For projects using the RT Calculator see Section 13.2.4.1.

Payment

For custom projects, see the Custom Projects Payment Table. For projects using the RT Calculator see Section 13.2.4.1.

Section 12: Multisector

12.1 Payment Summary 164
12.2 Processes 164
12.2.1 COTR Request and Acknowledgment Procedure 164
12.2.2 Measure Distribution Processes 164
12.3 Multisector Measures and Initiatives 166
12.3.1 Eligible Multisector Measure 166
12.3.2 Green Motors Rewind Initiative 166
12.3.3 Limited-Availability Emerging Technology Field Test Projects 167

Please check the changes and corrections summary to see if revisions were made to any of the measures in this sector. This section contains general information applicable across the sectors.

12.1 PAYMENT SUMMARY

Payments associated with measures eligible for installation in multiple sectors are identified in the body of the IM in the primary applicable sector.

12.2 PROCESSES

12.2.1 COTR Request and Acknowledgment Procedure

Under the COTR Request and Acknowledgment Procedure, customers must send a written request to their Contracting Officer's Technical Representative to participate or make changes to participation in certain programs and processes. If the procedure is required, it will be listed in the specific section. The specific section may also require the customer to include supporting information with the request.

If approved, the COTR shall confirm the request by written notice. A customer request is not effective until the COTR approves the request in writing.

12.2.2 Measure Distribution Processes

Many efficiency measures can be delivered through more than one channel. Allowable distribution methods are listed in the specific measure section. The Requirements and Specifications section for each measure contains the applicable distribution channels. Descriptions for each channel and associated documentation are listed below. Individual measures may have additional measure-specific requirements which can be found in the Documentation Requirements section associated with the individual measure.

If a customer believes a product should be on the list, and it is not, the customer should use the COTR Request and Acknowledgment Procedure to request approval to use the product.

MEASURE DISTRIBUTION CHANNELS	
Retail	Retail distribution of eligible items provides pricing discounts to energy-saving technologies sold through a physical or digital retailer. Retail distribution can occur through a BPA-provided retail program (such as Simple Steps or any successor program), or through a utility-run program in a either traditional retail environment or at utility facilities or other utility-operated venues. Eligible items distributed through Simple Steps or a successor BPA program will have separate Refnos.
By Request	Eligible items provided to end users at their request either through the mail or direct distribution (such as at a county fair). The By Request channel would apply to items given to end users in a number of circumstances such as: • Over the counter in the utility office; • At events (such as county fairs or an annual utility meeting); • Customer redemption of a utility coupon or postcard for a free item; • Reimbursing the customer for a qualified purchase. By request measures may be fulfilled through a utility program or a BPA program like Simple Steps. Eligible items distributed through Simple Steps or a successor BPA program will have separate Refnos.
Mailed Nonrequest	Eligible items mailed to end users without a request (only applies to LED lamps). Mailed Nonrequest measures may be fulfilled through a utility program or a BPA program like Simple Steps. Eligible items distributed through Simple Steps or a successor BPA program will have separate Refnos.

MEASURE DISTRIBUTION CHANNELS	
Direct Install	Eligible items that the utility or its agent provide and install for the end user at no cost. Direct install measures must be 1) installed by customer or agent; 2) witnessed by customer or agent; or 3) visually inspected by a representative sample after installation by another party. Direct install measures may be fulfilled through a utility program or a BPA program like Simple Steps. Eligible items distributed through Simple Steps or a successor BPA program will have separate Refnos.
Coupon or Instant Rebate	An instant discount applied to an eligible item at a physical or digital retailer. This discount can be based on a physical coupon, digital discount code or other digital coupon. Note: This channel would not apply to utility flyers or mailers asking customers to return a form for free light lamps, or similar promotions. These would be classified as By Request.
Standard Rebate Payment	Eligible items that are distributed or acquired outside of the channels above. Typically an end user will purchase and install a qualifying measure on their own and seek a rebate through their serving utility by providing a receipt, invoice and any necessary documentation. These measures are addressed simply as "payment" or as "standard rebate payment" in the body of IM and will not have any distribution-specific designators in the Unit Energy Savings (UES) measure list.

Documentation Requirements By Channel

Many channels (currently Mailed Nonrequest, By Request, Retail, and Direct Install) are available through Simple Steps, and may be available through any successor program. Whether utility-run, or provided through a BPA program like Simple Steps, Documentation Requirements will be consistent, but measures offered through a BPA program will have a separate Refno.

DOCUMENTATION REQUIRED*						
DISTRIBUTION CHANNEL	METHODOLOGY ALLOCATING SAVINGS	END-USER IDENTIFYING INFORMATION	DOCUMENTATION OF REQUEST	SALES REPORT	EQUIPMENT/ CONTRACTOR INVOICE	DOCUMENTATION OF MAILING
Retail	X			X		
By Request		X	X		X	X (when distributed by mail)
Mailed Non Request		X			X	X
Direct Install		X			X	
Coupon or Instant Rebate		X		X		
Standard Rebate Payment		X			X	

*Additional requirements may apply and will be listed in the body of the IM for each measure category.

DESCRIPTION OF DOCUMENTATION REQUIREMENTS	
End-user identifying Information	Information documenting a unique site ID and/or address of the customer receiving efficiency measure. This information can be delivered via the measure distribution log or document containing the same information, by entering end-user identifying information (unique site ID and address) into the BPA reporting system, or through record of distribution for bulk measures. Measure-specific restrictions may apply and will be noted in the measure-specific section of the IM.
Documentation of Request	Documentation demonstrating a customer request. This can be fulfilled by using the measure distribution log, a postcard returned by the customer, meeting attendance roster or other means to demonstrate a customer requested the efficiency measure.
Methodology Allocating Savings	The Retail Sales Allocation Tool (RSAT) or other approved method for allocating savings to utility service territory when items are sold in a retail location.

DESCRIPTION OF DOCUMENTATION REQUIREMENTS	
Sales Report	A report or invoice detailing: The date period for sales; sales by store location; qualified product make, model and manufacturer sufficient to assign corresponding energy efficiency measure. If this report does not contain sufficient information to demonstrate that program requirements have been met (e.g., ENERGY STAR® labeling) additional documentation may be required.
Equipment/ Contractor Invoice	Equipment invoice or contractor invoice showing (a) the measure requirements have been met (e.g., manufacturer, model number, type, size and quantity of equipment or product installed/used); (b) the order/purchase date; and (c) cost.
Documentation of Mailing	Documentation of mailing, air waybill or bill of lading to document the date the product entered the mail stream.

12.3 MULTISECTOR MEASURES AND INITIATIVES

12.3.1 Eligible Multisector Measure

Measures eligible for installation in multiple sectors are identified where applicable in the body of the IM in the primary applicable sector.

12.3.2 Green Motors Rewind Initiative

Basis for Energy Savings

The base case is induction motors between 15 and 5,000 horsepower that require motor repair and rewinding, and are repaired and rewound by motor service centers that use methods and equipment that do not meet the ANSI/EASA Standard AR100-2010 requirements. The efficient case is to test and verify each motor to be sure there is no permanent motor core damage, then repair and rewind by a Green Motors Initiative-certified motor service center that follows the ANSI/EASA Standard AR100-2010. Energy savings are based on the Unit of Energy Savings (UES) approved by the RTF for this set of measures.

More details on the testing and motor service center requirements, and a list of certified motor service centers, can be found at: http://www.greenmotors.org/

More details on the recommended practice for the repair of rotating electrical apparatus can be found at: http://www.easa.com/sites/files/resource_library_public/EASA_AR100-2010_1010.pdf.

Requirements and Specifications

The Green Motors Rewind Initiative uses direct acquisition. The incentives paid through the Green Motors Rewind Initiative are paid by BPA as part of the third-party program and are not counted against customer's EEI budget. No payments are required to BPA, the program implementer, or the participating end user. Customers receive credit for all energy savings achieved by the program in their service territory.

Qualified motors include National Electric Manufacturers Association (NEMA) standard horsepower-rated motors between 15 and 5,000 horsepower (either NEMA premium or other) that are rewound via certified Green Motors Initiative-certified motor service centers. Customers may enroll using the COTR Request and Acknowledgment Procedure.

A monthly report and annual report is created and sent to participating customers with end user names, total horsepower rewound, energy savings and incentives paid. Monthly reports will only be created and sent to customers with end-user participation in their service territory.

Customers may be contacted by the program implementer to verify an end users' eligibility to receive incentives through the program.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
Third-party provided monthly reports			X
Third-party provided annual reports			X

Payment

MEASURE CATEGORY	PAYMENT
Green Motors Rewind Initiative	$2 per horsepower is paid to the rewind service center (A $1 per horsepower credit is applied to the end user's invoice)

12.3.3 Limited-Availability Emerging Technology Field Test Projects

Requirements and Specifications

Limited-Availability Emerging Technology Field-Test Projects allow BPA to collect detailed data to more accurately estimate savings and potential performance to create future Unit of Energy Savings (UES) and BPA-Qualified measures. BPA may contract with third-parties to deploy the emerging technology, evaluate performance and verify energy savings.

On the BPA Emerging Technologies website, BPA maintains a list of available emerging technology projects with defined eligibility requirements, the number of installations targeted, participation obligations, savings and payment.

If a customer is eligible and wishes to participate in a project, it must follow the Option 1 Custom Project Process and submit a custom project proposal (a component of the Option 1 Custom Project Calculator) that uses the Engineering Calculations with Verification Protocol for measurement and verification. BPA will provide the information necessary to complete the custom project documentation and will provide staff assistance in the development of the proposal and completion report.

BPA may require metering to continue after project completion and may require customers to perform additional duties to support the research efforts (e.g., customers may be asked to provide access to end-user billing history and contact information). If additional metering is required, it will not change customers' payment or savings.

Documentation Requirements

Customers must follow the Option 1 Custom Project Documentation Requirements and may be required to provide end-user billing information and contact information.

Payment

MEASURE CATEGORY	PAYMENT
Limited-Availability Emerging Technology Field-Test Projects	Lesser of $0.25 per kWh or 70 percent project cost

Section 13: Updates and Revisions

Section 13 is reserved for revisions to the implementation manual made after Oct. 1, 2019. Revisions are released per section 1.5 Policy for Measure Changes/ Additions, and will include the description of the change, effective date and location.

13.1 UPDATES AND REVISIONS TABLES

13.1.1 OCTOBER 1, 2020 UPDATES AND REVISIONS

EFFECTIVE DATE (POSTED DATE)	LOCATION	DESCRIPTION	RATIONALE
October 2020	00.	Added definition for PTHP. Packaged Terminal Heat Pump.	This is a new Commercial and Residential measure.
October 2020	3.3	Oversight and Evaluation Review. First sentence, adjusted language from "... BPA shall (1) perform..." to "...BPA reserves the right to (1) perform..."	In response to BPA internal audit recommendation, we are clarifying language to accurately reflect BPA oversight practices.
October 2020	6.2	Freeze Resistant Stock Water Tanks/Fountains. Removed qualification: "Enclosed, fully foam or dead-air-space insulated, with the opening completely sealed in impact-resistant polyurethane."	There is no real need to require a particular material for the tank. Also, specifying a particular material was confusing for the participants, etc.
October 2020	6.7.2	Variable Frequency Drive for Centrifugal Agricultural Pumps (BPA-Qualified. Documentation requirements for this measure indicate that pump performance curves are required for EE docs and customer file. Pump performance curves are not required for EE docs and the customer file.	Pump performance curves are not required for this measure.
October 2020	6.7.3	Variable Frequency Drive for New Agricultural Pump Installations (BPA-Qualified). Documentation requirements for this measure indicate that pump performance curves are required for EE docs and customer file. Pump performance curves are not required for EE docs and the customer file.	Pump performance curves are not required for this measure.
October 2020	6.7.4	Variable Frequency Drives in Agricultural Turbine Pump Applications (BPA-Qualified). Documentation requirements for this measure indicate that pump performance curves are required for EE docs and customer file. Pump performance curves are not required for EE docs and the customer file.	Pump performance curves are not required for this measure.
October 2020	9.3	Fans for Variable Frequency Drives in Potato and Onion Storage Facilities. Corrected the requirement for customer's to retain the equipment or contractor invoice(s).	This is not a new requirement. When BPA reformatted the Documentation Requirements table the "X" was inadvertently removed.
October 2020	9.5	High Frequency Battery Charger Upgrade. Corrected and simplified the documentation requirements for equipment or contractor invoice(s).	The incorrect unit type was required. Utilities unable to submit correct invoice(s) for measure.
October 2020	9.6	Welder Upgrade. Corrected and simplified the documentation requirements for equipment or contractor invoice(s).	The incorrect unit type was required. Utilities unable to submit correct invoice(s) for measure.
October 2020	9.7	Water System Leak Abatement. Corrected and simplified the documentation requirements for equipment or contractor invoice(s).	The incorrect unit type was required. Utilities unable to submit correct invoice(s) for measure.

EFFECTIVE DATE (POSTED DATE)	LOCATION	DESCRIPTION	RATIONALE
October 2020	10.6	Ended the Simple Steps program consistent with prior notifications.	BPA will end operation of the Simple Steps program on September 30, 2020.
October 2020	10.7.4	Air Source Heat Pump Conversion from Electric Forced-Air Furnace to Air Source Heat Pump (without PTCS). Removal of the requirement to complete the Air Source Heat Pump Conversion Form (without PTCS).	This form is no longer necessary for program implementation.
October 2020	10.7.5	Air Source Heat Pump Conversion from Electric Forced-Air Furnace to Variable Speed Air Source Heat Pump (without PTCS). Removal of the requirement to complete the Air Source Heat Pump Conversion Form (without PTCS).	This form is no longer necessary for program implementation.
October 2020	10.10.2	Prime Window and Patio Door Replacement. BPA removed language in section 10.10.2 that precluded mid/high-rise multifamily buildings from patio door replacement.	Correcting an inconsistency between the Implementation Manual and Measure List. BPA intends to allow this application for mid/high-rise buildings.
October 2020	13.2.2.1	Commercial Packaged Terminal Heat Pump (PTHP). This new retrofit and new construction measure is for Lodging and Residential Care building types. Qualifying retrofit installations receive $600 per PTHP. Qualifying new construction installations receive $100 per PTHP. An AHRI certificate is required. This measure does not require a PIF.	This is a new Commercial measure.
October 2020	13.2.2.2	Commercial Heat Pump Water Heaters (HPWH). This new retrofit measure is for unitary HPWHs and split-system HPWHs. Qualifying unitary HPWHs receive $300 per unit for Tier 1, $600 per unit for Tier 2, and $600 per unit for Tier 3. Qualifying split-system HPWHs receive $800 per unit. This measure uses the same Qualified Product List as the residential HPWH measures. This measure does not require a PIF. Note: The Residential Sector 10.5.4 Unitary Heat Pump Water Heater and 10.5.5 Split-System Heat Pump Water Heater are still available for commercial sector installations through September 30, 2021; however, BPA recommends customers utilize the new Commercial Heat Pump Water Heater measure for all for commercial applications.	This is a new Commercial measure.
October 2020	13.2.5.4	Centrally Ducted Air Conditioners. This new measure is now available for centrally ducted new and existing single family and manufactured homes. For more information on measure specifications and requirements, see Section 13 of the Implementation Manual.	This Centrally Ducted Air Conditioner measure was adopted by the Regional Technical Forum (RTF) in January, 2020. BPA is making the measure available to utilities beginning October 1, 2020.
October 2020	13.2.5.5	Residential Packaged Terminal Heat Pump. Added new residential Packaged Terminal Heat Pump (PTHP) retrofit and new construction measure for Multifamily building types. An AHRI certificate is required. This measure does not require a PIF.	This is a new Residential measure.
April 2021	13.2.4.1	Updated the RT Calculator to include distribution transformers. Added a "quantity" field to allow for group unit purchasing and installation of distribution transformers; also added an "EEI% requested" field for customers to select the amount on a per measure basis.	RT Calculator was designed to report savings from substation power transformers, usually done one at a time. Because distribution transformers are often purchased in bulk. BPA added a "quantity" cell to allow for a group of units.

EFFECTIVE DATE (POSTED DATE)	LOCATION	DESCRIPTION	RATIONALE
April 2021	13.2.4.1	"Requirements and Specifications. Added the sentence below: The RT Calculator is an optional replacement for the custom project process for Option 1 utility-owned equipment and covers retrofit re-conductor measures and new and retrofit power transformer replacement measures. Effective April 1, 2021, Option 1 customers must use the optional RT Calculator version 1.1 to report re-conductor, substation power and distribution transformers of all sizes, and both single and three phase types. BPA will retire the RT Calculator version 1.0 on April 1, 2021. Option 2 customers must use the Option 2 custom project calculator."	BPA wants to simplify the number of RT Calculator versions available to customers. Additional features are included in version 1.1.
October 1 2021	2.1.3	Effective October 1, 2021, customers may only be able to request a performance payment equal to or below the amount of the measure payment.	To ensure performance payments do not exceed the actual savings value paid for these measures.
October 1 2021	4.2.1	Progress Payments. BPA will retire Progress Payments starting with BPA Rate Period 2022-2023. Effective October 1, 2021, Progress Payments and the Progress Payment Calculator will be retired.	The Progress Payment option has had very low uptake over the last 2 rate periods. In addition, BPA is removing this option in order to reduce the risk associated with payments for savings that have not yet been achieved.
October 1 2021	9.2.1	Energy Project Manager. Effective at the beginning of the 2022-2023 Rate Period, the existing Energy Project Manager (EPM) offering will be retired. BPA will release a new Energy Project Manager measure effective October 1, 2021. The new measure is anticipated to be applicable to both Industrial and Commercial sectors. BPA will retire the EPM Calculator and remove some documentation requirements as part of the new measure changes.	The EPM offering in being simplified and enhanced.

13.1.2 JULY 1, 2020 OFF-CYCLE UPDATES AND REVISIONS

EFFECTIVE DATE (POSTED DATE)	LOCATION	DESCRIPTION	RATIONALE
7/1/2020	2.1.3	Effective July 1, 2020, BPA is increasing the Performance Payment rates for the remainder of the 2020-2021 Rate Period, through September 30, 2021. Small, Rural, and Residential rates will increase from $0.08 to $0.10 per kWh; Non-SRR rate will increase from $0.04 to $0.05 per kWh.	The COVID-19 pandemic has impeded the region's economy and BPA's Energy Efficiency program's ability to implement energy efficiency. BPA is increasing the Performance Payment rate in effort to promote additional EE uptake.
7/1/2020	13.3	BPA is providing promotional payment rates for select Ductless Heat Pump, Heat Pump, and Thermostat Commercial and Residential measures completed on or after July 1, 2020. The promotional payment rate is not available for 10.10.7 Low-Income Energy Efficiency measures. Customers may invoice BPA for either the standard payment rate or the promotional payment rate. No measure requirements, specifications, or documentation requirements have changed as a result of the promotion. Customers should reference the appropriate Implementation Manual section for measure requirements. An updated Measure List that reflects additional REFNOs for measures with promotional rates will be released in August 2020.	The COVID-19 pandemic has impeded the region's economy and BPA's Energy Efficiency program's ability to implement energy efficiency. BPA is providing promotional payment rates in effort to promote additional EE uptake.

13.1.3 APRIL 1, 2020 UPDATES AND REVISIONS

EFFECTIVE DATE (POSTED DATE)	LOCATION	DESCRIPTION	RATIONALE
General			
April 2020	0.0	Busbar Energy Savings. Added language to clarify the different site-to-busbar savings factor for the BPA lighting calculator.	The definition is modified to clarify the BPA lighting calculator has its own site-to-busbar savings factor.
Custom Projects			
April 2020	4.1	Custom Projects. Added language to show different site-to-busbar savings factor for the BPA lighting calculator.	Updated the language to clarify the BPA lighting calculator has its own site-to-busbar savings factor.
April 2020	4.3.2	Custom Projects General Requirements. Clarified the language to differentiate between Option 1 and Option 2 customer M&V requirements when submitting nonresidential lighting custom projects.	Improved clarity regarding Option 1 and Option 2 customer M&V requirements when submitting nonresidential lighting custom projects.
Agricultural Sector			
April 2020	6.6.1	Added language clarifying that the LESA/LEPA/MDI measure was applicable to new or existing applications.	Addressed potential ambiguity in the language as previously written.
April 2020	6.6.2	Added clarification to the specifying the sprinkler replacement package measure was only applicable to sprinkler retrofits.	This change addressed some potential ambiguity in the language as written.
April 2020	6.6.3	Clarification that the MESA retrofit measure is for existing pivots and not for new pivots.	Provides additional language that reduces ambiguity and ensures consistency with the UES measure list.
April 2020	6.7.5	Additional clarification that the measure is intended for new irrigation pumps.	To address customer questions about whether or not rebuilt pumps qualify for this measure.
Commercial Sector			
April 2020	7.4.3	Ductless Heat Pump Retrofit and Upgrade. Updated the Ductless Heat Pump Efficiency Requirement table to include Mini-Split heat pumps.	Added language to improve clarity regarding classification of Mini-Split heat pumps and create consistency with how products are classified in the Qualified Products List.
Industrial Sector			
April 2020	9.5	High Frequency Battery Charger Upgrade. BPA removed the requirement, "BPA recommends the power conversion efficiency be no less than 89%.	Reduces confusion between a recommendation and requirement.
Residential Sector			
April 2020	10.7.1.1	Ductless and Ducted Mini-Split Heat Pump(s). Updated errors in the Eligibility Table that incorrectly referenced DHP Upgrades as section 10.7.2. DHP Upgrades are in the Implementation Manual under section 10.7.1.2.	Clarification. Updated an error in Implementation Manual section number references.
April 2020	10.7.1.1	Ductless and Ducted Mini-Split Heat Pump(s). Removal of Additional Information language that could be interpreted as a requirement. Strikethrough has been applied to the following language: "Mini-splits with a multi-position ducted indoor air handler should be invoiced as an air source heat pump even when the air handler and ductless heads are served by the same outdoor compressor."	Ductless or ducted heat pumps included on the DHP QPL may be invoiced as a DHP. Alternatively, whole-home centrally ducted heat pumps may instead be reported using BPA's Air Source Heat Pump measures with or without PTCS commissioning (if all other measure requirements are met).

EFFECTIVE DATE (POSTED DATE)	LOCATION	DESCRIPTION	RATIONALE
April 2020	10.7.1.2	Ductless Heat Pump Upgrade. Removal of Additional Information language that could be interpreted as a requirement. Strikethrough has been applied to the following language: "Mini-splits with a multi-position ducted indoor air handler should be invoiced as an air source heat pump even when the air handler and ductless heads are served by the same outdoor compressor."	Ductless or ducted heat pumps included on the DHP QPL may be invoiced as a DHP. Alternatively, whole-home centrally ducted heat pumps may instead be reported using BPA's Air Source Heat Pump measures with or without PTCS commissioning (if all other measure requirements are met).
April 2020	10.7.2.5	Corrected error in the Documentation Requirements table that pointed to the incorrect document.	Existing language pointed to the handwritten "Ground Source Heat Pump Form" instead of the "PTCS Duct Sealing Form".
April 2020	10.7.3	Removal of requirement. BPA will allow pre authorized training programs that meet or exceed BPA specifications and requirements.	Existing language did not allow other utility training programs.
April 2020	10.7.3	Correction to point to the Prescriptive Duct Sealing Specification	Existing language points to the PTCS Duct Sealing Specification.
April 2020	10.9.2	Replacement of Pre-1976 Manufactured Home with New Northwest Energy Efficient Manufactured Housing (NEEM) Certified Home. Added Air Source Heat Pump (ASHP) measures with and without PTCS commissioning to the Additional Information table in section 10.9.2 as allowable stand-alone measures in new manufactured homes.	Clarification. Correction to include air source heat pumps as allowable stand-alone measures in new manufactured homes. Stand-alone measures may not be claimed in addition to NEEM 1.1 or 2.0 with the exception of high efficiency heating and thermostat measures.
April 2020	10.10.1	Insulation. Removed an outdated reference to manufactured home floor insulation. BPA does not offer a measure for R-11 manufactured home floor insulation. Insulate to R-22 or maximum possible.	Clarification. BPA and the Regional Technical Forum removed R-11 manufactured home floor insulation in 2015/16. A reference remained in the BPA Implementation Manual, but has now been removed. Manufactured home floors must be insulated to a thermal value of R-22 or maximum possible.
April 2020	10.10.2	Prime Window and Patio Door Replacement. Clarification to allow up to 10% variance between rough opening sizes and final invoiced window dimensions to account for variability in measurements.	Additional Information added to clarify allowable variation of window measurements for compliance and oversight.
April 2020	10.10.7	Low-Income Energy Efficiency Measures. Clarification: Ductless and Ducted Mini-Split Heat Pump(s) are available as a qualifying low-income measure, this includes a conversion with a precondition of electric resistance heat (10.7.1.1) and a DHP Upgrade from existing ductless heat pump (10.7.1.2). This applies for existing single-family and manufactured homes.	Clarification. BPA is adding low-income measure reference numbers for utilities to invoice a DHP Upgrade for a low-income household.
Utility Distribution Sector			
April 2020	11.0	Added language that refers customers to Section 13.2.4.1 to learn more about the RT Calculator, which is an alternative for Option 1 customers to report re-conductor and transformer measures.	Provides Option 1 customers with a more simplified way to report re-conductor and power transformer measures.
New Measures			
April 2020	13.2.4.1	Added the new Re-conductor & Transformer (RT) Calculator as an alternative for Option 1 customers to report retrofit re-conductor and new and retrofit power transformer measures; rather than submitting them as a custom project.	This calculator simplifies data entry, automates some technical calculations and reduces administrative tasks for customers and BPA staff.

EFFECTIVE DATE (POSTED DATE)	LOCATION	DESCRIPTION	RATIONALE
April 2020	13.2.5.1	ENERGY STAR Level 2 Networked Electric Vehicle Charger. This new measure is now available for all types of residential homes.	This Level 2 Electric Vehicle charger measure was adopted by the Regional Technical Forum (RTF) in May 2019. BPA is making the measure available to utilities beginning April 1st, 2020.
April 2020	13.2.5.2	Behavioral Home Energy Reports - BPA Qualified. This new measure provides a deemed UES savings value for Behavioral Home Energy Reports. Reports are regularly sent to residential customers with information on household energy consumption, a normative comparison to similar households, and energy efficiency tips. For more information on measure specifications and requirements see Section 13 of the Implementation Manual.	This measure is BPA Qualified. Energy savings are derived from a weighted average of evaluated Northwest behavioral energy programs.
April 2020	13.2.5.3	Duct Insulation. This new measure is now available for single family homes. The measure is also available as a low-income energy efficiency measure. For more information on measure specifications and requirements see Section 13 of the Implementation Manual.	This Duct Insulation measure was adopted by the Regional Technical Forum (RTF) in October, 2019. BPA is making the measure available to utilities beginning April 1st, 2020.
April 2020	9.0	Compressed Air Calculator Version 3.5 is retiring on October 1, 2020. Compressed Air Calculator Version 4.0 has been effective since October 1, 2019 and includes more updated energy savings calculation methodology.	Retiring Compressed Air Calculator Version 3.5 on October 1, 2020.
April notice of October 2020 changes			
October 2020	10.6	Simple Steps Smart Savings Retail Promotion. The Simple Steps promotion and all Simple Steps measures will expire on September 30, 2020. The program sunset date has also been updated in IM section 10.6 in Additional Information.	Decreasing residential lighting savings and payments make this promotion obsolete.

13.2 NEW MEASURES

This section outlines the new measures and includes their effective dates as written in parentheses (e.g., April 1, 2020, October 1, 2020, etc.). These are optional, new measures for utilities to implement locally at their convenience. The text in this section will not be incorporated into the body of the IM programmatic sections until the next October rate period manual. The decision to separate out new measures was made based on feedback from BPA's utility customers to keep the principle of having a rate period manual intact.

13.2.1 AGRICULTURE

There are no new Agricultural measures at this time.

13.2.2 COMMERCIAL

13.2.2.1 COMMERCIAL PACKAGED TERMINAL HEAT PUMP (BPA QUALIFIED) (EFFECTIVE OCTOBER 1, 2020)

Basis for Savings

Commercial Packaged Terminal Heat Pumps (PTHPs) are an HVAC equipment type commonly used in lodging applications. A PTHP retrofit replaces a Packaged Terminal Air Conditioner (PTAC) or zonal electric-resistance heating.

Energy savings from PTHPs are primarily from a more efficient use of heating during the winter months of operation compared to a PTAC or zonal electric-resistance heating. Savings are calculated based on an analysis of annual heating requirements for a PTAC compared to a PTHP. The base case heating system is a code compliant PTAC unit with an annual coefficient of performance, or COP, of 1.0. The efficient case used to calculate savings is based on a COP of 3.45, which reflects the weighted COP for a mix of commonly available PTHP sizes.

Requirements and Specifications

- This measure applies to both retrofits and new construction.
- This measure is eligible to be installed in either:
  - A lodging building type which, for the purposes of this measure, includes: hotel, motel, bed and breakfast, boarding/rooming house, apartment hotel, dormitory, and shelter or;
  - In a residential care building type which, for the purposes of this measure, includes: nursing home, retirement home, and assisted living.
- No other building types are allowed.

Preconditions for retrofit installations:

- The space is conditioned by a PTAC or zonal electric-resistance heat as the primary heating source. No other heating sources are eligible.

Post-conditions:

- The installed PTHP must have an AHRI certificate of product rating. All AHRI certified PTHPs qualify for this incentive regardless of the rated COP.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information including unique site ID and address	X		X
Equipment or contractor invoice showing: 1. Equipment order or purchase date 2. Installed cost			X
AHRI Certificate			X

Payment

MEASURE CATEGORY	PAYMENT
Packaged Terminal Heat Pump Retrofit	$600 per PTHP
Packaged Terminal Heat Pump New Construction	$100 per PTHP

13.2.2.2 COMMERCIAL HEAT PUMP WATER HEATERS (EFFECTIVE OCTOBER 1, 2020)

Basis for Savings

Commercial heat pump water heaters save energy by using ambient heat to raise the temperature of water, rather than relying solely on electric-resistance heat such as with a conventional electric storage water heater.

Unitary heat pump water heaters combine the tank and compressor in a single unit, while split-system heat pump water heaters have interior storage tanks and outdoor compressors installed outside the building.

More detailed information is available on the Regional Technical Forum (RTF) Unit Energy Savings (UES) Measures webpage.

Note: The Residential Sector 10.5.4 Unitary Heat Pump Water Heater and 10.5.5 Split-System Heat Pump Water Heater are still available for commercial sector installations through September 30, 2021; however, BPA recommends customers utilize the new Commercial Heat Pump Water Heater measure for all commercial applications.

Requirements and Specifications

- This measure is available for retrofits only.

Preconditions

- Existing water heater must be an electric-resistance water heater.

Post-conditions

- The installed heat pump water heater must be listed on the Heat Pump Water Heater Qualified Products List (QPL) in the IM Document Library.

Eligible products are listed on the HPWH Qualified Products List (QPL) in the IM Document Library. If a product meets the requirements, but is not on the QPL, please use the COTR Request and Acknowledgement Procedure for approval to use the product.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information including unique site ID and address	X		X
Equipment or contractor invoice showing: 1. Equipment order or purchase date 2. Installed cost			X

Payment

MEASURE CATEGORY	PAYMENT
Unitary Heat Pump Water Heater Tier 1 - Any size tank	$300 per HPWH
Unitary Heat Pump Water Heater Tier 2 - Any size tank	$600 per HPWH
Unitary Heat Pump Water Heater Tier 3 - Any size tank	$600 per HPWH
Split-System Heat Pump Water Heater– Any size tank	$800 per HPWH

13.2.3 INDUSTRIAL

There are no new Industrial measures at this time.

13.2.4 UTILITY DISTRIBUTION

13.2.4.1 Re-conductor & Transformer (RT) Calculator

Basis for Savings

Utility System Improvements can reduce energy use in the electrical distribution system. The RT Calculator is an alternative to submitting a custom project for reporting re-conductor and power transformer projects. The RT Calculator has input data fields, technical calculations and M&V that are similar to custom projects but offers simplified data entry, automation of some technical calculations and reduced administrative tasks. This calculator is intended for use for substation power transformers or large transformers serving large loads, e.g., 1+ MVA. However, there is no formal size limitation on the applicable transformer.

Requirements and Specifications

The RT Calculator is an optional replacement for the custom project process for Option 1 utility-owned equipment and covers retrofit re-conductor measures and new and retrofit power transformer replacement measures. Effective April 1, 2021, Option 1 customers must use the optional RT Calculator version 1.1 to report re-conductor, substation power and distribution transformers of all sizes, and both single and three phase types. BPA will retire the RT Calculator version 1.0 on April 1, 2021. Option 2 customers must use the Option 2 custom project calculator.

Supporting Content

ENERGY STAR EVSE Qualified Products List

Review and Submission Process

1. Complete the RT Calculator: Customers must submit a complete RT Calculator to BPA via email to eedocs@bpa.gov. This calculator must have all applicable project information entered and appropriate documentation embedded. Both re-conductoring and transformer projects must include documentation of project cost. Transformer projects must include a loss test report for the existing system, and a loss test report from the proposed system. (Note, BPA customer service engineers are available to assist in the completion of the RT Calculator).

2. BPA review: Within 10 business days of receiving an RT Calculator BPA will review the submission and either indicate approval or return it to the customer for modification. Each RT Calculator will receive both technical review by a BPA engineer and compliance review by a BPA COTR to ensure all project requirements have been met and all necessary supporting documentation has been included. Upon BPA acceptance the COTR will return the approved calculator via email to the customer.

3. Once the fully approved calculator has been returned to the customer, they may submit it via IS 2.0 for payment.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
RT Calculator (Note: up to six (6) re-conductor and six transformer measures in one file.)	X	X	X
Documentation of project cost (Cost documentation for each measure will be embedded within the RT Calculator)	X		X
Loss Test Reports (transformer projects only) (Loss test reports for the existing and proposed systems will be embedded within the RT Calculator for transformer projects)	X		X

Payment

MEASURE	PAYMENT
Retrofit Re-conductor and Transformer measures	Lesser of $0.35 per kWh or 70 percent of project cost
New construction Transformer measures	Lesser of $0.25 per kWh or 70 percent of project cost.

13.2.5 RESIDENTIAL

13.2.5.1 Level 2 Electric Vehicle Chargers (Effective April 1, 2020)

Basis for Savings

Electric Vehicles (EVs) and Plug-in Hybrid Electric Vehicles (PEHVs) receive energy needed to charge the battery through Electric Vehicle Supply Equipment (EVSE), more commonly referred to as EV Chargers. There are two primary types of EV Chargers, one uses alternating-current (AC) electricity and the other uses direct-current (DC) electricity to deliver current to the vehicle battery. AC EV chargers come in two varieties, Level 1 and Level 2. The BPA EVSE measure represents ENERGY STAR-qualified 240-volt (V) AC Level 2 models with networking capability.

The base case used to calculate energy efficiency savings for the BPA Level 2 EV charger measure is the current practice mix of Level 2 chargers and is based on RTF analysis. The efficient case includes mitigated standby power losses when upgrading from a standard charger to an efficient (ENERGY

Supporting Content

Behavioral Home Energy Reports
Qualified Programs List

STAR) charger. Level 2 chargers have additional characteristics for the efficient case, based on network connectivity.

Connected functionality, also referred to as "networked", refers to the mechanism for bi-directional data transfers between the EVSE and one or more external applications, devices or systems. EV charging equipment that complies with the connected functionality criteria established in the Version 1.0 ENERGY STAR product specification for Electric Vehicle Supply Equipment will be identified on the ENERGY STAR EVSE product list as "Connected Functionality Capable".

BPA documentation requirements consider these factors. More detailed information is available on the RTF's UES Measures webpage.

Requirements and Specifications

This measure is available for all types of new and existing residential buildings (single-family, manufactured and multifamily).

ENERGY STAR Level 2 EV Charger measures are available through the following channels:

- Standard Rebate

Level 2 EV chargers must be ENERGY STAR-Qualified at the time of purchase.

ENERGY STAR Level 2 EV chargers must meet the following qualifications:

- Identified on the ENERGY STAR EVSE Qualified Products List as Level 2 Product Type and Connected Functionality Capable

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
A copy of the ENERGY STAR EVSE product list showing the product.			X
Equipment or contractor invoice showing: 1. Order or purchase date 2. Installed Cost 3. Model number, type and quantity of equipment purchased			X
See Measure Distribution Processes (Section 12.2) for Documentation Requirements for each channel listed above.			X

Payment

MEASURE	PAYMENT
ENERGY STAR EVSE Level 2 Networked Charger	$20

Additional Information

The ENERGY STAR EVSE Qualified Product List can be accessed by navigating to the ENERGY STAR Product Finder, then selecting "Electric Vehicle Supply Equipment" from the "Other" product category.

13.2.5.2 Behavioral Home Energy Reports (BPA-Qualified) (Effective April 1, 2020)

Basis for Savings

The base case (pre-existing state) used to calculate energy efficiency savings for Behavioral Home Energy Reports in existing homes is a single-family, multifamily, or manufactured home that does not receive home energy reports from their utility or other third-party vendor. The efficient case is an end-use household that regularly receives a Behavioral Home Energy Report from their utility or participating third-party vendor. Energy savings are derived from a weighted average of evaluated Northwest behavioral home energy report programs. BPA documentation requirements consider these factors.

Requirements and Specifications

1. Behavioral Home Energy Reports must include:
   - Seasonal household energy consumption information
   - A normative comparison of household energy consumption to similar households
   - Tips and strategies to reduce home energy consumption
2. Behavioral Home Energy Reports must be delivered to end-use residential customers on a quarterly cadence at a minimum. Programs that provide reports more frequently are allowed.
3. Households must be enrolled to receive Behavioral Home Energy Reports for one continuous year; this constitutes a cohort or program year. The IM rules in effect at the beginning date of the cohort or program year are the rules that will govern payment and eligibility. Payment is made at the conclusion of the year.

Behavioral Home Energy Reports must be provided by a vendor that is listed on BPA's Behavioral Home Energy Reports Qualified Programs List. If a customer believes a program vendor should be on BPA's Qualified Programs List, and it is not, the customer should use the COTR Request and Acknowledgment Procedure.

Documentation Requirements

1. Utilities must document summary energy saving reports (of the Behavioral Home Energy Report program) that are provided to utilities by qualified third-party vendors.
2. Utilities must document a sample copy or redacted version (to protect personally identifiable information) of a Behavioral Home Energy Report that is sent to end-use customers.
3. Utilities must document all third-party vendor invoice(s) for the cohort/program year in order to receive payment from BPA.

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
Summary Energy Savings Report showing: 1. Total number of households enrolled and receiving Behavioral Home Energy Reports. 2. Frequency or cadence of report delivery.		X	X
Documentation that the measure requirements have been met (ex. sample copy of end-use Behavioral Home Energy Report).		X	X
All vendor invoices showing: 1. Service period for Behavioral Home Energy Report delivery. 2. Total cost of Behavioral Home Energy Report delivery.			X

Payment

Utilities may request payment for each household that remains enrolled to receive Behavioral Home Energy Reports for the duration of one continuous cohort or program year. Households that opt out, move, and/or do not complete one year of Behavioral Home Energy Reports are not eligible for payment.

MEASURE	PAYMENT
Behavioral Home Energy Reports	$12 per household

Additional Information

Utilities deciding to implement Behavioral Home Energy Reports for the first time are encouraged to contact BPA Energy Efficiency Representatives (EERs) or BPA Program Staff with questions or for assistance.

13.2.5.3 Duct Insulation (Effective April 1, 2020)

Basis for Savings

The base case (pre-existing state) used to calculate energy efficiency savings for Duct Insulation in existing homes is a single-family home with an electric forced air furnace or centrally ducted air source heat pump as the primary heating system, where the existing duct work is uninsulated and in an unconditioned space. The efficient case in existing homes is a single-family home with an electric forced air furnace or centrally ducted air source heat pump as the primary heating system, where the existing duct work has been insulated to a minimum thermal value of R-11. Energy savings for insulation measures are estimated using SEEM, an energy modeling software calibrated to real world energy consumption using prototype homes representative of Northwest construction, assuming that all other weatherization measures have been installed in the home. BPA documentation requirements consider these factors.

Requirements and Specifications

Insulation measures in single-family homes must be installed according to the 2016 BPA Residential Weatherization Specifications found in the IM Document Library. Final installed R-values must meet the required final R-value of R-11 at a minimum. Duct Insulation can be professionally installed by a contractor or self-installed by the end-user.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information, including unique site ID and address.	X		X
Materials or contractor invoice showing: 1. Order or purchase date 2. Cost 3. Post-insulation R-value and linear footage of insulation installed			X

Payment

MEASURE	PAYMENT
Duct Insulation	$0.60 per linear foot insulated
Low-Income Duct Insulation	Dollar-for-dollar

Additional Information

Duct Insulation may be reported in addition to Prescriptive or PTCS Duct Sealing and other HVAC measures such as Air Source Heat Pumps and Thermostats.

13.2.5.4 Centrally Ducted Air Conditioners (Effective October 1, 2020)

Basis for Savings

The base case (pre-existing state) used to calculate energy efficiency savings for centrally ducted air conditioner installations are the air conditioners determined by RTF data to be current practice (SEER 14.2) in new and existing single-family and manufactured homes.

Energy savings are calculated using multiple runs of the calibrated SEEM simulation engine in combination with the prototype house weightings. This is in order to generate cooling energy use for baseline and efficient cases for each cooling system and cooling zone within the analysis, for the efficient case of 16 SEER.

BPA documentation requirements consider these factors. More detailed information is available on the RTF's UES Measures webpage.

Centrally Ducted Air Conditioners: Eligibility Table

PRIMARY RESIDENTIAL HEATING SYSTEM	HOME TYPE				
	SINGLE-FAMILY: EXISTING	SINGLE-FAMILY: NEW	MANUFACTURED: EXISTING	MANUFACTURED: NEW	MULTIFAMILY: EXISTING
Electric Forced- Air Furnace	Eligible if the home contains central duct work	Eligible if the home contains central duct work	Eligible if the home contains central duct work	Treat as manufactured existing once located on site for occupancy	Not eligible
Ducted Heat Pump					
Ductless Mini- Split Heat Pump					
Zonal (Electric)					
Wood					
Oil/Propane/Gas					
None existing					

Requirements and Specifications

- This measure is available for new and existing single-family and manufactured homes with whole-home centrally ducted systems.
- New centrally ducted air conditioners must be rated as having at least 16 SEER.
- Equipment must be AHRI-tested and certified; manufacturer claims of "equivalent to AHRI certified equipment" will not be accepted.

Applicable Home Types:

- New construction single-family
- Existing construction single-family
- Existing manufactured homes (including new manufactured homes once on site for occupancy)

Homes with less than 4,500 square feet of conditioned floor area may qualify for only one payment for (a) a centrally ducted air conditioner, (b) a PTCS or non-PTCS air source heat pump, or (c) a ductless heat pump. Homes with greater than 4,500 square feet of conditioned floor area may qualify for up to two centrally ducted air conditioner measures or one centrally ducted air conditioner and either one ductless heat pump or one PTCS or non-PTCS air source heat pump and no more, provided all other program requirements are met.

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information including unique site ID and address.	X		X
Equipment or contractor invoice showing: 1. Order or purchase date 2. Installed cost			X
Documentation that measure requirements have been met: • Manufacturer • Model number • Type • Quantity of product installed or used			X
AHRI Certificate documenting a minimum of 16 SEER			X

Payment

MEASURE	PAYMENT
Centrally Ducted Air Conditioner	$60

Additional Information

PTCS or Prescriptive Duct Sealing may be completed and claimed in addition to this measure; however duct sealing is not required for completion of this measure.

All centrally ducted systems in single family and manufactured homes qualify for this measure, including homes where the primary heating fuel is not electricity.

13.2.5.5 Residential Packaged Terminal Heat Pump (BPA-Qualified) (Effective October 1, 2020)

Basis for Savings

Residential Packaged Terminal Heat Pumps (PTHPs) are an HVAC equipment type commonly used in multifamily applications. A PTHP retrofit replaces a Packaged Terminal Air Conditioner (PTAC) or zonal electric-resistance heating.

Energy savings from PTHPs are primarily from a more efficient use of heating during the winter months of operation compared to a PTAC or zonal electric-resistance heating. Savings are calculated based on an analysis of annual heating requirements for a PTAC compared to a PTHP. The base case heating system is a code compliant PTAC unit with an annual coefficient of performance, or COP, of 1.0. The efficient case used to calculate savings is based on a COP of 3.45, which reflects the weighted COP for a mix of commonly available PTHP sizes.

Requirements and Specifications

- This measure is eligible to be installed in residential multifamily buildings.
- This measure applies to both retrofits and new construction.

Preconditions for retrofit installations:

- The space is conditioned by a PTAC or zonal electric-resistance heat as the primary heating source. No other heating sources are eligible.

Post-conditions:

- The installed PTHP must have an AHRI certificate of product rating. All AHRI certified PTHPs qualify for this incentive regardless of the rated COP

Documentation Requirements

DOCUMENTATION DESCRIPTION	RETENTION/SUBMITTAL LOCATIONS		
	BPA ENERGY EFFICIENCY REPORTING SYSTEM	EEDOCS@BPA.GOV	CUSTOMER FILE
End-user identifying information, including unique site ID and address.	X		X
Equipment or contractor invoice showing 1. Equipment order or purchase date 2. Installed cost			X
AHRI Certificate			X

Payment

MEASURE	PAYMENT
Packaged Terminal Heat Pump Retrofit	$200 per PTHP
Packaged Terminal Heat Pump New Construction	$125 per PTHP

Additional Information

For any of the following building types, see the Commercial Packaged Terminal Heat Pump measure:

- A lodging building type which, for the purposes of this measure, includes: hotel, motel, bed and breakfast, boarding/rooming house, apartment hotel, dormitory, and shelter or;
- In a residential care building type which, for the purposes of this measure, includes: nursing home, retirement home, and assisted living.

13.2.6 MULTISECTOR

13.3 Energy Efficiency Promotion Payment Rates (Effective July 1, 2020)

Measures completed on or after July 1, 2020 are eligible for a promotional payment rate per the table below. The promotional payment rate is not available for 10.10.7 Low-Income Energy Efficiency measures. Customers may invoice BPA for either the standard payment rate or the promotional payment rate. No measure requirements, specifications, or documentation requirements have changed as a result of the promotion. Customers should reference the appropriate Implementation Manual section for measure requirements.

IMPLEMENTATION MANUAL SECTION	STANDARD PAYMENT RATE PER UNIT: EFFECTIVE OCT. 1, 2019 - SEPT. 30, 2021	PROMOTIONAL PAYMENT RATE PER UNIT: EFFECTIVE JULY 1, 2020 - SEPT. 30, 2021
Section 7: Commercial Sector		
7.4.1 Advanced Rooftop Unit Control (ARC) - ARC Full only	$200	$225
7.4.1 Advanced Rooftop Unit Control (ARC) - ARC Lite only	$100	$125
7.4.2 Connected Thermostat - Initial Install only	$150	$200
7.4.3 Ductless Heat Pump Retrofit and Upgrade (BPA-Qualified) - Upgrade only	$300	$400
7.4.3 Ductless Heat Pump Retrofit and Upgrade (BPA-Qualified) - Retrofit only	$1,000	$1,250
7.4.4 Air-Source Heat Pump Retrofit and Upgrade (BPA-Qualified) - Upgrade only	$150	$200
7.4.4 Air-Source Heat Pump Retrofit and Upgrade (BPA-Qualified) - Retrofit only	$1,000	$1,125

IMPLEMENTATION MANUAL SECTION	STANDARD PAYMENT RATE PER UNIT: EFFECTIVE OCT. 1, 2019 - SEPT. 30, 2021	PROMOTIONAL PAYMENT RATE PER UNIT: EFFECTIVE JULY 1, 2020 - SEPT. 30, 2021
Section 10: Residential Sector		
10.7.1.1 Ductless and Ducted Mini-Split Heat Pumps Conversion	$800	$1,300
10.7.1.2 Ductless Heat Pump Upgrade	$100	$300
10.7.2.1 PTCS Air Source Heat Pumps Upgrade	$500	$700
10.7.2.1 PTCS Air Source Heat Pumps Conversion	$1,400	$1,900
10.7.2.2 PTCS Variable Speed Air Source Heat Pumps Conversion	$1,600	$2,100
10.7.2.2 PTCS Variable Speed Air Source Heat Pumps Upgrade	$700	$900
10.7.2.3 PTCS Commissioning Controls and Sizing	$300	$500
10.7.2.4 PTCS Ground Source Heat Pumps without Desuperheater	$3,000	$3,200
10.7.2.4 PTCS Ground Source Heat Pumps with Desuperheater	$3,500	$4,000
10.7.2.4 PTCS Ground Source Heat Pumps Compressor Only	$500	$700
10.7.4 Air Source Heat Pump Conversion from Electric Forced-Air Furnace to Air Source Heat Pump (without PTCS)	$800	$1,300
10.7.5 Air Source Heat Pump Conversion from Electric Forced-Air Furnace to Variable Speed Air Source Heat Pump (without PTCS)	$1,000	$1,500
10.8.2 Advanced Smart Thermostats: Standard Payment, Retail, By Request, or Coupon (BPAQ-Qualified)	$100	$150
10.8.2 Advanced Smart Thermostats: Direct Install (BPA-Qualified)	$125	$175