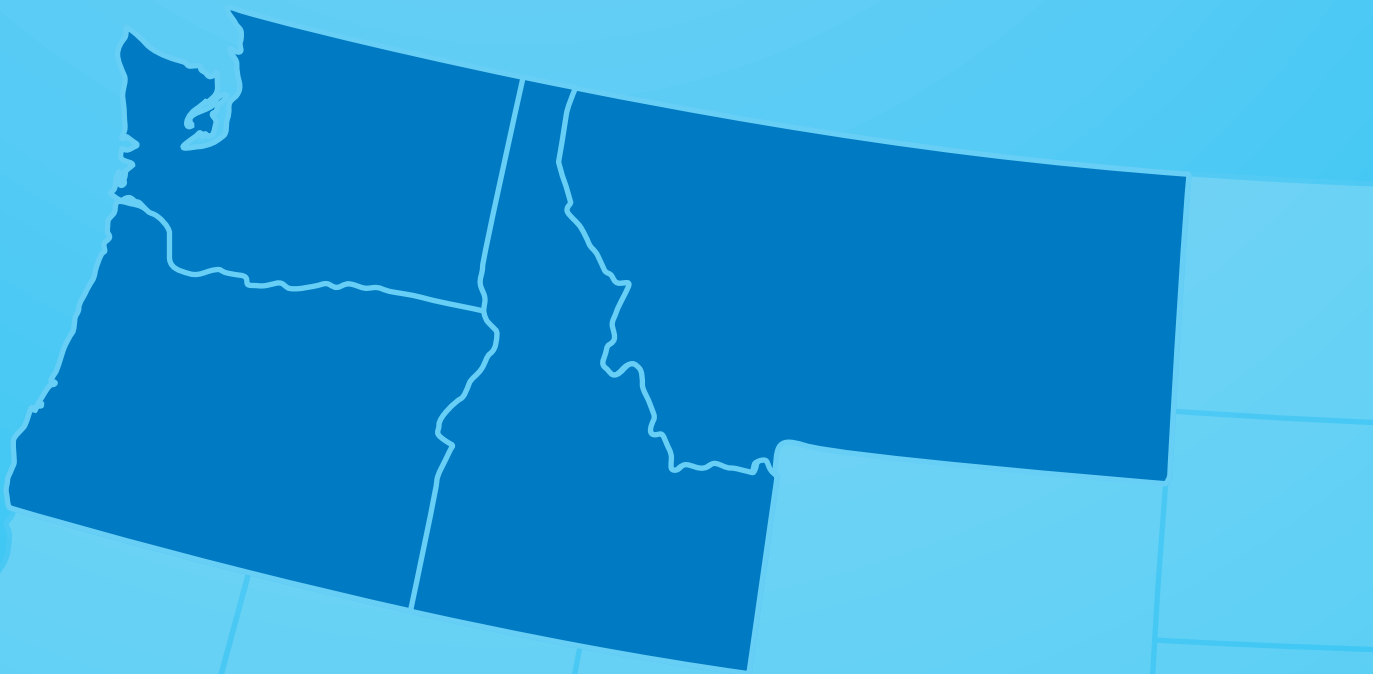
RESIDENTIAL BUILDING STOCK ASSESSMENT II

Single-Family Homes Report

2016-2017

Revised 04/2019



Updated March, 2019
See Addendum for a Summary of Updates

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Acknowledgements

A study of this magnitude requires extensive coordination, thought leadership, and input from numerous organizations. Cadmus would like to thank the following people and organizations for their contributions:

Anu Teja
Northwest Energy Efficiency Alliance project manager
Anu provided countless hours of strategic guidance and management to Cadmus. Her overall leadership was critical to the success of this project.

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The contributions of the RBSA advisory groups were essential to designing and planning another successful RBSA study.

NEEA is an alliance of more than 140 Northwest utilities and energy efficiency organizations working to accelerate the innovation and adoption of energy-efficient products, services and practices in the Northwest.

Many thanks to all of the Northwest utilities that participated in the quarterly meetings, provided billing data, and contributed suggestions throughout the course of the project.

About this Study

Primary Objective

Key Findings

Executive Summary

The Northwest Energy Efficiency Alliance (NEEA) completed its second Residential Building Stock Assessment (RBSA) in the fall of 2017. The RBSA is a broad, regional study that characterizes the building stock within three housing types: single-family homes, manufactured homes, and multifamily buildings. This is NEEA's second residential building stock assessment since its first comprehensive, regionally representative study in the 2011-2012 timeframe. For this study, NEEA continued the work of the first RBSA (referred to as RBSA I in this report) and, wherever possible, data were collected in a similar manner to ensure continuity and comparability between the studies. Cadmus conducted the second RBSA (referred to as RBSA II in this report) and collected data in the 2016-2017 timeframe, with recruiting support from Nexant.

This report presents findings for single-family homes, based on data collected from 1,100 site visits, which includes the core RBSA study (funded by NEEA), as well as data collected for three oversamples funded by Bonneville Power Administration (BPA), Seattle City Light, and Snohomish Public Utility District (PUD). Cadmus developed and applied sampling weights to ensure that all single-family home observations were weighted proportionally to the segment of the population represented by the sample; see Database User Manual for a description of the weighting methods and procedures.

The primary objective of the RBSA is to characterize the existing residential building stock in the Northwest region based on data from a representative sample of homes. NEEA and its partners designed the RBSA to account for regional differences, such as climate, building practices, and fuel choices, by using a large-scale residential sample. The characterization includes the principal characteristics of the homes (e.g., square footage, insulation level, and heating systems), their occupants (e.g., household size and income levels), and their end-use equipment (e.g., lighting, appliances, electronics, and water heating). The sample size chosen for the RBSA II allows benchmarking of energy use within households at sufficient detail to assess the progress of changes in energy efficiency and home characteristics within the region.

The following section presents the study's key findings by end use or measurement. All values in this section are weighted to represent the northwest population. These key findings represent notable and statistically significant differences between the RBSA I and RBSA II, and in some cases, the emergence of new or different technologies that were not observed in RBSA I.

Lighting

LED adoption has soared

The data from this study reveal a dramatic shift in the efficiency of residential lighting. LEDs have increased from less than one percent six years ago to nearly a quarter of all installed bulbs, with LEDs found in rooms of every type. The percentage of installed incandescent bulbs greatly declined, while CFLs remained relatively flat.

	Incandescent	CFL	LED
RBSA I	57%	25%	*Less than* 1%
RBSA II	39%	26%	20%

Connected Devices

Connected devices have emerged in homes

Though found in only a small percentage of homes, connected lighting products have emerged since RBSA I, largely without program support. Wi-Fi and smart thermostats, which have been rebated through regional programs for several years, were also observed in this RBSA study.

	Connected lighting	Smart/Wi-Fi Thermostats
RBSA I	0%	0%
RBSA II	2%	7%

Fuel

More homes are using gas equipment and appliances

Gas fuel shares for primary heating systems, water heaters, stoves, and ovens have increased, while the share of other fuel types, such as electric, have decreased.

	Primary Heating	Water Heaters	Cooktops
RBSA I	50%	43%	21%
RBSA II	56%	49%	28%

HVAC Efficiency

Electric heating and cooling equipment are more efficient

The efficiency of heat pumps and central air conditioners increased relative to the previous RBSA study. Gas furnace efficiencies also increased.

	Heat Pumps (HSPF)	Central Air Conditioners (SEER)
RBSA I	8.0	11.1
RBSA II	8.3	12.2

Mechanically Cooled Homes

More Northwest homes include mechanical cooling

The percentage of homes using some type of mechanical cooling increased in all three cooling zones. The distribution of cooling equipment did not noticeably change, except for ductless mini-split systems.

Mechanical Cooling

Mini Split

	Mechanical Cooling	Mini Split
RBSA I	42%	4%
RBSA II	65%	8%

Electronic Devices

Fewer homes have game consoles and set top boxes

Fewer homes had set-top boxes and game consoles than in the previous RBSA, and where present, they were in smaller quantities than previously identified.

Game Consoles

Set Top Boxes

	Game Consoles	Set Top Boxes
RBSA I	33%	81%
RBSA II	26%	64%

Television Technology

Television technology has shifted

The share of televisions using cathode ray tube designs has plunged since RBSA I, as the older technology gives way to LCD and LED televisions. With the rapid adoption of these more-efficient technologies, there was a large drop in average television power draw.

Cathode Ray Tubes

Power Draw (watts)

	Cathode Ray Tubes	Power Draw (watts)
RBSA I	49%	112W
RBSA II	13%	83W

Home Tightness

Homes are tighter on average

Blower door testing measured less air leakage for the region on average in this study than the previous study.

Blower Door ACH

	Blower Door ACH
RBSA I	10.3
RBSA II	8.9

This is NEEA's second comprehensive single-family building stock assessment.

NEEA conducted 10 working group sessions.

RBSA Overview

About this Report

This report includes key findings and themes from the RBSA II, organized by building component and end-use equipment. Each report section provides a high-level summary of data collection protocols, procedures, and findings. Where practical, these sections also highlight key differences between the RBSA II and RBSA I. Cadmus used two-sided t-tests for means and proportions to test the hypotheses that the current RBSA results were equal or not equal to the RBSA I results. We identified metrics where significant changes have occurred over time when tests resulted in p-values of $p<0.01$ and this is denoted by either ▲ or ▼ symbol, to indicate whether the value is higher or lower than in the previous study. We did not account for uncertainty of the RBSA I results and treated them as fixed values. Appendix A provides additional detail and supplemental data tables.

To streamline the results, the report includes only a snapshot of the collected and analyzed data. Readers may select the SEE THE DATA button (presented throughout the report) to view the detailed tables in the appendix. These tables provide all weighted single-family data from the study, with sample sizes and error bounds. In some instances, Cadmus rounded values to whole numbers for better readability. In these instances, values may not sum exactly to 100%.

The RBSA II database contains additional data, including the full data from the inventory of each home. For more details regarding the database go to neea.org/data or www.NEEA.org.

Facilitation of Working Group Sessions and Production Pretest

The RBSA provides data vital for planning and evaluation at the regional, state, and local utility levels. As such, NEEA engaged regional stakeholders in the study design and planning. Cadmus facilitated 10 working group sessions with NEEA funders and other regional stakeholders, including sessions focused on customer contact, sample design, data collection, and database development.

These sessions provided a mechanism for NEEA, Cadmus, and regional stakeholders to review and provide feedback on the proposed methods and activities planned for the RBSA II. Following the working groups, Cadmus delivered a set of interim protocols documenting the agreed-upon approach for all aspects of the RBSA data collection process such as procedures for customer engagement and interactions, the sample design, and the data points collected as part of the RBSA.

As agreed upon with NEEA, the team pretested the recruiting and data collection protocols developed during the working group sessions to ensure that the processes and tools operated as designed. During the pretest period in February 2016, the Cadmus team identified and recommended a number of small changes to improve the recruitment and data collection processes. Over the course of the study, the team made minor adjustments to the original plan, with most changes aimed at improving the recruitment process.

Implementing the RBSA II

The RBSA data collection effort included recruiting and surveying participants, acquiring signed billing release forms, and collecting data on observed equipment and home characteristics. Field technicians recorded observed information on nearly every characteristic that impacts the energy consumption of the home—from construction details to the wattage of light bulbs. The field team implemented lessons learned from the previous RBSA to improve data collection and measurements. These differences are called out throughout the report where applicable.

Customer Survey

Participants completed two short surveys about their home and its occupants: one as a part of a screening and opt-in process and another as part of the site visit. The in-home survey also collected information to help field technicians identify unusual types of equipment they should look for during the site visit such as Wi-Fi enabled equipment, electric vehicles, or seasonal heating and cooling equipment that may be kept in storage.

As the final step of the on-site interview, field technicians recorded the customer's utility (electric and gas) and utility account information and had the customer electronically sign a billing release form.

Observed Equipment and Home Characteristics

The RBSA on-site data collection was wide-ranging and, while the data collected varied based on the type of equipment in the home, generally included these observations:

- **Building configuration:** foundation type, number of floors, room square footage, and conditioned area and volume
- **Building envelope (shell):** window characteristics, insulation types and thicknesses, and construction materials
- **Air leakage:** air leakage in cubic feet per minute at 50 pascals, as measured by a blower door test
- **HVAC:** equipment characteristics, nameplate information, location, and TrueFlow® air handler flow testing and pressure measurements for electric central forced air heating systems
- **Domestic hot water:** equipment characteristics, nameplate information, and flow rate measurements for shower heads and faucets
- **Appliances:** equipment characteristics (size and configuration) and nameplate information
- **Electronics:** equipment characteristics and nameplate information
- **Lighting:** type, style, wattage, quantity, control type, and location

A comprehensive list of the types of equipment information field technicians collected by equipment category and home type and specific details for how field technicians collected data and tested home performance can be found at neea.org/data or go to www.NEEA.org.

Observed Equipment

Field technicians conducted whole-home air leakage and HVAC airflow testing.

Home Diagnostic Testing

Through the working groups, Cadmus and NEEA learned that regional stakeholders desired more comprehensive information about whole-home air leakage and HVAC airflow. As such, field technicians performed blower-door testing on all single-family homes in the study sample where they could run the test safely, without detracting from participant satisfaction. They also conducted TrueFlow testing and gathered pressure data for households with an electric central forced-air furnace or heat pump as the primary heating system.

A blower-door test measures the amount of air leakage (or air tightness) of a structure, which is a primary determinant of thermal energy efficiency. Air leakage can also affect occupant comfort, indoor air quality, and building durability. Field technicians conducted a two-point blower-door test, striking a balance between the expediency of single-point testing and the greater reliability and accuracy of multipoint testing.

Where practical, field technicians used the TrueFlow Air Handler Flow Meter to collect data and calculate airflow across air handlers in electric central HVAC systems such as furnaces and heat pumps. Considered with other information, such as the condition of the filter and the type and capacity of the current heating system, this data can help assess the adequacy of the duct system for the current system and/or an air source heat pump.

Data Cleaning and Building and Equipment Characteristic Analysis

Throughout the field data collection process, Cadmus performed continuous quality assurance (QA) reviews on data collected for randomly selected homes. The QA reviews focused on critical equipment categories, such as lighting and building construction, and emphasized identifying missing, incomplete, or inconsistent data (i.e., building construction attributes that were inconsistent with the other home characteristics). Where applicable, Cadmus updated data points based on data collection notes, photographs, or product lookup and provided feedback to its technicians to improve data collection.

After completing the site visits, Cadmus cleaned and analyzed the data. This process included reviewing the data for outliers, using field notes and photographs to determine whether a change to a data point was required, and correcting data where appropriate. The final data review also included a systematic review of each home and its equipment to ensure internal consistency. For example, Cadmus compared the type of wall framing to the age of home and reported R-value. If there was a discrepancy between these values, the team investigated the issue further and made appropriate changes if required.

The analysis relied on R statistical software to process, compile tables, and apply case weights to estimate population means and proportions as well as their error bounds. Each end-use table and reported statistic includes data on the associated population estimates and their error bounds (calculated at 90% confidence).

Billing Data Collection and Analysis

Cadmus conducted interviews to capture participant electric and gas billing information such as utility, account number, and meter numbers. Near the end of the field collection phase, Cadmus requested up to 24 months of participant billing data from utilities and reviewed them for completeness and to ensure Cadmus received data for every site, following up directly with utilities for clarification as necessary.

Cadmus performed the following checks to assess the quality of the billing data:

- Reviewed the premise address and accounts for each requested site to ensure they matched those in our database.
- Reviewed the data for inconsistencies such as duplicate reads, multiple readings on the same date, and missing data.
- Reviewed plots of each site's usage data to identify anomalies in the data, such as vacancies or erroneous readings, and removing the consumption data or further investigating the sites as needed.

Cadmus investigated anomalous data and, if possible, corrected the issue. If unable to correct the issue, Cadmus removed the customer from the energy use intensity (EUI) analysis .

The billing analysis relied on a PRISM-type variable-based degree day model. Cadmus used this model to process each home's monthly billing data to produce weather-adjusted annual consumption values. For each household, Cadmus modeled energy usage as a function of heating degree days and cooling degree days, collected from the nearest NOAA weather station. This allowed Cadmus to disaggregate energy into heating, cooling, and baseload components and then apply typical meteorological year (TMY)3 data to these components to derive a normalized annual usage for each household. Finally, to calculate a home's EUI, Cadmus divided the household's normalized usage by the home's conditioned living area.

Database

Results for the RBSA II are derived from data collected through participant surveys, on-site data collection by trained technicians, and historical energy consumption data furnished by regional utilities. Cadmus cleaned, anonymized, and compiled these data, including a number of calculated fields, into a publicly available database. The database includes data from all three housing types—single-family, multifamily, and manufactured—and is available for download through the NEEA website. The RBSA database is a relational database provided in CSV format. Users can import the flat files into other database software (i.e., Access or SQL) or spreadsheet programs such as Excel.

Cadmus also developed a database user manual and data dictionary. The user manual provides guidance on how to effectively use the database and includes instructions for incorporating sampling weights. The data dictionary defines each field in the database and provides example data for each field to give the end user a better idea of what the data mean and represent.

The database and associated documents are available at neea.org/data or go to www.NEEA.org.

Cadmus collected homeowner billing consumption data to develop an energy use intensity (EUI) for each home.

The RBSA II database contains complete data from the inventory of each home.

Sampling

Background

Cadmus designed the single-family home sample to achieve the desired level of confidence and precision (90% confidence with ±10% precision) for population estimates within each of seven geographic sub-regions. The sampling plan was designed so that these targets and the requisite sample sizes would be met wholly through NEEA project funding. Although NEEA expected some utilities and regional organizations to fund oversamples for their individual service territories, the core sample design accepted by NEEA did not rely on oversamples to meet the desired confidence and precision. This is a key difference between the current study and the previous RBSA; that is, the RBSA I did incorporate an oversample (the BPA oversample) into the core sample design; this study did not.

The following sections describe Cadmus's approach to developing the sample frame, determining the sample sizes for the core and the oversamples, and estimating population quantities using post-stratification to incorporate data from the core and oversamples.

Sample Frame Development

The goal of the single-family home sample design was to draw samples that were representative of the population within the following seven geographic sub-regions:

- Idaho
- Western Montana
- Western Oregon
- Eastern Oregon
- Western Washington
- Puget Sound
- Eastern Washington

To ensure that the sample was representative of the target population within each region, Cadmus purchased a randomized address-based sample generated by the U.S. Postal Service (USPS) within each geographic sub-region. Cadmus provided USPS with a list of counties and the number of residences required to reach the sample size targets in each geographic region. After identifying the total number of homes in each zip code that were proportional to the population of homes in the region, Cadmus requested those amounts from USPS. That is, if one county represented 50% of the total regional home population, approximately 50% of the address-based sample would be from that county.

Core Sample Sizes

Cadmus determined the sample sizes within each geographic sub-region for the core sample. The team calculated the target sample size within each sub-region and then combined them to determine the sample size for the entire region.

Table 1 lists the target and achieved sample sizes for the RBSA II single-family core sample by sub-region.

Table 1. Target and Achieved Sample Sizes

Sub-Region	Single-Family Homes	
	Target	Achieved
Western Montana	107	111
Idaho	107	107
Puget Sound	107	111
Western Washington	107	107
Eastern Washington	107	108
Eastern Oregon	107	107
Western Oregon	107	110
Total	**749**	**761**

Utility and BPA Oversample Sample Sizes

Seattle City Light, Snohomish PUD, and BPA requested oversamples in their service territories to include additional single-family homes. The Cadmus team calculated the sample sizes for the oversample using the same equation as used for the core sample, with inputs specific to each utility and BPA. Based on the population of homes served by each utility and BPA, relative to the population in the region, Cadmus predicted the number of homes that would eventually be included in the core sample from each oversample region and reduced the total oversample sample size by that amount. Table 2 shows resulting oversample sample sizes for each utility and BPA.

Table 2. Utility Oversample Sample Sizes

Sub-Region	Seattle City Light	Snohomish County PUD	BPA
Western Montana/ Idaho			32
Puget Sound	139	31	49
Western Washington			10
Eastern Washington/ Eastern Oregon			18
Western Oregon			60
Totals	**139**	**31**	**169**

The goal of the single-family home sample design was to draw samples that were representative of the population within seven sub-regions.

Sampling Weights

Cadmus used stratified sampling to select households for the core sample where strata were defined by geographic sub-regions. Cadmus calculated and applied sampling weights to estimate the overall population quantities and ensure that observations are weighted in proportion to the population represented by the sample. The oversamples introduced additional sampling within each core stratum and, thereby, the need for an adjustment to the core stratified sampling weights to account for sample size increases in the oversampled territories.

Cadmus used post-stratification to account for the combination of stratified sampling in the core and the additional sampling in the oversamples. To post-stratify, Cadmus divided the Puget Sound sub-region into BPA, Snohomish PUD, and Seattle City Light territories and divided the other sub-regions into BPA and non-BPA territories. Cadmus determined the population sizes in each post-stratification stratum based on home data from the 2014 American Community Survey (ACS) and achieved sample sizes.

The Cadmus team mapped home population sizes from the ACS data to the zip codes in each sub-region and service territory to determine stratum population sizes and counted the achieved sample sizes in each stratum. The team applied sampling weights to all observations within each stratum to estimate population totals, means, and proportions.

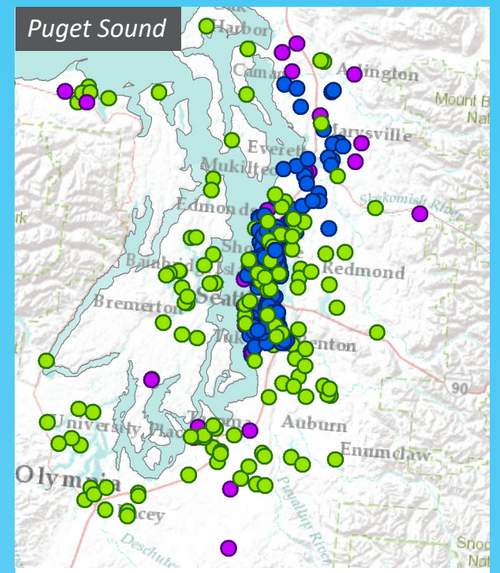
Table 3 lists the post-stratification strata within each sub-region.

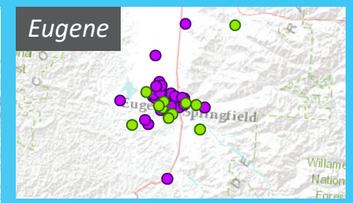
Table 3. Post-Stratification by Sub-Region

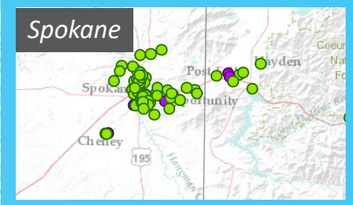
Sub-Region	Post-Stratification Strata
Western Montana	• Bonneville Power • Non-Bonneville
Idaho	• Bonneville Power • Non-Bonneville
Eastern Washington	• Bonneville Power • Non-Bonneville
Western Washington	• Bonneville Power • Non-Bonneville
Puget Sound	• Bonneville Power • Snohomish PUD • Seattle City Light • Non-Bonneville
Eastern Oregon	• Bonneville Power • Non-Bonneville
Western Oregon	• Bonneville Power • Non-Bonneville

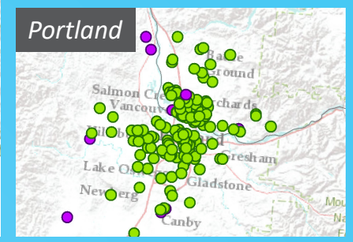
The following maps show the distribution of single-family site visits across Idaho, Western Montana, Oregon, and Washington by NEEA's core RBSA II sample, as well as utility and BPA oversample homes. The maps also show a more detailed breakout of site visits for these areas: Puget Sound, Portland, Eugene, and Spokane.

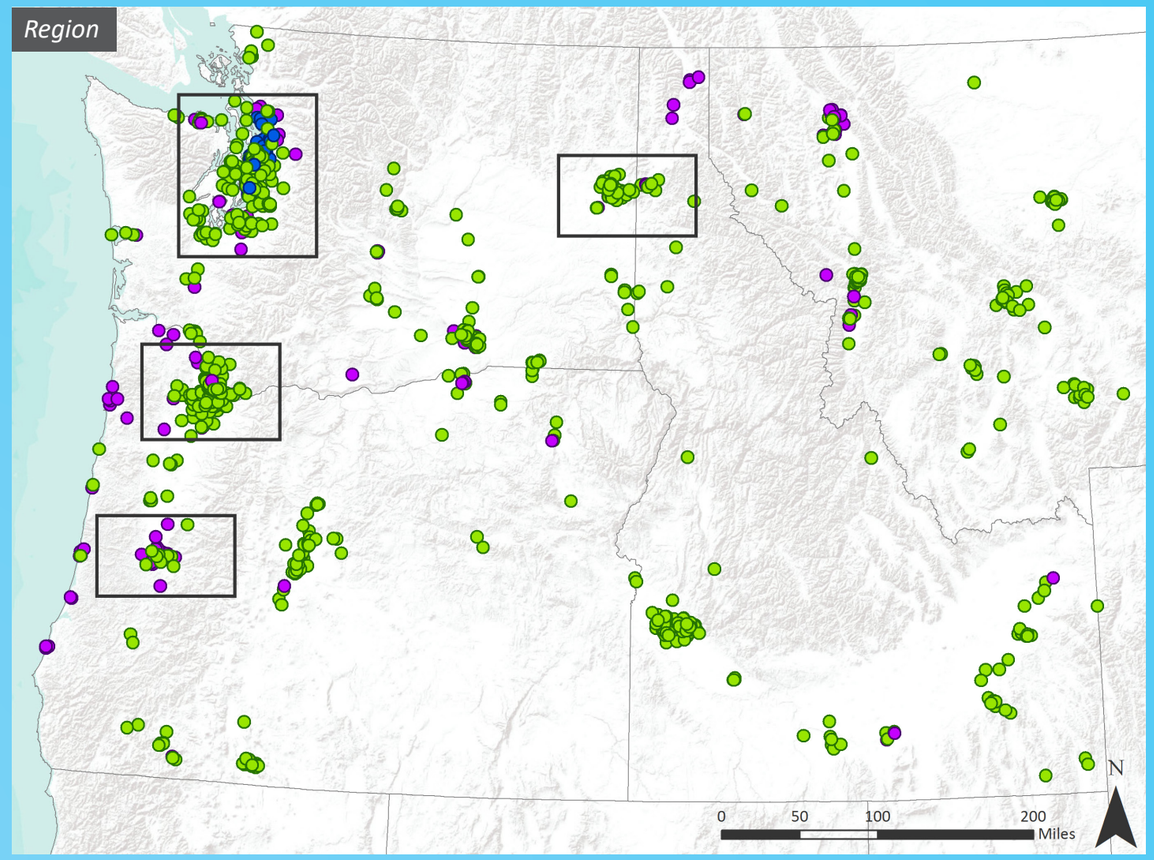
- Utility Oversample
- BPA Oversample
- NEEA Core











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SUMMARY OF BUILDING CHARACTERISTICS

The following sections provide detailed findings by home characteristic, measurement, and end use. All values in these sections are weighted. These findings represent notable and statistically significant differences between the RBSA II and the previous RBSA, and in some situations, the emergence of new or different technologies not observed in RBSA I.

Where practical, these sections also highlight key differences between the RBSA II and RBSA I. Differences that are statistically significant are denoted by either an ▲ or ▼ symbol, to indicate whether the value is higher or lower than in the previous study. Where Cadmus observed new or different technologies, or if we developed tables for this RBSA that were not present in the RBSA I, we did not conduct statistical significance testing.

Appendix A provides additional detail and supplemental data tables, as well as references to comparable RBSA I table numbers.

Age and Type

Description

The RBSA II defined single-family homes according to the Northwest Power and Conservation Council's definition: individual residences in buildings with fewer than five residential units in a single structure. Single-family building types include detached single-family, townhouse or rowhouse, duplex, triplex, and fourplex.

A detached single-family home does not share a common wall with an adjacent unit or structure. A townhouse or rowhouse abuts one or more buildings, does not sit even partially above or below a separate living unit, and rests on land owned by the owner of the home. A duplex, triplex, and fourplex may include shared floors or ceilings. When Cadmus recruited one unit within a duplex, triplex, or fourplex, field technicians only recorded information for the recruited unit.

Cadmus identified the age of the home first by asking the participant and then verifying through online sources.

Key Findings

Key findings for home type and vintage include:

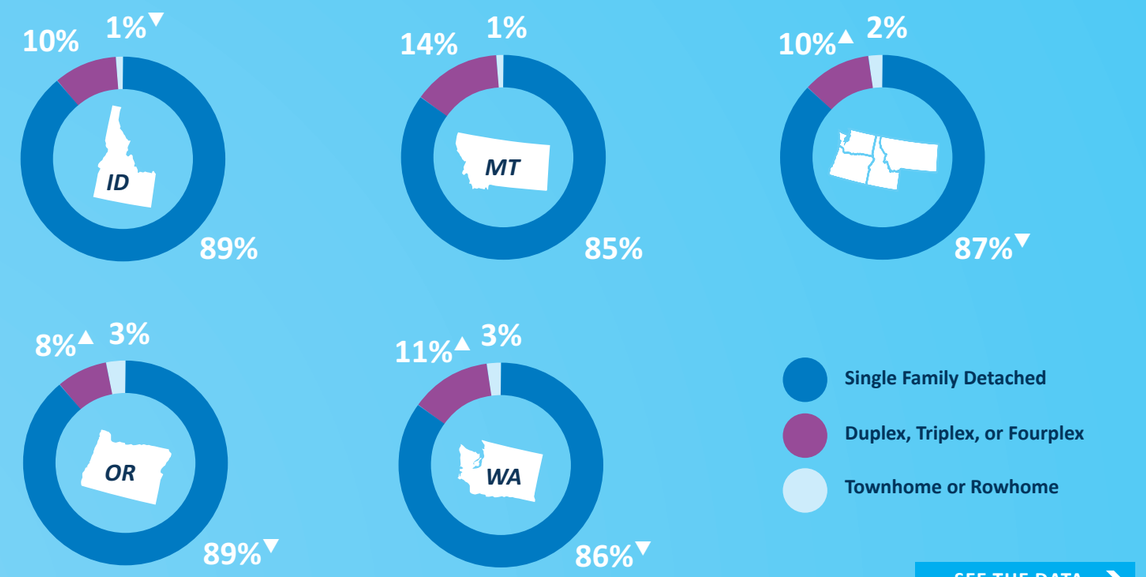
- Consistent with the previous RBSA, just under a quarter of the sample comprises homes built prior to 1951 that have only undergone modest additions in subsequent decades.
- Two decades stand out where new housing stock spiked (1970s and early 2000s), and these spikes are consistent for all states. The spikes are most pronounced in Idaho and Montana, with Idaho experiencing the largest housing stock increases across the region per decade . There is a noticeable decline in new housing stock after 2010, but these data represent only seven years.
- Cadmus conducted 87% of RBSA II site visits in single-family detached homes, which is a 6% decline from the previous RBSA. There was an increase in site visits to duplex, triplex, and fourplex homes for all states and decreased site visits to town and rowhomes in Idaho.
- Cadmus compared collected building stock data with applicable home characteristics from the American Community Survey (ACS) to ensure that the study results were representative of the population reported in the ACS. Both housing vintage and type were similar.

Distribution of Homes by Vintage and State

	Pre 1951	1951-1960	1961-1970	1971-1980	1981-1990	1991-2000	2001-2010	Post 2010	Total
ID	16%	5%	8%	20%	9%	15%	22%	5%	100%
MT	18%	7%	8%	15%	18%	11%	19%	3%	100%
OR	31%	9%	9%▼	14%	8%	15%	10%	5%	100%
WA	21%	8%	10%	14%	12%	14%	16%	5%	100%
	23%	8%	9%▼	15%	11%	14%	15%	5%	100%

SEE THE DATA

Distribution of Homes by Type and State



SEE THE DATA

▲▼ *Statistically different from 2011 RBSA*

Building Envelope

Description

The building envelope comprises the surfaces and insulation that separate conditioned space from the outdoors and is a key determinant of the energy use of any building. Field data collection for single-family homes included extensive characterization of the building envelope, including ceilings, walls, floors, and windows and doors.

Field technicians captured information about exterior surfaces using a variety of techniques. In accessible attics, crawlspaces, and basements, direct observation allowed collection of insulation type and thickness along with other relevant characteristics. With exterior walls, which are typically fully enclosed, field technicians used a combination of infrared thermography and probing around electrical boxes to determine whether a surface was insulated. Probing also often allowed an estimate of the thickness of wall insulation.

Unless otherwise noted, R-values represent only the R-value of the insulation, not of the wall, attic, or floor assembly as a whole.

Key Findings

Key findings for home building envelope include:

- The RBSA II weighted data show room for improvement: 27% of homes have attic insulation with a weighted average R-value less than 11. The lower R-values in RBSA II versus the RBSA I likely reflect differences in methodology. The RBSA II collected data on type, thickness, and completeness of insulation in each attic space rather than estimation of an R-value. The team used these insulation characteristics to calculate a weighted average U-factor and then the R-value.
- The RBSA II data show improvement in wall insulation in Washington, Oregon, and Idaho with fewer homes with no wall insulation. Again, the overall shift to lower R-values throughout the region is likely because of differences in methodology. Infrared thermography in the RBSA II study may have allowed more accurate identification of insulated and uninsulated walls, and estimation of the completeness of wall insulation. As with attic insulation, the team used this information to calculate a weighted average U-factor and weighted R-value for the home.

Distribution of Attic Insulation R-Value

*Attic insulation data show room for improvement, with **27%** of single-family homes in the Northwest having weighted average R-values **less than 11**.*

	R0	R1-R10	R11-R15	R16-R20	R21-R25	R26-R30	R31-R40	R41-R50	>R50
RBSA I	1%	5%	8%	11%	12%	16%	36%	8%	3%
RBSA II	2%	25%	8%	7%	12%	8%	20%	12%	6%

SEE THE DATA

** Due to differences in methodology between the RBSA I and RBSA II studies, testing for statistical differences was not performed.*

Distribution of Wall Insulation R-Value by State

*Approximately **8% of homes** in the region have no wall insulation, and another 18% have a weighted average R-value less than R-11 (usually because only some walls have insulation).*

	ID	MT	OR	WA	
R0	9%	11%	11%	6%	8%
R1-R10	20%	30%	16%	18%	18%
R11-R16	41%	33%	45%	41%	42%
R17-R22	29%	24%	24%	34%	30%
>R22	1%	2%	5%	1%	2%
Total	100%	100%	100%	100%	100%

** Due to differences in methodology between the RBSA I and RBSA II studies, testing for statistical differences was not performed.*

SEE THE DATA

▲▼ *Statistically different from 2011 RBSA*

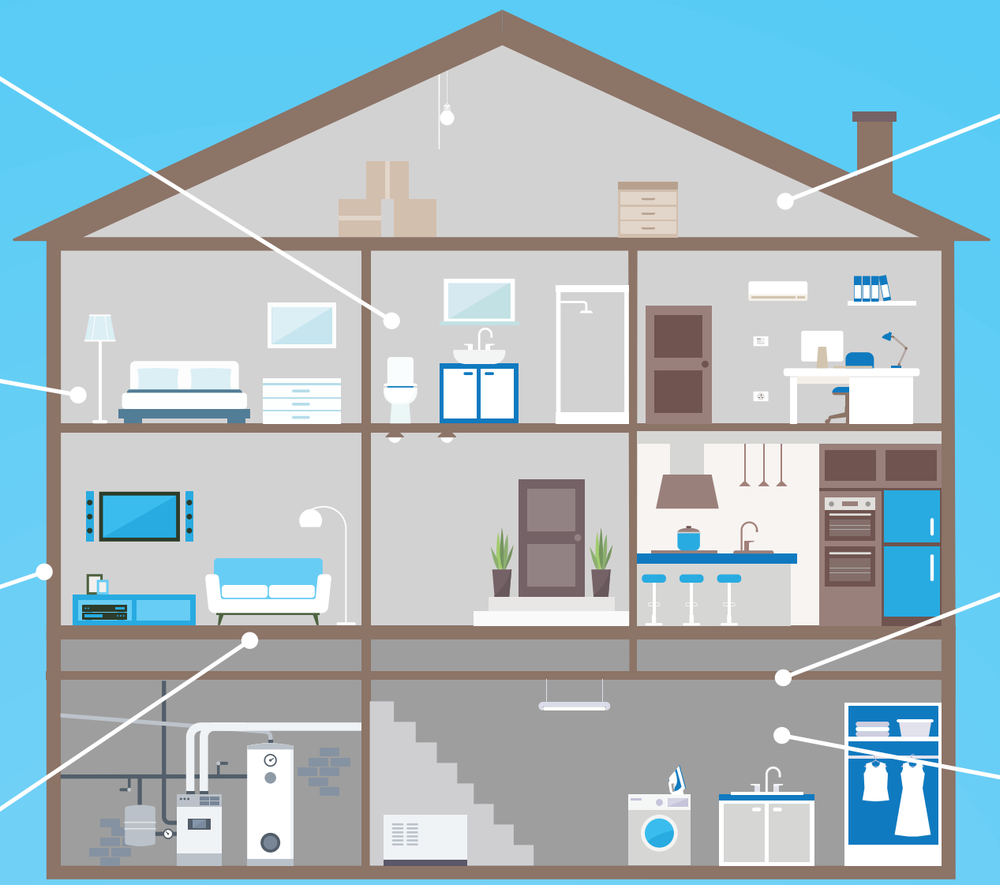
Building Envelope Characteristics

BATHROOMS/HOME
ID **2.3**
MT **2.1**
OR **2.3**
WA **2.2**
Region **2.2**

BEDROOMS/HOME
ID **3.1**
MT **3.0**
OR **2.9**
WA **2.9**▼
Region **3.0**▼

WALL FRAMING TYPES
2x4 **55%**▼
2x6 **43%**▲
2x8 **1%**
Alternative **<1%**

FLOOR AREA OVER CRAWLSPACE
ID **61%**
MT **48%**
OR **76%**
WA **64%**
Region **66%**



HOMES WITH ATTICS
ID **95%**
MT **88%**
OR **90%**
WA **93%**
Region **92%**

HOMES WITH BASEMENTS
ID **43%**
MT **49%**
OR **26%**
WA **28%**▼
Region **31%**

CONDITIONED BASEMENTS
(FOR HOMES WITH A BASEMENT)
ID **94%**
MT **100%**
OR **94%**
WA **95%**
Region **95%**

▲▼ *Statistically different from 2011 RBSA*

▲▼ *Statistically different from 2011 RBSA*

Description

Air Leakage

High air leakage in homes squanders energy as conditioned air leaks to outside. It can also lead to occupant discomfort and to moisture-related problems caused by condensation as warm air from inside meets cold surfaces inside walls, attics, or crawlspaces. Where safety protocols allowed, field technicians conducted a blower door test on homes to provide a measure of air leakage.

As prescribed by study protocols, field technicians used a two-point process for conducting the blower door tests, meaning results were measured at two house pressures—roughly 25 pascals and 50 pascals. These data allowed calculation of two commonly used indications of the air tightness of a building: air leakage in cubic feet per minute (CFM) at 50 pascals—denoted CFM50—and air changes per hour at 50 pascals, which is commonly denoted as ACH50. A two-point blower door test allows calculation of an approximation of the slope of the flow curve for each site, which must be assumed when testing at a single pressure. This increased the accuracy of results and allowed a level of quality assurance during testing.

For sites that met eligibility criteria and where practical, visits included a test of airflow across the air handler using the Energy Conservatory's TrueFlow Air Handler Flow Meter. Eligibility requirements included that the primary heating system use electricity as the heat source and that the system configuration allowed a TrueFlow plate to be placed at or near the air handler.

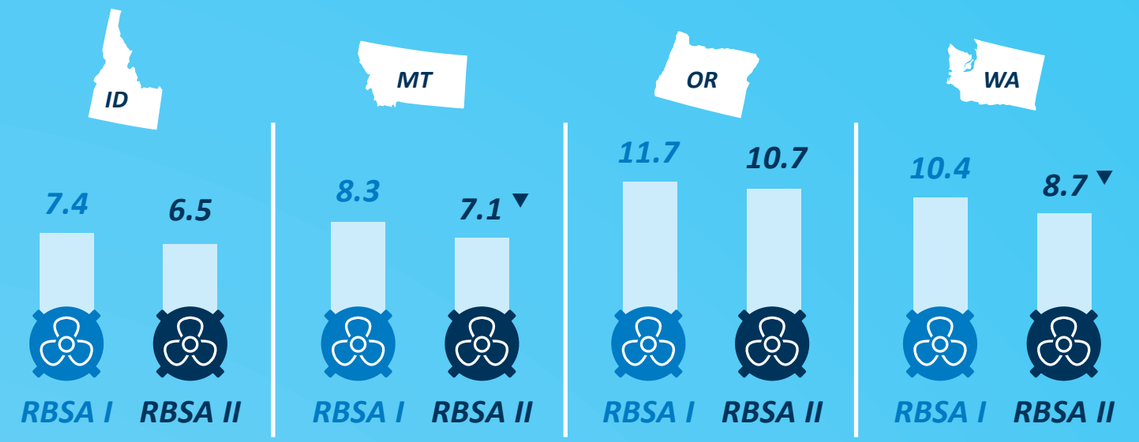
Key Findings

Key findings for homes air tightness include:

- The RBSA II blower door data show less air leakage on average than the previous RBSA homes in Montana, Washington, and the region. The RBSA II weighted regional average of 8.9 ACH50 represents 87% of the RBSA I average. This reduction is likely, in part, from home improvements such as air sealing, installation of high-efficiency sealed combustion furnaces, and window replacement. The addition of new, tighter homes to the housing stock since the previous RBSA also accounts for reduced average air leakage.
- Consistent with RBSA I findings, RBSA II blower door data show higher ACH50 for homes in Oregon and Washington than Idaho and Montana, indicating more air leakage on average in those homes. As expected, air leakage is higher on average with older homes, with average ACH50 ranging from 4.9 for homes built after 2010 to 13.0 for homes built before 1951.
- During TrueFlow air-handler airflow testing, air source heat pumps averaged 280 CFM per ton of heating capacity across the region, and electric forced air furnaces averaged 185. The report Appendix A includes summary tables of TrueFlow results. The RBSA II database shows results for each home, along with other relevant information.

Blower Door Air Tightness (ACH50) by State

*RBSA II blower door testing showed **less air leakage** on average than the previous RBSA.*



SEE THE DATA

Blower Door Air Tightness (ACH50) by Home Vintage

*Air leakage is **higher on average** with older homes.*

	Pre 1951	1951-1960	1961-1970	1971-1980	1981-1985	1986-1990	1991-1995	1996-2000	2001-2005	2006-2010	Post 2010
RBSA I	13.7	11.6	10.6	10.1	7.6	8.1	8.3	7.5	7.5	6.3	6.6
RBSA II	13.0▼	9.8▼	10.7▲	8.3▼	10.2▲	8.8▲	7.2▼	6.9▼	5.6▼	5.8▼	4.9▼

SEE THE DATA

▲▼ *Statistically different from 2011 RBSA*

Description

Code Updates

Key Findings

HVAC Systems

Data collection included extensive characterization of the heating, cooling, and ventilation equipment in each home. These systems include central equipment such as forced-air furnaces and heat pumps as well as zonal equipment such as baseboard heaters, heating stoves, and ductless mini-split heat pumps. Field technicians also collected information such as the make, model number, capacity, and year of manufacture of heating and cooling equipment where practical. Where year of manufacture was not included on the manufacturer's label, technicians collected serial number data, which often included encoding that allowed the team to determine the year of manufacture after the site visit. Where practical, Cadmus also used post-visit lookups to provide equipment efficiency ratings.

During the working group process, Cadmus collaborated with stakeholders to refine the data collection methods of the RBSA I. One improvement to the data collection, which is reflected in some of the results below, was increased focus on portable and seasonal heating and cooling devices. The field technicians asked residents whether they used these equipment at any point during the year, even if the equipment was stored during the site visit, and they captured relevant information about this equipment if applicable.

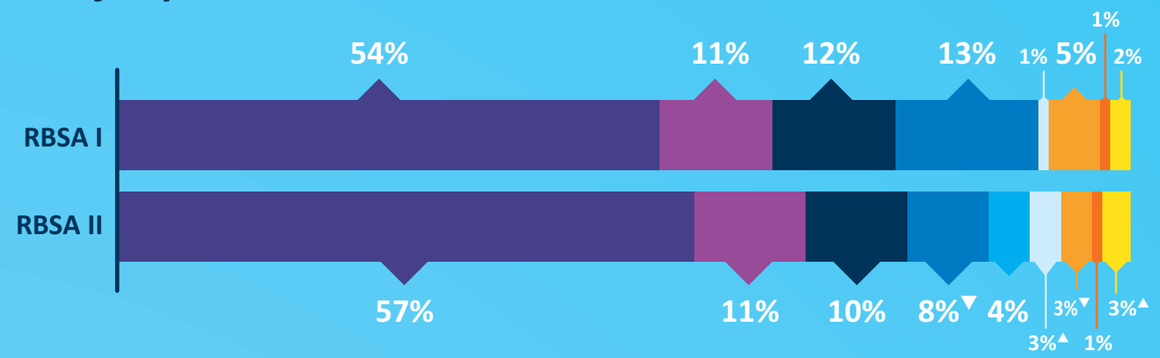
Changes in federal efficiency standards since the last RBSA mandate higher minimum efficiency ratings for some HVAC equipment. For instance, as of May 1, 2013, the minimum annual fuel utilization efficiency (AFUE) of non-weatherized gas furnaces for stick-built homes increased from 78 to 80. As of January 1, 2015, the minimum seasonal energy efficiency ratio (SEER) of split system heat pumps increased from 13 to 14, and the minimum heating seasonal performance factor (HSPF) increased from 7.7 to 8.2.

Key findings for HVAC include:

- Primary heating equipment remained much the same in RBSA II as in the previous RBSA, with two notable changes. First, use of heating stoves and fireplaces as the primary heating system decreased from 13% to 8%, and second, use of mini-split heat pumps increased from 1% to 3%.
- For electrically heated homes, the percentage of households using mini-split heat pumps as their primary heat source increased from 5% in RBSA I to 12% in RBSA II.
- The percentage of homes using some type of mechanical cooling increased from 42% to 57%.

Distribution of Primary Heating Systems

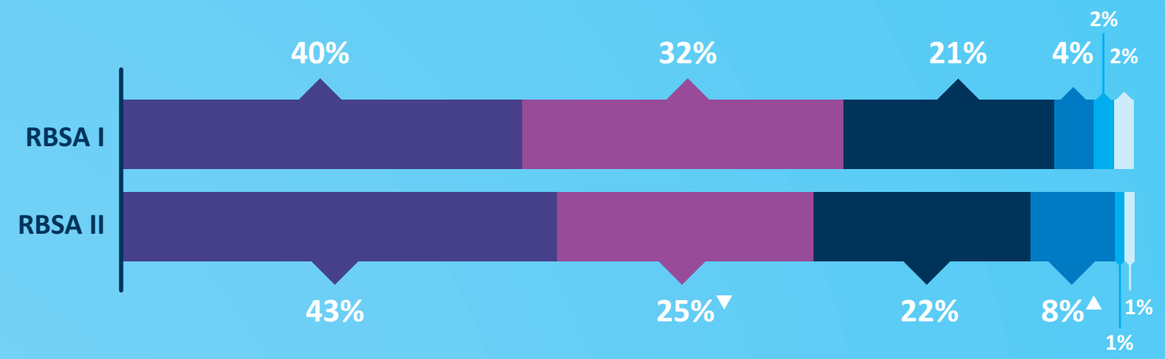
Distribution of primary heating and cooling systems was similar to the previous RBSA. The only notable changes included a ***decrease in heating stoves and fireplaces*** *for primary heat and an increase in mini-split heat pumps.*



Furnace
Electric Baseboard and Wall Heaters
Zonal Heat
Boiler
Other
Air Source Heat Pump
Stove/Fireplace
Mini-split HP
Geothermal Heat Pump

SEE THE DATA ›

Distribution of Primary Cooling Systems



Central AC
Packaged (and window) AC
Geothermal Heat Pump
Air Source Heat Pump
Mini-split HP
Other

SEE THE DATA ›

▲▼ *Statistically different from 2011 RBSA*

Distribution of Primary Heating Fuel Type by State

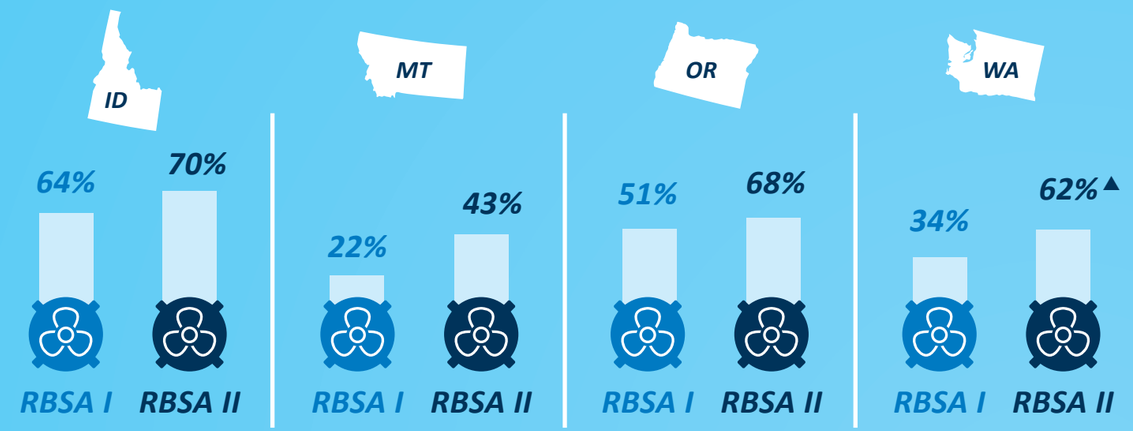
*Gas fuel **increased from 49% to 56%**. Other alternative fuel sources declined.*

	ID	MT	OR	WA	
Electric	22%	17%	33%	42%	35%
Gas	64%	67%	58%▲	52%	56%▲
Oil	—	—	2%▼	2%	2%▼
Pellets	1%	1%	2%	—	1%▼
Propane	4%	8%	0%▼	1%	2%
Wood	9%	7%▼	4%▼	2%▼	4%▼
Total	100%	100%	100%	100%	100%

SEE THE DATA

Percent of Homes with Cooling Equipment (All Systems and Cooling Zones)

***More homeowners** are mechanically cooling their homes.*

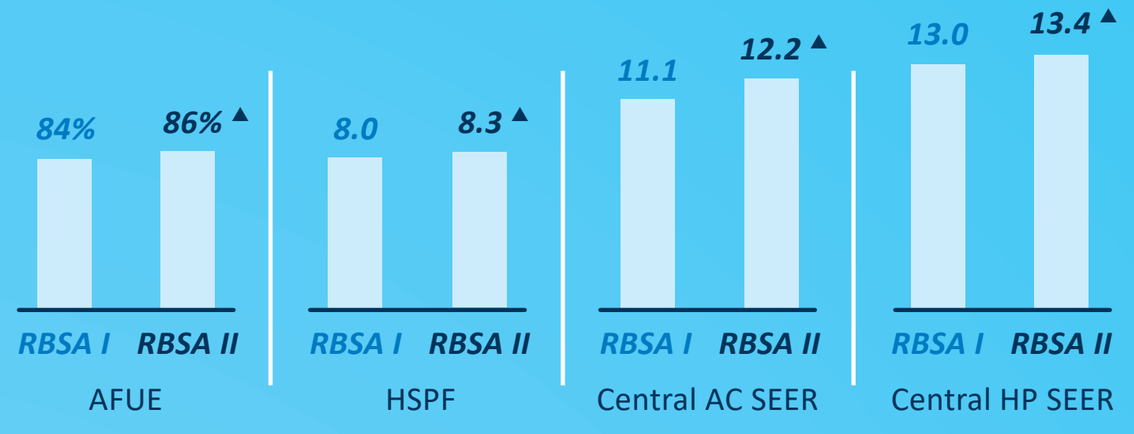


SEE THE DATA

▲▼ *Statistically different from 2011 RBSA*

Average Heating and Cooling Equipment Efficiency Ratings

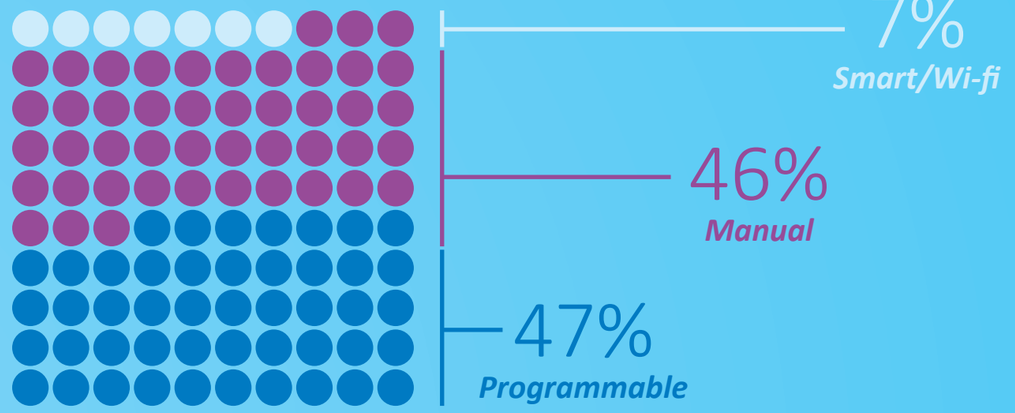
*Heating and cooling equipment are **trending toward greater efficiency.***



SEE THE DATA

Distribution of Thermostats by Type

*Connected thermostats now represent **7% of installed thermostats**.*



SEE THE DATA

▲▼ *Statistically different from 2011 RBSA*

Description

Code Updates

Key Findings

Lighting

Lighting data collection is a highly involved process, encompassing lighting inside and outside the residence as well as equipment kept in storage. Cadmus conducted a comprehensive lighting walk-through that captured details about lighting in every room accessible to the field technician. These details include lamp type, style, wattage, quantity, control, and location. In addition to bulbs currently installed, field technicians identified and recorded bulbs in storage.

To ensure all relevant data were collected, field technicians performed a systematic walk-through of the home, documenting control types, fixtures, lamp attributes, and quantities. They began the process by asking the resident about spare bulbs and recording bulb type and quantities. Identifying the type of bulb can be difficult due to accessibility or safety issues and the fact that many bulbs today look like incandescent but are in fact something different, such as a halogen. Where field technicians could not accurately assess the bulb type, they noted it as unknown.

Collecting information about LEDs and connected lighting, or lighting with an element of connectivity or intelligence, was new to this RBSA.

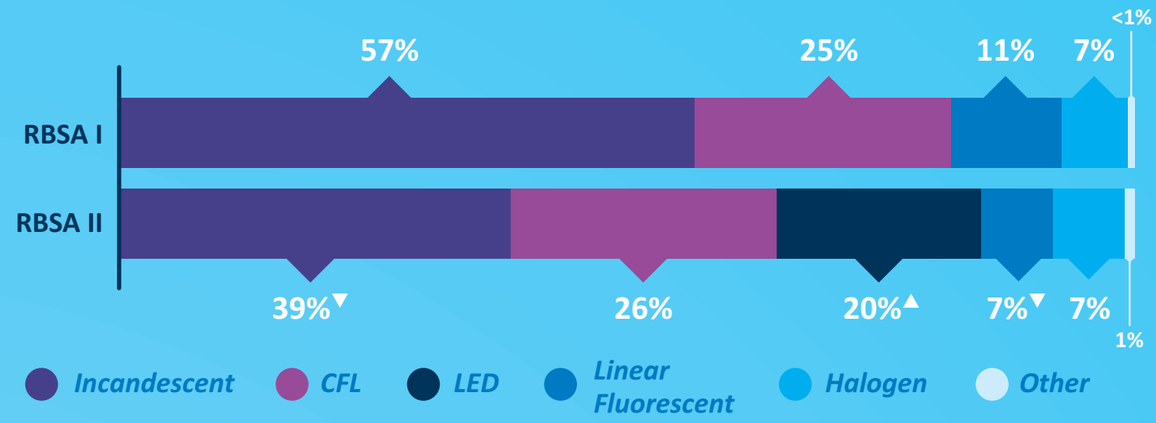
The Energy Independence and Security Act of 2007 was phased in beginning in 2012. This standard impacted many lamps that would have been targets of utility lighting programs and likely accelerated the adoption of energy efficient light bulbs.

Key findings for homes lighting include:

- Regional lighting stock changed dramatically since the RBSA I. Most notably, LEDs represent a significant share of installed bulbs (20% regionally). This is a substantial increase from the RBSA I, where LEDs were not found in sufficient quantities to be included in report tables.
- The percentage of incandescent lamps in use across the region decreased from 57% to 39%. Other bulb types such as CFLs and halogens remained about the same, with insignificant changes in proportional share.
- Connected lighting, bulbs that connect to the home Wi-Fi, were found in 2% of homes.

Average Distribution of Lamp Type by RBSA Study

***Almost half** (46%) of all light bulbs are now either a CFL or LED compared to just 25% (all CFLs) in the RBSA I study.*



SEE THE DATA

Distribution of Lamp Type by State

*The proportion of installed LED lamps ranged from **9% in Montana to 24% in Washington**.*

	ID	MT	OR	WA	
Compact Fluorescent	26%	27%	25%	26%	26%
Halogen	6%	10%	6%	8%	7%
Incandescent	42%▼	45%▼	44%▼	35%▼	39%▼
Incandescent/ Halogen[1]	1%	0%	0%	0%	0%
Light Emitting Diode	17%▲	9%▲	17%▲	24%▲	20%▲
Linear Fluorescent	8%	8%	6%▼	6%▼	7%▼
Other	1%	1%	1%	1%	1%
Total	100%	100%	100%	100%	100%

[1]*In some instances, field technicians could not differentiate between incandescent or halogen.*

SEE THE DATA

▲▼ *Statistically different from 2011 RBSA*

LEDs are installed ***throughout the home.***

The ***highest concentration*** *of LEDs is in the* ***kitchen****.*

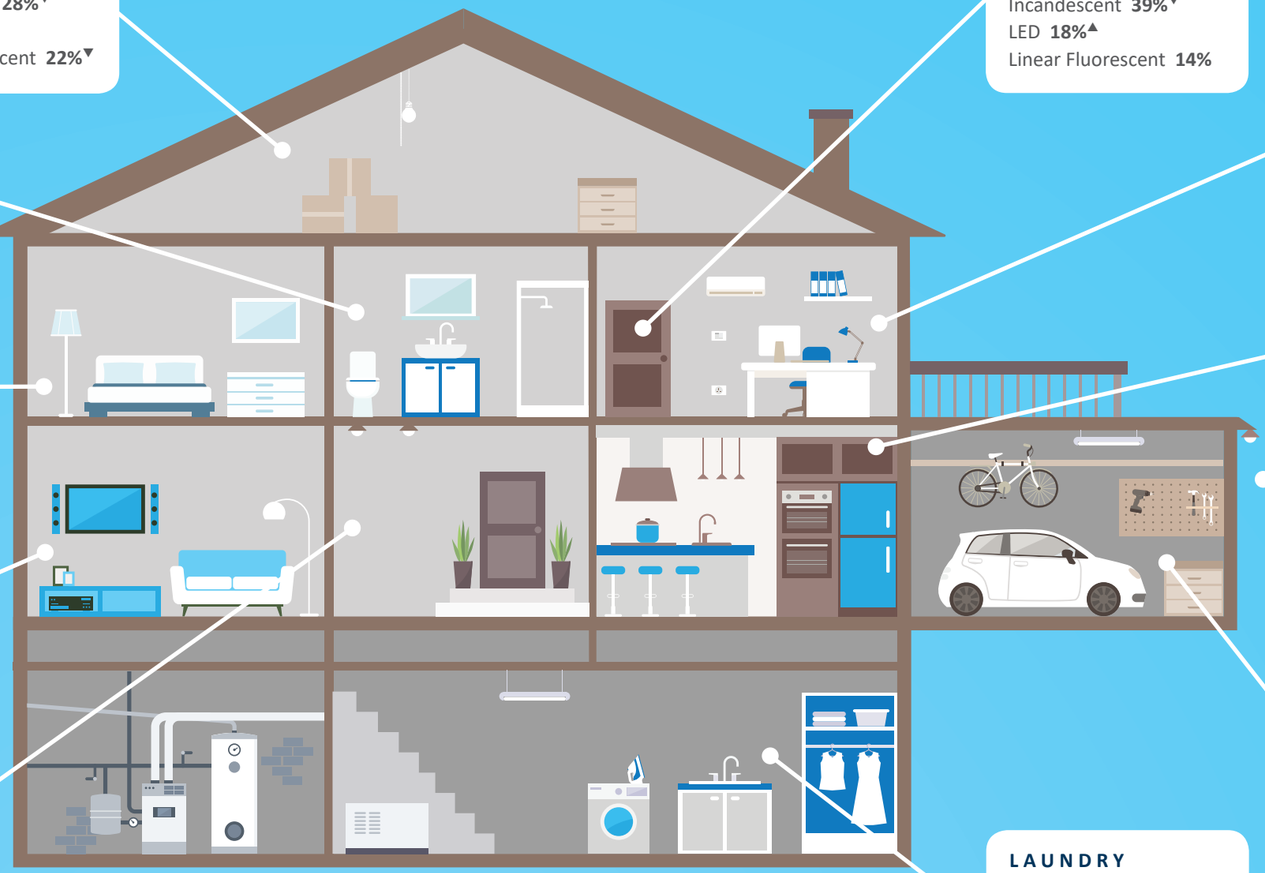
BATHROOM
CFL **22%**
Halogen **7%**▲
Incandescent **48%**▼
LED **19%**▲
Linear Fluorescent **2%**

BEDROOM
CFL **30%**
Halogen **7%**▲
Incandescent **41%**▼
LED **18%**▲
Linear Fluorescent **2%**

FAMILY/LIVING/ DINING ROOM
CFL **23%**
Halogen **8%**
Incandescent **43%**▼
LED **22%**▲
Linear Fluorescent **2%**▼

HALL
CFL **28%**
Halogen **7%**
Incandescent **44%**▼
LED **19%**▲
Linear Fluorescent **1%**

OTHER
CFL **29%**▲
Halogen **4%**
Incandescent **28%**▼
LED **15%**▲
Linear Fluorescent **22%**▼



CLOSET
CFL **22%**
Halogen **5%**▲
Incandescent **39%**▼
LED **18%**▲
Linear Fluorescent **14%**

OFFICE
CFL **33%**
Halogen **8%**
Incandescent **29%**▼
LED **22%**▲
Linear Fluorescent **6%**▼

KITCHEN
CFL **22%**
Halogen **9%**▼
Incandescent **26%**▼
LED **30%**▲
Linear Fluorescent **11%**▼

OUTSIDE
CFL **28%**
Halogen **12%**
Incandescent **40%**
LED **17%**
Linear Fluorescent **1%**

GARAGE
CFL **15%**
Halogen **3%**▲
Incandescent **23%**▼
LED **11%**▲
Linear Fluorescent **47%**▼

LAUNDRY
CFL **29%**
Halogen **3%**▼
Incandescent **24%**▼
LED **14%**▲
Linear Fluorescent **27%**

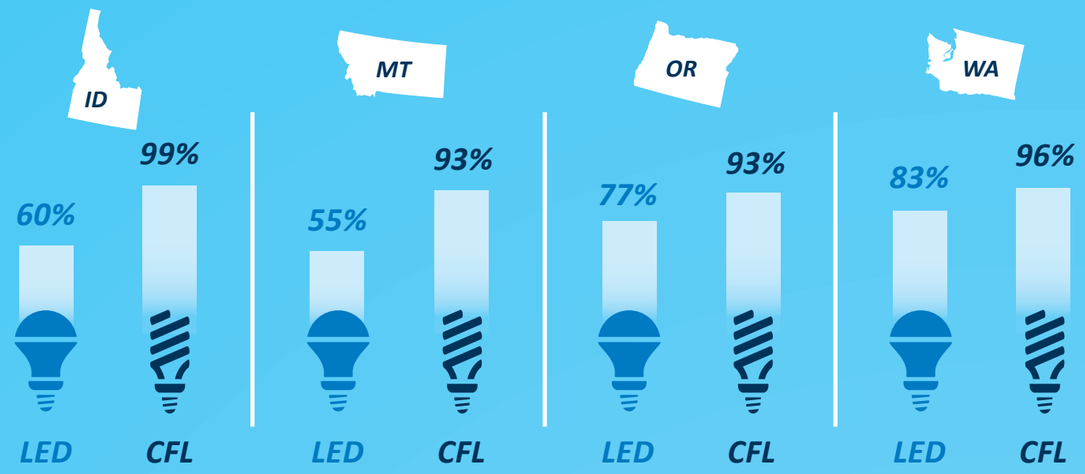
SEE THE DATA ›

▲▼ *Statistically different from 2011 RBSA*

▲▼ *Statistically different from 2011 RBSA*

Percent of Homes with CFLs and LEDs by State

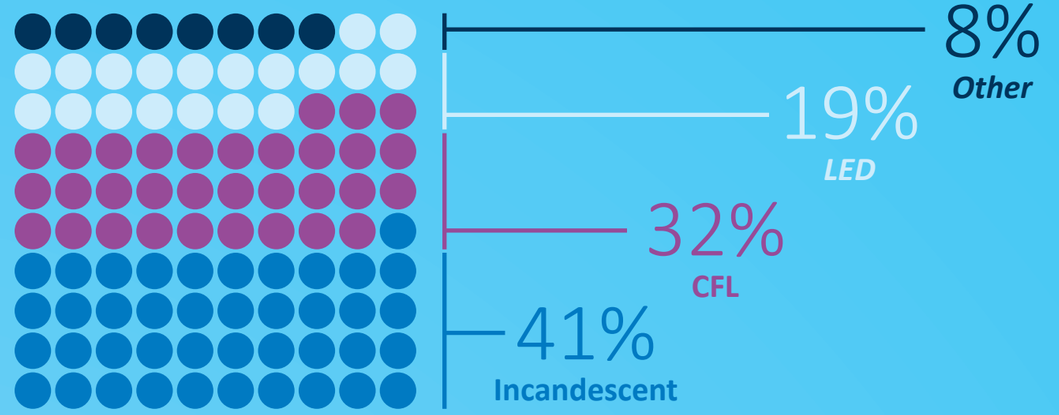
*Almost every home has **at least one CFL**; more than three-quarters of Northwest homes have one or more LEDs.*



SEE THE DATA

Distribution of Stored Bulbs

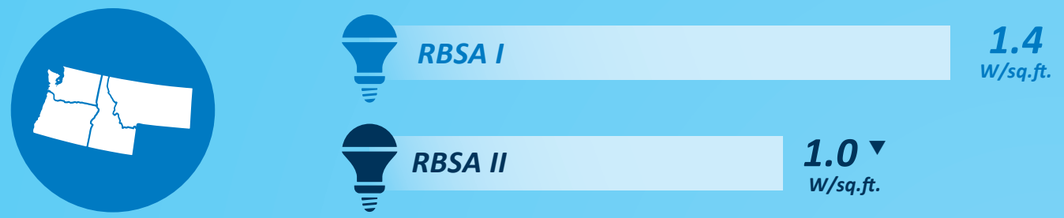
*Of bulbs not in use (in storage), incandescent bulbs represent the **highest quantity**, followed by CFLs.*



SEE THE DATA

Home Lighting Power Density by Study

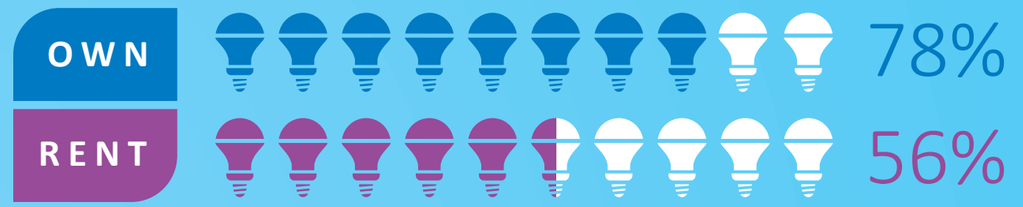
Due to the shift from inefficient incandescent bulbs to LEDs, the lighting power density (watt per sq. ft.) ***decreased from 1.4 to 1.0.***



SEE THE DATA

LED Installed by Owner Versus Renter

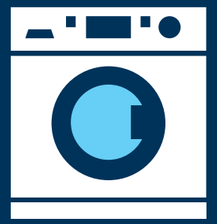
Homeowners are more likely than renters to have ***at least one LED installed.***



SEE THE DATA

▲▼ *Statistically different from 2011 RBSA*

▲▼ *Statistically different from 2011 RBSA*



Description

Code Updates

Key Findings

Appliances

The appliance data collection identified and characterized appliances in each home, including kitchen and laundry appliances. This section includes distribution of appliances by state and region, specific characteristics such as age and size, and appliance configurations such as door position for refrigerators. In many instances, Cadmus identified characteristic data such as age, efficiency, and size after the site visit through a combination of databases and other secondary sources.

For the first time, the RBSA II collected information about connected appliances (that is, appliances that are connected to the homes' Wi-Fi). In addition to identifying the presence of clothes dryers and fuel type, the RBSA II captured more information regarding clothes dryer configurations and other details (included in Appendix A).

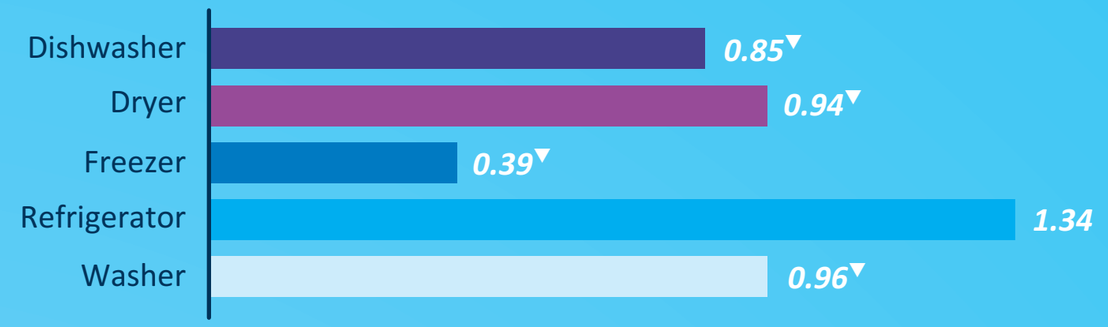
Federal energy efficiency standards can have a significant impact on appliance stock and efficiencies in particular. There have been a few federal efficiency standard changes since the previous RBSA. Appliances impacted by federal efficiency changes include the following equipment:

- Refrigerators and freezers (effective 2014)
- Dehumidifiers (effective 2012)
- Clothes washers and dryers (effective 2015)
- Dishwashers (effective 2013)

Key findings for appliances include:

- Appliance distributions, types, and efficiencies show some shift since the last RBSA. For instance, the distribution of clothes washer and refrigerator efficiencies and configurations changed.
- The average appliance age was 10 years, with 32% of dryers and 28% of dishwashers beyond their useful life. Useful life is based on Regional Technical Forum assumptions and ranges from 12 to 22 years, depending on the appliance.
- There were significant shifts in refrigerator configuration types: refrigerators with top freezers declined the most since the previous RBSA, and side-by-side refrigerators with bottom freezers increased the most. In general, side-by-side configuration refrigerators have been shown to consume more energy than single-door units when all else is equal.

Average Number of Appliances per Home



SEE THE DATA

Distribution of Clothes Washer Types

*Horizontal and vertical axis (without agitator) washers increased from a combined share of **39% to 57%** across the region.*

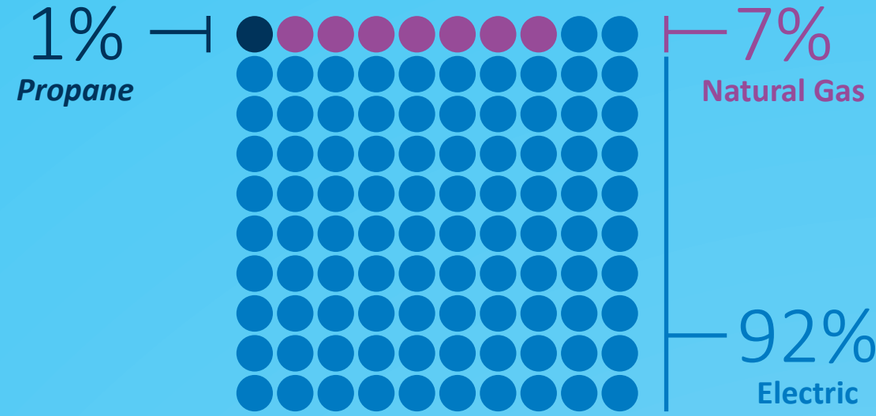
	ID	MT	OR	WA	
Horizontal Axis	30%	37%	51%▲	44%▲	44%▲
Vertical Axis (with agitator)	65%	47%	35%▼	38%▼	41%▼
Vertical Axis (without agitator)	4%	15%	12%▲	16%▲	13%▲

SEE THE DATA

▲▼ *Statistically different from 2011 RBSA*

Distribution of Clothes Dryer Fuel Types

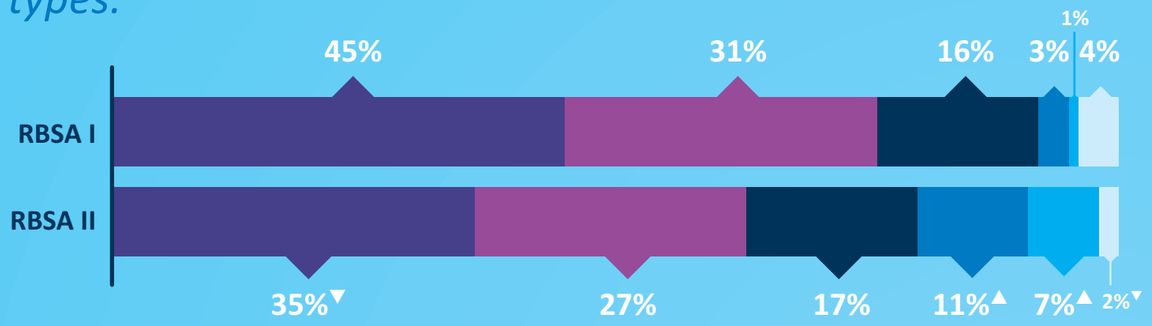
*The RBSA II found **92%** of dryers are electric, followed by natural gas (**7%**) and propane (**1%**).*



SEE THE DATA

Distribution of Refrigerators by Type

*There were **significant shifts** in refrigerator configuration types.*

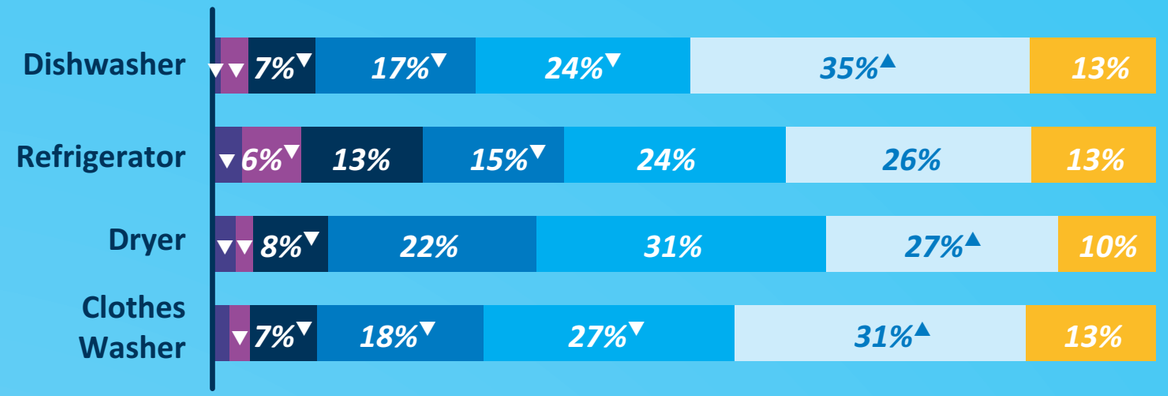


SEE THE DATA

▲▼ *Statistically different from 2011 RBSA*

Appliance Age

*Roughly **38% to 50%** of appliances were manufactured in 2010 or later.*



SEE THE DATA

Proportion of Equipment Past Effective Useful Life

*A **substantial proportion of appliances** are past their useful life.*

SEE THE DATA

▲▼ *Statistically different from 2011 RBSA*

Description

Code Updates

Key Findings

Water End-Uses

Field technicians identified and characterized water heaters in each home. Specifically, they collected information regarding the water heater type, size, fuel, make, model, input capacity, and location. Location is especially important for heat pump water heaters (HPWHs) because the location may affect not only how much energy is required to heat water, but also how much energy is required to heat and cool the home. For example, the HPWH will have less impact on heating and cooling the farther it is from the thermostat and the more thermal buffers that exist between it and the thermostat. However, HPWH efficiency will decline in winter if the water heater is located outside of the thermal boundary. The RBSA II did not directly capture the distances and thermal buffers, but field technicians noted where electric water heaters were located by room type. Collected data also included additional information such as ceiling height near the water heater and proximity to exterior walls for running vent ducts. This may help programs identify how many electric water heaters can be easily replaced with HPWHs.

Field technicians also conducted a thorough walk-through for showerheads and faucet aerators. For these end uses, technicians captured the rated flowrate (if available) and measured flowrate using documented procedures and equipment. The end uses were classified as primary, secondary, or used about the same.

Federal energy efficiency standards can have a significant impact on water heater efficiencies. New federal efficiency changes for water heaters went into effect in 2015.

Key findings for water end-uses include:

- There were a few statistically significant shifts with water heaters, including water heater fuel type. Homes with gas water heaters increased by 6%, from 43% to 49%.
- Saturation share of instantaneous water heaters increased from 3% to 6%.
- Distribution of electric water heater location shows 41% are located in the main house, 30% in the basement, 23% in the garage, and the remaining 6% in other locations around the home.

Distribution of Water Heater Fuel Type by State

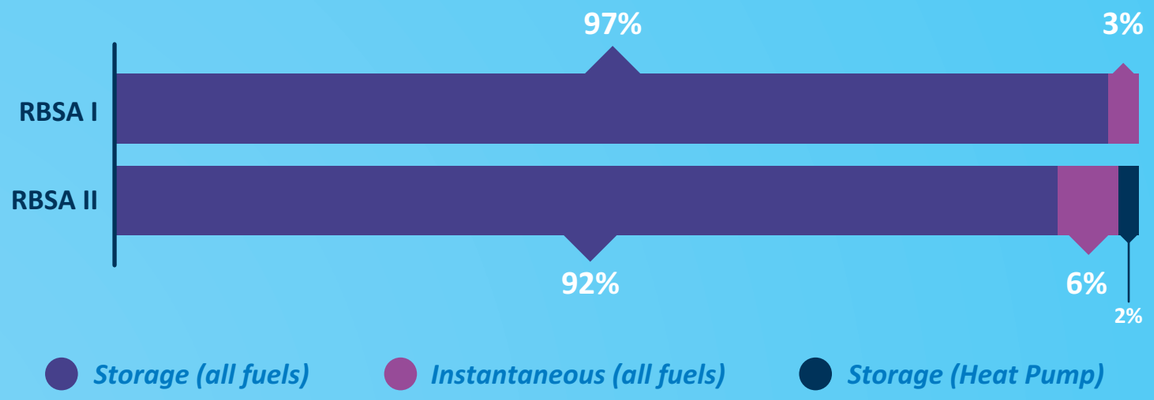
*Homes with gas water heaters **increased 6%**, from 43% to 49%.*

	ID	MT	OR	WA	
Electric	47%	40%	50%	50%▼	49%▼
Natural Gas	51%	52%	50%	48%▲	49%▲
Propane	2%	8%	1%	2%	2%

SEE THE DATA

Distribution of Water Heater Type

*HPWHs now account for approximately **2% of water heaters.***



SEE THE DATA

▲▼ *Statistically different from 2011 RBSA*

Distribution of Shower and Faucet Flow Rates (GPM)*

Showerhead

43%

are 2.0 GPM or below

Kitchen

34%

are 1.5 GPM or below

Bath

38%

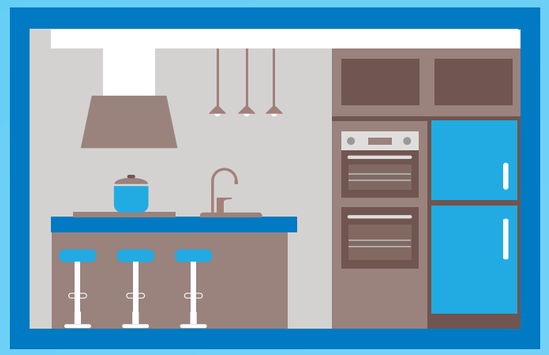
are 1.5 GPM or below

SEE THE DATA

** Observed GPM data were calibrated to adjust for systematic bias in the data collection approach. Results are not comparable to RBSA I.*

Average Number of Showerheads and Faucets Per Home

*Single Family Homes have **2.6** bathroom sinks, **0.9** standalone showers, and **0.9** shower and bath combo units*



*On average, homes have **1.1** kitchen sinks*

SEE THE DATA

▲▼ *Statistically different from 2011 RBSA*

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Description

Key Findings

Electronics

The electronics walk-through identified and characterized electronics in each home. Equipment captured included a range of electronic devices from televisions to computers. Field technicians did not include portable devices such as iPads and phones because of their general mobility. This section includes distribution of electronics by state and region, along with specific characteristics such as size, type, and usage. In some instances, Cadmus identified characteristic data such as efficiency and size after the site visit by searching a third-party database, manufacturer data sheets, or other online resources.

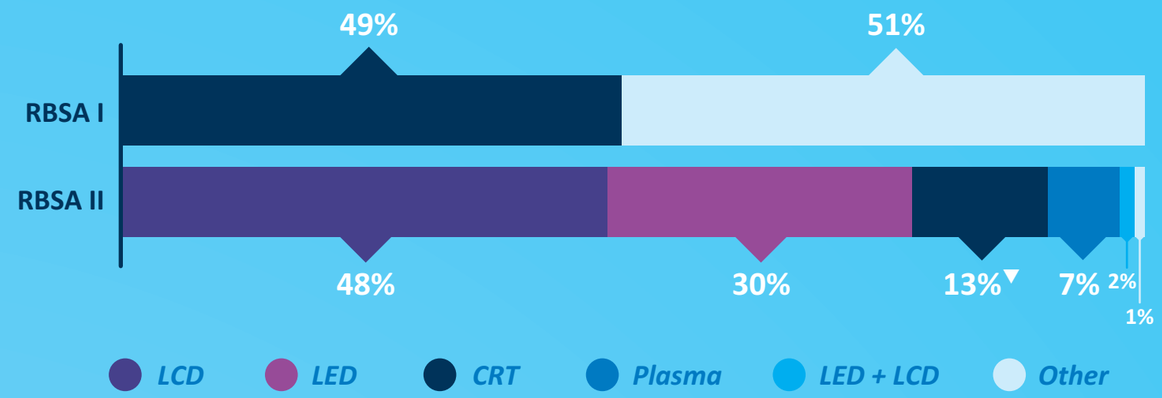
The walk-through also included capturing information regarding power strips and auxiliary items that may be plugged into them. Field technicians measured the television wattage whenever possible, using a plug-through power meter, and recorded the presence of television peripherals such as Roku, Fire Stick, and Apple TV devices. Technicians asked participants about usage patterns (e.g., how many hours per day each television is typically on).

Key electronic findings include:

- There have been many advancements in television technology since the last RBSA. Cathode ray tube televisions represented about half of all televisions found in homes since the last RBSA, whereas currently they represent only 13% of televisions, with LED and LCD televisions representing over three-quarters of what is currently installed in homes.
- Households now contain fewer televisions (2.3 to 2.1 per household), and the percentage of televisions present by room type declined or stayed the same for most room types except bedrooms and living rooms. The percentage of bedrooms and living rooms containing a television increased from 25% and 29% in RBSA I to 37% and 35% today.
- Set-top boxes and audio systems are declining in numbers. The number of homes with set-top boxes declined from 81% in RBSA I to 64% in RBSA II. Audio systems per home saw a significant decline from approximately two per home to fewer than one per home (0.8) on average. These changes are likely due to the popularity of web-enabled televisions and streaming services such as Netflix and Spotify.

Distribution of Television Screen Types

*Over **three-quarters of televisions** now use LED or LCD technology*



SEE THE DATA

Television Power Draw

The average television power

dropped by 29W

from 112W to 83W over the past 6 years

SEE THE DATA

▲▼ *Statistically different from 2011 RBSA*

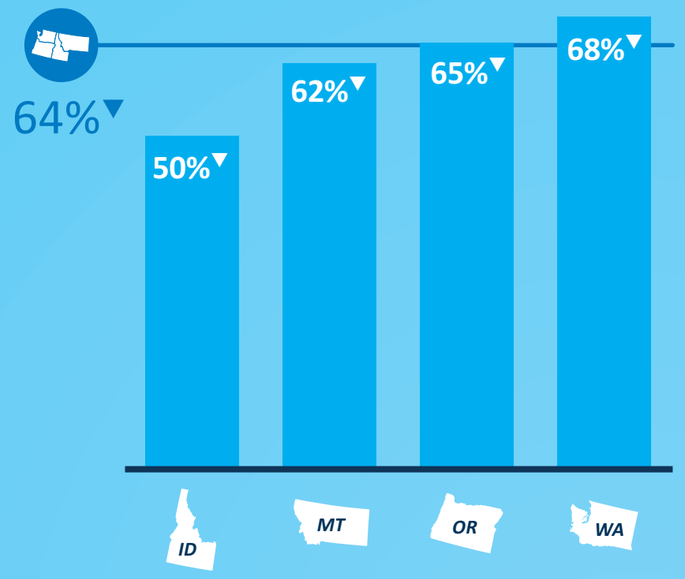
Percent of Homes with Game Consoles

The percentage of homes with gaming systems ***declined from 33% to 26%▼.***

SEE THE DATA

Percent of Homes with Set-Top Boxes

The average number of set-top boxes per home is ***1.1▼ - down from 1.5 in the previous study.***



SEE THE DATA

▲▼ *Statistically different from 2011 RBSA*

2% of homes have at least one smart power strip

SEE THE DATA

OTHER

What are power strips being used for?

SEE THE DATA

▲▼ *Statistically different from 2011 RBSA*

Energy Benchmarking

Description

Similar to the previous RBSA, the RBSA II provides an opportunity to calculate energy-use intensity (EUI) profiles. Cadmus conducted the RBSA II billing analysis using procedures and methods similar to those used for the previous study to allow for direct comparison of the results. Cadmus requested 24 months of electric and gas billing data for all 1,100 single-family participants. However, the team ultimately removed 121 sites for several reasons: the utilities did not provide billing information (most common), inconsistencies in data collection such as multiple readings on the same date or missing reads, or anomalies in the data such as lengthy vacancies or apparently erroneous readings. In the end, the analysis included billing data for 979 electric and 479 gas participants.

Key Findings

Key energy usage findings include:

- Average electric and gas usage per home remained relatively unchanged across the region from the last RBSA. There was a noticeable decline in other fuel use in Oregon and Washington.
- Annual electric usage per square foot remained approximately the same for Idaho, Oregon, and Washington. Electric usage per square foot increased by 2.8 for Montana.
- Gas EUI decreased in Oregon and Washington but remained the same in Idaho and Montana. EUI for other fuel sources declined significantly in every state except for Idaho.
- Higher electric EUIs were largely driven by whether a home had electric heating and electric water heating. Homes with large conditioned areas had lower EUIs. Variables such as efficient lighting and percentage of mechanical cooling did not vary much across quartiles.

Average EUI by State and Fuel Type

	ID	MT	OR	WA	
Electric EUI per Home (kWh/sq.ft)	7.4	8.2▲	7.5	7.9	7.7
Gas EUI per Home (therm/sq.ft)	0.4	0.5	0.3▼	0.3▼	0.3▼
Other Fuel EUI per Home (kBtu/sq.ft)	4.6▼	7.1	4.2▼	2.5▼	3.6▼

SEE THE DATA >

Electric EUI Quartiles and Corresponding Housing Characteristics

	Conditioned Area	Electric Heat	Efficient Lighting	Air Conditioning	Electric Hot Water
EUI Quartile 1 (<3.55)	2,488	5%	47%	58%	17%
EUI Quartile 2 (3.55-5.96)	2,179	19%	43%	62%	30%
EUI Quartile 3 (5.96-9.26)	2,015	39%	44%	72%	57%
EUI Quartile 4 (>9.26)	1,376	75%	40%	47%	81%

SEE THE DATA >

▲▼ *Statistically different from 2011 RBSA*

Conservation, Purchases, and Miscellaneous Loads

Description

As part of the recruitment process, recruitment specialists asked a series of questions related to household purchases and energy efficiency awareness. Specifically, specialists inquired if households had participated in rebate programs and, if so, which ones and what the participant purchased. The recruitment specialists also asked if participants received any federal, state, or local tax credits, or if they completed a home energy assessment in the past two years. Finally, specialists asked participants whether they or a landlord pay their gas and electrical bills and whether they receive financial assistance for their utility bills (and if so, what portion of the bill is covered by financial assistance).

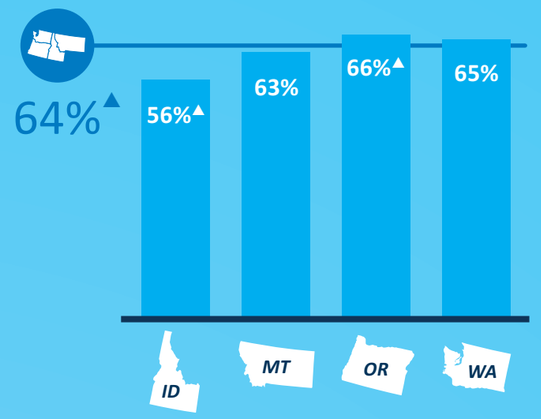
Data collection also captured information about miscellaneous and uncommon loads such as electric vehicle chargers, solar panels, smart home devices, well pumps, and pool and sauna equipment.

Key Findings

Key conservation, awareness, and miscellaneous findings include:

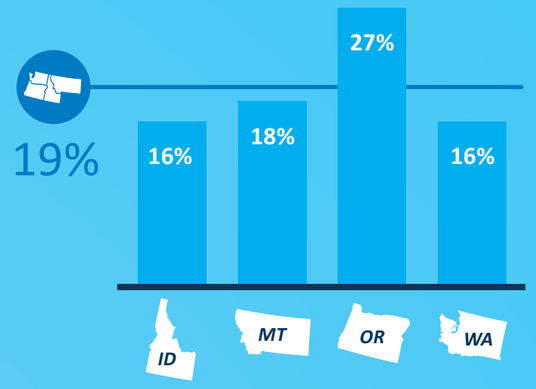
- A higher percentage of participants reported implementing conservation improvements without utility incentives in the past two years in this study compared to the previous RBSA (64% and 48%, respectively). This upward trend was true for all states except for Montana, which remained about the same. Out of the participants reporting some sort of energy efficient home improvement, roughly the same percentage as the last RBSA reported receiving an incentive from their utility (approximately 15% for the region).
- Approximately 3% of homes have solar panels, with Oregon and Washington having the most. Field technicians identified a small number of homes, nine in total, with electric vehicles present.
- Technicians also asked homeowners if they use or access any type of smart home device (such as a smart speaker like Google Home). Just over 9% of homeowners responded to having such devices, with Montana having the highest percentage of smart device users (11%).

Percent of Participants Reporting They Implemented Some Kind of Self-Funded Conservation Improvement



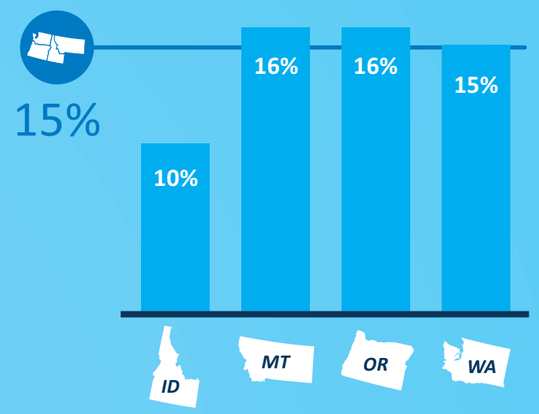
SEE THE DATA

Percent of Participants Reporting They Received State or Federal Tax Credit for an Energy Efficient Upgrade



SEE THE DATA

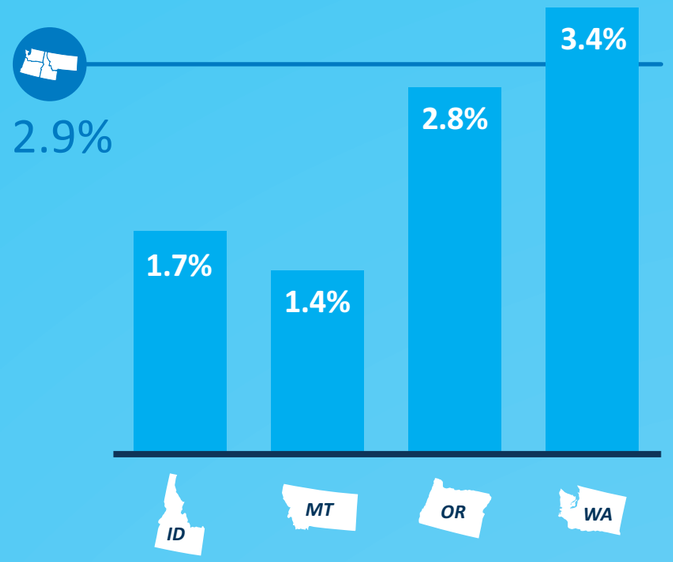
Percent of Participants Reporting Use of Utility Incentives



SEE THE DATA

▲▼ *Statistically different from 2011 RBSA*

Distribution of Households with Solar Panels



SEE THE DATA

Less than 1% of households have electric vehicles

SEE THE DATA

Just under 9% of participants indicated they use any type of smart home device (such as a smart speaker)

SEE THE DATA

4.4% of participants reported completing a home energy audit in the past 2 years

SEE THE DATA

▲▼ *Statistically different from 2011 RBSA*

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RESIDENTIAL BUILDING STOCK ASSESSMENT

Appendix A: Report Tables

Introduction

This appendix presents findings for single-family homes based on data collected for the core RBSA II study (funded by NEEA) and on data collected for three oversamples funded by the Bonneville Power Administration, Seattle City Light, and Snohomish County Public Utility District. Cadmus developed and applied sampling weights to ensure that all single-family home observations were weighted proportionally to the segment of the population represented by the sample; see the Database User Manual for a description of the weighting methods and procedures.

Where possible, Cadmus benchmarked the findings of the RBSA II against the findings presented in the RBSA I. Statistically significant differences between the two reports are denoted by either a ▲ or ▼ symbol, to indicate whether the RBSA II value is higher or lower than the value in the RBSA I study. This appendix identifies which table in the previous study was used to draw conclusions about each statistically significant difference.

New tables presented in this document that do not have a corollary in the RBSA I study do not have symbols indicating statistically significant increases or decreases from RBSA I, though statistically significant differences may exist. Without a comparable table in the RBSA I report, statistical testing could not be performed.

Unless otherwise noted, the following are true for all tables:

- Unknown, not applicable (N/A), and missing data are excluded from the analysis
- The presented sample size (n) represents the number of homes.
- Within a table, summing the sample size (n) across bins may result in a larger sample size than is shown in the 'Total' or summary row. This is intended and is possible because a home's equipment may fall into multiple bins within the same table. In these instances, the home will be counted towards the sample size for each bin it falls into.

Table A1 shows the complete sample and population sizes for each stratum and the case weight for each. The sample size is the number of homes that were observed in this study, the population size is the total number of homes in the stratum, and the case weight is the total number of homes that each sampled home represents.

Table A1. Single-Family Sample Sizes, Population Sizes, and Weights by Strata

State	Region	Territory	Sample Size – Number of Homes (n)	Population Size – Number of Homes (N)	Case Weight (N/n)
ID	-	BPA	22	103,448	4,702
ID	-	Non-BPA	99	456,392	4,610
MT	W	BPA	36	95,814	2,662
MT	W	Non-BPA	93	175,063	1,882
OR	E	BPA	37	86,912	2,349
OR	E	Non-BPA	75	102,156	1,362
OR	W	BPA	78	265,635	3,406
OR	W	Non-BPA	92	816,416	8,874
WA	E	BPA	47	184,785	3,932
WA	E	Non-BPA, Non-PSE	74	281,607	3,806
WA	PS	BPA	18	184,669	10,259
WA	PS	PSE	54	679,140	12,577
WA	PS	SCL EH	62	36,440	588
WA	PS	SCL LI	40	10,122	253
WA	PS	SCL LI and EH	28	1,822	65
WA	PS	SCL Not LI or EH	68	155,883	2,292
WA	PS	SnoPUD	60	228,091	3,802
WA	W	BPA	98	292,663	2,986
WA	W	PSE	19	97,346	5,123

For the RBSA II analysis, it is assumed that the sampled homes are representative of the total population within each stratum. For example, in Table A1 there are 22 sampled homes in the Idaho-BPA service territory that are representative of the 103,448 homes in the population. This means that each of the 22 sampled homes represent 4,702 homes in the population, which is the case weight for the stratum. All analyses are weighted using this methodology.

Many tables in the appendix use a subset of the data due to missing and unknown data, which are assumed to be missing completely at random. When performing the RBSA II analysis or working with the RBSA II database, the case weight needs to be re-calculated after sub-setting to remove missing or unknown data. The case weight needs to be recalculated because when sites are removed from the analysis, the sample size decreases, and each remaining sample point represents a larger proportion of the population. As an example, if only 20 out of the 22 sampled homes in the Idaho-BPA service territory have known data in the variable of interest, the case weight for this stratum would be recalculated as 103,448 divided by 20, such that each sampled home with known data would represent 5,172 total homes.

Contents

Table 1. DISTRIBUTION OF HOMES BY TYPE AND STATE
(Compare to Table 8 in 2011 RBSA)

Home Type	Percentage of Homes										n
	ID		MT		OR		WA		Region		
	%	EB	%	EB	%	EB	%	EB	%	EB	
Single Family Detached	89.2%	4.7%	84.8%	5.4%	88.7%▼	3.8%	86.2%▼	3.5%	87.3%▼	2.2%	967
Duplex, Triplex, or Fourplex	9.9%	4.8%	13.8%	5.4%	8.1%▲	3.2%	11.2%▲	3.2%	10.3%▲	2.0%	111
Townhome or Rowhome	0.8%▼	5.2%	1.4%	2.8%	3.2%	2.7%	2.6%	1.7%	2.4%	1.1%	22
Total	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	1,100

BACK TO REPORT

Table 2. DISTRIBUTION OF HOMES BY VINTAGE AND STATE
(Compare to Table 9 in 2011 RBSA)

Home Type	Percentage of Homes										n
	ID		MT		OR		WA		Region		
	%	EB	%	EB	%	EB	%	EB	%	EB	
Pre 1951	15.9%	5.7%	17.6%	5.6%	30.8%	5.7%	21.5%	3.7%	23.3%	2.6%	276
1951-1960	5.0%	3.8%	7.3%	4.0%	8.5%	3.7%	8.0%	2.3%	7.7%	1.6%	102
1961-1970	7.5%	4.4%	8.0%	4.1%	8.6%▼	3.4%	10.3%	3.0%	9.3%▼	1.9%	90
1971-1980	20.0%	6.2%	15.2%	5.5%	14.4%	4.1%	13.5%	3.3%	14.7%	2.2%	159
1981-1990	9.2%	4.7%	18.4%	6.0%	7.5%	3.4%	12.3%	3.4%	10.9%	2.1%	101
1991-2000	15.0%	5.7%	11.3%	5.1%	15.5%	4.3%	13.7%	3.3%	14.2%	2.2%	140
2001-2010	22.5%	6.5%	18.8%	6.0%	10.0%	3.4%	15.6%	3.3%	15.1%	2.2%	161
Post 2010	5.0%	3.9%	3.5%	3.0%	4.6%	2.4%	5.0%	1.7%	4.8%	1.2%	59
Total	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	1,088

BACK TO REPORT

Table 3. DISTRIBUTION OF HOMES BY GROUND CONTACT TYPE AND STATE
(Compare to Table 10 in 2011 RBSA)

Ground Contact Type	Percentage of Homes										
	ID		MT		OR		WA		Region		n
	%	EB	%	EB	%	EB	%	EB	%	EB	
> 90% Conditioned Basement	23.2%	5.6%	38.7%	5.5%	11.1%	3.6%	20.9%	2.9%	19.4%	9.0%	254
> 90% Crawlspace	43.0%	5.6%	37.4%▲	5.4%	52.6%	4.3%	51.0%	3.0%	49.6%	9.3%	512
> 90% Slab	5.8%	3.4%	9.9%	4.2%	13.0%	3.8%	14.5%	3.1%	12.6%	7.2%	130
> 90% Unconditioned Basement	5.8%	3.4%	4.5%	2.9%	4.4%	2.6%	2.1%	0.9%	3.4%	5.2%	47
Adiabatic Space Below	0.8%	1.3%	0.0%	0.0%	1.4%	1.6%	0.0%▼	0.0%	0.5%	2.1%	4
Mixed Basement and Slab	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1
Mixed Conditioned Basement and Slab	2.5%	2.3%	1.4%	1.6%	2.8%	2.2%	0.6%	0.3%	1.6%	3.6%	23
Mixed Crawlspace and Conditioned Basement	8.3%	4.0%	4.0%▼	2.9%	3.5%▼	2.3%	2.6%▼	1.2%	3.7%	5.5%	40
Mixed Crawlspace and Room Over Garage	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%▼	0.3%	0.1%▼	0.3%	2
Mixed Crawlspace and Slab	10.7%▲	4.3%	4.0%	2.9%	9.3%	3.4%	8.0%	2.6%	8.5%	6.6%	82
Other	0.0%	0.0%	0.0%	0.0%	1.9%	1.7%	0.1%	0.2%	0.6%	1.7%	5
Total	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	1,100

Table 4. AVERAGE CONDITIONED FLOOR AREA BY STATE
(Compare to Table 11 in 2011 RBSA)

State	Conditioned Floor Area (sq. ft.)		
	Mean	EB	n
ID	2,156.3	147.8	121
MT	2,075.1	145.9	129
OR	1,985.0	127.4	282
WA	1,962.1	81.5	568
Region	2,001.7	60.0	1,100

Table 5. AVERAGE CONDITIONED FLOOR AREA BY VINTAGE AND STATE
(Compare to Table 12 in 2011 RBSA)

Vintage	Conditioned Floor Area (sq. ft.)										
	ID		MT		OR		WA		Region		n
	Mean	EB	Mean	EB	Mean	EB	Mean	EB	Mean	EB	
Pre 1951	1,795.3	101.4	1,857.4	81.2	2,084.7	168.4	1,604.6▼	73.3	1,789.2▼	63.5	276
1951-1960	1,630.1▼	132.9	1,908.0▼	60.0	1,544.9	84.9	1,586.1▼	70.1	1,599.6▼	45.4	102
1961-1970	1,882.7	141.5	1,888.0▼	104.4	1,909.0	99.4	1,885.3▼	87.7	1,892.2▼	55.2	90
1971-1980	2,136.2	112.0	2,415.5▲	141.4	2,218.5▲	88.9	1,808.1▼	92.8	2,012.6▲	55.9	159
1981-1990	1,982.2	124.2	2,079.1	157.9	1,537.0▼	63.5	2,026.0	98.7	1,870.4	53.9	101
1991-2000	2,447.8	248.9	2,423.8	178.4	1,973.2▼	113.1	2,149.7	66.3	2,153.7	57.4	140
2001-2010	2,370.5	144.9	2,220.3	145.8	2,308.4▲	138.2	2,304.3	77.2	2,308.9	59.6	161
Post 2010	2,820.4	192.7	1,654.8	126.3	1,898.7	120.6	2,323.6	43.9	2,228.0	47.7	59
All Vintages	2,145.0	50.4	2,074.4▼	43.5	1,934.3	39.0	1,958.1▼	27.2	1,982.6▼	19.4	1,088

Table 6. DISTRIBUTION OF HOMES BY BUILDING HEIGHT AND STATE
(Compare to Table 13 in 2011 RBSA)

Building Height	Percentage of Homes										
	ID		MT		OR		WA		Region		n
	%	EB	%	EB	%	EB	%	EB	%	EB	
1 Story	58.7%	7.5%	48.9%	7.3%	38.4%▼	5.5%	46.3%	4.6%	45.7%▼	3.0%	536
1.5 Stories	14.0%	5.5%	20.0%	5.6%	13.5%	4.3%	11.4%▼	2.6%	12.9%	1.9%	165
2 Stories	23.2%	6.5%	29.4%	6.4%	38.7%▲	5.9%	34.9%	4.5%	34.1%▲	3.0%	324
2.5 Stories	4.1%	3.6%	1.7%	3.5%	8.5%▲	3.9%	5.9%▲	1.9%	6.2%▲	1.5%	62
3+ Stories	0.0%	0.0%	0.0%	0.0%	1.0%	2.2%	1.5%	1.2%	1.0%	0.7%	13
Total	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	1,100

Table 7. AVERAGE NUMBER OF BEDROOMS PER HOME BY STATE
(Compare to Table 14 in 2011 RBSA)

State	Bedrooms per Home		
	Mean	EB	n
ID	3.1	0.2	121
MT	3.0	0.2	129
OR	2.9	0.1	282
WA	2.9▼	0.1	568
Region	3.0▼	0.1	1,100

Table 8. AVERAGE NUMBER OF BATHROOMS PER HOME BY STATE
(Compare to Table 15 in 2011 RBSA)

State	Bathrooms per Home		
	Mean	EB	n
ID	2.3	0.1	121
MT	2.1	0.1	129
OR	2.3	0.1	282
WA	2.2	0.1	568
Region	2.2	0.1	1,100

Table 9. AVERAGE ROOM AREAS BY ROOM TYPE
(Compare to Table 16 in 2011 RBSA)

Room Type	Room Areas (sq. ft.)		
	Mean	EB	n
Bathroom	62.4	2.0	1,085
Bedroom	163.5	6.6	1,094
Closet	44.8▼	0.9	447
Dining Room	156.5▲	0.6	532
Family Room	276.7▼	1.9	476
Garage	492.0▼	2.4	324
Hall	77.7▼	2.2	984
Kitchen	185.8▲	1.1	1,064
Laundry	77.3▼	0.6	695
Living Room	298.8▲	2.5	980
Office	162.6▲	1.3	366
Other	299.3▲	5.1	424
All Room Types	171.5▲	1.3	1,100

Table 10. DISTRIBUTION OF FRAME WALL INSULATION LEVELS BY FRAMING TYPE (Compare to Table 17 in 2011 RBSA)

Wall Framing Type	Frame Wall Insulation Levels												
	R0		R1-R10		R11-R16		R17-R22		>R22		All Insulation Levels		n
	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB	
Framed 2x4	10.7%	2.3%	30.7%	3.3%	58.1%	3.6%	0.4%	0.5%	0.1%	0.6%	53.6%	3.9%	439
Framed 2x6	1.9%	1.4%	3.1%	1.5%	20.1%	3.1%	73.3%	3.4%	1.7%	1.4%	45.2%	3.8%	340
Framed 2x8	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	1.0%	0.8%	9
Framed (Unknown)	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.4%	1
Alternative	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.1%	0.6%	1
All Frame Types	6.8%	2.0%	17.6%	2.8%	40.1%	3.9%	33.7%	3.6%	1.8%	1.1%	100.0%	0.0%	756

* Due to differences in analysis methodology, no statistical testing was performed for this table.
* Walls with either unknown cavity insulation R-value or unknown continuous insulation R-value are excluded.
* Wall framing size in some homes updated to reflect insulation thickness.

Table 11. DISTRIBUTION OF WALL FRAMING TYPES BY VINTAGE (Compare to Table 18 in 2011 RBSA)

Vintage	Wall Framing Types								
	2x4		2x6		2x8		Alternative		n
	%	EB	%	EB	%	EB	%	EB	
Pre 1981	81.6%▼	2.5%	16.2%▲	2.4%	0.1%▼	0.3%	0.1%	0.4%	607
1981-1990	53.7%▼	3.0%	45.3%▲	3.0%	0.7%▼	0.5%	0.3%	0.8%	97
1991-2000	14.3%	1.9%	84.5%	1.9%	0.7%	0.6%	0.0%	0.0%	140
2001-2010	5.1%▼	1.6%	93.2%▲	1.5%	1.4%	0.7%	0.0%	0.0%	159
Post 2010	1.8%	0.7%	87.3%	1.9%	10.0%	2.6%	0.9%	1.6%	56
All Housing Vintages	54.7%▼	3.1%	42.9%▲	3.1%	0.9%	0.5%	0.2%	0.2%	1,059

* Wall framing size in some homes updated to reflect insulation thickness.

Table 12. DISTRIBUTION OF WALL INSULATION LEVELS BY HOME VINTAGE
(Compare to Table 19 in 2011 RBSA)

Vintage	Wall Insulation Levels										
	R0		R1-R10		R11-R16		R17-R22		>R22		n
	%	EB	%	EB	%	EB	%	EB	%	EB	
Pre 1981	13.0%	2.4%	28.7%	3.2%	49.7%	3.7%	7.7%	2.1%	0.9%	1.0%	459
1981-1990	1.4%	0.7%	16.6%	2.9%	41.8%	3.8%	38.4%	3.7%	1.8%	1.4%	81
1991-2000	0.0%	0.0%	7.3%	1.9%	27.2%	3.4%	64.0%	3.6%	1.5%	0.7%	99
2001-2010	1.1%	0.9%	1.2%	1.0%	32.3%	3.6%	63.8%	3.6%	1.7%	0.8%	121
Post 2010	3.5%	4.9%	0.0%	0.0%	26.0%	2.6%	53.7%	3.6%	16.9%	3.4%	48
All Housing Vintages	8.0%	2.0%	18.4%	2.8%	41.6%	3.7%	29.8%	3.4%	2.1%	1.1%	808

* Due to differences in analysis methodology, no statistical testing was performed for this table.
* Walls with either unknown cavity insulation R-value or unknown continuous insulation R-value are excluded.
* Wall framing size in some homes updated to reflect insulation thickness.

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Table 13. DISTRIBUTION OF WALL INSULATION LEVELS BY HOME VINTAGE, IDAHO
(Compare to Table 20 in 2011 RBSA)

Vintage	Wall Insulation Levels, Idaho										
	R0		R1-R10		R11-R16		R17-R22		>R22		n
	%	EB	%	EB	%	EB	%	EB	%	EB	
Pre 1981	18.4%	8.6%	31.4%	9.5%	41.7%	9.6%	8.6%	7.5%	0.0%	0.0%	34
1981-1990	0.0%	0.0%	30.6%	11.9%	20.4%	13.2%	38.9%	10.6%	10.2%	21.8%	9
1991-2000	0.0%	0.0%	23.3%	13.8%	32.5%	12.4%	44.2%	12.1%	0.0%	0.0%	9
2001-2010	0.0%	0.0%	0.0%	0.0%	43.2%	9.5%	56.8%	9.4%	0.0%	0.0%	19
Post 2010	20.4%	28.5%	0.0%	0.0%	40.8%	15.2%	38.9%	13.2%	0.0%	0.0%	5
All Housing Vintages	9.3%	6.3%	19.9%	8.0%	40.7%	9.5%	28.8%	8.8%	1.3%	8.4%	76

* Due to differences in analysis methodology, no statistical testing was performed for this table.
* Walls with either unknown cavity insulation R-value or unknown continuous insulation R-value are excluded.
* Wall framing size in some homes updated to reflect insulation thickness.

Table 14. DISTRIBUTION OF WALL INSULATION LEVELS BY HOME VINTAGE, MONTANA
(Compare to Table 21 in 2011 RBSA)

Vintage	Wall Insulation Levels, Montana										
	R0		R1-R10		R11-R16		R17-R22		>R22		n
	%	EB	%	EB	%	EB	%	EB	%	EB	
Pre 1981	13.6%	6.3%	42.4%	9.5%	37.2%	9.1%	5.1%	5.3%	1.7%	8.4%	45
1981-1990	10.9%	10.2%	32.7%	10.2%	32.7%	10.2%	23.8%	9.7%	0.0%	0.0%	18
1991-2000	0.0%	0.0%	0.0%	0.0%	17.7%	23.3%	66.2%	11.0%	16.2%	22.8%	6
2001-2010	0.0%	0.0%	0.0%	0.0%	49.0%	9.7%	51.0%	9.1%	0.0%	0.0%	12
Post 2010	0.0%	0.0%	0.0%	0.0%	50.0%	40.7%	50.0%	40.7%	0.0%	0.0%	2
All Housing Vintages	11.2%	6.0%	29.7%	8.6%	33.2%	8.9%	23.7%	8.2%	2.2%	4.4%	83

* Due to differences in analysis methodology, no statistical testing was performed for this table.
* Walls with either unknown cavity insulation R-value or unknown continuous insulation R-value are excluded.
* Wall framing size in some homes updated to reflect insulation thickness.

Table 15. DISTRIBUTION OF WALL INSULATION LEVELS BY HOME VINTAGE, OREGON
(Compare to Table 22 in 2011 RBSA)

Vintage	Wall Insulation Levels, Oregon										
	R0		R1-R10		R11-R16		R17-R22		>R22		n
	%	EB	%	EB	%	EB	%	EB	%	EB	
Pre 1981	15.8%	6.2%	22.6%	6.7%	51.9%	7.7%	7.1%	4.0%	2.6%	3.5%	113
1981-1990	2.3%	3.8%	14.0%	10.3%	43.0%	8.6%	39.6%	8.8%	1.1%	2.2%	17
1991-2000	0.0%	0.0%	0.0%	0.0%	38.5%	8.1%	59.8%	7.8%	1.7%	1.6%	34
2001-2010	2.3%	5.4%	0.0%	0.0%	41.5%	8.7%	52.4%	8.0%	3.8%	2.2%	28
Post 2010	0.0%	0.0%	0.0%	0.0%	11.8%	2.9%	51.3%	8.0%	36.9%	9.2%	14
All Housing Vintages	10.6%	5.3%	15.6%	6.0%	45.0%	7.7%	23.9%	6.3%	4.9%	3.2%	206

* Due to differences in analysis methodology, no statistical testing was performed for this table.
* Walls with either unknown cavity insulation R-value or unknown continuous insulation R-value are excluded.
* Wall framing size in some homes updated to reflect insulation thickness.

Table 16. DISTRIBUTION OF WALL INSULATION LEVELS BY HOME VINTAGE, WASHINGTON (Compare to Table 23 in 2011 RBSA)

Vintage	Wall Insulation Levels, Washington										
	R0		R1-R10		R11-R16		R17-R22		>R22		n
	%	EB	%	EB	%	EB	%	EB	%	EB	
Pre 1981	9.9%	2.6%	29.9%	4.4%	52.0%	5.2%	8.2%	3.3%	0.0%	0.0%	267
1981-1990	0.0%	0.0%	12.1%	3.8%	48.5%	5.6%	39.5%	5.6%	0.0%	0.0%	37
1991-2000	0.0%	0.0%	8.4%	3.1%	20.2%	4.6%	71.4%	4.8%	0.0%	0.0%	50
2001-2010	0.8%	2.4%	2.3%	1.9%	21.9%	5.2%	73.9%	4.9%	1.1%	3.2%	62
Post 2010	0.0%	0.0%	0.0%	0.0%	30.3%	4.7%	63.1%	4.7%	6.5%	3.6%	27
All Housing Vintages	5.8%	2.0%	18.2%	3.8%	40.9%	5.2%	34.4%	5.0%	0.7%	0.9%	443

* Due to differences in analysis methodology, no statistical testing was performed for this table.
* Walls with either unknown cavity insulation R-value or unknown continuous insulation R-value are excluded.
* Wall framing size in some homes updated to reflect insulation thickness.

Table 17. DISTRIBUTION OF MASONRY WALL INSULATION LEVELS BY HOME VINTAGE (Compare to Table 24 in 2011 RBSA)

Vintage	Masonry Wall Insulation Levels										
	None		R1-R9		R10-R15		R16-R20		R21+		n
	%	EB	%	EB	%	EB	%	EB	%	EB	
Pre 1981	72.7%	6.4%	12.1%	4.3%	14.1%	6.0%	1.2%	1.1%	0.0%	0.0%	179
1981-1990	27.1%	5.9%	9.3%	1.7%	54.8%	4.5%	8.8%	6.4%	0.0%	0.0%	14
1991-2000	18.9%	13.9%	7.8%	3.8%	34.8%	7.1%	33.9%	7.6%	4.5%	7.1%	15
2001-2010	14.9%	8.2%	7.5%	15.4%	37.7%	6.5%	33.7%	3.7%	6.1%	11.7%	13
Post 2010	20.4%	0.0%	0.0%	0.0%	12.2%	0.0%	67.4%	0.0%	0.0%	0.0%	6
All Housing Vintages	63.4%	7.0%	9.7%	4.0%	18.5%	6.4%	8.0%	3.1%	0.4%	0.9%	227

* Due to differences in analysis methodology, no statistical testing was performed for this table.
* Walls with either unknown cavity insulation R-value or unknown continuous insulation R-value are excluded.
* Wall framing size in some homes updated to reflect insulation thickness.

Table 18. DISTRIBUTION OF OBSERVED WALL SHEATHING INSULATION BY FRAMING TYPE (Compare to Table 25 in 2011 RBSA)

Framing Type	Observed Wall Sheathing Insulation Levels												
	0.5 Inches		0.75 Inches		1 Inch		2 Inch		3 Inch		None		n
	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB	
Framed 2x4	0.7%	0.5%	0.4%	1.5%	0.4%	0.4%	0.7%	0.5%	0.0%	0.0%	97.8%	0.7%	440
Framed 2x6	0.4%	1.5%	0.2%	0.7%	0.8%	0.5%	0.2%	0.7%	0.0%	0.0%	98.3%	0.6%	340
Framed 2x8	0.0%	0.0%	0.0%	0.0%	46.7%	0.0%	0.0%	0.0%	0.0%	0.0%	53.3%	0.0%	9
Framed (Unknown)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	1
Alternative	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1
Masonry	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	23
Masonry (Basement)	0.0%	0.0%	0.0%	0.0%	0.1%	0.6%	0.0%	0.0%	0.0%	0.0%	99.6%	0.2%	210
Other	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	54.0%	0.0%	46.0%	0.0%	2
SIP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	3
Log	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	7
All Framing Types	0.4%	0.4%	0.2%	0.4%	0.8%	0.6%	0.3%	0.3%	0.0%	0.2%	98.3%	0.8%	864

* Due to differences in analysis methodology, no statistical testing was performed for this table.

* Wall framing size in some homes updated to reflect insulation thickness.

Table 19. PERCENTAGE OF HOMES WITH BASEMENTS BY STATE (Compare to Table 26 in 2011 RBSA)

State	Homes with Basements		
	%	EB	n
ID	43.0%	7.5%	121
MT	49.4%	7.2%	127
OR	25.9%	5.5%	281
WA	28.3%▼	3.5%	566
Region	30.9%	2.6%	1,095

Table 20. PERCENTAGE OF BASEMENTS THAT ARE CONDITIONED BY STATE (Compare to Table 27 in 2011 RBSA)

State	Conditioned Basements		
	%	EB	n
ID	94.2%	5.5%	52
MT	100.0%	0.0%	65
OR	93.7%	5.1%	54
WA	95.3%	2.6%	210
Region	95.0%	2.1%	381

Table 21. DISTRIBUTION OF BASEMENT SLAB INSULATION BY INSULATION LEVEL (Compare to Table 28 in 2011 RBSA)

Insulation Level	Basement Perimeter Slab Insulation		
	%	EB	n
2 inches	0.7%	1.0%	3
None	99.3%	0.7%	231
Total	100.0%	0.0%	234

* Due to differences in analysis methodology, no statistical testing was performed for this table

Table 22. PERCENTAGE OF HOMES WITH FLOOR AREA OVER CRAWLSPACE BY STATE
(Compare to Table 29 in 2011 RBSA)

State	Homes with Floor Area over Crawlspace		
	%	EB	n
ID	61.1%	7.3%	121
MT	48.3%	7.2%	129
OR	75.5%	5.3%	282
WA	64.3%	4.3%	568
Region	66.2%	2.9%	1,100

Table 23. DISTRIBUTION OF FLOOR INSULATION BY HOME VINTAGE
(Compare to Table 30 in 2011 RBSA)

Vintage	Floor Insulation Levels																n
	None		R1-R3		R4-R10		R11-R15		R16-R22		R23-R27		R28-R35		R36+		
	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB	
Pre 1981	54.5%	3.7%	0.0%	0.0%	1.9%	1.0%	6.4%	2.0%	20.7%	3.2%	10.0%	2.1%	5.9%	1.9%	0.5%	0.6%	464
1981-1990	36.2%	2.2%	0.0%	0.0%	3.5%	1.1%	5.3%	2.8%	26.2%	3.8%	19.0%	3.2%	9.2%	3.1%	0.5%	1.0%	73
1991-2000	17.9%	2.0%	0.0%	0.0%	0.6%	1.3%	0.0%	0.0%	32.6%	3.7%	24.1%	2.6%	21.6%	3.2%	3.2%	1.6%	100
2001-2010	16.3%	1.5%	0.0%	0.0%	0.3%	0.9%	0.0%	0.0%	29.7%	3.3%	17.1%	2.3%	26.5%	2.9%	10.1%	2.7%	102
Post 2010	15.9%	1.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	16.0%	2.9%	27.4%	2.9%	19.7%	1.9%	21.0%	3.0%	42
All Housing Vintages	40.5%	3.4%	0.0%	0.0%	1.8%	0.9%	4.7%	1.9%	23.5%	3.4%	13.9%	2.5%	12.8%	2.6%	2.7%	1.3%	781

* Due to differences in analysis methodology, no statistical testing was performed for this table.

Table 24. PERCENTAGE OF CRAWLSPACES WITH INSULATED WALLS BY STATE (Compare to Table 31 in 2011 RBSA)

State	Insulated Crawlspace Walls		
	%	EB	n
ID	18.3%	8.1%	56
MT	65.8%▲	11.4%	48
OR	11.4%	5.2%	150
WA	3.2%	1.9%	243
Region	11.6%	2.2%	497

* Walls with either unknown cavity insulation R-value or unknown continuous insulation R-value are excluded.

Table 25. PERCENTAGE OF HOMES WITH ATTICS BY STATE (Compare to Table 32 in 2011 RBSA)

State	Homes with Attics		
	%	EB	n
ID	95.0%	3.3%	121
MT	87.7%	4.9%	129
OR	90.0%	3.7%	282
WA	92.5%	2.5%	568
Region	91.8%	1.8%	1,100

Table 26. DISTRIBUTION OF ATTIC INSULATION LEVELS
(Compare to Table 33 in 2011 RBSA)

Insulation Level	Attic Insulation Level		
	%	EB	n
R0	1.6%	1.0%	13
R1 - R10	24.6%	3.1%	158
R11 - R15	8.4%	2.0%	65
R16 - R20	7.2%	2.0%	58
R21 - R25	11.8%	2.4%	92
R26 - R30	8.4%	2.0%	65
R31 - R40	19.8%	2.7%	167
R41 - R50	12.0%	2.2%	107
>R50	6.2%	1.5%	53
Total	100.0%	0.0%	778

* Due to differences in analysis methodology, no statistical testing was performed for this table.

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Table 27. PERCENTAGE OF HOMES WITH VAULT CEILINGS BY STATE
(Compare to Table 35 in 2011 RBSA)

State	Homes with Vault Ceilings		
	%	EB	n
ID	38.9%▲	7.3%	121
MT	46.0%▲	6.6%	129
OR	39.3%▲	5.8%	282
WA	35.3%▲	4.4%	568
Region	37.6%▲	3.0%	1,100

Table 28. PERCENTAGE OF HOMES WITH ROOF DECK CEILINGS BY STATE (Compare to Table 36 in 2011 RBSA)

State	Homes with Roof Deck Ceilings		
	%	EB	n
ID	0.0%	0.0%	121
MT	0.7%	1.1%	129
OR	4.7%	2.8%	282
WA	2.4%	1.2%	568
Region	2.6%	1.0%	1,100

Table 29. DISTRIBUTION OF VAULT CEILING INSULATION LEVEL (Compare to Table 37 in 2011 RBSA)

Insulation Level	Vault Ceiling Insulation Level		
	%	EB	n
R0	20.8%	6.8%	27
R1-R15	23.0%	9.2%	24
R16-R20	17.5%	8.6%	16
R21-R25	9.0%	7.4%	8
R26-R30	0.3%	1.5%	1
R31-R40	20.5%	5.5%	28
R41-R50	9.0%	5.0%	10
Total	100.0%	0.0%	114

* Due to differences in analysis methodology, no statistical testing was performed for this table.

Table 30. DISTRIBUTION OF DOOR TYPES
(Compare to Table 39 in 2011 RBSA)

Door Type	Doors		
	%	EB	n
Garage Door with Glazing	0.4%	1.9%	1
Metal	9.7%	1.8%	195
Metal with Glazing	8.1%▼	1.7%	157
Other	0.2%	0.2%	5
Other with Glazing	1.0%	0.7%	18
Wood/Fiberglass	31.0%	3.0%	594
Wood/Fiberglass with Glazing	49.7%	3.2%	686
Total	100.0%	0.0%	1,062

Table 31. DISTRIBUTION OF WINDOW TYPES BY STATE
(Compare to Table 40 in 2011 RBSA)

Window Type	Windows										
	ID		MT		OR		WA		Region		n
	%	EB	%	EB	%	EB	%	EB	%	EB	
Metal Single Glazed	2.4%	2.4%	1.4%	1.9%	2.0%	1.5%	3.3%	1.6%	2.6%	1.0%	140
Metal Double Glazed	6.7%	3.9%	3.1%	2.7%	10.7%	3.8%	9.3%▼	2.8%	9.0%▼	1.9%	221
Metal Triple Glazed	0.3%	3.0%	0.0%	0.0%	0.1%	1.8%	0.1%	0.9%	0.1%	0.3%	3
Wood/Vinyl/Fiberglass/Tile Single Glazed	7.3%	4.1%	7.6%	3.8%	20.1%▲	5.1%	6.4%	1.8%	10.7%	1.8%	247
Wood/Vinyl/Fiberglass/Tile Double Glazed	83.2%	5.6%	87.6%	4.6%	65.3%	5.8%	80.4%▲	3.5%	76.8%	2.6%	989
Wood/Vinyl/Fiberglass/Tile Triple Glazed	0.1%	1.8%	0.2%▼	1.1%	1.8%	1.6%	0.5%	0.7%	0.8%	0.6%	18
Other Double Glazed	0.0%	0.0%	0.0%	0.0%	0.0%	1.1%	0.0%	0.0%	0.0%	0.3%	1
All Window Types	13.2%	0.0%	6.4%	0.0%	29.9%	0.0%	50.6%	0.0%	100.0%	0.0%	1,100

Table 32. PERCENTAGE OF HOMES WITH STORM WINDOWS BY STATE
(Compare to Table 41 in 2011 RBSA)

State	Homes with Storm Windows		
	%	EB	n
ID	7.5%	3.9%	121
MT	10.7%	4.3%	129
OR	6.7%	3.1%	282
WA	3.2%▼	1.1%	568
Region	5.3%▼	1.2%	1,100

Table 33. WINDOW AREA TO FLOOR AREA RATIO BY PRESENCE OF BASEMENT
(Compare to Table 42 in 2011 RBSA)

Foundation Type	Ratio of Window to Floor Area		
	Mean	EB	n
Home with Basements	0.108▼	0.002	386
Home without Basements	0.124▼	0.002	714
All Homes	0.116▼	0.002	1,100

Table 34. AVERAGE NORMALIZED HEAT-LOSS RATE BY VINTAGE AND STATE
(Compare to Table 43 in 2011 RBSA)

Vintage	Heat Loss Rate (UA/conditioned sq. ft.) per Home										
	ID		MT		OR		WA		Region		n
	Mean	EB	Mean	EB	Mean	EB	Mean	EB	Mean	EB	
Pre 1981	0.380	0.022	0.362▲	0.031	0.416	0.019	0.379	0.021	0.389	0.012	602
1981-1990	0.359▲	0.017	0.401▲	0.052	0.313	0.009	0.282	0.006	0.310▲	0.006	85
1991-2000	0.287▲	0.014	0.241	0.012	0.251▲	0.008	0.236	0.005	0.248▲	0.004	113
2001-2010	0.203▼	0.008	0.285▲	0.018	0.206	0.006	0.208▲	0.005	0.212▲	0.003	121
Post 2010	0.161	0.009	0.000	0.000	0.226	0.005	0.189	0.001	0.197	0.002	32
All Vintages	0.278▼	0.006	0.322▲	0.015	0.282▼	0.005	0.261▼	0.005	0.273▼	0.003	953

* Heat loss rates (UA) account for framing and building materials
* Storm windows are not accounted for in heat loss rate (UA)
* Heat loss rates (UA) account for buffer space heat loss reductions for unconditioned basements, floors over garages, and unvented crawlspaces

Table 35. AVERAGE HEAT-LOSS RATE BY VINTAGE AND STATE
(Compare to Table 44 in 2011 RBSA)

Vintage	Heat Loss Rate (UA) per Home										
	ID		MT		OR		WA		Region		n
	Mean	EB	Mean	EB	Mean	EB	Mean	EB	Mean	EB	
Pre 1981	687.3	53.6	658.7	51.9	757.5	51.9	620.8▼	31.7	672.8	23.5	602
1981-1990	673.8▲	40.6	763.6▲	101.8	457.8▼	18.3	522.1▼	21.8	539.0▼	14.3	85
1991-2000	573.2	73.6	542.4	43.8	494.4	35.1	500.0	18.3	511.1	16.9	113
2001-2010	437.4▼	22.2	606.9▲	50.8	475.3▲	25.5	484.1▲	14.8	483.2▲	11.2	121
Post 2010	458.3	28.1	0.0	0.0	329.6	9.7	419.0	9.6	394.8	6.1	32
All Vintages	566.0	19.4	642.9▲	31.7	502.9▼	13.9	510.9▼	9.3	523.0▼	7.0	953

* Heat loss rates (UA) account for framing and building materials
* Storm windows are not accounted for in heat loss rate (UA)
* Heat loss rates (UA) account for buffer space heat loss reductions for unconditioned basements, floors over garages, and unvented crawlspaces

Table 36. AVERAGE BLOWER DOOR AIR FLOW BY STATE
(Compare to Table 45 in 2011 RBSA)

State	Blower Door Air Flow (CFM @ 50 Pa)		
	Mean	EB	n
ID	1,765.9	140.2	79
MT	1,903.8	195.9	85
OR	2,605.6	214.1	152
WA	2,192.5▼	142.0	340
Region	2,241.4▼	98.4	656

Table 37. AVERAGE BLOWER DOOR AIR TIGHTNESS BY STATE
(Compare to Table 46 in 2011 RBSA)

State	Blower Door Air Tightness (ACH50)		
	Mean	EB	n
ID	6.5	0.6	79
MT	7.1▼	0.7	85
OR	10.7	1.0	152
WA	8.7▼	0.4	340
Region	8.9▼	0.4	656

* RBSA II calculated home volume using ceiling heights measured on-site.

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Table 38. AVERAGE BLOWER DOOR AIR TIGHTNESS BY HOME VINTAGE (Compare to Table 47 in 2011 RBSA)

Vintage	Blower Door Air Tightness (ACH50)		
	Mean	EB	n
Pre 1951	13.0▼	0.1	132
1951-1960	9.8▼	0.1	50
1961-1970	10.7▲	0.1	49
1971-1980	8.3▼	0.0	97
1981-1985	10.2▲	0.1	31
1986-1990	8.8▲	0.0	33
1991-1995	7.2▼	0.0	46
1996-2000	6.9▼	0.0	54
2001-2005	5.6▼	0.0	58
2006-2010	5.8▼	0.0	59
Post 2010	4.9▼	0.0	39
All Vintages	8.3▼	0.0	648

* RBSA II calculated home volume using ceiling heights measured on-site.

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Table 39. AVERAGE INFILTRATION RATE BY STATE, ACH50 DIVIDED BY 20 (Compare to Table 48 in 2011 RBSA)

State	Infiltration Rate (ACH50/20)		
	Mean	EB	n
ID	0.33	0.03	79
MT	0.35▼	0.03	85
OR	0.54	0.05	152
WA	0.43▼	0.02	340
Region	0.44▼	0.02	656

* RBSA II calculated home volume using ceiling heights measured on-site.

Table 40. DISTRIBUTION OF PRIMARY HEATING SYSTEMS (Compare to Table 50 in 2011 RBSA)

Heating System Type	Primary Heating Systems		
	%	EB	n
Air Source Heat Pump	11.3%	1.8%	131
Boiler	2.5%▼	0.8%	42
Electric Baseboard and Wall Heaters	9.9%	2.0%	119
Furnace	57.3%	3.0%	568
GeoThermal Heat Pump	0.7%	0.4%	9
Mini-split HP	3.4%▲	1.1%	52
Other Zonal Heat	4.4%	1.1%	62
Plug-In Heaters	2.9%▲	1.2%	28
Stove/Fireplace	7.6%▼	1.5%	101
Total	100.0%	0.0%	1,100

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Table 41. DISTRIBUTION OF FUEL CHOICE FOR PRIMARY HEATING SYSTEMS BY STATE
(Compare to Table 51 in 2011 RBSA)

Fuel Type	Fuel Choice (Primary System)										
	ID		MT		OR		WA		Region		n
	%	EB	%	EB	%	EB	%	EB	%	EB	
Electric	22.4%	6.4%	16.9%	5.7%	33.2%	5.2%	41.7%	4.4%	35.1%	2.8%	429
Gas	63.6%	7.2%	66.6%	6.4%	58.2%▲	5.4%	52.3%	4.4%	56.4%▲	2.9%	552
Oil/Kerosene	0.0%	0.0%	0.0%	0.0%	2.1%▼	2.8%	2.4%	1.3%	1.8%▼	0.9%	25
Pellets	0.8%	5.2%	1.4%	2.8%	1.5%	1.1%	0.0%	0.0%	0.7%▼	0.4%	11
Propane	4.1%	3.6%	8.4%	4.6%	0.4%▼	0.6%	1.3%	0.9%	1.9%	0.6%	25
Wood	9.1%	4.7%	6.7%▼	4.3%	4.5%▼	2.1%	2.2%▼	1.2%	4.1%▼	1.1%	58
Geothermal Well	0.0%	0.0%	0.0%	0.0%	0.1%	0.7%	0.0%	0.0%	0.0%	0.2%	1
Total	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	1,098

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Table 42. DISTRIBUTION OF SECONDARY HEATING SYSTEMS BY SYSTEM TYPE (Compare to Table 52 in 2011 RBSA)

Heating System Type	Secondary Heating Systems		
	%	EB	n
Air Handler	0.2%	0.5%	2
Air Source Heat Pump	4.8%	1.8%	39
Boiler	0.2%▼	0.2%	4
Electric Baseboard and Wall Heaters	8.0%▼	2.1%	87
Furnace	5.7%▲	1.8%	64
Mini-split HP	1.2%	0.9%	13
Other Zonal Heat	32.7%	3.6%	350
Packaged AC	0.1%	0.7%	1
Packaged HP	0.2%	0.4%	3
Stove/Fireplace	46.7%▼	3.9%	467
Water Source Heat Pump	0.1%	0.4%	2
Total	100.0%	0.0%	732

Table 43. DISTRIBUTION OF FUEL CHOICE BY SECONDARY HEATING SYSTEM AND STATE (Compare to Table 53 in 2011 RBSA)

Fuel Type	Fuel Choice (Secondary Systems)										
	ID		MT		OR		WA		Region		n
	%	EB	%	EB	%	EB	%	EB	%	EB	
Electric	51.4%	9.8%	46.4%▲	9.6%	53.1%	8.1%	45.2%	5.3%	48.4%▲	3.9%	439
Gas	28.7%	9.1%	18.9%	7.6%	18.7%	6.5%	24.1%▲	4.7%	22.8%▲	3.3%	206
Oil/Kerosene	0.8%	6.0%	0.0%	0.0%	0.6%	1.0%	0.5%	0.7%	0.5%	0.5%	10
Propane	3.7%	4.7%	8.4%	5.9%	3.4%	3.2%	3.2%	1.4%	3.6%	1.3%	44
Wood (cord)	13.3%	7.2%	24.5%	8.4%	22.4%▲	7.1%	26.7%▲	4.9%	23.5%▲	3.4%	246
Wood (pellets)	2.1%▼	5.1%	1.8%▼	4.5%	1.7%▼	2.7%	0.4%▼	0.5%	1.1%▼	0.8%	14
Total	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	731

Table 44. DISTRIBUTION OF FUEL CHOICE, FORCED AIR FURNACES (Compare to Table 54 in 2011 RBSA)

Fuel Type	Fuel Choice (Forced Air Furnaces)		
	%	EB	n
Electric	10.1%	2.2%	65
Gas	84.2%	2.6%	512
Oil/Kerosene	3.3%▼	1.4%	31
Propane	2.3%	0.9%	19
Total	100.0%	0.0%	628

Table 45. DISTRIBUTION OF FUEL CHOICE, BOILERS
(Compare to Table 55 in 2011 RBSA)

Fuel Type	Fuel Choice (Boilers)		
	%	EB	n
Electric	17.0%	1.7%	4
Natural Gas	79.8%	2.5%	37
Oil/Kerosene	1.2%	2.2%	2
Propane	1.4%	2.7%	2
Unknown	0.6%	3.5%	1

Table 46. DISTRIBUTION OF FUEL CHOICE, COMBUSTION HEATING STOVES
(Compare to Table 56 in 2011 RBSA)

Fuel Type	Fuel Choice (Combustion Stoves)		
	%	EB	n
Gas	20.2%	8.1%	25
Pellets	5.4%	3.2%	14
Propane	2.9%▼	2.2%	7
Wood	71.5%▲	8.4%	105
Total	100.0%	0.0%	147

Table 47. AVERAGE GAS FURNACE EFFICIENCY (AFUE) FOR PRIMARY SYSTEMS BY EQUIPMENT VINTAGE AND STATE (Compare to Table 57 in 2011 RBSA)

Vintage	Efficiency (AFUE)										
	ID		MT		OR		WA		Region		n
	%	EB	%	EB	%	EB	%	EB	%	EB	
Pre 1990	78.0%▲	0.1%	80.0%▼	0.0%	82.7%▲	1.0%	0.0%	0.0%	81.3%▲	0.6%	14
1990-1999	86.6%▲	0.3%	83.9%	0.2%	82.9%▲	0.1%	81.5%▼	0.1%	82.8%▼	0.1%	91
2000-2006	86.8%▲	0.2%	85.5%▲	0.2%	86.6%▲	0.2%	81.8%▼	0.1%	84.3%▲	0.1%	97
2007-2014	91.9%▲	0.1%	91.3%▲	0.1%	92.0%▼	0.2%	89.8%▲	0.2%	90.9%▲	0.1%	117
Post 2014	89.6%	0.2%	94.6%	0.2%	96.2%	0.0%	93.1%	0.3%	93.8%	0.1%	20
Vintage Unknown	72.6%	0.2%	84.0%	1.0%	84.4%	0.3%	81.7%	0.1%	81.7%	0.1%	124
All Vintages	84.6%▲	0.1%	86.0%▲	0.2%	87.3%▲	0.2%	85.1%▲	0.1%	85.9%▲	0.1%	461

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Table 48. DISTRIBUTION OF GAS FURNACE EFFICIENCY (AFUE) FOR PRIMARY SYSTEMS BY STATE (Compare to Table 58 in 2011 RBSA)

Furnace Efficiency	Percentage of Homes										
	ID		MT		OR		WA		Region		n
	%	EB	%	EB	%	EB	%	EB	%	EB	
< 80%	7.9%	5.9%	7.3%	6.6%	7.9%	4.9%	3.4%▼	2.4%	5.6%▼	1.9%	33
80-89%	41.1%	10.2%	42.7%	9.8%	36.8%▼	8.6%	66.8%	6.1%	52.8%	4.2%	235
90-94%	31.6%	9.7%	28.1%	9.2%	26.7%	8.3%	9.5%▼	3.3%	18.8%▼	3.2%	98
> 94%	19.4%	8.3%	21.9%	8.6%	28.5%▲	8.5%	20.3%▲	5.5%	22.7%▲	3.9%	95
Total	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	461

Table 49. AVERAGE AIR SOURCE HEAT PUMP EFFICIENCY (HSPF) FOR PRIMARY SYSTEMS BY EQUIPMENT VINTAGE (Compare to Table 59 in 2011 RBSA)

Vintage	Efficiency (HSPF)		
	Mean	EB	n
1990-1999	7.9▲	0.1	11
2000-2006	7.4▼	0.1	22
2007-2014	8.4	0.1	57
Post 2014	9.8	0.4	17
Vintage Unknown	7.9	0.0	4
All Vintages	8.3▲	0.1	111

Table 50. DISTRIBUTION OF AIR SOURCE HEAT PUMP EFFICIENCY (HSPF) FOR PRIMARY SYSTEMS BY STATE (Compare to Table 60 in 2011 RBSA)

HSPF	Percentage of Homes										n
	ID		MT		OR		WA		Region		
	%	EB	%	EB	%	EB	%	EB	%	EB	
6.8-7.6	16.7%	105.2%	0.0%	0.0%	20.3%	28.4%	4.0%▼	4.6%	10.8%▼	9.5%	10
7.7-8.2	66.7%	49.6%	100.0%	0.0%	39.0%	29.4%	28.3%▲	7.4%	38.3%▲	10.8%	42
8.3-8.9	16.7%	105.2%	0.0%	0.0%	24.2%	27.0%	9.7%▼	4.6%	15.1%▼	9.2%	20
9.0+	0.0%	0.0%	0.0%	0.0%	16.5%	6.4%	58.0%▲	7.1%	35.8%▲	4.2%	39
Total	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	111

Table 51. PERCENTAGE OF HOMES WITH COOLING EQUIPMENT BY COOLING ZONE AND STATE (Compare to Table 61 in 2011 RBSA)

Cooling Zone	Homes with Cooling Equipment										
	ID		MT		OR		WA		Region		n
	%	EB	%	EB	%	EB	%	EB	%	EB	
1	42.1%	7.8%	49.1%▲	7.4%	57.7%	5.9%	52.2%▲	4.0%	52.3%▲	2.9%	754
2	68.9%▲	7.1%	36.8%	7.4%	55.4%▲	6.0%	66.7%	7.1%	58.4%▲	3.6%	218
3	98.2%▲	2.0%	0.0%	0.0%	90.7%▼	3.7%	100.0%	0.0%	94.4%▲	2.0%	128
All Cooling Zones	69.7%	16.4%	43.0%	14.5%	67.9%	15.4%	61.6%▲	11.1%	64.6%▲	8.5%	1,100

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Table 52. DISTRIBUTION OF PRIMARY COOLING SYSTEMS IN COOLING ZONES BY TYPE (Compare to Table 62 in 2011 RBSA)

Cooling System Type	Percentage of Primary Cooling Systems								
	Cooling Zone 1		Cooling Zone 2		Cooling Zone 3		All Cooling Zones		n
	%	EB	%	EB	%	EB	%	EB	
Packaged AC (and Window AC)	21.6%	3.6%	18.5%▼	3.5%	5.0%▼	1.7%	21.5%	3.7%	105
Packaged HP	0.2%	0.4%	0.0%	0.0%	1.0%	1.2%	0.4%	0.4%	4
Central AC	40.7%▲	4.3%	55.0%	4.4%	42.9%	4.9%	43.2%	4.3%	243
Water Source Heat Pump	0.0%	0.0%	0.0%	0.0%	0.3%	1.4%	0.1%	0.6%	1
Air Source Heat Pump	27.8%▼	3.4%	21.2%	3.5%	48.3%▲	4.8%	25.2%▼	3.4%	166
Mini-split HP	8.9%	2.6%	3.7%	2.1%	0.7%	1.3%	8.0%▲	2.4%	60
Mini-split AC	0.0%	0.0%	1.1%	5.1%	0.0%	0.0%	0.4%	2.4%	1
GeoThermal Heat Pump	0.7%	0.7%	0.6%▼	1.8%	1.8%	1.4%	1.1%	0.7%	9
All Types	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	587

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Table 53. AVERAGE COOLING EFFICIENCY (SEER) FOR PRIMARY CENTRAL AC SYSTEMS BY VINTAGE (Compare to Table 63 in 2011 RBSA)

Vintage	Efficiency (SEER)		
	Mean	EB	n
1990-1999	10.8▲	0.1	34
2000-2006	11.7▲	0.1	63
2007-2014	13.1▼	0.1	55
Post 2014	13.4	0.0	18
Vintage Unknown	12.3	0.0	6
All Vintages	12.2▲	0.0	174

Table 54. AVERAGE COOLING EFFICIENCY (SEER) FOR PRIMARY CENTRAL AIR SOURCE HEAT PUMP SYSTEMS BY VINTAGE
(Compare to Table 64 in 2011 RBSA)

Vintage	Efficiency (SEER)		
	Mean	EB	n
Pre 1990	7.8	0.0	1
1990-1999	12.3▲	0.1	16
2000-2006	11.5	0.2	32
2007-2014	14.4▼	0.1	70
Post 2014	16.9	0.6	23
Vintage Unknown	13.0	0.0	6
All Vintages	13.4▲	0.1	146

Table 55. AVERAGE NUMBER OF PORTABLE COOLING DEVICES PER HOME BY STATE
(Compare to Table 65 in 2011 RBSA)

State	Number of Portable Cooling Devices per Home		
	Mean	EB	n
ID	0.2	0.1	121
MT	0.2▲	0.1	129
OR	0.2	0.0	282
WA	0.2▲	0.0	568
Region	0.2▲	0.0	1,100

Table 56. PERCENTAGE OF HOMES WITH DUCT SYSTEMS BY STATE
(Compare to Table 66 in 2011 RBSA)

State	Homes with Ducts		
	%	EB	n
ID	78.5%	6.1%	121
MT	63.1%	7.1%	129
OR	65.0%▼	5.5%	282
WA	71.2%	4.2%	568
Region	69.8%	2.8%	1,100

Table 57. DISTRIBUTION OF DUCTS PER HOME IN UNCONDITIONED SPACE BY STATE
(Compare to Table 67 in 2011 RBSA)

Percentage of Ducts in Unconditioned Space	Homes with Ducts										
	ID		MT		OR		WA		Region		n
	%	EB	%	EB	%	EB	%	EB	%	EB	
1-50%	15.8%	6.9%	5.3%	5.8%	15.8%	6.1%	14.2%	3.9%	14.3%	2.8%	91
51-99%	6.5%▼	5.1%	0.0%	0.0%	11.4%▼	5.4%	8.0%▼	3.3%	8.3%▼	2.3%	45
100%	49.4%▲	8.8%	35.9%▲	9.3%	49.3%▲	7.8%	47.6%▲	5.4%	47.6%▲	3.8%	307
None	28.4%▼	8.1%	58.9%▼	9.5%	23.5%	6.9%	30.2%▼	4.3%	29.8%▼	3.2%	261
Total	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	698

Table 58. AVERAGE TRUEFLOW® AIR HANDLER AIR FLOW (CFM) BY STATE

State	Average TrueFlow® Rate (CFM) by State		
	Mean	EB	n
ID	546.2	197.5	6
MT	828.6	NA	1
OR	701.1	105.1	21
WA	836.5	86.9	29
Region	738.9	59.5	57

Table 59. AVERAGE TRUEFLOW® AIR HANDLER AIR FLOW (CFM) BY STATE (NORMALIZED BY HOUSE AREA)

State	Average TrueFlow® Rate (CFM) Normalized by Home Area (sq. ft.)		
	Mean	EB	n
ID	0.23	0.09	6
MT	0.37	NA	1
OR	0.39	0.08	21
WA	0.39	0.03	29
Region	0.37	0.04	57

Table 60. AVERAGE TRUEFLOW® AIR HANDLER AIR FLOW (CFM) PER TON BY SYSTEM TYPE

System Type	Average TrueFlow® Rate (CFM) per Ton by System Type		
	Mean	EB	n
Air Source Heat Pump	280.3▲	29.6	46
Furnace	185.4▲	6.7	9
All Systems	234.9▲	15.5	53

Table 61. AVERAGE NUMBER OF LAMPS PER HOME BY STATE (Compare to Table 73 in 2011 RBSA)

State	Lamps per Home		
	Mean	EB	n
ID	60.8	5.5	121
MT	62.0	6.2	129
OR	59.4	4.4	282
WA	62.5	3.3	568
Region	61.3	2.3	1,100

Table 62. AVERAGE NUMBER OF FIXTURES PER HOME
(Compare to Table 74 in 2011 RBSA)

State	Fixtures per Home		
	Mean	EB	n
ID	37.9	3.6	121
MT	40.3	3.8	129
OR	38.2	2.7	282
WA	42.4	2.4	568
Region	40.4	1.6	1,100

Table 63. DISTRIBUTION OF LAMPS BY EISA CATEGORY AND STATE
(Compare to Table 75 in 2011 RBSA)

EISA Category	Percentage of Lamps										
	ID		MT		OR		WA		Region		n
	%	EB	%	EB	%	EB	%	EB	%	EB	
Exempt	34.0%	7.1%	38.9%▲	7.2%	46.0%▲	6.0%	43.0%▲	4.6%	42.4%▲	3.1%	1,077
Noncompliant	23.7%▼	6.4%	21.6%▼	6.1%	18.5%▼	4.7%	15.0%▼	3.3%	17.6%▼	2.3%	982
Compliant	42.3%	7.4%	39.5%	7.1%	35.5%	5.7%	42.0%	4.6%	39.9%	3.1%	1,097
Total	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	1,100

Table 64. DISTRIBUTION OF LAMPS BY TYPE AND STATE
(Compare to Table 76 in 2011 RBSA)

Lamp Type	Percentage of Lamps										n
	ID		MT		OR		WA		Region		
	%	EB	%	EB	%	EB	%	EB	%	EB	
Compact Fluorescent	26.0%	6.6%	26.8%	6.4%	25.4%	5.2%	26.2%	4.1%	26.0%	2.8%	1,056
Halogen	6.0%	3.6%	9.5%	4.4%	6.3%	2.8%	7.5%	2.3%	7.1%	1.5%	747
Incandescent	41.5%▼	7.4%	44.7%▼	7.3%	43.6%▼	5.9%	34.7%▼	4.4%	38.9%▼	3.0%	1,063
Incandescent / Halogen	0.7%	1.3%	0.1%	0.8%	0.4%	0.7%	0.3%	0.5%	0.3%	0.4%	54
Light Emitting Diode	17.0%▲	5.5%	9.4%▲	4.3%	17.1%▲	4.4%	23.8%▲	4.0%	20.0%▲	2.5%	844
Linear Fluorescent	7.7%	4.0%	8.3%	4.1%	6.5%▼	2.9%	6.0%▼	2.2%	6.5%▼	1.5%	663
Other	1.2%	1.6%	1.1%	1.6%	0.7%	0.9%	1.5%	1.2%	1.2%	0.7%	374
Total	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	1,100

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Table 65. DISTRIBUTION OF LAMPS BY TYPE AND ROOM
(Compare to Table 77 in 2011 RBSA)

Lamp Type	Percent of Lamps														n
	Compact Fluorescent		Halogen		Incandescent		Incandescent / Halogen		Light Emitting Diode		Linear Fluorescent		Other		
	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB	
Bathroom	22.2%	2.6%	6.7%▲	1.5%	47.6%▼	3.1%	0.5%	0.4%	18.9%▲	2.5%	1.9%	0.9%	2.2%▲	0.9%	1,084
Bedroom	30.1%	2.9%	6.6%▲	1.6%	41.4%▼	3.0%	0.1%	0.2%	17.8%▲	2.5%	2.4%	0.9%	1.6%▲	0.8%	1,093
Closet	22.4%	2.6%	5.5%▲	1.3%	38.7%▼	3.0%	0.2%	0.4%	17.7%▲	2.4%	13.6%	2.0%	2.0%▲	1.0%	415
Dining Room	19.8%	2.5%	5.9%	1.4%	48.5%▼	3.0%	0.7%	1.7%	23.1%▲	2.6%	1.2%	0.8%	0.8%	0.5%	518
Family Room	23.8%▼	2.6%	8.6%	1.7%	42.1%▼	3.0%	0.4%	0.6%	20.8%▲	2.6%	3.6%▼	1.1%	0.7%	0.4%	472
Garage	15.2%	2.2%	3.0%▲	1.1%	22.8%▼	2.6%	0.0%	0.4%	10.7%▲	2.1%	47.0%▼	3.1%	1.3%	0.9%	599
Hall	27.9%	2.9%	6.6%	1.4%	43.7%▼	3.1%	0.1%	0.3%	19.2%▲	2.5%	1.0%	0.5%	1.5%	0.8%	961
Kitchen	22.3%▼	2.6%	8.8%▼	1.6%	26.3%▼	2.7%	0.5%	0.6%	30.2%▲	2.9%	11.2%▼	2.0%	0.6%	0.4%	1,063
Laundry	29.4%	2.9%	3.0%▼	0.8%	24.1%▼	2.7%	0.1%	0.3%	14.4%▲	2.2%	26.7%	2.8%	2.2%▲	1.0%	657
Living Room	24.9%▼	2.7%	8.3%	1.6%	40.5%▼	3.1%	0.1%	0.2%	23.1%▲	2.6%	2.2%	0.9%	1.0%	0.6%	976
Office	32.7%	3.0%	8.2%	1.6%	28.9%▼	2.8%	0.3%	1.0%	22.1%▲	2.5%	6.2%▼	1.2%	1.6%	1.0%	358
Other	29.2%▲	2.9%	4.4%	1.1%	28.4%▼	2.8%	0.0%	0.1%	14.9%▲	2.3%	22.5%▼	2.6%	0.6%	0.4%	454
Outside	28.3%	2.9%	11.7%	1.9%	40.0%	3.0%	1.1%	0.6%	16.6%	2.3%	0.8%	0.5%	1.5%	0.8%	860
All Room Types	25.0%	2.7%	7.2%	1.5%	38.6%▼	3.0%	0.3%	0.3%	20.1%▲	2.6%	7.4%	1.6%	1.4%	0.7%	1,100

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Table 66. AVERAGE NUMBER OF CFLS INSTALLED PER HOME BY STATE (Compare to Table 78 in 2011 RBSA)

State	Average Number of CFLs Installed per Home by State		
	Mean	EB	n
ID	15.0	2.2	121
MT	14.4	2.0	129
OR	13.9	1.6	282
WA	15.4	1.4	568
Region	14.9	0.9	1,100

Table 67. AVERAGE NUMBER OF LEDS INSTALLED PER HOME BY STATE

State	Average number of LEDs installed per home by state		
	Mean	EB	n
ID	9.0	2.7	121
MT	6.1	1.8	129
OR	10.2	1.6	282
WA	14.5	1.8	568
Region	11.9	1.1	1,100

Table 68. AVERAGE NUMBER OF HALOGEN LAMPS INSTALLED PER HOME BY STATE (Compare to Table 79 in 2011 RBSA)

State	Average Number of Halogen Lamps Installed per Home by State		
	Mean	EB	n
ID	3.8▲	0.9	121
MT	6.2▲	1.8	129
OR	3.8	0.7	282
WA	4.7	0.7	568
Region	4.4	0.4	1,100

Table 69. AVERAGE NUMBER OF INCANDESCENT LAMPS INSTALLED PER HOME BY STATE (Compare to Table 80 in 2011 RBSA)

State	Average Number of Incandescent Lamps Installed per Home by State		
	Mean	EB	n
ID	24.8▼	3.1	121
MT	27.1▼	4.3	129
OR	25.3▼	3.2	282
WA	20.9▼	1.7	568
Region	23.1▼	1.4	1,100

Table 70. AVERAGE NUMBER OF LINEAR FLUORESCENT LAMPS INSTALLED PER HOME BY STATE (Compare to Table 81 in 2011 RBSA)

State	Average Number of Linear Fluorescent Lamps Installed per Home by State		
	Mean	EB	n
ID	5.2▼	1.2	121
MT	5.9	1.4	129
OR	4.2▼	0.8	282
WA	4.2▼	0.6	568
Region	4.4▼	0.4	1,100

Table 71. AVERAGE NUMBER OF OTHER LAMPS INSTALLED PER HOME BY STATE (Compare to Table 82 in 2011 RBSA)

State	Average Number of Other Lamps Installed per Home by State		
	Mean	EB	n
ID	0.8▲	0.3	121
MT	0.8▲	0.2	129
OR	0.5	0.1	282
WA	1.0▲	0.2	568
Region	0.8▲	0.1	1,100

Table 72. PERCENT OF HOMES WITH CFLS BY STATE

State	Percent of Homes		
	%	EB	n
ID	99.2%	1.4%	121
MT	92.6%	4.0%	129
OR	92.8%	3.0%	282
WA	95.7%	1.9%	568
Region	95.1%	1.4%	1,100

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Table 73. PERCENT OF HOMES WITH LEDS BY STATE

State	Percent of Homes		
	%	EB	n
ID	59.6%	7.0%	121
MT	54.6%	7.3%	129
OR	76.3%	5.2%	282
WA	79.7%	3.8%	568
Region	74.4%	2.7%	1,100

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Table 74. PERCENTAGE OF HOMES WITH LEDS BY STATE AND OWNERSHIP TYPE

Ownership Type	Percent of Homes										n
	ID		MT		OR		WA		Region		
	%	EB	%	EB	%	EB	%	EB	%	EB	
Own / buying	61.8%	7.0%	61.8%	7.1%	78.1%	5.0%	84.9%	3.3%	78.4%	2.4%	916
Rent	51.0%	7.5%	26.6%	6.7%	63.8%	5.9%	55.6%	4.5%	55.6%	3.0%	176
Occupy without rent	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%	0.0%	26.9%	0.0%	4
All Types	59.2%	7.1%	55.2%	7.3%	76.2%	5.2%	79.7%	3.8%	74.4%	2.7%	1,096

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Table 75. PERCENTAGE OF HOMES WITH CONNECTED LIGHTING BY STATE

State	Percent of Homes		
	%	EB	n
ID	0.8%	1.4%	121
MT	0.0%	0.0%	129
OR	2.4%	2.0%	282
WA	2.3%	1.5%	568
Region	2.0%	1.0%	1,100

Table 76. PERCENTAGE OF HOMES WITH GROW LIGHTS BY STATE

State	Percent of Homes		
	%	EB	n
ID	0.0%	0.0%	121
MT	0.7%	1.1%	129
OR	0.3%	0.4%	282
WA	0.2%	0.3%	568
Region	0.2%	0.2%	1,100

Table 77. AVERAGE NUMBER OF STORED COMPACT FLUORESCENT LAMPS BY STATE (Compare to Table 83 in 2011 RBSA)

State	Number of Lamps		
	Mean	EB	n
ID	3.0	0.8	121
MT	4.4	1.0	129
OR	3.2▼	0.9	282
WA	2.9▼	0.5	568
Region	3.1▼	0.4	1,100

Table 78. PERCENTAGE OF ALL CFLS THAT ARE STORED (Compare to Table 84 in 2011 RBSA)

State	Percent of CFLs		
	%	EB	n
ID	16.8%	5.7%	120
MT	23.2%	6.4%	124
OR	18.6%	4.8%	264
WA	15.8%▼	3.5%	548
Region	17.2%▼	2.4%	1,056

Table 79. AVERAGE NUMBER OF STORED LED LAMPS BY STATE

State	Number of Lamps		
	Mean	EB	n
ID	2.4	0.7	121
MT	0.7	0.3	129
OR	1.4	0.3	282
WA	2.1	0.3	568
Region	1.9	0.2	1,100

Table 80. PERCENTAGE OF ALL LEDS THAT ARE STORED

State	Percent of LEDs		
	%	EB	n
ID	22.7%	8.4%	73
MT	9.8%	6.0%	69
OR	11.7%	4.2%	230
WA	12.7%	3.2%	472
Region	13.5%	2.3%	844

Table 81. AVERAGE NUMBER OF STORAGE BULBS BY BULB TYPE AND STATE

Lamp Category	Average Number of Storage Lamps by Type and State										
	ID		MT		OR		WA		Region		n
	Mean	EB	Mean	EB	Mean	EB	Mean	EB	Mean	EB	
Compact Fluorescent	3.0	0.8	4.4	1.0	3.2	0.9	2.9	0.5	3.1	0.4	1,100
Halogen	0.4	0.2	0.9	0.4	0.5	0.2	0.8	0.2	0.6	0.1	1,100
Incandescent	4.1	1.1	5.4	1.9	4.2	1.1	3.7	0.5	4.0	0.5	1,100
Incandescent / Halogen	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,100
Light Emitting Diode	2.4	0.7	0.7	0.3	1.4	0.3	2.1	0.3	1.9	0.2	1,100
Linear Fluorescent	0.1	0.1	0.1	0.0	0.2	0.2	0.1	0.1	0.1	0.1	1,100
Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,100
Unknown	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,100
All Categories	10.0	1.5	11.5	2.2	9.4	1.5	9.7	0.8	9.8	0.7	1,100

Table 82. DISTRIBUTION OF STORAGE BULBS BY BULB TYPE AND STATE

Lamp Category	Percent of Lamps										
	ID		MT		OR		WA		Region		n
	%	EB	%	EB	%	EB	%	EB	%	EB	
Compact Fluorescent	30.0%	6.9%	39.1%	7.1%	33.8%	5.7%	30.8%	4.4%	32.1%	3.0%	1,100
Halogen	3.8%	2.9%	7.7%	4.0%	5.0%	2.5%	7.8%	2.3%	6.4%	1.4%	1,100
Incandescent	40.6%	7.4%	46.7%	7.3%	44.2%	5.9%	38.3%	4.5%	40.9%	3.1%	1,100
Incandescent / Halogen	0.3%	0.8%	0.0%	0.0%	0.3%	0.5%	0.5%	0.6%	0.4%	0.4%	1,100
Light Emitting Diode	24.2%	6.4%	5.8%	3.5%	14.5%	3.9%	22.0%	3.8%	19.0%	2.4%	1,100
Linear Fluorescent	1.1%	1.5%	0.5%	1.0%	2.2%	2.0%	0.5%	0.5%	1.1%	0.7%	1,100
Other	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	1,100
Unknown	0.1%	0.4%	0.2%	0.6%	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	1,100
Total	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	1,100

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Table 83. AVERAGE HOUSEHOLD WATTS PER BULB BY STATE

State	Average household watts per bulb by State		
	Mean	EB	n
ID	40.4	2.2	121
MT	42.4	2.4	129
OR	39.4	2.2	282
WA	35.8	1.6	568
Region	37.9	1.1	1,100

Table 84. AVERAGE LIGHTING POWER DENSITY (LPD) BY STATE (Compare to Table 85 in 2011 RBSA)

State	Home LPD (W/sq. ft.)		
	Mean	EB	n
ID	1.00▼	0.08	121
MT	1.03▼	0.08	129
OR	0.99▼	0.06	282
WA	0.93▼	0.05	568
Region	0.96▼	0.03	1,100

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Table 85. AVERAGE LIGHTING POWER DENSITY (LPD) BY ROOM TYPE (Compare to Table 86 in 2011 RBSA)

Room Type	Room LPD (W/sq. ft.)		
	Mean	EB	n
Bathroom	2.85▼	0.16	1,058
Bedroom	0.67▼	0.05	904
Closet	1.46▼	0.10	396
Dining Room	1.24▼	0.09	485
Family Room	0.74▼	0.04	389
Garage	0.41▼	0.02	301
Hall	1.27▼	0.08	927
Kitchen	1.21▼	0.09	1,018
Laundry	1.03▼	0.05	599
Living Room	0.60▼	0.03	758
Office	0.81▼	0.05	337
Other	0.72▼	0.05	193
All Room Types	1.08▼	0.02	1,099
Living Room	0.60▼	0.03	758
Office	0.81▼	0.05	337
Other	0.72▼	0.05	193
All Room Types	1.08▼	0.02	1,099

Table 86. AVERAGE NUMBER OF APPLIANCES PER HOME BY TYPE
(Compare to Table 87 in 2011 RBSA)

Appliance	Number of Appliances per Home		
	Mean	EB	n
Dishwasher	0.85▼	0.02	1,100
Dryer	0.94▼	0.02	1,100
Freezer	0.39▼	0.04	1,100
Refrigerator	1.34	0.04	1,100
Washer	0.96▼	0.01	1,100
Water Heater	1.01▼	0.02	1,100

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Table 87. AVERAGE MANUFACTURE DATE OF APPLIANCES BY TYPE

Type	Average Production Date by Type		
	Mean	EB	n
Dishwasher	2008	0.4	771
Dryer	2007	0.4	413
Freezer	2004	0.6	170
Refrigerator	2006	0.5	654
Washer	2008	0.4	843

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Table 88. DISTRIBUTION OF REFRIGERATOR/FREEZERS BY VINTAGE
(Compare to Table 88 in 2011 RBSA)

Vintage	Refrigerators		
	%	EB	n
Pre 1980	0.3%▼	2.4%	1
1980-1989	3.1%▼	2.1%	14
1990-1994	6.5%▼	2.4%	50
1995-1999	13.1%	3.1%	100
2000-2004	14.8%▼	3.1%	142
2005-2009	23.5%	3.7%	218
2010-2014	25.7%	3.6%	246
Post 2014	13.1%	3.0%	110
Total	100.0%	0.0%	708

Table 89. DISTRIBUTION OF REFRIGERATORS BY TYPE
(Compare to Table 89 in 2011 RBSA)

Refrigerator Type	Refrigerators		
	%	EB	n
Full Size Refrigerator Only	1.6%▼	0.9%	21
Mini Refrigerator	7.1%▲	1.6%	95
Refrigerated Beer Cooler	0.1%	0.6%	1
Refrigerator with Bottom Freezer	17.0%	2.4%	214
Refrigerator with Side-by-Side Freezer	27.4%	2.8%	368
Refrigerator with Top Freezer	35.4%▼	3.0%	489
Refrigerated Wine Cooler	0.2%	0.4%	2
Side-by-Side Refrigerator with Bottom Freezer	11.2%▲	2.0%	158
Total	100.0%	0.0%	1,077

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Table 90. AVERAGE REFRIGERATOR VOLUME BY TYPE
(Compare to Table 90 in 2011 RBSA)

Refrigerator Type	Volume (cu. ft.)		
	Mean	EB	n
Full Size Refrigerator Only	15.3▲	0.2	19
Mini Refrigerator	5.1▼	0.1	67
Refrigerated Beer Cooler	13.0	NA	1
Refrigerator with Bottom Freezer	21.1▼	0.3	164
Refrigerator with Side-by-Side Freezer	23.4	0.3	276
Refrigerator with Top Freezer	18.7▼	0.3	365
Refrigerated Wine Cooler	16.0	NA	1
Side-by-Side Refrigerator with Bottom Freezer	24.4	0.2	125
All Refrigerator Types	18.1▼	0.1	855

Table 91. DISTRIBUTION OF FREEZERS BY TYPE IN HOMES WITH FREEZERS
(Compare to Table 91 in 2011 RBSA)

Freezer Type	Freezers		
	%	EB	n
Freezer, chest	43.3%	5.5%	182
Freezer, upright	56.1%	5.5%	231
Mini-Freezer	0.6%	4.2%	1
Total	100.0%	0.0%	391

Table 92. AVERAGE FREEZER VOLUME BY TYPE
(Compare to Table 92 in 2011 RBSA)

Freezer Type	Freezer Volume (cu. ft.)		
	Mean	EB	n
Freezer, chest	11.8▼	0.8	139
Freezer, upright	17.0▼	0.5	182
All Refrigerator Types	14.4▼	0.5	310

Table 93. DISTRIBUTION OF CLOTHES WASHERS BY VINTAGE
(Compare to Table 93 in 2011 RBSA)

Vintage	Clothes Washers		
	%	EB	n
1980-1989	1.4%	0.9%	14
1990-1994	2.0%▼	1.0%	19
1995-1999	7.1%▼	1.8%	65
2000-2004	17.6%▼	2.8%	136
2005-2009	27.4%▼	3.3%	233
2010-2014	31.0%▲	3.3%	264
Post 2014	13.5%	2.3%	115
Total	100.0%	0.0%	843

Table 94. DISTRIBUTION OF CLOTHES WASHERS BY TYPE AND STATE
(Compare to Table 94 in 2011 RBSA)

Clothes Washer Type	Clothes Washers										
	ID		MT		OR		WA		Region		n
	%	EB	%	EB	%	EB	%	EB	%	EB	
Combined Washer/Dryer in one drum	0.0%	0.0%	1.0%	6.1%	1.1%	1.9%	0.4%	0.6%	0.6%	0.5%	7
Horizontal Axis	30.5%	7.2%	37.1%	7.4%	51.2%▲	6.2%	44.4%▲	4.7%	44.1%▲	3.2%	444
Vertical Axis (with agitator)	65.2%	7.4%	47.1%	7.6%	35.2%▼	5.9%	37.6%▼	4.4%	41.1%▼	3.0%	463
Vertical Axis (without agitator)	4.3%	3.8%	14.8%	5.5%	11.6%▲	4.0%	15.8%▲	3.7%	13.0%▲	2.3%	129
Unknown	0.0%	0.0%	0.0%	0.0%	0.2%	1.3%	1.2%	1.5%	0.7%	0.7%	5
Total	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	1,050

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Table 95. DISTRIBUTION OF CLOTHES WASHERS BY TYPE AND VINTAGE
(Compare to Table 95 in 2011 RBSA)

Clothes Washer Type	Vintage														
	Pre 1990		1990-1994		1995-1999		2000-2004		2005-2009		2010-2014		Post 2014		n
	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB	
Combined Washer/Dryer in one drum	0.0%▼	0.0%	0.0%▼	0.0%	48.0%▼	0.0%	30.3%	0.0%	6.0%	0.0%	15.7%▲	0.0%	0.0%	0.0%	4
Horizontal Axis	0.8%▼	1.0%	0.0%▼	0.0%	0.8%	0.6%	14.5%▼	2.6%	33.0%▼	3.4%	36.4%▲	3.4%	14.4%	2.3%	391
Vertical Axis (with agitator)	3.2%▼	1.4%	4.7%▼	1.6%	17.1%▼	2.7%	26.1%▼	3.2%	21.9%▼	2.8%	18.3%▲	2.9%	8.7%	1.6%	347
Vertical Axis (without agitator)	0.2%	0.3%	0.5%	0.4%	0.0%	0.0%	8.4%	2.3%	13.6%	2.9%	54.0%	3.7%	23.3%	3.3%	94
All Clothes Washer Types	1.4%	0.9%	2.0%	1.0%	7.1%	1.8%	17.6%	2.8%	27.4%	3.3%	31.0%	3.3%	13.5%	2.3%	843

Table 96. AVERAGE NUMBER OF CLOTHES WASHER LOADS PER WEEK BY STATE (Compare to Table 96 in 2011 RBSA)

State	Clothes Washer Loads per Week		
	Mean	EB	n
ID	4.3▼	0.4	121
MT	3.9	0.4	129
OR	4.2▼	0.3	282
WA	4.1▼	0.2	568
Region	4.2▼	0.2	1,100

Table 97. AVERAGE CLOTHES WASHER SIZE (CU. FT.) BY STATE

State	Average Size (cu. Ft.) of Clothes Washers by State		
	Mean	EB	n
ID	3.3	0.1	98
MT	3.3	0.1	120
OR	4.4	0.4	213
WA	3.5	0.1	493
Region	3.7	0.1	924

Table 98. DISTRIBUTION OF CLOTHES DRYERS BY VINTAGE
(Compare to Table 97 in 2011 RBSA)

Vintage	Clothes Dryers		
	%	EB	n
Pre 1980	0.2%▼	0.5%	2
1980-1989	0.8%▼	0.7%	6
1990-1994	1.1%▼	0.7%	9
1995-1999	8.3%▼	3.5%	33
2000-2004	21.5%	4.8%	69
2005-2009	30.7%	5.8%	131
2010-2014	27.4%▲	5.5%	117
Post 2014	9.9%	3.4%	47
Total	100.0%	0.0%	413

Table 99. DISTRIBUTION OF DRYERS BY FUEL TYPE AND STATE

Dryer Fuel	Dryers										
	ID		MT		OR		WA		Region		n
	%	EB	%	EB	%	EB	%	EB	%	EB	
Electric	96.4%	2.9%	92.7%	4.3%	92.6%	3.6%	90.2%	3.0%	91.9%	1.9%	945
Natural Gas	3.6%	3.7%	4.3%	3.9%	7.4%	3.8%	8.6%	2.9%	7.3%	1.9%	62
Propane	0.0%	0.0%	3.1%	4.2%	0.0%	0.0%	1.2%	1.5%	0.8%	0.7%	7
Total	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	1,014

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Table 100. DISTRIBUTION OF VENTED DRYERS BY STATE

State	Distribution of Vented Dryers by State		
	%	EB	n
ID	96.4%	2.9%	112
MT	95.4%	3.7%	99
OR	97.9%	1.6%	253
WA	98.5%	0.8%	520
Region	97.8%	0.8%	984

Table 101. PERCENTAGE OF DRYER LOADS PER WASHER LOAD BY STATE (Compare to Table 98 in 2011 RBSA)

State	Dryer Loads per Washer Load		
	%	EB	n
ID	82.1%	4.7%	116
MT	83.7%	4.2%	124
OR	85.3%	2.9%	273
WA	87.1%	2.4%	548
Region	85.7%▼	1.6%	1,061

Table 102. DISTRIBUTION OF DISHWASHERS BY VINTAGE
(Compare to Table 99 in 2011 RBSA)

Vintage	Dishwashers		
	%	EB	n
1980-1989	1.3%▼	0.9%	13
1990-1994	2.9%▼	1.3%	26
1995-1999	6.8%▼	1.8%	59
2000-2004	17.0%▼	3.0%	123
2005-2009	24.3%▼	3.3%	189
2010-2014	34.9%▲	3.7%	260
Post 2014	12.9%	2.5%	108
Total	100.0%	0.0%	771

Table 103. AVERAGE NUMBER OF DISHWASHER LOADS PER WEEK
(Compare to Table 100 in 2011 RBSA)

State	Dishwasher Loads per Week		
	Mean	EB	n
ID	3.9	0.4	121
MT	3.1	0.3	129
OR	3.4	0.3	282
WA	3.5	0.2	568
Region	3.5	0.2	1,100

Table 104. DISTRIBUTION OF COOK TOP FUEL BY TYPE
(Compare to Table 101 in 2011 RBSA)

Fuel Type	Cook Top Fuel		
	%	EB	n
Electric	69.6%▼	2.9%	786
Gas	28.1%▲	2.9%	278
Propane	2.3%▼	0.7%	31
Other	0.0%	0.3%	1
Total	100.0%	0.0%	1,084

Table 105. DISTRIBUTION OF OVEN FUEL BY TYPE
(Compare to Table 102 in 2011 RBSA)

Fuel Type	Oven Fuel		
	%	EB	n
Electric	79.3%▼	2.6%	885
Gas	19.3%▲	2.6%	198
Other	0.2%	0.3%	3
Propane	1.2%▼	0.5%	16
Total	100.0%	0.0%	1,090

Table 106. PERCENT OF APPLIANCES BEYOND MEASURE LIFE BY STATE

Type	Percent of Appliances Beyond Measure Life by State		
	%	EB	n
Dishwasher	27.9%	2.8%	771
Dryer	31.9%	2.8%	413
Freezer	19.6%	2.5%	170
Refrigerator	24.3%	2.7%	654
Washer	20.1%	2.5%	843

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Table 107. PERCENTAGE OF APPLIANCES THAT ARE WI-FI COMPATIBLE BY APPLIANCE TYPE AND STATE

Type	Percentage of Appliances that are Wi-Fi Compatible										
	ID		MT		OR		WA		Region		n
	%	EB	%	EB	%	EB	%	EB	%	EB	
Dryer	0.9%	1.5%	0.0%	0.0%	1.3%	0.9%	0.4%	0.4%	0.7%	0.4%	983
Freezer	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	384
Refrigerator	0.0%	0.0%	1.4%	1.6%	0.3%	0.4%	0.8%	1.0%	0.6%	0.5%	1,076
Stove/Oven	0.8%	1.4%	1.0%	1.6%	0.0%	0.0%	0.0%	0.0%	0.2%	0.2%	1,079
Washer	1.0%	1.5%	0.8%	1.2%	1.0%	0.8%	1.4%	1.1%	1.2%	0.7%	975

Table 108. DISTRIBUTION OF WATER HEATER FUEL BY STATE
(Compare to Table 103 in 2011 RBSA)

Water Heater Fuel Type	Water Heaters										
	ID		MT		OR		WA		Region		n
	%	EB	%	EB	%	EB	%	EB	%	EB	
Electric	47.5%	7.5%	39.7%	7.6%	49.6%	6.0%	50.5%▼	4.7%	49.1%▼	3.1%	573
Natural Gas	50.9%	7.5%	51.9%	7.3%	49.7%	5.9%	47.6%▲	4.7%	48.9%▲	3.1%	458
Propane	1.6%	3.4%	8.4%	5.0%	0.7%	1.0%	2.0%	1.0%	1.9%	0.7%	23
Total	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	1,046

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Table 109. DISTRIBUTION OF WATER HEATERS BY TYPE
(Compare to Table 104 in 2011 RBSA)

Water Heater Type	Water Heaters		
	%	EB	n
Instantaneous Water Heater	5.9%▲	1.6%	56
Storage Water Heater	94.1%▼	1.6%	1,001
Total	100.0%	0.0%	1,048

Table 110. DISTRIBUTION OF WATER HEATERS BY DETAILED TYPE

Detailed Type	Water Heaters		
	%	EB	n
Instantaneous-Electric Resistance	0.8%	0.7%	6
Instantaneous-Fossil Fuel Condensing	3.0%	1.1%	31
Instantaneous-Fossil Fuel Non-Condensing	2.0%	1.1%	19
Storage-Electric Heat Pump (Packaged)	1.8%	0.9%	20
Storage-Electric Resistance	46.3%	3.1%	551
Storage-Fossil Fuel Condensing	4.1%	1.3%	38
Storage-Fossil Fuel Non-Condensing	41.3%	3.2%	390
Storage-Indirect Water Heater	0.5%	0.3%	10
Total	100.0%	0.0%	1,048

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Table 111. DISTRIBUTION OF WATER HEATER LOCATION BY STATE (Compare to Table 105 in 2011 RBSA)

Water Heater Location	Water Heaters										
	ID		MT		OR		WA		Region		n
	%	EB	%	EB	%	EB	%	EB	%	EB	
Basement	35.4%	7.3%	47.3%	7.4%	25.7%	5.7%	24.8%	3.3%	27.9%	2.6%	339
Crawlspace	2.4%	3.3%	10.8%	4.9%	3.5%	2.4%	2.8%	1.8%	3.5%	1.2%	41
Garage	32.4%	7.1%	8.6%	4.6%	41.2%	6.1%	38.1%	4.6%	36.4%▲	3.1%	338
Main House	27.5%	6.8%	33.3%	7.1%	26.9%▼	5.0%	29.8%	4.5%	28.9%	2.9%	328
Other	2.4%	3.3%	0.0%	0.0%	2.7%	2.5%	4.4%	2.3%	3.4%	1.3%	30
Total	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	1,063

Table 112. DISTRIBUTION OF ALL WATER HEATER LOCATIONS BY SPACE HEATING FUEL TYPE (Compare to Table 106 in 2011 RBSA)

Water Heater Location	All Water Heaters by Space Heating Fuel														
	Electric		Gas		Oil		Pellets		Propane		Wood		All Fuels		n
	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB	
Basement	18.5%▼	2.1%	30.7%	2.8%	50.7%▲	3.5%	50.1%▲	2.5%	42.3%	4.0%	22.6%▲	1.5%	28.3%	2.6%	339
Crawlspace	3.7%	1.4%	3.8%	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.5%▼	0.7%	3.5%	1.2%	41
Garage	27.8%	2.9%	46.0%▲	3.2%	29.9%	0.0%	23.0%▲	2.8%	30.5%▲	3.7%	31.8%▲	2.7%	37.1%▲	3.1%	336
Main House	49.3%▲	2.9%	17.2%	2.5%	19.4%▼	3.9%	26.9%▼	3.2%	27.2%	4.1%	42.7%▼	3.0%	29.3%	2.9%	328
Other	0.7%▼	0.5%	2.3%	1.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.4%▼	1.0%	1.8%▼	1.0%	19
All Locations	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	1,051

Table 113. DISTRIBUTION OF ELECTRIC WATER HEATER LOCATION BY PRIMARY SPACE HEATING FUEL TYPE (Compare to Table 107 in 2011 RBSA)

Water Heater Location	Electric Water Heaters by Space Heating Fuel														
	Electric		Gas		Oil		Pellets		Propane		Wood		All Fuels		n
	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB	
Basement	19.5%	3.2%	47.9%▲	4.7%	50.7%	5.6%	45.7%	0.0%	55.2%	7.6%	21.5%	2.3%	30.3%	4.0%	187
Crawlspace	4.2%	2.3%	9.0%	3.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%▼	2.1%	5.0%	2.4%	19
Garage	25.5%	4.3%	15.2%	4.0%	29.9%	0.0%	23.3%▲	3.6%	5.6%	5.5%	32.4%▲	4.2%	22.9%	4.2%	124
Main House	50.2%	4.5%	25.1%▼	3.2%	19.4%▼	6.3%	31.0%▼	3.6%	39.3%	7.8%	43.7%▼	4.6%	40.6%	4.7%	237
Other	0.7%▼	0.6%	2.7%	8.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.5%▼	1.1%	1.3%▼	1.4%	10
Total	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	568

Table 114. DISTRIBUTION OF GAS WATER HEATER LOCATION BY SPACE HEATING FUEL TYPE (Compare to Table 108 in 2011 RBSA)

Water Heater Location	Gas Water Heaters by Space Heating Fuel												
	Electric		Gas		Pellets		Propane		Wood		All Fuels		n
	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB	
Basement	2.3%▼	2.1%	26.6%	3.6%	66.8%	0.0%	0.0%	0.0%	100.0%	0.0%	25.5%	3.6%	143
Crawlspace	2.1%▼	4.5%	2.8%	1.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.8%	1.4%	20
Garage	44.8%▼	4.0%	52.5%	4.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	51.5%	4.4%	198
Main House	47.0%▲	3.7%	15.9%	3.3%	33.2%	0.0%	0.0%	0.0%	0.0%	0.0%	17.8%	3.4%	84
Other	3.8%	5.6%	2.2%	1.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.4%	1.7%	9
Total	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%	0.0%	454

Table 115. DISTRIBUTION OF TANK SIZE BY FUEL TYPE (Compare to Table 109 in 2011 RBSA)

Fuel Type	Tank Size				
	0-50 gallons		>50 gallons		n
	%	EB	%	EB	
Electric	87.2%	2.1%	12.8%	2.2%	541
Natural Gas	92.4%	1.8%	7.6%	1.8%	399
Propane	100.0%	0.0%	0.0%	0.0%	18
Unknown	88.2%▼	2.9%	11.8%	9.4%	7
All Fuel Types	89.6%	2.0%	10.4%	2.0%	959

Table 116. DISTRIBUTION OF ELECTRIC WATER HEATER TANK SIZE BY LOCATION (Compare to Table 110 in 2011 RBSA)

Location	Electric Water Heater Tank Size				
	0-50 gallons		>50 gallons		n
	%	EB	%	EB	
Basement	80.4%	3.5%	19.6%	3.6%	179
Crawlspace	90.5%	3.7%	9.5%	6.3%	17
Garage	86.1%	3.6%	13.9%	3.8%	115
Main House	91.2%	2.6%	8.8%	2.7%	225
Other	99.9%▲	0.0%	0.1%▼	0.0%	10
All Locations	87.2%	3.2%	12.8%	3.3%	540

Table 117. DISTRIBUTION OF GAS WATER HEATER TANK SIZE BY LOCATION (Compare to Table 111 in 2011 RBSA)

Location	Gas Water Heater Tank Size				
	0-50 gallons		>50 gallons		n
	%	EB	%	EB	
Basement	93.0%	2.4%	7.0%	3.0%	124
Crawlspace	100.0%	0.0%	0.0%	0.0%	18
Garage	91.5%▼	2.2%	8.5%▲	2.3%	178
Main House	95.6%	2.0%	4.4%	3.5%	74
Other	36.1%	0.0%	63.9%	0.0%	3
All Locations	92.7%	2.5%	7.3%	2.5%	397

Table 118. DISTRIBUTION OF WATER HEATERS BY VINTAGE
(Compare to Table 112 in 2011 RBSA)

Vintage	Water Heaters		
	%	EB	n
Pre 1990	2.9%▼	1.7%	17
1990-1999	16.8%▼	2.8%	141
2000-2004	18.1%▼	3.1%	156
2005-2009	28.0%▼	3.5%	231
2010-2014	24.0%▲	3.2%	211
Post 2014	10.2%	2.3%	96
Total	100.0%	0.0%	837

Table 119. AVERAGE NUMBER OF SHOWERHEADS AND FAUCETS PER HOME BY STATE

Device	Number of Showerheads and Faucets per Home											
	ID		MT		OR		WA		Region		Count	n
	Mean	EB	Mean	EB	Mean	EB	Mean	EB	Mean	EB		
Bathroom Faucet	2.6	0.2	2.4	0.2	2.5	0.2	2.6	0.1	2.6	0.1	2,741	1,098
Kitchen Faucet	1.0	0.1	1.1	0.1	1.1	0.1	1.1	0.0	1.1	0.0	1,193	1,098
Shower	0.7	0.1	0.8	0.1	1.0	0.1	0.9	0.1	0.9	0.1	879	1,098
Shower / Bathtub combo with diverter valve	1.1	0.1	1.1	0.1	0.7	0.1	1.0	0.1	0.9	0.0	1,085	1,098
Shower / Bathtub combo with separate valve	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15	1,098

* Count represents the total number of fixtures. Means are based on the number of fixtures in each bin.
* n represents the total number of homes.

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Table 120. DISTRIBUTION OF SHOWERHEAD FLOW RATE BY STATE
(Compare to Table 113 in 2011 RBSA)

Flow Rate (GPM)	Showerhead Flow Rates											
	ID		MT		OR		WA		Region		Count	n
	%	EB	%	EB	%	EB	%	EB	%	EB		
≤ 1.5	7.2%	17.6%	13.1%	19.2%	21.6%	12.4%	15.5%	8.0%	16.1%	6.0%	167	137
1.6 - 2.0	23.6%	13.1%	22.0%	15.7%	29.6%	12.7%	27.7%	7.4%	27.4%	5.7%	268	221
2.1 - 2.5	51.0%	12.5%	40.0%	11.6%	31.9%	12.9%	43.6%	7.2%	40.8%	5.5%	415	326
2.6 - 3.5	15.5%	12.8%	23.5%	11.0%	14.0%	14.6%	12.4%	7.7%	14.0%	5.5%	146	133
≥ 3.6	2.7%	23.6%	1.4%	40.8%	2.9%	28.4%	0.8%	29.8%	1.7%	16.8%	20	16
Total	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	1,016	613

* No statistical testing performed because results include all showerheads. RBSA I only included primary.
* Count represents the total number of fixtures. Percentages are based on the number of fixtures in each bin.
* n represents the total number of homes.
* GPM data have been calibrated to adjust for systematic bias in the data collection approach.
* GPM error bounds incorporate both sampling and measurement uncertainty. Measurement uncertainty adjusts for systematic bias in the data collection approach

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Table 121. DISTRIBUTION OF BATHROOM FAUCET FLOW RATE BY STATE

Flow Rate (GPM)	Bathroom Faucet Flow Rate										Count	n
	ID		MT		OR		WA		Region			
	%	EB	%	EB	%	EB	%	EB	%	EB		
≤ 1.5	25.7%	9.2%	37.1%	8.3%	42.1%	8.4%	38.7%	5.5%	37.9%	3.9%	752	437
1.5 - 2.2	58.2%	10.0%	45.3%	8.4%	42.0%	8.3%	46.3%	5.6%	46.5%	4.0%	916	494
≥ 2.3	16.1%	8.5%	17.6%	7.1%	15.9%	6.8%	15.0%	4.1%	15.6%	3.1%	307	230
Total	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	1,975	810

* Count represents the total number of fixtures. Percentages are based on the number of fixtures in each bin.
* n represents the total number of homes.
* GPM data have been calibrated to adjust for systematic bias in the data collection approach.
* GPM error bounds incorporate both sampling and measurement uncertainty. Measurement uncertainty adjusts for systematic bias in the data collection approach

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Table 122. DISTRIBUTION OF KITCHEN FAUCET FLOW RATE BY STATE

Flow Rate (GPM)	Kitchen Faucet Flow Rate											
	ID		MT		OR		WA		Region		Count	n
	%	EB	%	EB	%	EB	%	EB	%	EB		
≤ 1.5	24.1%	9.0%	30.9%	8.9%	44.6%	8.5%	31.5%	5.4%	34.4%	3.9%	292	279
1.5 - 2.2	57.1%	9.5%	54.2%	9.1%	42.7%	8.5%	53.4%	5.7%	50.8%	4.0%	425	405
≥ 2.3	18.8%	8.8%	15.0%	7.9%	12.6%	6.2%	15.1%	4.3%	14.9%	3.1%	151	149
Total	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	868	791

* Count represents the total number of fixtures. Percentages are based on the number of fixtures in each bin.
* n represents the total number of homes.
* GPM data have been calibrated to adjust for systematic bias in the data collection approach.
* GPM error bounds incorporate both sampling and measurement uncertainty. Measurement uncertainty adjusts for systematic bias in the data collection approach

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Table 123. AVERAGE NUMBER OF TELEVISIONS PER HOME BY STATE
(Compare to Table 114 in 2011 RBSA)

State	Televisions per Home		
	Mean	EB	n
ID	2.1	0.2	121
MT	2.1	0.2	129
OR	1.9▼	0.1	282
WA	2.1▼	0.1	568
Region	2.1▼	0.1	1,100

Table 124. AVERAGE TELEVISION POWER BY VINTAGE
(Compare to Table 115 in 2011 RBSA)

Vintage	Television Power (W)		
	Mean	EB	n
Pre 1990	60.1	NA	3
1990-1994	57.9▼	2.4	8
1995-1999	65.1▼	2.7	27
2000-2004	66.5▼	2.6	49
2005-2009	141.0	6.7	209
2010-2014	76.2▼	3.9	285
Post 2014	61.9	3.5	120
Vintage Unknown	92.9	5.1	371
All Vintages	83.1	1.7	770

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Table 125. DISTRIBUTION OF TELEVISION SCREENS BY TYPE AND VINTAGE
(Compare to Table 116 in 2011 RBSA)

Vintage	Television Screens												
	CRT		LED		LCD		LED+LCD		Plasma		Other		n
	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB	
Pre 1990	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4
1990-1994	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	8
1995-1999	91.8%▼	1.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	8.2%	1.4%	35
2000-2004	82.7%▼	2.4%	0.9%	1.4%	10.8%	2.5%	0.0%	0.0%	0.9%	1.4%	4.7%	1.1%	76
2005-2009	8.9%▼	2.0%	2.8%	1.2%	75.7%	3.0%	0.0%	0.0%	12.1%	2.4%	0.6%	0.4%	307
2010-2014	0.1%▼	0.5%	35.9%	3.7%	52.4%	3.9%	3.8%	1.7%	7.9%	2.1%	0.0%	0.0%	401
Post 2014	0.0%	0.0%	87.9%	2.2%	12.0%	2.3%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	166
All Vintages	12.7%▼	2.7%	30.1%	3.6%	47.9%	3.9%	1.5%	1.1%	7.1%	1.9%	0.7%	0.4%	751

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Table 126. DISTRIBUTION OF TELEVISIONS BY ROOM TYPE
(Compare to Table 117 in 2011 RBSA)

Room	Televisions		
	%	EB	n
Bathroom	0.3%▼	0.2%	8
Bedroom	37.1%▲	1.9%	570
Closet	0.1%	0.1%	2
Dining Room	1.1%	0.4%	20
Family Room	16.0%	1.2%	320
Garage	0.7%	0.4%	13
Kitchen	4.3%	0.8%	89
Laundry	0.1%▼	0.1%	3
Living Room	34.9%▲	1.0%	758
Office	2.5%▼	0.6%	51
Other	2.9%	0.7%	67
Total	100.0%	0.0%	1,047

Table 127. AVERAGE PRIMARY TELEVISION ON-TIME HOURS PER DAY PER HOME BY STATE
(Compare to Table 118 in 2011 RBSA)

State	Television Use per Home (hours/day)		
	Mean	EB	n
ID	5.8	0.7	118
MT	4.0▼	0.5	122
OR	4.8	0.4	266
WA	5.4	0.5	540
Region	5.2	0.3	1,046

Table 128. AVERAGE NUMBER OF SET-TOP BOXES PER HOME BY STATE
(Compare to Table 119 in 2011 RBSA)

State	Set-Top Boxes per Home		
	Mean	EB	n
ID	0.8▼	0.2	121
MT	1.0▼	0.2	129
OR	1.0▼	0.1	282
WA	1.3▼	0.1	568
Region	1.1▼	0.1	1,100

Table 129. PERCENTAGE OF HOMES WITH SET-TOP BOXES
(Compare to Table 120 in 2011 RBSA)

State	Homes with Set-Top Boxes		
	%	EB	n
ID	49.5%▼	7.4%	121
MT	62.3%▼	7.2%	129
OR	64.8%▼	5.7%	282
WA	68.2%▼	4.3%	568
Region	64.4%▼	3.0%	1,100

BACK TO REPORT

Table 130. PERCENTAGE OF SET-TOP BOXES WITH DVR CAPABILITY BY STATE
(Compare to Table 121 in 2011 RBSA)

State	Set-Top Boxes with DVR		
	%	EB	n
ID	55.9%▲	12.1%	49
MT	53.1%▲	9.7%	74
OR	53.3%▲	7.9%	162
WA	45.7%▲	5.7%	332
Region	49.8%▲	4.1%	617

Table 131. PERCENTAGE OF HOMES WITH GAMING SYSTEMS
(Compare to Table 122 in 2011 RBSA)

State	Homes with Gaming Systems		
	%	EB	n
ID	27.3%	6.7%	121
MT	25.7%	6.5%	129
OR	22.0%▼	4.9%	282
WA	28.9%▼	4.2%	568
Region	26.4%▼	2.8%	1,100

BACK TO REPORT

Table 132. AVERAGE NUMBER OF GAMING SYSTEMS PER HOME
(Compare to Table 123 in 2011 RBSA)

State	Gaming Systems per Home		
	Mean	EB	n
ID	0.39	0.12	121
MT	0.49	0.15	129
OR	0.32	0.09	282
WA	0.47	0.08	568
Region	0.41	0.05	1,100

Table 133. AVERAGE NUMBER OF COMPUTERS PER HOME BY STATE
(Compare to Table 124 in 2011 RBSA)

State	Computers per Home		
	Mean	EB	n
ID	1.13▼	0.14	121
MT	1.08	0.13	129
OR	1.05▼	0.11	282
WA	1.38▼	0.11	568
Region	1.23▼	0.07	1,100

Table 134. PERCENTAGE OF HOMES WITH COMPUTERS BY STATE
(Compare to Table 125 in 2011 RBSA)

State	Homes with Computers		
	%	EB	n
ID	76.0%▼	6.4%	121
MT	71.7%	6.6%	129
OR	72.2%▼	5.3%	282
WA	81.1%▼	3.3%	568
Region	77.2%▼	2.5%	1,100

Table 135. AVERAGE NUMBER OF AUDIO SYSTEMS PER HOME BY STATE
(Compare to Table 126 in 2011 RBSA)

State	Audio Systems per Home		
	Mean	EB	n
ID	0.58▼	0.14	121
MT	0.83▼	0.15	129
OR	0.64▼	0.09	282
WA	0.96▼	0.12	568
Region	0.81▼	0.07	1,100

Table 136. AVERAGE NUMBER OF SUBWOOFERS PER HOME BY TYPE
(Compare to Table 127 in 2011 RBSA)

Subwoofer Type	Subwoofers per Home		
	Mean	EB	n
Passive	0.18▼	0.03	1,100
Powered	0.09▼	0.02	1,100
All Subwoofers	0.14▼	0.02	1,100

Table 137. AVERAGE NUMBER OF OCCUPANTS PER HOME BY STATE
(Compare to Table 129 in 2011 RBSA)

State	Occupants per Home		
	Mean	EB	n
ID	2.8	0.3	121
MT	2.2	0.2	129
OR	2.5	0.2	282
WA	2.6	0.1	568
Region	2.6	0.1	1,100

Table 138. AVERAGE NUMBER OF OCCUPANTS BY AGE CATEGORY BY STATE
(Compare to Table 130 in 2011 RBSA)

Age Category	Number of Occupants										
	ID		MT		OR		WA		Region		n
	Mean	EB	Mean	EB	Mean	EB	Mean	EB	Mean	EB	
18 or Younger	0.79	0.22	0.44	0.13	0.51	0.11	0.60	0.09	0.59▼	0.06	1,100
19 to 64	1.26	0.17	1.25	0.14	1.38	0.14	1.44	0.12	1.38	0.08	1,100
65 or Older	0.59	0.12	0.54	0.12	0.57	0.09	0.56	0.07	0.57	0.05	1,100

Table 139. DISTRIBUTION OF HOMES BY OWNERSHIP TYPE AND STATE
(Compare to Table 131 in 2011 RBSA)

Ownership Type	Percentage of Homes										
	ID		MT		OR		WA		Region		n
	%	EB	%	EB	%	EB	%	EB	%	EB	
Occupy without rent	0.8%	5.2%	0.0%	0.0%	0.7%	4.4%	0.2%▼	0.4%	0.4%▼	0.5%	4
Own / buying	79.3%	6.1%	80.3%	5.9%	84.0%	4.4%	84.4%	3.6%	83.4%	2.4%	916
Prefer not to say	0.8%	5.2%	1.0%	6.1%	0.3%	1.7%	0.1%	0.9%	0.3%	0.3%	4
Rent	19.0%	6.1%	18.7%	6.0%	15.0%	4.3%	15.3%▼	3.6%	15.9%▼	2.4%	176
Total	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	1,100

Table 140. PERCENTAGE OF HOMES AS PRIMARY RESIDENCE BY STATE
(Compare to Table 132 in 2011 RBSA)

State	Homes as Primary Residence		
	%	EB	n
ID	99.2%▲	1.4%	121
MT	98.3%	2.0%	129
OR	99.0%	1.2%	281
WA	100.0%	0.0%	568
Region	99.5%▲	0.4%	1,099

Table 141. DISTRIBUTION OF HOUSEHOLD INCOME BY STATE

Income Level	Household Income										
	ID		MT		OR		WA		Region		n
	%	EB	%	EB	%	EB	%	EB	%	EB	
$0 to under $25,000	20.4%	6.8%	13.7%	6.1%	13.0%	4.4%	16.8%	3.7%	15.9%	2.5%	159
$25,000 to under $50,000	34.6%	7.8%	31.7%	7.9%	20.7%	5.2%	18.9%	3.8%	22.3%	2.7%	227
$50,000 or more	44.9%	8.2%	54.6%	8.3%	66.3%	6.1%	64.3%	4.7%	61.7%	3.2%	522
Total	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	908

Table 142. DISTRIBUTION OF HOMES WITH ELECTRIC FUEL ASSISTANCE BY PERCENTAGE OF ASSISTANCE AND STATE (Compare to Table 134 in 2011 RBSA)

Percentage of Assistance	Homes with Electric Fuel Assistance										
	ID		MT		OR		WA		Region		n
	%	EB	%	EB	%	EB	%	EB	%	EB	
Less than 25%	1.7%	3.4%	1.4%	2.8%	0.6%▼	1.2%	1.6%	0.9%	1.3%	0.6%	19
Between 26% and 50%	0.0%	0.0%	0.7%	4.4%	0.7%	4.4%	3.1%	1.9%	1.8%	1.0%	29
Between 51% and 75%	0.0%	0.0%	1.0%	6.3%	0.0%	0.0%	0.2%	0.3%	0.2%	0.2%	7
Between 76% and 100%	0.0%	0.0%	0.7%	4.4%	0.0%	0.0%	0.9%	1.2%	0.5%	0.6%	7
No Utility Bill Assistance	98.3%	2.0%	96.2%	2.8%	98.7%	1.3%	94.1%	2.3%	96.2%	1.3%	1,005
Total	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	1,067

Table 143. DISTRIBUTION OF HOMES WITH GAS FUEL ASSISTANCE BY PERCENTAGE OF ASSISTANCE AND STATE (Compare to Table 135 in 2011 RBSA)

Percentage of Assistance	Homes with Gas Fuel Assistance										
	ID		MT		OR		WA		Region		n
	%	EB	%	EB	%	EB	%	EB	%	EB	
Less than 25%	1.2%	7.6%	0.9%	5.6%	1.7%	3.5%	0.5%	0.7%	1.0%	0.8%	8
Between 26% and 50%	0.0%	0.0%	0.9%	5.6%	0.0%	0.0%	0.0%▼	0.1%	0.1%▼	0.2%	2
Between 76% and 100%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	1.3%	0.2%	0.7%	2
No Utility Bill Assistance	98.8%	2.0%	98.2%	2.1%	98.3%	2.0%	98.9%	1.0%	98.7%	0.8%	571
Total	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	583

Table 144. AVERAGE HEATING THERMOSTAT SETPOINT BY STATE (Compare to Table 136 in 2011 RBSA)

State	Heating Thermostat Setpoint (°F)		
	Mean	EB	n
ID	69.6	0.5	118
MT	68.5	0.4	124
OR	68.4	0.4	274
WA	68.6	0.3	545
Region	68.7	0.2	1,061

Table 145. PERCENTAGE OF HOMES REPORTING A HEATING SETBACK BY STATE
(Compare to Table 137 in 2011 RBSA)

State	Homes Reporting Heating Setback		
	%	EB	n
ID	60.1%	7.8%	108
MT	63.0%	7.7%	114
OR	63.2%	6.2%	234
WA	70.3%	4.6%	495
Region	66.4%	3.2%	951

Table 146. AVERAGE SIZE OF HEATING SETBACK BY STATE
(Compare to Table 138 in 2011 RBSA)

State	Heating Setback (°F)		
	Mean	EB	n
ID	3.7▼	0.7	108
MT	4.0▼	0.7	114
OR	4.0▼	0.6	234
WA	4.1▼	0.4	495
Region	4.0▼	0.3	951

Table 147. AVERAGE COOLING THERMOSTAT SETPOINT BY STATE
(Compare to Table 139 in 2011 RBSA)

State	Cooling Setpoint (°F)		
	Mean	EB	n
ID	72.9	0.7	92
MT	71.2▼	0.8	55
OR	72.2▼	0.6	176
WA	71.8▼	0.6	274
Region	72.0▼	0.4	597

Table 148. PERCENTAGE OF HOMES REPORTING A COOLING THERMOSTAT SETUP BY STATE
(Compare to Table 140 in 2011 RBSA)

State	Homes Reporting Thermostat Setup		
	%	EB	n
ID	12.7%	7.1%	73
MT	13.5%	9.1%	35
OR	18.0%	6.9%	125
WA	7.8%	3.4%	199
Region	11.9%	2.9%	432

Table 149. DISTRIBUTION OF THERMOSTATS BY TYPE AND STATE

Thermostat Type	Distribution of thermostats by Type and State										
	ID		MT		OR		WA		Region		n
	%	EB	%	EB	%	EB	%	EB	%	EB	
Manual thermostat - Analog	30.6%	6.8%	51.8%	7.7%	34.4%	5.5%	37.2%	4.5%	36.4%	3.0%	357
Manual thermostat - Digital	16.8%	6.0%	11.0%	4.7%	10.9%	3.9%	6.6%	2.1%	9.5%	1.8%	128
Programmable thermostat	49.5%	7.6%	34.5%	7.4%	45.8%	6.1%	48.7%	4.7%	47.0%	3.2%	563
Smart thermostat	1.5%	3.4%	2.1%	2.6%	4.3%	3.0%	4.9%	2.4%	4.1%	1.5%	36
Smart/Wi-Fi thermostat	0.0%	0.0%	0.6%	4.9%	2.8%	2.6%	1.2%	0.8%	1.5%	0.8%	16
Wi-Fi enabled thermostat	1.5%	7.3%	0.0%	0.0%	1.8%	2.0%	1.4%	1.2%	1.4%	0.8%	18
None	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.6%	0.0%	0.3%	1
Total	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	1,041

BACK TO REPORT

Table 150. PERCENTAGE OF HOMES WITH AT LEAST ONE SMART POWER STRIP BY STATE

State	Homes with Smart Power Strips		
	%	EB	n
ID	0.8%	1.4%	121
MT	3.1%	2.5%	129
OR	3.0%	2.1%	282
WA	2.0%	1.2%	568
Region	2.2%	0.9%	1,100

BACK TO REPORT

Table 151. DISTRIBUTION OF POWER STRIPS BY USE TYPE

Power Strip Use	Power Strip Use Type										
	ID		MT		OR		WA		Region		n
	%	EB	%	EB	%	EB	%	EB	%	EB	
Entertainment Center	52.9%	13.2%	50.0%	10.7%	44.7%	10.8%	38.8%	6.3%	43.2%	4.8%	357
Home Office	30.9%	12.5%	30.9%	10.0%	28.9%	9.9%	35.1%	6.1%	32.4%	4.6%	254
Other	16.2%	10.3%	19.1%	8.6%	26.4%	9.1%	26.1%	5.7%	24.4%	4.2%	186
Total	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	507

BACK TO REPORT

Table 152. PERCENTAGE OF HOUSEHOLDS REPORTING GAS SERVICE BY STATE (Compare to Table 141 in 2011 RBSA)

State	Households Reporting Gas Service		
	%	EB	n
ID	64.7%	7.1%	119
MT	65.4%	6.6%	125
OR	64.3%	5.1%	279
WA	56.6%	4.4%	562
Region	60.5%	2.9%	1,085

Table 153. DISTRIBUTION OF WOOD USE AS HEATING FUEL BY STATE
(Compare to Table 142 in 2011 RBSA)

Annual Wood Use	Homes Using Wood Fuel										
	ID		MT		OR		WA		Region		n
	%	EB	%	EB	%	EB	%	EB	%	EB	
< 1 Cord	3.3%	3.4%	2.4%	3.2%	4.3%	2.9%	3.0%▲	1.7%	3.4%▲	1.2%	39
1-3 Cords	9.9%	4.8%	12.8%	5.3%	6.9%▼	2.9%	5.8%▼	2.1%	7.1%▼	1.5%	92
4-6 Cords	3.3%	3.4%	2.4%▼	3.2%	2.6%	1.7%	0.9%▼	1.1%	1.8%▼	0.8%	23
< 1 Cord	3.3%	3.4%	2.4%	3.2%	4.3%	2.9%	3.0%▲	1.7%	3.4%▲	1.2%	39
> 6 Cords	0.0%	0.0%	1.0%	6.1%	0.3%	1.7%	0.0%	0.0%	0.1%▼	0.3%	2
None	83.4%	5.6%	81.4%	5.8%	85.9%▲	4.0%	90.3%▲	2.7%	87.5%▲	2.0%	944
Total	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	1,100

Table 154. DISTRIBUTION OF PELLET FUEL USE BY STATE
(Compare to Table 143 in 2011 RBSA)

Annual Pellet Fuel Use	Homes Using Pellet Fuel										
	ID		MT		OR		WA		Region		n
	%	EB	%	EB	%	EB	%	EB	%	EB	
< 1 Ton	1.6%	3.4%	0.7%	4.4%	0.6%	0.9%	0.1%	0.9%	0.5%▲	0.4%	7
1-2 Tons	1.7%	3.4%	1.0%	6.1%	0.3%▼	1.7%	0.5%▼	0.6%	0.6%▼	0.4%	8
2-4 Tons	0.0%	0.0%	0.7%	4.4%	1.3%	1.5%	0.2%	1.1%	0.5%	0.5%	7
< 1 Ton	1.6%	3.4%	0.7%	4.4%	0.6%	0.9%	0.1%	0.9%	0.5%▲	0.4%	7
> 4 Tons	0.0%	0.0%	0.0%	0.0%	0.3%	1.7%	0.0%	0.0%	0.1%	0.5%	1
None	96.7%	2.7%	97.6%	2.3%	97.5%▲	1.5%	99.2%▲	0.6%	98.3%▲	0.7%	1,077
Total	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	1,100

Table 155. DISTRIBUTION OF OIL FUEL USE BY STATE
(Compare to Table 144 in 2011 RBSA)

Annual Oil Fuel Use	Homes Using Oil Fuel										
	ID		MT		OR		WA		Region		n
	%	EB	%	EB	%	EB	%	EB	%	EB	
< 100 Gallons	0.0%	0.0%	0.0%	0.0%	0.5%	0.9%	0.2%	1.5%	0.3%	0.4%	3
100-250 Gallons	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	0.6%	0.4%	0.3%	7
251-500 Gallons	0.8%	5.2%	0.0%	0.0%	1.4%	2.9%	0.3%▼	0.4%	0.7%	0.6%	8
501-1000 Gallons	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%	1.3%	0.5%	0.7%	4
None	99.2%▲	1.4%	100.0%	0.0%	98.2%▲	1.7%	97.7%	1.2%	98.2%▲	0.8%	1,078
Total	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	1,100

Table 156. DISTRIBUTION OF PROPANE FUEL USE BY STATE
(Compare to Table 145 in 2011 RBSA)

Annual Propane Fuel Use	Homes Using Propane Fuel										
	ID		MT		OR		WA		Region		n
	%	EB	%	EB	%	EB	%	EB	%	EB	
< 50 Gallons	0.8%▼	5.2%	1.0%	6.1%	0.4%	0.8%	1.0%	0.8%	0.8%	0.5%	10
50-250 Gallons	2.5%	3.3%	0.7%▼	4.4%	2.0%	1.2%	1.2%▼	0.8%	1.6%▼	0.6%	20
251-500 Gallons	0.0%	0.0%	3.1%	3.3%	0.5%▼	0.6%	0.6%	0.8%	0.6%▼	0.4%	10
501-1000 Gallons	1.6%	3.4%	4.6%	4.0%	0.0%	0.0%	0.5%	0.7%	0.8%▼	0.4%	10
> 1000 Gallons	1.7%	3.4%	2.0%	3.9%	0.0%	0.0%	0.2%	1.1%	0.4%	0.4%	5
None	93.4%▲	3.7%	88.7%	4.8%	97.2%▲	1.2%	96.6%▲	1.2%	95.8%▲	0.9%	1,045
Total	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	1,100

Table 157. PERCENTAGE OF HOUSEHOLDS REPORTING RECENT SELF-FUNDED CONSERVATION BY STATE (Compare to Table 146 in 2011 RBSA)

State	Households Reporting Recent Self-Funded Conservation Improvements		
	%	EB	n
ID	56.3%▲	7.5%	117
MT	62.8%	7.1%	129
OR	65.9%▲	5.8%	272
WA	65.5%▲	4.2%	564
Region	64.2%▲	3.0%	1,082

BACK TO REPORT

Table 158. PERCENTAGE OF HOUSEHOLDS REPORTING RECENT USE OF UTILITY CONSERVATION PROGRAMS BY STATE (Compare to Table 147 in 2011 RBSA)

State	Households Reporting Use of Utility Incentives		
	%	EB	n
ID	10.5%	5.0%	105
MT	16.0%	5.7%	118
OR	16.3%	4.8%	245
WA	15.2%	3.5%	504
Region	14.9%	2.4%	972

BACK TO REPORT

Table 159. PERCENTAGE OF HOUSEHOLDS REPORTING USE OF CONSERVATION TAX CREDIT
(Compare to Table 148 in 2011 RBSA)

State	Households Reporting Recent Conservation Tax Credits		
	%	EB	n
ID	16.0%	7.6%	67
MT	18.2%	6.8%	78
OR	26.8%	6.9%	168
WA	15.6%	3.9%	333
Region	19.2%	3.0%	646

BACK TO REPORT

Table 160. PERCENTAGE OF HOUSEHOLDS REPORTING USE OF BOTH UTILITY AND TAX CREDIT CONSERVATION PROGRAMS
(Compare to Table 149 in 2011 RBSA)

State	Households Reporting Use of Utility and Tax Credit Conservation Programs		
	%	EB	n
ID	1.9%▼	2.2%	105
MT	2.3%	2.1%	118
OR	7.6%	3.5%	245
WA	3.0%▼	1.5%	504
Region	4.2%▼	1.3%	972

Table 161. PERCENT OF HOMES REPORTING HAVING COMPLETED AN ENERGY AUDIT IN THE LAST TWO YEARS

State	Homes Reporting an Energy Audit		
	%	EB	n
ID	0.9%	1.5%	111
MT	10.4%	4.7%	121
OR	5.7%	2.8%	273
WA	3.8%	1.9%	533
Region	4.4%	1.3%	1,038

BACK TO REPORT

Table 162. PERCENTAGE OF HOUSEHOLDS WITH AN ELECTRIC VEHICLE

State	Percentage of Households Reporting Having an Electric Vehicle		
	%	EB	n
ID	0.0%	0.0%	121
MT	2.0%	2.2%	129
OR	1.5%	1.6%	282
WA	0.5%	0.5%	568
Region	0.9%	0.6%	1,100

BACK TO REPORT

Table 163. PERCENTAGE OF HOUSEHOLDS WITH SOLAR PANELS

State	Households with Solar Panels		
	%	EB	n
ID	1.7%	1.9%	121
MT	1.4%	1.6%	129
OR	2.8%	1.8%	282
WA	3.4%	1.7%	568
Region	2.9%	1.0%	1,100

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Table 164. PERCENTAGE OF HOUSEHOLDS REPORTING USE OF SMART EQUIPMENT

State	Households with Smart Equipment		
	%	EB	n
ID	4.2%	2.9%	121
MT	10.5%	4.6%	129
OR	9.9%	3.8%	282
WA	9.1%	2.7%	568
Region	8.8%	1.8%	1,100

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Table 165. AVERAGE ANNUAL KWH PER HOME BY STATE
(Compare to Table 150 in 2011 RBSA)

State	kWh per Home		
	Mean	EB	n
ID	12,750.7	1,103.3	106
MT	10,409.8	1,111.5	118
OR	11,500.7	749.4	249
WA	12,711.3▼	772.5	501
Region	12,208.2▼	477.5	974

Table 166. AVERAGE WEATHER NORMALIZED KWH PER HOME BY STATE
(Compare to Table 151 in 2011 RBSA)

State	kWh per Home		
	Mean	EB	n
ID	12,228.2	1,064.4	106
MT	10,338.6	1,075.0	118
OR	11,326.7	739.7	249
WA	12,306.1▼	706.0	501
Region	11,877.9▼	447.1	974

Table 167. AVERAGE ELECTRIC EUI PER HOME BY HEATING FUEL TYPE AND STATE (Compare to Table 152 in 2011 RBSA)

State	Electric EUI per Home (kWh/sq. ft.)						
	Homes w/ Electric Heat		Homes w/ Other Heat		All Homes		n
	Mean	EB	Mean	EB	Mean	EB	
ID	9.4▼	0.7	5.4▼	0.5	7.4	0.4	106
MT	11.7▲	0.8	4.7	0.5	8.2▲	0.5	118
OR	10.0	0.6	5.1▼	0.4	7.5	0.4	249
WA	11.3	0.6	4.7▼	0.2	7.9	0.3	499
Region	10.7	0.4	4.9	0.2	7.7	0.2	972

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Table 168. AVERAGE ESTIMATED ANNUAL ELECTRIC SPACE HEAT PER HOME BY STATE (Compare to Table 153 in 2011 RBSA)

State	Space Heat per Home (kWh)		
	Mean	EB	n
ID	6,406.2	1,700.8	22
MT	8,276.6	2,225.7	18
OR	6,285.5	666.7	100
WA	8,264.9	806.1	231
Region	7,395.7	514.1	371

Table 169. AVERAGE ANNUAL GAS USE PER HOME BY STATE
(Compare to Table 154 in 2011 RBSA)

State	Therms per Home		
	Mean	EB	n
ID	745.0	70.2	46
MT	846.1	111.2	57
OR	694.5	88.1	139
WA	710.8	41.9	235
Region	719.0	35.5	477

Table 170. AVERAGE WEATHER NORMALIZED GAS USE PER HOME BY STATE
(Compare to Table 155 in 2011 RBSA)

State	Therms per Home		
	Mean	EB	n
ID	726.9	68.3	46
MT	848.0	113.5	57
OR	677.2	83.7	139
WA	693.4	41.5	235
Region	702.8	34.4	477

Table 171. AVERAGE GAS EUI PER HOME BY HEATING FUEL AND STATE (Compare to Table 156 in 2011 RBSA)

State	Gas EUI per Home (therms/sq. ft.)						
	Homes w/ Gas Heat		Homes w/ Other Heat		All Heat w/ Gas Meters		n
	Mean	EB	Mean	EB	Mean	EB	
ID	0.35	0.03	0.36	0.05	0.35	0.02	45
MT	0.43	0.04	0.52	NA	0.46	0.03	57
OR	0.35	0.02	0.16▼	0.02	0.26▼	0.01	139
WA	0.37	0.02	0.18▼	0.01	0.30▼	0.01	230
Region	0.36	0.01	0.22	0.01	0.30▼	0.01	471

Table 172. AVERAGE ESTIMATED GAS SPACE HEAT BY STATE (Compare to Table 157 in 2011 RBSA)

State	Space Heat per Home (therms)		
	Mean	EB	n
ID	557.3	61.6	43
MT	697.5	106.1	56
OR	571.5	79.7	126
WA	557.5▼	34.9	210
Region	570.7▼	31.4	435

Table 173. AVERAGE ANNUAL ELECTRICITY AND GAS USE PER HOME BY STATE
(Compare to Table 158 in 2011 RBSA)

State	kBtu per Home		
	Mean	EB	n
ID	80,769.8	7,680.7	76
MT	80,972.9	9,223.1	89
OR	83,866.3	8,267.4	247
WA	82,063.4	4,711.9	474
Region	82,362.4	3,616.3	886

Table 174. AVERAGE ELECTRICITY AND GAS EUI BY STATE
(Compare to Table 159 in 2011 RBSA)

State	EUI per Home (kBtu/sq. ft.)		
	Mean	EB	n
ID	41.9	4.0	76
MT	44.0	4.4	89
OR	45.2	2.7	247
WA	45.7	2.1	474
Region	44.9	1.4	886

Table 175. AVERAGE WEATHER-NORMALIZED ELECTRICITY AND GAS EUI BY STATE
(Compare to Table 160 in 2011 RBSA)

State	EUI per Home (kBtu/sq. ft.)		
	Mean	EB	n
ID	40.7▼	3.9	76
MT	44.1	4.4	89
OR	44.3	2.6	247
WA	44.4	2.0	474
Region	43.9	1.4	886

Table 176. AVERAGE ANNUAL OTHER FUEL USE PER HOME BY STATE
(Compare to Table 161 in 2011 RBSA)

State	kBtu per Home		
	Mean	EB	n
ID	12,210.4	6,000.4	121
MT	17,232.2	6,655.1	129
OR	6,939.4▼	1,994.8	282
WA	5,594.1▼	1,828.0	568
Region	7,607.7▼	1,414.1	1,100

Table 177. AVERAGE EUI, OTHER FUEL USE
(Compare to Table 162 in 2011 RBSA)

State	EUI per Home (kBtu/sq. ft.)		
	Mean	EB	n
ID	4.6▼	1.8	121
MT	7.1	2.5	129
OR	4.2▼	1.2	282
WA	2.5▼	0.7	568
Region	3.6▼	0.6	1,100

Table 178. SUMMARY STATISTICS BY EUI QUARTILES

Quartile and EUI Range	Summary Statistics by EUI Quartile										
	Conditioned Area		Electric Heat		Efficient Lighting		Air Conditioning		Electric Hot Water		n
	Mean	EB	%	EB	%	EB	%	EB	%	EB	
1 (< 3.55)	2,487.6	70.6	4.5%	0.9%	47.1%	3.4%	57.5%	3.0%	16.5%	2.3%	241
2 (3.55 - 5.96)	2,179.2	61.3	19.4%	2.2%	43.4%	3.4%	62.0%	3.3%	29.7%	2.5%	240
3 (5.96 - 9.26)	2,015.2	56.7	38.7%	3.0%	44.3%	3.4%	72.0%	2.8%	57.4%	3.2%	240
4 (> 9.26)	1,375.7	39.7	75.0%	2.4%	39.5%	3.3%	46.5%	2.6%	80.8%	2.7%	241

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Table 179. DISTRIBUTION OF ELECTRICALLY HEATED HOMES BY VINTAGE AND STATE
(Compare to Table B-1 in 2011 RBSA)

Vintage	Percentage of Homes										n
	ID		MT		OR		WA		Region		
	%	EB	%	EB	%	EB	%	EB	%	EB	
Pre 1951	16.1%	10.5%	5.9%	11.1%	23.6%	11.7%	15.6%	5.5%	17.5%	4.6%	91
1951-1960	0.0%	0.0%	0.0%	0.0%	5.3%	6.3%	7.1%	3.4%	5.1%	2.4%	35
1961-1970	9.1%	17.6%	32.3%	31.0%	7.2%	6.0%	11.8%	5.9%	11.3%	3.9%	40
1971-1980	27.3%	17.2%	24.5%	30.0%	27.6%	11.5%	20.6%	7.0%	24.0%	5.5%	85
1981-1990	4.5%	27.8%	11.8%	10.3%	6.1%	6.0%	21.2%	7.2%	13.6%	4.0%	46
1991-2000	20.4%	16.7%	2.9%	17.8%	10.1%	5.9%	8.6%	3.7%	10.3%	3.2%	43
2001-2010	18.1%	17.0%	11.8%	10.3%	14.5%	9.3%	10.9%	3.6%	13.0%	3.8%	53
Post 2010	4.5%	27.8%	10.8%	62.1%	5.6%	6.2%	4.2%	2.2%	5.1%	2.5%	24
Total	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	417

Table 180. DISTRIBUTION OF ELECTRICALLY HEATED HOMES BY GROUND CONTACT TYPE AND STATE (Compare to Table B-2 in 2011 RBSA)

Ground Contact Type	Percentage of Homes										n
	ID		MT		OR		WA		Region		
	%	EB	%	EB	%	EB	%	EB	%	EB	
> 90% Conditioned Basement	19.8%	14.6%	29.7%	26.4%	3.3%	2.1%	9.5%▼	3.4%	10.3%▼	2.8%	53
> 90% Crawlspace	45.5%	17.6%	21.7%	21.8%	64.3%	11.4%	58.5%	7.9%	56.1%	5.8%	230
> 90% Slab	10.9%	14.4%	27.0%	27.6%	18.2%▲	9.8%	23.3%▲	7.5%	20.3%▲	5.1%	71
> 90% Unconditioned Basement	6.6%	13.7%	2.7%	16.5%	3.1%	18.8%	1.3%	1.1%	2.7%	2.1%	15
Adiabatic Space Below	0.0%	0.0%	0.0%	0.0%	0.0%▼	0.0%	0.0%▼	0.0%	0.0%▼	0.0%	1
Mixed Basement and Slab	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.1%	1
Mixed Conditioned Basement and Slab	0.0%	0.0%	0.0%	0.0%	3.1%	18.8%	0.2%	0.1%	1.0%	1.8%	7
Mixed Crawlspace and Conditioned Basement	4.3%	26.4%	16.2%	24.6%	0.8%▼	1.7%	1.9%▼	1.7%	2.8%▼	1.8%	13
Mixed Crawlspace and Room Over Garage	0.0%	0.0%	0.0%	0.0%	0.0%▼	0.0%	0.6%▼	1.5%	0.3%▼	0.7%	2
Mixed Crawlspace and Slab	12.9%	16.0%	2.7%	16.5%	6.8%▼	5.7%	4.8%	2.7%	6.4%	2.6%	35
Other	0.0%	0.0%	0.0%	0.0%	0.4%	2.8%	0.0%	0.0%	0.1%	0.9%	1
Total	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	429

Table 181. AVERAGE CONDITIONED FLOOR AREA BY STATE, ELECTRICALLY HEATED HOMES (Compare to Table B-3 in 2011 RBSA)

State	Conditioned Floor Area (sq. ft.)		
	Mean	EB	n
ID	1,945.1	425.6	27.0
MT	1,566.2	415.3	19.0
OR	1,580.0	151.5	114.0
WA	1,694.3▼	128.2	269.0
Region	1,684.7▼	99.5	429.0

Table 182. AVERAGE CONDITIONED FLOOR AREA BY VINTAGE AND STATE, ELECTRICALLY HEATED HOMES (Compare to Table B-4 in 2011 RBSA)

Vintage	Conditioned Floor Area (sq. ft.)										
	ID		MT		OR		WA		Region		n
	Mean	EB	Mean	EB	Mean	EB	Mean	EB	Mean	EB	
Pre 1951	1,511.9▼	109.8	2,246.3	56.7	1,161.7▼	194.6	1,105.4▼	62.3	1,209.8▼	68.1	91
1951-1960	0.0	0.0	0.0	0.0	1,305.6	110.9	1,821.7▲	137.5	1,557.3▲	74.7	35
1961-1970	820.0	221.0	1,415.0	1,279.8	1,821.4▲	42.5	1,546.5▼	155.0	1,545.2▼	85.4	40
1971-1980	1,962.6	361.2	1,476.6	891.7	1,905.7▲	66.7	1,721.7	104.8	1,795.7	69.8	85
1981-1990	2,190.3	NA	1,389.5	845.0	1,214.0▼	82.5	1,773.2▼	142.5	1,606.5▼	71.6	46
1991-2000	2,207.8	928.7	1,816.5	NA	1,456.2▼	53.6	2,299.6	155.8	1,937.7	132.1	43
2001-2010	2,427.8	822.8	3,028.3	1,188.9	1,929.3▲	152.0	2,252.6▼	148.6	2,170.6▼	122.9	53
Post 2010	3,309.3	NA	816.0	NA	1,743.1	73.9	2,354.0	85.6	2,145.8	38.0	24
All Vintages	2,046.6	145.6	1,596.3▼	188.2	1,567.1▼	33.6	1,780.4▼	43.4	1,727.8▼	30.2	417

Table 183. DISTRIBUTION OF FRAME WALL INSULATION LEVELS, ELECTRICALLY HEATED HOMES (Compare to Table B-5 in 2011 RBSA)

Wall Framing Type	Frame Wall Insulation Levels												
	R0		R1–R10		R11–R16		R17–R22		>R22		All Insulation Levels		n
	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB	
Framed 2x4	8.4%	4.1%	32.9%	6.9%	58.7%	7.5%	0.0%	0.0%	0.0%	0.0%	61.6%	7.3%	186
Framed 2x6	8.1%	9.7%	1.3%	0.9%	17.4%	6.2%	72.8%	6.3%	0.3%	1.6%	37.8%	7.3%	118
Framed 2x8	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.5%	0.6%	3
Alternative	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.1%	0.9%	1
All Frame Types	8.2%	4.9%	19.8%	6.3%	45.6%	8.0%	25.7%	6.3%	0.8%	0.7%	100.0%	0.0%	295

* Due to differences in analysis methodology, no statistical testing was performed for this table.
* Walls with either unknown cavity insulation R-value or unknown continuous insulation R-value are excluded.
* Wall framing size in some homes updated to reflect insulation thickness.

Table 184. PERCENTAGE OF ELECTRICALLY HEATED HOMES WITH BASEMENTS BY STATE
(Compare to Table B-6 in 2011 RBSA)

State	Homes with Basements		
	%	EB	n
ID	33.0%	15.0%	27
MT	56.7%	23.0%	19
OR	11.9%	8.3%	114
WA	15.0%▼	3.8%	269
Region	19.3%▼	4.0%	429

Table 185. PERCENTAGE OF ELECTRICALLY HEATED HOMES WITH FLOOR AREA OVER CRAWLSPACE BY STATE
(Compare to Table B-7 in 2011 RBSA)

State	Homes with Floor Area over Crawlspace		
	%	EB	n
ID	62.7%	15.8%	27
MT	40.6%	23.1%	19
OR	73.9%	10.8%	114
WA	64.8%	7.8%	269
Region	65.8%	5.7%	429

Table 186. DISTRIBUTION OF FLOOR INSULATION, ELECTRICALLY HEATED HOMES (Compare to Table B-8 in 2011 RBSA)

Floor Insulation Levels	Percentage of Homes															
	R1–R3		R4–R10		R11– R15		R16– R22		R23– R27		R28– R35		R38+		None	
	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB
Pre 1981	0.0%	0.0%	0.6%	0.8%	8.2%	4.3%	23.6%	5.5%	19.0%	6.7%	2.5%	1.3%	0.3%	1.3%	45.9%	7.7%
1981-1990	0.0%	0.0%	1.5%	4.3%	7.1%	8.0%	49.7%	6.6%	17.5%	6.6%	13.5%	8.5%	0.0%	0.0%	10.6%	2.2%
1991-2000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	42.7%	0.8%	16.0%	1.5%	22.1%	2.7%	0.0%	0.0%	19.2%	2.5%
2001-2010	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	28.6%	5.5%	12.9%	3.5%	39.2%	6.4%	8.9%	2.8%	10.4%	4.1%
Post 2010	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	8.3%	2.0%	29.7%	2.0%	5.0%	2.3%	33.8%	0.3%	23.2%	2.0%
All Housing Vintages	0.0%	0.0%	0.6%	0.8%	7.8%	5.2%	25.4%	6.9%	16.4%	5.9%	14.0%	5.7%	2.3%	2.9%	33.4%	7.2%

* Due to differences in analysis methodology, no statistical testing was performed for this table.

Table 187. DISTRIBUTION OF ATTIC INSULATION LEVELS, ELECTRICALLY HEATED HOMES (Compare to Table B-9 in 2011 RBSA)

Insulation Level	Attic Insulation Level		
	%	EB	n
R0	2.6%	2.7%	7
R1-R10	23.7%	6.5%	47
R11-R15	5.7%	3.3%	24
R16-R20	8.1%	3.8%	23
R21-R25	11.2%	5.0%	34
R26-R30	9.1%	4.5%	24
R31-R40	20.1%	5.9%	61
R41-R50	14.1%	5.4%	38
>R50	5.4%	3.3%	16
Total	100.0%	0.0%	274

* Due to differences in analysis methodology, no statistical testing was performed for this table.

Table 188. DISTRIBUTION OF VAULT CEILING INSULATION LEVEL, ELECTRICALLY HEATED HOMES (Compare to Table B-10 in 2011 RBSA)

Insulation Level	Vault Ceiling Insulation Level		
	%	EB	n
R0	23.6%	5.8%	9
R1-R15	38.3%	10.8%	12
R16-R20	7.6%	5.1%	6
R21-R25	2.7%	5.0%	2
R26-R30	0.0%	NA	0
R31-R40	20.6%	10.0%	12
R41-R50	7.1%	14.8%	2
Total	100.0%	0.0%	43

* Due to differences in analysis methodology, no statistical testing was performed for this table.

Table 189. DISTRIBUTION OF WINDOW TYPES BY STATE, ELECTRICALLY HEATED HOMES (Compare to Table B-11 in 2011 RBSA)

Window Type	Windows										
	ID		MT		OR		WA		Region		n
	%	EB	%	EB	%	EB	%	EB	%	EB	
Metal Double Glazed	3.2%	10.6%	0.4%▼	6.4%	4.8%▼	4.0%	12.6%	6.2%	8.1%▼	3.3%	92
Metal Single Glazed	4.8%	7.9%	1.0%	10.0%	2.7%▼	3.1%	4.1%	3.4%	3.5%	2.1%	65
Metal Triple Glazed	0.9%	8.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	1.2%	1
Other Double Glazed	0.0%	0.0%	0.0%	0.0%	0.3%	5.8%	0.0%	0.0%	0.1%	1.8%	1
Wood/Vinyl/Fiberglass/Tile Double Glazed	81.5%	12.5%	92.7%	13.0%	85.1%	7.8%	78.3%	7.0%	81.8%▲	4.5%	373
Wood/Vinyl/Fiberglass/Tile Single Glazed	9.6%	10.8%	5.9%	17.2%	5.8%	6.8%	4.5%	2.4%	5.7%	2.7%	65
Wood/Vinyl/Fiberglass/Tile Triple Glazed	0.0%	0.0%	0.0%	0.0%	1.3%	2.0%	0.4%	0.7%	0.6%	0.5%	7
All Framing Types	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	429

Table 190. AVERAGE NORMALIZED HEAT-LOSS RATE BY VINTAGE AND STATE, ELECTRICALLY HEATED HOMES (Compare to Table B-12 in 2011 RBSA)

Vintage	Heat Loss Rate (UA/conditioned sq. ft.) per Home										n
	ID		MT		OR		WA		Region		
	Mean	EB	Mean	EB	Mean	EB	Mean	EB	Mean	EB	
Pre 1981	0.345	0.031	0.445	0.314	0.416	0.036	0.414	0.055	0.407	0.034	248
1981-1990	0.248	NA	0.241	0.020	0.261▼	0.005	0.283	0.013	0.269	0.006	35
1991-2000	0.323▲	0.040	0.220	NA	0.192	0.004	0.230	0.008	0.231▲	0.006	40
2001-2010	0.211	0.033	0.194	0.034	0.185▼	0.007	0.225▲	0.006	0.206	0.005	37
Post 2010	0.166	NA	0.000	0.000	0.215	0.006	0.197	0.003	0.200	0.001	16
All Vintages	0.265▼	0.010	0.328	0.142	0.254▼	0.007	0.292▼	0.017	0.274▼	0.009	376

* Heat loss rates (UA) account for framing and building materials
* Storm windows are not accounted for in heat loss rate (UA)
* Heat loss rates (UA) account for buffer space heat loss reductions for unconditioned basements, floors over garages, and unvented crawlspaces

Table 191. AVERAGE HEAT-LOSS RATE BY VINTAGE AND STATE, ELECTRICALLY HEATED HOMES (Compare to Table B-13 in 2011 RBSA)

Vintage	Heat Loss Rate (UA) per Home										n
	ID		MT		OR		WA		Region		
	Mean	EB	Mean	EB	Mean	EB	Mean	EB	Mean	EB	
Pre 1981	544.1	95.3	584.4	186.2	564.0	66.6	562.9	63.3	562.1	40.2	248
1981-1990	544.2	NA	189.5	76.0	295.2▼	10.6	444.8	47.2	392.7▼	20.7	35
1991-2000	669.2	225.8	399.6	NA	275.8▼	11.5	507.3	38.8	439.1	32.7	40
2001-2010	504.4	182.9	495.5	278.4	400.1	24.8	482.8	17.6	452.4▼	20.2	37
Post 2010	547.8	NA	0.0	0.0	307.6	16.8	556.0	32.5	426.7	9.8	16
All Vintages	565.7	47.3	469.7	89.7	368.5▼	14.2	511.3▼	22.6	461.7▼	13.2	376

* Heat loss rates (UA) account for framing and building materials
* Storm windows are not accounted for in heat loss rate (UA)
* Heat loss rates (UA) account for buffer space heat loss reductions for unconditioned basements, floors over garages, and unvented crawlspaces

Table 192. AVERAGE BLOWER DOOR AIR TIGHTNESS BY STATE, ELECTRICALLY HEATED HOMES (Compare to Table B-14 in 2011 RBSA)

State	Blower Door Air Tightness (ACH50)		
	Mean	EB	n
ID	7.0	1.9	16
MT	7.0	1.3	10
OR	10.8	3.1	67
WA	8.4▼	0.8	164
Region	8.9	1.0	257

Table 193. AVERAGE HEATING THERMOSTAT SETPOINT BY STATE, ELECTRICALLY HEATED HOMES (Compare to Table B-15 in 2011 RBSA)

State	Heating Thermostat Setpoint (°F)		
	Mean	EB	n
ID	68.8	1.5	27
MT	68.1	1.4	18
OR	69.4	1.0	110
WA	69.1	0.5	254
Region	69.1	0.5	409

Table 194. PERCENTAGE OF ELECTRICALLY HEATED HOMES REPORTING A HEATING SETBACK BY STATE (Compare to Table B-16 in 2011 RBSA)

State	Homes Reporting Heating Setback		
	%	EB	n
ID	34.7%	16.1%	27
MT	48.6%	24.3%	19
OR	43.4%	11.9%	114
WA	55.2%▼	8.0%	269
Region	48.3%▼	6.0%	429

Table 195. AVERAGE WEATHER NORMALIZED KWH PER HOME BY STATE, ELECTRICALLY HEATED HOMES (Compare to Table B-17 in 2011 RBSA)

State	kWh per Home		
	Mean	EB	n
ID	16,855.5	1,861.3	22
MT	15,666.4	1,819.1	18
OR	14,316.3	980.7	101
WA	16,333.7▼	758.5	233
Region	15,733.7▼	555.2	374

Table 196. DISTRIBUTION OF PRIMARY HEATING SYSTEMS, ELECTRICALLY HEATED HOMES (Compare to Table B-18 in 2011 RBSA)

Heating System Type	Primary Heating Systems		
	%	EB	n
Air Source Heat Pump	29.9%	5.0%	131
Boiler	0.5%	0.7%	3
Electric Baseboard and Wall Heaters	30.8%	5.2%	115
Furnace	10.4%	3.5%	45
GeoThermal Heat Pump	1.9%	1.4%	9
Mini-split HP	8.4%	3.3%	52
Other Zonal Heat	9.2%	3.1%	57
Plug-In Heaters	8.9%	3.7%	28
Stove/Fireplace	0.1%	0.5%	1
Total	100.0%	0.0%	429

Addendum: Report Updates

Cadmus made the following updates to the RBSA II report and Appendix A tables.

RBSA II Updated GPM Flow Rate Calibration

Cadmus used two different techniques to measure fixture flow rates for the RBSA II study: a flow bag and a flow microweir. Technicians did not record which method was used at the time of data collection. The study results for water flow rate were higher than those recorded in the RBSA I study, raising understandable concerns about market trends and data reliability. To address these concerns and appropriately calibrate RBSA II results, Cadmus took these actions:

- Tested the accuracy of the two measurement methods (flow bag and microweir) and developed calibration factors for each method
- Contacted the field technicians who collected the RBSA II data to determine faucets and showerheads for which Cadmus could identify the measurement method with a high level of certainty

Our testing found that the measurements from both flow bags and microweirs were consistently higher than the actual flow rate of the faucets and showerheads. Based on this testing, applying a calibration factor for each method produced results that more accurately represent RBSA II average flow rates. Therefore, we developed calibration factors for the two measurement methods, based on our testing, and applied it to flow rates where we were confident in the measurement method used by the field technician.

The results of this calibration are presented in the showerhead and faucet aerator GPM flow rate tables of this report and Appendix A.

RBSA II UA and Total Heat Loss Methodology

Based on stakeholder feedback, Cadmus updated its method for calculating UA values and total heat-loss estimates for the RBSA II. These updated methods add several elements for consistency with RBSA I and incorporate Regional Technical Forum standard practices, NREL Efficiency Measure Database and Super Good Cents load calculations, including heat loss through building assembly layers and components.

The results of this update are presented in the insulation and UA chapters and tables of this report and Appendix A.

Other Updates and Corrections

As part of this update, Cadmus also addressed identified inconsistencies and oversights in several tables. These updates did not produce any significant change to the report or its key findings.

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