Annual energy and peak demand savings are calculated by weighting the early retirement and replace-on-burnout savings by the RUL of the unit and the remainder of the EUL period, as outlined in the Volume 3 appendices.

Where:

RUL = *Remaining useful life (see Table 365); if unknown, assume the age of the replaced unit is equal to the EUL resulting in a default RUL of 5.0 years*

EUL = *Estimated useful life = 22 years*[503]

Table 365. Freezers—RUL of Replaced Unit [504]

Age of replaced freezer (years)	RUL (years)	Age of replaced freezer (years)	RUL (years)	Age of replaced freezer (years)	RUL (years)
1	20.7	10	12.1	19	6.6
2	19.7	11	11.3	20	6.2
3	18.7	12	10.6	21	5.9
4	17.7	13	9.9	22	5.0
5	16.7	14	9.2	23	4.0
6	15.7	15	8.6	24	3.0
7	14.8	16	8.1	25	2.0
8	13.8	17	7.5	26	1.0
9	13.0	18	7.1	27[505,506]	0.0

[503] Department of Energy, Federal Register, 76 Final Rule 57516, Technical Support Document: 8.2.3.1 Estimated Survival Function. September 15, 2011. Download TSD at: https://www.regulations.gov/document/EERE-2008-BT-STD-0012-0128.

[504] Current federal standard effective date is 9/15/2014. Since the federal standard effective date occurred in late 2014, existing units manufactured as of 2015 are not eligible to use the early retirement baseline and should use the ROB baseline instead.

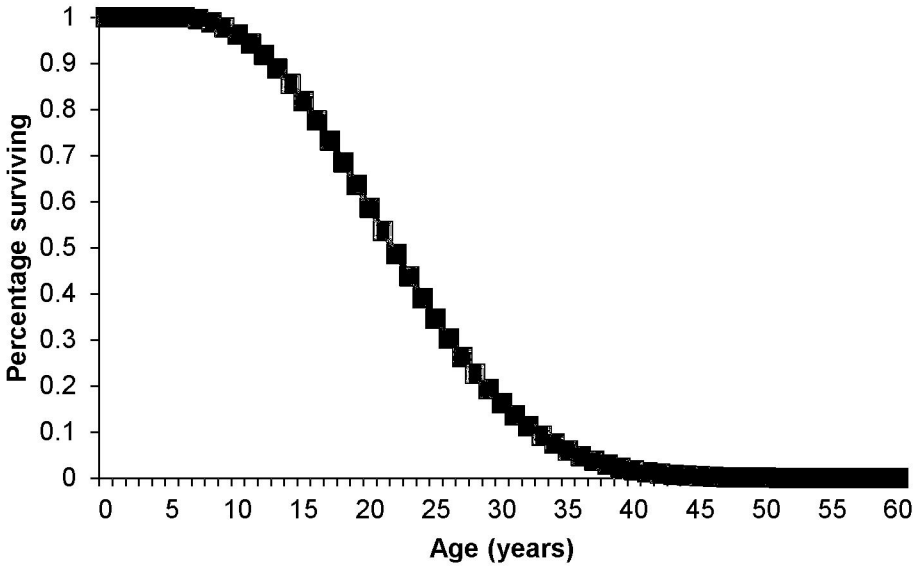
[505] RULs are capped at the 75th percentile of equipment age as determined based on DOE survival curves (see Figure 14). Systems older than this age should use the ROB baseline. See the January 2015 memo, "Considerations for early replacement of residential equipment," for further detail.

[506] Ward, B., Bodington, N., Farah, H., Reeves, S., and Lee, L. "Considerations for early replacement of residential equipment." Prepared by the Evaluation, Measurement, and Verification (EM&V) team for the Electric Utility Marketing Managers of Texas (EUMMOT). January 2015. This document has been made available to all Texas investor-owned utilities through the EM&V team's SharePoint.

Derivation of RULs

ENERGY STAR freezers have an estimated useful life of 22 years. This estimate is consistent with the age at which approximately 50 percent of the freezers installed in a given year will no longer be in service, as described by the survival function in Figure 15.

Figure 15. Freezers—Survival Function[507]



The method for estimating the RUL of a replaced system uses the age of the existing system to re-estimate the projected unit lifetime based on the survival function shown in Figure 15. The age of the freezer being replaced is found on the horizontal axis, and the corresponding percentage of surviving freezers is determined from the chart. The surviving percentage value is then divided in half, creating a new estimated useful lifetime applicable to the current unit age. Then, the age (year) that corresponds to this new percentage is read from the chart. RUL is estimated as the difference between that age and the current age of the system being replaced.

For example, assume a freezer being replaced is 22 years old (the estimated useful life). The corresponding percent surviving value is approximately 50 percent. Half of 50 percent is 25 percent. The age corresponding to 25 percent on the chart is approximately 27 years. Therefore, the RUL of the freezer being replaced is 27 – 22 = 5 years.

[507] Department of Energy, Federal Register, 76 Final Rule 57516, Technical Support Document: 8.2.3.1 Estimated Survival Function. September 15, 2011. http://www1.eere.energy.gov/buildings/appliance_standards/pdfs/refrig_finalrule_tsd.pdf.

Energy Savings Algorithms

For the RUL time period:

$$kWh_{savings,ER} = kWh_{manf} - kWh_{ES}$$

Equation 141

For the remaining time in the EUL period., calculate annual savings as you would for a replace-on-burnout project:

$$kWh_{savings,ROB} = kWh_{baseline} - kWh_{ES}$$

Equation 142

Where:

kWh_{manf} = *841 kWh/Year*[508]

Demand Savings Algorithms

To calculate demand savings for the early retirement of a freezer, a similar methodology is used as for replace-on-burnout installations, with separate savings calculated for the remaining useful life of the unit, and the remainder of the EUL as outlined in the section above.

For the RUL time period:

$$kW_{savings,ER} = \frac{kWh_{savings,ER}}{8{,}760\ hrs} \times LSAF_{S/W}$$

Equation 143

For The remaining time in the EUL period., calculate annual savings as you would for a replace-on-burnout project:

$$kW_{savings,ROB} = \frac{kWh_{savings,ROB}}{8{,}760\ hrs} \times LSAF_{S/W}$$

Equation 144

Annual deemed summer peak demand savings are calculated by weighting the early retirement and replace-on-burnout savings by the RUL of the unit and the remainder of the EUL period, as outlined in the Volume 3 appendices.

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[508] This is the weighted average of adjusted annual unit energy consumption, a metric obtained from the MwEPA Refrigerator and Freezer Energy Rating Database (if from metering, substitute recorded value in lieu of this weighted average). Weights are calculated from the millions-of-households measurements obtained from RECS, (https://www.eia.gov/consumption/residential/data/2015/hc/php/hc3.6.php) corresponding to the year range classifications of freezers greater than 15 years old (specifically, 15-to-19-years-old and 20-or-more-years-old). The oldest freezers for which we had data were from 1979.

Deemed Energy Savings Tables

Table 366. Freezers—Savings (kWh)

Freezer type	Size	ROB savings (kWh)	ER savings (kWh)
Chest	Standard (≥ 7.75 ft^3)	29	154
	Compact (< 7.75 ft^3)	22	163
Upright	Standard (≥ 7.75 ft^3)	48	130
	Compact (< 7.75 ft^3)	32	151

Deemed Summer Demand Savings Tables

Table 367. Freezers—Replace-on-Burnout—Summer Peak Demand Savings (kW)

Freezer type	Product class	Climate Zone 1: Amarillo	Climate Zone 2: Dallas	Climate Zone 3: Houston	Climate Zone 4: Corpus Christi	Climate Zone 5: El Paso
Chest	Standard (≥ 7.75 ft^3)	0.004	0.004	0.004	0.004	0.004
	Compact (< 7.75 ft^3)	0.003	0.003	0.003	0.003	0.003
Upright	Standard (≥ 7.75 ft^3)	0.006	0.006	0.006	0.006	0.006
	Compact (< 7.75 ft^3)	0.004	0.004	0.004	0.004	0.004

Table 368. Freezers—Early Retirement—Summer Peak Demand Savings (kW)

Freezer type	Product class	Climate Zone 1: Amarillo	Climate Zone 2: Dallas	Climate Zone 3: Houston	Climate Zone 4: Corpus Christi	Climate Zone 5: El Paso
Chest	Standard (≥ 7.75 ft^3)	0.020	0.019	0.019	0.019	0.019
	Compact (< 7.75 ft^3)	0.021	0.020	0.021	0.020	0.020
Upright	Standard (≥ 7.75 ft^3)	0.017	0.016	0.016	0.016	0.016
	Compact (< 7.75 ft^3)	0.019	0.019	0.019	0.019	0.019

Deemed Winter Demand Savings Tables

Table 369. Freezers—Replace-on-Burnout—Winter Peak Demand Savings (kW)

Freezer type	Product class	Climate Zone 1: Amarillo	Climate Zone 2: Dallas	Climate Zone 3: Houston	Climate Zone 4: Corpus Christi	Climate Zone 5: El Paso
Chest	Standard (≥ 7.75 ft^3)	0.003	0.003	0.003	0.003	0.003
	Compact (< 7.75 ft^3)	0.002	0.002	0.002	0.002	0.002
Upright	Standard (≥ 7.75 ft^3)	0.005	0.005	0.005	0.005	0.005
	Compact (< 7.75 ft^3)	0.003	0.003	0.003	0.003	0.003

Table 370. Freezers—Early Retirement—Winter Peak Demand Savings (kW)

Freezer type	Product class	Climate Zone 1: Amarillo	Climate Zone 2: Dallas	Climate Zone 3: Houston	Climate Zone 4: Corpus Christi	Climate Zone 5: El Paso
Chest	Standard (≥ 7.75 ft^3)	0.016	0.017	0.016	0.017	0.017
	Compact (< 7.75 ft^3)	0.017	0.018	0.017	0.018	0.018
Upright	Standard (≥ 7.75 ft^3)	0.014	0.014	0.014	0.014	0.014
	Compact (< 7.75 ft^3)	0.016	0.017	0.016	0.016	0.017

Claimed Peak Demand Savings

Refer to Volume 1, Section 4 for further details on peak demand savings and methodology.

Additional Calculators and Tools

Not applicable.

Measure Life and Lifetime Savings

The estimated useful life (EUL) is established at 22 years based on the current DOE Final Rule standards for residential freezers.[509]

Program Tracking Data and Evaluation Requirements

Primary inputs and contextual data that should be specified and tracked by the program database to inform the evaluation and apply the savings properly are:

- Climate zone
- Unit quantity
- Baseline type (new construction, replace-on-burnout, or early retirement)
- Manufacturer and model number
- Freezer type (upright or chest)
- Freezer size (standard, i.e., ≥ 7.75 ft^3, or compact, i.e., < 7.75 ft^3)
- Photograph demonstrating functionality of existing equipment and/or customer responses to survey questionnaire documenting the condition of the replaced unit and their motivation for measure replacement for early retirement eligibility determination (early retirement only)
- The installer will provide documentation of proper disposal of freezers in accordance with applicable federal, state, and local regulations (early retirement only)
- Proof of purchase – with date of purchase and quantity
    - Alternative: photo of unit installed or another pre-approved method of installation verification

[509] Final Rule: Standards, Federal Register, 76 FR 57516 (Sept. 15, 2011) and associated Technical Support Document. https://www.ecfr.gov/cgi-bin/text-idx?SID=48f64e166fe3561666f871e521996e13&mc=true&node=se10.3.430_132&rgn=div8. Download TSD at: https://www.regulations.gov/document/EERE-2008-BT-STD-0012-0128.

References and Efficiency Standards

Petitions and Rulings

Not applicable.

Relevant Standards and Reference Sources

Please refer to measure citations for relevant standards and reference sources.

Document Revision History

Table 371. Freezers—Revision History

TRM version	Date	Description of change
v7.0	10/2019	TRM v7.0 origin.
v8.0	10/2020	TRM v8.0 update. Updated early retirement age eligibility.
v9.0	10/2021	TRM v9.0 update. Updated early retirement age eligibility.
v10.0	10/2022	TRM v10.0 update. Updated early retirement age eligibility.

2.5.7 Refrigerator/Freezer Recycling Measure Overview

TRM Measure ID: R-AP-RR

Market Sector: Residential

Measure Category: Appliance Recycling

Applicable Building Types: Single-family, multifamily, manufactured

Fuels Affected: Electricity

Decision/Action Type(s): Early retirement

Program Delivery Type(s): Prescriptive

Deemed Savings Type: Deemed savings calculation

Savings Methodology: Engineering algorithms and estimates

Measure Description

This measure involves early retirement and recycling of an existing, full-size (7.75 ft^3 or greater) refrigerator or combined refrigerator/freezer in a residential application. Savings represent the entire estimated energy consumption of the existing unit and are applicable over the estimated remaining life of the existing unit.

Eligibility Criteria

This measure applies to operable primary and secondary retired refrigerators/freezers. Recycling savings for this measure are limited to the removal of a working refrigerator/freezer from the electrical grid and differ from the savings specified in the ENERGY STAR Refrigerator replacement measure. The latter, which pertain to the direct replacement of a refrigerator and reflect the difference in energy consumption between new ENERGY STAR qualifying and standard efficiency models, may be claimed for the recycling of primary refrigerators/freezers that have been replaced if savings for that replacement were not already claimed in another energy efficiency program. To qualify, the customer must release the existing unit to the utility or utility representative to ensure proper disposal in accordance with applicable federal, state, and local regulations.

Baseline Condition

Without program intervention, the recycled refrigerator or refrigerator/freezer would have remained operable on the electrical grid. As a result, the baseline condition for early retirement programs is continued operation of the existing refrigerator.

High-Efficiency Condition

There is no efficiency standard for a recycling measure because the energy efficient action is the removal of an operable appliance, not—as with most demand-side management programs—the installation of a higher efficiency model.

Energy and Demand Savings Methodology

The basis for estimating energy savings is the annual energy consumption of the refrigerator or refrigerator/freezer being retired.

Savings Algorithms and Input Variables

Energy Savings Algorithms

Energy savings are calculated as follows:

$$Energ\ Savings\ [\Delta kWh] = kWh_{existing} \times ISAF \times PUF$$

Equation 145

Where:

$kWh_{existing}$ = *Average annual energy consumption*[510] *(see Table 372)*

ISAF = *In situ adjustment factor*[511] *= 0.942*

PUF = *Part use factor*[512] *= 0.915*

Table 372. Refrigerator/Freezer Recycling—Average Annual Energy Consumption

Total capacity (ft^3)	Year manufactured	$kWh_{existing}$ by freezer configuration				
		Top	Bottom	Side	Upright	Chest
< 16.5	≤ 2000	861	962	1,139	937	532
	2001-2010	556	724	747	713	435
	≥ 2011	374	483	592	449	292

[510] ENERGY STAR Flip Your Fridge Calculator. https://www.energystar.gov/index.cfm?fuseaction=refrig.calculator.

[511] The Cadmus Group, Inc. "Residential Retrofit High Impact Measure Evaluation Report". Prepared for California Public Utilities Commission Energy Division. February 8, 2010. Factor to account for variation between site conditions and controlled DOE testing conditions (90 °F test chamber, empty refrigerator and freezer cabinets, and no door openings). Appliances in warmer climate zones use more energy than those in cooler climate zones; utilized SCE data (highest percentage of warm climate projects) to best approximate Texas climate, p. 139-140.

[512] Ibid. Factor to account for the number of refrigerators that were running, running part time, or not running at the time of recycling, p. 142-143 (weighted by representative utility survey participation, p. 117).

Total capacity (ft^3)	Year manufactured	$kWh_{existing}$ by freezer configuration				
		Top	Bottom	Side	Upright	Chest
16.5-18.9	≤ 2000	962	1,051	1,266	1,058	621
	2001-2010	613	747	818	805	508
	≥ 2011	412	517	640	507	341
19.0-21.4	≤ 2000	1,031	1,110	1,329	1,138	680
	2001-2010	651	762	854	866	557
	≥ 2011	438	539	664	545	373
21.5-24.4	≤ 2000	1,090	1,172	1,368	1,194	721
	2001-2010	683	777	876	909	591
	≥ 2011	459	562	679	572	396
≥ 24.5	≤ 2000	1,223	1,347	1,528	1,355	840
	2001-2010	758	822	966	1,031	688
	≥ 2011	508	627	740	648	461

Demand Savings Algorithms

Summer peak demand savings are calculated as follows:

$$Peak\ Demand\ Savings\ [\Delta \text{kW}] = \frac{\Delta kWh}{AOH} \times LSAF_{S/W}$$

Equation 146

Where:

AOH = *Annual operating hours = 8,760 hours*

$LSAF_{S/W}$ = *Seasonal load shape adjustment factor (see Table 373)*

Table 373. Refrigerator/Freezer Recycling—Load Shape Adjustment Factors[513]

Season	Climate Zone 1: Amarillo	Climate Zone 2: Dallas	Climate Zone 3: Houston	Climate Zone 4: Corpus Christi	Climate Zone 5: El Paso
Summer	1.112	1.099	1.108	1.100	1.081
Winter	0.929	0.966	0.924	0.941	0.966

[513] See Volume 1, Appendix B.

Deemed Energy Savings Tables

There are no lookup tables available for this measure. See engineering algorithms in the previous section for calculating energy and demand savings.

Deemed Summer Demand Savings Tables

There are no lookup tables available for this measure. See engineering algorithms in the previous section for calculating energy and demand savings.

Deemed Winter Demand Savings Tables

There are no lookup tables available for this measure. See engineering algorithms in the previous section for calculating energy and demand savings.

Claimed Peak Demand Savings

Refer to Volume 1, Section 4 for further details on peak demand savings and methodology.

Additional Calculators and Tools

Not applicable.

Measure Life and Lifetime Savings

Based on the KEMA Residential Refrigerator Recycling Ninth Year Retention Study,[514] the Estimated Useful Life of Refrigerator Recycling is 8 years, representing the assumed remaining useful life of the retired unit.

Program Tracking Data and Evaluation Requirements

Primary inputs and contextual data that should be specified and tracked by the program database to inform the evaluation and apply the savings properly are:

- Climate zone
- Number of refrigerators/freezers removed
- Year removed unit manufactured
- Total capacity (in cubic feet)
- Freezer configuration (top, bottom, side-by-side, upright, or chest)

[514] KEMA, Inc. "Residential Refrigerator Recycling Ninth Year Retention Study." Prepared for Southern California Edison Company. July 22, 2004.

References and Efficiency Standards

Petitions and Rulings

- Docket No. 42212. Petition of El Paso Electric Company to Approve Revisions to the Deemed Savings for the Appliance Recycling Market Transformation program. Public Utility Commission of Texas.

Relevant Standards and Reference Sources

Please refer to measure citations for relevant standards and reference sources.

Document Revision History

Table 374. Refrigerator/Freezer Recycling—Revision History

TRM version	Date	Description of change
v2.1	1/30/2015	TRM v2.1 origin.
v3.0	4/10/2015	TRM v3.0 update. LSAF updated to align with new peak demand methodology.
v3.1	11/05/2015	TRM v3.1 update. No revision.
v3.1	3/28/2016	TRM v3.1 March revision. Updated summer and winter coincidence factors.
v4.0	10/10/2016	TRM v4.0 update. No revision.
v5.0	10/2017	TRM v5.0 update. No revision.
v6.0	11/2018	TRM v6.0 update. No revision.
v7.0	10/2019	TRM v7.0 update. No revision.
v8.0	10/2020	TRM v8.0 update. Updated baseline energy consumption.
v9.0	10/2021	TRM v9.0 update. Correct deemed ranges for refrigerator volume.
v10.0	10/2022	TRM v10.0 update. No revision.

2.5.8 ENERGY STAR® Air Purifiers Measure Overview

TRM Measure ID: R-AP-AP

Market Sector: Residential

Measure Category: Appliances

Applicable Building Types: Single-family, multifamily, manufactured

Fuels Affected: Electricity

Decision/Action Type(s): Replace-on-burnout, new construction

Program Delivery Type(s): Prescriptive

Deemed Savings Type: Look-up tables

Savings Methodology: Engineering algorithms and estimates

Measure Description

This document presents the accepted deemed savings awarded for the installation of an ENERGY STAR air purifier. Savings are awarded at a flat per-unit rate, both for energy and demand savings. This measure will apply to existing homes and new construction.

Eligibility Criteria

This measure applies to floor, tabletop, and wall-mounted air purifiers/room air cleaners.

Baseline Condition

The baseline condition is defined as 1.0 cfm/W for a conventional air purifier unit's efficiency, a value from EPA research conducted in 2011, as cited in the previous October 2016 ENERGY STAR Appliance Savings Calculator.

High-Efficiency Condition

The table below displays the ENERGY STAR Final Version 2.0 Requirements for eligible room air cleaners effective October 17, 2020, and revised May 2022.[515] Energy efficiency service providers are expected to comply with the latest ENERGY STAR requirements.

[515] ENERGY STAR® Room Air Cleaners Final Version 2.0 Program Requirements. https://www.energystar.gov/sites/default/files/ENERGY%20STAR%20Version%202.0%20Room%20Air%20Cleaners%20Specification%20%28Rev.%20May%202022%29_0.pdf.

Table 375. Air Purifiers—ENERGY STAR Requirements

Smoke CADR	Minimum CADR/W
30–99	1.9
100–149	2.4
150+	2.9

Energy and Demand Savings Methodology

Savings Algorithms and Input Variables

Energy Savings Algorithms

Energy savings for this measure were derived using the ENERGY STAR Appliance Savings Calculator and the revised ENERGY STAR specification in Table 346.[516] Default baseline standby power and clean air delivery rate (CADR) efficiency (CADR/W) values were taken from the ENERGY STAR calculator. ENERGY STAR standby power, CADR, and CADR/W are averages from the ENERGY STAR qualified product listing. Baseline CADR is assumed to be equivalent to ENERGY STAR CADR.

This measure will be updated to comply with the latest available ENERGY STAR specification and appliance calculator. It will also periodically be updated to comply with the latest updates to the ENERGY STAR qualified product listing.

$$Energy\ Savings\ [\Delta kWh] = (kWh_{baseline,OP} + kWh_{baseline,SB}) - (kWh_{ES,OP} + kWh_{ES,SB})$$

Equation 147

$$kWh_{baseline,OP} = \left(\frac{CADR_{baseline}}{\eta_{baseline}}\right)/1{,}000 \times hours \times days$$

Equation 148

$$kWh_{baseline,SB} = (8{,}760 - hours \times days) \times \frac{W_{baseline,SB}}{1{,}000}$$

Equation 149

$$kWh_{ES,OP} = \left(\frac{CADR_{ES}}{\eta_{ES}}\right)/1{,}000 \times hours \times days$$

Equation 150

$$kWh_{ES,SB} = (8{,}760 - hours \times days) \times \frac{W_{ES,SB}}{1{,}000}$$

Equation 151

[516] ENERGY STAR® Appliance Savings Calculator (updated October 2016). The previously cited URL is no longer available, but a copy of the calculator can be provided upon request.

Where:

$kWh_{baseline,OP}$	=	*Baseline/conventional operating energy usage*
$kWh_{baseline,SB}$	=	*Baseline/conventional standby energy usage*
$kWh_{ES,OP}$	=	*ENERGY STAR average operating energy usage*
$kWh_{ES,SB}$	=	*ENERGY STAR average standby energy usage*
$CADR_{baseline}$	=	*Baseline unit clean air delivery rate (cu ft/min), assume equivalent to* $CADR_{ES}$
$CADR_{ES}$	=	*ENERGY STAR unit clean air delivery rate (cu ft/min) (see Table 377)*
$\eta_{baseline}$	=	*Baseline clean air delivery efficiency = 1.0 cfm/W*
η_{ES}	=	*ENERGY STAR air delivery efficiency (cfm/W) (see Table 377)*
hours	=	*Average hours of operation per day = 16*
days	=	*Average days of operation per year = 365*
$W_{baseline,SB}$	=	*Conventional model standby power = 1.0 W*
$W_{ES,SB}$	=	*ENERGY STAR model standby power = 0.6 W*
1,000	=	*Constant to convert from W to kW*
8,760	=	*Total hours per year*

Demand Savings Algorithms

$$Peak\ Demand\ Savings\ [\Delta kW] = \frac{\Delta kWh}{hours \times days} \times CF_{S/W}$$

Equation 152

Where:

$CF_{S/W}$	=	*Seasonal peak coincidence factor (see Table 376)*

Table 376. Air Purifiers—Coincidence Factors[517]

Season	Climate Zone 1: Amarillo	Climate Zone 2: Dallas	Climate Zone 3: Houston	Climate Zone 4: Corpus Christi	Climate Zone 5: El Paso
Summer	0.636	0.617	0.631	0.620	0.564
Winter	0.882	0.907	0.829	0.876	0.926

[517] See Volume 1, Section 4.

Deemed Energy Savings Tables

Table 377. Air Purifiers—Energy Savings (kWh)

Smoke CADR range (cu ft/min)	ENERGY STAR QPL Average Smoke CADR	ENERGY STAR QPL Average Smoke CADR/W	kWh savings
30–99	75	3.0	296
100–149	129	4.3	580
150–199	171	4.6	784
200–249	225	4.4	1,021
250–299	275	5.7	1,326
300+	375	5.5	1,795

Deemed Summer Demand Savings Tables

Table 378. Air Purifiers—Summer Peak Demand Savings (kW)

Smoke CADR range (cu ft/min)	Climate Zone 1: Amarillo	Climate Zone 2: Dallas	Climate Zone 3: Houston	Climate Zone 4: Corpus Christi	Climate Zone 5: El Paso
30–99	0.032	0.031	0.032	0.031	0.029
100–149	0.063	0.061	0.063	0.062	0.056
150–199	0.085	0.083	0.085	0.083	0.076
200–249	0.111	0.108	0.110	0.108	0.099
250–299	0.144	0.140	0.143	0.141	0.128
300+	0.195	0.190	0.194	0.191	0.174

Deemed Winter Demand Savings Tables

Table 379. Air Purifiers—Winter Peak Demand Savings (kW)

Smoke CADR range (cu ft/min)	Climate Zone 1: Amarillo	Climate Zone 2: Dallas	Climate Zone 3: Houston	Climate Zone 4: Corpus Christi	Climate Zone 5: El Paso
30–99	0.045	0.046	0.042	0.044	0.047
100–149	0.088	0.090	0.082	0.087	0.092
150–199	0.119	0.122	0.111	0.118	0.124
200–249	0.154	0.159	0.145	0.153	0.162
250–299	0.200	0.206	0.188	0.199	0.210
300+	0.271	0.279	0.255	0.269	0.285

Claimed Peak Demand Savings

Refer to Volume 1, Section 4 for further details on peak demand savings and methodology.

Additional Calculators and Tools

Not applicable.

Measure Life and Lifetime Savings

The estimated useful life (EUL) is 9 years, as specified in the California Database of Energy Efficiency Resources (DEER) READI tool for EUL ID RES-AirCleaner.[518]

Program Tracking Data and Evaluation Requirements

Primary inputs and contextual data that should be specified and tracked by the program database to inform the evaluation and apply the savings properly are:

- Climate zone
- Unit quantity
- Manufacturer and model number
- Smoke clean air delivery rate (CADR) in cu ft/min (cfm)
- Proof of purchase – including date of purchase and quantity
    - Alternative: photo of unit installed or another pre-approved method of installation verification.

[518] DEER READI (Remote Ex-Ante Database Interface). http://www.deeresources.com/index.php/readi.

References and Efficiency Standards

Petitions and Rulings

Not applicable.

Relevant Standards and Reference Sources

Please refer to measure citations for relevant standards and reference sources.

Document Revision History

Table 380. Air Purifiers—Revision History

TRM version	Date	Description of change
v7.0	10/2019	TRM v7.0 origin.
v8.0	10/2020	TRM v8.0 update. No revision.
v9.0	10/2021	TRM v9.0 update. Updated EUL reference.
v10.0	10/2022	TRM v10.0 update. Verified compliance with ENERGY STAR Final Version 2.0 Requirements. Updated dust CADR references to refer to smoke CADR. Updated deemed savings ranges and values.

2.5.9 ENERGY STAR® Pool Pumps Measure Overview

TRM Measure ID: R-AP-PP

Market Sector: Residential

Measure Category: Appliances

Applicable Building Types: Single-family, multifamily, manufactured

Fuels Affected: Electricity

Decision/Action Type(s): Retrofit

Program Delivery Type(s): Prescriptive

Deemed Savings Type: Look-up tables

Savings Methodology: Engineering algorithms and estimates

Measure Description

This measure involves the replacement of a single-speed pool pump with an ENERGY STAR-certified variable-speed or multi-speed pool pump.

Eligibility Criteria

This measure applies to all residential applications of in-ground pools or above-ground pools. Pools that serve multiple tenants in a common area are not eligible for this measure. Ineligible pump products include waterfall, integral cartridge filter, integral sand filter, storable electric spa, and rigid electric spa.[519]

Multi-speed pool pumps are an alternative to variable speed pumps. The multi-speed pump uses an induction motor that functions as two motors in one, with full-speed and half-speed options. Multi-speed pumps may enable significant energy savings. However, if the half-speed motor is unable to complete the required water circulation task, the larger motor will operate exclusively. Having only two speed-choices limits the ability of the pump motor to fine-tune the flow rates required for maximum energy savings.[520] Therefore, multi-speed pumps must have a high-speed override capability to revert back to low speed after a period not to exceed 24 hours.

[519] These product types are excluded by the ENERGY STAR® specification. https://www.energystar.gov/sites/default/files/ENERGY%20STAR%20Version%203.1%20Pool%20Pumps%20Final%20Specification_0.pdf.

[520] Hunt, A. and Easley, S., 2012, "Measure Guideline: Replacing Single-Speed Pool Pumps with Variable Speed Pumps for Energy Savings." Building America Retrofit Alliance (BARA), US DOE. May 2012. http://www.nrel.gov/docs/fy12osti/54242.pdf.

Baseline Condition

The baseline condition is a 1 to 5 horsepower (hp) standard efficiency[521] single-speed pool pump. This measure is only applicable to retrofit applications. New construction applications are not eligible as of July 19, 2021.[522]

High-Efficiency Condition

The high-efficiency condition is a 1 to 5 hp variable speed pump (VSP) or multi-speed pool pump that is compliant with the ENERGY STAR Final Version 3.1 Requirements for pool pumps effective July 19, 2021.[523] Energy efficiency service providers are expected to comply with the latest ENERGY STAR requirements.

Energy and Demand Savings Methodology

Savings for this measure are based on methods and input assumptions from the ENERGY STAR Pool Pump Savings Calculator.

Savings Algorithms and Input Variables

Energy Savings Algorithms

Energy savings for this measure were derived using the ENERGY STAR Pool Pump Savings Calculator with Texas selected as the applicable location, so Texas-specific assumptions were used.[524]

$$Energy\ Savings\ [\Delta kWh] = kWh_{conv} - kWh_{ES}$$

Equation 153

Where:

kWh_{conv} = *Conventional single-speed pool pump energy (kWh)*

kWh_{ES} = *ENERGY STAR variable speed pool pump energy (kWh)*

[521] The US DOE passed minimum efficiency standards for pool pumps effective July 19, 2021. These new baseline standards will be incorporated into TRM 10.0 to allow for sell down of existing inventory.

[522] Federal standard for dedicated-purpose pool pumps. https://www1.eere.energy.gov/buildings/appliance_standards/standards.aspx?productid=67.

[523] ENERGY STAR® Pool Pumps Final Version 3.1 Program Requirements. https://www.energystar.gov/sites/default/files/ENERGY%20STAR%20Version%203.1%20Pool%20Pumps%20Final%20Specification_0.pdf.

[524] The ENERGY STAR® Pool Pump Savings Calculator, updated February 2013, can be found on the ENERGY STAR® website at: https://www.energystar.gov/productfinder/product/certified-pool-pumps/results.

Algorithms to calculate the above parameters are defined as:

$$kWh_{conv} = \frac{PFR_{conv} \times 60 \times hours \times days}{EF_{conv} \times 1{,}000}$$

Equation 154

$$kWh_{ES} = \frac{V \times TO \times days}{EF_{ES} \times 1{,}000}$$

Equation 155

Where:

PFR_{conv}	=	*Conventional single-speed pump flow rate [gal/min] (Table 381)*
EF_{conv}	=	*Conventional single-speed pump energy factor [gal/W x hr] (Table 381)*
EF_{ES}	=	*ENERGY STAR pump energy factor [gal/W x hr] (Table 382)*
hours	=	*Pump daily operating hours (Table 381)*
days	=	*Operating days per year = 365 days (default)*
V	=	*Pool volume [gal] (Table 381)*
TO	=	*Turnovers per day, number of times the volume of the pool is run through the pump per day (Table 382)*
60	=	*Constant to convert between minutes and hours*
1,000	=	*Constant to convert from W to kW*

Table 381. Pool Pumps—Conventional Unit Assumptions[525]

New pump HP	Hours[526]	PFR_{conv} (gal/min)	EF_{conv} (gal/W-h)
≤ 1.25	9.1062	75.5000	2.5131
1.25 < hp ≤ 1.75		78.1429	2.2677
1.75 < hp ≤ 2.25		88.6667	2.2990
2.25 < hp ≤ 2.75		93.0910	2.1812
2.75 < hp ≤ 5		101.6667	1.9987

[525] Conventional pump PFR and EF values are taken from pump curves found in the ENERGY STAR® Pool Pump Savings Calculator. Note: input assumptions will be updated once calculator has been updated for compliance with the current specification.

[526] The daily average operating hours for conventional single-speed pumps, based on 2014 residential pool pump program survey results from CenterPoint Energy.

Table 382. Pool Pumps—ENERGY STAR Unit Assumptions[527]

New pump HP	V (gal)	EF_{ES} (gal/W·h)	Turnovers/day[528]
≤ 1.25	22,000	8.7	1.9
1.25 < hp ≤ 1.75		8.9	1.9
1.75 < hp ≤ 2.25		9.3	2.2
2.25 < hp ≤ 2.75		7.4	2.3
2.75 < hp ≤ 5		7.1	2.5

Demand Savings Algorithms

$$Peak\ Demand\ Savings\ [\Delta kW] = \frac{kWh_{conv} - kWh_{ES}}{hours} \times \frac{CF_{S/W}}{days}$$

Equation 156

Where:

$CF_{S/W}$ = *Seasonal peak coincidence factor (Table 383)*

Table 383. Pool Pumps—Demand Factors[529]

Climate zone	Summer CF	Winter CF
Zone 1: Amarillo	0.258	-0.002
Zone 2: Dallas	0.329	0.025
Zone 3: Houston	0.276	0.108
Zone 4: Corpus Christi	0.266	0.036
Zone 5: El Paso	0.497	-0.143

[527] ENERGY STAR® values are taken from default inputs and pump curves found in the ENERGY STAR® Pool Pump Savings Calculator. Note: input assumptions will be updated once calculator has been updated for compliance with the current specification.

[528] Calculated as TO = hours x 60 x PFR_{conv} ÷ V.

[529] Demand factors are calculated according to the method in Section 4 of the Texas TRM Vol 1 using data from the US Department of Energy's Building America B10 Benchmark load profiles for pool pumps. The profile used to determine demand factors is calculated as the difference of single speed and variable speed profiles. Summer profiles include April through September and winter profiles include October through March.

Deemed Energy Savings Tables

Table 384. Pool Pumps—Energy Savings (kWh)[530]

New pump hp	kWh savings
≤ 1.25	4,238
1.25 < hp ≤ 1.75	5,158
1.75 < hp ≤ 2.25	5,792
2.25 < hp ≤ 2.75	6,015
2.75 < hp ≤ 5	7,317

Deemed Summer Demand Savings Tables[531]

Table 385. Pool Pumps—Summer Peak Demand Savings (kW)

New pump HP	Climate Zone 1: Amarillo	Climate Zone 2: Dallas	Climate Zone 3: Houston	Climate Zone 4: Corpus Christi	Climate Zone 5: El Paso
≤ 1.25	0.329	0.419	0.352	0.339	0.634
1.25 < hp ≤ 1.75	0.401	0.510	0.429	0.413	0.771
1.75 < hp ≤ 2.25	0.450	0.573	0.481	0.463	0.866
2.25 < hp ≤ 2.75	0.468	0.595	0.500	0.481	0.900
2.75 < hp ≤ 5	0.569	0.724	0.608	0.586	1.094

Deemed Winter Demand Savings Tables

Table 386. Pool Pumps—Peak Demand Savings (kW)

New pump HP	Climate Zone 1: Amarillo	Climate Zone 2: Dallas	Climate Zone 3: Houston	Climate Zone 4: Corpus Christi	Climate Zone 5: El Paso
≤ 1.25	-0.002	0.032	0.138	0.046	-0.182
1.25 < hp ≤ 1.75	-0.003	0.039	0.168	0.056	-0.222
1.75 < hp ≤ 2.25	-0.003	0.043	0.189	0.062	-0.249
2.25 < hp ≤ 2.75	-0.003	0.045	0.196	0.065	-0.259
2.75 < hp ≤ 5	-0.004	0.055	0.239	0.079	-0.315

[530] The results in this table may vary slightly from results produced by the ENERGY STAR® calculator because of rounding of default savings coefficients throughout the measure and pool volume.
[531] Ibid.

Claimed Peak Demand Savings

Refer to Volume 1, Section 4 for further details on peak demand savings and methodology.

Additional Calculators and Tools

ENERGY STAR Pool Pump Savings Calculator, updated May 2020, can be found on the ENERGY STAR website at https://www.energystar.gov/productfinder/product/certified-pool-pumps/results.

Measure Life and Lifetime Savings

The estimated useful life (EUL) is 10 years, as specified in the California Database of Energy Efficiency Resources (DEER) READI tool for EUL ID OutD-PoolPump.[532]

Program Tracking Data and Evaluation Requirements

Primary inputs and contextual data that should be specified and tracked by the program database to inform the evaluation and apply the savings properly include the below.

For all projects collect:

- Unit quantity
- Manufacturer and model number of new pool pump
- Rated horsepower of new pool pump
- Climate zone
- Proof of purchase – with date of purchase and quantity
    - Alternative: photo of unit installed or other pre-approved method of installation verification

For a significant sample of projects where attainable (e.g., those projects that are selected for inspection, not midstream or retail programs):

- Items listed for all projects above
- Decision/action type: early retirement, replace-on-burnout, or new construction
- Rated horsepower of existing pool pump
- Existing and new pool pump operating hours

References and Efficiency Standards

Petitions and Rulings

Not applicable.

[532] DEER READI (Remote Ex-Ante Database Interface). http://www.deeresources.com/index.php/readi.

Relevant Standards and Reference Sources

Please refer to measure citations for relevant standards and reference sources.

Document Revision History

Table 387. Pool Pumps—Revision History

TRM version	Date	Description of change
v5.0	10/2017	TRM v5.0 origin.
v6.0	11/2018	TRM v6.0 update. No revision.
v7.0	10/2019	TRM v7.0 update. Updated eligibility to include above ground pool pumps now eligible for ENERGY STAR certification. Acknowledged the forthcoming ENERGY STAR v2.0.
v8.0	10/2020	TRM v8.0 update. Incorporated ENERGY STAR v2.0 updated deemed savings.
v9.0	10/2021	TRM v9.0 update. Updated EUL reference and tracking requirements.
v10.0	10/2022	TRM v10.0 update. Verified compliance with ENERGY STAR Final Version 3.1 Requirements. Updated savings coefficient definitions.

2.5.10 Advanced Power Strips Measure Overview

TRM Measure ID: R-AP-PS

Market Sector: Residential

Measure Category: Appliances

Applicable Building Types: Single-family, multifamily, manufactured

Fuels Affected: Electricity

Decision/Action Type(s): Retrofit, new construction

Program Delivery Type(s): Prescriptive

Deemed Savings Type: Deemed savings values

Savings Methodology: Engineering algorithms and estimates

Measure Description

This measure involves the installation of a multi-plug advanced power strip (APS) with the ability to automatically disconnect specific loads depending on the power draw of a specified, or "master," load.

For a Tier 1 APS, a load sensor in the strip disconnects power from the control outlets when the master power draw is below a certain threshold. This feature allows for a reduction of power draw from peripheral consumer electronics, which usually maintain some load even when in the off or standby position. Therefore, when the master device (e.g., television) is turned off, the power supply is cut to other related equipment (e.g., set-top boxes, speakers, video game consoles).

A Tier 2 APS uses an external sensor paired with a configurable countdown timer to manage both active and standby power loads for controlled devices in a complete system. A Tier 2 APS may operate either with or without a master control socket. Those without a master control socket sense power of all devices connected to the controlled sockets, while those with a master control socket sense power for the device connected to the master control socket. The external sensor of a Tier 2 APS may use an infrared-only sensor, or it may use a "multi-sensor," which detects both infrared (IR) remote control signals and motion to determine device inactivity and deliver additional savings as compared to a Tier 1 APS. Both versions of external sensors use IR filtering to prevent inappropriate switching events that may have otherwise resulted from natural interference, such as sunlight or CFL light bulbs.

Eligibility Criteria

This measure applies to all residential applications. For Tier 2 applications, the APS must control at least two audiovisual devices.

Baseline Condition

The baseline condition is assumed to be uncontrolled peripheral loads, each plugged into a traditional surge protector or wall outlet.

High-Efficiency Condition

The high-efficiency condition is peripheral loads controlled by a Tier 1 or Tier 2 APS.

Energy and Demand Savings Methodology

Savings Algorithms and Input Variables

Savings were developed based on reported plug load electricity consumption and hourly use data. A set of home entertainment and home office peripheral equipment and related performance data are presented in the following table. “Daily Standby Hours” and “Daily Off Hours” represent the average number of hours the device is left in standby or off mode. For each device, a weighted watt per hour value is calculated based on projected watts consumed in either mode.

There are three savings paths available for Tier 1. Savings can be estimated by:

1. Complete system type (home entertainment or home office)
2. Per APS for an average complete system if the type is unknown
3. Per individual peripheral device

Tier 2 savings are determined using the average component uses for a complete system and an energy reduction percentage.

Table 388. APS—Peripheral Watt Consumption Breakdown[533]

System type	Peripheral device	Daily standby hours	Daily off hours	Standby power (W)	Off power (W)	Weighted W/hr	Annual APS hours
Home entertainment	Audio equipment: AV receiver	0.0	18.0	19.2	3.1	3.1	6,570
	Audio equipment: Speakers	0.0	18.0	3.0	0.0	0.0	6,570
	Audio equipment: Subwoofer	0.0	18.0	7.8	0.6	0.6	6,570
	Media player: Blu-ray	2.5	20.8	7.0	0.1	0.8	8,505
	Media player: DVD	2.5	20.8	5.0	2.0	2.3	8,505
	Media player: DVD-R	2.5	20.8	7.0	3.0	3.4	8,505
	Media player: DVD/VCR	2.5	20.4	8.0	4.0	4.4	8,359
	Media player: VCR	2.2	21.4	6.0	3.0	3.3	8,614
	Set-top box: Cable	0.0	16.5	25.0	16.0	16.0	6,023
	Set-top box: Cable with DVR	0.0	16.5	45.0	43.0	43.0	6,023
	Set-top box: Satellite	0.0	15.1	10.0	15.0	15.0	5,512
	Set-top box: Satellite with DVR	0.0	15.1	27.0	28.0	28.0	5,512
	Set-top box: Stand-alone DVR	0.0	18.3	27.0	27.0	27.0	6,680
	Television: CRT	0.0	18.7	5.3	1.6	1.6	6,826
	Television: LCD	0.0	18.7	2.2	0.5	0.5	6,826
	Television: Plasma	0.0	18.7	0.9	0.6	0.6	6,826
	Television: Projection	0.0	18.7	4.4	7.0	7.0	6,826
	Video game console: Nintendo Wii	1.5	21.4	10.5	1.9	2.5	8,359
	Video game console: Wii U	1.5	21.4	34.0	0.4	2.6	8,359
	Video game console: PlayStation 2	1.5	21.4	17.0	0.2	1.3	8,359

[533] Derived from New York State Energy Research and Development Authority (NYSERDA), "Advanced Power Strip Research Report." August 2011.

System type	Peripheral device	Daily standby hours	Daily off hours	Standby power (W)	Off power (W)	Weighted W/hr	Annual APS hours
Home entertainment	Video game console: PlayStation 3	1.5	21.4	152.9	1.1	11.0	8,359
	Video game console: PlayStation 4	1.5	21.4	137.0	6.4	14.9	8,359
	Video game console: XBOX	1.5	21.4	68.0	2.0	6.3	8,359
	Video game console: XBOX 360	1.5	21.4	117.5	3.1	10.6	8,359
	Video game console: XBOX One	1.5	21.4	112.0	11.9	18.4	8,359
Home office	Computer: Desktop	4.1	16.7	11.6	3.3	4.9	7,592
	Computer: Laptop	4.1	16.7	7.6	4.4	5.0	7,592
	Computer monitor: CRT	2.4	16.5	7.6	1.5	2.3	6,899
	Computer monitor: LCD	2.4	16.5	1.9	1.1	1.2	6,899
	Computer speakers	0.0	18.7	3.7	2.3	2.3	6,826
	Copier	0.0	23.5	2.8	1.5	1.5	8,578
	Fax machine: Inkjet	0.5	23.3	6.0	5.3	5.3	8,687
	Fax machine: Laser	0.5	23.3	5.3	2.2	2.3	8,687
	Printer: Inkjet	4.4	19.5	2.5	1.3	1.5	8,724
	Printer: Laser	4.4	19.5	9.0	3.3	4.3	8,724
	Scanner	0.0	23.5	3.6	2.1	2.1	8,578

Energy Savings Algorithms

Tier 1 APS

Energy savings for a Tier 1 APS in use for home entertainment or home office are calculated using the following algorithm, where kWh saved is calculated and summed for all peripheral devices.

$$Energy\ Savings\ [\Delta kWh] = \sum \frac{W_i \times H_i}{1{,}000}$$

Equation 157

Where:

W	=	*Weighted watts per hour consumed in standby/off mode for each peripheral device (see* Table 388*)*
H	=	*Annual hours per year controlled by APS (see Table 388)*
1,000	=	*Constant to convert from W to kW*

Tier 2 APS

Energy savings for a Tier 2 APS are calculated using the average household home entertainment and home office usages, multiplied by an assumed energy reduction percentage.

$$\Delta kWh_{Home\ Entertainment} = kWh_{TV} \times ERP \times ISR$$

Equation 158

$$\Delta kWh_{Home\ Office} = kWh_{Comp} \times ERP \times ISR$$

Equation 159

$$\Delta kWh_{Unspecified} = \frac{kWh_{TV} + kWh_{Comp}}{2} \times ERP \times ISR$$

Equation 160

Where:

kWh_{TV}	=	*Average annual energy consumption of Tier 2 qualifying TV systems; default = 602.8 kWh*[534]
kWh_{Comp}	=	*Average annual energy consumption of Tier 2 qualifying computer systems; default = 197.9 kWh*[535]

[534] New York State Energy Research and Development Authority (NYSERDA), "Advanced Power Strip Research Report". August 2011. Page 30.

[535] New York State Energy Research and Development Authority (NYSERDA), "Advanced Power Strip Research Report". August 2011. Page 30.

ERP = *Energy reduction percentage (default = 47.5%[536])*

ISR = *In-service rate or the percentage of units rebated that are installed; default = 1.0*

Demand Savings Algorithms

Tier 1 and Tier 2 APS

Demand savings for a Tier 1 APS in use for a home entertainment system or home office are calculated using the following algorithm, where kWh saved is calculated and summed for all peripheral devices. Demand savings for a Tier 2 APS are calculated using the average household home office and home entertainment center usages, multiplied by an assumed energy reduction percentage.

$$Peak\ Demand\ Savings\ [\Delta kW] = \sum \frac{\Delta kWh}{hours} \times CF_{S/W}$$

Equation 161

Where:

hours = *Annual hours per year controlled by APS (see Table 388 for Tier 1 APS; assume 4,380 for Tier 2 APS[537])*

$CF_{S/W}$ = *Seasonal peak coincidence factor (see Table 389)[538]*

Table 389. APS—Coincidence Factors[539]

Season	Climate Zone 1: Amarillo	Climate Zone 2: Dallas	Climate Zone 3: Houston	Climate Zone 4: Corpus Christi	Climate Zone 5: El Paso
Summer	0.33	0.43	0.36	0.30	0.66
Winter	0.89	0.88	0.86	0.85	0.87

Deemed Energy Savings Tables

Refer to Table 390 and Table 391.

[536] Average of ERP from Northeast Energy Efficiency Partnerships (NEEP), "Case Study: Tier 2 Advanced Power Strips and Efficiency Programs". April 2015.

[537] Estimated based on assumption that approximately half of savings are during active hours (assumed to be 5.3 hours/day, or 1,936 hours/year) and half during standby hours (8,760-1,936 = 6,824 hours/year). The resulting weighted average is 4,380 hours/year.

[538] Derived using Electric Power Research Institute (EPRI) End Use Load Shapes for Residential TV and PC. http://loadshape.epri.com/enduse.

[539] See Volume 1, Section 4.

Deemed Summer Demand Savings Tables

Refer to Table 390 and Table 391.

Deemed Winter Demand Savings Tables

Refer to Table 390 and Table 391.

Table 390. APS—Tier 1 Deemed Savings

System type	Peripheral device	kWh savings	Summer kW savings					Winter kW savings				
			Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
Home entertainment	Audio equipment: AV receiver	20.4	0.0010	0.0013	0.0011	0.0009	0.0020	0.0028	0.0027	0.0027	0.0026	0.0027
	Audio equipment: speakers	0.0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Audio equipment: subwoofer	3.9	0.0002	0.0003	0.0002	0.0002	0.0004	0.0005	0.0005	0.0005	0.0005	0.0005
	Media player: Blu-ray	7.1	0.0003	0.0004	0.0003	0.0002	0.0006	0.0007	0.0007	0.0007	0.0007	0.0007
	Media player: DVD	19.7	0.0008	0.0010	0.0008	0.0007	0.0015	0.0021	0.0020	0.0020	0.0020	0.0020
	Media player: DVD-R	29.2	0.0011	0.0015	0.0012	0.0010	0.0023	0.0031	0.0030	0.0029	0.0029	0.0030
	Media player: DVD/VCR	37.1	0.0015	0.0019	0.0016	0.0013	0.0029	0.0040	0.0039	0.0038	0.0038	0.0038
	Media player: VCR	28.3	0.0011	0.0014	0.0012	0.0010	0.0022	0.0029	0.0029	0.0028	0.0028	0.0028
	Set-top box: Cable	96.4	0.0052	0.0069	0.0057	0.0047	0.0105	0.0142	0.0141	0.0137	0.0136	0.0139
	Set-top box: Cable with DVR	259.0	0.0141	0.0186	0.0153	0.0128	0.0283	0.0383	0.0378	0.0369	0.0365	0.0372
	Set-top box: Satellite	82.7	0.0049	0.0065	0.0053	0.0044	0.0099	0.0134	0.0132	0.0129	0.0127	0.0130
	Set-top box: Satellite with DVR	154.3	0.0092	0.0121	0.0100	0.0083	0.0184	0.0249	0.0246	0.0240	0.0238	0.0242
	Set-top box: Stand alone DVR	180.3	0.0088	0.0117	0.0096	0.0080	0.0178	0.0240	0.0238	0.0232	0.0229	0.0234
	Television: CRT	10.9	0.0005	0.0007	0.0006	0.0005	0.0011	0.0014	0.0014	0.0014	0.0014	0.0014
	Television: LCD	3.4	0.0002	0.0002	0.0002	0.0001	0.0003	0.0004	0.0004	0.0004	0.0004	0.0004
	Television: Plasma	4.1	0.0002	0.0003	0.0002	0.0002	0.0004	0.0005	0.0005	0.0005	0.0005	0.0005
	Television: Projection	47.8	0.0023	0.0030	0.0025	0.0021	0.0046	0.0062	0.0062	0.0060	0.0059	0.0061

System type	Peripheral device	kWh savings	Summer kW savings					Winter kW savings				
			Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
Home entertainment	Video game console: Nintendo Wii	20.6	0.0008	0.0011	0.0009	0.0007	0.0016	0.0022	0.0022	0.0021	0.0021	0.0021
	Video game console: Wii U	21.7	0.0009	0.0011	0.0009	0.0008	0.0017	0.0023	0.0023	0.0022	0.0022	0.0023
	Video game console: PlayStation 2	10.9	0.0004	0.0006	0.0005	0.0004	0.0009	0.0012	0.0011	0.0011	0.0011	0.0011
	Video game console: PlayStation 3	92.3	0.0036	0.0048	0.0039	0.0033	0.0073	0.0098	0.0097	0.0095	0.0094	0.0096
	Video game console: PlayStation 4	124.8	0.0049	0.0065	0.0053	0.0044	0.0098	0.0133	0.0131	0.0128	0.0127	0.0129
	Video game console: XBOX	52.9	0.0021	0.0027	0.0023	0.0019	0.0042	0.0056	0.0056	0.0054	0.0054	0.0055
	Video game console: XBOX 360	88.5	0.0035	0.0046	0.0038	0.0031	0.0070	0.0094	0.0093	0.0091	0.0090	0.0092
	Video game console: XBOX One	154.1	0.0060	0.0080	0.0066	0.0055	0.0121	0.0164	0.0162	0.0158	0.0157	0.0160
	Home entertainment system[540]	269.9	0.0132	0.0174	0.0143	0.0119	0.0265	0.0358	0.0354	0.0345	0.0342	0.0348

[540] Assuming Audio Equipment: AV Receiver, Media Player: Average, Set-Top Box: Average, and Video Game Console: Average.

System type	Peripheral device	kWh savings	Summer kW savings					Winter kW savings				
			Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
Home office	Computer: Desktop	37.5	0.0016	0.0021	0.0018	0.0015	0.0032	0.0044	0.0043	0.0042	0.0042	0.0043
	Computer: Laptop	38.2	0.0016	0.0022	0.0018	0.0015	0.0033	0.0045	0.0044	0.0043	0.0043	0.0044
	Computer monitor: CRT	15.7	0.0007	0.0010	0.0008	0.0007	0.0015	0.0020	0.0020	0.0020	0.0019	0.0020
	Computer monitor: LCD	8.3	0.0004	0.0005	0.0004	0.0004	0.0008	0.0011	0.0011	0.0010	0.0010	0.0010
	Computer speakers	15.7	0.0008	0.0010	0.0008	0.0007	0.0015	0.0020	0.0020	0.0020	0.0020	0.0020
	Copier	12.9	0.0005	0.0006	0.0005	0.0004	0.0010	0.0013	0.0013	0.0013	0.0013	0.0013
	Fax machine: Inkjet	46.2	0.0017	0.0023	0.0019	0.0016	0.0035	0.0047	0.0047	0.0046	0.0045	0.0046
	Fax machine: Laser	19.7	0.0007	0.0010	0.0008	0.0007	0.0015	0.0020	0.0020	0.0019	0.0019	0.0020
	Printer: Inkjet	13.3	0.0005	0.0007	0.0005	0.0005	0.0010	0.0014	0.0013	0.0013	0.0013	0.0013
	Printer: Laser	37.9	0.0014	0.0019	0.0015	0.0013	0.0029	0.0039	0.0038	0.0037	0.0037	0.0038
	Scanner	18.0	0.0007	0.0009	0.0007	0.0006	0.0014	0.0019	0.0018	0.0018	0.0018	0.0018
	Home office system[541]	87.1	0.0037	0.0049	0.0041	0.0034	0.0075	0.0101	0.0100	0.0098	0.0097	0.0098
Upstream/ midstream	Unspecified system[542]	178.5	0.0084	0.0112	0.0092	0.0077	0.0170	0.0230	0.0227	0.0221	0.0219	0.0223

Table 391. APS—Tier 2 Deemed Savings

System type	kWh savings	Summer kW savings					Winter kW savings				
		Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
Home entertainment	286.3	0.021	0.028	0.023	0.019	0.043	0.058	0.058	0.056	0.056	0.057
Home office	94.0	0.007	0.009	0.008	0.006	0.014	0.019	0.019	0.018	0.018	0.019
Upstream/midstream	190.2	0.014	0.019	0.015	0.013	0.029	0.039	0.038	0.037	0.037	0.038

[541] Assuming Computer: desktop, computer monitor: LCD, computer speakers, and printer: average.
[542] Average of *home entertainment* and *home office system* averages.

Claimed Peak Demand Savings

Refer to Volume 1, Section 4 for further details on peak demand savings and methodology.

Additional Calculators and Tools

Not applicable.

Measure Life and Lifetime Savings

The estimated useful life (EUL) is 10 years for a Tier 1 APS, according to the 2011 NYSERDA Advanced Power Strip Research Report.[543] While Tier 2 APS is not covered by the NYSERDA report, assume the same 10-year EUL for Tier 2 APS.

Program Tracking Data and Evaluation Requirements

Primary inputs and contextual data that should be specified and tracked by the program database to inform the evaluation and apply the savings properly are:

- Unit quantity
- Manufacturer and model number
- APS type (Tier 1 or Tier 2)
- System or peripheral type
- Climate zone
- Proof of purchase – including date of purchase and quantity
    - Alternative: photo of unit installed or another pre-approved method of installation verification.

References and Efficiency Standards

Petitions and Rulings

Not applicable.

Relevant Standards and Reference Sources

Please refer to measure citations for relevant standards and reference sources.

[543] New York State Energy Research and Development Authority (NYSERDA), "Advanced Power Strip Research Report". August 2011. Page 30.

Document Revision History

Table 392. APS—Revision History

TRM version	Date	Description of change
v7.0	10/2019	TRM v7.0 origin.
v8.0	10/2020	TRM v8.0 update. No revision.
v9.0	10/2021	TRM v9.0 update. Updated savings with current coincidence factors.
v10.0	10/2022	TRM v10.0 update. Corrected typos in deemed savings tables from TRM v9.0 update.

2.5.11 ENERGY STAR® Electric Vehicle Supply Equipment

TRM Measure ID: R-AP-EV

Market Sector: Residential

Measure Category: Appliance

Applicable Business Types: Single-family, manufactured

Fuels Affected: Electricity

Decision/Action Type: Retrofit, new construction

Program Delivery Type: Prescriptive

Deemed Savings Type: Look-up tables

Savings Methodology: Engineering algorithms and estimates

Measure Description

This measure applies to the installation of ENERGY STAR qualified Level 2 electric vehicle supply equipment (EVSE) at a residential site. EVSE is the infrastructure that enables plug-in electric vehicles (PEV) to charge onboard batteries. Level 2 EVSE require 240-volt electrical service. This measure provides deemed savings for the energy efficiency improvement of an ENERGY STAR EVSE over a standard or non-ENERGY STAR EVSE.

Eligibility Criteria

Eligible equipment includes an ENERGY STAR qualified Level 2 EVSE installed at a residence. The EVSE may be installed for use on either an all-battery electric vehicle (BEV) or a plug-in hybrid electric vehicle (PHEV). Multifamily buildings should use the commercial EVSE measure.

Baseline Condition

The baseline condition is a non-ENERGY STAR qualified Level 2 EVSE.

High-Efficiency Condition

The high-efficiency EVSE is a Level 2 EVSE compliant with ENERGY STAR Final Version 1.1 Requirements for eligible electric vehicle supply equipment effective March 31, 2021.[544] Energy efficiency service providers are expected to comply with the latest ENERGY STAR requirements.

[544] ENERGY STAR® Electric Vehicle Supply Equipment Final Version 1.1 Program Requirements. https://www.energystar.gov/sites/default/files/ENERGY%20STAR%20V1.1%20DC%20EVSE%20Final%20Specification_0.pdf.

Energy and Demand Savings Methodology

Savings Algorithms and Input Variables

Savings for EVSE come from efficiency gains of the ENERGY STAR equipment during operating modes when the vehicle is plugged in but not charging and when not plugged in. Deemed savings are calculated according to the following algorithms.

Demand Savings Algorithms

$$Peak\ Demand\ Savings\ [\Delta kW] = \frac{\Delta kWh \times HCF \times DCF}{hours_{p,c}}$$

Equation 162

Where:

ΔkWh = *Energy savings (Table 394)*

HCF = *Hourly coincidence factor (Table 393)*

DCF = *Daily coincidence factor*[545] *= 0.88*

$hours_{p,c}$ = *Hours per day vehicle is plugged in and charging = 2.4 hr* [546]

Table 393. EVSE—Coincidence Factors[547]

Climate zone	Summer	Winter
Zone 1: Amarillo	0.044	0.058
Zone 2: Dallas	0.040	0.053
Zone 3: Houston	0.043	0.041
Zone 4: Corpus Christi	0.042	0.059
Zone 5: El Paso	0.033	0.085

Deemed Energy Savings Tables

Table 394 presents the deemed energy savings per EVSE. Networked chargers refer to EVSE that are connected remotely to a larger network and are part of an infrastructure system of connected chargers.

[545] Idaho National Lab (INL) EV Project, June 2015, "Characterize the Demand and Energy Characteristics of Residential Electric Vehicle Supply Equipment," page 6. Eighty-eight percent of PEV owners charge every day.

[546] INL, page 5. A vehicle plugged in for 11.7 hours and charging for 2.4 hours leaves 9.3 hours when it is plugged in and not charging.

[547] Probability weighted peak load factors are calculated according to the method in Section 4 of the Texas TRM Vol 1 using data from 3 studies: CCET Wind Integration in ERCOT, Avista Utilities Semi-Annual Report on Electric Vehicle Supply, and Xcel CO EVCS Pilot.

Table 394. EVSE—Energy Savings (kWh)[548]

EVSE type	Steady state charging (kWh)	Standby mode (kWh)	Total savings (kWh)
Non-networked charger	18	22	40
Networked charger		53	71

Deemed Summer and Winter Demand Savings Tables

Table 395 presents the deemed summer and winter peak kW savings per EVSE.

Table 395. EVSE—Summer/Winter Peak Demand Savings (kW)[549]

Climate Zone	Summer	Winter
Zone 1: Amarillo	0.0009	0.0012
Zone 2: Dallas	0.0008	0.0011
Zone 3: Houston	0.0009	0.0008
Zone 4: Corpus Christi	0.0009	0.0012
Zone 5: El Paso	0.0007	0.0017

Claimed Peak Demand Savings

Refer to Volume 1, Section 4 for further details on peak demand savings and methodology.

Additional Calculators and Tools

Not applicable.

Measure Life and Lifetime Savings

The estimated useful life (EUL) for an EVSE is assumed to be 10 years.[550]

Program Tracking Data and Evaluation Requirements

Primary inputs and contextual data that should be specified and tracked by the program database to inform the evaluation and apply the savings properly:

- Climate zone

[548] ENERGY STAR® Market and Industry Scoping Report Electric Vehicle Supply Equipment (EVSE), September 2013. https://www.energystar.gov/sites/default/files/asset/document/Electric_Vehicle_Scoping_Report.pdf.

[549] Demand savings are only presented for steady state charging because those savings are higher than demand for plugged-in standby mode.

[550] US Department of Energy Vehicle Technologies Office, November 2015, "Costs Associated with Non-Residential Electric Vehicle Supply Equipment" p. 21. https://afdc.energy.gov/files/u/publication/evse_cost_report_2015.pdf.

- EVSE type (networked, non-networked)
- ESVE quantity
- EVSE manufacturer and model number
- Vehicle year, make, and model (if available)
- Estimated number of miles driven per day (if available)

References and Efficiency Standards

Petitions and Rulings

Not applicable.

Relevant Standards and Reference Sources

Please refer to measure citations for relevant standards and reference sources.

Document Revision History

Table 396. EVSE—Revision History

TRM version	Date	Description of change
v7.0	10/2019	TRM v7.0 origin.
v8.0	10/2020	TRM v8.0 update. Updated deemed savings tables
v9.0	10/2021	TRM v9.0 update. Updated documentation requirements.
v10.0	10/2022	TRM v10.0 update. Verified compliance with ENERGY STAR Final Version 1.1 Requirements. Updated savings calculation assumptions, deemed savings, and documentation requirements.

2.5.12 Induction Cooking

TRM Measure ID: R-AP-IC

Market Sector: Residential

Measure Category: Appliances

Applicable Building Types: Single-family, multifamily, manufactured

Fuels Affected: Electricity

Decision/Action Type(s): Retrofit, new construction

Program Delivery Type(s): Prescriptive

Deemed Savings Type: Look-up tables

Savings Methodology: Engineering algorithms and estimates

Measure Description

Residential cooking appliances include ovens, cooktops, and full ranges. A full range consists of an oven with a built-in cooktop. An induction range is an electric oven with a built-in induction cooktop.

Induction technology works on the principle of magnetic induction, where excited eddy currents in ferromagnetic cookware within the presence of an oscillating magnetic field dissipate heat through the Joule effect. This heat is directly generated by the cookware and is transmitted to the food within it, lessening thermal condition heat loss between the heating element and the cookware. Induction cooktops include a switching-power electronics circuit that delivers high-frequency current to a planar coil of wire embedded in the cooking surface. The cookware is magnetically coupled to the coil by the oscillating magnetic field. Current flows in the cooking vessel due to the low resistance of the metal. Resistance is a function of permeability and resistivity of the cookware as well as the frequency of excitation. Typical induction cooktops operate at switching frequency between 25 kHz and 50 kHz, which restricts coupling to ferromagnetic cookware such as cast iron, and some alloys of stainless steel.[551]

According to manufacturers, induction cooktops heat food faster, are easier to clean, are less likely to burn those using them, and have a higher cooking efficiency than electric resistance cooktops.

Eligibility Criteria

This measure requires the installation of an electric range with an induction cooktop or a standalone induction cooktop in a residential application. This measure assumes the use of small cookware typical of residential applications.

[551] Sweeney, M., J. Dols, B. Fortenbery, and F. Sharp (EPRI), "Induction Cooking Technology Design and Assessment." Proceedings of the 2014 ACEEE Summer Study on Energy Efficiency in Buildings, p. 9-370. https://www.aceee.org/files/proceedings/2014/data/papers/9-702.pdf.

Baseline Condition

The baseline condition is defined as an electric range with electric resistance cooktop or a standalone electric resistance cooktop. This measure assumes a default of four burners.

Table 397. Induction Cooking—Baseline Electric Resistance Cooktop Energy Consumption[552]

Number of burners	Electric cooktop baseline kWh
0	84
1	89
2	95
3	101
4	106
5	112
6	118
7+	124

High-Efficiency Condition

The high efficiency condition is defined as an electric range with an induction cooktop or a standalone induction cooktop.

Energy and Demand Savings Methodology

Savings Algorithms and Input Variables

Energy Savings Algorithms

Energy savings are calculated as the difference between the baseline and high-efficiency condition unit energy consumption (UEC). These exclude HVAC interactive effects or savings due to reduced kitchen hood consumption. Range oven cooking efficiency varies by cooktop type. Ranges with electric resistance and induction cooktops both have electric resistance oven components. Therefore, baseline and high-efficiency condition oven cooking efficiencies are equivalent and are excluded from the savings calculation.

$$Energy\ Savings\ [\Delta kWh] = UEC_{base} - UEC_{IC}$$

Equation 163

[552] "Plug Loads and Lighting Modeling," Codes and Standards Enhancement Initiative (CASE). 2016 California Building Energy Efficiency Standards. June 2016. Table 35. https://www.caetrm.com/media/reference-documents/2016_T24CASE_Report_-_Plug_Load_and_Ltg_Modeling_-_June_2016.pdf.

$$UEC_{IC} = UEC_{base} \times \frac{CE_{base}}{CE_{IC}}$$

Equation 164

Where:

UEC_{base}	=	*Baseline annual unit energy consumption [kWh]; see Table 206*
UEC_{IC}	=	*Induction cooking annual unit energy consumption [kWh]*
CE_{base}	=	*Baseline cooking efficiency = 75 percent*[553]
CE_{IC}	=	*Induction cooking efficiency = 85 percent*[554]

Summer Demand Savings Algorithms

$$Peak\ Demand\ Savings\ [\Delta kW] = \frac{kWh_{savings}}{8{,}760} \times CF_{S/W}$$

Equation 165

8,760	=	*Total hours per year*
$CF_{S/W}$	=	*Seasonal peak coincidence factor (Table 398)*

Table 398. Induction Cooking—Coincidence Factors[555]

Season	Climate Zone 1: Amarillo	Climate Zone 2: Dallas	Climate Zone 3: Houston	Climate Zone 4: Corpus Christi	Climate Zone 5: El Paso
Summer	0.003	0.003	0.003	0.003	0.002
Winter	0.009	0.008	0.007	0.008	0.010

553 "2021-2022 Residential Induction Cooking Tops," ENERGY STAR®. https://www.energystar.gov/about/2021_residential_induction_cooking_tops#:~:text=The%20per%20unit%20efficiency%20of,times%20more%20efficient%20than%20gas.

554 Ibid.

555 Calculated according to TX TRM Volume 1, Section 4 using data from the US DOE Building America B10 Benchmark load profiles for cooking equipment. Summer profiles include April through September, and winter profiles include October through March. https://www.energy.gov/eere/buildings/building-america-analysis-spreadsheets.

Deemed Energy Savings Tables

For all applications, this measure assumes a default value of four burners.[556]

Table 399. Induction Cooking—Energy Savings (kWh)

Number of burners	kWh savings
4	12

Deemed Summer Demand Savings Tables

For all applications, this measure assumes a default value of four burners.

Table 400. Induction Cooking—Summer Peak Demand Savings (kW)

Number of burners	Climate Zone 1: Amarillo	Climate Zone 2: Dallas	Climate Zone 3: Houston	Climate Zone 4: Corpus Christi	Climate Zone 5: El Paso
4	0.000004	0.000004	0.000004	0.000004	0.000003

Deemed Winter Demand Savings Tables

For all applications, this measure assumes a default value of four burners.

Table 401. Induction Cooking—Winter Peak Demand Savings (kW)

Number of burners	Climate Zone 1: Amarillo	Climate Zone 2: Dallas	Climate Zone 3: Houston	Climate Zone 4: Corpus Christi	Climate Zone 5: El Paso
4	0.000013	0.000011	0.000010	0.000011	0.000014

Claimed Peak Demand Savings

Refer to Volume 1, Section 4 for further details on peak demand savings and methodology.

Additional Calculators and Tools

Not applicable.

Measure Life and Lifetime Savings

The estimated useful life (EUL) of an induction cooktop is 16 years based on the average lifetime specified for electric cooktops in the 2016 DOE life-cycle cost tool for residential cooking products.[557]

[556] Savings for 0–7+ burners only vary from 10–15 kWh.

Program Tracking Data and Evaluation Requirements

Primary inputs and contextual data that should be specified and tracked by the program database to inform the evaluation and apply the savings properly are:

- Baseline unit type (electric range with electric resistance cooktop, standalone electric resistance cooktop)
- New unit type (electric range with induction cooktop, standalone induction cooktop)
- Manufacturer and model number
- Unit quantity
- Burner quantity
- Proof of purchase – with date of purchase and quantity
    - Alternative: photo of unit installed or another pre-approved method of installation verification

References and Efficiency Standards

Petitions and Rulings

Not applicable.

Relevant Standards and Reference Sources

Please refer to measure citations for relevant standards and reference sources.

Document Revision History

Table 402. Induction Cooking—Revision History

TRM version	Date	Description of change
v10.0	10/2022	TRM v10.0 origin.

[557] US Department of Energy (DOE), Energy Efficiency and Renewable Energy Office (EERE). 2016 SNOPR Analytical Tools: Life-Cycle Cost and Payback Period Analysis Spreadsheet. "Cooking_Pds_LCC_SNOPR_DOE_2016_publication.xlsm." Dockett EERE-2014-BT-STD-0005.

APPENDIX A: CENTRAL HEAT PUMPS WITHOUT SEER2 RATINGS DEEMED SAVINGS TABLES

Deemed Energy Savings Tables[558]

Table 403 through Table 442 present the energy savings (kWh) for all five Texas climate zones. In each table, the capacity of the efficient unit is represented in the columns and the capacity of the existing unit is represented in the rows. The savings are in the intersection of the appropriate efficient and existing capacities. Replacements where there has been to change in capacity are highlighted in light blue.

The rightsizing savings specified in the tables below are only applicable to replace-on-burnout and early retirement projects. New construction projects are not eligible to receive deemed savings for system rightsizing.[559]

Climate Zone 1: Panhandle Region, Amarillo

Cooling, New Construction

Table 403. Central Energy Savings (Cooling kWh) for 14.0 SEER Baseline—Zone 1

	SEER Range						
Size (Btuh)	14.5–14.9	15.0–15.9	16.0–16.9	17.0–17.9	18.0–20.9	21.0-23.9	24.0+
< 15,000	43	83	154	264	307	411	490
15,000-20,999	65	124	231	396	461	617	735
21,000-26,999	86	166	307	529	615	822	980
27,000-32,999	108	207	384	661	769	1,028	1,225
33,000-38,999	129	248	461	793	922	1,234	1,470
39,000-44,999	151	290	538	925	1,076	1,439	1,715
45,000-53,999	172	331	615	1,057	1,230	1,645	1,960
54,000-64,999	215	414	769	1,322	1,537	2,056	2,450

[558] Rated capacity ranges are specified based on normal rounding convention between capacity categories (values at and above the midpoint round up, while values below the midpoint round down).
[559] For projects using a custom baseline, see TRM Volume 4.

Cooling, Replace-on-Burnout

Table 404. Central Energy Savings (Cooling kWh) for 13.08 SEER Baseline—Zone 1

14.5-14.9 SEER								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	119							
15,000-20,999	695	178						
21,000-26,999	1,271	754	237					
27,000-32,999	1,847	1,330	813	297				
33,000-38,999	2,423	1,906	1,389	873	356			
39,000-44,999	2,998	2,482	1,965	1,449	932	416		
45,000-53,999	3,574	3,058	2,541	2,025	1,508	992	475	
54,000-64,999	4,726	4,210	3,693	3,177	2,660	2,143	1,627	594
15.0-15.9 SEER								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	158							
15,000-20,999	734	238						
21,000-26,999	1,310	814	317					
27,000-32,999	1,886	1,390	893	396				
33,000-38,999	2,462	1,966	1,469	972	475			
39,000-44,999	3,038	2,541	2,045	1,548	1,051	555		
45,000-53,999	3,614	3,117	2,621	2,124	1,627	1,131	634	
54,000-64,999	4,766	4,269	3,773	3,276	2,779	2,283	1,786	792

16.0-16.9 SEER								
Size (Btuh) Post	< 15,000	15,000-20,999	21,000-26,999	27,000-32,999	33,000-38,999	39,000-44,999	45,000-53,999	54,000-64,999
Size (Btuh) Pre								
< 15,000	229							
15,000-20,999	805	344						
21,000-26,999	1,381	920	459					
27,000-32,999	1,957	1,496	1,035	574				
33,000-38,999	2,533	2,072	1,611	1,150	688			
39,000-44,999	3,109	2,648	2,187	1,725	1,264	803		
45,000-53,999	3,685	3,224	2,763	2,301	1,840	1,379	918	
54,000-64,999	4,837	4,376	3,915	3,453	2,992	2,531	2,070	1,147
17.0-17.9 SEER								
Size (Btuh) Post	< 15,000	15,000-20,999	21,000-26,999	27,000-32,999	33,000-38,999	39,000-44,999	45,000-53,999	54,000-64,999
Size (Btuh) Pre								
< 15,000	340							
15,000-20,999	916	510						
21,000-26,999	1,492	1,086	680					
27,000-32,999	2,068	1,662	1,256	850				
33,000-38,999	2,644	2,238	1,832	1,426	1,020			
39,000-44,999	3,220	2,814	2,408	2,002	1,596	1,190		
45,000-53,999	3,796	3,390	2,984	2,578	2,172	1,766	1,360	
54,000-64,999	4,948	4,542	4,136	3,730	3,324	2,918	2,512	1,700
18.0-20.9 SEER								
Size (Btuh) Post	< 15,000	15,000-20,999	21,000-26,999	27,000-32,999	33,000-38,999	39,000-44,999	45,000-53,999	54,000-64,999
Size (Btuh) Pre								
< 15,000	383							
15,000-20,999	959	575						
21,000-26,999	1,535	1,151	766					
27,000-32,999	2,111	1,727	1,342	958				
33,000-38,999	2,687	2,303	1,918	1,534	1,149			
39,000-44,999	3,263	2,879	2,494	2,110	1,725	1,341		
45,000-53,999	3,839	3,454	3,070	2,686	2,301	1,917	1,533	
54,000-64,999	4,991	4,606	4,222	3,838	3,453	3,069	2,684	1,916

21.0-23.9 SEER								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	487							
15,000-20,999	1,063	730						
21,000-26,999	1,639	1,306	974					
27,000-32,999	2,215	1,882	1,550	1,217				
33,000-38,999	2,791	2,458	2,126	1,793	1,461			
39,000-44,999	3,367	3,034	2,702	2,369	2,037	1,704		
45,000-53,999	3,943	3,610	3,278	2,945	2,613	2,280	1,948	
54,000-64,999	5,094	4,762	4,430	4,097	3,765	3,432	3,100	2,435
24.0+ SEER								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	566							
15,000-20,999	1,142	849						
21,000-26,999	1,718	1,425	1,132					
27,000-32,999	2,294	2,001	1,708	1,414				
33,000-38,999	2,870	2,577	2,283	1,990	1,697			
39,000-44,999	3,446	3,152	2,859	2,566	2,273	1,980		
45,000-53,999	4,021	3,728	3,435	3,142	2,849	2,556	2,263	
54,000-64,999	5,173	4,880	4,587	4,294	4,001	3,708	3,415	2,829

Cooling, Early Retirement

Table 405. Central Energy Savings (Cooling kWh) for 12.44 SEER Baseline—Zone 1

14.5-14.9 SEER								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	178							
15,000-20,999	784	267						
21,000-26,999	1,389	873	356					
27,000-32,999	1,995	1,478	962	445				
33,000-38,999	2,600	2,084	1,567	1,051	534			
39,000-44,999	3,206	2,689	2,173	1,656	1,140	623		
45,000-53,999	3,811	3,295	2,778	2,262	1,745	1,229	712	
54,000-64,999	5,023	4,506	3,989	3,473	2,956	2,440	1,923	890
15.0-15.9 SEER								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	218							
15,000-20,999	823	327						
21,000-26,999	1,429	932	435					
27,000-32,999	2,034	1,538	1,041	544				
33,000-38,999	2,640	2,143	1,647	1,150	653			
39,000-44,999	3,246	2,749	2,252	1,756	1,259	762		
45,000-53,999	3,851	3,354	2,858	2,361	1,864	1,368	871	
54,000-64,999	5,062	4,566	4,069	3,572	3,076	2,579	2,082	1,089

16.0-16.9 SEER								
Size (Btuh) Post	< 15,000	15,000-20,999	21,000-26,999	27,000-32,999	33,000-38,999	39,000-44,999	45,000-53,999	54,000-64,999
Size (Btuh) Pre								
< 15,000	289							
15,000-20,999	894	433						
21,000-26,999	1,500	1,039	577					
27,000-32,999	2,105	1,644	1,183	722				
33,000-38,999	2,711	2,250	1,789	1,327	866			
39,000-44,999	3,317	2,855	2,394	1,933	1,472	1,010		
45,000-53,999	3,922	3,461	3,000	2,538	2,077	1,616	1,155	
54,000-64,999	5,133	4,672	4,211	3,750	3,288	2,827	2,366	1,443
17.0-17.9 SEER								
Size (Btuh) Post	< 15,000	15,000-20,999	21,000-26,999	27,000-32,999	33,000-38,999	39,000-44,999	45,000-53,999	54,000-64,999
Size (Btuh) Pre								
< 15,000	399							
15,000-20,999	1,005	599						
21,000-26,999	1,610	1,204	799					
27,000-32,999	2,216	1,810	1,404	998				
33,000-38,999	2,822	2,416	2,010	1,604	1,198			
39,000-44,999	3,427	3,021	2,615	2,209	1,803	1,397		
45,000-53,999	4,033	3,627	3,221	2,815	2,409	2,003	1,597	
54,000-64,999	5,244	4,838	4,432	4,026	3,620	3,214	2,808	1,996
18.0-20.9 SEER								
Size (Btuh) Post	< 15,000	15,000-20,999	21,000-26,999	27,000-32,999	33,000-38,999	39,000-44,999	45,000-53,999	54,000-64,999
Size (Btuh) Pre								
< 15,000	442							
15,000-20,999	1,048	664						
21,000-26,999	1,654	1,269	885					
27,000-32,999	2,259	1,875	1,490	1,106				
33,000-38,999	2,865	2,480	2,096	1,712	1,327			
39,000-44,999	3,470	3,086	2,702	2,317	1,933	1,548		
45,000-53,999	4,076	3,691	3,307	2,923	2,538	2,154	1,770	
54,000-64,999	5,287	4,903	4,518	4,134	3,750	3,365	2,981	2,212

21.0-23.9 SEER								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	546							
15,000-20,999	1,152	819						
21,000-26,999	1,757	1,425	1,092					
27,000-32,999	2,363	2,030	1,698	1,365				
33,000-38,999	2,968	2,636	2,304	1,971	1,639			
39,000-44,999	3,574	3,242	2,909	2,577	2,244	1,912		
45,000-53,999	4,180	3,847	3,515	3,182	2,850	2,517	2,185	
54,000-64,999	5,391	5,058	4,726	4,393	4,061	3,728	3,396	2,731
24.0+ SEER								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	625							
15,000-20,999	1,231	938						
21,000-26,999	1,836	1,543	1,250					
27,000-32,999	2,442	2,149	1,856	1,563				
33,000-38,999	3,047	2,754	2,461	2,168	1,875			
39,000-44,999	3,653	3,360	3,067	2,774	2,481	2,188		
45,000-53,999	4,259	3,965	3,672	3,379	3,086	2,793	2,500	
54,000-64,999	5,470	5,177	4,884	4,591	4,297	4,004	3,711	3,125

Table 406. Central Energy Savings (Cooling kWh) for 10.0 SEER Baseline—Zone 1

14.5-14.9 SEER								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	474							
15,000-20,999	1,227	710						
21,000-26,999	1,980	1,464	947					
27,000-32,999	2,734	2,217	1,700	1,184				
33,000-38,999	3,487	2,970	2,454	1,937	1,421			
39,000-44,999	4,240	3,724	3,207	2,690	2,174	1,657		
45,000-53,999	4,994	4,477	3,960	3,444	2,927	2,411	1,894	
54,000-64,999	6,500	5,984	5,467	4,950	4,434	3,917	3,401	2,368
15.0-15.9 SEER								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	513							
15,000-20,999	1,267	770						
21,000-26,999	2,020	1,523	1,027					
27,000-32,999	2,773	2,277	1,780	1,283				
33,000-38,999	3,527	3,030	2,533	2,036	1,540			
39,000-44,999	4,280	3,783	3,287	2,790	2,293	1,796		
45,000-53,999	5,033	4,537	4,040	3,543	3,046	2,550	2,053	
54,000-64,999	6,540	6,043	5,547	5,050	4,553	4,056	3,560	2,566

16.0-16.9 SEER								
Size (Btuh) Post	< 15,000	15,000-20,999	21,000-26,999	27,000-32,999	33,000-38,999	39,000-44,999	45,000-53,999	54,000-64,999
Size (Btuh) Pre								
< 15,000	584							
15,000-20,999	1,338	876						
21,000-26,999	2,091	1,630	1,168					
27,000-32,999	2,844	2,383	1,922	1,461				
33,000-38,999	3,598	3,136	2,675	2,214	1,753			
39,000-44,999	4,351	3,890	3,428	2,967	2,506	2,045		
45,000-53,999	5,104	4,643	4,182	3,721	3,259	2,798	2,337	
54,000-64,999	6,611	6,150	5,688	5,227	4,766	4,305	3,844	2,921
17.0-17.9 SEER								
Size (Btuh) Post	< 15,000	15,000-20,999	21,000-26,999	27,000-32,999	33,000-38,999	39,000-44,999	45,000-53,999	54,000-64,999
Size (Btuh) Pre								
< 15,000	695							
15,000-20,999	1,448	1,042						
21,000-26,999	2,201	1,796	1,390					
27,000-32,999	2,955	2,549	2,143	1,737				
33,000-38,999	3,708	3,302	2,896	2,490	2,084			
39,000-44,999	4,461	4,056	3,650	3,244	2,838	2,432		
45,000-53,999	5,215	4,809	4,403	3,997	3,591	3,185	2,779	
54,000-64,999	6,721	6,316	5,910	5,504	5,098	4,692	4,286	3,474
18.0-20.9 SEER								
Size (Btuh) Post	< 15,000	15,000-20,999	21,000-26,999	27,000-32,999	33,000-38,999	39,000-44,999	45,000-53,999	54,000-64,999
Size (Btuh) Pre								
< 15,000	738							
15,000-20,999	1,491	1,107						
21,000-26,999	2,245	1,860	1,476					
27,000-32,999	2,998	2,614	2,229	1,845				
33,000-38,999	3,751	3,367	2,983	2,598	2,214			
39,000-44,999	4,505	4,120	3,736	3,351	2,967	2,583		
45,000-53,999	5,258	4,874	4,489	4,105	3,720	3,336	2,952	
54,000-64,999	6,765	6,380	5,996	5,612	5,227	4,843	4,458	3,690

21.0-23.9 SEER								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	842							
15,000-20,999	1,595	1,263						
21,000-26,999	2,348	2,016	1,683					
27,000-32,999	3,102	2,769	2,437	2,104				
33,000-38,999	3,855	3,523	3,190	2,858	2,525			
39,000-44,999	4,608	4,276	3,943	3,611	3,278	2,946		
45,000-53,999	5,362	5,029	4,697	4,364	4,032	3,699	3,367	
54,000-64,999	6,868	6,536	6,203	5,871	5,538	5,206	4,874	4,209
24.0+ SEER								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	921							
15,000-20,999	1,674	1,381						
21,000-26,999	2,427	2,134	1,841					
27,000-32,999	3,181	2,888	2,594	2,301				
33,000-38,999	3,934	3,641	3,348	3,055	2,762			
39,000-44,999	4,687	4,394	4,101	3,808	3,515	3,222		
45,000-53,999	5,441	5,148	4,854	4,561	4,268	3,975	3,682	
54,000-64,999	6,947	6,654	6,361	6,068	5,775	5,482	5,189	4,603

Heating, New Construction/Replace-on-Burnout

Table 407. Central Energy Savings (Heating kWh) for 8.2 HSPF Baseline—Zone 1

8.5-8.9 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	139							
15,000-20,999	1,177	208						
21,000-26,999	2,216	1,247	278					
27,000-32,999	3,254	2,285	1,316	347				
33,000-38,999	4,293	3,324	2,355	1,386	417			
39,000-44,999	5,331	4,362	3,393	2,424	1,455	486		
45,000-53,999	6,370	5,401	4,432	3,463	2,493	1,524	555	
54,000-64,999	8,447	7,478	6,509	5,539	4,570	3,601	2,632	694
9.0-9.4 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	297							
15,000-20,999	1,335	445						
21,000-26,999	2,373	1,483	593					
27,000-32,999	3,412	2,522	1,632	741				
33,000-38,999	4,450	3,560	2,670	1,780	890			
39,000-44,999	5,489	4,599	3,708	2,818	1,928	1,038		
45,000-53,999	6,527	5,637	4,747	3,857	2,967	2,076	1,186	
54,000-64,999	8,604	7,714	6,824	5,934	5,043	4,153	3,263	1,483

9.5-9.9 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	378							
15,000-20,999	1,417	568						
21,000-26,999	2,455	1,606	757					
27,000-32,999	3,494	2,645	1,795	946				
33,000-38,999	4,532	3,683	2,834	1,984	1,135			
39,000-44,999	5,571	4,721	3,872	3,023	2,174	1,324		
45,000-53,999	6,609	5,760	4,911	4,061	3,212	2,363	1,514	
54,000-64,999	8,686	7,837	6,988	6,138	5,289	4,440	3,591	1,892
10.0-10.4 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	409							
15,000-20,999	1,448	614						
21,000-26,999	2,486	1,652	818					
27,000-32,999	3,525	2,691	1,857	1,023				
33,000-38,999	4,563	3,729	2,895	2,061	1,228			
39,000-44,999	5,602	4,768	3,934	3,100	2,266	1,432		
45,000-53,999	6,640	5,806	4,972	4,138	3,304	2,471	1,637	
54,000-64,999	8,717	7,883	7,049	6,215	5,381	4,548	3,714	2,046
10.5-10.9 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	439							
15,000-20,999	1,477	658						
21,000-26,999	2,516	1,697	878					
27,000-32,999	3,554	2,735	1,916	1,097				
33,000-38,999	4,593	3,774	2,955	2,136	1,316			
39,000-44,999	5,631	4,812	3,993	3,174	2,355	1,536		
45,000-53,999	6,670	5,851	5,032	4,212	3,393	2,574	1,755	
54,000-64,999	8,747	7,928	7,108	6,289	5,470	4,651	3,832	2,194

11.0-11.4 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	467							
15,000-20,999	1,506	701						
21,000-26,999	2,544	1,740	935					
27,000-32,999	3,583	2,778	1,973	1,168				
33,000-38,999	4,621	3,816	3,012	2,207	1,402			
39,000-44,999	5,660	4,855	4,050	3,245	2,441	1,636		
45,000-53,999	6,698	5,893	5,089	4,284	3,479	2,674	1,870	
54,000-64,999	8,775	7,970	7,166	6,361	5,556	4,751	3,946	2,337
11.5-11.9 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	495							
15,000-20,999	1,533	742						
21,000-26,999	2,572	1,781	990					
27,000-32,999	3,610	2,819	2,028	1,237				
33,000-38,999	4,649	3,858	3,067	2,276	1,485			
39,000-44,999	5,687	4,896	4,105	3,314	2,523	1,732		
45,000-53,999	6,726	5,935	5,144	4,353	3,562	2,771	1,980	
54,000-64,999	8,803	8,012	7,221	6,430	5,639	4,848	4,057	2,475
12.0+ HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	511							
15,000-20,999	1,549	766						
21,000-26,999	2,588	1,805	1,022					
27,000-32,999	3,626	2,843	2,060	1,277				
33,000-38,999	4,665	3,882	3,099	2,316	1,533			
39,000-44,999	5,703	4,920	4,137	3,354	2,571	1,788		
45,000-53,999	6,742	5,959	5,176	4,393	3,610	2,827	2,044	
54,000-64,999	8,819	8,036	7,253	6,470	5,687	4,904	4,121	2,555

Heating, Early Retirement of a Heat Pump

Table 408. Central Energy Savings (Heating kWh) for 7.7 HSPF Baseline—Zone 1

8.5-8.9 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	336							
15,000-20,999	1,472	503						
21,000-26,999	2,609	1,640	671					
27,000-32,999	3,746	2,777	1,808	839				
33,000-38,999	4,883	3,914	2,945	1,976	1,007			
39,000-44,999	6,020	5,050	4,081	3,112	2,143	1,174		
45,000-53,999	7,156	6,187	5,218	4,249	3,280	2,311	1,342	
54,000-64,999	9,430	8,461	7,492	6,523	5,554	4,585	3,616	1,678
9.0-9.4 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	493							
15,000-20,999	1,630	740						
21,000-26,999	2,767	1,877	986					
27,000-32,999	3,904	3,013	2,123	1,233				
33,000-38,999	5,040	4,150	3,260	2,370	1,480			
39,000-44,999	6,177	5,287	4,397	3,507	2,616	1,726		
45,000-53,999	7,314	6,424	5,534	4,643	3,753	2,863	1,973	
54,000-64,999	9,588	8,697	7,807	6,917	6,027	5,137	4,246	2,466

9.5-9.9 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	575							
15,000-20,999	1,712	863						
21,000-26,999	2,849	1,999	1,150					
27,000-32,999	3,985	3,136	2,287	1,438				
33,000-38,999	5,122	4,273	3,424	2,574	1,725			
39,000-44,999	6,259	5,410	4,561	3,711	2,862	2,013		
45,000-53,999	7,396	6,547	5,697	4,848	3,999	3,149	2,300	
54,000-64,999	9,669	8,820	7,971	7,122	6,272	5,423	4,574	2,875
10.0-10.4 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	606							
15,000-20,999	1,743	909						
21,000-26,999	2,879	2,046	1,212					
27,000-32,999	4,016	3,182	2,348	1,515				
33,000-38,999	5,153	4,319	3,485	2,651	1,818			
39,000-44,999	6,290	5,456	4,622	3,788	2,954	2,120		
45,000-53,999	7,427	6,593	5,759	4,925	4,091	3,257	2,423	
54,000-64,999	9,700	8,866	8,033	7,199	6,365	5,531	4,697	3,029
10.5-10.9 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	635							
15,000-20,999	1,772	953						
21,000-26,999	2,909	2,090	1,271					
27,000-32,999	4,046	3,227	2,408	1,589				
33,000-38,999	5,183	4,364	3,545	2,726	1,906			
39,000-44,999	6,320	5,500	4,681	3,862	3,043	2,224		
45,000-53,999	7,456	6,637	5,818	4,999	4,180	3,361	2,542	
54,000-64,999	9,730	8,911	8,092	7,273	6,454	5,635	4,816	3,177

11.0-11.4 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	664							
15,000-20,999	1,801	996						
21,000-26,999	2,938	2,133	1,328					
27,000-32,999	4,074	3,270	2,465	1,660				
33,000-38,999	5,211	4,406	3,602	2,797	1,992			
39,000-44,999	6,348	5,543	4,738	3,934	3,129	2,324		
45,000-53,999	7,485	6,680	5,875	5,071	4,266	3,461	2,656	
54,000-64,999	9,758	8,954	8,149	7,344	6,539	5,735	4,930	3,320
11.5-11.9 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	692							
15,000-20,999	1,828	1,037						
21,000-26,999	2,965	2,174	1,383					
27,000-32,999	4,102	3,311	2,520	1,729				
33,000-38,999	5,239	4,448	3,657	2,866	2,075			
39,000-44,999	6,376	5,585	4,794	4,003	3,211	2,420		
45,000-53,999	7,512	6,721	5,930	5,139	4,348	3,557	2,766	
54,000-64,999	9,786	8,995	8,204	7,413	6,622	5,831	5,040	3,458
12.0+ HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	708							
15,000-20,999	1,844	1,061						
21,000-26,999	2,981	2,198	1,415					
27,000-32,999	4,118	3,335	2,552	1,769				
33,000-38,999	5,255	4,472	3,689	2,906	2,123			
39,000-44,999	6,392	5,609	4,826	4,043	3,260	2,477		
45,000-53,999	7,528	6,745	5,962	5,179	4,396	3,613	2,830	
54,000-64,999	9,802	9,019	8,236	7,453	6,670	5,887	5,104	3,538

Table 409. Central Energy Savings (Heating kWh) for 6.8 HSPF Baseline—Zone 1

8.5-8.9 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	808							
15,000-20,999	2,181	1,212						
21,000-26,999	3,554	2,585	1,616					
27,000-32,999	4,927	3,958	2,989	2,020				
33,000-38,999	6,300	5,331	4,362	3,393	2,424			
39,000-44,999	7,673	6,704	5,735	4,766	3,797	2,828		
45,000-53,999	9,046	8,077	7,108	6,139	5,170	4,201	3,232	
54,000-64,999	11,792	10,823	9,854	8,885	7,916	6,947	5,978	4,040
9.0-9.4 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	966							
15,000-20,999	2,339	1,448						
21,000-26,999	3,712	2,821	1,931					
27,000-32,999	5,085	4,195	3,304	2,414				
33,000-38,999	6,458	5,568	4,677	3,787	2,897			
39,000-44,999	7,831	6,941	6,050	5,160	4,270	3,380		
45,000-53,999	9,204	8,314	7,423	6,533	5,643	4,753	3,863	
54,000-64,999	11,950	11,060	10,169	9,279	8,389	7,499	6,609	4,828

9.5-9.9 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	1,048							
15,000-20,999	2,421	1,571						
21,000-26,999	3,794	2,944	2,095					
27,000-32,999	5,167	4,317	3,468	2,619				
33,000-38,999	6,540	5,690	4,841	3,992	3,143			
39,000-44,999	7,913	7,063	6,214	5,365	4,516	3,666		
45,000-53,999	9,286	8,436	7,587	6,738	5,889	5,039	4,190	
54,000-64,999	12,032	11,182	10,333	9,484	8,635	7,785	6,936	5,238
10.0-10.4 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	1,078							
15,000-20,999	2,451	1,617						
21,000-26,999	3,824	2,990	2,157					
27,000-32,999	5,197	4,364	3,530	2,696				
33,000-38,999	6,570	5,737	4,903	4,069	3,235			
39,000-44,999	7,943	7,110	6,276	5,442	4,608	3,774		
45,000-53,999	9,316	8,483	7,649	6,815	5,981	5,147	4,313	
54,000-64,999	12,063	11,229	10,395	9,561	8,727	7,893	7,059	5,391
10.5-10.9 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	1,108							
15,000-20,999	2,481	1,662						
21,000-26,999	3,854	3,035	2,216					
27,000-32,999	5,227	4,408	3,589	2,770				
33,000-38,999	6,600	5,781	4,962	4,143	3,324			
39,000-44,999	7,973	7,154	6,335	5,516	4,697	3,878		
45,000-53,999	9,346	8,527	7,708	6,889	6,070	5,251	4,432	
54,000-64,999	12,092	11,273	10,454	9,635	8,816	7,997	7,178	5,540

11.0-11.4 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	1,136							
15,000-20,999	2,510	1,705						
21,000-26,999	3,883	3,078	2,273					
27,000-32,999	5,256	4,451	3,646	2,841				
33,000-38,999	6,629	5,824	5,019	4,214	3,409			
39,000-44,999	8,002	7,197	6,392	5,587	4,783	3,978		
45,000-53,999	9,375	8,570	7,765	6,960	6,156	5,351	4,546	
54,000-64,999	12,121	11,316	10,511	9,706	8,902	8,097	7,292	5,682
11.5-11.9 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	1,164							
15,000-20,999	2,537	1,746						
21,000-26,999	3,910	3,119	2,328					
27,000-32,999	5,283	4,492	3,701	2,910				
33,000-38,999	6,656	5,865	5,074	4,283	3,492			
39,000-44,999	8,029	7,238	6,447	5,656	4,865	4,074		
45,000-53,999	9,402	8,611	7,820	7,029	6,238	5,447	4,656	
54,000-64,999	12,148	11,357	10,566	9,775	8,984	8,193	7,402	5,820
12.0+ HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	1,180							
15,000-20,999	2,553	1,770						
21,000-26,999	3,926	3,143	2,360					
27,000-32,999	5,299	4,516	3,733	2,950				
33,000-38,999	6,672	5,889	5,106	4,323	3,540			
39,000-44,999	8,045	7,262	6,479	5,696	4,913	4,130		
45,000-53,999	9,418	8,635	7,852	7,069	6,286	5,503	4,720	
54,000-64,999	12,164	11,381	10,598	9,815	9,032	8,249	7,466	5,900

Heating, Early Retirement of an Electric Resistance Furnace

Table 410. Central Energy Savings (Heating kWh) for 3.412 HSPF Baseline—Zone 1

8.5-8.9 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	4,313							
15,000-20,999	7,438	6,469						
21,000-26,999	10,564	9,595	8,626					
27,000-32,999	13,689	12,720	11,751	10,782				
33,000-38,999	16,815	15,846	14,876	13,907	12,938			
39,000-44,999	19,940	18,971	18,002	17,033	16,064	15,095		
45,000-53,999	23,065	22,096	21,127	20,158	19,189	18,220	17,251	
54,000-64,999	29,316	28,347	27,378	26,409	25,440	24,471	23,502	21,564
9.0-9.4 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	4,470							
15,000-20,999	7,596	6,706						
21,000-26,999	10,721	9,831	8,941					
27,000-32,999	13,847	12,957	12,066	11,176				
33,000-38,999	16,972	16,082	15,192	14,302	13,411			
39,000-44,999	20,098	19,207	18,317	17,427	16,537	15,647		
45,000-53,999	23,223	22,333	21,443	20,552	19,662	18,772	17,882	
54,000-64,999	29,474	28,584	27,694	26,803	25,913	25,023	24,133	22,352

9.5-9.9 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	4,552							
15,000-20,999	7,678	6,828						
21,000-26,999	10,803	9,954	9,105					
27,000-32,999	13,929	13,079	12,230	11,381				
33,000-38,999	17,054	16,205	15,356	14,506	13,657			
39,000-44,999	20,180	19,330	18,481	17,632	16,782	15,933		
45,000-53,999	23,305	22,456	21,606	20,757	19,908	19,059	18,209	
54,000-64,999	29,556	28,707	27,857	27,008	26,159	25,310	24,460	22,762
10.0-10.4 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	4,583							
15,000-20,999	7,709	6,875						
21,000-26,999	10,834	10,000	9,166					
27,000-32,999	13,959	13,126	12,292	11,458				
33,000-38,999	17,085	16,251	15,417	14,583	13,749			
39,000-44,999	20,210	19,376	18,543	17,709	16,875	16,041		
45,000-53,999	23,336	22,502	21,668	20,834	20,000	19,166	18,332	
54,000-64,999	29,587	28,753	27,919	27,085	26,251	25,417	24,583	22,916
10.5-10.9 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	4,613							
15,000-20,999	7,738	6,919						
21,000-26,999	10,864	10,045	9,226					
27,000-32,999	13,989	13,170	12,351	11,532				
33,000-38,999	17,115	16,295	15,476	14,657	13,838			
39,000-44,999	20,240	19,421	18,602	17,783	16,964	16,145		
45,000-53,999	23,365	22,546	21,727	20,908	20,089	19,270	18,451	
54,000-64,999	29,616	28,797	27,978	27,159	26,340	25,521	24,702	23,064

11.0-11.4 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	4,641							
15,000-20,999	7,767	6,962						
21,000-26,999	10,892	10,087	9,283					
27,000-32,999	14,018	13,213	12,408	11,603				
33,000-38,999	17,143	16,338	15,534	14,729	13,924			
39,000-44,999	20,269	19,464	18,659	17,854	17,049	16,245		
45,000-53,999	23,394	22,589	21,784	20,980	20,175	19,370	18,565	
54,000-64,999	29,645	28,840	28,035	27,231	26,426	25,621	24,816	23,207
11.5-11.9 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	4,669							
15,000-20,999	7,794	7,003						
21,000-26,999	10,920	10,129	9,338					
27,000-32,999	14,045	13,254	12,463	11,672				
33,000-38,999	17,171	16,380	15,589	14,798	14,007			
39,000-44,999	20,296	19,505	18,714	17,923	17,132	16,341		
45,000-53,999	23,422	22,631	21,839	21,048	20,257	19,466	18,675	
54,000-64,999	29,672	28,881	28,090	27,299	26,508	25,717	24,926	23,344
12.0+ HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	4,685							
15,000-20,999	7,810	7,027						
21,000-26,999	10,936	10,153	9,370					
27,000-32,999	14,061	13,278	12,495	11,712				
33,000-38,999	17,187	16,404	15,621	14,838	14,055			
39,000-44,999	20,312	19,529	18,746	17,963	17,180	16,397		
45,000-53,999	23,438	22,655	21,872	21,089	20,306	19,523	18,740	
54,000-64,999	29,688	28,905	28,122	27,339	26,556	25,773	24,990	23,424

Climate Zone 2: North Region, Dallas/Fort Worth

Cooling, New Construction

Table 411. Central Energy Savings (Cooling kWh) for 14.0 SEER Baseline—Zone 2

Size (Btuh)	SEER Range						
	14.5–14.9	15.0–15.9	16.0–16.9	17.0–17.9	18.0–20.9	21.0-23.9	24.0+
< 15,000	70	134	249	433	502	672	800
15,000-20,999	105	201	374	649	753	1,008	1,200
21,000-26,999	140	268	498	865	1,004	1,343	1,601
27,000-32,999	174	335	623	1,082	1,256	1,679	2,001
33,000-38,999	209	403	748	1,298	1,507	2,015	2,401
39,000-44,999	244	470	872	1,514	1,758	2,351	2,801
45,000-53,999	279	537	997	1,731	2,009	2,687	3,201
54,000-64,999	349	671	1,246	2,163	2,511	3,359	4,001

Cooling, Replace-on-Burnout

Table 412. Central Energy Savings (Cooling kWh) for 13.08 SEER Baseline—Zone 2

14.5-14.9 SEER								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	192							
15,000-20,999	1,126	289						
21,000-26,999	2,060	1,222	385					
27,000-32,999	2,993	2,156	1,318	481				
33,000-38,999	3,927	3,089	2,252	1,415	577			
39,000-44,999	4,860	4,023	3,186	2,348	1,511	674		
45,000-53,999	5,794	4,956	4,119	3,282	2,445	1,607	770	
54,000-64,999	7,661	6,824	5,986	5,149	4,312	3,474	2,637	962

15.0-15.9 SEER								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	257							
15,000-20,999	1,190	385						
21,000-26,999	2,124	1,319	514					
27,000-32,999	3,058	2,252	1,447	642				
33,000-38,999	3,991	3,186	2,381	1,576	771			
39,000-44,999	4,925	4,120	3,314	2,509	1,704	899		
45,000-53,999	5,858	5,053	4,248	3,443	2,638	1,833	1,028	
54,000-64,999	7,725	6,920	6,115	5,310	4,505	3,700	2,895	1,284
16.0-16.9 SEER								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	372							
15,000-20,999	1,305	558						
21,000-26,999	2,239	1,491	744					
27,000-32,999	3,173	2,425	1,677	930				
33,000-38,999	4,106	3,359	2,611	1,863	1,116			
39,000-44,999	5,040	4,292	3,544	2,797	2,049	1,302		
45,000-53,999	5,973	5,226	4,478	3,730	2,983	2,235	1,488	
54,000-64,999	7,840	7,093	6,345	5,598	4,850	4,102	3,355	1,859
17.0-17.9 SEER								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	555							
15,000-20,999	1,489	833						
21,000-26,999	2,422	1,767	1,111					
27,000-32,999	3,356	2,700	2,044	1,388				
33,000-38,999	4,290	3,634	2,978	2,322	1,666			
39,000-44,999	5,223	4,567	3,911	3,256	2,600	1,944		
45,000-53,999	6,157	5,501	4,845	4,189	3,533	2,877	2,221	
54,000-64,999	8,024	7,368	6,712	6,056	5,400	4,744	4,089	2,777

18.0-20.9 SEER								
Size (Btuh) Post	< 15,000	15,000-20,999	21,000-26,999	27,000-32,999	33,000-38,999	39,000-44,999	45,000-53,999	54,000-64,999
Size (Btuh) Pre								
< 15,000	625							
15,000-20,999	1,558	937						
21,000-26,999	2,492	1,871	1,250					
27,000-32,999	3,426	2,805	2,183	1,562				
33,000-38,999	4,359	3,738	3,117	2,496	1,875			
39,000-44,999	5,293	4,672	4,051	3,429	2,808	2,187		
45,000-53,999	6,226	5,605	4,984	4,363	3,742	3,121	2,500	
54,000-64,999	8,093	7,472	6,851	6,230	5,609	4,988	4,367	3,125
21.0-23.9 SEER								
Size (Btuh) Post	< 15,000	15,000-20,999	21,000-26,999	27,000-32,999	33,000-38,999	39,000-44,999	45,000-53,999	54,000-64,999
Size (Btuh) Pre								
< 15,000	794							
15,000-20,999	1,728	1,192						
21,000-26,999	2,662	2,125	1,589					
27,000-32,999	3,595	3,059	2,522	1,986				
33,000-38,999	4,529	3,992	3,456	2,920	2,383			
39,000-44,999	5,462	4,926	4,389	3,853	3,317	2,780		
45,000-53,999	6,396	5,859	5,323	4,787	4,250	3,714	3,178	
54,000-64,999	8,263	7,727	7,190	6,654	6,117	5,581	5,045	3,972
24.0+ SEER								
Size (Btuh) Post	< 15,000	15,000-20,999	21,000-26,999	27,000-32,999	33,000-38,999	39,000-44,999	45,000-53,999	54,000-64,999
Size (Btuh) Pre								
< 15,000	923							
15,000-20,999	1,857	1,384						
21,000-26,999	2,790	2,318	1,846					
27,000-32,999	3,724	3,252	2,779	2,307				
33,000-38,999	4,657	4,185	3,713	3,241	2,769			
39,000-44,999	5,591	5,119	4,647	4,174	3,702	3,230		
45,000-53,999	6,524	6,052	5,580	5,108	4,636	4,164	3,692	
54,000-64,999	8,391	7,919	7,447	6,975	6,503	6,031	5,559	4,615

Cooling, Early Retirement

Table 413. Central Energy Savings (Cooling kWh) for 12.44 SEER Baseline—Zone 2

14.5-14.9 SEER								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	289							
15,000-20,999	1,270	433						
21,000-26,999	2,252	1,414	577					
27,000-32,999	3,233	2,396	1,559	721				
33,000-38,999	4,215	3,378	2,540	1,703	866			
39,000-44,999	5,196	4,359	3,522	2,684	1,847	1,010		
45,000-53,999	6,178	5,341	4,503	3,666	2,829	1,991	1,154	
54,000-64,999	8,141	7,304	6,467	5,629	4,792	3,955	3,117	1,443
15.0-15.9 SEER								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	353							
15,000-20,999	1,335	529						
21,000-26,999	2,316	1,511	706					
27,000-32,999	3,298	2,493	1,687	882				
33,000-38,999	4,279	3,474	2,669	1,864	1,059			
39,000-44,999	5,261	4,456	3,651	2,846	2,040	1,235		
45,000-53,999	6,242	5,437	4,632	3,827	3,022	2,217	1,412	
54,000-64,999	8,206	7,400	6,595	5,790	4,985	4,180	3,375	1,765

16.0-16.9 SEER								
Size (Btuh) Post	< 15,000	15,000-20,999	21,000-26,999	27,000-32,999	33,000-38,999	39,000-44,999	45,000-53,999	54,000-64,999
Size (Btuh) Pre								
< 15,000	468							
15,000-20,999	1,450	702						
21,000-26,999	2,431	1,684	936					
27,000-32,999	3,413	2,665	1,917	1,170				
33,000-38,999	4,394	3,647	2,899	2,151	1,404			
39,000-44,999	5,376	4,628	3,881	3,133	2,385	1,638		
45,000-53,999	6,357	5,610	4,862	4,115	3,367	2,619	1,872	
54,000-64,999	8,321	7,573	6,825	6,078	5,330	4,583	3,835	2,340
17.0-17.9 SEER								
Size (Btuh) Post	< 15,000	15,000-20,999	21,000-26,999	27,000-32,999	33,000-38,999	39,000-44,999	45,000-53,999	54,000-64,999
Size (Btuh) Pre								
< 15,000	651							
15,000-20,999	1,633	977						
21,000-26,999	2,615	1,959	1,303					
27,000-32,999	3,596	2,940	2,284	1,629				
33,000-38,999	4,578	3,922	3,266	2,610	1,954			
39,000-44,999	5,559	4,903	4,248	3,592	2,936	2,280		
45,000-53,999	6,541	5,885	5,229	4,573	3,917	3,262	2,606	
54,000-64,999	8,504	7,848	7,192	6,536	5,881	5,225	4,569	3,257
18.0-20.9 SEER								
Size (Btuh) Post	< 15,000	15,000-20,999	21,000-26,999	27,000-32,999	33,000-38,999	39,000-44,999	45,000-53,999	54,000-64,999
Size (Btuh) Pre								
< 15,000	721							
15,000-20,999	1,703	1,081						
21,000-26,999	2,684	2,063	1,442					
27,000-32,999	3,666	3,045	2,424	1,802				
33,000-38,999	4,647	4,026	3,405	2,784	2,163			
39,000-44,999	5,629	5,008	4,387	3,766	3,145	2,523		
45,000-53,999	6,610	5,989	5,368	4,747	4,126	3,505	2,884	
54,000-64,999	8,574	7,953	7,331	6,710	6,089	5,468	4,847	3,605

21.0-23.9 SEER								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	890							
15,000-20,999	1,872	1,336						
21,000-26,999	2,854	2,317	1,781					
27,000-32,999	3,835	3,299	2,763	2,226				
33,000-38,999	4,817	4,280	3,744	3,208	2,671			
39,000-44,999	5,798	5,262	4,726	4,189	3,653	3,117		
45,000-53,999	6,780	6,244	5,707	5,171	4,635	4,098	3,562	
54,000-64,999	8,743	8,207	7,670	7,134	6,598	6,061	5,525	4,452
24.0+ SEER								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	1,019							
15,000-20,999	2,001	1,529						
21,000-26,999	2,982	2,510	2,038					
27,000-32,999	3,964	3,492	3,020	2,548				
33,000-38,999	4,945	4,473	4,001	3,529	3,057			
39,000-44,999	5,927	5,455	4,983	4,511	4,039	3,567		
45,000-53,999	6,909	6,436	5,964	5,492	5,020	4,548	4,076	
54,000-64,999	8,872	8,400	7,928	7,455	6,983	6,511	6,039	5,095

Table 414. Central Energy Savings (Cooling kWh) for 10.0 SEER Baseline—Zone 2

14.5-14.9 SEER								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	768							
15,000-20,999	1,989	1,151						
21,000-26,999	3,210	2,372	1,535					
27,000-32,999	4,431	3,593	2,756	1,919				
33,000-38,999	5,652	4,815	3,977	3,140	2,303			
39,000-44,999	6,873	6,036	5,198	4,361	3,524	2,686		
45,000-53,999	8,094	7,257	6,419	5,582	4,745	3,907	3,070	
54,000-64,999	10,536	9,699	8,862	8,024	7,187	6,350	5,512	3,838
15.0-15.9 SEER								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	832							
15,000-20,999	2,053	1,248						
21,000-26,999	3,274	2,469	1,664					
27,000-32,999	4,495	3,690	2,885	2,080				
33,000-38,999	5,716	4,911	4,106	3,301	2,496			
39,000-44,999	6,937	6,132	5,327	4,522	3,717	2,912		
45,000-53,999	8,158	7,353	6,548	5,743	4,938	4,133	3,328	
54,000-64,999	10,601	9,796	8,990	8,185	7,380	6,575	5,770	4,160

16.0-16.9 SEER								
Size (Btuh) Post	< 15,000	15,000-20,999	21,000-26,999	27,000-32,999	33,000-38,999	39,000-44,999	45,000-53,999	54,000-64,999
Size (Btuh) Pre								
< 15,000	947							
15,000-20,999	2,168	1,420						
21,000-26,999	3,389	2,642	1,894					
27,000-32,999	4,610	3,863	3,115	2,367				
33,000-38,999	5,831	5,084	4,336	3,589	2,841			
39,000-44,999	7,052	6,305	5,557	4,810	4,062	3,314		
45,000-53,999	8,274	7,526	6,778	6,031	5,283	4,535	3,788	
54,000-64,999	10,716	9,968	9,220	8,473	7,725	6,978	6,230	4,735
17.0-17.9 SEER								
Size (Btuh) Post	< 15,000	15,000-20,999	21,000-26,999	27,000-32,999	33,000-38,999	39,000-44,999	45,000-53,999	54,000-64,999
Size (Btuh) Pre								
< 15,000	1,130							
15,000-20,999	2,352	1,696						
21,000-26,999	3,573	2,917	2,261					
27,000-32,999	4,794	4,138	3,482	2,826				
33,000-38,999	6,015	5,359	4,703	4,047	3,391			
39,000-44,999	7,236	6,580	5,924	5,268	4,612	3,957		
45,000-53,999	8,457	7,801	7,145	6,489	5,833	5,178	4,522	
54,000-64,999	10,899	10,243	9,587	8,932	8,276	7,620	6,964	5,652
18.0-20.9 SEER								
Size (Btuh) Post	< 15,000	15,000-20,999	21,000-26,999	27,000-32,999	33,000-38,999	39,000-44,999	45,000-53,999	54,000-64,999
Size (Btuh) Pre								
< 15,000	1,200							
15,000-20,999	2,421	1,800						
21,000-26,999	3,642	3,021	2,400					
27,000-32,999	4,863	4,242	3,621	3,000				
33,000-38,999	6,084	5,463	4,842	4,221	3,600			
39,000-44,999	7,305	6,684	6,063	5,442	4,821	4,200		
45,000-53,999	8,527	7,905	7,284	6,663	6,042	5,421	4,800	
54,000-64,999	10,969	10,348	9,727	9,105	8,484	7,863	7,242	6,000

21.0-23.9 SEER								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	1,369							
15,000-20,999	2,591	2,054						
21,000-26,999	3,812	3,275	2,739					
27,000-32,999	5,033	4,496	3,960	3,424				
33,000-38,999	6,254	5,717	5,181	4,645	4,108			
39,000-44,999	7,475	6,939	6,402	5,866	5,330	4,793		
45,000-53,999	8,696	8,160	7,623	7,087	6,551	6,014	5,478	
54,000-64,999	11,138	10,602	10,065	9,529	8,993	8,456	7,920	6,847
24.0+ SEER								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	1,498							
15,000-20,999	2,719	2,247						
21,000-26,999	3,940	3,468	2,996					
27,000-32,999	5,161	4,689	4,217	3,745				
33,000-38,999	6,382	5,910	5,438	4,966	4,494			
39,000-44,999	7,603	7,131	6,659	6,187	5,715	5,243		
45,000-53,999	8,825	8,352	7,880	7,408	6,936	6,464	5,992	
54,000-64,999	11,267	10,795	10,323	9,851	9,378	8,906	8,434	7,490

Heating, New Construction/Replace-on-Burnout

Table 415. Central Energy Savings (Heating kWh) for 8.2 HSPF Baseline—Zone 2

8.5-8.9 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	78							
15,000-20,999	649	118						
21,000-26,999	1,220	688	157					
27,000-32,999	1,790	1,259	728	196				
33,000-38,999	2,361	1,830	1,298	767	235			
39,000-44,999	2,932	2,400	1,869	1,337	806	275		
45,000-53,999	3,502	2,971	2,440	1,908	1,377	845	314	
54,000-64,999	4,644	4,112	3,581	3,049	2,518	1,987	1,455	392
9.0-9.4 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	168							
15,000-20,999	738	251						
21,000-26,999	1,309	822	335					
27,000-32,999	1,880	1,393	906	419				
33,000-38,999	2,450	1,963	1,476	990	503			
39,000-44,999	3,021	2,534	2,047	1,560	1,073	586		
45,000-53,999	3,592	3,105	2,618	2,131	1,644	1,157	670	
54,000-64,999	4,733	4,246	3,759	3,272	2,785	2,298	1,812	838

9.5-9.9 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	214							
15,000-20,999	784	321						
21,000-26,999	1,355	891	428					
27,000-32,999	1,926	1,462	998	535				
33,000-38,999	2,496	2,033	1,569	1,105	641			
39,000-44,999	3,067	2,603	2,140	1,676	1,212	748		
45,000-53,999	3,638	3,174	2,710	2,247	1,783	1,319	855	
54,000-64,999	4,779	4,315	3,852	3,388	2,924	2,460	1,997	1,069
10.0-10.4 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	231							
15,000-20,999	802	347						
21,000-26,999	1,373	917	462					
27,000-32,999	1,943	1,488	1,033	578				
33,000-38,999	2,514	2,059	1,604	1,149	694			
39,000-44,999	3,085	2,629	2,174	1,719	1,264	809		
45,000-53,999	3,655	3,200	2,745	2,290	1,835	1,380	925	
54,000-64,999	4,797	4,341	3,886	3,431	2,976	2,521	2,066	1,156
10.5-10.9 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	248							
15,000-20,999	819	372						
21,000-26,999	1,389	943	496					
27,000-32,999	1,960	1,513	1,067	620				
33,000-38,999	2,531	2,084	1,637	1,191	744			
39,000-44,999	3,101	2,655	2,208	1,761	1,315	868		
45,000-53,999	3,672	3,225	2,779	2,332	1,885	1,438	992	
54,000-64,999	4,813	4,367	3,920	3,473	3,027	2,580	2,133	1,240

11.0-11.4 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	264							
15,000-20,999	835	396						
21,000-26,999	1,405	967	528					
27,000-32,999	1,976	1,537	1,099	660				
33,000-38,999	2,547	2,108	1,670	1,231	792			
39,000-44,999	3,117	2,679	2,240	1,802	1,363	924		
45,000-53,999	3,688	3,249	2,811	2,372	1,934	1,495	1,056	
54,000-64,999	4,829	4,391	3,952	3,514	3,075	2,636	2,198	1,320
11.5-11.9 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	280							
15,000-20,999	850	419						
21,000-26,999	1,421	990	559					
27,000-32,999	1,992	1,561	1,130	699				
33,000-38,999	2,562	2,131	1,701	1,270	839			
39,000-44,999	3,133	2,702	2,271	1,840	1,410	979		
45,000-53,999	3,704	3,273	2,842	2,411	1,980	1,549	1,119	
54,000-64,999	4,845	4,414	3,983	3,552	3,122	2,691	2,260	1,398
12.0+ HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	289							
15,000-20,999	859	433						
21,000-26,999	1,430	1,004	577					
27,000-32,999	2,001	1,574	1,148	722				
33,000-38,999	2,571	2,145	1,719	1,292	866			
39,000-44,999	3,142	2,716	2,289	1,863	1,437	1,010		
45,000-53,999	3,713	3,286	2,860	2,434	2,007	1,581	1,155	
54,000-64,999	4,854	4,428	4,001	3,575	3,149	2,722	2,296	1,444

Heating, Early Retirement of a Heat Pump

Table 416. Central Energy Savings (Heating kWh) for 7.7 HSPF Baseline—Zone 2

8.5-8.9 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	190							
15,000-20,999	816	284						
21,000-26,999	1,442	911	379					
27,000-32,999	2,068	1,537	1,005	474				
33,000-38,999	2,694	2,163	1,632	1,100	569			
39,000-44,999	3,321	2,789	2,258	1,726	1,195	664		
45,000-53,999	3,947	3,416	2,884	2,353	1,821	1,290	758	
54,000-64,999	5,199	4,668	4,137	3,605	3,074	2,542	2,011	948
9.0-9.4 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	279							
15,000-20,999	905	418						
21,000-26,999	1,531	1,044	557					
27,000-32,999	2,157	1,670	1,184	697				
33,000-38,999	2,784	2,297	1,810	1,323	836			
39,000-44,999	3,410	2,923	2,436	1,949	1,462	975		
45,000-53,999	4,036	3,549	3,062	2,575	2,088	1,602	1,115	
54,000-64,999	5,288	4,802	4,315	3,828	3,341	2,854	2,367	1,393

9.5-9.9 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	325							
15,000-20,999	951	487						
21,000-26,999	1,577	1,114	650					
27,000-32,999	2,204	1,740	1,276	812				
33,000-38,999	2,830	2,366	1,902	1,439	975			
39,000-44,999	3,456	2,992	2,529	2,065	1,601	1,137		
45,000-53,999	4,082	3,619	3,155	2,691	2,227	1,763	1,300	
54,000-64,999	5,335	4,871	4,407	3,943	3,480	3,016	2,552	1,625
10.0-10.4 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	342							
15,000-20,999	969	513						
21,000-26,999	1,595	1,140	685					
27,000-32,999	2,221	1,766	1,311	856				
33,000-38,999	2,847	2,392	1,937	1,482	1,027			
39,000-44,999	3,473	3,018	2,563	2,108	1,653	1,198		
45,000-53,999	4,100	3,645	3,190	2,734	2,279	1,824	1,369	
54,000-64,999	5,352	4,897	4,442	3,987	3,532	3,077	2,622	1,712
10.5-10.9 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	359							
15,000-20,999	985	539						
21,000-26,999	1,612	1,165	718					
27,000-32,999	2,238	1,791	1,344	898				
33,000-38,999	2,864	2,417	1,971	1,524	1,077			
39,000-44,999	3,490	3,044	2,597	2,150	1,703	1,257		
45,000-53,999	4,116	3,670	3,223	2,776	2,330	1,883	1,436	
54,000-64,999	5,369	4,922	4,476	4,029	3,582	3,135	2,689	1,795

11.0-11.4 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	375							
15,000-20,999	1,001	563						
21,000-26,999	1,628	1,189	750					
27,000-32,999	2,254	1,815	1,377	938				
33,000-38,999	2,880	2,441	2,003	1,564	1,126			
39,000-44,999	3,506	3,068	2,629	2,190	1,752	1,313		
45,000-53,999	4,133	3,694	3,255	2,817	2,378	1,939	1,501	
54,000-64,999	5,385	4,946	4,508	4,069	3,631	3,192	2,753	1,876
11.5-11.9 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	391							
15,000-20,999	1,017	586						
21,000-26,999	1,643	1,212	782					
27,000-32,999	2,269	1,839	1,408	977				
33,000-38,999	2,896	2,465	2,034	1,603	1,172			
39,000-44,999	3,522	3,091	2,660	2,229	1,798	1,368		
45,000-53,999	4,148	3,717	3,286	2,856	2,425	1,994	1,563	
54,000-64,999	5,401	4,970	4,539	4,108	3,677	3,246	2,815	1,954
12.0+ HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	400							
15,000-20,999	1,026	600						
21,000-26,999	1,652	1,226	800					
27,000-32,999	2,279	1,852	1,426	1,000				
33,000-38,999	2,905	2,478	2,052	1,626	1,199			
39,000-44,999	3,531	3,105	2,678	2,252	1,826	1,399		
45,000-53,999	4,157	3,731	3,305	2,878	2,452	2,026	1,599	
54,000-64,999	5,410	4,983	4,557	4,131	3,704	3,278	2,852	1,999

Table 417. Central Energy Savings (Heating kWh) for 6.8 HSPF Baseline—Zone 2

8.5-8.9 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	457							
15,000-20,999	1,216	685						
21,000-26,999	1,976	1,444	913					
27,000-32,999	2,736	2,204	1,673	1,141				
33,000-38,999	3,495	2,964	2,432	1,901	1,370			
39,000-44,999	4,255	3,724	3,192	2,661	2,129	1,598		
45,000-53,999	5,015	4,483	3,952	3,420	2,889	2,358	1,826	
54,000-64,999	6,534	6,003	5,471	4,940	4,408	3,877	3,346	2,283
9.0-9.4 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	546							
15,000-20,999	1,305	818						
21,000-26,999	2,065	1,578	1,091					
27,000-32,999	2,825	2,338	1,851	1,364				
33,000-38,999	3,584	3,098	2,611	2,124	1,637			
39,000-44,999	4,344	3,857	3,370	2,883	2,397	1,910		
45,000-53,999	5,104	4,617	4,130	3,643	3,156	2,669	2,182	
54,000-64,999	6,623	6,136	5,649	5,163	4,676	4,189	3,702	2,728

9.5-9.9 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	592							
15,000-20,999	1,352	888						
21,000-26,999	2,111	1,648	1,184					
27,000-32,999	2,871	2,407	1,943	1,480				
33,000-38,999	3,631	3,167	2,703	2,239	1,776			
39,000-44,999	4,390	3,927	3,463	2,999	2,535	2,072		
45,000-53,999	5,150	4,686	4,223	3,759	3,295	2,831	2,368	
54,000-64,999	6,670	6,206	5,742	5,278	4,814	4,351	3,887	2,959
10.0-10.4 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	609							
15,000-20,999	1,369	914						
21,000-26,999	2,129	1,674	1,219					
27,000-32,999	2,888	2,433	1,978	1,523				
33,000-38,999	3,648	3,193	2,738	2,283	1,828			
39,000-44,999	4,408	3,953	3,498	3,043	2,588	2,132		
45,000-53,999	5,168	4,712	4,257	3,802	3,347	2,892	2,437	
54,000-64,999	6,687	6,232	5,777	5,322	4,867	4,412	3,956	3,046
10.5-10.9 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	626							
15,000-20,999	1,386	939						
21,000-26,999	2,145	1,699	1,252					
27,000-32,999	2,905	2,458	2,012	1,565				
33,000-38,999	3,665	3,218	2,771	2,325	1,878			
39,000-44,999	4,425	3,978	3,531	3,084	2,638	2,191		
45,000-53,999	5,184	4,738	4,291	3,844	3,397	2,951	2,504	
54,000-64,999	6,704	6,257	5,810	5,364	4,917	4,470	4,023	3,130

11.0-11.4 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	642							
15,000-20,999	1,402	963						
21,000-26,999	2,162	1,723	1,284					
27,000-32,999	2,921	2,483	2,044	1,605				
33,000-38,999	3,681	3,242	2,804	2,365	1,926			
39,000-44,999	4,441	4,002	3,563	3,125	2,686	2,248		
45,000-53,999	5,200	4,762	4,323	3,885	3,446	3,007	2,569	
54,000-64,999	6,720	6,281	5,843	5,404	4,965	4,527	4,088	3,211
11.5-11.9 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	658							
15,000-20,999	1,417	987						
21,000-26,999	2,177	1,746	1,315					
27,000-32,999	2,937	2,506	2,075	1,644				
33,000-38,999	3,697	3,266	2,835	2,404	1,973			
39,000-44,999	4,456	4,025	3,595	3,164	2,733	2,302		
45,000-53,999	5,216	4,785	4,354	3,923	3,493	3,062	2,631	
54,000-64,999	6,735	6,305	5,874	5,443	5,012	4,581	4,150	3,289
12.0+ HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	667							
15,000-20,999	1,426	1,000						
21,000-26,999	2,186	1,760	1,334					
27,000-32,999	2,946	2,520	2,093	1,667				
33,000-38,999	3,706	3,279	2,853	2,427	2,000			
39,000-44,999	4,465	4,039	3,613	3,186	2,760	2,334		
45,000-53,999	5,225	4,799	4,372	3,946	3,520	3,093	2,667	
54,000-64,999	6,744	6,318	5,892	5,465	5,039	4,613	4,187	3,334

Heating, Early Retirement of an Electric Resistance Furnace

Table 418. Central Energy Savings (Heating kWh) for 3.412 HSPF Baseline—Zone 2

8.5-8.9 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	2,461							
15,000-20,999	4,224	3,692						
21,000-26,999	5,986	5,454	4,923					
27,000-32,999	7,748	7,217	6,685	6,154				
33,000-38,999	9,510	8,979	8,447	7,916	7,384			
39,000-44,999	11,272	10,741	10,209	9,678	9,147	8,615		
45,000-53,999	13,035	12,503	11,972	11,440	10,909	10,377	9,846	
54,000-64,999	16,559	16,027	15,496	14,965	14,433	13,902	13,370	12,307
9.0-9.4 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	2,551							
15,000-20,999	4,313	3,826						
21,000-26,999	6,075	5,588	5,101					
27,000-32,999	7,837	7,350	6,863	6,376				
33,000-38,999	9,599	9,112	8,625	8,139	7,652			
39,000-44,999	11,361	10,875	10,388	9,901	9,414	8,927		
45,000-53,999	13,124	12,637	12,150	11,663	11,176	10,689	10,202	
54,000-64,999	16,648	16,161	15,674	15,187	14,700	14,213	13,727	12,753

9.5-9.9 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	2,597							
15,000-20,999	4,359	3,895						
21,000-26,999	6,121	5,657	5,194					
27,000-32,999	7,883	7,420	6,956	6,492				
33,000-38,999	9,646	9,182	8,718	8,254	7,790			
39,000-44,999	11,408	10,944	10,480	10,016	9,553	9,089		
45,000-53,999	13,170	12,706	12,242	11,779	11,315	10,851	10,387	
54,000-64,999	16,694	16,230	15,767	15,303	14,839	14,375	13,912	12,984
10.0-10.4 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	2,614							
15,000-20,999	4,376	3,921						
21,000-26,999	6,139	5,684	5,228					
27,000-32,999	7,901	7,446	6,991	6,536				
33,000-38,999	9,663	9,208	8,753	8,298	7,843			
39,000-44,999	11,425	10,970	10,515	10,060	9,605	9,150		
45,000-53,999	13,187	12,732	12,277	11,822	11,367	10,912	10,457	
54,000-64,999	16,712	16,257	15,801	15,346	14,891	14,436	13,981	13,071
10.5-10.9 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	2,631							
15,000-20,999	4,393	3,946						
21,000-26,999	6,155	5,709	5,262					
27,000-32,999	7,917	7,471	7,024	6,577				
33,000-38,999	9,680	9,233	8,786	8,340	7,893			
39,000-44,999	11,442	10,995	10,548	10,102	9,655	9,208		
45,000-53,999	13,204	12,757	12,311	11,864	11,417	10,971	10,524	
54,000-64,999	16,728	16,282	15,835	15,388	14,942	14,495	14,048	13,155

11.0-11.4 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	2,647							
15,000-20,999	4,409	3,971						
21,000-26,999	6,171	5,733	5,294					
27,000-32,999	7,934	7,495	7,056	6,618				
33,000-38,999	9,696	9,257	8,819	8,380	7,941			
39,000-44,999	11,458	11,019	10,581	10,142	9,703	9,265		
45,000-53,999	13,220	12,782	12,343	11,904	11,466	11,027	10,588	
54,000-64,999	16,745	16,306	15,867	15,429	14,990	14,551	14,113	13,235
11.5-11.9 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	2,663							
15,000-20,999	4,425	3,994						
21,000-26,999	6,187	5,756	5,325					
27,000-32,999	7,949	7,518	7,087	6,657				
33,000-38,999	9,711	9,281	8,850	8,419	7,988			
39,000-44,999	11,474	11,043	10,612	10,181	9,750	9,319		
45,000-53,999	13,236	12,805	12,374	11,943	11,512	11,081	10,651	
54,000-64,999	16,760	16,329	15,898	15,468	15,037	14,606	14,175	13,313
12.0+ HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	2,672							
15,000-20,999	4,434	4,008						
21,000-26,999	6,196	5,770	5,343					
27,000-32,999	7,958	7,532	7,106	6,679				
33,000-38,999	9,720	9,294	8,868	8,441	8,015			
39,000-44,999	11,483	11,056	10,630	10,204	9,777	9,351		
45,000-53,999	13,245	12,818	12,392	11,966	11,540	11,113	10,687	
54,000-64,999	16,769	16,343	15,917	15,490	15,064	14,638	14,211	13,359

Climate Zone 3: South Region, Houston

Cooling, New Construction

Table 419. Central Energy Savings (Cooling kWh) for 14.0 SEER Baseline—Zone 3

Size (Btuh)	SEER Range						
	14.5–14.9	15.0–15.9	16.0–16.9	17.0–17.9	18.0–20.9	21.0-23.9	24.0+
< 15,000	82	157	292	504	586	783	933
15,000-20,999	123	236	438	756	879	1,175	1,400
21,000-26,999	163	314	584	1,008	1,172	1,566	1,866
27,000-32,999	204	393	729	1,260	1,465	1,958	2,333
33,000-38,999	245	471	875	1,512	1,757	2,350	2,799
39,000-44,999	286	550	1,021	1,764	2,050	2,741	3,266
45,000-53,999	327	628	1,167	2,017	2,343	3,133	3,732
54,000-64,999	409	786	1,459	2,521	2,929	3,916	4,665

Cooling, Replace-on-Burnout

Table 420. Central Energy Savings (Cooling kWh) for 13.08 SEER Baseline—Zone 3

14.5-14.9 SEER								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	225							
15,000-20,999	1,318	338						
21,000-26,999	2,412	1,431	451					
27,000-32,999	3,505	2,524	1,544	563				
33,000-38,999	4,598	3,617	2,637	1,656	676			
39,000-44,999	5,691	4,710	3,730	2,750	1,769	789		
45,000-53,999	6,784	5,803	4,823	3,843	2,862	1,882	901	
54,000-64,999	8,970	7,990	7,009	6,029	5,048	4,068	3,088	1,127

15.0-15.9 SEER								
Size (Btuh) Post	< 15,000	15,000-20,999	21,000-26,999	27,000-32,999	33,000-38,999	39,000-44,999	45,000-53,999	54,000-64,999
Size (Btuh) Pre								
< 15,000	301							
15,000-20,999	1,394	451						
21,000-26,999	2,487	1,544	602					
27,000-32,999	3,580	2,637	1,695	752				
33,000-38,999	4,673	3,730	2,788	1,845	902			
39,000-44,999	5,766	4,823	3,881	2,938	1,995	1,053		
45,000-53,999	6,859	5,917	4,974	4,031	3,089	2,146	1,203	
54,000-64,999	9,045	8,103	7,160	6,217	5,275	4,332	3,389	1,504
16.0-16.9 SEER								
Size (Btuh) Post	< 15,000	15,000-20,999	21,000-26,999	27,000-32,999	33,000-38,999	39,000-44,999	45,000-53,999	54,000-64,999
Size (Btuh) Pre								
< 15,000	435							
15,000-20,999	1,529	653						
21,000-26,999	2,622	1,746	871					
27,000-32,999	3,715	2,839	1,964	1,089				
33,000-38,999	4,808	3,932	3,057	2,182	1,306			
39,000-44,999	5,901	5,026	4,150	3,275	2,399	1,524		
45,000-53,999	6,994	6,119	5,243	4,368	3,493	2,617	1,742	
54,000-64,999	9,180	8,305	7,429	6,554	5,679	4,803	3,928	2,177
17.0-17.9 SEER								
Size (Btuh) Post	< 15,000	15,000-20,999	21,000-26,999	27,000-32,999	33,000-38,999	39,000-44,999	45,000-53,999	54,000-64,999
Size (Btuh) Pre								
< 15,000	648							
15,000-20,999	1,741	972						
21,000-26,999	2,834	2,065	1,296					
27,000-32,999	3,927	3,158	2,389	1,619				
33,000-38,999	5,020	4,251	3,482	2,713	1,943			
39,000-44,999	6,113	5,344	4,575	3,806	3,036	2,267		
45,000-53,999	7,206	6,437	5,668	4,899	4,130	3,360	2,591	
54,000-64,999	9,392	8,623	7,854	7,085	6,316	5,547	4,777	3,239

18.0-20.9 SEER								
Size (Btuh) Post	< 15,000	15,000-20,999	21,000-26,999	27,000-32,999	33,000-38,999	39,000-44,999	45,000-53,999	54,000-64,999
Size (Btuh) Pre								
< 15,000	729							
15,000-20,999	1,823	1,094						
21,000-26,999	2,916	2,187	1,459					
27,000-32,999	4,009	3,280	2,552	1,824				
33,000-38,999	5,102	4,373	3,645	2,917	2,188			
39,000-44,999	6,195	5,467	4,738	4,010	3,282	2,553		
45,000-53,999	7,288	6,560	5,831	5,103	4,375	3,646	2,918	
54,000-64,999	9,474	8,746	8,017	7,289	6,561	5,832	5,104	3,647
21.0-23.9 SEER								
Size (Btuh) Post	< 15,000	15,000-20,999	21,000-26,999	27,000-32,999	33,000-38,999	39,000-44,999	45,000-53,999	54,000-64,999
Size (Btuh) Pre								
< 15,000	927							
15,000-20,999	2,020	1,390						
21,000-26,999	3,113	2,483	1,854					
27,000-32,999	4,206	3,576	2,947	2,317				
33,000-38,999	5,299	4,670	4,040	3,410	2,781			
39,000-44,999	6,392	5,763	5,133	4,503	3,874	3,244		
45,000-53,999	7,485	6,856	6,226	5,596	4,967	4,337	3,707	
54,000-64,999	9,672	9,042	8,412	7,783	7,153	6,523	5,894	4,634
24.0+ SEER								
Size (Btuh) Post	< 15,000	15,000-20,999	21,000-26,999	27,000-32,999	33,000-38,999	39,000-44,999	45,000-53,999	54,000-64,999
Size (Btuh) Pre								
< 15,000	1,077							
15,000-20,999	2,170	1,615						
21,000-26,999	3,263	2,708	2,154					
27,000-32,999	4,356	3,801	3,247	2,692				
33,000-38,999	5,449	4,894	4,340	3,785	3,230			
39,000-44,999	6,542	5,987	5,433	4,878	4,323	3,769		
45,000-53,999	7,635	7,081	6,526	5,971	5,416	4,862	4,307	
54,000-64,999	9,821	9,267	8,712	8,157	7,603	7,048	6,493	5,384

Cooling, Early Retirement

Table 421. Central Energy Savings (Cooling kWh) for 12.44 SEER Baseline—Zone 3

14.5-14.9 SEER								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	338							
15,000-20,999	1,487	507						
21,000-26,999	2,636	1,656	676					
27,000-32,999	3,786	2,805	1,825	845				
33,000-38,999	4,935	3,955	2,974	1,994	1,014			
39,000-44,999	6,084	5,104	4,124	3,143	2,163	1,182		
45,000-53,999	7,234	6,253	5,273	4,293	3,312	2,332	1,351	
54,000-64,999	9,532	8,552	7,572	6,591	5,611	4,630	3,650	1,689
15.0-15.9 SEER								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	413							
15,000-20,999	1,563	620						
21,000-26,999	2,712	1,769	826					
27,000-32,999	3,861	2,919	1,976	1,033				
33,000-38,999	5,011	4,068	3,125	2,182	1,240			
39,000-44,999	6,160	5,217	4,274	3,332	2,389	1,446		
45,000-53,999	7,309	6,366	5,424	4,481	3,538	2,596	1,653	
54,000-64,999	9,608	8,665	7,722	6,780	5,837	4,894	3,952	2,066

16.0-16.9 SEER								
Size (Btuh) Post	< 15,000	15,000-20,999	21,000-26,999	27,000-32,999	33,000-38,999	39,000-44,999	45,000-53,999	54,000-64,999
Size (Btuh) Pre								
< 15,000	548							
15,000-20,999	1,697	822						
21,000-26,999	2,847	1,971	1,096					
27,000-32,999	3,996	3,121	2,245	1,370				
33,000-38,999	5,145	4,270	3,394	2,519	1,644			
39,000-44,999	6,295	5,419	4,544	3,668	2,793	1,918		
45,000-53,999	7,444	6,568	5,693	4,818	3,942	3,067	2,192	
54,000-64,999	9,742	8,867	7,992	7,116	6,241	5,366	4,490	2,740
17.0-17.9 SEER								
Size (Btuh) Post	< 15,000	15,000-20,999	21,000-26,999	27,000-32,999	33,000-38,999	39,000-44,999	45,000-53,999	54,000-64,999
Size (Btuh) Pre								
< 15,000	760							
15,000-20,999	1,910	1,140						
21,000-26,999	3,059	2,290	1,521					
27,000-32,999	4,208	3,439	2,670	1,901				
33,000-38,999	5,358	4,588	3,819	3,050	2,281			
39,000-44,999	6,507	5,738	4,968	4,199	3,430	2,661		
45,000-53,999	7,656	6,887	6,118	5,349	4,579	3,810	3,041	
54,000-64,999	9,955	9,186	8,416	7,647	6,878	6,109	5,340	3,801
18.0-20.9 SEER								
Size (Btuh) Post	< 15,000	15,000-20,999	21,000-26,999	27,000-32,999	33,000-38,999	39,000-44,999	45,000-53,999	54,000-64,999
Size (Btuh) Pre								
< 15,000	842							
15,000-20,999	1,991	1,263						
21,000-26,999	3,141	2,412	1,684					
27,000-32,999	4,290	3,562	2,833	2,105				
33,000-38,999	5,439	4,711	3,983	3,254	2,526			
39,000-44,999	6,589	5,860	5,132	4,404	3,675	2,947		
45,000-53,999	7,738	7,010	6,281	5,553	4,824	4,096	3,368	
54,000-64,999	10,037	9,308	8,580	7,851	7,123	6,395	5,666	4,210

21.0-23.9 SEER								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	1,039							
15,000-20,999	2,189	1,559						
21,000-26,999	3,338	2,708	2,079					
27,000-32,999	4,487	3,858	3,228	2,598				
33,000-38,999	5,637	5,007	4,377	3,748	3,118			
39,000-44,999	6,786	6,156	5,527	4,897	4,267	3,638		
45,000-53,999	7,935	7,306	6,676	6,046	5,417	4,787	4,157	
54,000-64,999	10,234	9,604	8,975	8,345	7,715	7,086	6,456	5,197
24.0+ SEER								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	1,189							
15,000-20,999	2,339	1,784						
21,000-26,999	3,488	2,933	2,378					
27,000-32,999	4,637	4,082	3,528	2,973				
33,000-38,999	5,787	5,232	4,677	4,122	3,568			
39,000-44,999	6,936	6,381	5,826	5,272	4,717	4,162		
45,000-53,999	8,085	7,530	6,976	6,421	5,866	5,312	4,757	
54,000-64,999	10,384	9,829	9,274	8,720	8,165	7,610	7,056	5,946

Table 422. Central Energy Savings (Cooling kWh) for 10.0 SEER Baseline—Zone 3

14.5-14.9 SEER								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	899							
15,000-20,999	2,328	1,348						
21,000-26,999	3,758	2,778	1,797					
27,000-32,999	5,188	4,208	3,227	2,247				
33,000-38,999	6,618	5,637	4,657	3,677	2,696			
39,000-44,999	8,047	7,067	6,087	5,106	4,126	3,145		
45,000-53,999	9,477	8,497	7,516	6,536	5,556	4,575	3,595	
54,000-64,999	12,337	11,356	10,376	9,396	8,415	7,435	6,454	4,494
15.0-15.9 SEER								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	974							
15,000-20,999	2,404	1,461						
21,000-26,999	3,834	2,891	1,948					
27,000-32,999	5,263	4,321	3,378	2,435				
33,000-38,999	6,693	5,750	4,808	3,865	2,922			
39,000-44,999	8,123	7,180	6,237	5,295	4,352	3,409		
45,000-53,999	9,553	8,610	7,667	6,725	5,782	4,839	3,896	
54,000-64,999	12,412	11,469	10,527	9,584	8,641	7,699	6,756	4,871

16.0-16.9 SEER								
Size (Btuh) Post	< 15,000	15,000-20,999	21,000-26,999	27,000-32,999	33,000-38,999	39,000-44,999	45,000-53,999	54,000-64,999
Size (Btuh) Pre								
< 15,000	1,109							
15,000-20,999	2,539	1,663						
21,000-26,999	3,968	3,093	2,218					
27,000-32,999	5,398	4,523	3,647	2,772				
33,000-38,999	6,828	5,952	5,077	4,202	3,326			
39,000-44,999	8,258	7,382	6,507	5,631	4,756	3,881		
45,000-53,999	9,687	8,812	7,937	7,061	6,186	5,311	4,435	
54,000-64,999	12,547	11,671	10,796	9,921	9,045	8,170	7,295	5,544
17.0-17.9 SEER								
Size (Btuh) Post	< 15,000	15,000-20,999	21,000-26,999	27,000-32,999	33,000-38,999	39,000-44,999	45,000-53,999	54,000-64,999
Size (Btuh) Pre								
< 15,000	1,321							
15,000-20,999	2,751	1,982						
21,000-26,999	4,181	3,411	2,642					
27,000-32,999	5,610	4,841	4,072	3,303				
33,000-38,999	7,040	6,271	5,502	4,733	3,963			
39,000-44,999	8,470	7,701	6,932	6,162	5,393	4,624		
45,000-53,999	9,900	9,130	8,361	7,592	6,823	6,054	5,285	
54,000-64,999	12,759	11,990	11,221	10,452	9,682	8,913	8,144	6,606
18.0-20.9 SEER								
Size (Btuh) Post	< 15,000	15,000-20,999	21,000-26,999	27,000-32,999	33,000-38,999	39,000-44,999	45,000-53,999	54,000-64,999
Size (Btuh) Pre								
< 15,000	1,403							
15,000-20,999	2,833	2,104						
21,000-26,999	4,262	3,534	2,806					
27,000-32,999	5,692	4,964	4,235	3,507				
33,000-38,999	7,122	6,393	5,665	4,937	4,208			
39,000-44,999	8,552	7,823	7,095	6,367	5,638	4,910		
45,000-53,999	9,981	9,253	8,525	7,796	7,068	6,340	5,611	
54,000-64,999	12,841	12,112	11,384	10,656	9,927	9,199	8,471	7,014

21.0-23.9 SEER								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	1,600							
15,000-20,999	3,030	2,400						
21,000-26,999	4,460	3,830	3,200					
27,000-32,999	5,889	5,260	4,630	4,001				
33,000-38,999	7,319	6,690	6,060	5,430	4,801			
39,000-44,999	8,749	8,119	7,490	6,860	6,230	5,601		
45,000-53,999	10,179	9,549	8,919	8,290	7,660	7,030	6,401	
54,000-64,999	13,038	12,409	11,779	11,149	10,520	9,890	9,260	8,001

24.0+ SEER								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	1,750							
15,000-20,999	3,180	2,625						
21,000-26,999	4,610	4,055	3,500					
27,000-32,999	6,039	5,485	4,930	4,375				
33,000-38,999	7,469	6,914	6,360	5,805	5,250			
39,000-44,999	8,899	8,344	7,789	7,235	6,680	6,125		
45,000-53,999	10,329	9,774	9,219	8,664	8,110	7,555	7,000	
54,000-64,999	13,188	12,633	12,079	11,524	10,969	10,415	9,860	8,750

Heating, New Construction/Replace-on-Burnout

Table 423. Central Energy Savings (Heating kWh) for 8.2 HSPF Baseline—Zone 3

8.5-8.9 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	51							
15,000-20,999	420	77						
21,000-26,999	789	446	102					
27,000-32,999	1,158	815	471	128				
33,000-38,999	1,527	1,184	840	497	154			
39,000-44,999	1,896	1,552	1,209	866	523	179		
45,000-53,999	2,265	1,921	1,578	1,235	892	548	205	
54,000-64,999	3,003	2,659	2,316	1,973	1,629	1,286	943	256
9.0-9.4 HSPF								
Size (Btuh) Post	**< 15,000**	**15,000-20,999**	**21,000-26,999**	**27,000-32,999**	**33,000-38,999**	**39,000-44,999**	**45,000-53,999**	**54,000-64,999**
Size (Btuh) Pre								
< 15,000	109							
15,000-20,999	478	164						
21,000-26,999	847	533	219					
27,000-32,999	1,216	902	588	274				
33,000-38,999	1,585	1,271	957	642	328			
39,000-44,999	1,954	1,640	1,326	1,011	697	383		
45,000-53,999	2,323	2,009	1,694	1,380	1,066	752	438	
54,000-64,999	3,061	2,747	2,432	2,118	1,804	1,490	1,176	547