ENERGY STAR® PortfolioManager®

Technical Reference

ENERGY STAR Score for Senior Care Communities in the United States

OVERVIEW

The ENERGY STAR Score for Senior Care Communities applies to buildings that house and provide care and assistance for elderly residents. The objective of the ENERGY STAR score is to provide a fair assessment of the energy performance of a property relative to its peers, taking into account the climate, weather, and business activities at the property. To identify the aspects of building activity that are significant drivers of energy use and then normalize for those factors, a statistical analysis of the peer building population is performed. The result of this analysis is an equation that will predict the energy use of a property, based on its experienced business activities. The energy use prediction for a building is compared to its actual energy use to yield a 1 to 100 percentile ranking of performance, relative to the national population.

- **Property Types.** The ENERGY STAR score for senior care communities applies to buildings that house and provide care and assistance for elderly residents. The score applies to an entire senior care community whether it is a single building or a campus of buildings.
- **Reference Data.** The analysis for senior care communities is based on data from an industry survey conducted by the Assisted Living Federation of America, American Association of Homes and Services for the Aging, the American Health Care Association, and the National Center on Assisted Living.
- **Adjustments for Weather and Business Activity.** The analysis includes adjustments for:
    - Number of Units
    - Resident Capacity
    - Number of Workers
    - Number of Personal Computers
    - Number of Commercial Refrigeration Units
    - Number of Commercial Washing Machine Units
    - Number of Residential Washing Machine Units
    - Number of Electronic Lifts
    - Weather and Climate (using Heating and Cooling Degree Days, retrieved based on Zip code)
    - Percent of the Building that is Heated and Cooled
- **Release Date.** The ENERGY STAR score for senior care communities was released in March 2011.

This document presents details on the development of the 1 - 100 ENERGY STAR score for senior care communities. More information on the overall approach to develop ENERGY STAR scores is covered in our Technical Reference for the ENERGY STAR Score, available at www.energystar.gov/ENERGYSTARScore. The subsequent sections of this document offer specific details on the development of the ENERGY STAR score for senior care communities:

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REFERENCE DATA & FILTERS

For the ENERGY STAR score for senior care communities, the reference data used to establish the peer building population in the United States is based on a survey conducted by the Assisted Living Federation of America (ALFA), American Association of Homes and Services for the Aging (AAHSA), the American Health Care Association (AHCA), and the National Center on Assisted Living (NCAL).

To analyze the building energy and operating characteristics in this survey data, four types of filters are applied to define the peer group for comparison and to overcome any technical limitations in the data: Building Type Filters, Program Filters, Data Limitation Filters, and Analytical Filters. A complete description of each of these categories is provided in our Technical Reference for the ENERGY STAR Score, at www.energystar.gov/ENERGYSTARScore. ***Figure 1*** presents a summary of each filter applied in the development of the ENERGY STAR score for senior care communities, the rationale behind the filter, and the resulting number of properties in the data set after the filter is applied. After all filters are applied, the remaining data set has 553 properties.

Figure 1 – Summary of Filters for the ENERGY STAR Score for Senior Care Communities

Condition for Including an Observation in the Analysis	Rationale	Number Remaining
Must have complete data for energy use and operating characteristics	EPA Program Filter – Complete data is necessary for analysis	658
Combined total of assisted living (with or without dementia care) and skilled nursing facility (with or without dementia care) units must be more than 50% of the units	Building Type Filter – In order to be defined as senior care, more than 50% of the units must be devoted to assisted living (with or without dementia care) or to skilled nursing (with or without dementia care)	599
If parking energy is reported with metered data, the size of all parking structures (completely enclosed and partially enclosed parking) cannot exceed building size.	Building Type Filter – If the combined square foot of parking structures exceeds the size of the senior care building then the overall structure is classified as parking, not senior care. This is a standard policy in Portfolio Manager	593
If parking energy is reported with metered data, EPA's Estimated Parking Adjustment must be less than 50% of the actual source energy.	Analytical Filter – In order to perform an analysis of the building (not the parking), EPA estimates the energy use of the parking area[1]. If this estimation is 50% or more the actual source energy, it is determined that there is too much variability/error in the energy use.	589
Must have Source EUI[2] greater than 10 kBtu/ft^2 and not more than 700 kBtu/ft^2	Analytical Filter – Values determined to be data entry errors or statistical outliers.	579

[1] For more information on the methodology used for estimation, refer to the standard Portfolio Manager technical description for Parking, available at: www.energystar.gov/ScoreDetails.
[2] Source EUI refers to Source EUI_Adjusted (i.e. after parking and pool energy estimates have been removed to isolate the Senior Care EUI).

Condition for Including an Observation in the Analysis	Rationale	Number Remaining
Must have square foot per unit greater than 50 but less than 5,000	Analytical Filter – Values determined to be data entry errors or statistical outliers.	573
Must have greater than 0.2 and less than 30 residents per 1,000 square foot	Analytical Filter – Values determined to be data entry errors or statistical outliers.	571
Must have less than or equal to 1.0 commercial refrigeration units per 1,000 square foot	Analytical Filter – Values determined to be data entry errors or statistical outliers.	570
Must have less than or equal to 2.7 electronic lifts per 1,000 square foot	Analytical Filter – Values determined to be data entry errors or statistical outliers.	569
Must have Percent Resident Capacity less than or equal to 100%	Analytical Limitation – Values determined to be data entry errors or statistical outliers.	557
Must not be less than 50% cooled *and* less than 50% heated.	Analytical Limitation – Values determined to be data entry errors or statistical outliers.	**553**

Of the filters applied to the reference data, some result in constraints on calculating a score in Portfolio Manager and others do not. Building Type and Program Filters are used to limit the reference data to include only properties that are eligible to receive a score in Portfolio Manager, and are therefore related to eligibility requirements. In contrast, Data Limitation Filters account for limitations in the data availability, but do not apply in Portfolio Manager. Analytical Filters are used to eliminate outlier data points or different subsets of data, and may or may not affect eligibility. In some cases, a subset of the data will have different behavior from the rest of the properties (e.g., office buildings smaller than 5,000 ft^2 do not behave the same way as larger buildings), in which case an Analytical Filter will be used to determine eligibility in Portfolio Manager. In other cases, Analytical Filters exclude a small number of outliers with extreme values that skew the analysis, but do not affect eligibility requirements. A full description of the criteria you must meet to get a score in Portfolio Manager is available at www.energystar.gov/EligibilityCriteria.

Related to the filters and eligibility criteria described above, another consideration is how Portfolio Manager treats properties that are situated on a campus. The main unit for benchmarking in Portfolio Manager is the property, which may be used to describe either a single building or a campus of buildings. The applicability of the ENERGY STAR score depends on the type of property. For senior care communities, the score is based on a campus of buildings, because each building on the campus is necessary to make the complete function of the property. For property types that earn a campus score, the entire campus will receive a 1 - 100 score and no individual buildings on the campus can earn a separate score. When there is a single building property of this type (e.g., entire senior care community in one building), it is also eligible for a score.

Survey Weights

The senior care survey data represented data from a total of 110 companies. Within this group, there were four companies that provided a large number of responses (over 50 each). These four companies accounted for 426 of the 658 complete observations. Given the high representation of these companies, the survey is better viewed as a

survey of *companies* rather than a survey of *buildings* in the national population. That is, rather than being a simple random sample from the entire population, it is regarded as a stratified random sample, with five groups: each of the four major companies and a fifth group of all other companies. In order to properly account for this stratification, survey sample weights were constructed to reflect the probability of being selected within each of these five groups. Within each group, the weight of an individual observation was computed as:

Observation Weight = Total Size of Population in Group/Number of Responses in Group

The Total Size of Population in Group was obtained through market research on the companies and available census data. The Number of Responses in Group was counted from the complete set of 658 observations in the survey.

VARIABLES ANALYZED

To normalize for differences in business activity, we perform a statistical analysis to understand what aspects of building activity are significant with respect to energy use. The filtered reference data set described in the previous section is analyzed using a weighted ordinary least squares regression, which evaluates energy use relative to business activity (e.g., number of units, number of workers, and climate). This linear regression yields an equation that is used to compute energy use (also called the dependent variable) based on a series of characteristics that describe the business activities (also called independent variables). This section details the variables used in the statistical analysis for senior care communities.

Dependent Variable

The dependent variable is what we try to predict with the regression equation. For the senior care analysis, the dependent variable is energy consumption expressed in source energy use intensity (source EUI). This is equal to the total source energy use of the property divided by the gross floor area. The regressions analyze the key drivers of source EUI – those factors that explain the variation in source energy use per square foot in senior care communities.

Independent Variables

The reference survey collects numerous property operating characteristics that were identified as potentially important for senior care communities. Based on a review of the available variables in the data, in accordance with the criteria for inclusion in Portfolio Manager[3], Figure 2 summarizes the variables were analyzed.

[3] For a complete explanation of these criteria, refer to our Technical Reference for the ENERGY STAR Score, at www.energystar.gov/ENERGYSTARScore.

Figure 2 – Summary of Variables Analyzed in Regression Equations

Overall descriptors of the community
Building Square Footage
Total Number of Units
Total Resident Capacity
Average Number of Residents
Average Units Size (Square foot per unit)
Percentage of Resident Capacity (Average Number of Residents/Total Resident Capacity)
Variables describing operation and equipment
Number of Main Shift Staff
Number of computers
Number of elevators
Number of electronic lifts
Number of Walk-in commercial refrigeration units
Number of Open commercial refrigeration units
Number of Closed commercial refrigeration units
Sum of all commercial type refrigeration units
Number of Residential refrigeration units
Number of Residential washers
Number of Commercial washers
Number of Residential dryers
Number of Commercial dryers
Variables describing heating and cooling
Percent Central/Residential Heat
Percent Central/Residential Cool
Heating Degree Days (Base 65)
Cooling Degree Days (Base 65)

Variables for type of senior care
Community type (Single Building / Campus / Part of Building / Other)
Primary Use (Independent Living / Assisted Living / Skinned Nursing Facility / Dementia Care)
Percent of Units designated as Skilled Nursing
Percent of Units designated as Assisted Living
Percent of Units designated as Assisted Living/Dementia Care
Percent of Units designated as Skilled Nursing/Dementia Care
Percent of Units designated as Independent Living (Apartment)
Percent of Units designated as Independent Living (Single Family)
Percent of Units designated as Other
Variables for type of senior care
Community type (Single Building / Campus / Part of Building / Other)
Primary Use (Independent Living / Assisted Living / Skinned Nursing Facility / Dementia Care)
Percent of Units designated as Skilled Nursing
Percent of Units designated as Assisted Living
Percent of Units designated as Assisted Living/Dementia Care
Percent of Units designated as Skilled Nursing/Dementia Care
Percent of Units designated as Independent Living (Apartment)
Percent of Units designated as Independent Living (Single Family)
Percent of Units designated as Other
Percent of Units defined as Senior Care (Assisted Living / Assisted Living with Dementia Care / Skilled Nursing Facility / Skilled Nursing Facility with Dementia Care)[4]
Variables describing amenities offered
Coffee Shop/Bistro (yes or no)
Commercial kitchen (yes or no)
Auxiliary Kitchen (yes or no)
Fitness Center (yes or no)
Beauty salon (yes or no)
Pharmacy (yes or no)
TV/Entertainment Room (yes or no)
Individually controlled thermostats (yes or no)
Number of Spas/Whirlpools

We perform extensive review on all of these operational characteristics. In addition to reviewing each characteristic individually, characteristics are reviewed in combination with each other (e.g., Heating Degree Days times Percent Heated). As part of the analysis, some variables are reformatted to reflect the physical relationships of building components. For example, the number of workers on the main shift is typically evaluated in a density format. The number of workers *per square foot* (not the gross number of workers) is expected to be correlated with the energy use per square foot. In addition, based on analytical results and residual plots, variables are examined using different transformations (such as the natural logarithm, abbreviated as Ln). The analysis consists of multiple regression

[4] Note that Independent Living is not considered a type of Senior Care

formulations. These analyses are structured to find the combination of statistically significant operating characteristics that explain the greatest amount of variance in the dependent variable: source EUI.

The final regression equation includes the following variables:

- Number of units per 1,000 square feet
- Percent resident capacity
- Number of electronic lifts per 1,000 square feet
- Number of workers per 1,000 square feet
- Number of personal computers per 1,000 square feet
- Number of commercial refrigeration units per 1,000 square feet
- Number of commercial washing machine units per 1,000 square feet
- Number of residential washing machine units per 1,000 square feet
- Cooling degree days times Percent cooled
- Heating degree days times Percent heated

These variables are used together to compute the predicted source EUI for senior care communities. The predicted source EUI is the mean EUI for a hypothetical population of buildings that share the same values for each of these variables. That is, the mean energy use for a building that operates just like your building.

Residential Washer Analysis

The regression analysis shows that facilities with higher density of residential washing machines (more residential washers on a per square foot basis) have higher source EUI values on average. This relationship between source EUI and the residential washer density was only observed up to a certain density of washing machines. Therefore, the regression adjustment on residential washer density within the model is applied over that range, and capped at a maximum adjustment at the value of 0.16 washers per 1,000 square feet. That is, the residential washer density adjustment in the regression equation for a building whose actual density is greater 0.16 will be identical to the adjustment for a building with a density of 0.16.

Testing

Finally, we test the regression equation using actual senior care communities that have been entered in Portfolio Manager. This provides another set of buildings to examine in addition to the industry survey data, to see the average ENERGY STAR scores and distributions, and to assess the impacts and adjustments. This analysis provides a second level of confirmation that the final regression equation produces robust results that are unbiased with respect to the key operational characteristics such as building size, percent occupied, equipment density, and heating and cooling degree days.

It is important to reiterate that the final regression equation is based on the nationally representative reference data, not data previously entered into Portfolio Manager.

REGRESSION EQUATION RESULTS

The final regression is a weighted ordinary least squares regression across the filtered data set of 553 observations. The dependent variable is source EUI. Each independent variable is centered relative to the mean value, presented in ***Figure 3***. The final equation is presented in ***Figure 4***. All variables in the regression equation are significant at the 98% confidence level or better, as shown by the significance levels (a p-level of less than 0.02 indicates 98% confidence).

The regression equation has a coefficient of determination (R^2) value of 0.4450, indicating that this equation explains 44.5% of the variance in source EUI for senior care communities. Because the final equation is structured with energy per square foot as the dependent variable, the explanatory power of square foot is not included in the R^2 value, thus this value appears artificially low. Re-computing the R^2 value in units of source energy[5], demonstrates that the equation actually explains 79.0% of the variation of source energy of senior care communities. This is an excellent result for a statistically-based energy model.

Detailed information on the ordinary least squares regression approach is available in our Technical Reference for the ENERGY STAR Score, at www.energystar.gov/ENERGYSTARScore.

Figure 3 - Descriptive Statistics for Variables in Final Regression Equation

Variable	Mean	Minimum	Maximum
Source EUI (kBtu/ft^2)	253.0	11.48	673.9
Number of Units per 1,000 ft^2	1.582	0.3481	4.526
Percent Resident Capacity	87.61	24.51	100.0
Number of Electronic lifts per 1,000 ft^2	0.0692	0.0000	0.3580
Number of Workers per 1,000 ft^2	0.9370	0.1205	3.761
Number of Personal Computers per 1,000 ft^2	0.3636	0.01961	1.566
Number of Commercial Refrigeration units per 1,000 ft^2	0.0905	0.0	0.3624
Number of Commercial Washing Machine units per 1,000 ft^2	0.0432	0.0	0.1426
Number of Residential Washing Machine units per 1,000 ft^2	0.0584	0.0	2.308
Cooling Degree Days x Percent Cooled	1,184	0.0	3,862
Heating Degree Days x Percent Heated	4,524	257.0	9,752

[5] The R^2 value in Source Energy is calculated as: 1 – (Residual Variation of Y) / (Total Variation of Y). The residual variation is sum of (Actual Source Energy$_i$ – Predicted Source Energy$_i$)^2 across all observations. The Total variation of Y is the sum of (Actual Source Energy$_i$ – Mean Source Energy)^2 across all observations.

Figure 4 - Final Regression Results

Summary				
Dependent Variable		Source Energy Intensity (kBtu/ft²)		
Number of Observations in Analysis		553		
R^2 value		0.4450		
Adjusted R^2 value		0.4347		
F Statistic		43.45		
Significance (p-level)		0.0000		
	Unstandardized Coefficients	**Standard Error**	**T value**	**Significance (p-level)**
Constant	253.0	3.339	75.75	0.0000
C_Number of Units per 1,000 ft²	24.10	6.759	3.566	0.0004
C_Percent Resident Capacity	0.9156	0.315	2.905	0.0038
C_Number of Electronic lifts per 1,000 ft²	256.5	53.92	4.758	0.0000
C_Number of Workers per 1,000 ft²	35.42	10.30	3.440	0.0006
C_Number of Personal Computers per 1,000 ft²	90.30	22.46	4.020	0.0001
C_Number of Commercial Refrigeration units per 1,000 ft²	251.5	60.14	4.183	0.0000
C_Number of Commercial Washing Machine units per 1,000 ft²	378.2	134.4	2.814	0.0051
C_Number of Residential Washing Machine units per 1,000 ft²	253.0	42.73	5.922	0.0000
C_Cooling Degree Days x Percent Cooled	0.0200	0.0079	2.596	0.0097
C_Heating Degree Days x Percent Heated	0.0059	0.0032	1.835	0.0671

Notes:

- *The regression is a weighted ordinary least squares regression, weighted by the Survey Weights (refer to Survey Weights Section).*
- *The prefix "C_" on each variable indicates that it is centered. The centered variable is equal to the difference between the actual value and the observed mean. The observed mean values are presented in **Figure 3**.*
- *Commercial Refrigeration units include open, closed, and walk-in units.*

ENERGY STAR SCORE LOOKUP TABLE

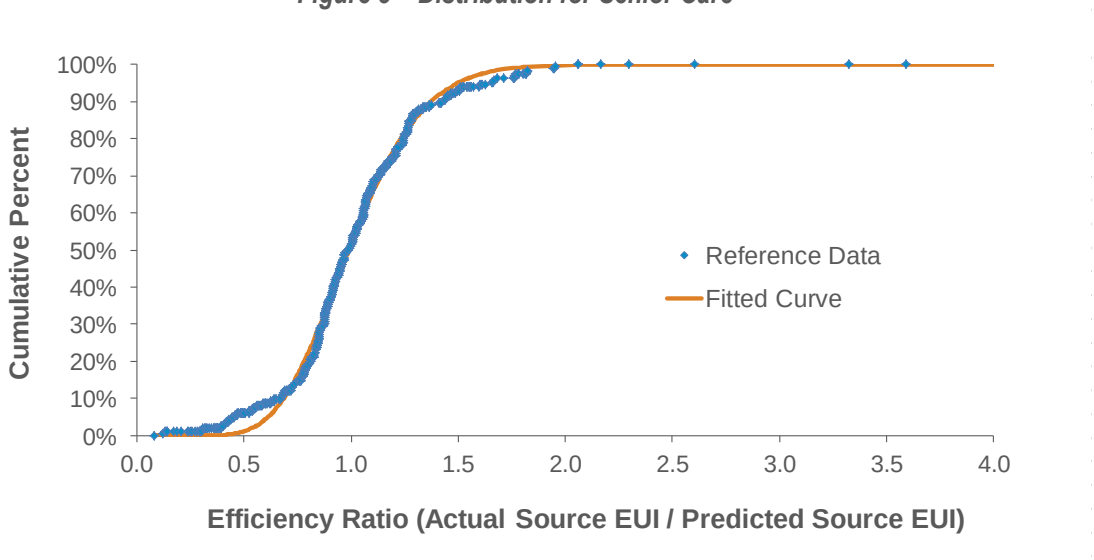
The final regression equation (presented in ***Figure 4***) yields a prediction of source EUI based on a building's operating characteristics. Some buildings in the reference data sample use more energy than predicted by the regression equation, while others use less. The *actual* source EUI of each reference data observation is divided by its *predicted* source EUI to calculate an energy efficiency ratio:

$$Energy\ Efficiency\ Ratio = \frac{Actual\ Source\ EUI}{Predicted\ Source\ EUI}$$

A lower efficiency ratio indicates that a building uses less energy than predicted, and consequently is more efficient. A higher efficiency ratio indicates the opposite.

The efficiency ratios are sorted from smallest to largest and the cumulative percent of the population at each ratio is computed using the individual observation weights from the reference data set. ***Figure 5*** presents a plot of this cumulative distribution. A smooth curve (shown in orange) is fitted to the data using a two parameter gamma distribution. The fit is performed in order to minimize the sum of squared differences between each building's actual percent rank in the population and each building's percent rank with the gamma solution. The final fit for the gamma curve yielded a shape parameter (alpha) of 13.92 and a scale parameter (beta) of 0.07282. For this fit, the sum of the squared error is 0.2721.

Figure 5 – Distribution for Senior Care



The final gamma shape and scale parameters are used to calculate the efficiency ratio at each percentile (1 to 100) along the curve. For example, the ratio on the gamma curve at 1% corresponds to a score of 99; only 1% of the population has a ratio this small or smaller. The ratio on the gamma curve at the value of 25% will correspond to the ratio for a score of 75; only 25% of the population has ratios this small or smaller. The complete score lookup table is presented in ***Figure 6***.

Figure 6 – ENERGY STAR Score Lookup Table for Senior Care Communities

ENERGY STAR Score	Cumulative Percent	Energy Efficiency Ratio > =	Energy Efficiency Ratio <
100	0%	0.0000	0.4620
99	1%	0.4620	0.5058
98	2%	0.5058	0.5351
97	3%	0.5351	0.5579
96	4%	0.5579	0.5769
95	5%	0.5769	0.5935
94	6%	0.5935	0.6083
93	7%	0.6083	0.6217
92	8%	0.6217	0.6342
91	9%	0.6342	0.6458
90	10%	0.6458	0.6566
89	11%	0.6566	0.6669
88	12%	0.6669	0.6768
87	13%	0.6768	0.6861
86	14%	0.6861	0.6952
85	15%	0.6952	0.7039
84	16%	0.7039	0.7123
83	17%	0.7123	0.7205
82	18%	0.7205	0.7286
81	19%	0.7286	0.7364
80	20%	0.7364	0.7439
79	21%	0.7439	0.7514
78	22%	0.7514	0.7587
77	23%	0.7587	0.7659
76	24%	0.7659	0.7730
75	25%	0.7730	0.7799
74	26%	0.7799	0.7867
73	27%	0.7867	0.7935
72	28%	0.7935	0.8002
71	29%	0.8002	0.8068
70	30%	0.8068	0.8133
69	31%	0.8133	0.8198
68	32%	0.8198	0.8264
67	33%	0.8264	0.8328
66	34%	0.8328	0.8391
65	35%	0.8391	0.8455
64	36%	0.8455	0.8517
63	37%	0.8517	0.8580
62	38%	0.8580	0.8643
61	39%	0.8643	0.8706
60	40%	0.8706	0.8768
59	41%	0.8768	0.8830
58	42%	0.8830	0.8892
57	43%	0.8892	0.8955
56	44%	0.8955	0.9017
55	45%	0.9017	0.9079
54	46%	0.9079	0.9142
53	47%	0.9142	0.9205
52	48%	0.9205	0.9268
51	49%	0.9268	0.9331

ENERGY STAR Score	Cumulative Percent	Energy Efficiency Ratio >=	Energy Efficiency Ratio <
50	50%	0.9331	0.9394
49	51%	0.9394	0.9458
48	52%	0.9458	0.9522
47	53%	0.9522	0.9587
46	54%	0.9587	0.9652
45	55%	0.9652	0.9718
44	56%	0.9718	0.9784
43	57%	0.9784	0.9851
42	58%	0.9851	0.9918
41	59%	0.9918	0.9985
40	60%	0.9985	1.0054
39	61%	1.0054	1.0124
38	62%	1.0124	1.0195
37	63%	1.0195	1.0265
36	64%	1.0265	1.0338
35	65%	1.0338	1.0412
34	66%	1.0412	1.0487
33	67%	1.0487	1.0563
32	68%	1.0563	1.0640
31	69%	1.0640	1.0719
30	70%	1.0719	1.0799
29	71%	1.0799	1.0882
28	72%	1.0882	1.0966
27	73%	1.0966	1.1052
26	74%	1.1052	1.1141
25	75%	1.1141	1.1231
24	76%	1.1231	1.1324
23	77%	1.1324	1.1420
22	78%	1.1420	1.1519
21	79%	1.1519	1.1622
20	80%	1.1622	1.1728
19	81%	1.1728	1.1838
18	82%	1.1838	1.1953
17	83%	1.1953	1.2074
16	84%	1.2074	1.2200
15	85%	1.2200	1.2333
14	86%	1.2333	1.2473
13	87%	1.2473	1.2622
12	88%	1.2622	1.2782
11	89%	1.2782	1.2954
10	90%	1.2954	1.3141
9	91%	1.3141	1.3345
8	92%	1.3345	1.3573
7	93%	1.3573	1.3829
6	94%	1.3829	1.4126
5	95%	1.4126	1.4480
4	96%	1.4480	1.4922
3	97%	1.4922	1.5525
2	98%	1.5525	1.6504
1	99%	1.6504	>1.6504

EXAMPLE CALCULATION

As detailed in our Technical Reference for the ENERGY STAR Score, at www.energystar.gov/ENERGYSTARScore, there are five steps to compute a score. The following is a specific example for senior care communities:

1 User enters building data into Portfolio Manager

- 12 months of energy use information for all energy types (annual values, entered in monthly meter entries)
- Physical building information (size, units, etc.) and use details describing building activity (workers, etc.)

Energy Data	Value
Electricity	3,070,000 kWh
Natural gas	166,000 therms

Property Use Details	Value
Gross floor area (ft²)	220,000
Average number of residents	480
Total resident capacity	525
Number of Units	310
Number of electronic lifts	14
Workers on the main shift[6]	260
Number of personal computers	85
Number of commercial refrigeration units	25
Number of commercial washing machines	15
Number of residential washing machines	11
Percent of the building that is heated	100 %
Percent of the building that is cooled	100 %
HDD (provided by Portfolio Manager, based on Zip code)	4,200
CDD (provided by Portfolio Manager, based on Zip code)	1,300

2 Portfolio Manager computes the actual source EUI

- Total energy consumption for each fuel is converted from billing units into site energy and source energy
- Source energy values are added across all fuel types
- Source energy is divided by gross floor area to determine actual source EUI

Computing Actual Source EUI

Fuel	Billing Units	Site kBtu Multiplier	Site kBtu	Source kBtu Multiplier	Source kBtu
Electricity	3,070,000 kWh	3.412	10,474,840	3.14	32,890,998
Natural gas	166,000 therms	100	16,600,000	1.05	17,430,000
				Total Source Energy (kBtu)	50,320,998
				Actual Source EUI (kBtu/ft²)	**228.7**

[6] This represents typical peak staffing level during the main shift. For example, in an office if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.

3 Portfolio Manager computes the predicted source EUI

- Using the property use details from Step 1, Portfolio Manager computes each building variable value in the regression equation (determining the natural log or density as necessary).
- The centering values are subtracted to compute the centered variable for each operating parameter.
- The centered variables are multiplied by the coefficients from the regression equation to obtain a predicted source EUI.

Computing Predicted Source EUI

Variable	Actual Building Value	Reference Centering Value	Building Centered Variable	Coefficient	Coefficient * Centered Variable
Constant	--	--	--	252.9	252.9
Number of Units per 1000 ft²	1.409	1.582	-0.1729	24.1	-4.167
Percent Resident Capacity	91.43	87.61	3.819	0.9156	3.496
Number of Electronic Lifts per 1000 ft²	0.0636	0.0692	-0.0056	256.5	-1.427
Number of Workers per 1000 ft²	1.182	0.937	0.2448	35.42	8.671
Number of Computers per 1000 ft²	0.3864	0.3636	0.0228	90.3	2.056
Commercial Refrigeration Units per 1000 ft²	0.1136	0.0905	0.0231	251.5	5.819
Commercial Washing Machines per 1000 ft²	0.0682	0.0432	0.02498	378.2	9.448
Min(Residential Washing Machines per 1000 ft², 0.16)	0.0500	0.0584	-0.0084	253	-2.125
CDD x Percent Cooled	1,300	1,184	116.0	0.02004	2.325
HDD x Percent Heated	4,200	4,524	-324.0	0.005879	-1.905
				Predicted Source EUI (kBtu/ft²)	**275.1**

4 Portfolio Manager computes the energy efficiency ratio

- The ratio equals the actual source EUI (Step 2) divided by predicted source EUI (Step 3)
- Ratio = 228.7 / 275.1 = 0.8314

5 Portfolio Manager uses the efficiency ratio to assign a score via a lookup table

- The ratio from Step 4 is used to identify the score from the lookup table
- A ratio of 0.8314 is greater than or equal to 0.8264 and less than 0.8328.
- ***The ENERGY STAR score is 67.***