Technical Reference

ENERGY STAR Score for K-12 Schools in the United States

OVERVIEW

The ENERGY STAR Score for K-12 Schools applies to buildings or campuses used as a school for kindergarten through 12th grade students. 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 K-12 schools applies to a property used as a school for kindergarten through 12th grade students. The score applies to an entire school whether it is a single building or a campus of buildings.
- **Reference Data.** The analysis for K-12 schools is based on data from the Department of Energy, Energy Information Administration's 2012 Commercial Building Energy Consumption Survey (CBECS).
- **Adjustments for Weather and Business Activity.** The analysis includes adjustments for:
    - Number of Workers
    - Whether or not the School is Open on Weekends
    - Whether or not there is Energy Used for Cooking
    - Whether or not the School is a High School
    - 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 K-12 schools is updated periodically as more recent data becomes available:
    - Most Recent Update: August 2018
    - Previous Update: February 2009
    - Original Release: April 2000

This document presents details on the development of the 1 - 100 ENERGY STAR score for K-12 school properties. 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 K-12 schools:

REFERENCE DATA & FILTERS

For the ENERGY STAR score for K-12 schools, the reference data used to establish the peer building population in the United States is based on data from the Department of Energy, Energy Information Administration's (EIA) 2012 Commercial Building Energy Consumption Survey (CBECS). Detailed information on this survey, including complete data files, is available at: https://www.eia.gov/consumption/commercial/index.php.

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 K-12 schools, 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 350 properties.

Figure 1 – Summary of Filters for the ENERGY STAR Score for K-12 Schools

Condition for Including an Observation in the Analysis	Rationale	Number Remaining
PBAPLUS = 28 or 29	Building Type Filter – CBECS defines building types according to the variable "PBAPLUS." Elementary/Middle Schools are coded as PBAPLUS=28; High Schools are coded as PBAPLUS=29.	539
Must operate for at least 30 hours per week	EPA Program Filter – Baseline condition for being a full time K-12 school.	523
Must operate for at least 8 months per year	EPA Program Filter – Baseline condition for being a full time K-12 school.	517
Must have at least 1 worker	EPA Program Filter – Baseline condition for being a full time K-12 school.	517
Must have at least 1 classroom seat	EPA Program Filter – Baseline condition for being a full time K-12 school.	517
A single activity must characterize greater than 50% of the floor space[1]	EPA Program Filter – In order to be considered part of the K-12 school peer group, more than 50% of the building must be defined as elementary/middle school or high school.	513
Must report energy usage	EPA Program Filter – Baseline condition for being a full time K-12 school.	513

[1] This filter is applied by a set of screens. If the variable ONEACT=1, then one activity occupies 75% or more of the building. If the variable ONEACT=2, then the activities in the building are defined by ACT1, ACT2, and ACT3. One of these activities must be coded as education (PBAX=17), with a corresponding percent (ACT1PCT, ACT2PCT, ACT3PCT) that is greater than 50.

Condition for Including an Observation in the Analysis	Rationale	Number Remaining
Must be less than or equal to 1,000,000 square feet	Data Limitation Filter – CBECS masks surveyed properties at or above above 1,000,000 square feet by applying regional averages.	513
If propane is used, the amount category (PRAMTC) must equal 1, 2, or 3	Data Limitation Filter – Cannot estimate propane use if the quantity is "greater than 1000" or unknown.	496
If propane is used, the unit (PRUNIT) must be known	Data Limitation Filter – Cannot estimate propane use if the unit is unknown.	496
If propane is used, the maximum estimated propane amount must be 10% or less of the total source energy	Data Limitation Filter – Because propane values are estimated from a range, propane is restricted to 10% of the total source energy.	496
Must not use chilled water, wood, coal, or solar	Data Limitation Filter – CBECS does not collect quantities of chilled water, wood, coal, or solar.	457
Must have Source EUI no greater than 250 kBtu/ft^2	Analytical Filter – Values determined to be statistical outliers.	435
Must have no more than 1.9 workers per 1,000 square feet	Analytical Filter – Values determined to be statistical outliers.	411
Must have no more than 0.06 walk-in refrigeration per 1,000 square feet	Analytical Filter – Values determined to be statistical outliers.	402
Must have no more than 17 classroom seats per 1,000 square feet	Analytical Filter – Values determined to be statistical outliers.	355
Must operate no more than 140 hours per week	Analytical Filter – Values determined to be statistical outliers.	350

The reasons for applying filters on the use and quantity of propane are worthy of additional discussion. In CBECS, major fuel use is reported in exact quantities. However, if a building uses propane, the amount of propane is reported according to the variable PRAMTC, which uses ranges rather than exact quantities (e.g., less than 100 gallons, 100 to 500 gallons, etc.). Therefore, the quantity must be estimated within the range. To limit error associated with this estimation, EPA applies three filters related to propane.

1. The quantity of propane expressed by PRAMTC must be 1000 gallons or smaller.
2. The unit (e.g., gallons) for the quantity of propane used must be known.
3. The value of propane cannot account for more than 10% of the total source energy use. Because the exact quantity of propane is not reported, this cap ensures that the quantity of propane entered will not introduce undue error into the calculation of total energy consumption. In order to determine if the 10% cap is exceeded, the value at the high end of the propane category is employed (e.g., for the category of less than 100, a value of 99 is used). If the 10% cap is not exceeded, then EPA will use the value at the middle of the

range to calculate total energy use for the regression analysis (e.g., for the category of less than 100, a value of 50 is used).

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., hotels smaller than 5,000 ft^2 do not behave the same way as larger properties), 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 K-12 schools, 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 example, the school gym may be in a separate building, but it is inherently part of the school. 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 school in one building), it is also eligible for a score.

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 workers, whether or not the school is a high school, 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 K-12 schools.

Dependent Variable

The dependent variable in the K-12 school analysis is source energy use intensity (source EUI). Source EUI is equal to the total source energy use of the facility divided by the gross floor area. By setting source EUI as the dependent variable, the regressions analyze the key drivers of source EUI – those factors that explain the variation in source energy per square foot in K-12 schools.

Independent Variables

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

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

- SQFT – Square footage
- NFLOOR – Number of floors
- NELVTR – Number of elevators
- NESLTR – Number of escalators
- EDSEAT – Number of classroom seats
- COURT – Food court
- MONUSE – Months in use
- OPNWE – Open on weekend
- WKHRS – Total hours open per week
- NWKER – Number of employees
- COOK – Energy used for cooking
- HEATP – Percent heated
- COOLP - Percent cooled
- SNACK – Snack bar or concession stand
- FASTFD - Fast food or small restaurant
- CAF – Cafeteria or large restaurant
- FDPREP – Commercial or large kitchen
- KITCHN – Small kitchen area
- BREAKRM – Employee lounge, breakroom, or pantry
- OTFDRM – Other food prep or serving area
- LABEQP – Laboratory equipment
- POOL – Indoor swimming pool
- HTPOOL – Heated indoor swimming pool
- RFGRES – Number of full-size residential-type refrigerator
- RFGCOMPN – Number of half-size or compact refrigerators
- RFGWIN – Number of walk-in refrigeration units (also includes freezers)
- RFGOPN – Number of open case refrigeration units
- RFGCLN – Number of closed case refrigeration units
- RFGVNN – Number of refrigerated vending machines
- RFGICN –Number of ice makers
- PCTERMN – Number of computers
- LAPTPN – Number of laptops
- PRNTRN – Number of printers
- SERVERN – Number of servers
- TRNGRM – Computer-based training room
- STDNRM – Student or public computer center
- WBOARDS – Interactive whiteboards
- TVVIDEON – Number of TV or video displays
- RGSTRN – Number of cash registers
- COPIERN – Number of photocopiers
- HDD65 – Heating degree days (base 65)
- CDD65 – Cooling degree days (base 65)

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 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 were examined using different transformations (such as the natural logarithm, abbreviated as Ln). The analysis consisted of multiple regression formulations. These analyses were structured to find the combination of statistically significant operating characteristics that explained the greatest amount of variance in the dependent variable: source EUI.

The final regression equation includes the following variables:

- Number of Workers per 1,000 Square Feet
- Heating Degree Days times Percent of the Building that is Heated
- Cooling Degree Days times Percent of the Building that is Cooled
- Whether there is Energy Used for Cooking (1 = yes, 0 = no)
- Whether the School is Open on Weekends (1 = yes, 0 = no)
- Whether the School is a High School (1 = yes, 0 = no)

These variables are used together to compute the predicted source EUI for K-12 schools. 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.

High School Analysis

Analysis revealed that high school buildings have a different average Source EUI than elementary/middle schools. Due to this unique response, the final regression includes a Yes/No variable to account for the different average energy use at high schools. The determination of this adjustment was based on a substantial analysis of the data and the differences among types of K-12 schools. EPA investigated a wide variety of regression formulations. The adjustment for high schools was determined to be statistically significant when added to the K-12 schools regression equation. This adjustment improved the overall significance of the K-12 schools regression equation, and resulted in more equitable ENERGY STAR scores for both elementary/middle schools and high schools.

Testing

Finally, we test the regression equation using actual K-12 school buildings that have been entered in Portfolio Manager. This provides another set of buildings to examine in addition to the CBECS 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 worker density, percent of the building that is heated and cooled, 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 350 observations. The dependent variable is source EUI. Each independent variable is centered relative to the mean value, presented in ***Figure 2***. The final equation is presented in ***Figure 3***. All variables in the regression equation are significant at the 90% confidence level or better, as shown by the significance levels (a p-level of less than 0.10 indicates 90% confidence).

The regression equation has a coefficient of determination (R^2) value of 0.2120, indicating that this equation explains 21.20% of the variance in source EUI for K-12 schools. 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[3] demonstrates that the equation actually explains 84.07% of the variation of source energy of offices. 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 2 - Descriptive Statistics for Variables in Final Regression Equation

Variable	Mean	Minimum	Maximum
Source EUI (kBtu/ft^2)	114.7	25.71	241.8
Number of Workers per 1,000 ft^2	0.7967	0.1194	1.885
Percent Heated x Heating Degree Days	3,597	0	10,744
Percent Cooled x Cooling Degree Days	1,472	0	4,883
Cooking (yes/no)	0.6390	0	1
Open Weekends (yes/no)	0.2619	0	1
High School (yes/no)	0.2577	0	1

[3] 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 3 - Final Regression Results

Summary				
Dependent Variable	Source Energy Intensity (kBtu/ft²)			
Number of Observations in Analysis	350			
R^2 value	0.2120			
Adjusted R^2 value	0.1983			
F Statistic	15.38			
Significance (p-level)	< 0.0001			
	Unstandardized Coefficients	**Standard Error**	**T value**	**Significance (p-level)**
Constant	101.7	4.438	22.92	<0.0001
C_Number of Workers per 1,000 ft²	25.61	6.994	3.661	0.0003
C_Percent Heated x Heating Degree Days	0.008370	0.001480	5.654	<0.0001
C_Percent Cooled x Cooling Degree Days	0.02059	0.002620	7.864	<0.0001
Cooking	8.182	4.900	1.670	0.0959
Open Weekends	15.66	5.296	2.960	0.0033
High School	14.08	5.588	2.520	0.0122

Note:

- *The regression is a weighted ordinary least squares regression, weighted by the CBECS variable "FINALWT".*
- *The prefix C_ on each variable indicates that it is centered. The centered variable is equal to difference between the actual value and the observed mean. The observed mean values are presented in **Figure 2**.*
- *Cooking is a yes/no variable (1 for yes, 0 for no) indicating whether energy is used for cooking at the property.*
- *High School is a yes/no variable (1 for yes, 0 for no) indicating whether the property is a high school.*
- *Open Weekends is a yes/no variable (1 for yes, 0 for no) indicating whether the property is open on the weekend.*

ENERGY STAR SCORE LOOKUP TABLE

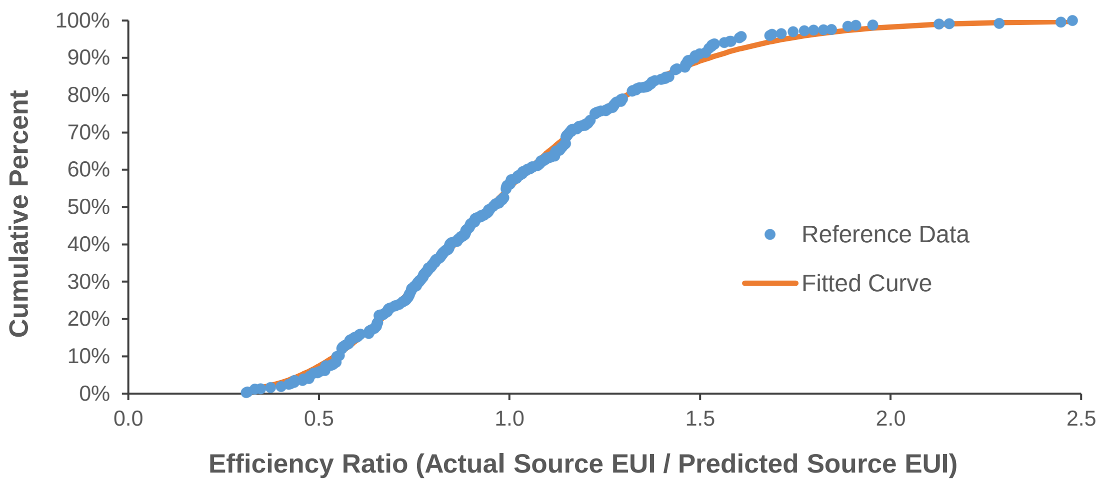
The final regression equation (presented in ***Figure 3***) yields a prediction of source EUI based on a building's operating characteristics. Some buildings in the reference data sample use more energy than predicted by the regression equation, while others use less. The *actual* source EUI of each 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 4*** 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 6.497 and a scale parameter (beta) of 0.1539. For this fit, the sum of the squared error is 0.0406.

Figure 4 – K-12 School Distribution



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 5***.

Figure 5 – ENERGY STAR Score Lookup Table for K-12 Schools

ENERGY STAR Score	Cumulative Percent	Energy Efficiency Ratio	
		> =	<
100	0%	0.0000	0.3158
99	1%	0.3158	0.3664
98	2%	0.3664	0.4015
97	3%	0.4015	0.4294
96	4%	0.4294	0.4531
95	5%	0.4531	0.4740
94	6%	0.4740	0.4928
93	7%	0.4928	0.5102
92	8%	0.5102	0.5263
91	9%	0.5263	0.5415
90	10%	0.5415	0.5559
89	11%	0.5559	0.5696
88	12%	0.5696	0.5827
87	13%	0.5827	0.5954
86	14%	0.5954	0.6076
85	15%	0.6076	0.6195
84	16%	0.6195	0.6310
83	17%	0.6310	0.6422
82	18%	0.6422	0.6532
81	19%	0.6532	0.6640
80	20%	0.6640	0.6746
79	21%	0.6746	0.6849
78	22%	0.6849	0.6951
77	23%	0.6951	0.7052
76	24%	0.7052	0.7152
75	25%	0.7152	0.7250
74	26%	0.7250	0.7347
73	27%	0.7347	0.7443
72	28%	0.7443	0.7539
71	29%	0.7539	0.7634
70	30%	0.7634	0.7728
69	31%	0.7728	0.7821
68	32%	0.7821	0.7915
67	33%	0.7915	0.8007
66	34%	0.8007	0.8100
65	35%	0.8100	0.8192
64	36%	0.8192	0.8284
63	37%	0.8284	0.8376
62	38%	0.8376	0.8468
61	39%	0.8468	0.8559
60	40%	0.8559	0.8651
59	41%	0.8651	0.8743
58	42%	0.8743	0.8836
57	43%	0.8836	0.8928
56	44%	0.8928	0.9021
55	45%	0.9021	0.9114
54	46%	0.9114	0.9207
53	47%	0.9207	0.9301
52	48%	0.9301	0.9396
51	49%	0.9396	0.9491
50	50%	0.9491	0.9587
49	51%	0.9587	0.9683
48	52%	0.9683	0.9780
47	53%	0.9780	0.9878
46	54%	0.9878	0.9977
45	55%	0.9977	1.0077
44	56%	1.0077	1.0178
43	57%	1.0178	1.0280
42	58%	1.0280	1.0383
41	59%	1.0383	1.0488
40	60%	1.0488	1.0594
39	61%	1.0594	1.0701
38	62%	1.0701	1.0810
37	63%	1.0810	1.0921
36	64%	1.0921	1.1034
35	65%	1.1034	1.1148
34	66%	1.1148	1.1265
33	67%	1.1265	1.1384
32	68%	1.1384	1.1505
31	69%	1.1505	1.1629
30	70%	1.1629	1.1755
29	71%	1.1755	1.1885
28	72%	1.1885	1.2018
27	73%	1.2018	1.2154
26	74%	1.2154	1.2294
25	75%	1.2294	1.2439
24	76%	1.2439	1.2587
23	77%	1.2587	1.2741
22	78%	1.2741	1.2900
21	79%	1.2900	1.3064
20	80%	1.3064	1.3236
19	81%	1.3236	1.3414
18	82%	1.3414	1.3600
17	83%	1.3600	1.3796
16	84%	1.3796	1.4001
15	85%	1.4001	1.4218
14	86%	1.4218	1.4448
13	87%	1.4448	1.4693
12	88%	1.4693	1.4956
11	89%	1.4956	1.5239
10	90%	1.5239	1.5549
9	91%	1.5549	1.5889
8	92%	1.5889	1.6270
7	93%	1.6270	1.6701
6	94%	1.6701	1.7201
5	95%	1.7201	1.7802
4	96%	1.7802	1.8558
3	97%	1.8558	1.9594
2	98%	1.9594	2.1299
1	99%	2.1299	> 2.1299

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 the score for K-12 schools:

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, location, etc.) and use details describing building activity (hours, etc.)

Energy Data	Value
Electricity	700,000 kWh
Natural gas	20,000 therms

Property Use Details	Value
Gross floor area (ft^2)	100,000
High School	1 (Yes)
Open weekends	1 (Yes)
Number of workers	80
Presence of cooking	0 (No)
Percent heated	100%
Percent cooled	100%
HDD (provided by Portfolio Manager, based on Zip code)	4,937
CDD (provided by Portfolio Manager, based on Zip code)	1,046

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	700,000 kWh	3.412	2,388,400	2.80	6,687,520
Natural gas	20,000 therms	100	2,000,000	1.05	2,100,000
				Total Source Energy (kBtu)	8,787,520
				Actual Source EUI (kBtu/ft^2)	**87.9**

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, or applying any minimum or maximum values used in the regression model, 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	--	--	--	101.7	101.7
Number of Workers per 1,000 ft^2	0.8000	0.7967	0.003300	25.61	0.08451
Percent Heated x HDD	4,937	3,597	1,340	0.008370	11.22
Percent Cooled x CDD	1,046	1,472	- 426	0.02059	-8.771
Presence of Cooking (yes/no)	0.0000	--	0.0000	8.182	0.0000
Open Weekends (yes/no)	1.000	--	1.000	15.66	15.66
High School (yes/no)	1.000	--	1.000	14.08	14.08
				Predicted Source EUI (kBtu/ft^2)	**134.0**

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 = 87.9 / 134.0 = 0.6560

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 0.6560 is greater than 0.6532 and less than 0.6640
- ***The ENERGY STAR score is 81***