ENERGY STAR® Performance Ratings
Technical Methodology for Office, Bank/Financial Institution, and Courthouse

This document presents specific details on the EPA's analytical result and rating methodology for Office, Bank/Financial Institution, and Courthouse. For background on the technical approach to development of the energy performance ratings, refer to *Energy Performance Ratings – Technical Methodology.*
(http://www.energystar.gov/ia/business/evaluate_performance/General_Overview_tech_methodology.pdf)

Model Release Date[1]
Most Recent Update: October 2007
Previous Update: January 2004
Original Release Date: January 1999

Portfolio Manager Definitions
The regression analysis and modeling approach detailed herein applies to three types of buildings. Each is defined as follows:

1. Office applies to facility spaces used for general office, professional, and administrative purposes. The total gross floor area should include all supporting functions such as kitchens used by staff, lobbies, atria, conference rooms and auditoria, fitness areas for staff, storage areas, stairways, elevator shafts, etc.

2. Bank/Financial Institution applies to facility space used for financial services. Relevant businesses include bank branches, bank headquarters, securities and brokerage firms. The total gross floor area should include all supporting functions such as vaults, kitchens used by staff, lobbies, atria, conference rooms and auditoria, fitness areas for staff, storage areas, stairways, elevator shafts, etc.

3. Courthouse applies to facility space used for federal, state, or local courts and associated office space. The total gross floor area should include all supporting functions such as temporary holding cells, kitchens used by staff, lobbies, atria, conference rooms and auditoria, fitness areas for staff, storage areas, stairways, elevator shafts, etc.

Reference Data
The Office, Bank/Financial Institution and Courthouse regression model is based on data from the Department of Energy, Energy Information Administration's 2003 Commercial Building Energy Consumption Survey (CBECS). Detailed information on this survey, including complete data files, is publicly available at: http://www.eia.doe.gov/emeu/cbecs/contents.html.

[1] Periodic updates to the model occur to reflect the most current available market data. The original model was developed using the CBECS 1995 database; a previous update in 2003 reflected the CBECS 1999 database. The most current update of October 2007 reflects the CBECS 2003 database.

Data Filters

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, EPA Program Filters, Data Limitation Filters, and Analytical Filters. A complete description of each of these categories is provided in Section V of the general technical description document: *Energy Performance Ratings – Technical Methodology*. **Table 1** presents a summary of each filter applied in the development of the Office, Bank/Financial Institution and Courthouse model, the rationale behind the filter, and the resulting number of observations after the filter is applied. After all filters are applied, the remaining data set has 498 observations.

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 of consumption. However, if a building uses propane, the amount of propane is reported according to the variable PRAMT8, 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 two limits to the propane quantity.

1. The quantity of propane expressed by PRAMT8 must be 1000 gallons or smaller.
2. 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 apply this 10% limitation, 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 (e.g. for the category of less than 100, a value of 50 is used).

Table 1 **Summary of Office, Bank/Financial Institution and Courthouse Model Filters**		
Condition for Including an Observation in the Analysis	**Rationale**	**Number Remaining**
PBAPLUS8=2, 3, or 4 or Court8=1	Building Filter – CBECS defines building types according to the variable "PBAPLUS8." Offices are coded as PBAPLUS8=2 and 4; Bank/Financial Institutions are coded with PBAPLUS8=3; Courthouses are designated by a 1 value in a separate variable, COURT8[2].	755
Must have at least 1 personal computer	EPA Program Filter – Baseline condition for being a functioning Office building, there must be PCs.	750
Must operate for at least 30 hours per week	EPA Program Filter – Baseline condition for being a full time Office, Bank/Financial Institution or Courthouse.	746
Must operate for at least 10 months per year	EPA Program Filter – Baseline condition for being a full time Office, Bank/Financial Institution or Courthouse.	727
Office, Bank/Financial Institution or Courthouse activity must characterize more than 50% of the floor space[3]	EPA Program Filter – In order to be considered part of the Office, Bank/Financial Institution, and Courthouse peer group, more than 50% of the building must be defined one of those activities.	698
Must have square foot <=1,000,000	Data Limitation Filter – CBECS masks actual values above 1,000,000 using regional averages.	672
If propane is used, the amount category (PRAMTC8) must equal 1, 2, or 3	Data Limitation Filter – Cannot estimate propane use if the quantity is "greater than 1000" or unknown.	662
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.	660
Must not use chilled water	Data Limitation Filter – CBECS does not collect quantities of chilled water.	625
Must have square foot >= 5,000	Analytical Limitation – Analysis could not model behavior for buildings smaller than 5,000ft^2.	498

[2] The variable COURT8 is not presented in the public 2003 CBECS data set. Because courts were identified and incorporated in the previous EPA benchmarking model, EPA requested and received this information from EIA.

[3] If the variable ONEACT8=1, this indicates that one activity occupies 75% or more of the building. If the variable ONEACT8=2, then the building can specify up to 3 activities (ACT18, ACT28, ACT38). One of these activities must Office (PBAX=11) or Public Order and Safety (PBAX=22), and must account for more than 50% of the floor area.

Dependent Variable

The dependent variable in the Office, Bank/Financial Institution, and Courthouse analysis is source energy use intensity (source EUI). This 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 Offices, Bank/Financial Institutions, and Courthouses.

Independent Variables

General Overview:

The CBECS data contain numerous building operation questions that EPA identified as potentially important for Offices, Bank/Financial Institutions, and Courthouses. Based on a review of the available variables in the CBECS data, in accordance with the EPA criteria for inclusion[4], EPA analyzed the following variables[5]:

- SQFT8 – Square footage
- WKHRS8 – Weekly hours of operation
- NWKER8 – Number of employees during the main shift
- PCNUM8 – Number of personal computers
- SRVNUM8 – Number of servers
- PRNTRN8 – Number of printers
- MNFRM8 – Mainframe computer room (yes/no)
- SRVFRM8 – Server farm (yes/no)
- TRNGRM8 – Computer-based training room (yes/no)
- COPRN8 – Number of photocopiers
- RFGWIN8 – Number of walk-in refrigeration units
- RFGOPN8 – Number of open refrigerated cases
- RFGRSN8 – Number of residential refrigerators
- RFGCLN8 – Number of closed refrigerated cases
- RFGVNN8 – Number of refrigerated vending machines
- COOK8 – Energy used for cooking (yes/no)
- FDRM8 – Commercial food preparation area (yes/no)
- SNACK8 – Snack bar (yes/no)
- FASTFD8 – Fast food or small restaurant (yes/no)
- CAF8 – Cafeteria or large restaurant (yes/no)
- ELEVTR8 – Elevators (yes/no)
- LABEQP8 – Laboratory equipment used (yes/no)
- SKYLT8 – Skylights/atriums designed for lighting (yes/no)
- HEATP8 – Percent heated
- COOLP8 – Percent cooled
- HDD658 – Heating degree days
- CDD658 – Cooling degree days

[4] For a complete explanation of these criteria, refer to *Energy Performance Ratings – Technical Methodology* (http://www.energystar.gov/ia/business/evaluate_performance/General_Overview_tech_methodology.pdf).

[5] Note that the 8 at the end of all variables indicates that the 2003 CBECS survey is the eighth survey conducted by the Energy Information Administration

EPA performed extensive review on all of these operational characteristics. In addition to reviewing each characteristic individually, characteristics were reviewed in combination with each other (e.g., Heating Degree Days * Percent Heated). As part of the analysis, some variables were 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 were examined using different transformations (such as the natural logarithm). 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.

Based on the regression analysis, the following six characteristics were identified as key explanatory variables that can be used to estimate the expected average source EUI (kBtu/ft^2) in Offices, Bank/Financial Institutions, and Courthouses:

- Natural log of gross square foot
- Number of personal computers (PCs) per 1,000 square feet
- Natural log of weekly operating hours
- Natural log of the 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

Bank/Financial Institution Analysis:
In addition, analysis revealed that bank/financial institutions of 50,000 square feet or smaller have different average energy consumption and different responses to two of the preceding characteristics: Natural log of gross square foot, and Natural log of the number of workers per 1,000 square feet. Due to this unique response, the final regression also includes:

- Yes/No variable indicating whether the building is a bank/financial institution that is 50,000 square feet or smaller.
- Adjustment for Natural log of gross square foot if the bank/financial institution is 50,000 square feet or smaller
- Adjustment for Natural log of the number of workers per 1,000 square feet if the bank/financial institution is 50,000 square feet or smaller

The determination of these adjustments was based on a substantial analysis of the data and the differences among bank/financial institutions. Working from the hypothesis that the larger and smaller bank/financial institutions may differ in their energy consumption, EPA investigated a wide variety of regression formulations. These included regressions where all bank/financial institutions were treated the same and regressions where a size cut-off point was established at 20,000 square feet, 30,000 square feet, 50,000 square feet, and 100,000 square feet. For each division, the average energy consumption of the groups was examined, as were the regression results and the individual impacts of each operating characteristic. Analysis indicated that bank/financial institutions of 50,000 square foot or smaller behave differently than their larger counterparts. This deviation is seen not only in the average energy consumption, but also in the impact that size and worker density have on energy consumption. These impacts have been incorporated into the regression model accordingly.

Refrigeration Analysis:
Another significant area of analysis during model development was the use of refrigeration in Offices, Bank/Financial Institutions, and Courthouses. Unlike previous surveys, the 2003 CBECS incorporated questions about five types of refrigeration used in commercial buildings: residential-style refrigerators, refrigerated vending machines, walk-in refrigerators, open refrigeration cases, and closed refrigeration cases. These types of equipment may be present in employee break rooms, cafeteria, or small snack bars.

EPA analyzed the variables in a variety of formulations, including examining each variable individually as well as looking at combinations of variables. Results of the analysis indicate that refrigeration does have an impact on energy consumption. Regression modeling showed that the effects were best captured through the use of two variables: residential refrigeration density (number of residential refrigerators and refrigerated vending machines per 1,000 square feet); and commercial refrigeration density (number of walk-in, open, and closed refrigeration units per 1,000 square feet).

The refrigeration variables were analyzed in the context of the standard EPA criteria for inclusion in energy performance rating models[6]. Refrigeration has characteristics of both variables that the analysis should include and variables that it should exclude. While refrigeration describes the physical operation of the building (i.e. should be included), it also represents a technology variable that explains how a building provides its services (i.e. should be excluded). For example, an office building may offer its employees 2 vending machines per floor or 20 vending machines per floor. This decision does not reflect a business constraint on the building, but rather a discretionary choice about building operation. If refrigeration were included in the model, buildings would with wasteful amounts of refrigeration would effectively receive an energy allowance to account for the wasteful decision and therefore receive an artificially high rating.

Due to these unique characteristics, the impacts of refrigeration were incorporated using a unique protocol. The two refrigeration variables were used in the final regression analysis, in order to provide the best estimates for all of the other coefficients in the model. However, in order to compute the predicted energy use and to establish the distribution (i.e. make the lookup table), each CBECS building was assigned the average value for both refrigeration variables. Due to the variable-centering technique, this means that each building had a centered value of zero. As such, the refrigeration variables have no impact on an individual building's predicted source EUI. This approach enabled EPA to correctly account for the relationship between refrigeration and other key drivers of energy use, without providing undue credit to buildings that have wasteful practices. To compute a rating in Portfolio Manager, buildings are treated identically to the way the CBECS buildings were treated to create the lookup table, and assigned a centered

[6] For a complete explanation of these criteria, refer to *Energy Performance Ratings – Technical Methodology* (http://www.energystar.gov/ia/business/evaluate_performance/General_Overview_tech_methodology.pdf).

value of zero for the refrigeration variables. Thus, the density of refrigeration does not impact an individual building's predicted source EUI.

Model Testing:
Finally, once the final regression model was developed EPA performed a variety of test runs using existing Office, Bank/Financial Institution, and Courthouse buildings that have been entered in Portfolio Manager. This existing data provided another set of buildings to examine in addition to the CBECS data, to see the average ratings and distributions, and to assess the impacts and adjustments. This analysis provided a second level of confirmation that the final regression model produces robust results that are unbiased with respect to the key operational characteristics such as building size, computer density, worker density, and heating and cooling degree days.

It is important to reiterate that the final regression model is based on the nationally representative CBECS data, not data previously entered into EPA's Portfolio Manager.

Regression Modeling Results

The final regression is a weighted ordinary least squares regression across the filtered data set of 498 observations. The dependent variable is source EUI. Each independent variable is centered relative to the mean value, presented in **Table 2**. The final model is presented in **Table 3**. All model variables are significant at the 95% confidence level or better, as shown by the significance levels, with the exception of worker density (a p-level of less than 0.05 indicates 95% confidence). Worker density has a slightly lower level of significance (84%). However, given the physical relationship between worker density and energy consumption, this result was considered acceptable given the model framework, and therefore worker density was retained in the analysis.

The model has an R^2 value of 0.334, indicating that this model explains 33.4% of the variance in source EUI for Office, Bank/Financial Institution, and Courthouse buildings. Because the final model 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[7], demonstrates that the model actually explains 79.1% of the variation of source energy of Offices, Bank/Financial Institutions, and Courthouses. This is an excellent result for a statistically based energy model.

Detailed information on the ordinary least squares regression approach, the methodology for performing weather adjustments, and the independent variable centering technique is available in the technical document: *Energy Performance Ratings – Technical Methodology*.

[7] 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 $(\text{Actual Source Energy}_i - \text{Predicted Source Energy}_i)^2$ across all observations. The Total variation of Y is the sum of $(\text{Actual Source Energy}_i - \text{Mean Source Energy})^2$ across all observations.

Table 2 Descriptive Statistics for Variables in Final Regression Model				
Variable	**Full Name**	**Mean**	**Minimum**	**Maximum**
SrcEUI	Source Energy per Square Foot	198.4	19.62	1133
LNSqFt	Natural Log of Square foot	9.535	8.517	13.82
PCDen	Number of Computers per 1000 ft2	2.231	0.0273	11.11
LNWkHrs	Natural Log of Weekly Operating Hours	3.972	3.611	5.124
LNWkrDen	Natural Log of Number of Workers per 1000 ft2	0.5616	-3.882	2.651
HDDxPH	Heating Degree Days x Percent Heated	4411	0.0000	9277
CDDxPC	Cooling Degree Days x Percent Cooled	1157	0.0000	5204

Note:
- *Statistics are computed over the filtered data set (n=498 observations).*
- *Values are weighted by the CBECS variable ADJWT8.*
- *The mean values are used to center variables for the regression.*

Table 3 Final Regression Modeling Results				
Dependent Variable	Source Energy Intensity (kBtu/ft^2)			
Number of Observations in Analysis	498			
Model R^2 value	0.3344			
Model F Statistic	22.19			
Model Significance (p-level)	0.0000			
	Unstandardized Coefficients	**Standard Error**	**T value**	**Significance (p-level)**
(Constant)	186.6	4.699	39.71	0.0000
CLnSqFt	34.17	5.271	6.484	0.0000
CPCDen	17.28	3.645	4.739	0.0000
CLNWkHrs	55.96	13.53	4.135	0.0000
CLNWkrDen	10.34	7.304	1.416	0.1575
CHDDxPH	0.0077	0.0026	2.962	0.0032
CCDDxPC	0.0144	0.0064	2.253	0.0249
BANK_50xCLNSqFt	-64.83	20.25	-3.201	0.0015
BANK_50xCLNWkrDen	34.20	15.88	2.153	0.0318
BANK_50	56.30	15.01	3.751	0.0002

Note:
- *The regression is a weighted ordinary least squares regression, weighted by the CBECS variable "ADJWT8".*
- *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 **Table 2**.*
- *BANK_50 is a yes/no variable (1 for yes, 0 for no) indicating whether the Bank/Financial Institution is 50,000 square foot or smaller in size.*
- *Full variable names and definitions are presented in **Table 2.***
- *The final regression run also included two variables to capture the effects of commercial and residential type refrigeration. These are included to insure proper estimates for all other coefficients, but are not incorporated into the rating for programmatic reasons, as discussed in the preceding text.*

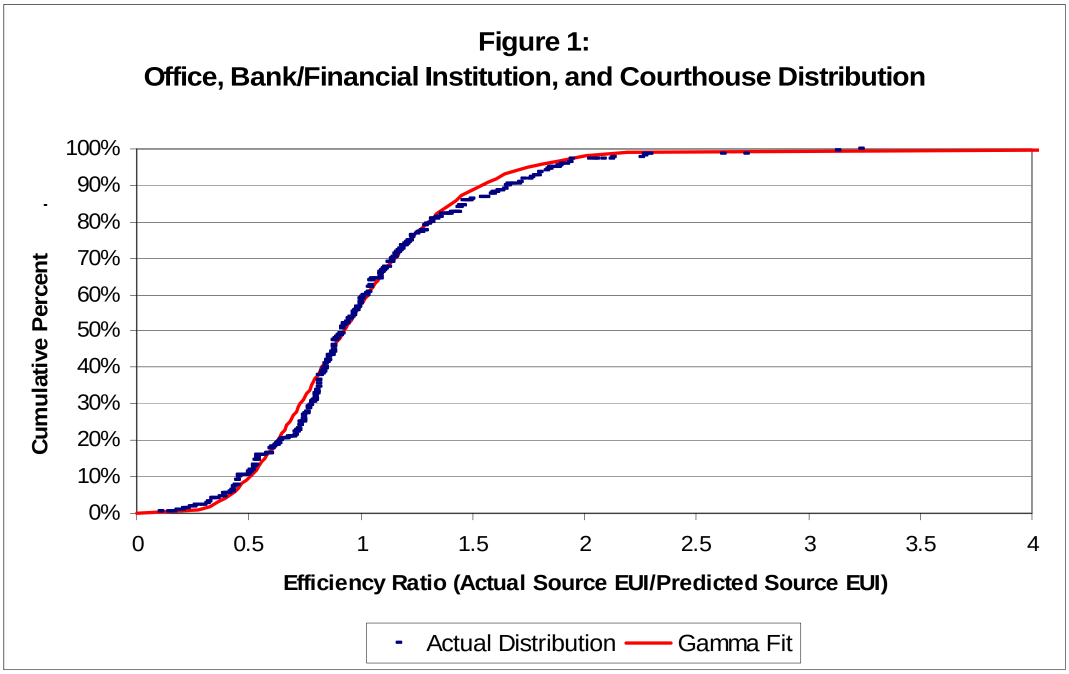
Office, Bank/Financial Institution and Courthouse Lookup Table

The final regression model (presented in **Table 3**) yields a prediction of source EUI based on a building's operating constraints. Some buildings in the CBECS data sample use more energy than predicted by the regression equation, while others use less. The *actual* source EUI of each CBECS observation is divided by its *predicted* source EUI to calculate an energy efficiency ratio:

Energy Efficiency Ratio = 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 CBECS dataset. **Figure 1** presents a plot of this cumulative distribution. A smooth curve (shown in red) 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 5.6456 and a scale parameter (beta) of 0.1741. For this fit, the sum of the squared error is 0.2673.



The final gamma shape and scale parameters are then 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 rating 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 rating of 75; only 25% of the population has ratios this small or smaller. The complete lookup table is presented at the end of the document. In order to read this lookup table, note that if the ratio is less than

0.278705 the rating for that building should be 100. If the ratio is greater than or equal to 0.278705 and less than 0.328379 the rating for the building should be 99, etc.

Example Calculation

As detailed in the document *Energy Performance Ratings – Technical Methodology*, there are five steps to compute a rating. The following is a specific example with the Office, Bank/Financial Institution, and Courthouse model:

<u>Step 1 – User enters building data into Portfolio Manager</u>

For the purposes of this example, sample data is provided

- Energy data
  - Total annual electricity = 3,500,000 kWh
  - Total annual natural gas = 4,000 therms
  - Note that this data is actually entered in monthly meter entries
- Operational data
  - Gross floor area (ft^2) = 200,000
  - Weekly operating hours = 80
  - Workers on main shift[8] = 250
  - Number of personal computers = 250
  - Percent heated = 100
  - Percent cooled = 100
  - HDD (provided by Portfolio Manager, based on zip code) = 4937
  - CDD (provided by Portfolio Manager, based on zip code) = 1046

<u>Step 2 – Portfolio Manager computes the Actual Source Energy Use Intensity</u>

In order to compute actual source EUI, Portfolio Manager must convert each fuel from the specified units (e.g. kWh) into Site kBtu, and must convert from Site kBtu to Source kBtu.

- Convert the meter data entries into site kBtu
  - Electricity: (3,500,000kWh)*(3.412kBtu/kWh) = 11,942,000 kBtu Site
  - Natural gas: (4,000 therms)*(100kBtu/therm) = 400,000 kBtu Site
- Apply the source-site ratios to compute the source energy
  - Electricity:
    11,942,000 Site kBtu*(3.34 Source kBtu/Site kBtu) = 39,889,280 kBtu Source
  - Natural Gas:
    400,000 Site kBtu *(1.047 Source kBtu/Site kBtu) = 418,800 kBtu Source
- Combine source kBtu across all fuels
  - 39,889,280 kBtu + 418,800 kBtu = 40,308,080 kBtu
- Divide total source energy by gross floor area
  - Source EUI = 40,308,080 kBtu/200,000ft^2 = 201.5 kBtu/ft^2

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[8] 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.

Step 3 – Portfolio Manager computes the Predicted Source Energy Intensity

Portfolio Manager uses the building data entered under Step 1 to compute centered values for each operating parameter. These centered values are entered into the Office, Bank/Financial Institution, and Courthouse regression equation to obtain a predicted source EUI.

- Calculate centered variables
  - Use the operating characteristic values to compute each variable in the model. (e.g. LN(Square Foot) = LN(200,000) = 12.21) .
  - Subtract the reference centering value from calculated variable (e.g. LN(Square Foot) - 9.535 = 12.21 – 9.535 = 2.675).
  - These calculations are summarized in **Table 4**
- Compute predicted source energy use intensity
  - Multiply each centered variable by the corresponding coefficient in the model (e.g. Coefficient*CenteredLN(Square Foot) = 34.17*2.675 = 91.40)
  - Take the sum of these products (i.e. coefficient*CenteredVariable) and add to the constant (this yields a predicted Source EUI of 282.9 kBtu/ft^2)
  - This calculation is summarized in **Table 5**

Step 4 – Portfolio Manager computes the energy efficiency ratio

The energy efficiency ratio is equal to: Actual Source EUI/ Predicted Source EUI

- Ratio = 201.5/282.9 = 0.7123

Step 5 – Portfolio Manager looks up the efficiency ratio in the lookup table

Starting at 100 and working down, Portfolio Manager searches the lookup table for the first ratio value that is larger than the computed ratio for the building.

- A ratio of 0.7123 is less than 0.7218 (requirement for 72) but greater than 0.7119 (requirement for 73)
- ***The rating is 72***

Table 4 **Example Calculation – Computing Building Centered Variables**				
Operating Characteristic	Formula to Compute Variable	Building Variable Value	Reference Centering Value	Building Centered Variable (Variable Value - Center Value)
CLnSqFt	LN(Square Foot)	12.21	9.535	2.675
CPCDen	#Computers/ft^2*1000	1.250	2.231	-0.9810
CLNWkHrs	LN(Weekly Operating Hours)	4.382	3.972	0.4100
CLNWkrDen	LN(#Workers/ft^2*1000)	0.2230	0.5616	-0.3386
CHDDxPH	(HDD*Percent Heated)	4937	4411	526.0
CCDDxPC	(CDD*Percent Cooled)	1046	1157	-111.0
BANK_50xCLNSqFt	BANK_50*C_LNSqFt	0.0000	NA	0.0000
BANK_50xCLNWkrDen	BANK_50*C_LNWkeDen	0.0000	NA	0.0000
BANK_50	BANK_50	0.0000	NA	0.0000

Note
- *Densities are always expressed as the number per 1,000 square feet.*
- *The center reference values are the weighted mean values from the CBECS population, show in Table 2.*
- *Bank_50 has a value of 1 if the building is a bank of 50,000 square foot or smaller; otherwise it has a value of 0.*
- *The Bank_50 terms are not centered because they represent a multiplier on the already centered variables LNSqFt and LNWkrDen.*

Table 5 **Example Calculation – Computing predicted Source EUI**			
Operating Characteristic	Centered Variable	Coefficient	Coefficient * Centered Variable
Constant	NA	186.6	186.6
CLnSqFt	2.675	34.17	91.40
CPCDen	-0.9810	17.28	-16.95
CLNWkHrs	0.4100	55.96	22.94
CLNWkrDen	-0.3386	10.34	-3.501
CHDDxPH	526.0	0.0077	4.050
CCDDxPC	-111.0	0.0144	-1.598
Bank_50xCLNSqFt	0.0000	-64.83	0.0000
Bank_50xCLNWkrDen	0.0000	34.20	0.0000
BANK_50	0.0000	56.30	0.0000
		Predicted Source EUI (kBtu/ft^2)	***282.9***

Attachment

Table 6 lists the energy efficiency ratio cut-off point for each rating, from 1 to 100.

Table 6
Lookup Table for Office, Bank/Financial Institution, and Courthouse Rating

Rating	Cumulative Percent	Ratio	Rating	Cumulative Percent	Ratio
100	0%	<0.278705	50	50%	0.935487
99	1%	0.328379	49	51%	0.945611
98	2%	0.363070	48	52%	0.955821
97	3%	0.390860	47	53%	0.966125
96	4%	0.414570	46	54%	0.976528
95	5%	0.435548	45	55%	0.987040
94	6%	0.454556	44	56%	0.997667
93	7%	0.472069	43	57%	1.008419
92	8%	0.488407	42	58%	1.019304
91	9%	0.503796	41	59%	1.030331
90	10%	0.518402	40	60%	1.041511
89	11%	0.532352	39	61%	1.052853
88	12%	0.545744	38	62%	1.064369
87	13%	0.558657	37	63%	1.076072
86	14%	0.571154	36	64%	1.087973
85	15%	0.583289	35	65%	1.100087
84	16%	0.595105	34	66%	1.112428
83	17%	0.606640	33	67%	1.125013
82	18%	0.617925	32	68%	1.137858
81	19%	0.628989	31	69%	1.150984
80	20%	0.639856	30	70%	1.164412
79	21%	0.650546	29	71%	1.178163
78	22%	0.661079	28	72%	1.192263
77	23%	0.671471	27	73%	1.206741
76	24%	0.681738	26	74%	1.221627
75	25%	0.691894	25	75%	1.236956
74	26%	0.701950	24	76%	1.252768
73	27%	0.711919	23	77%	1.269105
72	28%	0.721810	22	78%	1.286018
71	29%	0.731635	21	79%	1.303565
70	30%	0.741401	20	80%	1.321809
69	31%	0.751118	19	81%	1.340827
68	32%	0.760793	18	82%	1.360708
67	33%	0.770434	17	83%	1.381554
66	34%	0.780049	16	84%	1.403491
65	35%	0.789645	15	85%	1.426665
64	36%	0.799227	14	86%	1.451258
63	37%	0.808804	13	87%	1.477493
62	38%	0.818380	12	88%	1.505650
61	39%	0.827963	11	89%	1.536087
60	40%	0.837558	10	90%	1.569275
59	41%	0.847171	9	91%	1.605847
58	42%	0.856808	8	92%	1.646683
57	43%	0.866475	7	93%	1.693068
56	44%	0.876178	6	94%	1.746975
55	45%	0.885923	5	95%	1.811687
54	46%	0.895716	4	96%	1.893296
53	47%	0.905563	3	97%	2.005317
52	48%	0.915469	2	98%	2.190161
51	49%	0.925442	1	99%	>2.190161