Sector
Limited Statewide

Building Type
All Commercial

Fuel
Electric

Results
Summary

Display Charts

Workbook Documentation

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Annual Summary Statistics

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End Use	EUFS End-use Floor Stock (kSqFt)	EUI Energy-use Indices (kWh/ EUFS/ Year)	End-use Floor Stock Distribution (%)	EI Energy Intensity (kWh/ Segment FS/ Year)	End-use Energy Distribution (%)	Non-coincident Peak Load (watts/SF)	Connected Load (watts/SF)	Annual Energy Usage (GWh)
		(a)	(b)	(a*b)				
Heating	2,037,405	0.53	41.4	0.22	1.6	0.15	417.06 SF/kB	1,087
Cooling	3,374,531	2.97	68.6	2.04	14.9	1.18	519.44 SF/ton	10,017
Ventilation	3,697,217	2.16	75.1	1.63	11.9	0.32	0.58	8,000
Water Heating	2,247,021	0.27	45.7	0.12	0.9	0.03	0.21	611
Cooking	4,501,298	0.62	91.5	0.57	4.2	0.12	0.80	2,805
Refrigeration	4,643,497	1.94	94.4	1.83	13.4	0.26	2.49	9,014
Exterior Lighing	4,407,150	0.89	89.6	0.80	5.8	0.20	0.26	3,916
Interior Lighting	4,915,027	3.92	99.9	3.92	28.7	0.78	1.06	19,265
Office Equipment	4,839,543	0.99	98.4	0.97	7.1	0.19	0.79	4,782
Miscellaneous	4,491,364	0.87	91.3	0.80	5.8	0.15	1.45	3,924
Process	106,818	1.91	2.2	0.04	0.3	0.01	0.03	204
Motors	2,839,736	0.99	57.7	0.57	4.2	0.12	0.67	2,811
Air Compressor	1,801,858	0.36	36.6	0.13	1.0	0.03	0.14	642
Segment Total	4,920,114	--	--	13.63	100.0	3.06	--	67,077

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Notes on Selected Columns in Summary Table

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End-Use Floor Stock (End-Use ft2).

It is also useful to define a concept that relates only to the portion of the floor stock in which a specific end-use and fuel type are present. For all non-HVAC end uses, the end-use floor stock is defined as the premise-level floor stock associated with the end use and fuel in question. As a result, the end-use floor stock for gas water heating, for example, is based only on the floor area of premises in which gas water heaters are present. For example, if a 20,000 square foot premise has gas water heating equipment, then the entire 20,000 square feet is considered as the gas water heating end-use floor stock. If that same premise also has electric water heating equipment, then the electric water heating end-use floor stock would also be 20,000 square feet.

The approach used for HVAC end uses—space heating, space cooling, and ventilation—differs from that of the non-HVAC end uses in one significant way. That is, only the portions of floor area actually heated and cooled are used instead of the entire premise floor area. For instance, if a 20,000 square foot premise has gas space heating equipment serving 15,000 square feet of floor area, the end-use floor stock for gas space heating would be 15,000 square feet. Estimates of the percentage of heated and cooled floor area were captured on the on-site survey form at the activity area level (see Figure 7-2 "% Colled", "% Heated" columns in full CEUS report).

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End-Use Floor Stock Distribution.

For any end use and fuel, the floor stock distribution is defined as the fraction of total floor stock in which the fuel-specific end use is present. It is simply computed as the ratio of end-use floor stock to total floor stock in the segment. For instance, if the total floor stock for a segment is 1,000,000 square feet, but the total floor area for premises in that segment that use gas water heating (i.e., the gas water heating floor stock) is only 800,000 square feet, then the gas water heating floor stock distribution would be 80%. As explained in the previous section, if a premise has equipment of both fuel types for a single end use, then the end-use floor area is associated with both fuel types. Therefore, it is possible for a single building with

both a gas water heater and an electric water heater to have an electric end-use floor stock distribution of 100% and a gas end-use floor stock distribution of 100%. Floor stock distributions are also sometimes referred to as either fuel shares or fuel saturations.

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Energy-Use Indices (EUIs).

For the analysis of energy usage patterns, it is very useful to develop indicators of energy usage per square foot at the end-use level. Two such indicators are used in the analytical literature. The first of these is an energy use index (EUI). An EUI is defined as the annual energy usage for a specific fuel and end use per square foot of end-use floor stock (area served by the fuel and end-use in question). For instance, if the total floor stock for a segment is 1,000,000 square feet, but the total floor area for premises that use gas water heating equipment (i.e., the end-use floor stock) is 800,000 square feet, the gas water heating EUI would be derived by dividing total segment gas water heating energy usage by the gas water heating end-use floor stock (800,000 ft2).

As with all energy estimates produced for this study, simulation results represent the total end-use consumption at a premise, rather than just purchases from the electric or gas utility. For electricity, simulations include all portions of electric usage satisfied through self-generation. For gas, simulated usage is restricted to end-use consumption, and excludes the use of gas for self-generation.

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Energy Intensities (EIs).

The second indicator is an energy intensity (EI), defined as the total fuel-specific consumption per square foot of total floor stock. EIs can be expressed at the segment or building-type level, at the premise level, or at the end-use level. For example, the energy intensity for electric end uses is referred to as an “electric end-use EI,” and for gas end uses it is referred to as a “gas end-use EI”.

The difference between an EI and an EUI is in the floor stock used to develop the estimate; the EUI is based on end-use floor stock, while the EI is based on segment total floor stock. For example, for a segment, make the following assumptions:

- Total segment floor stock is 1,000,000 square feet,
- The gas water heating end-use floor stock is 800,000 square feet
- Total water heating gas consumption is 5,000,000 kBtu/year for the segment.

Then the gas water heating EI would be 5 kBtu per square foot (5,000,000 divided by 1,000,000), while the EUI would be 6.25 kBtu per square foot (5,000,000 divided by 800,000). Again, the distinction between an EI and an EUI is that the EIs characterize the entire floor stock in the segment, while the EUIs pertain only to the floor stock that has the end-use and fuel in question. Another approach to note is that the EI can be calculated as the product of the fuel share and corresponding EUI (0.8 multiplied by 6.25).

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End-Use Energy Distribution (%):

The fraction of total segment energy that is attributable to an end use.

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Non-coincident Peak Load (Watts/Segment FS):

These values represent the maximum annual hourly load in watts per total segment floor stock. The values are non-coincident across end uses and will not sum up to the segment peak load.

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Connected Load (Watts/Segment FS):

These values represent the end use connected loads in watts per total segment floor stock, except for Heating and Cooling end uses; Heating values are presented in square feet per kBtu and Cooling values are square feet per ton.