U.S. Commercial Sector Energy Consumption, Floorspace, and Equipment Efficiency

End-Use / Indicators	2015 Reference Case	2025 by Case			2025 Relative to Reference	
		Reference	High Technology	Best Available Technology	High Technology	Best Available Technology
Commercial Building Delivered Energy Consumption (quadrillion Btu) 1/						
Assembly	0.59	0.61	0.57	0.56	-6%	-8%
Education	1.04	1.03	0.97	0.95	-6%	-7%
Food Sales	0.28	0.30	0.29	0.27	-3%	-9%
Food Service	0.46	0.48	0.45	0.43	-7%	-11%
Health Care	0.49	0.51	0.48	0.47	-7%	-9%
Lodging	0.63	0.70	0.66	0.64	-6%	-7%
Office - Large	0.71	0.83	0.77	0.75	-8%	-11%
Office - Small	0.56	0.61	0.57	0.55	-6%	-10%
Mercantile/Service	1.54	1.62	1.52	1.47	-7%	-9%
Warehouse	0.44	0.48	0.45	0.44	-7%	-10%
Other	0.60	0.66	0.63	0.61	-5%	-7%
Total	**7.33**	**7.84**	**7.35**	**7.15**	-6%	-9%
Commercial Building Floorspace (billion square feet)						
Assembly	8.46	8.93	8.93	8.93	0%	0%
Education	12.22	12.82	12.82	12.82	0%	0%
Food Sales	1.44	1.59	1.59	1.59	0%	0%
Food Service	1.91	2.12	2.12	2.13	0%	0%
Health Care	2.43	2.76	2.76	2.76	0%	0%
Lodging	6.27	7.21	7.21	7.21	0%	0%
Office - Large	7.39	8.63	8.63	8.63	0%	0%
Office - Small	7.26	8.46	8.46	8.46	0%	0%
Mercantile/Service	18.09	19.71	19.71	19.72	0%	0%
Warehouse	11.89	13.77	13.77	13.77	0%	0%
Other	6.80	7.92	7.92	7.92	0%	0%
Total	**84.16**	**93.93**	**93.93**	**93.94**	0%	0%
Stock Average Equipment Efficiency 2/						
Space Heating						
Electricity	1.17	1.15	1.33	1.31	15%	13%
Natural Gas	0.76	0.78	0.81	0.81	3%	4%
Distillate Fuel Oil	0.78	0.79	0.80	0.80	2%	2%
Space Cooling						
Electricity	3.31	3.60	3.82	4.19	6%	16%
Natural Gas	0.89	0.94	1.02	1.03	8%	10%
Water Heating						
Electricity	1.03	1.04	1.25	1.25	20%	19%
Natural Gas	0.86	0.88	0.92	0.92	4%	4%
Distillate Fuel Oil	0.79	0.80	0.81	0.81	2%	2%
Ventilation (cubic feet per minute per Btu) 3/						
Electricity	0.49	0.49	0.66	0.68	32%	37%
Cooking						
Electricity	0.74	0.75	0.78	0.78	4%	4%
Natural Gas	0.51	0.51	0.58	0.58	13%	13%
Lighting Efficacy 4/ (efficacy in lumens per watt)						
Electricity	57.75	66.85	94.54	98.48	41%	47%

Source: Energy Solutions analysis of U.S. Energy Information Administration (EIA), *Annual Energy Outlook 2014.*
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Notes:

1/ Excludes commercial sector energy consumption (from uses such as street lights or municipal water services) that is not attributable to buildings.
2/ Unless noted otherwise, the efficiency measures are in the terms of Btu of energy output divided by Btu of energy input.
3/ The efficiency measure for ventilation is in terms of cubic feet per minute (cfm) of ventilation air delivered divided by Btu of energy input.

4/ A measurement of the ratio of light produced by a light source to the electrical power used to produce that quantity of light, expressed in lumens per watt.
5/ May include coal, wood, municipal waste, and hydropower.

Cases:

Reference case projection is a business-as-usual trend estimate, given known technology and technological and demographic trends. See *AEO 2014* for more details on assumptions.

High Demand Technology case assumes that residential advanced equipment is available earlier, at lower costs, and/or at higher efficiencies. Existing building shell efficiencies exhibit 50% more improvement than in the Reference case after 2013. For new construction, building code compliance is assumed to improve after 2013, and building shell efficiencies are assumed to meet ENERGY STAR requirements by 2023. Consumers evaluate investments in energy efficiency at a 7% real discount rate.

Best Available Technology case assumes that all future residential equipment purchases are made from a menu of technologies that includes only the most efficient models available in a particular year for each technology class, regardless of cost. Existing building shell efficiencies have twice the improvement of the Reference case after 2013. For new construction, 100% compliance with building codes is assumed, and building shell efficiencies are assumed to meet the criteria for the most efficient components after 2013. Consumers evaluate investments in energy efficiency at a 7% real discount rate.