

Table CE1.3 Summary Household Site Consumption and Expenditures in Midwest Region, Divisions, and States - Totals and Intensities, 2009  
British Thermal Units (Btu) and Dollars, Final

FILED WITH  
Executive Secretary  
September 11, 2014  
IOWA UTILITIES BOARD

Housing Unit Characteristics and Energy Usage Indicators	Total Housing Units <sup>1</sup> (millions)	Site Energy Consumption <sup>2</sup>				Energy Expenditures <sup>2</sup>			
		Total (quadrillion Btu)	Per Household (million Btu)	Per Household Member (million Btu)	Per Square Foot (thousand Btu)	Total (billion Dollars)	Per Household (Dollars)	Per Household Member (Dollars)	Per Square Foot (Dollars)
<b>Total Midwest</b> .....	25.9	2.914	112.4	45.1	49.5	51.34	1,981	795	0.87
<b>Midwest Divisions and States</b>									
East North Central.....	17.9	2.053	115.0	45.6	51.1	36.06	2,020	801	0.90
IL.....	4.8	0.613	128.8	50.7	58.9	9.84	2,067	814	0.95
MI.....	3.8	0.471	123.3	46.0	63.1	8.21	2,148	802	1.10
WI.....	2.3	0.235	103.2	43.8	39.6	4.38	1,926	817	0.74
IN, OH.....	7.0	0.735	105.0	42.4	44.8	13.64	1,948	786	0.83
West North Central.....	8.1	0.861	106.7	44.1	46.1	15.28	1,895	782	0.82
MO.....	2.3	0.234	100.2	40.4	42.7	4.43	1,892	764	0.81
IA, MN, ND, SD.....	3.9	0.442	113.0	46.9	46.6	7.61	1,947	808	0.80
KS, NE.....	1.8	0.185	101.7	42.7	49.5	3.24	1,786	750	0.87
<b>Urban and Rural<sup>3</sup></b>									
Urban.....	19.9	2.248	112.8	45.8	53.1	37.06	1,859	755	0.88
Rural.....	6.0	0.666	111.3	43.0	40.3	14.27	2,385	921	0.86
<b>Metropolitan and Micropolitan Statistical Area</b>									
In metropolitan statistical area.....	19.4	2.277	117.2	46.3	51.1	38.38	1,975	780	0.86
In micropolitan statistical area.....	4.7	0.444	95.1	41.0	44.5	8.79	1,883	812	0.88
Not in metropolitan or micropolitan statistical area.....	1.8	0.193	106.5	42.3	45.0	4.17	2,296	912	0.97
<b>Climate Region<sup>4</sup></b>									
Very Cold/Cold.....	20.4	2.359	115.7	46.8	51.0	40.49	1,986	803	0.87
Mixed-Humid.....	5.5	0.555	100.4	39.3	44.0	10.85	1,963	768	0.86
Mixed-Dry/Hot-Dry.....	N	N	N	N	N	N	N	N	N
Hot-Humid.....	N	N	N	N	N	N	N	N	N
Marine.....	N	N	N	N	N	N	N	N	N
<b>Housing Unit Type</b>									
Single-Family.....	19.2	2.425	126.1	47.2	46.3	42.38	2,204	826	0.81
Single-Family Detached.....	18.0	2.302	128.0	47.6	46.1	40.34	2,243	834	0.81
Single-Family Attached.....	1.2	0.123	98.6	41.5	50.0	2.05	1,646	692	0.83
Multi-Family.....	5.6	0.390	89.4	37.8	72.5	6.95	1,236	672	1.29
Apartments in 2-4 Unit Buildings.....	1.9	0.199	102.6	49.0	80.2	3.25	1,673	800	1.31
Apartments in 5 or More Unit Buildings.....	3.7	0.191	51.9	30.5	66.0	3.70	1,005	589	1.28
Mobile Homes.....	1.1	0.099	93.2	34.2	85.5	2.00	1,885	692	1.73
<b>Ownership of Housing Unit<sup>5</sup></b>									
Owned.....	18.6	2.324	125.2	48.3	46.6	40.83	2,199	849	0.82
Single-Family.....	16.9	2.154	127.6	48.5	45.0	37.72	2,234	849	0.79
Multi-Family.....	0.8	0.089	110.5	67.7	82.3	1.44	1,791	1,098	1.33
Mobile Homes.....	0.9	0.081	92.4	34.7	81.5	1.66	1,901	715	1.68
Rented.....	7.4	0.590	80.2	35.8	65.9	10.51	1,429	638	1.17
Single-Family.....	2.3	0.270	115.1	39.2	60.2	4.66	1,986	677	1.04
Multi-Family.....	4.8	0.301	62.6	33.4	70.1	5.51	1,143	610	1.28
Mobile Homes.....	0.2	0.018	97.1	32.1	109.5	0.34	1,812	598	2.04
<b>Year of Construction</b>									
Before 1940.....	4.6	0.614	133.0	55.7	52.2	10.39	2,249	942	0.88
1940 to 1949.....	1.4	0.182	127.2	47.9	51.0	3.13	2,186	822	0.88
1950 to 1959.....	3.6	0.431	119.9	49.1	59.4	7.09	1,973	808	0.98
1960 to 1969.....	3.2	0.349	107.6	46.3	54.8	5.80	1,788	769	0.91
1970 to 1979.....	4.2	0.407	95.9	38.2	50.8	7.68	1,810	722	0.96
1980 to 1989.....	3.1	0.289	94.6	41.4	47.1	5.49	1,798	786	0.89
1990 to 1999.....	3.2	0.348	110.4	41.8	43.7	6.34	2,012	762	0.80
2000 to 2009.....	2.6	0.294	113.9	39.3	37.6	5.41	2,100	725	0.69
<b>Total Square Footage<sup>6</sup></b>									
Fewer than 500.....	0.6	0.030	53.1	47.7	152.7	0.52	924	829	2.66
500 to 999.....	4.4	0.308	70.8	38.2	93.6	5.61	1,289	696	1.70
1,000 to 1,499.....	4.3	0.388	90.9	36.1	73.7	6.91	1,619	643	1.31
1,500 to 1,999.....	3.7	0.412	110.5	44.8	63.1	7.24	1,940	786	1.11
2,000 to 2,499.....	3.6	0.435	120.7	46.2	53.8	7.52	2,086	799	0.93
2,500 to 2,999.....	2.9	0.372	128.2	45.9	46.8	6.51	2,243	803	0.82
3,000 to 3,499.....	2.2	0.284	131.5	49.4	40.6	4.90	2,266	851	0.70

**Table CE1.3 Summary Household Site Consumption and Expenditures in Midwest Region, Divisions, and States - Totals and Intensities, 2009**  
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Housing Unit Characteristics and Energy Usage Indicators	Total Housing Units <sup>1</sup> (millions)	Site Energy Consumption <sup>2</sup>				Energy Expenditures <sup>2</sup>			
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<b>Total Midwest</b> .....	25.9	2.914	112.4	45.1	49.5	51.34	1,981	795	0.87
3,500 to 3,999.....	1.7	0.234	140.7	49.1	37.5	4.10	2,469	861	0.66
4,000 or More.....	2.7	0.451	168.8	57.1	31.5	8.03	3,006	1,017	0.56
<b>Number of Household Members</b>									
1 Person.....	7.4	0.634	85.4	85.4	53.0	10.95	1,474	1,474	0.92
2 Persons.....	8.5	0.963	112.9	56.5	45.2	17.17	2,012	1,006	0.81
3 Persons.....	3.9	0.491	127.1	42.4	54.1	8.42	2,180	727	0.93
4 Persons.....	3.5	0.466	133.3	33.3	48.6	8.33	2,384	596	0.87
5 Persons.....	1.7	0.230	134.8	27.0	50.2	4.18	2,452	490	0.91
6 or More Persons.....	0.9	0.130	145.1	21.7	54.5	2.28	2,551	381	0.96
<b>2009 Annual Household Income</b>									
Less than \$20,000.....	5.5	0.516	94.1	48.1	65.9	9.08	1,657	847	1.16
\$20,000 to \$39,999.....	6.5	0.644	98.5	42.7	53.4	11.44	1,752	758	0.95
\$40,000 to \$59,000.....	5.0	0.563	112.0	43.9	46.7	9.72	1,935	759	0.81
\$60,000 to \$79,999.....	3.4	0.397	115.7	41.7	47.3	7.09	2,069	745	0.85
\$80,000 to \$99,999.....	2.0	0.264	129.2	42.8	42.8	4.65	2,274	754	0.75
\$100,000 to \$119,999.....	1.3	0.177	138.9	45.3	44.8	3.07	2,407	786	0.78
\$120,000 or More.....	2.1	0.354	166.2	55.7	42.0	6.28	2,947	988	0.74
<b>Income Relative to Poverty Line<sup>7</sup></b>									
Below 100 Percent.....	3.7	0.368	99.0	37.8	64.3	6.50	1,747	668	1.13
100 to 150 Percent.....	2.6	0.268	104.8	37.4	65.6	4.73	1,851	661	1.16
Above 150 Percent.....	19.6	2.278	116.0	47.8	46.4	40.11	2,042	841	0.82
<b>Payment Method for Energy Bills</b>									
All Paid by Household.....	22.6	2.632	116.4	45.0	47.4	46.51	2,057	794	0.84
Some Paid, Some in Rent.....	1.6	0.120	74.9	40.0	84.0	1.88	1,173	626	1.32
All Included in Rent.....	1.0	0.061	61.4	39.7	83.3	1.01	1,017	657	1.38
Other Method.....	0.7	0.101	141.4	67.9	89.4	1.94	2,707	1,300	1.71

<sup>1</sup> Includes all primary occupied housing units in the 50 States and the District of Columbia. Vacant housing units, seasonal units, second homes, military housing, and group quarters are excluded.

<sup>2</sup> Data in these tables represent site or delivered energy. Consumption and expenditures for biomass (e.g. wood), coal, and solar are excluded. See RECS Terminology (<http://www.eia.gov/consumption/residential/terminology.cfm>) for further explanation of these terms.

<sup>3</sup> Housing units are classified as urban or rural using definitions created by the U.S. Census Bureau, which are publically available through 2009 TIGER/Line Shapefiles.

<sup>4</sup> These climate regions were created by the Building America program, sponsored by the U.S. Department of Energy's Office of Energy and Efficiency and Renewable Energy (EERE).

<sup>5</sup> Rented includes households that occupy their primary housing unit without payment of rent.

<sup>6</sup> Total square footage includes all basements, finished or conditioned (heated or cooled) areas of attics, and conditioned garage space that is attached to the home. Unconditioned and unfinished areas in attics and attached garages are excluded.

<sup>7</sup> To determine the number of households below the poverty line, the annual household income and number of household members were compared to the 2009 Poverty Guidelines for families published by the U.S. Department of Health and Human Services.

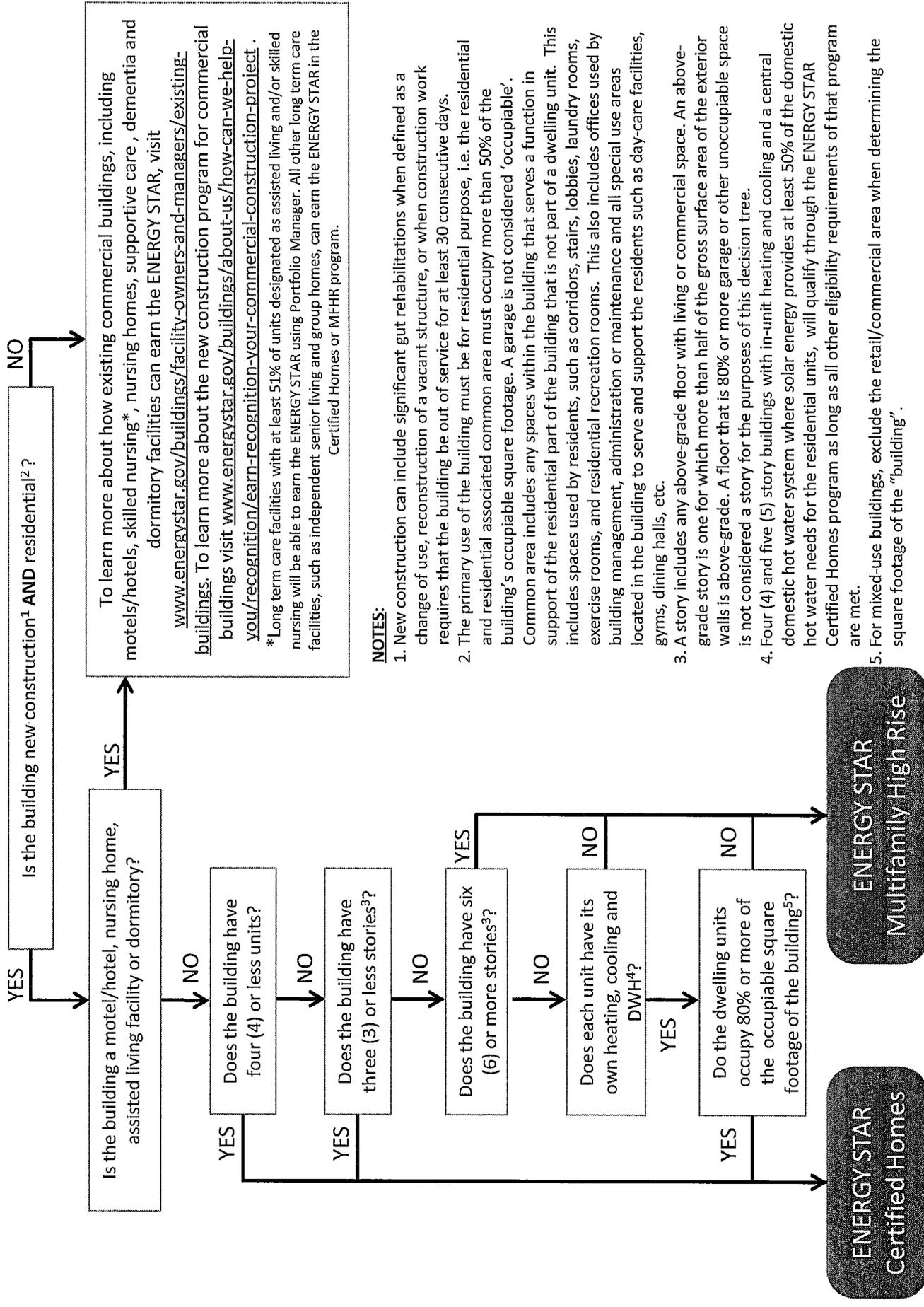
Q = Data withheld either because the Relative Standard Error (RSE) was greater than 50 percent or fewer than 10 households were sampled.

N = No cases in reporting sample.

Notes: • Because of rounding, data may not sum to totals.

Source: Energy Information Administration, Office of Energy Consumption and Efficiency Statistics, Forms EIA-457 A and C-G of the 2009 Residential Energy Consumption Survey.

# EPA ENERGY STAR Multifamily New Construction Program Decision Tree, Version 1.0



**NOTES:**

1. New construction can include significant gut rehabilitations when defined as a change of use, reconstruction of a vacant structure, or when construction work requires that the building be out of service for at least 30 consecutive days.
2. The primary use of the building must be for residential purpose, i.e. the residential and residential associated common area must occupy more than 50% of the building's occupiable square footage. A garage is not considered 'occupiable'. Common area includes any spaces within the building that serves a function in support of the residential part of the building that is not part of a dwelling unit. This includes spaces used by residents, such as corridors, stairs, lobbies, laundry rooms, exercise rooms, and residential recreation rooms. This also includes offices used by building management, administration or maintenance and all special use areas located in the building to serve and support the residents such as day-care facilities, gyms, dining halls, etc.
3. A story includes any above-grade floor with living or commercial space. An above-grade story is one for which more than half of the gross surface area of the exterior walls is above-grade. A floor that is 80% or more garage or other unoccupiable space is not considered a story for the purposes of this decision tree.
4. Four (4) and five (5) story buildings with in-unit heating and cooling and a central domestic hot water system where solar energy provides at least 50% of the domestic hot water needs for the residential units, will qualify through the ENERGY STAR Certified Homes program as long as all other eligibility requirements of that program are met.
5. For mixed-use buildings, exclude the retail/commercial area when determining the square footage of the "building".



# ENERGY STAR Multifamily High Rise National Performance Path Requirements, Version 1.0

## **ENERGY STAR MFHR Performance Path Requirements:**

To earn the ENERGY STAR using this performance approach, a building must meet the requirements specified below, the Performance Target, and be verified and field-tested in accordance with the *ENERGY STAR MFHR Testing and Verification Protocols*. Note that compliance with these guidelines is not intended to imply compliance with all local code requirements that may be applicable to the building to be built.<sup>1</sup>

To ensure that a MFHR building meets ENERGY STAR guidelines, the developer of a project participating in the program must provide EPA or its designated agent with program specific submittals. These submittals, which must be validated by a licensed professional (registered architect or professional engineer), are used to demonstrate that the program's performance target has been met, that all prerequisites are included, and that each energy conservation measure chosen by the design team is installed to specification.

## **Performance Target:**

The Performance Target is 15% energy cost savings over the ASHRAE 90.1-2007 baseline using the Appendix G protocols and the *ENERGY STAR MFHR Simulation Guidelines*. In California, the Performance Target attained must be 15% above Title 24 using Title 24 modeling guidance. Energy cost savings associated with on-site power generation, including cogeneration, photovoltaics, and wind turbines, may not be used to meet the Performance Target of 15%.

## **ENERGY STAR MFHR Simulation Guidelines (Simulation Guidelines):**

The *Simulation Guidelines* is a companion document to ASHRAE 90.1-2007 and ASHRAE 90.1 - Appendix G and contains program guidance to assist energy modelers in developing the Baseline Building, Proposed Design, and As-Built models for each project. The intent of these guidelines is to:

- Facilitate consistent modeling among different modelers;
- Facilitate consistent modeling of baseline components not mentioned in Appendix G;
- Establish modeling protocols for measures that ASHRAE 90.1 leaves to the rating authority to determine; and
- Ensure that modeling results are used to drive the energy-efficient design process.

If an energy conservation measure is included in the model that is not addressed in the *Simulation Guidelines* or ASHRAE 90.1-2007 - Appendix G, the energy modeler is required to clearly document their assumptions and calculations. Each measure not included in the guidelines is subject to approval by EPA or its designated agent.

## **ENERGY STAR MFHR Testing and Verification Protocols (T&V Protocols):**

The *T&V Protocols* are mandatory requirements for the inspection, testing, and verification of components related to the building's energy performance. All inspections and diagnostic tests described within these protocols are required for each of the energy-related components and systems that exist in the participating building. Results of inspections must be documented and kept on record with the building file by a licensed professional and submitted to EPA, or its designated agent, at the completion of construction. These inspections shall be conducted throughout the project construction phase at a time that is best suited to determine whether the energy efficiency element is installed to specification.

## **ENERGY STAR MFHR Submittal Requirements:**

To certify a MFHR building as ENERGY STAR, EPA or its designated agent must approve a complete Proposed Design Submittal and a complete As-Built Submittal. EPA or its designated agent will not approve incomplete submittals, but will communicate with Developer Partners and licensed professionals on which requirements must be met to bring the submittal into compliance with program requirements.



# ENERGY STAR Multifamily High Rise National Performance Path Requirements, Version 1.0

## Proposed Design Submittal (Submitted prior to construction)

The Proposed Design Submittal is used to ensure that the project design meets the Performance Target and that the mandatory requirements of the program have been included in the construction documents. The licensed professional is responsible for submitting a Proposed Design Submittal, with an *ENERGY STAR MFHR Submittal Validation Form* to EPA, or its designated agent for approval, prior to beginning construction. The Proposed Design Submittal includes the following:

- Proposed Design Performance Path Calculator<sup>2</sup>  
The *Proposed Design Performance Path Calculator* summarizes the modeling results of the proposed building design, and is used to demonstrate achievement of the Performance Target.
- Testing and Verification Worksheets  
A full review of all construction documents must be conducted prior to construction and documented using the *T&V Worksheets*. The *Prerequisites Checklist* is used at this stage to demonstrate that prerequisites and energy conservation measures chosen by the design team have been properly specified within the construction documents. The checklist is included as part of the *T&V Worksheets* and is automatically completed if the other *T&V Worksheets* are used to document the review process.

## As-Built Submittal (Submitted post construction)

The As-Built Submittal is used to ensure that the energy conservation measures chosen by the design team are installed to specification. After the final inspection, the licensed professional is responsible for submitting an As-Built Submittal, with an *ENERGY STAR MFHR Submittal Validation Form* to EPA, or its designated agent for approval. Once EPA has determined that the project has fulfilled all of the program requirements, the Developer Partner will be notified that the building has earned the ENERGY STAR and that it can be marketed and promoted per the *ENERGY STAR Logo Identity Guidelines*. The As-Built Submittal includes the following:

- As-Built Performance Path Calculator  
The *As-Built Performance Path Calculator* summarizes the modeling results of the completed building, and is used to demonstrate achievement of the Performance Target. Any modifications to the project's energy conservation measures during construction must be reflected in the *As-Built Performance Path Calculator*.
- Testing and Verification Worksheets and Photo Template  
The *T&V Worksheets* and *Photo Template* are used to demonstrate that prerequisites and energy conservation measures chosen by the design team are included in the completed building and meet all requirements of the *ENERGY STAR MFHR Testing and Verification Protocols*. (Note, once a licensed professional or Developer Partner has successfully certified 3 buildings, submission of a Photo Template as a component of the Testing and Verification Protocols is no longer required.)

## ENERGY STAR MFHR Prerequisites<sup>3</sup>:

<b>Appliances</b>	When provided in common areas and/or apartments, refrigerators, dishwashers, clothes washers, ceiling fans and vending machines must be ENERGY STAR certified.
<b>Heating and Cooling Equipment</b>	<ul style="list-style-type: none"> <li>▪ The heating and cooling systems must comply with ASHRAE 90.1-2007, Section 6.4.</li> <li>▪ Load sizing calculations must reflect the design<sup>4</sup>. The installed capacity cannot exceed design by more than 20%, except when smaller sizes are not available.</li> <li>▪ Atmospherically vented gas furnaces and boilers shall not be specified.</li> </ul>
<b>Heating and Cooling Distribution<sup>5,6,7,8,9,10,11,12</sup></b>	<ul style="list-style-type: none"> <li>▪ Total duct leakage for in-unit systems shall be <math>\leq 8</math> CFM25 per 100 ft<sup>2</sup> of conditioned floor area<sup>6</sup>. Sampling procedures and tolerances are described in the <i>T&amp;V Protocols</i>.</li> <li>▪ Heating and cooling supply and return ductwork shall be insulated to a minimum R-6 in unconditioned space.</li> </ul>



# ENERGY STAR Multifamily High Rise National Performance Path Requirements, Version 1.0

<p><b>Envelope</b><sup>13,14,15</sup></p>	<ul style="list-style-type: none"> <li>▪ The envelope components must comply with ASHRAE 90.1-2007, Section 5.4. Assembly U-value determinations must follow ASHRAE 90.1-2007, Appendix A<sup>16</sup>.</li> <li>▪ The building plans shall demonstrate a continuous, unbroken air barrier separating the conditioned space of the building from the following spaces:             <ul style="list-style-type: none"> <li>- the exterior,</li> <li>- unconditioned spaces within the building,</li> <li>- commercial spaces,</li> <li>- mechanical rooms vented with unconditioned air,</li> <li>- mechanical chases opening to unconditioned spaces,</li> <li>- elevator shafts, and</li> <li>- garages or other vehicle/equipment storage facilities.</li> </ul> </li> <li>▪ All roof, wall, floor, and slab insulation shall achieve RESNET-defined Grade I installation or, alternatively, Grade II for surfaces that contain a layer of continuous, air impermeable insulation (<math>\geq R-3</math> in CZ 1-4 and <math>\geq R-5</math> in CZ 5-8).</li> <li>▪ For steel-framed and metal building walls, continuous exterior insulation (<math>\geq R-3</math>) is required on above grade walls<sup>17</sup>. For mass or masonry walls with metal framing, continuous interior or exterior insulation (<math>\geq R-3</math>) is required on above grade walls.</li> <li>▪ Specified windows must be double or triple-pane, with low-emissivity glass or coatings.</li> </ul>
<p><b>Garages and Sidewalks</b><sup>18,19</sup></p>	<p>Attached garages shall be fully compartmentalized from the rest of the building through air sealing. All pipe and conduit penetrations shall be sealed with material compatible with the surface and resilient to temperature fluctuations.</p>
<p><b>Ventilation and Infiltration</b><sup>20</sup></p>	<ul style="list-style-type: none"> <li>▪ Apartments shall be sealed to reduce air exchange between the apartment and outside as well as the apartment and other adjacent spaces. A maximum air leakage rate of 0.30 CFM50 per square feet of enclosure is allowed. Sampling procedures and tolerances are described in the <i>T&amp;V Protocols</i>. Specific apartment air leakage paths to be sealed are listed in the <i>T&amp;V Worksheets</i>.</li> <li>▪ Common area ventilation systems shall be designed and tested to satisfy minimum requirements of ASHRAE 62.1-2007. Apartment ventilation and local exhaust systems shall be designed and tested to satisfy minimum requirements of ASHRAE 62.2-2007, without reliance on natural ventilation<sup>21</sup>. Apartment in-line and ceiling exhaust fans must be ENERGY STAR certified.</li> </ul>
<p><b>Domestic Water Heating</b><sup>22,23</sup></p>	<ul style="list-style-type: none"> <li>▪ Domestic water heating systems must comply with ASHRAE 90.1-2007, Section 7.4.</li> <li>▪ Atmospherically vented gas water heaters, <u>tankless coils</u> and side-arm water heaters shall not be specified. Indirect water heaters, with or without storage, are acceptable. If storage is provided, the maximum storage tank capacity shall be specified based on occupancy.</li> <li>▪ The average flow rate for all faucets must be <math>\leq 2.0</math> gallons per minute (as rated at 80 psi)<sup>24</sup>.</li> <li>▪ All showerheads must be WaterSense<sup>®</sup> labeled</li> <li>▪ All tank-type toilets must be WaterSense<sup>®</sup> labeled.</li> </ul>
<p><b>Lighting</b><sup>25,26</sup></p>	<p><u>Occupancy Controls</u></p> <p>All non-apartment spaces, except those intended for 24-hour operation or where automatic shutoff would endanger the safety of occupants, must have occupancy sensors or automatic bi-level lighting controls.</p>



# ENERGY STAR Multifamily High Rise National Performance Path Requirements, Version 1.0

	<p><u>Common Space Lighting</u> 80% of installed light fixtures in common spaces must be ENERGY STAR certified or have ENERGY STAR certified lamps installed. Alternatively, 100% of installed light fixtures in common spaces must have high-efficacy lamps installed, as defined in Appendix B. Total specified lighting power for the combined common spaces must not exceed ASHRAE 90.1-2007 allowances for those combined spaces by more than 20%.</p> <p><u>In-Unit Lighting</u> 80% of installed light fixtures within apartments must be ENERGY STAR certified or have ENERGY STAR certified lamps installed. Alternatively, 100% of installed light fixtures within apartments must have high-efficacy lamps installed, as defined in Appendix B.</p> <p><u>Exterior Lighting</u></p> <ul style="list-style-type: none"> <li>▪ 80% of outdoor lighting fixtures shall be ENERGY STAR certified or have ENERGY STAR certified lamps installed. Alternatively, 100% of outdoor lighting fixtures must have high-efficacy lamps installed, as defined in Appendix B.</li> <li>▪ Fixtures must include automatic switching on timers or photocell controls except fixtures intended for 24-hour operation, required for security, or located on apartment balconies.</li> </ul> <p><u>Exit Signs</u> All exit signs shall be specified as LED (not to exceed 5W per face) or photo-luminescent and shall conform to local building code; fixtures located above stairwell doors and other forms of egress shall contain a battery back-up feature.</p>
<p><b>Pump Motor Efficiency<sup>27</sup></b></p>	<p>All three-phase pump motors 1 horse-power or larger shall meet or exceed efficiency standards for NEMA <u>Premium</u><sup>TM</sup> motors, where available.</p>

## ENERGY STAR MFHR Benchmarking:

Although an eligible building may earn the ENERGY STAR based on the mandatory requirements listed above, building performance is as much a function of proper building management as the energy conservation measure incorporated into the structure. Therefore, after earning the ENERGY STAR for the project, the developer/owner must commit to benchmarking their building in Portfolio Manager for a period of two years.

Portfolio Manager is a free, online, interactive energy management tool that allows developer/owner to measure and track their building's energy and water consumption, identify investment priorities, and verify improvements over time. Developers/owners can use Portfolio Manager to track weather-normalized energy use intensity (EUI), energy costs, greenhouse gas emissions, and water consumption. For more information on how to use Portfolio Manager, see the [Portfolio Manager - Multifamily Housing Quick Reference Guide](#) document.

To accomplish this goal, the developer/owner or an entity working on their behalf, must be capable of evaluating the utility consumption of the residential-associated spaces independent of any commercial/retail space. These nonresidential associated parts of the building shall be separately metered (or sub-metered) for electricity, gas, fuel oil, water, steam, and hot water for domestic and/or space heating purposes. Also, they should work with tenants to secure consumption information. If the building is direct-metered for utilities to the apartments, the building owner may need signed releases from individual apartment occupants to allow for benchmarking or find alternative methods to assessing whole building energy consumption such as a whole-building meter or asking the utility for aggregated data.

All data uploaded to Portfolio Manager is strictly confidential and only used to estimate the energy performance of the building as a whole, not of individual apartments.



# ENERGY STAR Multifamily High Rise National Performance Path Requirements, Version 1.0

**ENERGY STAR MFHR Website:**

More information on program requirements, submittals, processes, and benchmarking can be found at [www.energystar.gov/mfhr](http://www.energystar.gov/mfhr), including our Current Policy Record, which contains policy issues that were received and have been resolved since the last revision of the program documents. Questions? Please email us at [mfhr@energystar.gov](mailto:mfhr@energystar.gov).



# ENERGY STAR Multifamily High Rise National Performance Path Notes

1. Where requirements of the local codes, manufacturers' installation instructions, engineering documents, or regional ENERGY STAR programs overlap with the requirements of these guidelines, EPA offers the following guidance:
  - a. In cases where the overlapping requirements exceed the ENERGY STAR guidelines, these overlapping requirements shall be met;
  - b. In cases where overlapping requirements conflict with a requirement of these ENERGY STAR guidelines (e.g., slab insulation is prohibited to allow visual access for termite inspections), then the conflicting requirement within these guidelines shall not be met. Qualification shall only be allowed if the licensed professional has determined that no equivalent option is available that could meet the intent of the conflicting requirement of these ENERGY STAR guidelines (e.g., switching from exterior to interior slab edge insulation).
2. The *Performance Path Calculator* is a set of worksheets in an Excel file designed to provide consistency among energy modelers by providing the exact calculations described in the Simulation Guidelines. It also provides a consistent format for reporting the results of the Performance Rating. Many of these worksheets are optional, however, submission of the Excel file, with Basic Info and Reporting Summary worksheets completed, is mandatory.
3. Each building that participates in the program, regardless if it chooses the Performance Path or the Prescriptive Path, must meet certain mandatory program requirements. These requirements are listed within this document and outlined in the *Prerequisites Checklist*, a worksheet within the *ENERGY STAR MFHR Testing and Verification Worksheets*. These prerequisites establish the minimum program requirements within which the design team may make performance trade-offs in the design of an ENERGY STAR certified building. While these prerequisites can contribute to the achievement of the Performance Target, these requirements alone are not sufficient to earn the ENERGY STAR. As used in this document, the word 'shall' means that the action specified is mandatory and must be accomplished.

## Heating and Cooling Equipment

4. Heating and cooling loads shall be calculated, equipment capacity shall be selected, and duct systems shall be sized according to the latest editions of ACCA Manual J, S, & D, respectively, ASHRAE 2009 Handbook of Fundamentals, or a substantively equivalent procedure. Indoor temperatures shall be 70°F for heating and 75°F for cooling. Outdoor temperatures shall be the 1.0% and 99.0% design temperatures, respectively, as published by the ASHRAE Handbook of Fundamentals.

## Heating and Cooling Distribution

5. Terminal heating and cooling distribution equipment serving an apartment shall be controlled by a thermostat(s) within the same apartment.
6. Heating and cooling ductwork shall be sealed at all transverse joints and connections, including ductwork connections through drywall or other finish materials, using UL-181 compliant methods and materials. Construction documents shall specify that ductwork must be inspected before access is covered up. As an alternative to meeting total duct leakage requirements post-construction, total duct leakage measured at rough-in,  $\leq 4$  CFM25 per 100ft<sup>2</sup>, with air handler and all ductwork installed, is accepted.
7. Heating and cooling ductwork that is specified as flex duct shall follow the Sheet Metal and Air Conditioning Contractors' (SMACNA) installation standards for flex ducts (see *Appendix A*).
8. For hydronic distribution systems, all terminal heating and cooling distribution equipment must be separated from the riser or distribution loop by a control valve or terminal distribution pump, so that heated or cooled fluid is not delivered to the apartment distribution equipment when there is no call from the apartment thermostats.
9. Piping carrying fluid or steam with temperatures greater than 105°F must have a minimum of 1" of insulation; pipes 1.5" in diameter and greater must have a minimum of 1.5" of insulation. Piping carrying fluid with temperatures less than 60°F



# ENERGY STAR Multifamily High Rise National Performance Path Notes

must have a minimum of 0.5" of insulation; pipes 1.5" in diameter and greater must have a minimum of 1.0" of insulation. Construction documents must account for piping total thickness including required insulation when passing through planks or any other penetrations. For PTACs or any other heating/cooling systems that require branch pipe insulation, the insulation thickness must be considered when designing room dimensions and access chases. Construction documents shall specify that the piping must be inspected before access is covered up. Extent and location to be determined by ASHRAE 90.1-2007 Section 6.4.4.1.3 or local code.

10. For systems designed with outdoor-air supplied to the heating, cooling, or ventilation distribution system, provide motorized dampers that will automatically shut when systems or spaces are not in use.
11. For hydronic distribution systems without automatic balancing valves, all supply/return headers must be designed in a "reverse return" configuration (i.e. first riser supplied is the last returned, etc.) and/or sized based on a water velocity of less than 4 ft/s. Total pressure drop of terminal unit branch piping and fittings between a supply and return riser must be significantly greater than the total pressure drop from the top to the bottom of these risers. Calculations and assumptions for sizing circulating pumps must meet Chapter 43 of the ASHRAE Handbook, HVAC Systems and Equipment or equivalent industry accepted standard.
12. For in-unit forced air distribution systems, perform design calculations (using ACCA Manuals J and D, the ASHRAE Handbook of Fundamentals, or an equivalent procedure) and install ducts accordingly. Bedrooms must be pressure-balanced using any combination of transfer grills, jump ducts, dedicated return ducts, and/or undercut doors.

## Envelope

13. When required by local building code, entranceways shall be designed with vestibules with weather-stripping hard-fastened to the door or frame.
14. If installing sleeves for through-wall AC units, insulated covers must be provided by the building for use during heating season and when AC units are not installed.
15. Ductwork penetrating the building envelope shall be sealed to prevent air leakage through the duct system and/or the building envelope. This includes, but is not limited to, roof curbs and exterior wall exhaust/intake vents.
16. An area weighted average of the U-factors of the wall and floor perimeter assemblies is acceptable in the energy model. When calculating the wall U-factor, the full R-value for any exterior wall insulation can only be used for portions of the assembly where shelf angles or other continuous metal fastened to the wall are not used. For portions of this assembly where shelf angles or other continuous metal fastened to the wall are used, the exterior insulation cannot contribute to the assembly R-value and an overall U-value shall be calculated based on an area weighted ratio.
17. Where specific details cannot meet this continuous insulation requirement, the Licensed Professional shall provide the detail to EPA to request an exemption prior to the building's certification. Projected balconies are currently exempt, however EPA recommends that they be thermally broken.

## Garages and Sidewalks

18. Garages, including plenums and dropped ceilings within the garage, shall not be heated for comfort or to prevent pipes from freezing. Piping design and layout shall locate piping within conditioned spaces or grouped and properly insulated to prevent freezing. If heat tracing is used for freeze protection, it must be activated based on pipe wall temperature, rather than air temperature, and the energy consumption must be modeled in the As-Built (but excluded in the Baseline). The heat tracing thermostat set point must be no higher than 40°F and the set point must be confirmed by a field inspection.
19. Radiant heating, either wall or ceiling-mounted or within the garage floor (or sidewalks) may be used to prevent ice formation on the ground as a safety feature only and temperature-based controls must comply with ASHRAE 90.1-2007



# ENERGY STAR Multifamily High Rise National Performance Path Notes

Section 6.4.3.8. Energy consumption associated with these systems must be modeled in the As-Built (but excluded in the Baseline).

## Ventilation and Infiltration

20. Ventilation system ductwork shall be sealed at all transverse joints and connections including boot to wall/ceiling connections through drywall using UL-181 compliant materials and methods. Central exhaust systems that serve one or more apartments must be tested for duct leakage, where the maximum leakage allowance is calculated as 5 CFM per register per shaft plus 5 CFM per floor per shaft. See *T&V Protocols* for details.
21. Compliance with ASHRAE 62.2-2007 Sections 4.3 and 5.3.1 is recommended, but not required. Providing outdoor air to each unit directly from the outdoors is recommended, but not required. For kitchen exhaust fans, prescriptive duct sizing requirements described at [www.energystar.gov/newhomesresources](http://www.energystar.gov/newhomesresources) may be used in lieu of measuring the actual air flow rate.

## Domestic Water Heating

22. The temperature setting of in-unit storage water heaters must not exceed 140°F. For both in-unit and central DHW systems, temperatures measured at faucets and showerheads must not exceed 125°F. Domestic hot water piping carrying liquid with temperatures greater than 105°F must have a minimum of 1" insulation. Pipes over 1.5" in diameter must have a minimum of 1.5" of insulation. Extent and location to be determined by ASHRAE 90.1-2007 Section 7.4.3 or local code.
23. Self-contained or electronic mixing valves shall be used to control hot water temperature for central domestic water heating systems serving apartments.
24. If flow ratings at 80 psi are not available, WaterSense® labeled faucets or aerators may be used to meet this prerequisite.

## Lighting

25. ASHRAE 90.1-2007, Section 9.1.4a, requires that light fixtures be modeled with the maximum labeled wattage of the fixture. EPA will allow light fixtures to be modeled based on the installed wattage of the lamps. Ex: A fixture with a 13 W screw-in CFL can be modeled as 13 W, plus any associated ballast power. See Appendix B to determine input power.



# ENERGY STAR Multifamily High Rise National Performance Path Notes

26. Lighting must comply with ASHRAE 90.1-2007, Section 9.4. At a minimum, interior lighting must be designed to meet light levels (footcandles) by space type as recommended by the Illumination Engineering Society (IESNA) Lighting Handbook, 9<sup>th</sup> edition. Values for commonly used spaces are listed below. For senior housing, minimum illumination requirements may follow recommendations in IESNA's 2007 Lighting and the Visual Environment for Senior Living, and an increase in lighting power densities and allowances corresponding to the increase in footcandles, is permitted. See Appendix B to determine lamp lumens.

ASHRAE Space Type	Lighting Power Densities (W/ft <sup>2</sup> )	Recommended Light Levels (Weighted Avg. Footcandles)	ASHRAE Space Type	Lighting Power Densities (W/ft <sup>2</sup> )	Recommended Light Levels (Weighted Avg. Footcandles)
Apartments	1.1	16	Stairs - Active	0.6	15
Storage, active	0.8	20	Restroom	0.9	12
Storage, inactive	0.3	8	Office	1.1	35
Food Preparation	1.2	40	Conference/meeting/ multipurpose	1.3	30
Dining Area - For Family Dining	2.1	23	Electrical/Mechanical	1.5	30
Lobby/Elevator	1.3	16	Workshop	1.9	50
Corridor/Transition	0.5	10	Parking garage	0.2	7

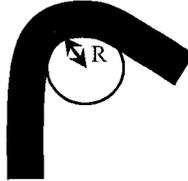
## Motors

27. Many motors are NEMA labeled and this label alone, does not ensure that a motor is energy-efficient. This requirement refers specifically to the **NEMA Premium** energy efficient motors program. Participating companies may be found at [http://www.nema.org/Policy/Energy/Efficiency/Documents/NEMA\\_Premium\\_Partners.pdf](http://www.nema.org/Policy/Energy/Efficiency/Documents/NEMA_Premium_Partners.pdf). Motors for fire pumps and booster pumps are exempt from this requirement.



# ENERGY STAR Multifamily High Rise National Performance Path Notes

## Appendix A: Specifications for Flexible Duct Installation

Component/Location	Standard
Duct length	Limit duct length to no more than 25' per run for flex duct, not to exceed the manufacturer's recommended limit
Excess ductwork	Runs should be as direct as possible. Excess ductwork should be no more than 5% for any given section of flexible duct.
Supports	Suspended horizontal ducts should be supported at least every 5'.
Hangers	Hanger material should be at least 1-1/2" in width and hangers should not crimp the ductwork, causing the interior dimension of the duct to be less than specified
Sag	Suspended ductwork should be allowed to sag no more than 1/2" for every 1' of run
Trunk and boot connections	Flexible duct should be allowed to run straight out of any connection at least 12" before taking a turn
Bends	The radius at the centerline of a bend must be a minimum of one duct diameter as shown in the diagram (R = 1 duct diameter): 
Connections	Connections to boots, collars, and trunks must be substantially airtight
Sealants	Sealants and tapes used to make ductwork airtight must be compliant with UL=181 standards and installed according to the manufacturer's specifications

Reference: Sheet Metal and Air Conditioning Contractor's National Association



# ENERGY STAR Multifamily High Rise National Performance Path Notes

## Appendix B: Typical lamp lumens and input power for installed lighting

**Efficacy:** Lumens per Watt = Measured Lamp Lumens [Lumens]/Measured Input Power [Watts]

**High Efficacy Lamps:** Compact fluorescent lamps, T-8 or smaller diameter linear fluorescent lamps or lamps with a minimum efficacy of 60 lumens/W for lamps over 40W; 50 lumens/W for lamps over 15W to 40W; and 40 lumens/W for lamps 15W or less

**Footcandle:** one lumen per square foot.

**Lamp Lumens:** Lamp lumens must be measured using the lamp and ballast that are shipped with the fixture, using the tables on the ENERGY STAR website, or by using the charts below.

**Input Power:** Input power must be measured with the lamp and ballast that are shipped with the fixture, by using Tables 9-E through 9-H in the User's Manual for ASHRAE 90.1-2007, or the charts below.

Standard Metal Halide			
Lamp Watts	Lumens	Input Power	Efficacy
150	13,500	186	73
175	15,000	205	73
250	23,000	295	78
360	36,000	388	93
400	40,000	461	87

Typical T-8 (Electronic Ballast)			
Lamp Watts	Lumens	Input Power	Efficacy
17	1400	22	64
25	2225	27	82
32	3100	32	97
40	3725	46	81
86	8200	88	93

Compact Fluorescent					
Lamp Watts	Lumens	Input Power	Ballast	Efficacy	Minimum Lumens Needed
9	280-680	13	Electro-magnetic	22*-52	650
9	280-680	10	Electronic	28*-68	500
13	600-950	17	Electro-magnetic	35*-56	850
13	600-950	14	Electronic	43*-68	700
26	1200-1900	37	Electro-magnetic	32*-51	1850
26	1200-1900	28	Electronic	43*-68	1400

\*may not meet current ENERGY STAR specifications, check lamp lumens on ENERGY STAR website.



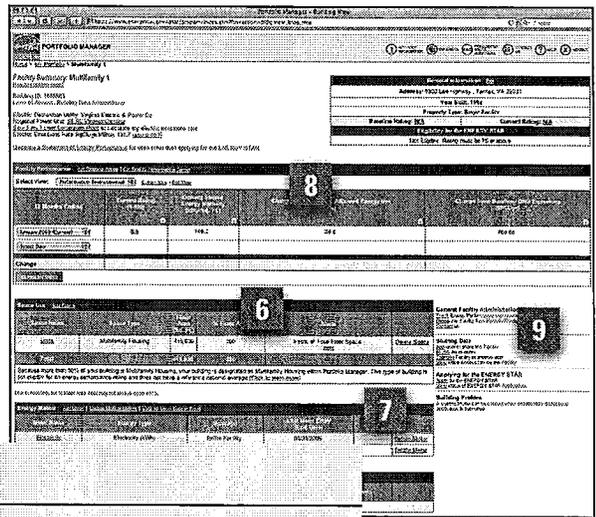
# PORTFOLIO MANAGER - QUICK REFERENCE GUIDE

## MULTIFAMILY HOUSING

### Tracking Your Energy Performance

Portfolio Manager is an online, interactive energy management tool that allows you to measure and track your building's energy and water consumption, identify investment priorities, and verify improvements over time. Multifamily housing communities can use Portfolio Manager to track weather-normalized energy use intensity (EUI), energy costs, greenhouse gas emissions, and water consumption.

### USE PORTFOLIO MANAGER STEP-BY-STEP



STEP	ACTIVITY	ACTION
1	Access Portfolio Manager	<a href="http://www.energystar.gov/benchmark">www.energystar.gov/benchmark</a>
2	Access your account <ul style="list-style-type: none"> <li>Create a new account</li> <li>Login to an existing account</li> </ul>	<ul style="list-style-type: none"> <li>Click REGISTER.</li> <li>Enter user name and password and click LOGIN.</li> </ul>
3	Review system updates and enter your account	Click ACCESS MY PORTFOLIO.
4	Add a new facility	Click ADD a Property.
5	Select property type and enter general facility information	From the "Add a Property" screen, most users will select "A single facility for which my organization owns or manages 90% or more of the floor area." This is the case even for garden or townhouse properties with multiple buildings. Only select the last option ("A campus or other collection of multiple facilities at the same geographic location") if you have multiple multifamily buildings, all on the same master meter. Click CONTINUE, enter General Facility Information, and then click SAVE.
6	Enter space use data	Go to "Space Use" section and click ADD SPACE. <ul style="list-style-type: none"> <li>Enter a facility name. In the "Select a Space Type" menu, select "Multifamily Housing." Enter an effective date. Click CONTINUE.</li> <li>Enter space data. Enter total gross square footage (including both common area and apartment space) even if you are only entering common area energy data. The other space use questions are voluntary, but it is highly encouraged to enter optional space use information. Click SAVE.</li> </ul>
7	Enter energy use data	Go to "Energy Meters" section and click ADD METER. <ul style="list-style-type: none"> <li>Enter meter name, type, and units. Click SAVE.</li> <li>Enter number of months and start date. Click CONTINUE.</li> <li>Enter energy use and cost. Click SAVE.</li> </ul> Repeat for all energy meters and fuel types.
8	Set metering configuration	Underneath the "Energy Meters" section, click SET METERING CONFIGURATION. <ul style="list-style-type: none"> <li>Select appropriate option from radio button list. Click SAVE.</li> <li>See Features section for additional guidance.</li> </ul>
9	Review and interpret results	Go to "Facility Performance" section and review your results. More information is provided on pages two and three of this guide.
10	Manage account	Share data and perform other administrative tasks.

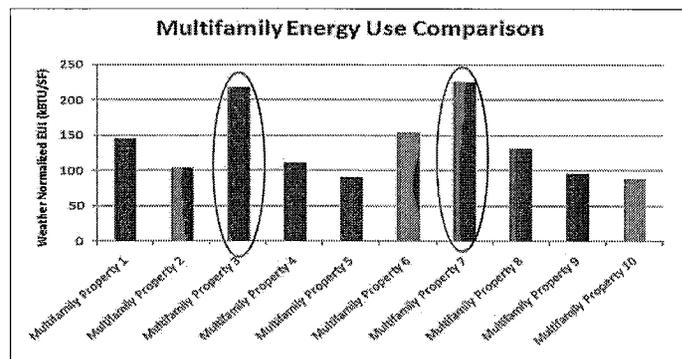
www.energystar.gov/benchmark

## INTERPRETING ENERGY PERFORMANCE

At this time, multifamily housing communities are unable to receive a 1-100 rating. However, Portfolio Manager provides a number of energy performance metrics for you to use to compare buildings across your portfolio or against past performance.

- "Current Weather Normalized Energy Use Intensity" (EUI) shows energy use per square foot, controlling for climatic variables that influence energy use. This allows you to compare buildings against past performance regardless of differences in weather, as well as compare buildings in different geographic locations.
- "Change from Baseline: Adjusted Energy Use (%)" shows how your past 12-month energy performance compares to what your performance would have been had your building been operated as it was during the baseline period. The baseline period is automatically set as the first 12-month period for which you have complete energy data; however you can manually change your baseline period by selecting "Set Baseline Periods" to the right of the Facility Performance header on the building's Facility Summary page.
- There are a number of other metrics to track performance including "Current Total Site Energy Use," "Annual Energy Cost," and "Change from Baseline: GHG Emissions" (Greenhouse Gas Emissions). These can all be added to your custom views (see Features).

Many of these energy performance metrics can be used to track performance within a portfolio and prioritize energy efficiency investments.



## DATA NEEDED

All multifamily properties must enter:

- Building address including ZIP code
- Gross floor area (always enter gross floor area, even if you only have access to common area energy data)
- At least 12 consecutive months of energy use for all fuel types

Optional space use attributes are:

- Total number of units in building
- Total number of bedrooms in building
- Number of floors
- Percentage of square footage that is common space only
- Total number of in-unit laundry hookups
- Total number of common area laundry hookups
- Total number of dishwashers in building
- Percent of building that is heated
- Percent of building that is cooled
- Market Rate or Affordable Housing

## HELPFUL HINTS

- Enter 12 consecutive months of energy data for all fuel types (e.g. electricity, natural gas) without gaps in time.
- When entering data, there is no need to include commas or other punctuation.
- When inputting a facility's energy use, be sure to select the correct units of measurement.



Change your password or user profile.



Maintain contact information for your energy team.



View online answers to Frequently Asked Questions.



E-mail the system for technical assistance.



Access online user-support information.

## FEATURES

**Group your facilities.** The grouping feature allows Portfolio Manager users to create unlimited sub-groups within their portfolios to make comparisons among their buildings. Groups are not mutually exclusive—any building can be in any number of sub-groups of the user's choosing. The grouping feature can be useful to make many comparisons, for example dividing properties by geographic area, building type, property management company, or metering scenario. In the example below, an operator could compare buildings for which there is a master meter for both electricity and gas, buildings for which the owner only has access to common areas, or buildings that have a master gas meter but in which residents receive their own electricity bills. From the My Portfolio screen, click on Create Group. Once the group is created, it will appear in the GROUP drop down menu:

**Create view to customize your analysis.** Portfolio Manager allows users to track and compare dozens of metrics including energy and water costs, consumption, and performance compared with the baseline; greenhouse gas emissions; energy efficiency investments; renewable energy production; and general building characteristics and attributes. In addition to a number of pre-set views, users can create and customize their own views to compare their buildings. Users can also export all data into Excel for further manipulation, analysis, and reporting, making Portfolio Manager an even more dynamic benchmarking tool. From the My Portfolio or Facility Summary screen, select the VIEW drop down menu:

**Set metering configuration.** Many multifamily operators may not have access to resident energy data but would still like to benchmark their common areas. Portfolio Manager allows users to select the metering configuration at each building which will allow you to better compare like properties. From any Facility Summary screen, select Set Metering Configuration underneath the Energy Meters section. Choose from the options "Whole Facility Energy Consumption," "Common Area Energy Consumption Only," "Tenant Energy Consumption Only," and "Other." To add metering configuration as a column when comparing buildings across your portfolio, select Create View from the My Portfolio page. Under the Building Characteristics header, "Metering Configuration" is the first option.

**Share facilities across accounts.** From the My Portfolio page, go to "Sharing Data" section and click ADD. Select user from current address list, enter a new Portfolio Manager name, or select a Portfolio Manager Account to share with.

**Generate a Statement of Energy Performance and Facility Summary Report.** Review your facility's energy performance and environmental impact for a 12-month period and against a baseline. Use it as a management report and transactional document. From the Facility Summary page, click GENERATE A STATEMENT OF ENERGY PERFORMANCE and select a period ending date. Check "Statement of Energy Performance" and "Facility Summary" under Report Options, and click GENERATE REPORT.

Category	Value
Energy Intensity Site (kBtu/ft²/yr)	52
Energy Intensity Source (kBtu/ft²/yr)	173
Greenhouse Gas Emissions (MTCO₂e/year)	2,352

**Track Water Use.** From the Facility Summary page, go to the "Water Meters" section below the "Energy Meters" section. Click ADD METER and enter data as you did with energy.

Wastewater/Sewer Cost (US Dollars 1st)	Change from Baseline Total Water Use (%)	Change from Baseline Indoor Water Use (%)
\$127,496.77	-7.25	-25.12

## LEARN MORE

To find out more about the ENERGY STAR multifamily housing program, including tools and resources to assist with strategic energy management and benchmarking, visit [www.energystar.gov/MultifamilyHousing](http://www.energystar.gov/MultifamilyHousing). To listen to a recorded training on how to benchmark multifamily properties, visit <https://energystar.webex.com> and click on Recorded Sessions.



# ENERGY STAR<sup>®</sup> Statement of Energy Design Intent (SEDI)<sup>1</sup>

## Altoona Towers

# N/A

Primary Property Function: Multifamily Housing

Gross Floor Area (ft<sup>2</sup>): 130,000

Estimated Date of Certification of Occupancy: \_\_\_\_\_

Date Generated: August 03, 2014

ENERGY STAR<sup>®</sup>  
Design Score<sup>2</sup>

1. This form may be used to apply for the ENERGY STAR Designed to Earn. This form was generated from Portfolio Manager's target finder: <http://www.portfoliomanager.energystar.gov/targetfinder>.

2. The ENERGY STAR Score is based on total source energy. The scale is 1-100. A score of 75 is the minimum to be eligible for the ENERGY STAR.

### Property & Contact Information for Design Project

Property Address	Project Architect	Owner Contact
Altoona Towers 1414 Adventureland Drive Altoona, Iowa 50009	_____ ( ) - _____	_____ ( ) - _____
Property ID: 4126174	Architect Of Record	Property Owner
	_____ ( ) - _____	_____ ( ) - _____

### Estimated Design Energy

Fuel Type	Usage	Energy Rate (\$/Unit)
Electric - Grid	1,173,324 kWh (thousand Watt-hours)	\$ 0.08/kWh (thousand Watt-hours)
Natural Gas	7,812 therms	\$ 0.72/therms

### Estimated Design Use Details

Multifamily Housing	
Gross Floor Area	130,000 Sq. Ft.
Number of Laundry Hookups in Common Area(s)	6
Government Subsidized Housing	No
Percent That Can Be Cooled	All of it - 100%
Number of Dishwasher Hookups	104
Number of Bedrooms	216
Percent of Gross Floor Area that is Common Space Only	22,754
Percent That Can Be Heated	All of it - 100%
Resident Population Type	No specific resident population
Maximum Number of Floors	4
Primary Hot Water Fuel Type (for units)	Natural Gas
Number of Laundry Hookups in All Units	206
Number of Residential Living Units	120

**Design Energy and Emission Results**

Metric	Design Project	Median Property	Estimated Savings
ENERGY STAR Score (1-100)	N/A	50	N/A
Energy Reduction (from Median)(%)	N/A	0	N/A
Source Energy Use Intensity (kBtu/ft <sup>2</sup> /yr)	103	0	-103
Site Energy Use Intensity (kBtu/ft <sup>2</sup> /yr)	36	0	-36
Source Energy Use (kBtu/yr)	13,390,879	0	-13,390,879
Site Energy Use (kBtu/yr)	4,784,582	0	-4,784,582
Energy Costs (\$)	95,970	0	-95,970
Total GHG Emissions (Metric Tons CO <sub>2</sub> e)	913	0	-913

**Designed to earn the ENERGY STAR: Application Checklist**

This section is only required if you are using this document to apply for Designed to Earn the ENERGY STAR. All design projects that achieve an EPA energy performance score of 75 or higher are eligible for this certification.

- 1) Does the intended function or use for the property match the criteria of a property type that's eligible to receive an ENERGY STAR score?  Yes  No/Not Sure

If you are not sure that your property design is eligible for a design ENERGY STAR score, please describe the property's major functions:

- 2) Is the design project at least 95% complete with construction documents?  Yes  No

If no, please explain:

- 3) Is the property unoccupied and not yet generating energy bills?  Yes  No

- 4) Do energy calculations account for the whole building intended operations and all energy sources?  Yes  No

- 5) Is the Architect of Record (AOR) an ENERGY STAR partner?  Yes  No

- 6) Will the AOR review the SEDI with building owner before they sign the Owner Letter of Intent?  Yes  No

- 7) Do the AOR and Building Owner agree that EPA may use information from this document in ENERGY STAR program materials?  Yes  No

- 8) Are you seeking other qualifications for this design project?  Yes  No

If so, please select all that apply:

- AIA 2030 Commitment
- Architecture 2030 Challenge
- Federal, State or Local Disclosure Ordinance
- Green Globes
- LEED
- Other, please indicate: \_\_\_\_\_

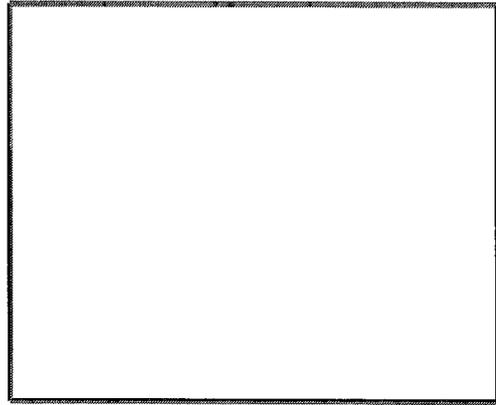
**Professional Verification**

I \_\_\_\_\_ (Name) verify that the above information is true and correct to the best of my knowledge.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

**Verifying Professional**

\_\_\_\_\_  
( ) - \_\_\_\_\_  
\_\_\_\_\_



**Verifying Professional Stamp  
(if applicable)**

**Note:** When applying for the ENERGY STAR Designed to Earn, the signature of the Verifying Professional must match the stamp.



## Portfolio Manager

- [Help](#)

Language: [English](#) | [Français](#)

### Target Finder

You can use this tool to set energy targets and possibly receive an ENERGY STAR score for design projects. To get started, tell us more about your design property, including information about how it will be used once it's constructed, and optionally the estimated annual energy use.

#### About Your Design Project

Name: Altoona Towers

Country: \* United States

Street Address: 1414 Adventureland Drive

City/Municipality: Altoona

State/Province: \* Iowa

State/Province: \*

Postal Code: \* 50009

Year Planned for Construction Completion: 2014

Primary Function for your Design Project:

\*  
Multifamily Housing

Gross Floor Area: \*130000      Sq. Ft.  [Temporary Value](#)

Gross Floor Area is the total floor area, expressed in square feet or square meters, measured from the principal exterior surfaces of the building(s) and not including parking area(s). [Learn More](#)  
How many physical buildings will be part of your property?

- None:** My property is part of a building
- One:** My property is a single building
- More than One:** My property includes multiple buildings ([Campus Guidance](#))  
How many? 2

**Property Use Details**

In order to provide you with metrics about your design, we need to know how the space in this property will be used. Based on the primary function you selected, we are assuming this is how the floor area of this property will be used. If your property has multiple uses you can add them below in order to correctly classify the square footage of your design property.

Add Another Type of Use Add

▼ Building Use [Edit Name](#)

Multifamily refers to residential buildings that contain more than two residential living units. These properties may be high rise buildings (4 or more stories), or garden-style apartments (3 stories or less), townhomes broken into two or more units, or duplex homes. Occupants of these buildings may include tenants, cooperators, and/or individual owners.

Gross Floor Area should include all space within the building(s) including living space in each unit, interior common areas, hallways, elevator shafts, and mechanical space, such as a boiler room.

Property Use Detail	Value
<p><b>Gross Floor Area - The Gross Floor Area is the total size, as measured between the principal exterior surfaces of the enclosing fixed walls of the building(s). This includes <i>all areas</i> inside the building(s) such as: occupied tenant areas, common areas, meeting areas, break rooms, restrooms, elevator shafts, mechanical equipment areas, and storage rooms. Gross Floor Area should not include interstitial plenum space between floors, which may house pipes and ventilation.</b></p> <p>Gross Floor Area is <i>not</i> the same as rentable, but rather includes all area inside the building(s). Leasable space would be a sub-set of Gross Floor Area.</p> <p>In the case where there is an atrium, you should count the Gross Floor Area at the base level only. <i>Do not</i> increase the size to accommodate open atrium space at higher levels.</p> <p>The Gross Floor Area should not include any exterior spaces such as balconies or exterior loading docks and driveways.</p> <p>If your property is in the design phase, use your best estimate for the intended conditions when the property is fully operational.</p> <p style="text-align: center;">In addition, please note these specific property type considerations:</p> <ul style="list-style-type: none"> <li>Wastewater Treatment Plant and Municipal Water Treatment and Distribution Plant - For these spaces Gross Floor Area is not a typical value used to normalize, but is required as a basic system input. Area should reflect interior spaces only and should not include exterior portions of the facility such as retention or settling ponds.</li> </ul> <p style="text-align: center;"><u>Gross Floor Area</u></p>	<p>* 130000                      Sq. Ft.</p>
<p><b>Percent of Gross Floor Area That is Common Space Only - The Percentage of Gross Floor Area that is Common Space Only is the percentage of the total Gross Floor Area that is not part of individual apartment units. The floor area counted toward this percentage should include all common areas and supporting space such as entryways, lobbies, building front desk areas, offices and mail areas; it should also include mechanical rooms, storage areas, elevator shafts, and shared laundry rooms. If there are common rooms for the whole building such as exercise rooms, party rooms, or lounges, they should also be considered common space. <i>Do not count</i> any floor space that is located within any occupied or unoccupied apartments or retail/commercial spaces.</b></p> <p>If your property is in the design phase, use your best estimate for the intended conditions when the property is fully operational.</p> <p style="text-align: center;"><u>Percent of Gross Floor Area that is Common Space Only</u></p>	<p>22754</p>
<p><b>Government Subsidized Housing - Government Subsidized Housing is entered as either Yes or No.</b></p> <ul style="list-style-type: none"> <li>Yes - The property receives some type of local, state, or federal affordable housing subsidy for some or all units. Examples include Federal Housing Association (FHA) Insured; Public Housing; Agricultural Housing; Veterans Affairs (VA) Housing; Department of Defense (DoD) Housing; Low Income Housing Tax Credit (LIHTC); Project Based Housing Assistance Payment (HAP) (including Section 8), or another type of local, state or federal subsidy.</li> <li>No - The property does not receive any subsidies.</li> </ul> <p>If your property is in the design phase, use your best estimate for the intended conditions when the property is fully operational.</p> <p style="text-align: center;"><u>Government Subsidized Housing</u></p>	<p>No</p>
<p><b>Residential Population Type - The Resident Population Type describes the specific resident population, if any, to which the</b></p>	

### Estimated Design Energy (Optional)

If you have an estimate of how much energy your design property will use annually, enter it below to receive a score (if available) and energy metrics for your design. You can then use these metrics to compare to your target and/or property's performance (in the future). To get the most accurate metrics, provide estimates for total annual energy from each energy type.

I don't have (or don't want to) enter energy estimates.

<input type="checkbox"/>	Energy Type	Units	Estimated Total Annual Energy Use	Energy Rate (\$/unit)
<input checked="" type="checkbox"/>	Electric - Grid	kWh (thousand Watt-hours)	1173324	\$ 0.077/ kWh (thousand Watt-hours)
<input checked="" type="checkbox"/>	Natural Gas	therms	7812	\$ 0.72/ therms
<input type="checkbox"/>				
<input checked="" type="checkbox"/>	Electric - Grid	kBtu (thousand Btu)		\$ / kBtu (thousand Btu)

Delete Selected Entries

Add Another Entry

Glossary.AnnualtEnergy.title - Glossary.AnnualtEnergy.text

Glossary.AnnualtEnergy.title - Glossary.AnnualtEnergy.text

### Target

You can choose either a Target ENERGY STAR Score or a Target % Better than Median to see how much energy your property would need to be consuming annually to reach your target. If you have estimated your property's annual consumption, you can compare this against your target.

Target ENERGY STAR Score

ENERGY STAR Scores are not available for every type of property because of availability of reliable reference information.

Target % Better than Median

30%

This is calculated based on the median property. For example, you might like your property to be 20% better than a typical property of the same type.

Place Holder Title - Place Holder Body  
 Place Holder Title - Place Holder Body Glossary.AverageInfluentFlow.title - Glossary.AverageInfluentFlow.text Average Flow - Average Flow is the total average daily flow of water through a Water Treatment and Distribution Plant or Wastewater Treatment Plant. Specifically:

- **Water Treatment and Distribution Plants** - This daily flow rate includes all sources of water through the plant, including ground water, surface water, and purchased water. This value is provided via a flow rate meter, through which you can update flow rates regularly (quarterly, monthly, daily, etc.).
- **Wastewater Treatment Plant** - This value is the average daily flow of wastewater into the plant. It is provided via a flow rate meter, through which you can update flow rates regularly (quarterly, monthly, daily, etc.).

If your property is in the design phase, use your best estimate for the intended conditions when the property is fully operational. Glossary.ItEnergy.title - Glossary.ItEnergy.text  
**Gross Floor Area** - The Gross Floor Area is the total size, as measured between the principal exterior surfaces of the enclosing fixed walls of the building(s). This includes *all areas* inside the building(s) such as: occupied tenant areas, common areas, meeting areas, break rooms, restrooms, elevator shafts, mechanical equipment areas, and storage rooms. Gross Floor Area should not include interstitial plenum space between floors, which may house pipes and ventilation.

Gross Floor Area is *not* the same as rentable, but rather includes all area inside the building(s). Leasable space would be a sub-set of Gross Floor Area.

In the case where there is an atrium, you should count the Gross Floor Area at the base level only. *Do not* increase the size to accommodate open atrium space at higher levels.

The Gross Floor Area should not include any exterior spaces such as balconies or exterior loading docks and driveways.

If your property is in the design phase, use your best estimate for the intended conditions when the property is fully operational.

In addition, please note these specific property type considerations:

- **Wastewater Treatment Plant and Municipal Water Treatment and Distribution Plant** - For these spaces Gross Floor Area is not a typical value used to normalize, but is required as a basic system input. Area should reflect interior spaces only and should not include exterior portions of the facility such as retention or settling ponds.

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## Portfolio Manager

- [Help](#)

### Target Finder Results

Based on the information you have provided, we have calculated metrics to help you understand the energy efficiency associated with your current design and/or target ([jump to the detailed table below](#)). For a print out of this information, you can [download your Statement of Energy Design Intent](#).

#### Score for Your Design

N/A

Your design does not meet the requirements to calculate a score. [Learn more about ENERGY STAR scores](#).



#### Download Your Statement of Energy Design Intent (SEDI)

This document provides an overview of your design and metrics. It is also used for Designed to Earn the ENERGY STAR applications.

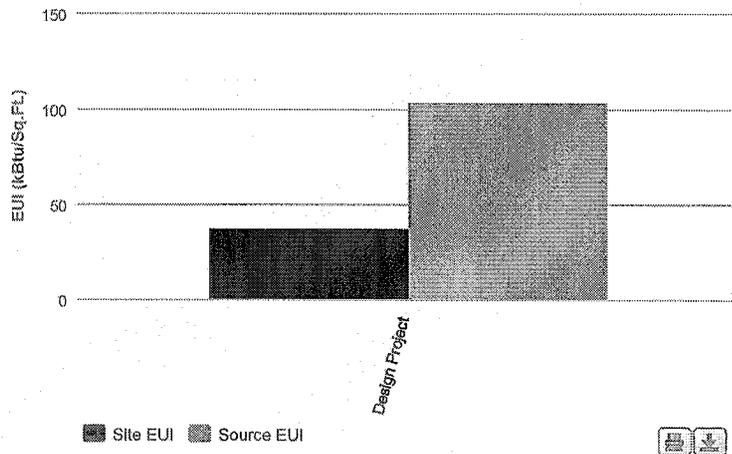
[Download & Print Statement](#)

#### About this Property's Design

<b>Target:</b>	Target % Better than Median: 30
<b>Uses:</b>	Multifamily Housing (100.0%)
<b>Energy Types:</b>	Electric - Grid (99.3%) Natural Gas (0.7%)

[Edit](#)

### Energy Use Intensity (EUI)



Place Holder Title - Place Holder Body  
Place Holder Title - Place Holder Body  
Place Holder Title - Place Holder Body  
Place Holder Title - Place Holder Body

#### Metrics Comparison for Your Design and/or Target

Metric	Property Estimate at Design	Design Target*	Median Property*
<a href="#">ENERGY STAR score</a> (1-100)	Not Available	Not Available	50
<a href="#">Source EUI</a> (kBTU/ft <sup>2</sup> )	103.0	Not Available	Not Available
<a href="#">Site EUI</a> (kBTU/ft <sup>2</sup> )	36.8	Not Available	Not Available
<a href="#">Source Energy Use</a> (kBTU)	13,390,879.6	Not Available	Not Available
<a href="#">Site Energy Use</a> (kBTU)	4,784,582.1	Not Available	Not Available
<a href="#">Energy Cost</a> (\$)	95,970.61	Not Available	Not Available
<a href="#">Total GHG Emissions</a> (Metric Tons CO <sub>2</sub> e)	913.1	Not Available	Not Available

\* To perform calculations for your design target, we use the fuel mix that you've entered for your design energy estimates. If you have not entered estimated design energy, we'll use the average for your state. To perform calculations for the national median, we will assume the fuel mix and operational details of your property measurement in use, if available. Otherwise, we will use your design estimates.

#### Save Your Design?

By saving your design in Portfolio Manager, you can continue to work with your design and eventually track energy consumption after the property has been constructed and is in use.

- I want to create an account in Portfolio Manager and save my design
- I already have an account in Portfolio Manager and want to save my design

Username: \*  
Password: \*

- I don't want to save my design



# Energy-Efficient Apartments

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Having an energy-efficient apartment can save you money, help the environment, and improve your comfort. Tools on this page will help you find an energy-efficient apartment and make it even more efficient after you move in!

## Average energy use and cost

Before you move, find out the cost of the unit's monthly energy bill. [This convenient, easy-to-use address search \(https://myaccount.alliantenergy.com/ma-ui/ae-energyuse-flow.html?jsessionid=397F37CEC4BB147592CFD0F3803B35F9?execution=e1s1\)](https://myaccount.alliantenergy.com/ma-ui/ae-energyuse-flow.html?jsessionid=397F37CEC4BB147592CFD0F3803B35F9?execution=e1s1) shows you an estimate of energy use and energy costs at the property based on the past year's usage.

## Energy efficiency rating form

Another way to check the apartment's energy-efficiency is to ask the landlord if they have completed the [energy efficiency rating form \(wcm/groups/wcm\\_internet/@int/documents/document/mdaw/mdiz/~edisp/023841.pdf\)](#). Landlords voluntarily rate their own properties and can provide the rating data to potential tenants like you!

The rating system awards points for installing energy efficiency upgrades.

Platinum Star – 38 points  
Gold Star – 33 points  
Silver Star – 27 points  
Bronze Star – 21 points

If the landlord has not filled-out this form, consider asking them to fill one out and send you the results.

## What you can do

There are several small things you can do around your apartment that can make a big difference in your utility bill costs.

- **Adjust your thermostat.** If you lower the temperature ten degrees in winter, or raise it during the summer for at least eight hours a day, you can save ten percent on your energy bills - without sacrificing your comfort.
- **Check your furnace filter.** Failing to clean or replace a filter can make your furnace and central air conditioner run harder, quickly reducing its operating efficiency and life span.
- **Install a water-saving showerhead.** A family of four can cut their water-heating costs by \$250 a year just by switching to an energy-saving showerhead.

For even more tips, [visit here \(/SaveEnergyAndMoney/TipsforSavingEnergy/CutEnergyBills/index.htm\)](#).

## Rebates

Alliant Energy offer rebates to customers in [Iowa \(/SaveEnergyAndMoney/Rebates/HomeIA/index.htm\)](#) and [Minnesota \(/SaveEnergyAndMoney/Rebates/HomeMN/index.htm\)](#) on ENERGY STAR® rated products to help make your utility bill more affordable. Customers in Wisconsin can visit [Focus on Energy \(http://www.focusonenergy.com/Default.aspx\)](http://www.focusonenergy.com/Default.aspx) for rebate information.

Alliant Energy must provide the primary energy to the products for which the rebate is being paid. Also, please check with your landlord prior to making energy efficiency upgrades to your apartment.

## Payment options

Why waste your time and money tracking down bills, buying stamps and making it to the mailbox on time? Make your life easier with our free payment options including [Paperless Billing \(/CustomerService/AccountManagement/PaymentOptions/029759\)](#), [Budget Billing \(/CustomerService/AccountManagement/PaymentOptions/029762\)](#) and [Automatic Payment \(/CustomerService/AccountManagement/PaymentOptions/029761\)](#).

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## ENERGY EFFICIENCY RATING SYSTEM FOR RENTAL PROPERTIES

The rental property rating system serves two purposes:

- To help renters compare apartments and houses with energy efficient features against those that are less efficient, and
- To allow landlords to rate the efficiency of their properties, be recognized publicly for efficiency improvements, and to use energy efficiency as a selling point for potential tenants.

Owners voluntarily rate their own properties and provide the rating data to potential tenants. Either landlord or tenant can update information at any time to report discrepancies or improvements which would impact the unit's rating. Landlords are encouraged to provide updated ratings annually so that information can be verified if necessary and community average ratings can be established.

Since unit size and tenant behavior patterns vary, this rating system is designed to evaluate structural, electrical and mechanical features that have an impact on the overall energy efficiency of the rental property. The rating system awards points for easy (low-cost) measures as well as for measures that have a longer payback. This way, landlords can be recognized for their efforts to maintain energy efficient units despite factors like age or size of the unit.

We hope that property owners will choose to participate in the rating system and view it as a win-win prospect.

PROPERTY INFORMATION			
Property Address	City	State	Zip
Owner Name	Phone No. (      )	E-mail Address	
Current Tenant Name	Phone No. (      )	E-mail Address	
Last Inspection Date	Has unit received an Alliant Energy Home Energy Audit? <input type="checkbox"/> Yes <input type="checkbox"/> No	Current Rating	
<div style="border: 1px solid black; padding: 10px; display: inline-block;"> <p><b>The Altoona Towers Project would score maximum points in all of the categories below</b></p> </div>			

**RATING SCALE:    21 points – Bronze Star      27 points – Silver Star      33 points – Gold Star      38 points – Platinum Star**

CATEGORIES	ITEM	POINTS
<b>Lighting</b>		<b>Max. Points = 5</b>
Lighting	CFL or T8 fluorescent bulbs in all hardwired fixtures in the living areas (not closets, etc.) (6 pts.)	
Lighting	CFL or T8 fluorescent bulbs in 50-99% fixtures hardwired in the living areas (not closets, etc.) (3 pts.)	
Lighting	CFL or T8 fluorescent bulbs in 1-49% fixtures hardwired in the living areas (not closets, etc.) (1 pt.)	
Lighting	Only incandescent bulbs provided at time of rental (negative 2 pts.)	
<b>Hot Water</b>		<b>Max. Points = 5</b>
Hot Water	All accessible hot water piping insulated with 1/2 inch foam wrap (1 pt.)	
Hot Water	Low flow (<2 gal/min.) showerhead and faucet aerator installed on all showers, bathroom & kitchen sinks. (2 pts.)	
Hot Water	Natural gas water heater – Energy Factor 0.62 or greater (2 pts.); or Electric water heater – Energy Factor 0.93 or greater (2 pts.)	
Hot Water	Water heater more than 15 years old (negative 1 pt.)	
<b>Laundry</b>		<b>Max. Points = 3</b>
Laundry	ENERGY STAR-rated washer (2 pts.)	
Laundry	Clothes dryer with moisture control (1 pts.)	
Laundry	Older or non-ENERGY STAR-rated laundry machines (negative 1 pt. each)	
Laundry	No laundry (0 pts.)	
<b>Heating, AC &amp; Ventilation</b>		<b>Max. Points = 11</b>
HVAC	ENERGY STAR-rated clock programmable thermostat(s) installed for heating and cooling (3 pts.)	
HVAC	Natural gas boiler – 85% or greater (4 pts.); or Natural gas furnace – 92% or greater (4 pts.)	
HVAC	Central air conditioner – 14.0 SEER or greater (2 pts.); or ENERGY STAR-rated window air conditioner (2 pts.)	
HVAC	Certified service (clean coils and test) in past year (1 pt.)	
HVAC	Old furnace - new prior to 1995 (10 yrs.) (negative 1 pt.) new prior to 1985 (20 yrs.) (negative 2 pts.)	
HVAC	Old AC - new prior to 1995 (10 yrs.) (negative 1 pt.) new prior to 1985 (20 yrs.) (negative 2 pts.)	
HVAC	New furnace filters provided by owner annually (1 pt.)	
<b>Insulation</b>		<b>Max. Points = 16</b>
Insulation	All interior outlets and exterior wall switches have insulating insert behind wall plate (1 pt.)	
Insulation	Weather-stripping/caulking around all exterior openings including windows and doors (2 pts.)	
Insulation	Unit has windows with:	
Insulation	Double pane windows (5 pts.)	
Insulation	Owner provided interior film (tenant installed) (1 pt.)	
Insulation	Completely insulated exterior walls (1 pt. per ordinal exposure; 4 pts. maximum)	
Insulation	Tight storm windows (no broken glass) (3 pts.)	
<b>Insulation</b>	<b>Attic insulation</b>	<b>Max. Points = 6</b>
Insulation	Minimum R-38 insulation (6 pts.)	
Insulation	Living space above rental unit (5 pts.)	
Insulation	Minimum R-21 insulation (2 pts.)	
<b>Insulation</b>	<b>Floor insulation</b>	<b>Max. Points = 3</b>
Insulation	Living space below rental (3 pts.)	
Insulation	Minimum R-12 under all floors with unconditioned space below AND/OR Minimum 3 feet of R-12 insulation around sill plate of enclosed unfinished basement (3 pts.)	
<b>Appliances</b>		<b>Max. Points = 2</b>
Appliances	ENERGY STAR-rated refrigerator (2 pts.)	
Appliances	Refrigerator new since 1997 (or past 8 yrs.) (1 pt.)	
Appliances	Refrigerator new prior to 1990 (more than 15 yrs.) (negative 1 pt.)	
Appliances	Extra refrigerator any age (negative 2 pts.)	
Appliances	Extra chest freezer (0 pts.)	
Appliances	Extra upright freezer (negative 1 pt.)	

The above information was provided by Imagine Grinnell.  
For more information visit: [imaginegrinnell@iowatelecom.net](mailto:imaginegrinnell@iowatelecom.net).

**TOTAL**



- [ABOUT ENERGY STAR](#)
- [PARTNER RESOURCES](#)

## Top 10 Tips for Renters!

Even if you rent an apartment, townhouse, or a home, you can make a big difference, too! These tips will show you how to be more energy efficient and save energy, money, and reduce the risks of climate change. If there are things you can't change on your own, share these tips and encourage your landlord to help you make a change for the better.

1. Lighting is one of the easiest places to start saving energy. Replacing your five most frequently used light fixtures or the bulbs in them with ENERGY STAR qualified lights can save more than \$65 a year in energy costs. ENERGY STAR qualified compact fluorescent light bulbs (CFLs) provide high-quality light output, use 75% less energy, and last 6–10 times longer than standard incandescent light bulbs, saving money on energy bills and replacement costs.
  - Remember to always turn off your lights when leaving a room. Turning off just one 60-watt incandescent bulb that would otherwise burn eight hours a day can save about \$15 per year!
2. Considering purchasing a room air conditioner? Consider an ENERGY STAR qualified model. They use at least 10 percent less energy than standard models.
  - In the winter, be sure to insulate room air conditioners from the outside with a tight-fitting a/c unit cover, available at your local home improvement center or hardware store. This keeps heated air from escaping outside. Alternately, you can remove the window unit in the winter months to prevent energy losses.
  - Be sure the window unit fits tightly in the window so outdoor air is not getting in.
3. If possible, install a programmable thermostat to automatically adjust your home's temperature settings when you're away or sleeping.
  - When used properly, a programmable thermostat with its four temperature settings can save up to \$150 a year in energy costs. Proper use means setting the thermostat at energy-saving temperatures without overriding that setting. You should also set the "hold" button at a constant energy-saving temperature when you're away or on vacation.
4. Consumer electronics play an increasingly larger role in your home's energy consumption, accounting for 15 percent of household electricity use. Many consumer electronics products use energy even when switched off. Electronics equipment that has earned the ENERGY STAR helps save energy when off, while maintaining features like clock displays, channel settings, and remote-control functions.
  - Unplug any battery chargers or power adapters when not in use (like your cell phone charger!).
  - Use a power strip as a central "turn off" point when you are done using equipment.
    - Even when turned off, electronic and IT equipment often use a small amount of electricity. For home office equipment, this stand-by or "phantom" power load can range from a few watts to as much as 20 or even 40 watts for each piece of equipment. Using a power strip for your computer and all peripheral equipment allows you to completely disconnect the power supply from the power source, eliminating standby power consumption.
5. A ten minute shower can use less water than a full bath.
  - With a new 2.5 gallon-per-minute (low-flow) shower head, a 10-minute shower will use about 25 gallons of water, saving you five gallons of water over a typical bath. A new showerhead also will save energy — up to \$145 each year on electricity — beating out both the bath and an old-fashioned showerhead.
  - To avoid moisture problems, control humidity in your bathroom by running your ventilating fan during and 15 minutes after showers and baths.
6. Make sure all air registers are clear of furniture so that air can circulate freely. If your home has radiators, place heat-resistant reflectors between radiators and walls. In the winter, this will help heat the room instead of the wall.
7. During cold weather, take advantage of the sun's warmth by keeping drapes open during daylight hours. To keep out the heat of the summer sun, close window shades and drapes in warm weather.
8. Save water by scraping dishes instead of rinsing them before loading in the dishwasher. Run your dishwasher with a full load and use the air-dry option if available.
  - Rinsing dirty dishes before loading your dishwasher uses a lot of water and energy. Most dishwashers today can thoroughly clean dishes that have had food scraped, rather than rinsed, off — the wash cycle and detergent take care of the rest. To make the most efficient use of your dishwasher's energy and water consumption, run the dishwasher only when enough dirty dishes have accumulated for a full load.
9. Wash your laundry with cold water whenever possible. To save water, try to wash full loads or, if you must wash a partial load, reduce the level of water appropriately.
  - Hot water heating accounts for about 90 percent of the energy your machine uses to wash clothes — only 10 percent goes to electricity used by the washer motor. Depending on the clothes and local water quality (hardness), many homeowners can effectively do laundry exclusively with cold water, using cold water laundry detergents. Switching to cold water can save the average household more than \$40 annually (with an

electric water heater) and more than \$30 annually (with a gas water heater).

- Washing full loads can save you more than 3,400 gallons of water each year.

0. Don't over dry your clothes. If your dryer has a moisture sensor that will automatically turn the machine off when clothes are done, use it to avoid over drying. Remember to clean the lint trap before every load. Dry full loads, or reduce drying time for partial loads. [Learn more.](#)
- It's easy to over dry your clothes, if one setting is used for various fabric types. Try to dry loads made up of similar fabrics, so the entire load dries just as the cycle ends. Many dryers come with energy-saving moisture or humidity sensors that shut off the heat when the clothes are dry. If you don't have this feature, try to match the cycle length to the size and weight of the load. A dryer operating an extra 15 minutes per load can cost you up to \$34, every year.
  - The lint trap is an important energy saver. Dryers work by moving heated air through wet clothes, evaporating and then venting water vapor outside. If the dryer cannot provide enough heat, or move air sufficiently through the clothes, they will take longer to dry, and may not dry at all. One of the easiest things you can do to increase drying efficiency is to clean the lint trap before each and every load. This step also can save you up to \$34 each year.

## Learn More!

[View the full list of tips](#)

[Launch ENERGY STAR @ home](#)

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Find ENERGY STAR Products	Start Saving Now	Find Builders and Incentives	Facility Owners & Managers	Recursos
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Take the Pledge	Home Assessment Tools	Homeowner Testimonials	Energy Efficiency Program Administrators	Contact U
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EPA Home



Home » Easy Energy Tips for Apartments or Rental Homes

# Easy Energy Tips for Apartments or Rental Homes

October 6, 2008 - 12:08pm



**Elizabeth Spencer**  
Communicator, National Renewable Energy Laboratory

Over the last few weeks we've talked about things like energy audits and energy-saving incentives, and now that we're in the midst of Energy Awareness Month we're going to be talking about ways to save energy this winter. But there's just one problem with all these super-cool resources: What if you don't actually own your home?

Z KDW#G R HV#WKIV#P HDQ  
IR U#P HB

If you're a renter like me, then you're probably looking at all of these tips and wondering what it all means for you. You probably can't make drastic changes to your living space, and thus are limited in what you can do to make your home more energy efficient.

But that doesn't mean there's nothing you can do to reduce your apartment's energy costs this winter!

First off, the EERE's Consumer site has a small page on saving energy in apartments that you might find useful. And if you're limited by how much you can do in your rental home or apartment, you might find yourself limited to these:

- Reducing your electricity use. That means, on top of all the normal ways of keeping your electrical use down (like turning off the lights or changing your light bulbs to compact fluorescent bulbs), you should consider keeping your thermostat at 68 degrees—and even lower when you're asleep or out of the house.
- Reducing your hot water usage. Shorter showers are good. So is running your washing machine with cold water.
- Leaving the blinds or curtains open during the day to help warm your house with the sun. This is especially good for south-facing windows.

These are not, I admit, particularly exciting ways to save energy. So, if you do want to make some small improvements to your apartment, you will probably want to look into getting window treatments or weatherstripping your home.

Weatherstripping is, essentially, anything you can use to seal the air leaks in your doors and windows. And this is important: If cold air is leaking into your home, you'll not only have an uncomfortable home. You'll also be paying more money to keep your apartment heated.

If you don't own your apartment, you probably can't make any changes without consulting your landlord. If you have windows and doors that gush air, your first task is to go educate yourself. Most forms of weatherstripping require some sort of special installation, and may even require a contractor to install. Check your local hardware store and see what options are out there and what work they require. And if you want to

- During winter months, try keeping your thermostat set at 68 degrees.
- You can save energy on hot water usage by cutting down on shower time and running the washing machine with cold water.
- Warm your home during the day by leaving the curtains on sun-facing windows open.

learn about weatherstripping options for your windows, be sure to go in knowing whether you have aluminum or vinyl windows, how big they are, and how much trim is around them—I ended up having to make two trips, since I never paid any attention to my windows.

In any case, first you have to figure out what sort of work is required to install the option you want. Then go talk to your landlord and see if they'll make the changes for you. If not, then see if they'll approve you to make the changes yourself.

That's all there is to it! You might not be in control of the home you own, but you can always make smarter choices to reduce your energy costs.



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UHODWHG #DUWIF OHV

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**Improving the Energy Efficiency of Existing Windows**

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**Purchasing Energy-Efficient Windows**

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**Random Acts of Kindness: Helping Others Save Energy**

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**CAREERS & INTERNSHIPS**



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*Toggle menu* [#off-screen-nav]

# The Ultimate Guide to Making Any Rental More Energy Efficient

Renters Solutions

[<http://www.apartmenttherapy.com/make-your-rental-more-energy-efficient-167808>]

Think that because you don't own, you have no control over your home's energy use? Not true! Here's our ultimate guide; full of links to quick, easy and yes, even inexpensive, ways to reduce your carbon footprint and lower your bills (your landlord will thank you!).

Most of these changes are likely to pay for themselves in energy savings over the duration of your rental. Also, don't forget that once you move, you can either leave the improvements intact and sell them to the future tenants, or take them with you to your next home.

**1. Install a Programmable Thermostat:** Use a programmable thermostat to take control of your heat and cooling levels, which will reduce your energy use and lower your bills. A good thermostat [<http://www.amazon.com/dp/B00421BGHY/?tag=apartmentth0a-20>] can be found for under \$35 and installed in just a an hour or two.

- How to Install a Programmable Thermostat [<http://www.apartmenttherapy.com/how-to-install-a-programmable-109692>]

- DIY: *Install a Programmable Thermostat* [<http://www.apartmenttherapy.com/diy-install-a-programmable-the-76050>]

**2. Install Gaskets Behind Outlets & Switches:** If you put your hand next to an outlet or switch plate and can feel air coming through, then you should install these gaskets to prevent unnecessary heat loss and air infiltration.

- How To Insulate Outlets & Switches [<http://www.apartmenttherapy.com/how-to-insulate-outlets-amp-sw-108348>]

**3. Caulk & Seal Around Window and Doors:** If you live in an old building, it's likely you have single pane windows and old or missing caulk. Combat air leaks by applying caulk around window frames and sashes and door panels, and of course there's the old plastic sheet option for the winter.

- The Importance of Air Sealing [<http://www.apartmenttherapy.com/the-importance-of-air-sealing-113290>]

- Learning To Love Caulk: *5 Eco-Friendly Options* [<http://www.apartmenttherapy.com/learning-to-love-caulk-5-ecofr-124103>]

- How To: *Make Your Own Draft Dodger* [<http://www.apartmenttherapy.com/how-to-make-your-own-draft-dod-98008>]

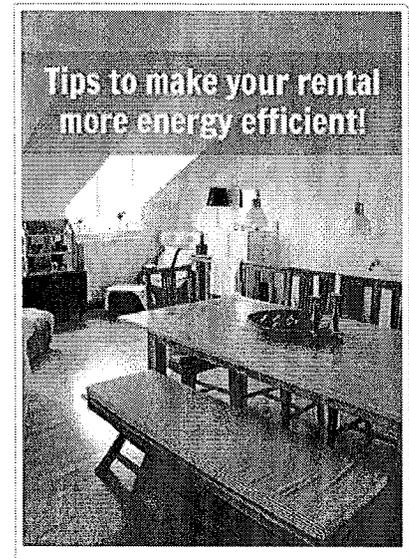
- Zip-A-Way: *Removable Window Sealant* [<http://www.apartmenttherapy.com/zipaway-removable-window-seala-100560>]

- 5 Ways to Insulate Your Windows for Winter [<http://www.apartmenttherapy.com/5-ways-to-insul-37643>]

**4. Use Power Strips:** A lot of energy is wasted through electronics left plugged in, and the resulting vampire energy. Put a stop to it by using one of a number of cool, smart energy strips, which will turn off vampire energy when the electronics are not in use.

- Smart Power Strips to Cut Down On Power [<http://www.apartmenttherapy.com/smart-power-strips-to-cut-down-110653>]

- 10 Devices To Help You Plug Electrical Leaks & Save Energy [<http://www.apartmenttherapy.com/10-devices-to-help-you-plus->



el-125934]

- iGo Green Technology Surge Protector: *A Great Way to Save Money on Power* [<http://www.apartmenttherapy.com/igo-green-technology-surge-pro-73494>]
- Belkin Introduces a Slew of Energy Saving Accessories [<http://www.apartmenttherapy.com/belkin-introduces-a-slew-of-en-119576>]

**5. Check Your Water Heater Settings:** Make sure your water heater is set at the lowest comfortable setting. If you've ever experienced scalding hot water, it's possible it's set too high and is wasting energy. If the tank is old, it's probably an uninsulated unit, which can be easily remedied by covering it with an insulating jacket.

- How To Heat Up The Water at Home [<http://www.apartmenttherapy.com/how-to-heat-up-the-water-at-ho-107986>]
- Simple Green: *Wrap Water Heater In Insulation Blanket* [<http://www.apartmenttherapy.com/simple-green-wrap-water-heater-55520>]

**6. Replace The Furnace Filter:** Make sure the furnace filter is being changed every 1-3 months to ensure clean air and improve the furnace efficiency. These are inexpensive and easy to install, but depending on where your mechanical closet is located, you may need to ask your landlord for assistance.

- A Guide to Furnace Filters [<http://www.apartmenttherapy.com/a-guide-to-furnace-filters-thi-134710>]
- Is Your Furnace Ready for Winter? [<http://www.apartmenttherapy.com/is-your-furnace-ready-for-wint-131403>]

**7. Use Energy Efficient Bulbs:** We've tested a ton of great energy efficient bulbs [<http://www.apartmenttherapy.com/search?q=lightbulb+wars>], and at this point they look so good, and the prices have dropped enough, that there's no reason a majority of your bulbs *shouldn't* be LED or CFLs. Even if you're put off by the higher (slightly) upfront cost, you can simply unscrew them and take them with you when it's time to move.

- The Lightbulb Wars: *The Best Lighting For Your Home* [<http://www.apartmenttherapy.com/the-lightbulb-wars-the-best-li-160488>]
- The Energy Impact of LED vs CFL vs Incandescent Lighting [<http://www.apartmenttherapy.com/the-energy-impact-of-led-vs-cf-163773>]
- How to Buy the Right CFL: *A Cheat Sheet* [<http://www.apartmenttherapy.com/how-to-buy-the-right-cfl-a-cheat-sheet-166313>]

**8. Install Window Shades:** More than just window decor, blinds and curtains can help control the heat loss/gain and light levels. Using heavy curtains in the winter will help block any heat loss, as well as unwanted heat gain in the summer. Blinds can be adjusted throughout the year to also control light levels and privacy.

- Block Out the Sun and Beat the Heat With Motorized Blinds [<http://www.apartmenttherapy.com/block-out-the-sun-and-beat-the-154112>]
- Insulating Windows with Curtains [<http://www.apartmenttherapy.com/roundup-cafe-ki-35540>]

**9. Use a Humidifier & Lower Your Heat:** Keeping humidity levels up during the winter is not only good for your health, but also for your air and furniture. It also helps keep the ambient air temperature feeling warmer than dry air, which means you can turn your thermostat down. If your HVAC system doesn't have a humidifier built-in, then you can get an inexpensive and portable humidifier to use during dry conditions.

- Controlling Humidity Levels at Home [<http://www.apartmenttherapy.com/hot-tip-use-a-humidifier-105471>]
- Roundup: *Unobtrusive Humidifiers* [<http://www.apartmenttherapy.com/roundup-unobtrusive-humidifier-163173>]
- 5 Humidifiers to Consider [<http://www.apartmenttherapy.com/5-humidifiers-to-consider-105155>]
- Monitor Humidity Levels to Save Archived Memories [<http://www.apartmenttherapy.com/monitor-your-homes-humidity-le-109577>]

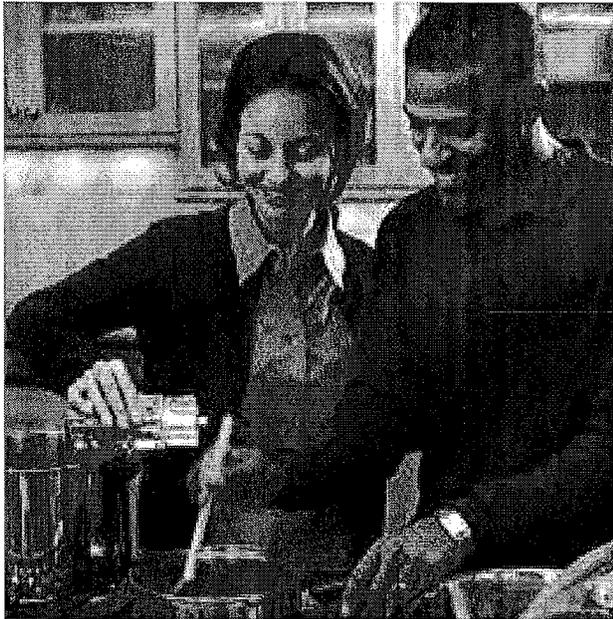
**10. Clean Your Refrigerator:** It's unlikely that you'll purchase new energy efficient appliances for your rental, but you can tweak the ones you already have. For example, by cleaning the coils on the back of your fridge you'll help one of the biggest energy hogging appliances run more efficiently.

- How to Make Any Fridge More Efficient [<http://www.apartmenttherapy.com/how-to-make-your-fridge-more-e-109841>]
- How To Clean the Inside of Your Fridge in 30 Minutes or Less [<http://www.apartmenttherapy.com/how-to-clean-the-inside-of-your-fridge-in-30-minutes-or-less-202073>] [<http://www.apartmenttherapy.com/how-to-keep-the-fridge-clean-77778>]

**RELATED ECO-FRIENDLY RENTAL POSTS ON APARTMENT THERAPY:**

# energy-saving tips

## for renters



## **taking responsibility**

As an individual, your efficient use of energy brings benefits such as lower bills, improved comfort levels in your home and a reduced personal impact on the environment.

Acting together, our individual choices add up—for the benefit of our community, our environment and our energy future. That's the power of working together.

As your community energy company, we are committed to sharing our experience and energy expertise. You can always contact us for:

- Answers to your energy questions.
- Energy efficiency information and advice.
- Help in evaluating energy-saving options.
- Assistance in finding energy-efficient products.

## Before and after you rent

Saving energy and money can be easy if you know what to look for before you sign your lease. This booklet explains what to be aware of and how to plan ahead. In addition, you'll find helpful energy-saving ideas to keep your costs down throughout the year. For more information, visit [mge.com](http://mge.com) or call us at 252-7117.

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## **What to ask before you rent**

### **Heating/air-conditioning**

#### **Who pays for electricity? Who pays for gas?**

Ask the landlord exactly what energy items you must pay.  
Plan for utility expenses ahead of time.

If you'll be paying for gas or electricity, visit *mge.com* and click on "Average Energy Use and Cost" or call MGE at 252-7222. We can provide the average monthly utility cost or the highest and lowest utility cost for the apartment you are considering. For some accounts, we can provide both. Use this as an estimate of what you'll pay.

#### **Who pays for the air-conditioning?**

The tenant usually pays for air-conditioning unless electricity is included in the rent.

#### **What kind of a heating system does the house/apartment have?**

The common types of heating systems are electric baseboard, forced air, hot water or steam. The most expensive to operate is electric baseboard—at least twice as much as natural gas.

#### **Where is the thermostat located?**

You can control your comfort and your budget if the thermostat is located in your apartment. An older two- or three-unit apartment building may have only one heating system with one thermostat. If heat is not included in your rent, find out how the heating bill is divided.

## **Appliances**

### **What appliances are included?**

- Make sure appliances furnished by the owner work properly.
- Gas dryers and ranges cost half as much to operate as electric appliances.
- Side-by-side refrigerators usually cost more to run than top or bottom freezer models. Newer auto-defrost refrigerators cost much less to operate than older ones.
- Don't expect a wall or window air conditioner to cool a multi-room apartment.
- Some appliances (made before 1990) can cost three times as much to operate than newer, energy-efficient models.

## **Water use**

In most cases, the landlord pays the water bill. In a duplex or rental house, tenants might pay the water bill.

- The most expensive way to heat water is with an electric water heater. An energy-efficient natural gas water heater heats water for half as much.
- Ask if the shower has a low-flow showerhead. It helps conserve water and energy.

## **Building insulation/weatherization**

Ask if older buildings have been weatherized. A building with no insulation may have high heating bills and feel uncomfortable.

## Save energy after you move in

Ask your landlord to repair energy-using equipment that isn't working properly. Prompt repair saves money for you and your landlord. Follow these tips to save energy and stay comfortable:

<b>Heating</b>	<b>Benefit</b>
Wear warm clothes to stay comfortable at lower thermostat settings.	Improve comfort.
Don't open windows when you feel too warm.	Wastes energy and costs more.
Check furnace filter monthly; replace as needed.	Prevent problems from too little airflow.
Tune up heating system at least every other year.	Increase safety.
Keep registers and cold-air returns clear of furniture and drapes.	Improve comfort and system efficiency.
Open drapes to allow sun in. Close at night.	Save money and improve comfort.
Use fireplaces only in the early fall or late spring when not using your furnace. Close the fireplace damper after the fire is out.	Save money and improve comfort. Prevent heat loss.
Keep windows tightly latched.	Improve comfort and security.
Cover wall-mounted air conditioners with plastic film or air-tight cover.	Reduce air infiltration.
Don't run furnace fan 24/7.	Save money and electricity.

### Heating - Gas

Keep the thermostat at 68°F or below.	Save on heating costs.
Lower thermostat at night and when you're gone (55°F lowest setting).	Save 1% during setback time period for every 1°F decrease in temperature.

## Heating - Electric

## Benefit

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If you only have one thermostat:  
Set temperature lower at night and  
when you're gone.

Save on heating costs.

---

If you have more than one thermo-  
stat: Set temperature lower in  
unused rooms and close door.

The bigger the setback, the more  
you save on heating costs.

---

Air-conditioning is a big electricity user. The lower you set the  
thermostat, the higher your bill will be.

## Cooling

## Benefit

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Set the thermostat at 78°F or higher.

Save 1% for every 1°F increase in  
thermostat setting when unit is  
running.

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Turn off the air conditioner when no  
one is home. Use a programmable  
thermostat for central air or a timer  
for room air conditioners to start  
cooling before you get home.

Save 20 to 60 cents per hour for  
central units. Save 10 to 20 cents  
per hour for room units.

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Use window fans to blow hot air out  
or bring cool air in.

Save on cooling costs.

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Use room fans or ceiling fans  
instead of air-conditioning.

Save on cooling costs.

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If buying a dehumidifier, look for an  
ENERGY STAR® model.

Save money.

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Shade your windows:

- Close drapes, shades and blinds  
during the day.

Save money. Reduce heat from  
direct sunlight.

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Keep air conditioner filters clean.

Prevent problems.

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Cook outside or use a microwave to  
avoid a hot kitchen.

Reduce cooling costs.

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Use exhaust fans to remove heat  
and moisture produced from cook-  
ing and showering.

Reduce cooling and dehumidification  
costs. Improve indoor air quality.

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Keep registers and cold-air returns  
clear of furniture and drapes.

Improve comfort and system  
efficiency.

---

## Energy-saving tips by type of product

<b>Lighting</b>	<b>Benefit</b>
Replace the most-used incandescent bulbs and fixtures with ENERGY STAR lights.	Use less than one-third the energy with fluorescent bulbs and fixtures. Keep your home cooler.
Turn lights off when leaving a room.	Save energy.
Use the lowest wattage bulbs, except for reading.	Save energy.
Replace halogen torchieres with ENERGY STAR fluorescent torchieres. The 300- to 500-watt halogen bulbs can reach 1,000°F!	Save \$50 per year. Keep your home cooler.
Keep bulbs and fixtures clean.	Get more light.

<b>Appliances &amp; entertainment</b>	<b>Benefit</b>
Switch from an electric to a natural gas dryer.	Reduce drying costs by more than 55%.
Cook in a microwave oven rather than stove.	Heat food faster with less energy.
Use cold water to wash clothes.	Save 12 to 25 cents per load.
Keep refrigerator fresh food section at 35 to 40 degrees and freezer section between 0 and 5 degrees.	Save energy.
Run the dishwasher at night.	Reduce cooling costs and daytime humidity.
Wash a full load of dishes in the dishwasher.	Save hot water, electricity and detergent.
Use the dishwasher's air-dry or energy-saver cycle.	Save up to 8 cents per drying cycle.
Dry laundry on a line or rack.	Save 8 to 11 cents per load for a gas dryer or 27 to 32 cents per load for an electric dryer.

<b>Appliances &amp; entertainment</b>	<b>Benefit</b>
Clean the clothes dryer lint trap after each load.	Dry faster and safer and save money.
Turn off TV and computer plus the devices connected to them when not in use. Even better, put them on a power strip and turn off the power strip when not in use.	Save electricity and keep your home cooler.
Configure sleep/hibernate settings on computer.	Save up to \$40 per year.

No matter which fuel heats your water, take these steps to save:

<b>Water use</b>	<b>Benefit</b>
Measure the hot water temperature at the tap. Keep it at 120°F.	Save money and prevent scalding.
Tell the owner about dripping faucets or water heater leaks.	Save water and energy.
Ask the landlord to install a water-saving showerhead.	Save water and reduce water-heating costs.
Take showers instead of baths.	Save water and energy.

Ask your landlord if your building meets energy codes for insulation and weatherization. You can also take these steps:

<b>Insulating/weatherizing</b>	<b>Benefit</b>
Keep windows, storm windows and doors closed in winter.	Save energy.
Use removable rope caulk or shrink-film plastic on drafty windows. Get the owner's permission first. Removing window plastic sometimes takes paint with it.	Eliminate drafts and improve comfort.

## Home office equipment

## Benefit

Buy ENERGY STAR monitors, printers and computers. Use power-saving settings.

Save money and reduce heat produced.

Shut off equipment that's not in use. A powerstrip can make this more convenient.

Save money and reduce heat produced.

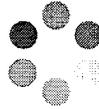
Use energy-efficient lights

Save money and reduce heat produced.

## Resources

### Focus on Energy

*focusonenergy.com*



**focus on energy**<sup>sm</sup>

Partnering with Wisconsin utilities

MGE partners with Focus on Energy to bring energy-saving resources and incentives to our customers.

(800) 762-7077

## CNET Energy Efficiency Guide

Energy-saving and TV power-saving tips:

[http://reviews.cnet.com/2708-19754\\_7-42.html](http://reviews.cnet.com/2708-19754_7-42.html)

## Look for this symbol when you shop



ENERGY STAR labeled products use less energy than other products. They reduce your energy costs and help to protect the environment. We're an ENERGY STAR partner. Learn more about qualifying products at [www.energystar.gov](http://www.energystar.gov) or call MGE at 252-7117.

## **listening. learning.**

MGE takes responsibility to provide information and education to serve our customers and stakeholders. We educate customers today to help inform their decision making. We educate tomorrow's stakeholders so they can help plan our energy future.

Replace the five most frequently used lightbulbs in your home with Energy Star labeled bulbs. If we all take this step, we can save 44 million pounds of coal a year. Working together we can make a difference.

Contact us for information about:

- Heating/Air-conditioning.
- Insulating/Weatherizing.
- Lighting.
- Windows/Doors.
- Appliances.
- Water heating.

Get more home energy information at:

- [mge.com/saving-energy/](http://mge.com/saving-energy/).
- Home Energy Line 608-252-7117.
- 800-245-1125.

Questions about billing? Call:

- 608-252-7222.
- 800-245-1125.

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your community energy company

Table CE1.3 Summary Household Site Consumption and Expenditures in Midwest Region, Divisions, and States - Totals and Intensities, 2009  
British Thermal Units (Btu) and Dollars, Final

Housing Unit Characteristics and Energy Usage Indicators	Total Housing Units <sup>1</sup> (millions)	Site Energy Consumption <sup>2</sup>				Energy Expenditures <sup>2</sup>			
		Total (quadrillion Btu)	Per Household (million Btu)	Per Household Member (million Btu)	Per Square Foot (thousand Btu)	Total (billion Dollars)	Per Household (Dollars)	Per Household Member (Dollars)	Per Square Foot (Dollars)
<b>Total Midwest</b> .....	25.9	2.914	112.4	45.1	49.5	51.34	1,981	795	0.87
<b>Midwest Divisions and States</b>									
East North Central.....	17.9	2.053	115.0	45.6	51.1	36.06	2,020	801	0.90
IL.....	4.8	0.613	128.8	50.7	58.9	9.84	2,067	814	0.95
MI.....	3.8	0.471	123.3	46.0	63.1	8.21	2,148	802	1.10
WI.....	2.3	0.235	103.2	43.8	39.6	4.38	1,926	817	0.74
IN, OH.....	7.0	0.735	105.0	42.4	44.8	13.64	1,948	786	0.83
West North Central.....	8.1	0.861	106.7	44.1	46.1	15.28	1,895	782	0.82
MO.....	2.3	0.234	100.2	40.4	42.7	4.43	1,892	764	0.81
IA, MN, ND, SD.....	3.9	0.442	113.0	46.9	46.6	7.61	1,947	808	0.80
KS, NE.....	1.8	0.185	101.7	42.7	49.5	3.24	1,786	750	0.87
<b>Urban and Rural</b> <sup>3</sup>									
Urban.....	19.9	2.248	112.8	45.8	53.1	37.06	1,859	755	0.88
Rural.....	6.0	0.666	111.3	43.0	40.3	14.27	2,385	921	0.86
<b>Metropolitan and Micropolitan Statistical Area</b>									
In metropolitan statistical area.....	19.4	2.277	117.2	46.3	51.1	38.38	1,975	780	0.86
In micropolitan statistical area.....	4.7	0.444	95.1	41.0	44.5	8.79	1,883	812	0.88
Not in metropolitan or micropolitan statistical area.....	1.8	0.193	106.5	42.3	45.0	4.17	2,296	912	0.97
<b>Climate Region</b> <sup>4</sup>									
Very Cold/Cold.....	20.4	2.359	115.7	46.8	51.0	40.49	1,986	803	0.87
Mixed-Humid.....	5.5	0.555	100.4	39.3	44.0	10.85	1,963	768	0.86
Mixed-Dry/Hot-Dry.....	N	N	N	N	N	N	N	N	N
Hot-Humid.....	N	N	N	N	N	N	N	N	N
Marine.....	N	N	N	N	N	N	N	N	N
<b>Housing Unit Type</b>									
Single-Family.....	19.2	2.425	126.1	47.2	46.3	42.38	2,204	826	0.81
Single-Family Detached.....	18.0	2.302	128.0	47.6	46.1	40.34	2,243	834	0.81
Single-Family Attached.....	1.2	0.123	98.6	41.5	50.0	2.05	1,646	692	0.83
Multi-Family.....	5.6	0.390	69.4	37.8	72.5	6.95	1,236	672	1.29
Apartments in 2-4 Unit Buildings.....	1.9	0.199	102.6	49.0	80.2	3.25	1,673	800	1.31
Apartments in 5 or More Unit Buildings.....	3.7	0.191	51.9	30.5	66.0	3.70	1,005	589	1.28
Mobile Homes.....	1.1	0.099	93.2	34.2	85.5	2.00	1,885	692	1.73
<b>Ownership of Housing Unit</b> <sup>5</sup>									
Owned.....	18.6	2.324	125.2	48.3	46.6	40.83	2,199	849	0.82
Single-Family.....	16.9	2.154	127.6	48.5	45.0	37.72	2,234	849	0.79
Multi-Family.....	0.8	0.089	110.5	67.7	82.3	1.44	1,791	1,098	1.33
Mobile Homes.....	0.9	0.081	92.4	34.7	81.5	1.66	1,901	715	1.68
Rented.....	7.4	0.590	80.2	35.8	65.9	10.51	1,429	638	1.17
Single-Family.....	2.3	0.270	115.1	39.2	60.2	4.66	1,986	677	1.04
Multi-Family.....	4.8	0.301	62.6	33.4	70.1	5.51	1,143	610	1.28
Mobile Homes.....	0.2	0.018	97.1	32.1	109.5	0.34	1,812	598	2.04
<b>Year of Construction</b>									
Before 1940.....	4.6	0.614	133.0	55.7	52.2	10.39	2,249	942	0.88
1940 to 1949.....	1.4	0.182	127.2	47.9	51.0	3.13	2,186	822	0.88
1950 to 1959.....	3.6	0.431	119.9	49.1	59.4	7.09	1,973	808	0.98
1960 to 1969.....	3.2	0.349	107.6	46.3	54.8	5.80	1,788	769	0.91
1970 to 1979.....	4.2	0.407	95.9	38.2	50.8	7.68	1,810	722	0.96
1980 to 1989.....	3.1	0.289	94.6	41.4	47.1	5.49	1,798	786	0.89
1990 to 1999.....	3.2	0.348	110.4	41.8	43.7	6.34	2,012	762	0.80
2000 to 2009.....	2.6	0.294	113.9	39.3	37.6	5.41	2,100	725	0.69
<b>Total Square Footage</b> <sup>6</sup>									
Fewer than 500.....	0.6	0.030	53.1	47.7	152.7	0.52	924	829	2.66
500 to 999.....	4.4	0.308	70.8	38.2	93.6	5.61	1,289	696	1.70
1,000 to 1,499.....	4.3	0.388	90.9	36.1	73.7	6.91	1,619	643	1.31
1,500 to 1,999.....	3.7	0.412	110.5	44.8	63.1	7.24	1,940	786	1.11
2,000 to 2,499.....	3.6	0.435	120.7	46.2	53.8	7.52	2,086	799	0.93
2,500 to 2,999.....	2.9	0.372	128.2	45.9	46.8	6.51	2,243	803	0.82
3,000 to 3,499.....	2.2	0.284	131.5	49.4	40.6	4.90	2,266	851	0.70

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		Total (quadrillion Btu)	Per Household (million Btu)	Per Household Member (million Btu)	Per Square Foot (thousand Btu)	Total (billion Dollars)	Per Household (Dollars)	Per Household Member (Dollars)	Per Square Foot (Dollars)
<b>Total Midwest.....</b>	25.9	2.914	112.4	45.1	49.5	51.34	1,981	795	0.87
3,500 to 3,999.....	1.7	0.234	140.7	49.1	37.5	4.10	2,469	861	0.66
4,000 or More.....	2.7	0.451	168.8	57.1	31.5	8.03	3,006	1,017	0.56
<b>Number of Household Members</b>									
1 Person.....	7.4	0.634	85.4	85.4	53.0	10.95	1,474	1,474	0.92
2 Persons.....	8.5	0.963	112.9	56.5	45.2	17.17	2,012	1,006	0.81
3 Persons.....	3.9	0.491	127.1	42.4	54.1	8.42	2,180	727	0.93
4 Persons.....	3.5	0.466	133.3	33.3	48.6	8.33	2,384	596	0.87
5 Persons.....	1.7	0.230	134.8	27.0	50.2	4.18	2,452	490	0.91
6 or More Persons.....	0.9	0.130	145.1	21.7	54.5	2.28	2,551	381	0.96
<b>2009 Annual Household Income</b>									
Less than \$20,000.....	5.5	0.516	94.1	48.1	65.9	9.08	1,657	847	1.16
\$20,000 to \$39,999.....	6.5	0.644	98.5	42.7	53.4	11.44	1,752	758	0.95
\$40,000 to \$59,000.....	5.0	0.563	112.0	43.9	46.7	9.72	1,935	759	0.81
\$60,000 to \$79,999.....	3.4	0.397	115.7	41.7	47.3	7.09	2,069	745	0.85
\$80,000 to \$99,999.....	2.0	0.264	129.2	42.8	42.8	4.65	2,274	754	0.75
\$100,000 to \$119,999.....	1.3	0.177	138.9	45.3	44.8	3.07	2,407	786	0.78
\$120,000 or More.....	2.1	0.354	166.2	55.7	42.0	6.28	2,947	988	0.74
<b>Income Relative to Poverty Line<sup>7</sup></b>									
Below 100 Percent.....	3.7	0.368	99.0	37.8	64.3	6.50	1,747	668	1.13
100 to 150 Percent.....	2.6	0.268	104.8	37.4	65.6	4.73	1,851	661	1.16
Above 150 Percent.....	19.6	2.278	116.0	47.8	46.4	40.11	2,042	841	0.82
<b>Payment Method for Energy Bills</b>									
All Paid by Household.....	22.6	2.632	116.4	45.0	47.4	46.51	2,057	794	0.84
Some Paid, Some in Rent.....	1.6	0.120	74.9	40.0	84.0	1.88	1,173	626	1.32
All Included in Rent.....	1.0	0.061	61.4	39.7	83.3	1.01	1,017	657	1.38
Other Method.....	0.7	0.101	141.4	67.9	89.4	1.94	2,707	1,300	1.71

<sup>1</sup>Includes all primary occupied housing units in the 50 States and the District of Columbia. Vacant housing units, seasonal units, second homes, military housing, and group quarters are excluded.

<sup>2</sup>Data in these tables represent site or delivered energy. Consumption and expenditures for biomass (e.g. wood), coal, and solar are excluded. See RECS Terminology (<http://www.eia.gov/consumption/residential/terminology.cfm>) for further explanation of these terms.

<sup>3</sup>Housing units are classified as urban or rural using definitions created by the U.S. Census Bureau, which are publicly available through 2009 TIGER/Line Shapefiles.

<sup>4</sup>These climate regions were created by the Building America program, sponsored by the U.S. Department of Energy's Office of Energy and Efficiency and Renewable Energy (EERE).

<sup>5</sup>Rented includes households that occupy their primary housing unit without payment of rent.

<sup>6</sup>Total square footage includes all basements, finished or conditioned (heated or cooled) areas of attics, and conditioned garage space that is attached to the home. Unconditioned and unfinished areas in attics and attached garages are excluded.

<sup>7</sup>To determine the number of households below the poverty line, the annual household income and number of household members were compared to the 2009 Poverty Guidelines for families published by the U.S. Department of Health and Human Services.

Q = Data withheld either because the Relative Standard Error (RSE) was greater than 50 percent or fewer than 10 households were sampled.

N = No cases in reporting sample.

Notes: • Because of rounding, data may not sum to totals.

Source: Energy Information Administration, Office of Energy Consumption and Efficiency Statistics, Forms EIA-457 A and C-G of the 2009 Residential Energy Consumption Survey.