

COST ANALYSIS

CITY OF MADISON

ENERGY STAR MULTIFAMILY NEW CONSTRUCTION



This report evaluates the cost implications of meeting the ENERGY STAR Multifamily New Construction (MFNC) program requirements in comparison to ASHRAE 90.1-2010 standards for multifamily buildings in Madison, Wisconsin. By analyzing hard building systems—including HVAC, water heating, windows, doors, lighting, appliances, and fixtures—this report aims to inform city officials and developers about the economic trade-offs of pursuing ENERGY STAR MFNC certification.

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ENERGY STAR Multifamily New Construction Overview

The ENERGY STAR Multifamily New Construction program is designed for residential new construction with the notable exceptions of “single-family detached homes, two-family dwellings, and townhouses.”¹ The building’s primary purpose must be for residency, with dwelling units, sleeping units, and common spaces making up at least 50% of the square footage.² Energy saving from ENERGY STAR multifamily buildings must exceed their state’s energy code by 10% under the Energy Rating Index (ERI) score, ASHRAE 90.1-2010 model, or the EPA’s prescriptive energy efficiency features.³ Developers are incentivized to reach MFNC standards because they can earn \$2,500 in federal tax credits per dwelling unit that is certified and occupancy ready by June 2026 through the Inflation Reduction Act.⁴

Certification Pathways

To reach the ENERGY STAR standard for multifamily buildings, developers and builders have three approved pathways.

1. ERI Path: Energy savings are evaluated on a unit-by-unit basis, utilizing an approved rating tool software. Certification is obtained through an EPA-recognized Home Certification Organization (HCO).⁵
2. ASHRAE Path: Net energy cost savings of a building are compared to the ASHRAE 90.1-2010 standard using an energy modeling software. Certification is issued through a Multifamily Review Organization (MRO).⁶

¹ Energy Star. n.d. “Multifamily New Construction Building Eligibility | ENERGY STAR.” Energy Star. Accessed July 11, 2025.

https://www.energystar.gov/partner-resources/residential_new/program_reqs/mfnc_building_eligibility.

² ENERGY STAR. n.d.

³ ENERGY STAR. n.d. “Introduction to the ENERGY STAR Multifamily New Construction (MFNC) Program.” Energy Star. Accessed July 11, 2025.

<https://www.energystar.gov/sites/default/files/asset/document/ENERGY%20STAR%20Fact%20Sheet%20-%20Introduction%20to%20MFNC%20Program.pdf>.

⁴ ENERGY STAR. n.d.

⁵ ENERGY STAR. n.d. “Multifamily Program Requirements | ENERGY STAR.” Energy Star. Accessed July 23, 2025. <https://www.energystar.gov/partner-resources/residential-new/multifamily-national-page>.

⁶ ENERGY STAR. n.d.

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3. Prescriptive Path (*not available in California*): Builders follow a "prescriptive package of energy efficient measures developed by the EPA." Certification is also completed through an MRO.⁷

Wisconsin

The ENERGY STAR MFNC program includes multiple implementation versions. Wisconsin is one of over 30 states that only requires National Version 1.1, which is the least updated (see Figure 1). This version is based on the 2012 IECC Climate Zones (see Figure 2), placing southern Wisconsin into Cold Climate Zone 6. However, National Version 1.2 and 1.3 rely on the 2021 IECC and 2024 IECC Climate Zones respectively, classifying southern Wisconsin as Cold Climate Zone 5.⁸ This shift would lower certain performance thresholds for developers in areas like Madison, potentially leading to modest cost savings. Interestingly, it is worth noting that ASHRAE 90.1-2010 also classifies southern Wisconsin as being a part of Climate Zone 6. If Wisconsin were to adopt National Version 1.2 or 1.3, a zone classification mismatch would emerge between ENERGY STAR MFNC and ASHRAE 90.1-2010, lowering ENERGY STAR standards to be more closely aligned with ASHRAE 90.1-2010.

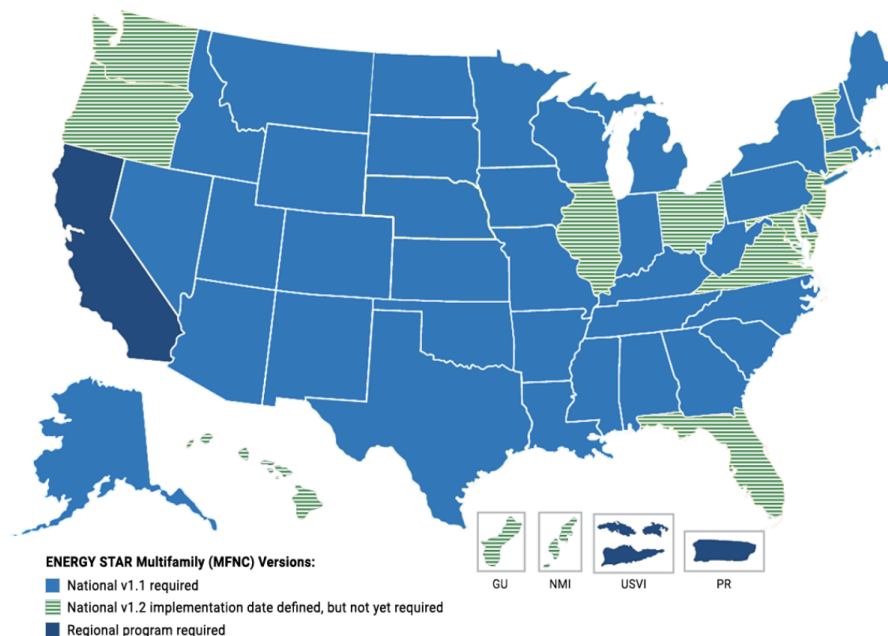


Figure 1: ENERGY STAR Multifamily (MFNC) Versions Map

⁷ ENERGY STAR. n.d.

⁸ ENERGY STAR. n.d.

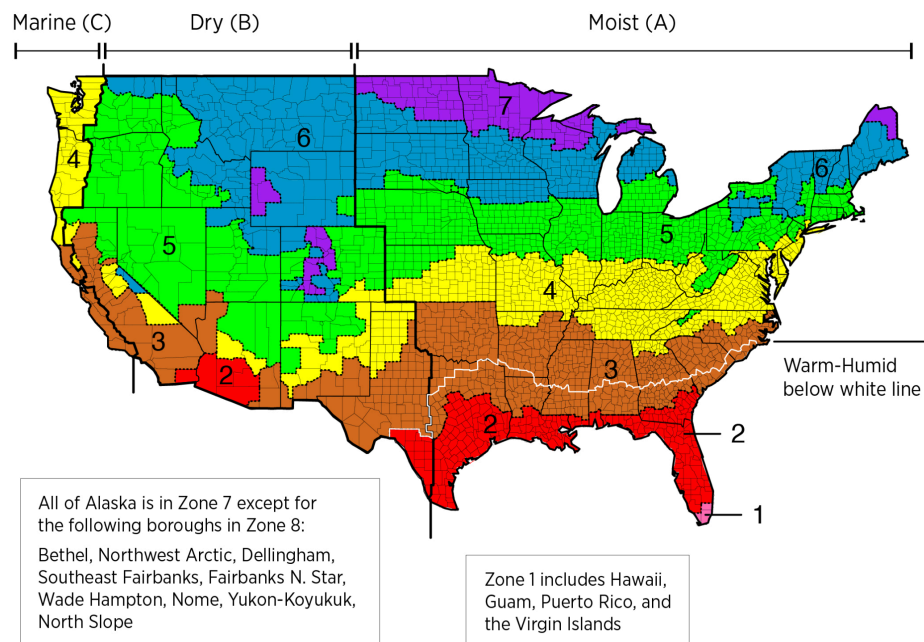


Figure 2: 2012 IECC Climate Zone Map

Comparing ENERGY STAR to ASHRAE

Insulation

ENERGY STAR v ASHRAE Requirements

Insulation Type	ENERGY STAR Requirement	ASHRAE Requirement
Ceiling Insulation	U-0.021~ R-49	Insulation above Deck U-0.048 Metal Building U-0.049 Attics & Other: U-Factor 0.027
Wall Insulation	U-0.051	Mass U-0.071 Metal Building U-0.069 Steel-Framed U-0.064 Wood-Framed and Other U-0.051
Frame Floor	U-0.033 ~ R30	R-30
Mass Floor	U-0.057	U-0.057
Slab Insulation	R-15 2ft	R-15 2ft
Basement Wall Continuous	R-7.5	R-7.5

Highlighted cells/words indicate a match between the ENERGY STAR and ASHRAE code

Assumptions: Frame floor comparison assumes a wood-framed or other non-steel-joist floor. Type of ceiling insulation is not specified in ENERGY STAR and ASHRAE does not have an explicit ceiling category. In this case, the "Roofs" insulation section of ASHRAE is being compared to the ENERGY STAR ceiling insulation section.

Analysis

There is little to no difference in requirements between ENERGY STAR and ASHRAE regarding insulation. Even though ASHRAE is not explicit regarding ceiling standards, the 2009 International Energy Conservation Code (IECC) states that ceilings in Climate Zone 6 must be minimum R-49—same as ENERGY STAR.⁹ Overall, developers should not expect a cost burden to meet ENERGY STAR insulation standards.

Net Cost Differential: Minimal

⁹ 2009 International Energy Conservation Code Table 402.1.1

Questions for Further Exploration

1. What is the additional cost of materials to install insulation of a higher R-value?
2. What is the cost difference between continuous and non-continuous insulation?

Dwelling Units Windows and Doors

ENERGY STAR v ASHRAE Requirements

Unit Type	ENERGY STAR Requirement	ASHRAE Requirement
Window	U-0.27; SHGC Any	Non-metal framing U-0.35 Metal framing (curtainwall/storefront) U-0.45 Metal framing (all other) U-0.55
Door	Opaque: U-0.17 / SHGC Any	*Opaque Swinging U-0.50 *Opaque Non-swinging U-0.50
≤½ lite Door	U-0.25 / SHGC 0.25	Not Specified
>½ lite Door	U-0.30 / SHGC Any	Not Specified

**Note: ASHRAE describes opaque doors under the “building envelope” section of the code. This usually refers to the exterior of a building, not the individual dwelling unit. Thus, it is likely that the gap between ENERGY STAR and ASHRAE door standards is not as significant as implied by the table above.*

Analysis

While ASHRAE has very specific standards for each type of window framing, ENERGY STAR is much more particular regarding doors. High performance double-paned windows usually have a U-factor of 0.30, while triple-paned windows can have a U-factor as low as 0.15.¹⁰ For those living in Northern Climates, it is strongly recommended to purchase windows with a U-factor of 0.30 or lower. The 2009 IECC Code requires a U-factor of 0.35 for fenestration.¹¹ Estimating the window net cost difference between low and high efficiency windows is difficult because windows have a broad range of sizes, styles, and may be customized to fit

¹⁰ Gromicko, Nick. n.d. “U-Factor Ratings for Windows.” InterNACHI. Accessed July 23, 2025. <https://www.nachi.org/u-factor-windows.htm>.

¹¹ 2009 International Energy Conservation Code Table 402.1.1

one building. One ENERGY STAR report assumes an \$18 premium for U-factor 0.27 windows with a SHGC >0.25 over the market baseline of U-0.32-0.35.¹² In 2012, approximately 41.5% of window products in the National Fenestration Rating Council Certified Products Directory (CPD) had a U-factor of 0.27 or lower.¹³ Around this time, the EPA estimated that the total additional cost to go from U-factor ≤ 0.30 to ≤ 0.27 with an improved SHGC was \$54 per window.¹⁴

Regarding opaque dwelling doors, developers should expect no cost burden. The CPD has almost all listed opaque door products as being ENERGY STAR compliant. Similarly, a majority of $\leq \frac{1}{2}$ lite doors and $> \frac{1}{2}$ lite doors meet the ENERGY STAR standard, making it inexpensive to follow this requirement.¹⁵

Net Cost Differential: Low (doors) to Moderate (windows)

Questions for Further Exploration

1. How does window size impact cost differential?
2. How does window style impact the cost differential?
3. Which EPA figure on the additional window cost is accurate?

Common Space & Class AW Windows and Doors

ENERGY STAR v ASHRAE Requirements

Unit Type	ENERGY STAR Requirement	ASHRAE Requirement
Fixed Window	U-0.36	U-0.55

¹² ENERGY STAR. 2024. *Using ENERGY STAR Windows to Help Meet ENERGY STAR Single-Family New Homes, National v3.2*. U.S. Environmental Protection Agency.
<https://www.energystar.gov/sites/default/files/2024-06/Using%20ENERGY%20STAR%20Windows%20to%20Help%20Meet%20ENERGY%20STAR%20Single-Family%20New%20Homes%2C%20National%20v3.2.pdf>

¹³ ENERGY STAR. July 2012. "ENERGY STAR® for Windows, Doors, and Skylights Version 6.0 Draft 1 Criteria and Analysis Report." ENERGY STAR.
https://www.energystar.gov/sites/default/files/specs//Draft6_V1_Criteria_Analysis_Report.pdf.

¹⁴ ENERGY STAR. July 2013. "ENERGY STAR for Windows, Doors, Skylights Version 6.0 Criteria Revision Review of Cost Effectiveness Analysis." Energy Star.
https://www.energystar.gov/sites/default/files/ESWDS-ReviewOfCost_EffectivenessAnalysis.pdf.

¹⁵ ENERGY STAR. July 2012.

Operable Window	U-0.41	U-0.55
Glazed Entrance Door	U-0.73	U-0.80

Assumptions: None

Analysis

While it is relatively easy to find double-hung windows that meet ENERGY STAR standards, it can be more challenging to source compliant sliding or casement windows. The wide variation in window size, frame material, and customization options makes it difficult to precisely estimate the net cost difference between basic ASHRAE-compliant windows and ENERGY STAR-qualified models.

However, one consistent cost driver is Low-E (low-emissivity) glass, which is frequently required to meet ENERGY STAR criteria. According to Homebuilding UK, windows with Low-E glazing typically cost 10–20% more than standard alternatives.¹⁶

Net Cost Differential: Low to Moderate

Questions for Further Exploration

1. How does window size impact cost differential?
2. How does window style impact the cost differential?

Heating, Ventilation & Air Conditioning (HVAC)

ENERGY STAR v ASHRAE Requirements

HVAC Type	ENERGY STAR Requirement	ASHRAE Requirement
Ductless Air Conditioning	SEER2 12.3	SEER 13.0 for < 65,000 Btu/h
Ducted Split System Air Conditioning	SEER2 12.3	SEER 12.0 $\leq$ 30,000 Btu/h

¹⁶ Philips, Tim. 2025. "What do new windows cost during a build? What to budget for uPVC, timber and aluminium glazing." Homebuilding & Renovating. <https://www.homebuilding.co.uk/advice/new-window-costs?>

Ducted Single Packaged System Air Conditioning	SEER2 12.3	SEER 12.0 ≤ 30,000 Btu/h
Ductless Heat Pump	HSPF2 8.5; SEER2 15	SEER 13.0 < 65,000 Btu/h
Ducted Split System Heat Pump	HSPF2 8.0; SEER2 14.2	SEER 12.0 ≤ 30,000 Btu/h
Ducted Single Packaged System Heat Pump	HSPF2 7.9; SEER2 14.2	SEER 12.0 ≤ 30,000 Btu/h
Duct and Air Handler Location	100% Conditioned Space	Not Specified
Infiltration Rate	CFM50/sq. ft. 0.30	Not Specified

Highlighted cells and words indicate that the DOE's energy efficient requirements exceed the listed value.

Assumptions: Assumes that one HVAC unit will be installed per apartment unit. Larger HVAC systems (ones with a greater Btu/h) that are used to heat/cool multiple units may have lower energy efficiency standards.

Analysis

When evaluating HVAC efficiency, a key distinction emerges between ENERGY STAR and ASHRAE standards: ENERGY STAR accounts for climate zones, while ASHRAE does not. This makes ENERGY STAR a more nuanced benchmark for performance, especially across diverse U.S. climates.

It is easy to find ductless systems for both air conditioning units and heat pumps that readily meet or exceed ENERGY STAR requirements. For example, MR COOL's ductless mini-split systems [start](#) at a SEER2 rating of 17.5, comfortably above ENERGY STAR minimums. Carrier's ductless AC and heat pump products typically [begin](#) at 20 SEER2, demonstrating that ENERGY STAR compliance is not only feasible but common in the ductless market. Carrier notes that the general market range for HVAC SEER2 ratings spans from 13 to 20, suggesting that ENERGY STAR-level performance is becoming standard among leading manufacturers.¹⁷ This is because the U.S. Department of Energy (DOE) enacted new energy efficiency requirements in 2023 for residential HVAC systems and heat

¹⁷ Baugh, Travis. n.d. "Understanding Heat Pump Efficiency and Ratings." Carrier. Accessed July 27, 2025. <https://www.carrier.com/residential/en/us/products/heat-pumps/heat-pump-efficiency/>.

pumps, some of which are equal to or above ENERGY STAR.¹⁸ In the Northern zone, they mandate that split AC systems meet SEER2 13.4, packaged AC 13.4 SEER2, and split heat pump SEER2 14.3/HSPF2 7.5.¹⁹

Out of all HVAC systems, packaged heat pumps appear to be the only one with a cost premium. Interestingly, while the SEER2 threshold is relatively easy to surpass, the HSPF2 rating presents more of a hurdle—likely due to the DOE’s decision to lower the HSPF2 baseline for packaged heat pumps from 8 to 6.7.²⁰ This discrepancy highlights how packaged heat pumps may struggle more to achieve ENERGY STAR certification.

Net Cost Differential: Minimal (all systems except packaged heat pumps)

Questions for Further Exploration

1. How does the duct and air handler location effect cost?
2. Given that heat pumps often have a higher upfront cost, what incentives exist for developers to choose those systems over standard AC?
3. How would a larger HVAC system impact efficiency and cost?

Furnaces & Boilers

ENERGY STAR v ASHRAE Requirements

Unit Type	ENERGY STAR Requirement	ASHRAE Requirement
Gas Furnace	AFUE 95	AFUE 78 or 80% Et
Oil Furnace	AFUE 95	AFUE 78 or 80% Et
Gas Boiler	AFUE 90	AFUE 80
Oil Boiler	AFUE 86	AFUE 80

Assumptions: Assumes these are warm-air furnaces <225,000 Btu/h; boilers are hot water based and <300,000 Btu/h

¹⁸ International Code Council. 2023. “2023 Regional Efficiencies for Residential Systems.” ICC. <https://www.iccsafe.org/products-and-services/i-codes/doe-seer2-eer2/>.

¹⁹ International Code Council. 2023.

²⁰ International Code Council. 2023.

Analysis

It is uncommon to find oil furnaces and boilers, especially in the retail market space. Gas appears to be the industry standard. For example, Lennox— a leading climate control product company with a \$22.92 billion market cap— [offers](#) just two oil furnace models, but gives 24 gas options.²¹ Moreover, furnaces seem to be preferred over boilers due to their lower upfront cost, ease of installation, and the fact that they are less prone to leakage.²² Thus, this analysis focuses primarily on the cost differential between 78% AFUE and 95% AFUE gas furnace.

It is worth noting that furnaces typically fall under two categories: standard efficiency (80% AFUE) and high efficiency (95%+ AFUE).²³ As expected, high efficiency models are more expensive than their standard counterparts. For MRCOOL VersaPro furnace products that both have a 100k BTU, the [96% AFUE](#) (retailing for ~\$1,720) is about \$570 more than the [80% AFUE](#) (~\$1,150) equivalent model. Similar patterns exist across manufacturers. A Goodman gas furnace with a 60k BTU and an [96% AFUE](#) is about \$640 net cost increase, compared to their [80% AFUE](#) model. Finally, a 110k BTU Royalton furnace with an [80% AFUE](#) is about \$565 less than the [95% AFUE](#) product.

Even if developers and contractors secure discounts by buying directly from the manufacturer, they should be prepared to pay at least a few hundred dollars more per high efficiency furnace.

Note: Retail prices are highly subject to change. This section analysis was written in July 2025.

Net Cost Differential: High

Questions for Further Exploration

1. In what situations does it make more sense for Madison developers to install an oil furnace or boiler over a gas one?

²¹ Companies Market Cap. 2025. "Lennox (LII) - Market capitalization." Companies Market Cap. https://companiesmarketcap.com/lennox/marketcap/#google_vignette

²² Constellation Energy. 2023. "Furnace vs. Boiler: Pros, Cons, & Efficiency | Constellation." Constellation Energy Blog. <https://blog.constellation.com/2016/11/11/boilers-furnace-comparison/>.

²³ Peavey, Jason. n.d. "The Great 80% Vs. 95% Furnace Showdown | PV Heating, Cooling." PV Heating, Cooling & Plumbing. Accessed July 25, 2025. <https://www.pvhvac.com/blog/the-great-80-vs-95-furnace-showdown/>.

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2. How does installing a model with a higher BTU affect the cost differential between standard and high efficiency models?

Water Heating

ENERGY STAR v ASHRAE Requirements

Tank Type	ENERGY STAR Requirement	ASHRAE Requirement
Gas Efficiency	Gallons $\leq$ 55: medium-draw, 0.64 UEF; high-draw, 0.68 UEF Gallons $>$ 55: medium-draw, 0.78 UEF; high-draw, 0.80 UEF	For a storage tank, <75,000 Btu/h requires an efficiency of 0.67-0.0019V EF.
Oil Efficiency	(UEF) 30 gal: 0.63 UEF 40 gal: 0.61 UEF 50 gal: 0.58 UEF 60 gal: 0.56 UEF 70 gal: 0.54 UEF 80 gal: 0.52 UEF	For a storage tank, <105,000 Btu/h requires an efficiency of 0.59-0.0019V EF
Electric Efficiency	UEF 0.93	For a <12 kW tank requires an efficiency of 0.93-0.00132V EF

Assumptions: Assumes these are storage water tanks not instantaneous water tanks. All multifamily buildings will have one tank per unit, or will be clustered where one tank will serve a few dwellings.

Analysis

Natural gas remains the dominant fuel source for water heating in American households, making it the standard baseline for comparison.²⁴ Between ENERGY STAR and ASHRAE, ENERGY STAR clearly represents the more stringent standard. Since oil-fired water heaters are uncommon and difficult to find in the retail market, this analysis focuses primarily on electric and natural gas storage tanks.

For gas water heaters, direct comparison between ASHRAE and ENERGY STAR requirements has slight complications. Unlike ENERGY STAR, ASHRAE evaluates efficiency using the older Energy Factor (EF) metric and does not differentiate between tank draw patterns. Nevertheless, ASHRAE's gas requirements are weaker—for instance, a 40-gallon

²⁴ U.S. Energy Information Administration. 2023. "The majority of U.S. households used natural gas in 2020." EIA. <https://www.eia.gov/todayinenergy/detail.php?id=55940>.

tank only needs to reach 0.594 EF under ASHRAE, whereas ENERGY STAR requires 0.64 or 0.68 UEF depending on the draw. ENERGY STAR is closer to the DOE's § 430.32 which outlines the minimum energy conservation standards, varying based on both tank size and draw pattern.²⁵ With the DOE's formulas, a 40-gallon tank would require a UEF of 0.58 (medium draw) or 0.64 (high draw) while a 60-gallon tank must meet a 0.77 UEF (medium draw) or a 0.79 UEF (high draw).²⁶ As ENERGY STAR is still the higher bar, meeting that efficiency does come with an extra cost, often adding a few hundred dollars per heater. For example, one 40 gal A.O. Smith tank that does not meet ENERGY STAR standards [retails](#) for \$769 while its compliant 40 gal comparable model [retails](#) for \$1009. However, it is worth noting that high efficiency water heaters may also come with features like longer warranties, causing price comparisons to be somewhat misleading.

For electric tanks, the industry already operates at a higher baseline, so achieving ENERGY STAR's UEF requirements adds a minimal cost. Manufacturers like Rheem already [produce](#) models in the 0.90–0.94 UEF range showing that ASHRAE remains outdated. For example, ASHRAE's formula sets the threshold at roughly 0.89 EF for 30-gallon tanks and 0.824 EF for 80-gallon ones. Interestingly, this is well below the minimum efficiency levels the DOE mandates for manufacturers. Using their formula, § 430.32 sets a standard of approximately 0.91 UEF for low-draw, 0.92 UEF for medium-draw, and 0.93 UEF for high-draw tanks between 20 and 55 gallons.²⁷ DOE requirements explain why AO Smith, a leading manufacturer, [offers](#) only eight products in the 0.8–0.89 UEF range but 69 models between 0.9 and 0.99 UEF. Still, while high-efficiency electric tanks may be cost-effective upfront, Wisconsin's high electricity prices relative to natural gas could result in significantly higher utility bills, potentially imposing an energy burden on residents.²⁸

Note: Retail prices are highly subject to change. This section analysis was written in July 2025.

Net Cost Differential: Low (electric) to High (natural gas)

Questions for Further Exploration

²⁵ 10 CFR § 430.32

²⁶ 10 CFR § 430.32

²⁷ 10 CFR § 430.32

²⁸ Wisconsin Public Service. n.d. "Switching from electricity to natural gas." Wisconsin Public Service. Accessed July, 2025. <https://www.wisconsinpublicservice.com/savings/switch/electric>.

1. How does installing a water heater to be shared across multiple units affect costs for developers?
2. How does the net cost differential between standard and high efficiency models change with a higher tank volume?
3. Does the misalignment between DOE standards for manufacturers and ASHRAE standards for developers lead to industry discrepancies?

Lighting, Appliances & Fixtures

ENERGY STAR v ASHRAE Requirements

Unit Type	ENERGY STAR Requirement	ASHRAE Requirement
Lighting	90% Fluorescent or LED Lighting	Not Specified
Refrigerator	ENERGY STAR	Not Specified
Dishwasher	ENERGY STAR	Not Specified
Clothes Washer	ENERGY STAR	Not Specified
Dryer	ENERGY STAR	Not Specified
Bathroom Faucets	WaterSense	Not Specified
Aerators	WaterSense	Not Specified
Showerhead	WaterSense	Not Specified
Thermostat	Programmable	Not Specified

Assumptions: None

Analysis

While fluorescent lighting is still available on the market, it is rapidly being phased out. Fluorescent lighting is either fully banned or mostly banned in several states including California, Colorado, Hawaii, Oregon, Rhode Island, and Vermont.²⁹ Bans will be going into

²⁹ Harvey, Matt. 2024. "Active List of U.S. States Banning Fluorescent Lights." Pacific Energy Concepts. <https://www.pecnw.com/blog/active-list-of-us-states-banning-fluorescent-lights/>.

effect within the next two years in Illinois, Maine, Minnesota, and Washington.³⁰ Finally, additional restrictions already exist in Maryland, Massachusetts, Nevada, New Jersey, New York, and Washington D.C.³¹ Since LED is already becoming the industry standard, this means it should be relatively easy to meet the ENERGY STAR requirements regarding lighting.

Using ENERGY STAR appliances should not cause an unnecessary burden on developers. According to a 2022 report, almost 85% of U.S. households have a general or high level understanding of the ENERGY STAR label.³² Awareness translates into purchasing, with 45% of U.S. households reporting knowingly buying at least one ENERGY STAR-labeled product in the past 12 months.³³ Among those who purchased a product, 57% said they were “very much or “somewhat” influenced by the label.³⁴ High consumer confidence has led to manufacturers certifying a greater number of their appliances. For example, Samsung has now certified over 81% of its appliances to ENERGY STAR.³⁵ As more manufacturers opt-in to ENERGY STAR, the cost compared to standard models should close. While ENERGY STAR appliances do generally face a higher upfront cost, they are well-trusted by the American public.

Although ENERGY STAR appliances add a moderate cost, Watersense fixtures add a negligible cost difference. There are over 21,000 Watersense labelled bathroom sink faucets and aerators and more than 16,000 showerhead products with the same label.³⁶ Developers have a broad range of products to choose from and therefore should be able to find fixtures within their budgets.

Net Cost Differential: Minimal (lighting and WaterSense) to Moderate (appliances)

Questions for Further Exploration

³⁰ Harvey, Matt. 2024

³¹ Harvey, Matt. 2024

³² ENERGY STAR. 2022. “ENERGY STAR Awareness | 2022 Report.” Energy Star. <https://www.energystar.gov/partner-resources/awareness>.

³³ ENERGY STAR. 2022.

³⁴ ENERGY STAR. 2022.

³⁵ ENERGY STAR. 2022.

³⁶ Environmental Protection Agency. 2025. “WaterSense Product Search.” EPA. <https://lookforwatersense.epa.gov/products/>.

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1. What could the City of Madison do to further encourage the phase-out of fluorescent lighting?
 2. How have the Trump administration's plans to shut down the ENERGY STAR program influenced consumer confidence behind the label?

Cost Summary Differential

One Bedroom ~750 sq/ft

Section	Additional Cost
Insulation	\$0
Windows and Doors	\$275
HVAC — Spilt AC	\$0
Gas Furnace	\$500
Gas Water Heater	\$250
Lighting	\$0
Appliances	\$200

Total: \$1,225

Note: This summary does NOT include the additional common space cost shared in the building. It also uses a larger furnace and water heater than what is necessary for a one bedroom. In this case, it makes more sense to “cluster” those pieces of equipment—meaning they are shared between two or more units.

Assumptions: Assumes an opaque door, three 3ft x 5ft fixed windows and two 3ft x 5ft operable windows at a conservative cost estimate of +\$55/window. It uses a split AC unit and a gas furnace. It also utilizes a gas water heater, fully LED lighting, a dishwasher and fridge—it does not include a washer and dryer. Assumes that developers are paying retail prices for products.

Additional Barriers

Developers are affected by costs beyond achieving sustainability certifications. In recent years, the construction industry has faced huge inflationary pressures, higher interest rates, and unpredictable federal grants. These have complicated efforts to reach ENERGY

STAR New Multifamily Construction requirements, and are outside of the city's control to regulate.

Inflationary Construction Costs

Global supply chain disruptions caused by the pandemic significantly increased the cost of construction materials. Despite markets stabilizing, prices remain 39.7% higher than pre-pandemic levels.³⁷ To be specific, raw iron and steel prices have risen 40.5% since February 2020, steel mill products are up 45.8%, and copper wire and cable are 41.9% more expensive.³⁸ Analyzing prices by market sector finds that while multifamily construction costs saw about a 0.4% decrease in 2024, they are still 39.2% higher than before the pandemic.³⁹ This has resulted in an elevated cost baseline that makes it particularly difficult to build affordable housing.

Interest Rates

Changes to the interest rates for residential development loans has a major effect on developers. Depending on the loan's size, increasing the interest rate by a small margin represents a loss for the developer. Construction loan rates have stabilized since 2024, but are still higher than pre-pandemic lows, ranging between 6.5% and 9%.⁴⁰

Unpredictable Federal Grants

To keep the upfront cost competitive, clean energy projects are often financed by federal grants. However, since the Trump administration has returned to office, several of these programs have been cancelled or frozen, creating an unpredictable environment for developers to navigate. One critical example is The Greenhouse Gas Reduction Fund

³⁷ Morris, Manning & Martin, LLP. 2024. "The Current State of Construction Material Pricing: A Look Back at COVID Peaks and Year-on-Year Trends." Morris, Manning & Martin, LLP. <https://www.mmmlaw.com/news-resources/the-current-state-of-construction-material-pricing-a-look-back-at-covid-peaks-and-year-on-year-trends/>.

³⁸ Morris, Manning & Martin, LLP. 2024.

³⁹ Morris, Manning & Martin, LLP. 2024.

⁴⁰ Trident Home Loans. 2025. "Construction Loan Rates 2025 Compare Interest Rates & Loan Types Today." Trident Home Loans. https://tridenthomeloans.com/construction-loan-rates-2025-compare-interest-rates/?utm_source=chatgpt.com.

(GGRF), where \$20 billion out of \$27 billion of its awarded funds have been blocked.⁴¹ The Environmental Protection Agency (EPA) is currently prohibiting the withdrawal of grant funds, citing alleged “financial mismanagement, conflicts of interest, and oversight failures.”

⁴² The GGRF includes the National Clean Investment Fund (NCIF), which supports new clean energy projects across the country, with a commitment to invest 50% to 75% of funds into low-income and disadvantaged communities.⁴³ It also includes the Clean Communities Investment Accelerator (CCIA), designed to provide sub-grants and technical assistance to community leaders for net zero projects.⁴⁴ Although a federal court has temporarily halted the EPA’s attempt to terminate the grants, their future remains uncertain until court proceedings.⁴⁵ Projects dependent on these grants will either be delayed, face higher costs, or be cancelled altogether.

Moreover, the signing of the “One Big Beautiful Bill” means that energy efficiency and solar incentives are disappearing quickly.⁴⁶ Home solar tax credits— ending December 31st, 2025— meant that homeowners could get 30% off the cost of solar installation and equipment.⁴⁷ Likewise, the Energy Efficient Home Improvement credit, providing up to \$2,000 off for heat pumps, water heaters, biomass stoves, or biomass boilers will disappear the same day.⁴⁸

Questions for Further Exploration

1. How can cities respond effectively to the cancellation of federal grants? What alternative incentives can they provide?

⁴¹ Tajo, Mikaela, and Rachel Jacobson. 2025. “Continued Freeze of Greenhouse Gas Reduction Fund Threatens Climate Investments in Vulnerable Communities Across the Country.” Center on Budget and Policy Priorities.
<https://www.cbpp.org/blog/continued-freeze-of-greenhouse-gas-reduction-fund-threatens-climate-investments-in-vulnerable>.

⁴² Guarna, Olivia. 2025. “EPA’s Attacks on Greenhouse Gas Reduction Fund and the Fate of IRA’s “Green Banks.”” Climate Law - Sabin Center Blog.
<https://blogs.law.columbia.edu/climatechange/2025/04/02/epas-attacks-on-greenhouse-gas-reduction-fund-and-the-fate-of-iras-green-banks/>.

⁴³ Tajo, Mikaela, and Rachel Jacobson. 2025.

⁴⁴ Tajo, Mikaela, and Rachel Jacobson. 2025.

⁴⁵ Tajo, Mikaela, and Rachel Jacobson. 2025.

⁴⁶ Simon, Julia, and Camila Domonoske. 2025. “Federal tax credits for home solar and EVs will disappear soon.” NPR.
<https://www.npr.org/2025/07/16/nx-s1-5462190/trump-tax-credit-solar-ev-heat-pump>.

⁴⁷ Simon, Julia, and Camila Domonoske. 2025.

⁴⁸ Simon, Julia, and Camila Domonoske. 2025.

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2. Are these additional barriers holding back developers more than the cost of achieving ENERGY STAR Multifamily New Construction certification?
 3. How do “soft costs” like extra contractor due diligence, more advanced labour, and building tests add to the cost of achieving ENERGY STAR?

Project Limitations

While this report represents approximately 6 weeks of research from June 2025 to July 2025, it is still limited in scope. Further research in the following areas would enrich our understanding of the cost ENERGY STAR adds to development.

1. Product diversity: As previously mentioned, products like windows and doors come in a variety of sizes, shapes, and materials. Similarly, appliances can come with a wide array of features that make it difficult to determine the true cost differential between non-certified and ENERGY STAR products. It may serve to conduct a deeper investigation into factors that influence net cost.
2. Soft costs: Meeting ENERGY STAR standards may require more project oversight, technical labour, or energy efficiency expertise not captured in this analysis. There may also be higher hardware costs associated with the installation of ENERGY STAR certified materials.
3. Technical requirements: ENERGY STAR has requirements beyond just building systems. They mandate that the duct and air handler location be a 100% conditioned space and the infiltration rate be 0.30 CFM50/sqft. It is challenging to provide a cost estimate for these additional standards without further information.

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