



Proposed ENERGY STAR® NextGen™ Certification for Existing U.S. Commercial and Multifamily Buildings

Background and Request for Comments

EPA has developed a new certification under the ENERGY STAR program, available to energy-efficient, low-carbon buildings in the U.S. EPA is requesting comments from the public before it is finalized and launched. Comments will be accepted until March 2, 2023.

Overview

The Biden Administration established a goal of net-zero emissions, economy-wide, by 2050. Reaching this goal will require increases in efficiency, vastly increased renewable energy capacity, and a transition from fossil fuels to clean electricity. Buildings have a critical role to play in achieving each of these objectives. Toward that end, EPA is proposing a new recognition offering, called ENERGY STAR NextGen™ certification, designed to encourage top energy performance, use of renewable energy, and electrification of U.S. commercial and multifamily buildings.



The following set of principles guided EPA's development of this proposed new recognition:

Ensure energy efficiency. There is widespread agreement that achieving cost-effective energy efficiency is an essential step to reducing carbon emissions from buildings. Studies have consistently shown that inefficiencies in building systems waste energy, leading to greater emissions, higher costs to building owners and occupants, and additional energy system infrastructure needs. To move forward on the path to a decarbonized economy by 2050, we need to step up our efforts to achieve all cost-effective energy efficiency. The ENERGY STAR NextGen recognition must ensure efficiency.

Encourage use of cost-effective renewable energy. Providing buildings with the option to procure renewable energy onsite or offsite allows the market to determine the best, most cost-effective approach for each building. The option that is best for a particular building depends on its size, location, and other factors. For example, tall, narrow buildings and others that have limited roof space or shading may not have feasible options for onsite renewable energy but can procure renewable energy from nearby installations, from other renewable energy projects, or via renewable energy certificates. On the other hand, buildings with more roof space (such as ware-

houses) or with significant open area around them (such as buildings in more rural areas) will have a greater ability to deploy onsite renewable energy.

Incentivize electrification. A key objective of ENERGY STAR recognition is to motivate building owners to improve the performance of their buildings. Recognizing only those that are 100% electric would miss the opportunity to help buildings to move meaningfully along the path of electrification. Therefore, NextGen recognition should encourage buildings to transition to efficient electric-powered heating, water heating, and cooking, as well as recognizing those that already are fully electric and efficient.

Establish one set of national criteria. EPA will implement the NextGen recognition at a national level. Therefore, it needs to include one set of criteria that works nationally and can be applied to all buildings regardless of their location.

Recognize top performance. By design, the recognition should only recognize top performers, even if that is a relatively small number of buildings.

In addition, it is important that the recognition be easily understood, with clear metrics, so that buildings know how to achieve it, what improvements are needed and how they are progressing toward meeting the requirements.

The proposed NextGen certification criteria were developed with these principles in mind.

Proposed NextGen Certification Criteria

Below are the proposed initial ENERGY STAR NextGen certification criteria for existing U.S. commercial and multifamily buildings. EPA intends to periodically reevaluate the requirements for each criterion and potentially revise them (e.g., increase their stringency) based on the market's response and the advancement of demonstrated efficiency, renewable energy, and low carbon activity in buildings.



Demonstrate Top Energy Efficiency



Use Renewable Energy



Meet a Direct Emissions Target

1. Demonstrate Top Energy Efficiency



Demonstrate Top Energy Efficiency

- **Requirement:**

The building achieves an ENERGY STAR score of 75 or higher and meets all criteria associated with ENERGY STAR certification.
- **Implementation:**

No changes are required since EPA already administers ENERGY STAR certification for buildings through Portfolio Manager.
- **Rationale:**

Requiring buildings to achieve ENERGY STAR certification to qualify for NextGen recognition ensures top energy efficiency without sacrifice in comfort.

ENERGY STAR certification recognizes buildings that achieve an ENERGY STAR score of 75 or greater and whose data and acceptable indoor air and lighting levels are verified by a Professional Engineer or Registered Architect. The ENERGY STAR score measures the energy performance of buildings relative to the market, accounting for differences in key operating characteristics.

Requiring this certification restricts NextGen recognition to only those [building types eligible for ENERGY STAR certification](#). As EPA develops ENERGY STAR scores and certification for additional building types, they will become eligible for NextGen recognition.

2. Use Renewable Energy



Use Renewable Energy

- **Requirement:**

The building obtains at least 30% of the total energy it consumes (on a site basis) from renewable sources. Renewable energy sources can include onsite renewable electricity, offsite green power procurement, renewable fuels, and/or renewable thermal certificates. Renewable energy components of standard grid-supplied electricity or district energy would not count toward the 30% requirement. For the purposes of meeting the 30% requirement, the sum of onsite renewable electricity used in the building and green power purchased cannot exceed the total amount of electricity used by the building. Likewise, the amount of energy represented by renewable thermal certificates cannot exceed the total amount of fuel used by the building.

- **Implementation:**

EPA will enhance the renewable energy tracking features in Portfolio Manager to support this criterion, including adding the ability to track specific renewable energy credits (RECs) and other renewable energy products as well as adding a new metric to inform users if they meet the 30% threshold.

- **Rationale**

Buildings have an important role to play in increasing the supply and use of renewable energy. Since ENERGY STAR is a national program and the mix of energy resources on the local or regional electricity grid changes over time, EPA is proposing a single percentage requirement for NextGen, regardless of building location. In other words, renewable energy that contributes to the generation of electricity on the regional or local grid does not count toward the 30% requirement (unless the building owner can claim ownership of the RECs or the RECs have been retired on the building owner's behalf).

As most buildings do not use renewable energy, EPA is proposing a relatively modest initial requirement of 30% of total site energy to incentivize more buildings to procure renewable energy. EPA envisions increasing this percentage over time.

The requirement is expressed as a percentage of total total site energy use rather than as a percentage of electricity use for two key reasons:

- If the requirement were for 30% of electricity use, buildings with a higher proportion of electricity would need to demonstrate a greater overall use of renewable energy. This would mean all-electric buildings would have a more stringent renewable energy requirement than buildings using fossil fuels directly, which is counter to the goal of electrification.
- By requiring a percentage of total energy rather than a percentage of electricity, buildings can use renewable fuels to meet the 30% threshold.

3. Meet a Direct Emissions Target



Meet a Direct Emissions Target

- Requirement:**

The building’s direct (i.e., onsite) greenhouse gas emissions intensity (GHGi) is at or below a specified level. Each building will have a unique direct GHGi target—or “NextGen Direct GHGi Target”—normalized for both the type of building and the climate/weather. Because direct GHG emissions in buildings are driven primarily by heating needs, EPA is proposing to normalize every building’s NextGen Direct GHGi Target based on the number of Heating Degree Days (HDD) experienced by the building.

EPA took the following steps to develop the normalization approach:

1. Analyzed data from ENERGY STAR certified buildings (excluding 100% electric buildings) and calculated direct GHGi per HDD for each building.
2. Calculated the median direct GHGi per HDD for each property type and compared the results.

EPA found that for each property type, median GHGi per HDD is relatively consistent across climate zones. Therefore, EPA is confident that using the GHGi per HDD factors shown in Table 1 below to normalize direct GHGi targets will result in equitable targets for buildings across the country.

TABLE 1. Proposed Factors for Calculating Direct GHGi Targets

Property Type	Proposed GHGi Factor (g CO ₂ e/ft ² /HDD)*
Data Center	0.15
Retail Store	0.14
Warehouse	0.18
Office (incl. Office, Bank, Courthouse, Financial)	0.25
K-12 School	0.22
Worship Facility	0.25
Medical Office	0.24
Senior Living Community	0.46
Hotel	0.43
Multifamily Housing	0.29
Supermarket/Grocery Store	0.49
Hospital (General Medical & Surgical)	1.25

*EPA is exploring setting minimum targets by property type to account for areas with extremely low HDD values that may not have heating needs but still have a baseline level of water heating.

To calculate a particular building’s NextGen Direct GHGi Target and determine whether the building’s actual emissions meet the target, Portfolio Manager would:

1. Multiply the GHGi Factor for the relevant property type by the building’s actual HDD for the previous 12 months. The result is the building’s NextGen Direct GHGi Target.
2. Compare the result of step 1 to the building’s actual direct GHGi for that same period.
3. If the building’s actual direct GHGi is at or below the Target, the building has met this criterion.

Buildings that use only electricity would automatically meet this criterion as they have zero direct GHG emissions.

Table 2 illustrates example calculations for office buildings and retail stores in different locations.

TABLE 2. Example ENERGY STAR NextGen Direct GHGi Target Calculations

	Office DC	Office NYC	Retail Store NYC	Retail Store Atlanta
Direct GHGi Factor (g CO ₂ e/ft ² /HDD)	0.25	0.25	0.14	0.14
Experienced Weather (actual HDD for prior 12 months)	3620	4147	4147	2682
Building’s NextGen Direct GHGi Target (g CO ₂ e/ft ²)	905	1,037	581	375
Building’s NextGen Direct GHGi Target (kg CO ₂ e/ft ²)*	0.91	1.04	0.58	0.38

*GHGi target is converted from g CO₂e/ft² to kg CO₂e/ft² as this is the unit of measurement used and displayed in Portfolio Manager.

- **Implementation:**

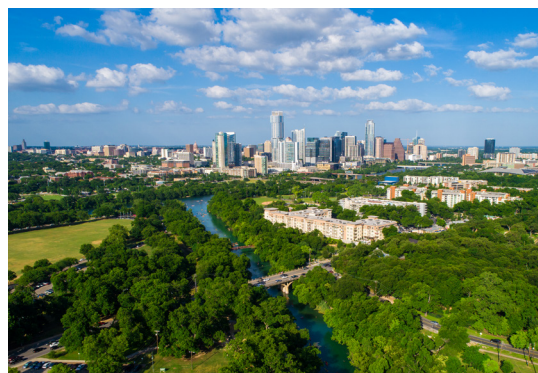
EPA will add metrics to Portfolio Manager for the NextGen Direct GHGi Target and GHGi Factor.

- **Rationale:**

Direct emissions from energy use at buildings results from combustion of fossil fuels, such as natural gas, for space heating, water heating, cooking, and miscellaneous uses. The primary options for reducing these emissions include improving energy efficiency, which generally leads to incremental reductions, and electrifying end uses. Therefore, a direct GHGi level, if set properly, will encourage electrification. EPA considered requiring buildings to be 100% electric to qualify for NextGen recognition; however, that would not help

motivate buildings to begin transitioning to electrification but rather would only recognize those that are already fully electrified.

EPA also considered establishing emissions targets for total GHG emissions instead of direct GHG emissions. Total GHG emissions include both direct emissions from onsite fuel use as well as indirect emissions that occur at the power plant generating electricity used in the building. Indirect emissions intensity varies significantly based largely on the fuels used at the power plant, which is outside the control of the building owner. To establish a total GHG emissions criterion, EPA would not be able to rely on a single, national emissions factor and would have to propose multiple thresholds, which would vary not just geographically but also over time. This would be very complex and, depending on the regional grid, might discourage electrification in some regions.



Establishing NextGen Targets is not simple, as direct emissions vary significantly among building types, and even more so among regions. A major factor in the level of direct GHG emissions is weather – since a predominant use of onsite fuels is space heating, even energy efficient buildings in colder climates will tend to have higher direct GHG emissions than most buildings in warmer climates. The number of Heating Degree Days in a particular area reflects the climate and weather in that area and is a standard measure of heating needs. The higher the HDD, the more energy needed for heating and consequently the higher the emissions. To account for variations in heating needs, EPA proposes to normalize the NextGen Direct GHGi Targets by building type and the annual number of HDD, as described above.

EPA based its development of the proposed GHGi Factors on data from thousands of ENERGY STAR certified buildings. One reason for limiting the analysis to these buildings is that their energy data has undergone a verification process as part of the application for ENERGY STAR certification. By choosing the median GHGi values for ENERGY STAR certified buildings as the basis for determining the NextGen Direct GHGi Targets, EPA would be awarding NextGen recognition to those buildings with direct emissions lower than 50% of ENERGY STAR certified buildings that use onsite fuels.

The proposed approach to establishing NextGen Direct GHGi Targets does not normalize for other operating characteristics that could impact the amount of energy needed for heating, cooking, etc. Developing a methodology for such normalization would be very difficult in part because the end uses for which buildings use onsite fuels vary among buildings – one may use natural gas for water heating but not space heating, and another may use it only for cooking. Nevertheless, EPA analyzed Portfolio Manager data to assess the impact of operating characteristics on GHGi and did not find a strong case for developing an approach to normalize for operating characteristics.

Next Steps and How to Provide Comments

EPA is requesting comment on the proposed ENERGY STAR NextGen recognition criteria. We encourage those interested in providing comments to take the following steps:

1. View the recording of the recent webinar presenting an overview of the proposed recognition and criteria. The webinar is available at www.energystar.gov/NextGenBuildings.
2. Submit your comments to EPA by completing the form at www.energystar.gov/NextGenBuildings before **March 2, 2023**. Please note that EPA will not respond to individual comments, but we will summarize comments and provide summary responses on our website. You are free to provide any comments you wish, but EPA is particularly interested in receiving responses to the following questions:



1. General

- a. Will there be any unintended consequences of the NextGen certification as proposed?
- b. Are there different NextGen criteria you recommend? Please describe and provide a rationale for your recommendations.
- c. How should ENERGY STAR NextGen certification be characterized relative to the existing ENERGY STAR certification (which EPA will continue to offer)?

2. Criteria: Demonstrate Top Energy Efficiency

- a. Is this criterion appropriate? Why or why not?
- b. Is the requirement for an ENERGY STAR score of 75 or higher appropriate, or should the required score be higher or lower? Please provide a rationale for any alternative recommendation.
- c. Should EPA make the NextGen certification available to buildings not eligible for ENERGY STAR certification? If so, how can EPA ensure such buildings have achieved top efficiency in the absence of an ENERGY STAR score?

3. Criteria: Use Renewable Energy

- a. Is this criterion appropriate? Why or why not?
- b. Is the renewable energy percentage requirement of at least 30% of total site energy appropriate, or should the requirement be higher or lower? Please provide a rationale for any alternative recommendation.
- c. Should EPA allow both onsite renewable energy and offsite green power to contribute to the requirement, as proposed? If not, please explain your reasoning.

4. Criteria: Limited Direct Emissions

- a. Is this criterion appropriate? Why or why not?
- b. Is the methodology for this criterion as proposed appropriate? Please explain and include any suggestions for alternative approaches.
- c. Should EPA start with a higher or lower direct emissions target than proposed (i.e., based on the median for ENERGY STAR certified buildings)? Please provide a rationale for any alternative recommendation.

Submit your comments using the form at www.energystar.gov/NextGenBuildings by **March 2, 2023**. After reviewing all comments received, EPA will proceed to finalize the ENERGY STAR NextGen certification criteria, considering those comments, as appropriate. We expect to launch the NextGen certification in early 2024.