DGS DEPARTMENT OF GENERAL SERVICES BUILD MAINTAIN SUSTAIN

Net Zero Energy Frequently Asked Questions for DC Government Buildings

Information is as of February 2026

Purpose: This FAQ document seeks to clarify the requirements and impacts of existing Net Zero Energy (NZE) requirements, with the goal of making a case for a more feasible set of requirements.

Specifically, these FAQs describe the current requirements that *publicly-funded or -financed building construction projects in the District* (new buildings and renovations meeting a certain threshold) must meet for building energy production and use requirements under the Greener Government Buildings Amendment Act (GGBAA), which was passed by the DC Council in 2022 and went into effect in 2023. Under the GGBAA, covered projects must be designed such that the building conserves an amount of energy attributable to building operations that is equal to or greater than the amount that would be required by the most recent version of Appendix Z *and* that a building obtains energy from renewable energy sources in the amount that would be required by the most recent version of Appendix Z, among other more specific requirements (as explained in more detail below).

These FAQs also explain the challenges that NZE requirements present for certain types of construction projects. Collectively, these requirements can be challenging, if not impossible, to meet for certain projects, including indoor aquatic facilities, large recreational spaces, and small capital projects such as roof and HVAC replacements. While members of the Council have noted negative impacts from NZE requirements on particular projects and (in some cases) sought project-specific exemptions, **this is a systemic problem that requires a systemic solution**.

With some pragmatic adjustments to current law, we *can, must, and will* find ways to protect the environment, mitigate climate change, and achieve the District's ambitious clean energy goals, while also meeting the immediate needs and reasonable requests of residents for high-quality, modern facilities that enable and encourage them to *live, work, and play* in the District.

A. Current Requirements:

1. What is the Greener Government Buildings Amendment Act (GGBAA)?

The GGBAA is an amendment to the Green Building Act of 2006. The GGBAA is a law that requires government projects to meet a specific definition of "Net Zero Energy" (NZE) and restricts the use of fossil fuels in the building to emergency generators only, along with other requirements about maintaining net zero energy. For the definition of NZE, the GGBAA refers to the Clean Energy DC Building Code Amendment Act of 2022, which refers to Appendix Z of the Energy Conservation Code of 2017.

2. **What types of buildings must adhere to the GGBAA?**

The GGBAA applies to all projects subject to the Green Building Act. The NZE requirements apply to all projects that are "new construction" and "substantial improvements."

"New construction" means the construction of any building, whether as a stand-alone building or an addition to an existing building.

A "substantial improvement" is any repair, alteration, addition, or improvement of a building or structure, the cost of which equals or exceeds 50% of the market value of the structure before the improvement or repair starts. Because this threshold is based on a cost ratio, it applies disproportionately to construction work on under-appraised buildings (including many in the DGS portfolio), and smaller buildings. In addition, no size, cost, or scope threshold currently exists for new construction projects (no matter how small or minor).

The Department of General Services (DGS), the Department of Buildings (DOB) and the Department of Energy and the Environment (DOEE) support changing the threshold to Level 3 Alterations, a standard established in the Building Code based on the scope of the work being done.

See FAQ#8 for further details.

3. **What is Net Zero Energy (NZE)?**

Net Zero Energy (NZE) means that the total amount of energy used by a building in a calendar year is 100 percent offset by onsite renewable energy production and/or procurement of renewable energy produced offsite, depending on the specific NZE definition.

   a. **What is the difference between the definition of NZE under current DC Law (2017 Appendix Z) and the "traditional" definition of NZE (sometimes called "true Net Zero")?**

Appendix Z is the net zero energy compliance path established under the DC Energy Conservation Code. Projects that demonstrate compliance with Appendix Z satisfy the District's legal NZE requirement. However, compliance with Appendix Z does not necessarily mean that the facility is designed to meet or will operate in accordance with the original, industry-standard definition of NZE.

There are three main differences between DC Law's (*i.e.,* 2017 Appendix Z's) definition of NZE and "true NZE." Under current DC law, (1) building energy use is calculated

using *"source* Energy Use Intensity (EUI)" rather than *site* EUI (this is a *stricter* standard than "true NZE"); (2) *offsite* renewable energy may be purchased to offset building energy use (this is *less strict* than "true NZE", which requires 100% *onsite* renewable energy production); and (3) a building's *design* must meet NZE requirements, rather than its *operation*s.

(1) 2017 Appendix Z uses source EUI to measure building efficiency; however, the traditional NZE definition typically uses site EUI. A building's Energy Use Intensity (EUI) score is based on the annual energy use (amount of energy used by a building per year) divided by the building's square footage (gross floor area). There are two types of EUI: site and source. Site EUI is the amount of energy a building consumes at the building itself. Source EUI goes one step further and adds in the energy lost or used before the energy got to the building, including energy loss at the power plant and during transmission across power lines, and energy used to extract, refine, or transport fuels.

(2) 2017 Appendix Z allows some offsite renewable energy production, whereas traditionally, all renewable energy must be produced onsite for the project to meet the NZE definition. Under DC Law, while a certain amount of renewable energy must be produced onsite, the purchase of renewable energy produced offsite is also accepted as a means of offsetting the building's energy use. 2017 Appendix Z's version of net zero energy is based on hitting design-phase energy efficiency targets and does not require onsite solar to fully offset consumption on an annual basis. DGS used its wind Power Purchase Agreement (PPA) to offset the remaining renewable requirements at certain projects to comply with Appendix Z. However, the average private building owner typically lacks the scale of annual energy load and the legal, procurement, and programmatic expertise required to develop, negotiate, and manage an offsite PPA while mitigating risk. Focusing on feasible, onsite renewable generation aligns more closely with the traditional definition of net zero energy and is more realistic for building owners, while also being significant easier to enforce through building codes.(At a minimum, if offsite purchasing requirements are maintained, they should allow for the purchase of unbundled renewable energy credits rather than requiring PPAs.)

(3) 2017 Appendix Z's NZE standard is based on design models and assumptions. However, many factors play into how a building performs once completed and occupied. This means that while a building may be designed to meet Appendix Z, it may not perform that way in reality. Appendix Z requires buildings to track performance post-occupancy, but it does not penalize buildings that do not meet intended performance goals. Factors that can impact how a building performs compared to how it was designed to perform include changes to programming, hours of operations, occupant behavior, system operations, building systems, and seasonality. Many of these factors are outside of the control of the building designers and building owners.

b. Per current DC law, does a building have to maintain Net Zero Energy after construction?

Yes, the last section of 2017 Appendix Z, Z5. ENERGY REPORTING**,** requires building owners to track and submit evidence of building performance after building occupancy. DGS annually benchmarks the energy performance of each DC government-owned building over 10,000 square feet in its portfolio. Please note, private industry has a higher building gross floor area threshold for their benchmarking requirements.

The Department of Buildings (DOB) issues construction and occupancy permits but is not structured to track or monitor building energy performance over time. Additionally, the GGBAA stipulates that projects must "maintain NZE." This has been interpreted by DOB to mean achieve NZE in proposed design through permit issuance.

DGS strongly recommends coordinating with existing structures and processes for energy monitoring rather than introducing additional requirements. We would further request to address this issue within a holistic, practical, and long-term framework for public and private construction to improve building energy performance and expand the use of renewable energy sources.

c. Does DC have any public buildings that meet the "true NZE" definition?

District government's John Lewis Elementary is Zero Energy certified by the International Living Future Institute, which is a third-party certification that requires the building's in-service energy consumption to demonstrate that 100 percent of the building's energy consumption on a net annual basis be supplied by on-site renewable energy. That said, DGS has successfully delivered several school projects and one DPR project (Stead Park Recreation) that either (a) meet the true onsite NZE definition; (b) meet the NZE definition under DC Law/Appendix Z; and/or (c) are net zero energy-ready.

The following list includes examples of successful projects that have been completed or will be completed in the coming years:

John Lewis ES	Certified NZE
Banneker HS	Onsite NZE
Bard HS	No solar panels yet but will be onsite NZE
Raymond ES	Onsite NZE
Stead Park Recreation Center	Onsite NZE
Garfield ES	NZE-ready, was before Appendix Z but low EUI, requires offsite renewables.
Dorothy Height ES	NZE-ready, was before Appendix Z but low EUI, requires offsite renewables

John Francis Education Campus	NZE-ready, was before Appendix Z but low EUI, requires offsite renewables
Whitlock ES	NZE-ready, was before Appendix Z but low EUI. requires offsite renewables
Adams Education Campus	Low EUI, no space for solar panels
J.O. Wilson ES	Opens Summer 2026, projected onsite NZE
Thomas ES	Opens Summer 2026, projected onsite NZE
Tubman ES	Opens Summer 2026, projected onsite NZE
Malcolm X ES @ Green	Opens Summer 2026, projected onsite NZE
Brent ES	Opens summer 2027, meets Appendix Z
Burroughs ES	Opens summer 2027, meets Appendix Z
MLK ES	Opens summer 2027, meets Appendix Z
Barnard ES	Addition only, opens summer 2026, meets Appendix Z
Whittier ES	Opens summer 2028, projected potentially to meet onsite NZE
Euclid MS	Opens summer 2028, projected to meet Appendix Z
Hart MS	Opens winter 2029, potentially will meet Appendix Z
Chisholm ES	Opens summer 2029, projected onsite NZE
Ketcham ES	Opens summer 2029, projected Appendix Z
Seaton ES	Opens summer 2029, projected onsite NZE
Burrville ES	Opens summer 2029, projected onsite NZE

4. **If a project meets Appendix Z, does that mean it will be energy efficient? If so, how?**

If a project meets Appendix Z, it will be energy efficient. 2017 Appendix Z has three benchmark requirements, which control the amount of energy a building can use. The sections are listed below:

Z2.1.1 Zero Energy Performance Index, zEPI. Building design shall demonstrate a zEPI of 30 or lower as determined in accordance with Equation 1.

$$zEPI = 50.4 \times (EUIp/EUI)$$

The zEPI score is a calculation of the building's energy performance (measured using a predictive energy model) compared to a "code clone," or the modeled performance of the same building designed only to meet code minimum requirements. In other words, zEPI measures how close a building is, as a whole, to net zero energy. **It measures whole building performance**.

Think of zEPI as determining whether a thermos can keep itself hot using its own heater. Thermal energy demand intensity (TEDI) – discussed below – is a measure of how leaky the thermos is and Cooling Demand (CEDI) – also discussed below – is a measure of how much heat the thermos absorbs from the sun.

Z2.2.1 Annual Heating Demand. Building design shall demonstrate a maximum annual heating demand of 4.2 kBtu/ ft2 iCFA/yr. Building must not exceed 4.2 kBtu/ft² interior conditioned floor area per year.

Thermal energy demand intensity (TEDI) essentially measures how much heating a building needs relative to its envelope and form. It calculates how much heat the building needs over a year to stay warm divided by building gross floor area. This calculation ignores HVAC efficiency or fuel type. It only cares about how much heat must be delivered to the building over the year. This calculation requires all buildings being designed for 2017 Appendix Z only use a certain amount of energy during the heating season. This is a difficult measure because – unlike the zEPI score – TEDI does not account for different building typologies that may not be able to meet this requirement. For example, schools have an easier time meeting these requirements because a large portion of their building consists of standard, regularly occupied spaces with relatively predicable schedules. In contrast, recreation centers typically cannot meet this invariant target due to their programmatic requirements and the predominance of specialty spaces such as gyms, multipurpose rooms, and indoor courts; that require large, open volumes and high ventilation rates.

Similarly, 24/7 facilities such as police and FEMS stations face comparable challenges in meeting the prescriptive thermal and cooling demand intensity targets established in Appendix Z. These facilities are conditioned continuously, have elevated ventilation and exhaust requirements for health and safety (including vehicle bays), experience large temperature differentials due to frequently opened apparatus bay doors, and require year-round cooling needs in dispatch and server rooms which generate high internal heat gains. In addition, their mission critical operations necessitate conservative HVAC sizing, system redundancy, and rapid recovery following power outages, all of which further increase heating and cooling demand.

Z2.2.2 Annual Cooling Demand (CEDI). Building design shall demonstrate a maximum annual cooling demand of 6.4 kBtu/ ft2 iCFA/yr. Building must not exceed 6.4 kBtu/ft² interior conditioned floor area per year.

This calculation is similar to the heating demand, but for the cooling months. CEDI calculates the cooling energy required due to the envelope, solar heat gains from radiation, and internal heat gains. This target is driven by window-wall ratios, shading, internal heat gain (people generating heat when they are active), and ventilation.

The challenges associated with meeting thermal energy demand intensity targets similarly apply to cooling energy demand intensity targets. High internal heat gains—generated by occupants in gyms and other recreation spaces, as well as by the continuous operation of dense electronics and occupied workstations in 24/7 facilities—significantly increase cooling demand. This elevated cooling demand occurs not only during summer conditions but also in winter, when building cores often require active cooling. The CEDI and TEDI targets do not adjust based on whether this is new construction or modernization, nor whether this is a school or recreation center. However, while new construction can optimize its building orientation to get closer to the CEDI target, a modernization cannot adjust its orientation. Just as a recreation center cannot lower the height of its gym ceilings to that of a classroom, it cannot reduce internal heat gain and ventilation rates to that of a classroom filled with sitting students, instead of people running and jumping. This is why invariant TEDI and CEDI targets of Appendix Z are not technically feasible for so many building types other than schools.

5. What is the difference between Net Zero Energy and Net Zero Energy-Ready?

Net Zero Energy-Ready means that the building has been designed to allow for the use of renewable energy sources in the future, but these renewable energy sources are not currently installed or not yet procured. As explained in the response to FAQ #1, depending on the definition used, these anticipated renewable energy sources may be onsite ("traditional" or "true Net Zero" definition) or offsite (current definition used by DC Law/2017 Appendix Z). As an example, NZE-ready may mean a building is relying on solar panels to generate renewable energy, but that renewable energy system may not yet be installed at the building when it delivers, or a contract for offsite renewables is not yet in effect. So, while the building may be performing very efficiently, it currently is not making up the balance of its energy use through a renewable resource but can or will in the future. All schools that are designed to meet the District's NZE requirements are actually NZE-ready when they open because DGS procures solar panels through power purchase agreements (PPAs) that are not in place as soon as the building opens.

6. What is the difference between Net Zero Energy and LEED?

LEED is a more holistic green building measurement system, which includes different options a project can select to receive "points." These points include items like building energy performance but also branch out into other project factors related to sustainability like water usage, construction waste, land reuse or rehabilitation, and proximity to public transit. The more points a building receives, the higher LEED certification it can achieve. Net Zero Energy is a more specific sustainability factor directly related to the amount of energy a building uses once it is operational, with the goal of achieving a net elimination of carbon emissions from building operations.

7. **Does a project need to be all-new construction for 2017 Appendix Z requirements to apply?**

Projects do not need to be entirely new construction to meet 2017 Appendix Z standards. Many of the school projects projected to meet Appendix Z or achieve on-site net zero are at least partially existing buildings. Raymond Elementary School and Stead Park Rec Center were the first two projects that included an existing building (including the facade) to be designed to be Net Zero Energy (and this was prior to the GGBAA). See the list under question 14 below for more projects that have met or are expected to meet Appendix Z or onsite Net Zero Energy. However, a modernization of an existing building needs to meet certain criteria for the inclusion of NZE modifications to be cost-efficient. While the previously mentioned projects from the exterior may appear similar to their pre-modernization versions, most have been completely renovated on the interior, including significant work to the building envelope to meet thermal and air infiltration requirements.

As modernizations improve buildings' energy performance, the industry has turned its attention to another major contributor of carbon emissions worldwide: the building materials themselves. Embodied carbon refers to the carbon emissions associated with the production of building materials. It is formally defined as:
"the total impact of all GHG emitted from material extraction through the end of its useful life. Embodied carbon is calculated by summing all GHG emitted from nonrenewable energy sources resulting from sourcing raw materials, manufacturing, transporting, construction and installation activities, ongoing material/product energy use, maintenance, repair, and finally, disposal." - New Building Institute.

Existing buildings that are reused as part of a modernization inherently generate significantly fewer embodied carbon emissions and are often more cost-effective, depending on the scope of the project. New construction buildings generate more carbon emissions due to the extraction, production, and transportation of new materials like concrete and steel. As a result, alternative construction materials, like mass timber, are increasingly sought after.

Alteration projects, no matter the scope, may have difficulty in meeting an overall performance requirement. In the energy code, they often pursue the prescriptive pathway which allows for those components in scope to comply while not requiring an expansion of that scope. In other words, if a new wing of classrooms is being added, the addition itself might be held to the new standards but the rest of the existing building would not need to be entirely retrofitted to comply. The 2017 Appendix Z does not include a prescriptive path, which makes compliance difficult for alteration projects.

B. Challenges:

8. Is it difficult for certain building types to meet 2017 Appendix Z's Net Zero Energy requirements?

Yes, it is difficult for the some building types described below, that were not already exempted by the DC Council (i.e., temporary structures), to meet 2017 Appendix Z's NZE requirements. One particular challenge of the Appendix Z model is that, unlike the true net zero energy model, it includes inflexible targets for thermal energy demand intensity, which measure how well the building holds in heat during winter and keeps heat out during summer.

Please note that projects may request exemptions from Appendix Z through the Green Building Advisory Council (GBAC). However, ***if an exemption is denied—or only partially or conditionally approved—the project may need to be redesigned or undergo additional studies. This often results in project delays, increased costs, and/or removing community requested programmatic features from buildings.*** In her December 16, 2025 letter to Council, Mayor Bowser said, "we need a more holistic and refined review of environmental mandates that are being applied to buildings – such as indoor pools and recreation centers – that those building standards were never intended for. To demonstrate the financial and operational impacts of these Council mandates, the Department of General Services will not seek waivers from the Green Building Advisory Council for these types of projects and will build them to the highest environmental standard possible as allowed by the project's current funding." ***The exemption request process carries costs, and DGS must be a responsible steward of public funds.***

1. Projects below 10,000 square feet:
Because these projects have smaller budgets and shorter timelines, the cost and effort required to meet Net Zero Energy compliance represent a larger share of the overall project resources. Yet since these buildings are smaller, the additional measures result in relatively modest energy savings. Many also have limited roof space for solar installation. We therefore strongly recommend prioritizing new construction or full modernizations larger than 10,000 square feet, where energy savings are both more substantial and cost effective.

2. Level 1 and 2 alterations:
Level 1 and level 2 alteration projects involve a limited scope of work rather than a full modernization. These projects typically consist of minor capital improvements, such as HVAC upgrades, roof replacements, new finishes, or limited interior modifications. These interventions alone are generally insufficient to achieve net zero energy compliance. ***However, these projects can inadvertently trigger the definition of "substantial improvement," requiring the entire building to comply with Appendix Z., This creates significant budgetary and***

review challenges, which can discourage targeted efficiency upgrades, such as HVAC improvements, that could have meaningfully enhanced building energy performance within the project's original scope. In these scenarios, NZE (the ideal) becomes the enemy of the good (significant improvements). Importantly, the Climate Commitment Amendment Act already ensures that selected HVAC systems are all-electric by prohibiting fossil fuel-based installations.

Alteration projects, no matter the scope, may have difficulty in meeting an overall performance requirement. In the energy code, they often pursue the prescriptive pathway which allows for those components in scope to comply while not requiring an expansion of that scope. The 2017 Appendix Z does not include a prescriptive path, which makes compliance difficult for alteration projects.

3. Indoor pools/aquatic facilities:

Aquatic facilities are inherently high-energy-use buildings due to the demands of heating and ventilating the pool(s) and maintaining proper humidity levels. In the District's climate, characterized by hot, humid summers and cold winters, there is limited opportunity to rely on passive heating and cooling strategies that may be viable in more temperate zones.

An aquatic center may be able to meet the broader definition of "Net Zero Energy," which means annually producing an amount of renewable equal to or greater than the building's energy use, if the site meets the following conditions: (1) substantial open space with suitable ground thermal conductivity to accommodate dozens of geothermal wells; and (2) a large, unobstructed rooftop and additional on-site areas capable of supporting a sufficient number of solar PV panels in a non-historic area where visible solar is permitted by entitlements. ***In urban settings, additional on-site solar capacity often requires steel canopy structures, which are costly and further strain the project's construction budget***. However, under the GGBAA, these projects are required to comply with Appendix Z, which outlines a far more prescriptive version of net zero energy. 2017 Appendix Z establishes several stringent benchmarks, including achieving a zEPI score of 30 or below, meeting fixed thermal and cooling energy demand intensity targets that do not adjust for building type, and satisfying both offsite and onsite renewable energy generation requirements. Collectively, these Appendix Z requirements are significantly more challenging to achieve than the general definition of net zero energy – and more costly. An aquatic center may be able to meet the zEPI requirement, but even with the most efficient mechanical systems, it would likely be unable to meet the heating and cooling energy demand intensity targets.

4. 24/7 emergency/public safety/public health facilities:

Facilities that operate 24 hours a day/seven days a week are inherently high-energy-use buildings. Other building types, such as schools, can reduce consumption during nights, weekends, and, in some cases, summers, allowing them to achieve lower energy use intensity scores. In contrast, 24/7 facilities have far fewer opportunities to reduce load and often include substantial plug loads, such as MRI machines in hospitals. While investing in efficient systems should remain a priority for these buildings, ***expecting 24/7 buildings to achieve net zero energy compliance would significantly increase project costs and still make it challenging to meet all 2017 Appendix Z requirements***.

The specific sections in 2017 Appendix Z that present the most challenges to these facilities are Annual Heating Demand, Annual Cooling Demand and the total amount of onsite energy required. The longer run times of a 24/7 facility and energy and ventilation intensive needs of mission critical settings make these challenges particularly more acute.

5. **Projects designed prior to the Greener Government Buildings Amendment Act (GGBAA) and/or budgeted to a non-Net Zero standard:** Projects designed prior to the GGBAA would require a redesign without an exemption. Many projects were not funded to meet net zero energy requirements and would require additional funding, or would need to significantly de-scope, if not exempted. Achieving net-zero energy compliance requires additional funding for building construction, design fees, and potential redesign efforts.

9. In general, can indoor aquatic facilities be built to Net Zero?

See 8.3 above. Aquatic facilities are inherently high-energy-use buildings due to the demands of heating and ventilating the pool(s) and the air between the pool and ceiling, as well as maintaining proper humidity levels. For instance, a truly net zero energy school's site energy use intensity (EUI) is typically in the ballpark of 20-25. An extremely efficient aquatic center that has enough unobstructed outdoor space to rely on a full geothermal field may target an aggressive EUI in the ballpark of 125-150.

However, under the GGBAA, DC projects are required to comply with Appendix Z, which outlines a far more prescriptive version of net zero energy. 2017 Appendix Z establishes several stringent benchmarks, including achieving a zEPI score of 30 or below, and meeting fixed thermal and cooling energy demand intensity targets that do not adjust for building type. Collectively, these requirements are significantly more challenging to achieve than the general definition of net zero energy. An aquatic center may be able to meet the zEPI requirement, but even with the most efficient mechanical systems, it would likely be unable to meet the heating and cooling energy demand intensity targets. These projects have historically requested exemptions from Appendix Z through the GBAC. However, if an exemption was denied—or only partially or

conditionally approved—projects frequently needed to be redesigned or undergo additional studies, resulting in project delays and increased costs. These circumstances have greatly complicated the District's ability to efficiently and successfully budget for and deliver on these projects.

In short – aquatic facilities in the District cannot be built to the current **Appendix Z definition** of net zero energy because they cannot meet the prescribed thermal and cooling energy demand intensity targets required by Appendix Z. It is currently unclear whether such facilities could meet the zEPI score of 30 or lower. Aquatic Centers in the District *might* be capable of meeting the **traditional standard Net Zero Energy definition**. However, achieving this would require an outsized budget compared to existing budgets, new construction, a location outside of entitlement restrictions on visible solar PV, and substantial unobstructed land free from conflicts with underground utilities and infrastructure. Overall, such a project would demand significant upfront financial and land resources. Nevertheless, DGS will design and deliver aquatic centers that are as energy-efficient as possible within the constraints of available resources, land, project scope, and entitlement requirements.

10. Is DGS aware of Net Zero pools in the United States?

To our knowledge, there are no existing or proposed municipal indoor aquatic centers that are performing to NZE standards in the United States. The Barack and Michelle Obama Sports Facility in Los Angeles, CA, and the Round Rock Aquatic Center in Austin, TX – although intended to be NZE at the early stages of design – did not end up being NZE.

- California pool: Only part of the facility, primarily the basketball court, is NZE. The indoor pool is not included in the NZE calculation.
- Texas pool: Half of the energy needed to heat the pool comes from natural gas.