

Comments from

The Real Estate Roundtable and Nareit®

Regarding the Draft National Definition of a Zero Emissions Building (“ZEB”)
Part 1 Operating Emissions, Version 1.00
89 Fed. Reg. 1,086 (Jan. 9, 2024)

Request for Information from the U.S. Department of Energy

Submitted February 2, 2024

I. GENERAL COMMENTS

A. *A ZEB definition from the U.S. government can send a powerful signal to real estate markets regarding an asset’s zero emissions status.*

- ZEB is a proposed definition from DOE. It is not a building label. No legal authority exists for any federal agency to issue formal brand certification for a ZEB asset.
 - ✓ In contrast, EPA *does* certify and label buildings under the ENERGY STAR brand. For example, EPA has conducted a public input process for certifications under its ENERGY STAR NextGen label for low-carbon buildings.¹
- Third-party verifiers will enhance ZEB’s credibility as the national definition gains traction in the marketplace. Rigor and recognition will be enhanced through consistency in the following use cases, even though DOE does not offer a federal-level certification:
 - ✓ *NGO Rating Programs:* A key objective is for non-government green building organizations to embed the definition in their various rating systems.² We expect ZEB will be used to earn “points” or achieve higher levels of program recognition (e.g., “emerald” or “platinum”). A qualified third-party professional would need to verify that an asset meets DOE’s criteria during an application process. The sponsoring NGO would certify ZEB compliance when granting its proprietary label.
 - ✓ *Capital Markets:* Another goal is for capital markets to recognize the U.S. government-backed definition. DOE should encourage ZEB’s inclusion in the Treasury Department’s net zero financing and investment principles.³ If debt or equity providers wish to tie financial commitments to ZEB alignment, an owner or

¹ See *infra* n. 19 and accompanying text on the importance to recognize EPA’s NextGen certification as indicating an asset is “on the path” to ZEB status.

² E.g., [GRESB](#), [Green Globes](#), [LEED](#), [National Green Building Standard \(NGBS\)](#).

³ U.S. Department of the Treasury, [Principles of Net-Zero Financing and Investment](#) (Sept. 2023).

developer would likely need to hire qualified professionals during project underwriting to verify that the asset (or a portfolio) meets or has accurately disclosed its path toward meeting DOE’s definition.

- ✓ *Reporting and Disclosure Laws:* ZEB may support compliance with laws requiring real estate companies to report climate-related financial risks. Final disclosure requirements expected from the SEC⁴ and enacted in California⁵ are harbingers of other mandates at home and abroad for companies to disclose third-party verification of carbon reduction targets and other clean energy metrics. Accountants and other professionals may need to provide assurance regarding claims in corporate filings, including whether buildings fully, partially, or strive to meet DOE’s criteria.
- ✓ *Federal Financial Assistance:* We expect federal loan, grant, and other financial assistance programs to design policies around DOE’s definition. For example, the Administration has announced a suite of federal loans and guarantees that may support “zero emissions conversions” for adaptive re-use of under-performing commercial properties to much-needed housing.⁶ Agency rules might encourage the use of ZEB criteria as a condition for obtaining federal incentives.
- ✓ *Federal Leasing:* The General Services Administration (GSA) is developing guidelines to satisfy Executive Order 14057.⁷ While the ZEB definition excludes federally owned buildings, managers of GSA’s leased portfolio should work with private sector owners toward zero emissions goals. In this regard, GSA should not create new criteria. It should consider private sector buildings that evidence a path toward or meet ZEB status as eligible for federal leases.
- ✓ *State and Local Laws:* The trend is upward for states and localities to adopt building performance standards (BPS).⁸ The Administration has the platform, through the National BPS Coalition, to ingrain the ZEB definition in state and local programs

⁴ A final SEC climate disclosure rule is expected by April 2024. See White House Office of Management and Budget, Office of Information and Regulatory Affairs, “Fall 2023 Unified Agenda of Regulatory and Deregulatory Action” ([SEC’s “Reg Flex” agenda for climate disclosure rule](#)).

⁵ See RER’s [fact sheet](#), “California’s Climate Disclosure Package – Summary of [SB 253](#) and [SB 261](#)” (Sept. 2023).

⁶ White House [fact sheet](#), “Biden-Harris Administration Takes Action to Create More Affordable Housing by Converting Commercial Properties to Residential Use” (Oct. 27, 2023).

⁷ [Executive Order](#) 14057, “Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability (Dec. 8, 2021).

⁸ DOE describes BPS as “outcome-based policies and laws aimed at reducing the carbon impact of the built environment by requiring existing buildings to meet energy and/or greenhouse gas emissions-based performance targets.” [DOE website](#), Building Energy Codes Program, “Building Performance Standards.” See also [updated and interactive map](#) maintained by DOE’s Building Energy Codes Program, supported by the Pacific Northwest National Laboratory, of state and local jurisdictions that have adopted BPS requirements.

- nationwide.⁹ The coalition’s numerous participating jurisdictions¹⁰ and future localities that join should be urged to align with ZEB to foster rational, consistent, and achievable building emissions frameworks across the nation.
- DOE’s ZEB definition should draw heavily from the federal government’s existing ecosystem of tools, data, methods, and standards that help buildings measure and reduce their carbon impacts.
 - ✓ ZEB’s criteria should integrate preexisting and well accepted federal programs as much as possible to further consistency in verification and accelerate acceptance of the national definition in the marketplace.
 - ✓ For example, efforts to meet and document ZEB attainment should incorporate:
 - The suite of offerings by [EPA’s ENERGY STAR Commercial](#) branch, including [Portfolio Manager](#)’s protocols to measure building efficiency, [calculate emissions](#), [rate asset performance](#), and procedures for [licensed professionals](#) to verify relevant climate metrics;
 - EPA’s and DOE’s long-running programs to recognize highly energy-efficient [new residential construction](#) and [zero energy-ready homes](#);
 - EPA’s Emissions and Generation Resource Integrated Database ([eGRID](#)), which provides the best available national and regional information regarding the carbon intensity of the U.S. electric grid;
 - The most comprehensive, open access, and established nationwide datasets available regarding building efficiency and emissions – namely, Commercial Building Energy Consumption Survey ([CBECS](#)) data collected by the U.S. Energy Information Administration (“EIA”), and EPA’s vast ENERGY STAR database now searchable through the Portfolio Manager [Data Explorer](#) tool;
 - The broad set of carbon conversion factors regularly published and updated by [EPA’s Emissions Factors hub](#);
 - Guidelines to help assure high quality and credible purchases of RECs provided by EPA’s [Green Power Partnership](#), and carbon offsets developed by the [U.S. Commodity Futures Trading Commission](#); and
 - Standards related to building energy and climate performance codified by Congress (for example, the *Inflation Reduction Act*’s modifications to the [section 179D](#) tax deduction and the [section 45L](#) tax credit for energy efficient buildings and homes, and the [federal process](#) from the *Energy Independence and Security Act* to review and update a list of credible green building certifications).

⁹ National BPS Coalition [website](#).

¹⁰ *Id.*, “[Participating Jurisdictions](#).”

B. DOE should clarify the language to denote, and the amount of data to support, claims that a building “meets” ZEB status.

- ZEB verifications should indicate status as either “ZEB New Construction” or “ZEB Existing Building,” including the verification year.
 - ✓ For example, an owner should denote a building’s zero emissions status as: “ZEB Version 1.00 New Construction 2024; ZEB Version 2.00 Existing Building 2030.”
 - ✓ ZEB verification for new construction should apply up to the point that a building reaches “minimum occupancy requirements” as defined by ENERGY STAR,¹¹ and for the next five (5) years thereafter.
 - ✓ After that five-year threshold is met, an asset should pursue ZEB verification under existing building criteria in place at that time.¹²
- No federal agency has authority to certify or label a “ZEB” asset. Stakeholders would benefit from a clear statement by DOE that it intends the definition may be “*met*” – not “*certified*” – and amplified with descriptions and examples as to how ZEB’s criteria should be “*verified*” and “*measured*.”
 - ✓ The Draft definition does not (indeed, cannot) require a ZEB asset to obtain ENERGY STAR *certification*.
 - ✓ Because companies may choose not to pursue EPA labels for all of their assets every year, they should have the option to either conduct ZEB *verifications* independent of ENERGY STAR *certifications* – or synchronize simultaneous pursuit of ZEB and ENERGY STAR status in the same year – to support streamlined procedures and minimize paperwork.
 - In this regard, a ZEB building’s “75” score would not require independent *certification* through ENERGY STAR’s established validation procedures.¹³
 - Although the federal government cannot certify ZEB qualification, ENERGY STAR Portfolio Manager account holders should be able to indicate if a building has been “ZEB-verified” in EPA’s online interface and on a specific asset’s Statement of Energy Performance (“SEP”).¹⁴
- We support the Draft’s approach that 12 months of whole-building energy use and emissions data should provide the basis for an asset’s ZEB verification.

¹¹ See [EPA ENERGY STAR website](#), “How do I determine my occupancy?” (Apr. 19, 2023) (“minimum occupancy requirements” for ENERGY STAR certification for various building types).

¹² We recommend five years as the point to distinguish “new construction” from “existing buildings” as consistent with section 179D’s definitions codified by the *Inflation Reduction Act* (“IRA”). See 26 U.S.C. § 179D(f)(4) (existing buildings that qualify for retrofit deduction are those “placed in service not less than 5 years” before a retrofit plan is established for such building).

¹³ See [EPA website](#), “ENERGY STAR Certification.”

¹⁴ See [EPA website](#), “Sample ENERGY STAR statement of energy performance.”

- ✓ ZEB attainment based on monthly data over a year reflects ENERGY STAR’s certification requirements. Consistency in data quantity will allow building owners and their consultants to merge DOE’s and EPA’s respective criteria.¹⁵

C. DOE should clarify how to measure and verify claims that a building is “on a path” to meet ZEB status – and endorse EPA’s “NextGen” certification as a recognized intermediate step showing progress toward zero emissions.

- Very few buildings will “meet” all ZEB criteria now or in the near term. ZEB’s immediate acceptance in the marketplace will largely depend on how building owners articulate, measure and verify that an asset is “on a path” for eventual zero emissions. Measurement and verification standards to support claims that a building is “on a path to ZEB” are also important to avoid allegations of greenwashing.
- As urged above, ENERGY STAR’s Statement of Energy Performance (“SEP”) should indicate whether and when an asset “meets” ZEB status.¹⁶ The SEP form should also be used to bring consistency in measurement and verification of claims that an asset “is on a path to meet” zero emission levels. ENERGY STAR’s SEP form and online inputs can help make long-term zero emissions claims auditable and include fields to indicate:
 - ✓ Who verified the “pathway to ZEB” claim, and when they verified it;
 - ✓ A short description of the use case or context in which the claim is made (e.g.: “in a government-filed disclosure;” “in corporate marketing publications;” “in public offering or loan underwriting materials;” “in an application for a building rating”);
 - ✓ Online links to any documents showing where the claim is made; and
 - ✓ An estimated “target year” year for attainment of full ZEB status, and/or to attain individual criteria in the ZEB definition.
- DOE should support building owners to adopt business practices that consider and plan for life-cycle investments. The national definition must not be construed as encouraging owners to demolish and rip out efficient fossil fuel burning equipment that is not near the end of its useful life.
 - ✓ The ZEB definition provides a prime opportunity to recognize owners that have prepared and verified cap ex plans that demonstrate how they are being held accountable for sticking to that plan through strong governance practices.

¹⁵ See [EPA ENERGY STAR website](#), “Building Owners and Managers” (“Certification is based on 12 months of energy use data and is valid for one year, and applications must be verified by a Licensed Professional”).

¹⁶ See *supra* note 14 and accompanying text.

- ✓ The remaining life span, efficiency, and space allocations of existing systems for space heating, water heating, cooking and other needs are key variables that impact investment decisions regarding how and when a building may electrify.¹⁷
 - ✓ Disposal and waste hauling of functioning equipment would generate their own negative environmental impacts, including increased embodied emissions that would undercut the national definition’s goals.
 - ✓ In addition, capital markets need time to develop lending and equity products to help building owners make the necessary investments for meeting ZEB status, including electrification (where feasible). The Administration estimates that *only* “\$124 billion will flow into the building electrification industry” – “*by 2040.*”¹⁸
 - ✓ RER/Nareit members look forward to collaboration with DOE alongside verifiers and standard setters to develop procedures and methods to communicate planned equipment replacements, retrofits, and other improvements that have been confirmed to put the asset “on a path” for zero emissions.
- Means to measure and verify statements that an asset is “on the path to ZEB” can also help building owners with the nebulous task of quantifying, reporting, and disclosing climate transition risk.
 - Moreover, a near-term signal will provide the marketplace with “here and now” context for long-term ZEB aspirations. In this regard, DOE should expressly endorse EPA’s “*low*” carbon NextGen label¹⁹ as the intermediate step for buildings to show progress toward “*zero*” carbon. The two federal policies can – and should – work together:

US Government Draft Policy	Energy Efficiency	Renewable Energy Use	On-Site Emissions Reductions
EPA’s NextGen	ENERGY STAR Score >75 (Top 25%)	30% of energy use	GHG emission intensity target, based on building’s specific climate zone/heating degree days
DOE’s ZEB	ENERGY STAR Score >75 (Top 25%)	100% of energy use	No on-site emissions allowed

¹⁷ A group offering compliance assistance with Washington, D.C.’s BPS law recommends: “Newer systems and appliances within buildings that are less than 10 years old do not need to be electrified until they are at least 15–20 years old or have reached the end of their useful life. Newer buildings should instead investigate opportunities for increased energy efficiency within the existing building systems.” E.g., [Building Innovation Hub website](#), “Building Electrification Considerations in DC.”

¹⁸ White House [fact sheet](#), “Biden-Harris Administration Announces First-Ever Federal Building Performance Standard,” (Dec. 7, 2022).

¹⁹ See [EPA website](#), “ENERGY STAR NextGen Certification for Commercial Buildings.”

D. The ZEB definition should be reviewed every five years with updates that reflect current market practices and the capabilities of EPA’s Portfolio Manager.

- The national ZEB definition should be reconsidered and updated, with public input, every five years. DOE’s criteria should evolve as new emissions standards develop, building technologies advance, and the grid de-carbonizes.
- Analogous federal policy supports placing ZEB on a five-year review cycle.
 - ✓ Federal law requires DOE, EPA and GSA to re-evaluate, every five years, rating programs that “encourage a comprehensive ... approach to certification of green buildings.”²⁰
 - ✓ The goal (noted earlier)²¹ to embed ZEB in various NGO rating platforms would be furthered by synchronizing ZEB updates with the agencies’ building certification reviews.
 - ✓ In this manner, NGO platforms can keep pace with the latest ZEB changes while industry and other stakeholders can anticipate changes to the national definition.
 - ✓ Reviews every five years will provide policy stability and support companies in coordinating the U.S. ZEB definition with efforts to meet global science-based targets aligned with “1.5-degree scenarios” prompted by the United Nations’ Paris Treaty.
- Five-year ZEB updates should reflect EPA’s continual efforts to refine and improve Portfolio Manager – the standard tool used by at least 25% of U.S. commercial buildings to track energy usage and calculate emissions.²²
 - ✓ Our industry strongly supports EPA’s use of *Inflation Reduction Act (IRA)* funds to enhance the tool.²³
 - ✓ To our knowledge no other government body, at home or abroad, has developed a climate accounting tool for buildings that comes close to Portfolio Manager’s broad scope in function and application.
 - ✓ Reliance on the tool by owners and their consultants will support consistency in calculations and reports between and among companies, within real estate portfolios, and across asset classes that strive for ZEB criteria.
- Accordingly, we agree with DOE’s Draft to exclude Scope 1 refrigerant emissions, and Scope 3 embodied carbon emissions,²⁴ for purposes of ZEB Version 1.00.

²⁰ 42 U.S.C. §§ 17092(h)(1), (2)(A). GSA provided its [most recent green building certification review letter](#) to the DOE on September 16, 2019, so a new review is expected in 2024.

²¹ See *supra* note 2 and accompanying text.

²² See EPA website, “Benchmark Your Building Using ENERGY STAR® Portfolio Manager®”

²³ See [RER’s website](#), “U.S. Real Estate Industry Supports EPA’s ENERGY STAR ‘Portfolio Manager’ Enhancements,” letter to EPA Administrator Michael S. Regan (Sept. 14, 2023).

²⁴ The results of EPA’s *IRA*-funded embodied carbon work with product manufacturers should be incorporated, where appropriate, into Portfolio Manager as a future enhancement to the tool. See [EPA website](#), “*Inflation*

- ✓ Portfolio Manager does not – yet – allow buildings to track refrigerant and embodied emissions. EPA has planned upgrades to “advance the goal of reducing greenhouse gas emissions from buildings,” and refrigerant tracking specifically.²⁵
- ✓ Whenever EPA’s tool eventually incorporates measurements for such emissions – and building owners, developers, managers and consultants receive training on how to use these new functions – subsequent ZEB versions might then address refrigerants and embodied carbon.

II. COMMENTS ON SPECIFIC ZEB CRITERIA

A. *First ZEB Criterion: “Highly Energy Efficient”*

- DOE’s Version 1.00 Draft states:

*“For **existing buildings**, an ENERGY STAR score of 75 or higher or measured whole building energy usage intensity (EUI) at least 35% better than median EUI (for buildings ineligible for the ENERGY STAR score) meets these criteria.*

*“For **new construction**, whole building energy use to be modeled at least 10% lower than the energy use according to the latest IECC or ASHRAE 90.1 model code and designed to achieve an ENERGY STAR score of 90 or higher (for buildings eligible for the ENERGY STAR score) meet these criteria.”*

- Clarifications for Existing Buildings that are ENERGY STAR Eligible.
 - ✓ We recognize that ZEB status (like ENERGY STAR and NextGen certifications) is intended to recognize high-performing assets – and only existing buildings with a “75” score or higher will be eligible.
 - ✓ However, we emphasize the importance of creating avenues that drive low performing buildings to substantially reduce their energy consumption through retrofit projects.
 - The goals of Executive Order 14057²⁶ for a net zero economy by 2050 will not be accomplished without market incentives for low-scoring assets to reduce energy use significantly.
 - The most climate benefits will be achieved not by raising the ceiling for the “top of class,” but by moving low-tier buildings to higher performance and improving their energy usage per square foot.

Reduction Act Programs to Fight Climate Change by Reducing Embodied Greenhouse Gas Emissions of Construction Products and Materials.”

²⁵ [EPA ENERGY STAR website](#), “The Portfolio Manager Upgrade Project.”

²⁶ [Executive Order 14057](#), § 102(a)(iii).

- ✓ We agree that a building’s ZEB status should include energy use in leased spaces. However, the federal government should prioritize policies that assist building owners to obtain, and encourage utilities to provide, data on tenant-controlled energy use.
 - DOE should acknowledge that a commercial owner’s inability to capture 12 months of energy consumption data from all tenants is a persistent problem that has long challenged the real estate industry. It will remain a significant hurdle to attain ZEB status for many buildings.
 - We urge the federal government to continue developing and furthering policies and programs to support:
 - Tenant recognition when they provide building owners with data on leased space energy consumption;²⁷
 - Commercial leasing practices that make whole-building energy data access a contractual obligation;²⁸
 - Guidance, incentives and recognition for utilities to provide aggregated, anonymized whole-building energy data to asset owners and managers in software formats that can be uploaded to Portfolio Manager;²⁹ and
 - Model language for a letter of authorization where directly metered tenants may provide their consent to a utility to provide the building owner with energy data covering that leased space.
- Clarifications for Existing Buildings that are *not* ENERGY STAR Eligible: DOE should resolve key questions for real estate stakeholders to understand and implement the Draft’s approach for “*measured whole building EUI at least 35% better than median EUI.*”
- ✓ Specify Data Source(s): The definition should identify the data used to derive “median” EUI baselines.
 - The only two federal government sources that DOE should consider are the Commercial Building Energy Consumption Survey (“CBECS”),³⁰ and building data collected by ENERGY STAR Portfolio Manager (“ESPM”) now searchable through the “Data Explorer” function.³¹ Each data collection has its pros and cons, long debated by industry stakeholders.³²

²⁷ E.g., [EPA ENERGY STAR website](#), “ENERGY STAR Tenant Space” recognition program.

²⁸ [DOE website](#), “Green Lease Leaders” recognition program.

²⁹ See EPA ENERGY STAR, [Guidance for Utilities on Providing Whole-Building Energy Data to Enable Benchmarking in ENERGY STAR Portfolio Manager](#) (updated Sept. 26, 2023).

³⁰ See <https://www.eia.gov/consumption/commercial/>.

³¹ See [EPA ENERGY STAR website](#), “Portfolio Manager Data Explorer.”

³² The main “pro” for CBECS is that its data may be more representative of energy characteristics in U.S. buildings because it is collected through a random sample of assets, whereas the ESPM set is populated voluntarily (except where data is collected from state and local benchmarking mandates) and may skew toward information gathered from more efficient buildings. The main “pro” for ESPM data is that it is much more recent. The ESPM set available

- Because both have benefits and limitations, for purposes of the inaugural definition, we recommend that Version 1.00 allow a ZEB aspirant to consider *either* CBECS *or* ESPM data to gauge whether an asset performs above “median EUI.”
- To facilitate adoption and verification EPA’s technical reference³³ that currently lists “median EUI” by asset classes – based solely on CBECS – should be updated to include side-by-side ESPM data.
- ✓ Specify “Site” EUI: DOE’s final definition should specify *site* EUI as the correct metric because it reflects operations within a building’s boundaries that asset owners can control (whereas performance of the grid, transmission lines, or other off-site power *sources* fall beyond an owner’s immediate control).
 - Using “site EUI” will also favor consistency across federal standards and guidelines. Site EUI measures 179D(f) compliance,³⁴ and EPA recommended it as a metric (after much stakeholder deliberation) to cities and states that may design building performance standards.³⁵
 - ZEB’s separate criteria for 100% renewable energy already considers “source” characteristics, so they should not be double counted in the efficiency criterion.
- ✓ Account for Climate Zone/Heating Degree Days (“HDD”): The amount of energy used for heating and cooling depends heavily on climate zone. An asset owner must deliver more heat in colder locations and more cooling in warmer locations to meet the safety and comfort needs of occupants.
 - “Median EUI” entails a comparison between the verified buildings’ energy use to similar buildings. Like-kind comparisons to “median” should reflect not only the building’s particular product type, but also the climate zone and the “degree days” for heating in which the building is located.
 - HDD provided a key normalization variable in EPA’s last update to ENERGY STAR scoring models.³⁶

for Data Explorer searches is refreshed every year while CBECS data is only collected every 5-6 years; the most recent CBECS data was collected in 2018. Furthermore, ESPM data captures tens of thousands of buildings to allow for deeper energy consumption analyses by building product type, size, age, and location. In contrast, the 2018 CBECS only reflects information captured from a sample of about 6,000 U.S. buildings across all categories.

³³ EPA ENERGY STAR Technical Reference, [U.S. Energy Use Intensity by Property Type](#) (Aug. 2023).

³⁴ 26 U.S.C. § 179D(f)(7)(A).

³⁵ EPA ENERGY STAR, [Recommended Metrics and Normalization Methods for Use in State and Local Building Performance Standards](#) (Nov. 2022).

³⁶ E.g., ESPM Technical Reference, [“Analysis and Key Findings from ENERGY STAR’s Review of the Model for U.S. Office Properties”](#) (July 2019) (EPA’s “analysis found that an adjustment [was] needed to account for energy used for heating; and it “[t]herefore reintroduce[d] HDD into the scoring process, which results in more equitable scores for office properties in all climates.”

- EPA uses HDD adjustments to set a level playing field for the NextGen label’s emissions limit.³⁷
- We likewise urge that ZEB’s efficiency criterion require that HDD variables be incorporated for the “median site EUI” approach.
- Clarifications for New Construction: Federal 179D rules and the national ZEB definition should reflect the same efficiency levels applicable to new construction. Both policies should drive new construction to achieve **25%** improved performance as modeled over ASHRAE 90.1 **(2019)** – as opposed to the Draft’s suggestion of **10%** over the **2022** version.

Federal Policy Defining High Efficiency <u>New Construction</u>	Percent of Improvement Over ASHRAE 90.1 Baseline	ASHRAE 90.1 Edition Serving as Baseline
Section 179D	At least 25% improvement (codified in law)	2019, for new buildings “placed in service” on or after Jan. 1, 2027 (regulatory determination already made by IRS/DOE)
ZEB Version 1.00 Draft	At least 10% improvement (proposed definition)	2022 (proposed definition)

- ✓ The 179D new construction standard is now a permanent part of the U.S. tax code and DOE has already developed guidance to implement it.³⁸ ZEB should follow 179D’s existing determinations to:
 - Avoid marketplace confusion: There is no valid policy reason for DOE to reach different conclusions on the same energy efficiency issues relevant for new construction. ZEB and 179D should mirror each other to encourage real estate markets to implement consistent “high standard” performance levels.
 - Allow time for modeling software to adjust: DOE conducts periodic reviews of the 179D “reference standard” through a statutory process that gives software developers time to “certify” – and the agency to “qualify” – updated models that

³⁷ EPA, [“Proposed ENERGY STAR NextGen Certification for Existing U.S. Commercial and Multifamily Buildings”](#) (Jan. 31, 2023) (“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.”)

³⁸ Internal Revenue Service [Announcement 2023-1](#) (Jan. 17, 2023) (ASHRAE 90.1 version from 2019 provides 179D’s “reference standard” for new buildings “placed in service” on or after January 1, 2027).

reflect changes from one iteration of ASHRAE 90.1 to the next.³⁹ For example, the 2022 version of 90.1 “incorporates over 80 addenda to the 2019 edition.”⁴⁰ The qualification and certification process for modeling software to account for all of these new changes will take time.⁴¹ For this reason, DOE issued its approved software list to model building performance against the **2019** ASHRAE edition *only last year*.⁴² The ZEB definition will be putting the “cart before the horse” if Version 1.00 jumps ahead too quickly to adopt the 2022 ASHRAE baseline. The agency should give sufficient runway to allow development and adoption of capable software needed to accommodate building modeling under ASHRAE 2022. While the *next* version of the ZEB definition might rely on the **2022** baseline, Version 1.00 should use ASHRAE **2019**.

- Respect the determination DOE has yet to make on the 2022 version’s effectiveness. Federal law requires DOE to determine whether and by how much the latest edition of 90.1 improves energy efficiency relative to its immediate predecessor. The agency should not calibrate the ZEB definition to the newest ASHRAE baseline code until it officially assesses how much it has improved vis-à-vis 2019.⁴³
- ✓ We recommend that DOE eliminate the requirement that a new ZEB building be designed to meet a “90” ENERGY STAR score. Performance modeled at 25% over ASHRAE 90.1 (2019) is itself a significant goal for high efficiency in a newly constructed asset. Adding the further requirement of “90”-level modeled performance will unduly complicate how the marketplace understands DOE’s criteria, particularly when the building would need to meet a “75” score when it eventually transitions to ZEB’s “existing building” definition.
- Clarifications for Residential Buildings: Current residential labels certified by DOE and EPA should set the efficiency criteria for ZEB single and multifamily homes.

³⁹ 26 U.S.C. § 179D(d)(2)(B)(i) (modeling software must reflect all “procedures and detailed methods” for 179D calculations). After the developer’s certification, DOE must then determine that the latest available software is “qualified” to suit modeling calculations under the newer, governing ASHRAE baseline. *Id.* § 179D(d)(2)(B) (defining “qualified computer software”).

⁴⁰ See [ASHRAE webpage](#), “Preview 90.1-2022.” A [blog post](#) from American National Standards Institute (ANSI) also describes the numerous changes incorporated in the 2022 iteration compared to the 2019 version.

⁴¹ Existing 179D guidance provides a long list of technical criteria entailed in software certification. IRS [Bulletin 2008-14, Notice 2008-40](#), § 3.02 (April 7, 2008).

⁴² DOE website, “[Qualified Software for Calculating Commercial Building Tax Deductions](#).”

⁴³ In any event, 10% performance over the 2022 iteration (as per the Draft) is comparable to the 25% over 2019 level used by 179D that we suggest carry-over for ZEB purposes. The 2019 version of ASHRAE 90.1 is itself 19.1.% more “site” energy efficient than the 2013 version.

- 2019 version: 4.7% percent more site energy efficient than 2016 version. ([DOE July 28, 2021 determination](#)).
- 2016 version: 6.8% more site energy efficient than the 2013 version. ([DOE Oct. 2017 determination](#)).
- 2013 version: 7.6% more site energy efficient than 2010 version. ([DOE Aug. 2014 determination](#)).
- 2010 version: 18.5% more site energy efficient than 2007 version. ([DOE Oct. 2011 determination](#)).

- ✓ DOE and EPA each currently administer a complex regime of certification programs to recognize high levels of residential energy efficiency. The final ZEB definition should incorporate the agencies’ respective home “labels” as follows:

	ZEB for Residential New Construction	ZEB for Existing Residential Buildings
Single-family for Ownership	DOE’s Zero Energy Ready Home (ZERH) certification	(Not clear that ZEB status is geared to existing s-f home owners)
Single-family for Rental	DOE’s Zero Energy Ready Home (ZERH) certification	179D’s retrofit standard: 25% site EUI reduction (where s-f home is 5 years or older)
Multifamily	<p><u>Any</u> of the following:</p> <ul style="list-style-type: none"> ▪ DOE’s ZERH Multifamily Version 2 (starting in 2025) ▪ EPA’s ENERGY STAR Multifamily New Construction certification ▪ 179D’s new construction standard for 25% modeled performance over ASHRAE 90.1 (2019) 	<p><u>Any</u> of the following:</p> <ul style="list-style-type: none"> ▪ DOE’s ZERH Multifamily Version 2 (starting in 2025) ▪ EPA’s ENERGY STAR Multifamily New Construction (which includes “substantial rehabilitation”) ▪ EPA’s “75” ENERGY STAR score on the 1-100 scale

- ✓ Since 2013, DOE has had a version of Zero Energy Ready Home (“ZERH”) certification available for new single-family construction,⁴⁴ which Congress has now incentivized with an *IRA* “bonus” tax credit.⁴⁵ It is only logical for the agency’s ZEB definition to recognize its own zero energy label for single-family homes.
- ✓ However, ZERH certification has been exceedingly rare for larger multi-family rental properties. And, “ZERH Multifamily Version 2” released last November⁴⁶ does not apply until a project has a “permit date[] on or after January 1, 2025.”⁴⁷ Apartments, student housing, seniors housing, and similar income-producing residences merit viable pathways to strive for ZEB status aside from a largely unattainable ZERH rating. They should be ZEB-eligible if they meet any of the following:
 - Certified by EPA under the ENERGY STAR Multifamily New Construction program, which also includes “substantial rehabilitation” of existing buildings;⁴⁸

⁴⁴ See [DOE website](#), “Zero Energy Ready Homes” program.

⁴⁵ 26 U.S.C. §§ 45L(a)(2)(A)(ii), (B)(ii) and § 45L(c)(1)(B). See also [DOE website](#), “Section 45L Tax Credits for Zero Energy Ready Homes.”

⁴⁶ See [DOE’s website](#), “ZERH Multifamily Version 2.”

⁴⁷ See [DOE’s website](#), “ZERH Program Requirements.”

⁴⁸ See [EPA ENERGY STAR website](#), “Certified Multifamily Building Locator.”

- Since 2014, existing multifamily can obtain a 1-100 rating on EPA’s commercial building rating scale.⁴⁹ DOE should expressly state that multifamily assets with a “75” score are ZEB-eligible; or
 - Section 179D covers multifamily buildings greater than three stories. The tax deduction’s standards for new structures⁵⁰ should apply equally to multifamily “ZEB New Construction” for the reasons discussed above regarding other commercial real estate types.⁵¹
- ✓ Companies in the single-family *rental* market should be eligible to pursue ZEB status for the residences they lease, as follows:
- A company that **constructs new** single-family homes to lease should be ZEB eligible by pursuing DOE’s ZERH certification for those assets.
 - A company that owns **existing** single family homes to lease should be ZEB eligible if those assets are five years or older, and they are retrofitted to satisfy section 179D(f)’s performance standard of at least 25% certified site EUI reduction.^{52, 53}
- Clarifications Regarding Electric Vehicle Support Equipment (EVSE): DOE’s Draft states: “[W]hile [EVSE] is not considered part of the building load, it is one of the key components supporting reduced transportation-related emissions.”
- ✓ The final Version 1.00 definition should state plainly that DOE follows ENERGY STAR’s approach to building load attributable to EVSE. ENERGY STAR has concluded: “You should exclude your EV charging stations when benchmarking”⁵⁴ for energy use – and when calculating emissions from electricity use.
 - ✓ Building owners support their tenants’, residents’, and visitors’ use of EVs. We agree that alternative fuel charging infrastructure plays an important role to decarbonize the economy. However, building owners typically do not have separate utility meters to calculate the impacts specifically from EV charging equipment.
 - ✓ The ENERGY STAR score – like the ZEB definition – is intended to provide an assessment of **a building**’s energy use and emissions, not an assessment of the

⁴⁹ See [EPA ENERGY STAR website](#), “ENERGY STAR Score for Multifamily Housing in the United States.”

⁵⁰ That is, 25% better performance over ASHRAE 90.1 (2019) for new construction.

⁵¹ See *supra* notes 38-43 and accompanying text.

⁵² The text of section 179D(f), as modified by the *IRA*, pertains to the retrofit of any “qualified building” as long as it is at least 5 years old. 26 U.S.C. §179D(f)(4) (“originally placed in service not less than 5 years before the establishment of the qualified retrofit plan with respect to such building”). Aside from being located within the U.S., 179D’s retrofit section does not limit “qualified building” beyond this 5 year age restriction – and thus it may encompass any commercial or residential structure, whether single- or multifamily.

⁵³ We do not believe that 179D can provide an appropriate reference for *newly constructed* ZEB single-family, because 179D’s new construction standard is limited to buildings covered by ASHRAE 90.1 – and single-family homes under three floors are beyond 90.1 scope. However, as noted above, we believe that 179D provides an appropriate reference for multifamily new construction, because this asset class is covered by ASHRAE 90.1. See *supra* note 50 and accompanying text.

⁵⁴ See [EPA ENERGY STAR website](#), “How do I benchmark my EV charging station?” (Oct. 19, 2023).

transportation choices selected by tenants and other occupants. We thus recommend that DOE state that a building may exclude EV charging impacts for ZEB purposes as EPA does through ENERGY STAR guidance.

B. *Second ZEB Criterion: “Free of On-Site Emissions from Energy Use”*

- DOE’s Version 1.00 Draft states: “[A] zero operating emissions building meets the following criteria: [The building’s] direct or scope 1 greenhouse gas emissions from energy use must equal zero The only exception is for testing and use of backup generators when grid power is unavailable.”
- Excluding Emergency Generation is Critical. We support the Draft’s term that a ZEB asset should eliminate onsite Scope 1 operational emissions – excluding emissions from emergency power generation equipment.
 - ✓ The fleet of backup generators available on the market overwhelmingly depends on the combustion of natural gas and/or diesel.⁵⁵
 - ✓ Building owners are responsible for ensuring the availability of power and the safety of building occupants when the grid fails due to extreme weather, peak demands, cyberattacks, or other crises.
 - ✓ This limited exception from the ZEB definition protects resident safety, patient health, business tenant productivity, mission-critical emergency operations, communications, internet access, and grid resilience.
- Emissions Tracking Should Keep Pace With Portfolio Manager Upgrades: We support future versions of the ZEB definition to eliminate on-site refrigerant emissions, as well as to lower embodied emissions in construction materials and other purchased goods – once Portfolio Manager is capable of measuring these impacts and their standard for verification has evolved.
 - ✓ Enhancing Portfolio Manager to capture refrigerants and embodied carbon should be priorities. Our industry is committed to tackle those challenges and offer our members’ real-world experiences to help expand EPA’s tool.

C. *Third ZEB Criterion: “Powered Solely from Clean Energy”*

- DOE’s Version 1.00 Draft states: “[A] zero operating emissions building meets the following criteria: ... All the building’s energy is from carbon-free sources (which can include onsite generation and off-site sources) ... Qualified clean energy procurement shall meet at least one of the following:
 - The requirements of ASHRAE Standard 228 Sections 8.3 to 8.5

⁵⁵ See Joint Institute for Strategic Energy Analysis, National Renewable Energy Laboratory (NREL), [A Comparison of Fuel Choice for Backup Generators](#), Technical Report NREL/TP-6A50-72509 (March 2019).

- *The U.S. Environmental Protection Agency's (EPA) Green Power Partnership guidelines*
- *Green-e certified and surplus to regulation (if 100% green power product.)*

“In addition ... district energy must be generated from clean, emission-free sources. Carbon offsets are not permitted to meet this definition.”

- Offsite Clean Power Procurements are Essential to ZEB's Success.
 - ✓ The majority of claims that buildings are carbon-free depend on purchase of high quality RECs and similar measures. We strongly agree with the Draft's allowance for market-based solutions to meet the 100% renewable energy use requirement.
 - ✓ Not all buildings have the physical, design, or geographical characteristics to deploy clean power on site. For example, buildings in dense urban locations typically do not have the capacity to host solar panels or wind turbines to supply whole building energy needs, and may not feasibly tap into geothermal heat. Additionally, an individual building owner cannot control utility and grid decarbonization plans.
 - ✓ ZEB's success will depend on encouraging building owners to pursue cost effective solutions that shift their energy supplies from fossil to clean sources through power purchase agreements (PPAs), green tariffs, and purchases of energy attribute certificates including RECs.
 - ✓ The Clean Energy Buyers Association (CEBA) confirms these measures play a “crucial role ... in driving clean energy investments and project development that reduce corporate greenhouse gas emissions.”⁵⁶
- REC Tracking in Portfolio Manager is a Priority. We support EPA's planned Portfolio Manager upgrades⁵⁷ to create a standardized system for reporting that RECs are valid, independently verified, and not double-counted. We agree with principles stated on EPA's “Green Power Markets” webpage⁵⁸ and expressly acknowledged in the Draft's text. They should guide Portfolio Manager enhancements to capture REC-related information such as:

⁵⁶ CEBA [submission](#). “Resources for Responding to SBTi's Call for Evidence on Market Certificates” (November 2023).

⁵⁷ [EPA ENERGY STAR website](#), “The Portfolio Manager Upgrade Project.”

⁵⁸ [EPA website](#), Green Power Markets, “Credible Claims.” EPA advises that an organization should promote its renewable energy consumption through RECs using the following guidelines:

- Ensure contractual right to make claims;
- Retain ownership of the RECs from self-generation supply options;
- Limit claims to match the scope of the purchase;
- Retire the RECs associated with green power purchases to prevent double claims;

- ✓ dates of a clean power purchase;
 - ✓ electric meters covered by a certificate purchase;
 - ✓ the amount of purchased green power and whether it is estimated;
 - ✓ where purchased green power is generated; and
 - ✓ whether RECs are Green-e certified.⁵⁹
- Geographic Limits Should Not Encumber REC Purchases. We commend the Draft for *not* placing geographic restrictions on REC purchases. Legislative and market constraints dictate there should be no such restrictions as to where energy is generated that supports purchased RECs. Certificates should “count” if they are third-party verified and meet EPA’s quality control criteria.
 - ✓ For example, REC purchases should not be limited to the grid region where the building is located. Utilities may not even make RECs available in U.S. electricity markets that operate as monopolies (e.g., non-ISO/RTO regions.)⁶⁰
 - ✓ Even if RECs are available in competitive ISO wholesale electricity markets, utilities might purchase all available certificates to meet their own renewable portfolio standards imposed by state law⁶¹ – leaving no (or minimal) RECs available for commercial building customers to purchase at scale.
 - ZEB’s Criteria can Strengthen the Nexus Between a Zero Emissions Building Sector and a Zero Emissions Grid. Long-term goals for a carbon-free building sector depend on a carbon-free power grid. DOE should strive to reflect the reduced transition risk for buildings connected to grids that are decarbonizing at a faster pace – while driving investments to U.S. grid regions that need the most capital to reduce their reliance on fossil fuels.
 - ✓ Measurement and verification requirements for ZEB’s 100% clean energy criterion provide a major opportunity to “normalize” REC purchases based on carbon impact. DOE’s definition can help accelerate decarbonization in the grid regions further behind in their progress toward zero emissions.

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- Buy certified green power to support claims;
 - Limit claims to emissions associated with purchased electricity (Scope 2 emissions);
 - Use the terms "REC" and "offset" correctly in claims;
 - Be able to substantiate claims;
 - Avoid project claims of "additionality"; and
 - Follow available market guidance, such as the US-FTC [Green Guides](#).

⁵⁹ “Green-e® certified renewable energy and carbon offset products meet the most stringent environmental and consumer protection standards in North America.” See <https://www.green-e.org/certified-resources>.

⁶⁰ See Federal Energy Regulatory Commission ([FERC website](#)), U.S. map of “RTOs and ISOs.”

⁶¹ See Center for Climate and Energy Solutions, [“U.S. State Electricity Portfolio Standards.”](#) (Renewable Portfolio Standards have been “adopted by 20 states and the District of Columbia [and] require[] a certain percentage of a utility’s electricity to come from renewable energy sources”).

- ✓ DOE and EPA should develop the concept for “location-adjusted” RECs that consider the carbon intensity of the grid where the building is located, and/or the carbon intensity of the grid where the electricity was delivered for the purchased REC (where the source is known).
 - A building that draws energy from a “cleaner” grid should not be held to the same standard to purchase RECs equal to 100% energy use compared to a building serviced by a “dirtier” grid.
 - Adjusting REC purchase requirements based on location can be achieved through eGRID emissions factors supplied by EPA,⁶² or a factor provided by a specific supplier where the REC is bundled with a Power Purchase Agreement.
 - Similar methods can be designed for unbundled RECs where the certificate lacks a specific source or origin, using EPA’s published national average emissions factor for electricity.⁶³

- ✓ The Version 1.00 definition should lay the foundation for innovation to refine credible accounting methods for location-adjusted REC purchases. Our members look forward to working with the White House and the agencies to collaborate on market-based solutions that can prioritize a grid region’s carbon intensity as a key factor to drive clean power financing.

- Buildings that Use District Heating and Cooling Should be Afforded Opportunities to Pursue ZEB Status.
 - ✓ The Draft states that “district energy must be generated from clean, emissions-free sources,” yet “[c]arbon offsets are not permitted to meet this definition.” The upshot is that the definition would preclude buildings reliant on district energy systems from any realistic opportunity to attain ZEB levels.

 - ✓ District energy systems are commonly located in our nation’s older and more established cities as well as hospitals, college campuses, and government buildings. These systems are still years away from zero-carbon power generation.⁶⁴ For example, New York City’s district steam system operator has a goal for decarbonization **by 2050**.⁶⁵

⁶² See [EPA Website](#), Center for Corporate Climate Leadership, “2023 GHG Emission Factors Hub,” Table 6, “Electricity.”

⁶³ *Id.*

⁶⁴ The International District Energy Association (IDEA) reports that district systems served 105 million square feet of building space in 2022 in North America and overseas. See IDEA, [District Energy Space 2022](#) (July 17, 2023)

⁶⁵ International District Energy Association, [“A New Decarbonization Strategy Rises from the Streets of New York City: How Con Edison’s District Steam System is Planning for a Carbon-free Future”](#) (Nov. 15, 2023).

- ✓ An individual building owner has no influence over the speed at which district systems decarbonize. Tearing out steam pipes and other district infrastructure embedded in properties for decades, and utilizing less efficient methods of heating and cooling, would be environmentally and financially irresponsible.
 - ✓ Meanwhile, a marketplace for renewable thermal certificates (RTCs) – as distinguished from RECs and carbon offsets⁶⁶ – is nascent at best. Currently, the relative availability of RTCs (for thermal energy) is nowhere close to RECs (for electricity).⁶⁷
 - ✓ Allowance of credible carbon offsets will be necessary as the only viable option for many urban, medical, educational, and government real estate owners to strive for “zero” emissions from district thermal use.
 - ✓ We recommend – for purposes of ZEB Version 1.00, and with regard to emissions from district thermal use – that DOE allow carbon offsets as long as they meet stringent quality control criteria developed by the U.S. Commodity Futures Trading Commission (CFTC).⁶⁸ The CFTC’s first-ever federal guidelines for carbon offsets should be used to amplify DOE’s first-ever federal definition for zero emissions buildings.
 - ✓ Alternatively, if the final Version 1.00 definition completely precludes carbon offsets, then DOE should follow the decision made by EPA for NextGen criteria. NextGen’s renewable energy use requirement also disfavors carbon offsets but *excludes* emissions attributed to district heating and cooling – precisely because there is presently no realistic market for owners to procure RTCs at scale.
- DOE Should Have a Broad View to Define the Carbon-Free “Fuel Mix.”
 - ✓ Reflect EPA’s eGRID. DOE should clarify that the nationwide clean power fuel mix for ZEB purposes includes any non-fossil source used to generate electricity as portrayed in EPA’s eGRID “Power Profiler” – *i.e.*, hydropower, nuclear, solar, wind, geothermal, and biofuels.⁶⁹

⁶⁶ EPA’s Green Power Partnership distinguishes between energy attribute certificates (likes RECs and RTCs) from carbon offsets. See EPA, [Offsets and RECS: What’s the Difference?](#) (Feb. 2018).

⁶⁷ According to M-RETS, which provides a tracking platform for environmental attribute certificates and other clean energy commodities, developing markets for RTCs have only started to emerge in Europe, California, and Massachusetts. See M-RETS, [Introduction to RTCs and Thermal Energy Markets](#) (“Existing Markets,” slide 6) (May 2020).

⁶⁸ Final CFTC guidelines are imminent to improve the transparency, quality, and pricing of carbon offset projects. CFTC, [Commission Guidelines Regarding the Listing of Voluntary Carbon Credit Derivative Contracts](#), 88 Fed. Reg. 89,410 (Dec. 27, 2023). See also CFTC [news release](#) (Dec. 4, 2023)

⁶⁹ [EPA website](#), “eGRID Power Profiler.”

- ✓ Offtake from community solar – supported by valid RECs – should be allowed. Buildings unable to install onsite renewable systems should be encouraged to consider community solar (where available).⁷⁰ Subscribers who support their offtake with credible RECs (that meet EPA’s Green Power Partnership criteria) should be allowed to count those attributes toward meeting a ZEB claim.
- ✓ Consider IRA standards regarding biofuel use. Similar to our suggestions that ZEB should follow standards already approved by Congress regarding sections 45L and 179D, the IRA codifies how use of biodiesel can qualify for a tax credit.⁷¹ We recommend that DOE assess how the tax code’s provisions for qualified biofuel use can apply in the ZEB context and seek further stakeholder input on this issue.
- ✓ Consider FERC order on grid interactivity. The real estate industry supports government policies that promote buildings’ interactivity with the grid to help make power infrastructure more resilient and less reliant on carbon-free fuel sources. However, in response to DOE’s question in the RFI, it is not apparent to us at this time how “grid interactivity” qualifies as a “clean fuel” for ZEB purposes. DOE should assess a relevant Federal Energy Regulatory Commission (FERC) order addressing distributed energy resources,⁷² develop a proposal, and solicit further public input for possible relevance in a future version of the ZEB definition.

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⁷⁰ See DOE, [Solar Energy Technologies Office website](#), “Community Solar Basics” (“Currently, there is at least one community solar project in 43 states and the District of Columbia”).

⁷¹ See US-DOE, [Alternative Fuels Data Center website](#) (summarizing IRA tax credits for alternative fuels and biodiesel).

⁷² See [FERC Order No. 2222 Explainer: Facilitating Participation in Electricity Markets by Distributed Energy Resources](#) (updated June 14, 2023).