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Comments from the Institute for Policy Integrity on a National Definition for Zero Emissions Building: Part 1 Operating Emissions

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Section A: Overall

5. Are the draft criteria clear and appropriate for the definition of a zero emissions building? Should any other criteria be considered for Part 1? Please provide specific feedback about this draft definition.

The Department of Energy (DOE) and the Office of Domestic Climate Policy (CPO) should first clarify the goals motivating the creation of the definition, as the initiative's overall goals may inform the appropriateness of the criteria. Neither the *Federal Register* notice nor the draft criteria set clear, measurable goals or identify target use cases, besides general pronouncements like making "zero emissions resilient new construction and retrofits common practice by 2030."

The metric for assessing "common practice" is not clear. DOE and CPO should consider instead setting a more explicit and concrete goal, such as the goal articulated in the referenced EERE Proposed Appropriation Language: i.e., reducing the carbon footprint of the U.S. building stock by 50 percent by 2035, by electrifying a significant share of building end-uses and improving the efficiency of buildings and equipment.

The initiative's intentions could be confusing to the general public given the definition's name and currently stated goal. For example, the name "zero emissions buildings" could be read to imply a focus on the emissions directly from buildings, such that the appropriateness and inclusion of requirements for carbon-free off-site energy or even energy-efficiency may not be immediately clear to the public (as a building could have "zero emissions" onsite even while otherwise being relatively energy-inefficient). If the definition's goal is to more broadly incentivize the design and operation of buildings that will support an overall reduction in demand for polluting energy sources and thus economy-wide emissions reductions, DOE and CPO should state that goal more clearly in the criteria document itself.

DOE and CPO should then ensure that the definition's criteria align with the goal as articulated. Importantly, DOE and CPO should consider whether a different name for the initiative—such as Energy-Smart Buildings, Climate-Smart Buildings, or Zero-Emissions-Ready Buildings—may better convey to the general public the range of goals that may extend beyond a building's direct emissions. DOE and CPO should explore whether available surveys or other data could elucidate

[1] This document does not purport to represent the views, if any, of New York University School of Law.

which nomenclature the general public may most readily associate with this initiative's intended goals.

Section B: Energy efficiency criteria

6. Should energy efficiency be considered a criteria for the definition of a zero emissions building? If the efficiency of an existing building should be considered, do you agree that requiring energy performance in the top 25% of similar buildings is an appropriate measure of energy efficiency for this definition? (ENERGY STAR® score of 75 or above.) Should it be higher or lower? Are there other benchmarks or approaches that should be considered? For an existing building, is one year of measured energy performance an appropriate requirement for demonstrating efficiency or is another approach appropriate?
Linguistically, including energy efficiency in a "zero emissions" standard may be confusing to the general public (see answer above to question #5). Although energy efficiency is a necessary complement to decarbonization of the building sector, and although energy efficiency is a logical requirement in an effort to reduce overall emissions, "efficiency" is not a measure of whether a building itself produces emissions, directly or indirectly. An inefficient building running on clean energy could fit under a "zero emissions building" umbrella—at least as the term "zero emissions" may be commonly understood by the general public—without efficiency as a component. As suggested above in response to question #5, DOE and CPO should consider whether a different name for this effort would better convey to the general public the goal of improving building performance in order to reduce emissions not just from the building itself but also from the overall energy grid.

Efficiency is, of course, an effective measurement for climate- and energy-smart design in retrofits and new construction. Efficiency is highly relevant to economy-wide emissions because it drives the building sector's overall energy demand and so informs whether the available supply of clean energy can meet the total economy-wide energy demand without relying on emission-producing generation. If DOE and CPO's intent is to "help move the building sector to zero emissions" and "substantially reduce building sector emissions," including energy efficiency as a component of the zero emissions building label is reasonable. *See, e.g.*, Danielle Spiegel-Feld & Katrina Wyman, *Building Better Building Performance Standards,* 52 Envtl. L. Rep. (Envtl. Law Inst.) 10268, Issue 4 (2022).

DOE and CPO should explain why they have set different efficiency targets for existing versus new buildings (i.e., allowing the top 25% most efficient existing buildings to qualify for the definition, as compared to only the top 10% most efficient new buildings), and why the percentage targets proposed are the best options to promote the goals for this initiative. To begin, the draft criteria are not clear as written on whether buildings will be compared across the entire building stock, or whether existing buildings will be compared only to other existing buildings, and new buildings against only new buildings. For example, if new buildings are required "to achieve energy performance in the top 10% of similar buildings," do "similar buildings" include only new buildings, or all existing and new buildings with a common use? Is that question resolved by the Energy Star scoring system and, if so, how? Similarly, how will "new" versus "existing" buildings be defined, in terms of cut-off dates for design and construction, and for

applicability in the context of substantial building modification? Such crucial details should be clear in the text of the criteria.

More broadly, DOE and CPO should explain why the proposed differentiated standards for new versus existing buildings will best promote the initiative's goals. In other emissions sectors, setting significantly looser standards for existing versus new sources has historically often led to inefficient results and even to perverse emissions outcomes. *See, e.g.*, Richard L. Revesz & Allison L. Westfahl Kong, *Regulatory Change and Optimal Transition Relief*, 105 Nw. U. L. Rev. 1581 (2011). Could, for instance, the relatively looser 25% benchmark for existing buildings fail to appropriately incentivize socially beneficial and economically achievable retrofits and upgrades to existing buildings? Will applying the same definition (i.e., "zero emissions building") both to the most cutting-edge new buildings and also to a wider array of relatively less efficient existing buildings create public confusion about the significance of the label? Is this particular set of differentiated benchmarks (i.e., 25% for existing and 10% for new) best aligned with the initiative's goals, as opposed to, for example, selecting different percentage targets (e.g., perhaps a 20% target for existing and 5% for new), or a uniform benchmark for both existing and new buildings (e.g., perhaps a 15% target for both)? DOE and CPO should explain its choices in the final definition, to transparently convey to the public the program's goals.

7. For existing buildings, are the draft criteria appropriate for single-family homes? Are there other benchmarks that should be considered for single-family homes?
DOE and CPO should consider whether it is appropriate to expect single-family homes, other relatively small buildings with low overall energy consumption, and other property types like leased properties to be responsible for procuring carbon-free energy from off-site sources (when off-site generation is necessary). Not all building owners are equally positioned in terms of their capacity to generate power on site, nor in terms of their access to competitive markets for clean energy, administrative resources, or even their geography to be reasonably able to procure carbon-free energy from off-site sources. If the initiative's goal is to incentivize the construction of buildings that are well-positioned to be free of both direct and indirect emissions by approximately 2035, an initial focus on electrification and efficiency may be more productive for some building types, especially for buildings that are likely to have trouble procuring their own clean energy. DOE and CPO should consider whether to create different criteria for certain building types, to promote electrification and efficiency even for buildings that cannot reasonably obtain carbon-free electricity in the near term.

8. For new construction, are the draft criteria appropriate? The modeled building performance is at least 10% lower than the energy use according to the latest version of IECC or ASHRAE 90.1 (e.g. model energy code) and the building is designed to achieve an ENERGY STAR design score of at least 90 (for eligible buildings). Are there other benchmarks that should be considered?
See above answer to question #6, on the need for DOE and CPO to explain the different standards set for new versus existing buildings' efficiency requirements.

9. For new construction, are the draft criteria appropriate for single family homes? Are there other benchmarks that should be considered for single family homes?
See answer above to question #7 on standards for single-family homes in general, whether they are existing or new construction.

Section C: On-site emissions from energy use

10. Should there be an exemption allowed for emission producing emergency generation? Are there any other exemptions needed?
[No answer.]

11. Should biofuels consumed on-site be allowed? If so, how?
DOE and CPO should not allow the on-site consumption of biofuels unless the biofuels are demonstrated to have zero or net-negative lifecycle emissions, after accounting for all upstream emissions and land-use change-related emissions, with an adequate margin for uncertainty. Given recent literature showing that past estimates of lifecycle emissions from common biofuels were often overly optimistic about the lifecycle environmental benefits of biofuels, DOE and CPO should proceed cautiously with allowing biofuels to meet the criteria. Allowing on-site consumption of biofuels would also require DOE and CPO to monitor new estimates of lifecycle emissions that may be published in the future, and to adjust the definition and criteria if new evidence on the lifecycle effects of biofuels emerges.

Section D: Clean energy generation and procurement

12. Are the clean energy criteria provided appropriate for this definition? Are there other clean energy criteria that should be considered? Should community solar qualify for the requirement? If so, how?
As discussed above in response to question #5, the overall purpose of this definition is unclear, and without clarity it is not possible to determine whether it is appropriate for the definition to require buildings, in all settings, to procure either on-site or off-site clean electric energy. As discussed above in response to question #7, not all building owners are equally positioned in terms of geography, access to competitive markets for clean energy, and other factors in their ability to achieve 100% clean energy from onsite generation or off-site sources. If the initiative's goal is to incentivize the construction of buildings that are well-positioned to be free of both direct and indirect emissions by approximately 2035, an initial focus on electrification and efficiency may be more productive for some building types. DOE and CPO should consider whether to create different criteria for certain building types, to promote electrification and efficiency even for buildings that cannot immediately obtain carbon-free energy.

In the context of a "zero emissions building" standard, the ultimate test for whether grid energy is "clean" would turn on the emissions associated with its generation. Without access to ASHRAE Standard 228 Sections 8.3 to 8.5, which are behind a paywall, it is not clear if the proposed definition adequately considers the emissions associated with electric generation. The two other pathways for compliance appear to be based primarily or entirely on whether generation resources are renewable, rather than on whether they are "zero emissions." If there is a "clean energy" requirement applicable to grid power, to the maximum extent possible, it should

be a technology-neutral requirement that buildings rely exclusively on power that is generated in a manner that (a) does not give rise to direct emissions and (b) does not rely on fuel whose production and transportation give rise to emissions.

For example, hydrogen-based generation is sometimes described as a zero-emissions resource. But it can be considered zero-emissions only if it has no production emissions and does not leak. Today, the only emissions-free hydrogen is electrolytic hydrogen powered by zero-emissions electricity. Verification protocols would be necessary to determine whether grid-connected electrolyzers cause zero production emissions. A marginal-emissions approach with temporal and spatial granularity would accurately measure the production emissions of grid-connected electrolyzers. Grid-connected electrolyzers producing hydrogen would in turn need to rely on zero-emissions generation that is additional, time-matched, and deliverable to the specific geographic area. Further, because hydrogen is itself an indirect greenhouse gas, hydrogen-based generation cannot be considered zero-emissions unless there is no leakage of hydrogen. For a more extensive discussion of these issues, *see* Policy Integrity's August 16, 2023 comments to the New York Public Service Commission, available at https://policyintegrity.org/documents/_E0FCFF89-0000-CC1B-A089-206BEC79AD9A__%281%29.pdf. Without a rigorous analysis such as this, it would not be possible to assess the emissions impact of purportedly "zero emissions" resources that are not renewable. Evaluating the criteria requires access to the ASHRAE standard that is incorporated only by reference (and that is behind a paywall).

Regardless of the ultimate approach to clean off-site power that is actually procured, it is likely that this definition should seek to move the building sector toward better alignment with the operational capabilities and needs of an electric sector in which renewable resources will play an increasingly dominant role. If that is part of the definition's purpose, it would be helpful for building systems and appliances to be designed for flexible operation that is responsive to price signals and other information about temporally variable grid conditions. These capabilities are distinct from energy efficiency. DOE and CPO should consider incorporating additional building system requirements that provide for this flexibility, to the extent such functionality is not already encompassed by applicable energy efficiency standards.

13. Should there be a proximity requirement for off-site power used to meet the clean power criterion? If so, how should a proximity requirement be implemented (e.g., regional definition, phase-in, etc.)?
[No answer.]

Section E: Documentation is important for effective implementation

14. Should organizations leveraging the definition be able to determine whether buildings have to meet it annually, one time, or on a different frequency?
[No answer.]

15. If the definition is extended to single family homes, what documentation should be required?
[No answer.]

16. Are licensed professional and third-party certification bodies the appropriate parties to independently verify the documentation that a building has met the definition? Beyond existing government resources such as EPA's ENERGY STAR Portfolio Manager, are there other methods to verify meeting the zero emissions building definition?
[No answer.]

17. What time frame should be used for GHG calculations (i.e. hourly, monthly by year, annually)? Explain how this would be implemented effectively across the market.
[No answer.]

18. What other verification criteria are necessary to make this definition useful for the marketplace?
Under the "Verification" section, the draft criteria state that electric vehicle supply equipment "is not considered part of the building load." The meaning of this statement is not clear. For buildings with EV charging equipment but without separate electricity meters for such equipment, it is not clear how the electricity consumed by such chargers would be subtracted out of the buildings' measured energy use. DOE and CPO should clarify the methodology with respect to energy consumed by EV charging.

The intention of the statement more broadly is also unclear. Is the statement that EV charging is "not considered part of the building load" intended as a temporary definition, reflecting the fact that the draft criteria do not currently require buildings to obtain clean energy to cover their EV chargers? Or is it a more general statement that EV charging is part of the transportation sector and so not part of the building sector, such that future updates to this definition could not be expanded to cover buildings' electricity demand from on-site charging? Or does the statement mean that EV charging will affect a building's GHG emissions as evaluated by this standard despite DOE and CPO taking the position that the emissions associated with EV charging are not part of building load? DOE and CPO should clarify and explain their intended meaning.

19. Are there any issues regarding conflict or synergy with regional, state or local energy and climate programs that ought to be addressed?
[No answer.]

Section F: Use cases

20. Is it important for a national definition to cover all building types, including commercial, multifamily, and single-family?
A single national definition to cover all building types is not necessarily important and, indeed, may be counterproductive to the goals. As mentioned in above answers (see #7 and #12), DOE and CPO should consider whether separate definitions may be appropriate for some building types, allowing more finely-tuned criteria appropriate to the specific building type. For each building type, the intended audience must understand the differences in requirements. Depending on how DOE and CPO define the goals for this initiative, it may not be necessary or most productive, for example, to require all single-family homes to obtain carbon-free off-site energy (see answer to #7 above). Additional clarity from DOE and CPO on accurate measurement and verification would also be necessary for each building type.

21. Are there any other recommendations that would help clarify and improve the definition?
DOE and CPO should identify specific potential uses for the definition. DOE and CPO should provide additional context on how and where this definition can be useful, including providing examples. This definition is not a formal regulation, nor is there a stated enforcement plan. Therefore, DOE and CPO should expound on the benefits of having a formal standardized definition beyond creation of a market signal—and providing specific use-cases would help communicate those potential benefits.

22. While Part 1 of the definition focuses on operating emissions, what other areas should be considered in future parts of the definition, such as embodied carbon, refrigerant, and grid interactivity?
The appropriate scope of future actions depends on the context and on the initiative's goals. If the goal of the initiative is to more broadly incentivize the design and operation of buildings that will support an overall reduction in demand for polluting energy sources, then adding criteria for EV chargers in the future may be especially important. (Note also that, as explained in the answer above to question #18, DOE and CPO should clarify whether (assuming the instant proposal would exclude EV load) the criteria intend to permanently exclude EV charging as "not…part of the building load," or if EV charging could be incorporated into a future update.) If the broad goal is focused more on achieving climate targets than on reducing energy use, perhaps refrigerants, embodied carbon, or net-zero concrete should be the next priority for the future. Again, better defining the initiative's goal should inform the next steps.

General questions and comments

23. Other questions or comments not included above
We appreciate DOE and CPO's continuing efforts and attention to encourage decarbonization of the buildings sector.

To advance both transparency and the substantive goals of the proposed definition, DOE and CPO should meaningfully engage in public education and outreach regarding this definition and its potential uses and benefits.

DOE and CPO should make generally available online the information provided during the listening sessions, especially given that registration and attendance for the sessions were limited. For example, staff from the Institute for Policy Integrity was not able to listen to the information sessions, as registration cap was already reached.