

Net Zero Has Failed. We Need a Universal Carbon Standard for Buildings.

This is the first article in a five-part series introducing a comprehensive, universal carbon standard for buildings. It explains how “net zero” has failed us. Part Two introduces the six building blocks of a proposed low-carbon standard. And Part Three provides details on each of those six things.

Part Four explains why we need to prohibit offsets and RECs, and eliminate other distractions, and Part Five offers a condensed recap as well as a path toward adoption of this comprehensive low-carbon standard across the building sector.

No one is zero emissions until we are all zero emissions. Image: Ada Melton-Houghton

Net zero has run its course.

We’re going to be mostly talking about buildings in this series, but in the corporate world (or higher ed or city government), claims of Net Zero or carbon neutrality (or really anything that suggests that you’re all done here) are increasingly spurious.

For one thing, achieving “net zero” requires the use of offsets, because it’s mostly impossible for any building or entity today to reduce emissions to zero without them. Offsets are meaningless, and the world is beginning to understand why that is so. You just can’t pay to offset a flight or your corporate footprint in any credible way. All you can do is make reductions and recognize

that your path to zero is interdependent with other systems—like the power and manufacturing industries, which need to decarbonize in concert.

For another thing, you need to include emission scopes 1 through 3 (see this primer on the scopes), meaning you have to account for (among other things):

- the impact of the products you make
- the supplies you use to make them
- the way your employees get to and from work or your building

This is especially important where those scope 3 emissions represent the majority of an entity's total. What if a car company called itself net zero because it had achieved some energy efficiency at its plants and bought some renewable energy certificates (RECs) and offsets, but ignored the fact that their product and supply chains—which are within their control—are one of the largest collective emitters on the planet? We'd all collectively cry foul.

Credible standards include offsets as a last resort

To try and make sense of all this, the Science Based Targets initiative (SBTi)^[1] has stepped into the fray and established some important reforms through the Corporate Net-Zero Standard. In addition, a United Nations Expert Group is recommending an “Integrity Matters” approach that aligns with the SBTi approach. At the heart of this approach are the following principles:

- an accounting of scope 1–3 emissions
- a long-term goal of zero by 2050
- a short-term goal of around 50% reduction by 2030
- a severe limitation of the use of offsets for anything but what SBTi refers to as “residual emissions”

RECs, however—the little brother of carbon offsets—are still permitted to

offset scope 2 emissions under the market-based accounting method in the GHG Protocol Corporate Accounting and Reporting Standard. But these too are likely (or maybe just hopefully) on the way out the door as the GHG Protocol is updated at its next revision in 2024-2025.

What is good about the SBTi Net-Zero Standard is that it effectively requires every company or organization to take action to reduce all aspects of its own emissions, without getting to pick and choose which ones they think may be easier or harder to address.

There are industry-specific versions of the SBTi standard for certain heavy industry sectors, which is appropriate, because not every industry has the same pathway and timeline to decarbonization (think steel or aviation). But if I am a stakeholder or investor, I don't want to have to figure out what random carbon-neutral standard a company has decided to use, or whether the voluntary actions they've decided to focus on are the right ones or not. They're either reducing all of their emissions or they aren't.

So while I don't think the Corporate Net-Zero Standard is perfect, I think it gets a lot of things right, and there is a lot that the building sector can learn from this in terms of the way it thinks about both new and existing buildings.^[2]

In many ways, buildings are much more straightforward than corporations, which might vary in business activities and footprint between Whole Foods or Nissan or Burt's Bees.

Sure, we have zero-energy and zero-carbon certifications for buildings, but these standards are inconsistent and represent a hodgepodge of incomplete accounting and offsetting.

If our cherished net-zero standards were corporate standards, they would rank at the bottom in terms of credibility, despite their best intentions. To understand why, let's look at the brief history of the net-zero building programs.

The original appeal of net zero: simplicity

Net-zero energy was the original highest ideal for buildings.

Looking back, its appeal was its simplicity: a building produces enough onsite renewable energy over the course of the year to balance the amount of energy used over the course of that year.

I like to think that we always knew that didn't make sense.

But when the idea was gaining traction (around 2015), the world looked a lot different than it does now. Heat pumps and electric vehicles (EVs) were fledgling, the grid was still looking to be fossil fuel dominated for the indefinite future, and scope 3 emissions were someone else's problem.

The original U.S. Department of Energy (DOE) definition didn't stipulate what type of energy you used (whether gas, electric, or other), nor did it concern itself much with the fact that the source of renewables for most projects was (and is) onsite solar, and that one would have to use the grid as a buffer to import and export electricity for most hours of the year.

If you wanted to be NZE, then you needed to use only what you could produce. If you couldn't produce enough, then you needed to keep cutting and cutting your usage until you could balance it out, or find ways to increase production: to do that, you could put solar panels on parking canopies or integrate solar into the façade.

Why net zero unraveled

The simplicity of NZE really started to unravel when the National Renewable Energy Lab began pointing out that even the most efficient buildings could only be net zero if they were low rise or had low energy density. Source: B. Griffith et al., "Assessment of the Technical Potential for Achieving Net-Zero-Energy Buildings in the Commercial Sector," NREL/TP-550-41957

But eventually, people started to realize that some of the best ways to cut usage

relative to solar collection area are to use a building less often, make it less dense, fill it with fewer people, or externalize one of your biggest loads by letting Amazon or Google manage your data.

As a result, some of the buildings with the lowest energy use intensity (EUI) are those that are also the emptiest.

With NZE, you also didn't have to worry about the fact that solar produces during the daytime, and more in the summer than the winter—and in places with a “duck curve,” which will be everywhere at some point in the coming years, the solar you're adding in the middle of the day is incrementally worth less and less, and doing less and less, to reduce emissions.

But in the current zero-energy and -carbon programs, you can just blithely assume that your daytime “deposits” had the exact same value as your nighttime “withdrawals.”

The simplicity of NZE really started to unravel when the National Renewable Energy Lab began pointing out that even the most efficient buildings could only be net zero if they were low rise or had low energy density.

Ironically, many environmentally minded NIMBYs enjoy the fact that only low-density buildings can meet the traditional definition of NZE. It means that they can effectively reduce growth and housing—and therefore housing affordability—while increasing transportation emissions, all under the pretense of a pro-environment, zero-carbon approach. Appalling!

So a sprawling, non-transit-oriented, relatively inefficient single- or two-story building (imagine a shopping mall) could be NZE simply by adding rooftop solar. Good job, team.

From this recognition came the need to expand NZE to allow for taller and more energy-dense buildings (e.g., from multifamily to labs), leading to the new

(albeit subtle) need to allow access to offsite renewables and then define—in laborious detail—the kinds of offsite renewables that would be acceptable.

And since your onsite renewables budget was no longer determining how efficient your building needed to be, you now needed to stipulate a specific efficiency target as well.

Why there is actually no net and no zero

Then there's the scope 3 issue, and if you care about carbon, you likely have other and/or more important fish to fry than just operational energy—namely embodied carbon, refrigerant emissions, and transportation emissions.

Lastly, there is the problem of using the term “zero.” It's worth noting that when the SBTi references net zero in the Corporate Net-Zero Standard, they are charting out a 2050 goal to truly eliminate all but residual emissions (the latter being the reason to keep “Net” in the name).

When buildings include all of their various emission sources, they too are likely aiming at a true zero target that is some distance in the future. That's because:

- Once you connect to the grid (which you should, since connected systems are far more resilient), then you can't achieve zero emissions until the grid achieves zero emissions, no matter how many RECs you may acquire (more on this to come in Part Four).
- Once you include transportation, refrigerant, and embodied emissions, there's no longer a zero-emission goal that can actually be obtained until we get to a broader zero-carbon economy. So a zero-carbon economy should be the real focus.

In the future, we will hopefully have:

- All-electric transportation
- A 100% carbon-free grid
- Refrigerants like CO₂ or ammonia with a global warming potential (GWP) at or under 1
- A manufacturing industry that is zero carbon because of the zero-carbon grid, large-scale energy storage, and renewable-energy-based industrial processes using the same low-cost renewable supply (such as through green hydrogen to produce e-fuels and green steel)

Until then, there is no zero, and branding things as “zero” or “net zero” is misleading. It suggests that emissions can be eliminated or offset in some way, and they can’t.

The truth is that no one is zero emissions until we are all zero emissions.

Shut it down (and then reboot it)

What started as a simple metric to measure the best we could do for building energy—and thus, by proxy, achieve building-related carbon reductions—has become an unwieldy mess that overcomplicates everything and distracts us from what should be a few simple tenets and requirements.

I’ve heard several policy makers, city officials, and project owners effectively say: “I want net zero because we need to act on climate change, and I don’t care if it doesn’t make sense or if we gloss over the more important aspects of climate mitigation that actually move the needle.”

We need to deconstruct “net zero”—both carbon and energy—and rebuild it as a clean, accessible set of basic principles.

To do that right, we’ll have to develop a straightforward standard that every developer, owner, investor, and practitioner in our industry can understand and

embrace. A standard that confronts the actual thing we need to eliminate: greenhouse gas emissions.

In the following posts, I will propose a new Universal Low-Carbon Building Standard that does for buildings what the Corporate Net-Zero Standard does for business entities:

- It will create a single set of targets that all buildings—new and existing—should meet to be considered on a path to zero emissions.
- It will account for all sources of building-related emissions, including the building sector’s version of scope 3.
- It will rely on a REC- and offset-free approach to reducing as much carbon from buildings as is possible today while regularly updating to incorporate new opportunities to reduce further.
- And it will do all this with the goal of establishing a compliance standard that can be used for any building project, regardless of geography or typology—thus replacing the current “best practice” of certifying or showcasing a few voluntary projects whose owners choose to participate (a la the LEED Zero and ILFI programs).

This series is broken up into the following parts:

1. Net Zero Has Failed. We Need a Universal Carbon Standard for Buildings. (this one)
2. This is the Universal Low-Carbon Building Standard We Need
3. The Universal Low-Carbon Building Standard Does Six Things
4. The Universal Low-Carbon Building Standard Avoids RECs and Unnecessary Complications
5. The Universal Low-Carbon Building Standard’s Path to Adoption

^[1] SBTi is “science” based, because this pace of reductions aligns with the 1.5C

pathway outlined in the Paris Climate Agreement. It's what the planet needs, not what you think you can deliver, because the planet doesn't care.

^[2] In fact, as of this writing, the SBTi has issued draft science-based target-setting guidance for the building sector, which more or less attempts to outline responsibility among developers, designers, construction firms, and building owners for the various scopes of emissions associated with buildings.

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