

UKGBC's Net Zero Carbon Buildings Framework Definition: Clarifications

This document was last updated in November 2022. UKGBC commits to regularly revisiting and updating this document to reflect emerging research and guidance around net zero carbon buildings.

*If you have any outstanding questions which are not covered in this document, please contact us at ANZ@ukgbc.org.
For a supplementary list of resources around net zero carbon buildings, please see [Appendix A](#).*

This document is set out in the following sections:

- Step 1: Establish Net Zero Carbon Scope
- Step 2: Reduce Construction Impacts
- Step 3: Reduce Operational Energy Use
- Step 4: Increase Renewable Energy Supply
- Step 5: Offset Any Remaining Carbon
- Step 6: Public disclosure and verification
- Appendix A: Resource List for NZCB's

STEP 1: ESTABLISH NET ZERO CARBON SCOPE

- N/A

STEP 2: REDUCE CONSTRUCTION IMPACTS

1. To achieve 'net zero carbon - construction' does the project need to achieve any embodied carbon targets?

Science-based targets for embodied carbon do not currently exist, therefore in the meantime, UKGBC recommend organisations align with the interim targets set out by industry guidance such as LETI's Climate Emergency Design Guide and RIBA's 2030 Climate Challenge. Please see the [Levels of Performance](#) guidance document for further detail.

2. The Framework can be applied to both new buildings and major refurbishments. Should the same targets be used for refurbishment projects as for new builds?

Targets do not currently exist for refurbishment projects. As such, projects should work to new build targets where possible. A Whole Life Carbon (WLC) assessment should be used to inform early design decisions with a view to reducing embodied carbon as much as possible.

3. I am working on a building that is targeting NZC - Construction. Does this include the demolition of existing buildings?

The Framework's NZC – Construction definition currently doesn't require the demolition of existing buildings to be included within the Lifecycle Carbon Assessment (LCA) scope. However, a developer could voluntarily measure, report and disclose the associated data, with a view to then offset. This would encourage minimal demolition, which is a key component of minimising whole life carbon.

STEP 3: REDUCE OPERATIONAL ENERGY USE

4. To achieve 'net zero carbon - operational energy' does the project need to achieve any energy targets?

Yes, projects will be expected to achieve energy performance targets, which will differ according to different building types. UKGBC recommends adopting targets from CRREM, RIBA and LETI. Please see the [Levels of Performance](#) guidance document for further detail. For performance targets specifically for office buildings, please see the [Energy performance targets for offices](#) document.

5. At what stage can a new project achieve 'net zero carbon - operational energy'?

"Net zero carbon - operational energy" can only be achieved one year after practical completion, once 12 months of in-use performance data has been publicly disclosed and third party verified. Prior to this, organisations can publicise their commitment to achieving this, with wording along the lines of "Committed to achieving *Net zero carbon - operational energy*". Please see guidance on marketing net zero carbon claims [here](#).

6. What happens if an office project doesn't meet UKGBC's office energy targets, can it still claim to be 'net zero carbon - operational energy'?

Where the energy performance targets have not been achieved, a project can still claim "net zero carbon - operational energy" as long as the relevant data has been publicly disclosed along with an action plan

detailing how the targets will be achieved in subsequent years. Please see the [Energy performance targets for offices](#) document for further detail.

7. Can a project which uses fossil fuels achieve 'net zero carbon - operational energy'?

Yes, a project which uses on-site fossil fuel generation to meet its energy demand can still achieve "net zero carbon - operational energy". The importance is demonstrating an overall net zero carbon balance on a yearly basis, which can be achieved through offsetting. The claim can be made once the data has been publicly disclosed, third party verified, and net zero carbon has been achieved. However, in the longer term, projects should seek to phase out on-site fossil fuels.

8. If pursuing the 'net zero carbon - operational energy' route, does this cover just electricity and natural gas or should emissions from water and waste be included?

UKGBC defines 'operational energy' as Module B6 of EN15978 Sustainability of construction work. This is essentially just heating, lighting, appliances etc (electricity and gas) and does not include maintenance, repair, refurbishments and water use. Please see page 23 of [this document](#) for further clarity.

9. When pursuing 'net zero carbon - operational energy', does the carbon offset through PV have to be calculated over a 60-year timeframe, as per the RICS Whole Life Carbon Assessment Guidance?

There is no need to calculate the future carbon emissions of a building in order to claim NZC - Operational Energy in line with our Framework, as any claims are based on measured (i.e. as built or in-use data), not projected, information. As such, any building using solar PV to offset carbon associated with operational energy consumption would calculate the carbon offset based on the actual performance of the grid (i.e. the reported carbon intensity of electricity) that year, rather than any prospective future scenarios, such as FES. It's important to note that whilst we do not have a route for claiming NZC for whole life carbon, we do recommend that a WLC assessment is used at design stage to inform design and strategy decisions, in which calculating the likely future ability of solar PV to offset carbon is necessary.

10. The targets in UKGBC's 'Energy performance targets for offices' are defined as the net import of energy (i.e. net of on-site renewables) whereas the targets published by LETI and RIBA – and more recently, CRREM – exclude the contribution of on-site renewable generation – why is this?

This guidance document was originally published in January 2020. Given the evolving nature of research and drive to progress net zero buildings some information, as in this case, now varies from what is considered emerging best practice guidance.

There are valid arguments for both including and excluding on-site generation from EUI targets. Including the contribution of, say, electricity generation from solar PV, encourages the deployment of all potential solutions for delivering net zero, i.e. not favouring demand reduction. It also enables alignment with NABERS and DEC. Excluding it, on the other hand, ensures comparability between offices with different available roof space for PV, prioritises demand reduction, and avoids any potential double counting of the contribution of solar PV to decarbonising the wider electricity system, as well as aligning with LETI, RIBA, and now CRREM's methodologies. These discussions are technically complex, and it is not appropriate for these clarifications to go to the depth that would be necessary to properly explore.

In light of the progressing cross-industry project to deliver a UK Net Zero Carbon Buildings Standard – which will provide clarity on how EUI targets should be derived and treated for UK buildings – we at UKGBC have decided to maintain our current position, as described in the 'Energy performance targets for offices' publication, pending the publication of the Standard.

STEP 4: INCREASE RENEWABLE ENERGY SUPPLY

11. The Renewables & Offsets Guidance recommends prioritising on-site renewable energy sources, before procuring off-site renewable energy. What exactly is meant by off-site?

On-site renewable energy refers to a renewable energy system that is fitted to the building and integrated within its mechanical and electrical systems, is located next to the building on the same LV/HV network; or is connected by a private wire from an adjacent site. On the other hand, off-site refers to PPA's (without a private wire) and green tariffs. Off-site procurement routes must demonstrate additionality (i.e. comprising unsubsidised PPA's or "high quality green tariffs"), or offsetting will be required. For further details, please see p14-20 of the [Renewables & Offsets](#) guidance.

12. Is there an initial 'rule of thumb' for whether PPA's should potentially be explored?

The customer will want to consider:

- a) Whether it can make a longer term commitment in respect of the volumes it is looking to purchase (with a Back-to-Back PPA we would normally expect this to be 10-15+ years, for a Virtual PPA, we are beginning to see shorter periods of 5+ years, but the period will need to be sufficiently attractive to the generator and, if the generator is financing a new project with debt finance, it will ideally want the term of the PPA to match the term of the debt). The customer will need to have a good understanding of its energy needs and how those needs might fluctuate over time.
- b) Whether there is management-level support within its organisation (as the procurement process does involve some additional work and cost, including any legal and other advisory fees, and this is often outside the 'core' business of the customer, so will involve working with new concepts and understanding of the risks involved).
- c) Whether it has undertaken financial analysis of how it wants to structure the pricing, (e.g., fixed price, market prices with a cap and floor) bearing in mind that the PPA price covers only the cost of the electricity and the customer will still have to pay non-commodity costs as it ordinarily would via its supply contract (unlike with on-site/private wire generation).
- d) Particularly where putting in place a Back-to-Back PPA, whether its contracted licensed supplier will support the proposed approach. With a Back-to-Back PPA, the customer will need its licensed supplier to sleeve the electricity into its supply contract and this creates some additional work for the supplier (in terms of agreeing, documenting and managing these arrangements), the supplier will usually expect a certain commitment from the customer in terms of the supply period (and this will vary from supplier to supplier), and may only look at this for those customers with a significant annual energy demand (again, this varies from supplier to supplier).

For the Virtual PPA, depending on the structure that the customer wants to use (and whether it wants its licensed supplier to purchase the electricity being produced by the generator), the customer may need to discuss this with its licensed supplier, in terms of arrangements for the movement of REGOs and ensuring the Virtual PPA dovetails with the customer's supply contract.

As a general rule, we would normally only expect a Back-to-Back PPA to be attractive where the customer has a moderate to high energy demand, due to the additional work required (by all parties: generator, customer and licensed supplier) to set up these arrangements. However, with the Virtual PPA, we have seen that this can work for smaller volumes and is perhaps less complex for the customer, in terms of the contract it is entering into with the generator and so suitable for a much wider customer base.

13. The Renewables & Offsets Guidance recommends three energy suppliers that provide Additionality: Ecotricity, Good Energy or Green Energy. None of these suppliers are taking on new clients. Can UKGBC recommend other suppliers that would be in line with the Framework?

UKGBC appreciates that the recognised suppliers are rarely taking new customers in the current climate and, as such, that it's difficult to secure a high-quality tariff. It's something that will potentially be explored in more detail in the upcoming phase 2 of the renewable procurement guidance to help support members and industry in

navigating the choices, and to help stimulate the market into offering higher quality products. However, the questions on page 42 of the current guidance can be used to increase the transparency of any product procured and to increase engagement with prospective suppliers.

14. If a renewable energy supplier states that their energy is 100% REGO-backed, does this guarantee additionality?

As per the Renewables & Offsets Guidance, suppliers claiming that their energy is 100% REGO-backed does not guarantee that the power itself is renewable sourced. This is because REGO certificates can be sold separately to the power itself – known as “unbundled REGO’s” – and therefore a green electricity tariff consisting of fossil fuel-sourced power can be sold as 100% renewable electricity if 100% matched by REGO’s. To avoid this, UKGBC recommends procuring only bundled renewable power and REGO certificates, and engaging with energy suppliers to confirm the make up of their tariffs.

STEP 5: OFFSET ANY REMAINING CARBON

15. What is the carbon offset price for 2022?

The [Renewables & Offsets](#) guidance recommends following the values set in the HM Treasury's [Green Book](#). For 2021, the carbon price was £70/tCO₂. For 2022, the value is £245/tCO₂.

16. Does the UKGBC have any guidance on vintage year requirements for carbon offsets and credits to be used?

No, UKGBC does not have any specific requirements around this. Some argue that the vintage of an offset is indicative of the quality of the project, with older projects tending to be considered lower quality. As a result, it is generally recommended to purchase carbon offsets with vintages that roughly correspond to the emissions which are being offset. However, the Gold Standard, one of the carbon standards recommended in the [Renewables & Offsets](#) Guidance, states that as long as a project can align with the criteria of a reputable and legitimate offset standard, the vintage should not matter.

17. What do I do if the offset credits I purchased for a project targeting "Net Zero Carbon - Construction" have not actually completed the verification process?

The minimum reporting templates that must be filled in to verify any net zero carbon claim, available at the link below, require a registry link from the offset provider. As long as the offset provider can provide a registry link for the new credits purchased to demonstrate that they have been verified, the project can still achieve "Net Zero Carbon - Construction" and this should not impact the net zero carbon claim.

<https://www.ukgbc.org/ukgbc-work/verifying-net-zero-carbon-buildings/>

STEP 6: PUBLIC DISCLOSURE AND VERIFICATION

18. How do I verify a building as net zero carbon and ensure it is in alignment with the Framework Definition?

UKGBC has developed a verification process so that any net zero carbon claims can be verified. This requires publicly disclosing data, as per the minimum reporting templates provided by UKGBC. To clarify, a building can achieve "Net zero carbon - Construction" once the embodied carbon impacts have been measured and offset at practical completion. "Net zero carbon - Operational" can only be achieved 1 year after practical completion, once 12 months of in-use data has been collected and third-party verified. This is done on an annual basis thereafter to maintain the claim.

Further information and downloadable versions of the templates can be found at the following webpage:

<https://www.ukgbc.org/ukgbc-work/verifying-net-zero-carbon-buildings/>

19. How can UKGBC help to promote net zero carbon claims?

UKGBC is happy to help promote any members' projects which have achieved, or have committed to achieve, "Net Zero Carbon - Construction" or "Net Zero Carbon - Operational energy" on the below webpage. In order to be listed, all relevant project data will need to have been publicly disclosed and third party verified. Please see detailed guidance on marketing and communications around net zero carbon claims [here](#), as certain words such as "certified" or "validated" should not be used (see Question 3).

20. Alignment with the Framework Definition does not constitute certification or validation - is the UKGBC planning to develop a verification standard?

The UKGBC's Framework Definition provides a best practice approach to delivering net zero carbon buildings, but it is not a certification or validation. The UKGBC have been involved in the early stages of development of the [UK Net Zero Carbon Standard](#) which will act as a full verification standard to validate building performance against.

The development of the cross-industry initiative will build on the successful Framework Definition. The Standard will create a standardised model to both measure and validate a building as net zero. It will cover all building types, including new and existing, setting out performance targets to address both operational and embodied carbon emissions in line with the UK's 2035 and 2050 targets.

The Standard will set out metrics by which net zero carbon performance is evaluated, as well as performance targets, or limits, that need to be met. It is likely to cover aspects of energy use, upfront embodied, and lifecycle embodied carbon, with other metrics – such as space heating/cooling demand and peak load limits – also to be considered.

21. The minimum reporting templates state that verification should be carried out by a third-party organisation - can you please provide additional context?

With regards to what constitutes a third-party auditor – it should be said that the client and project team ultimately make the call on who is suitable. The wording in the framework (p32 of the original framework) states that: "This information should be the subject of third-party auditing to avoid self-made claims." This indicates that a party external to the client and project team could indeed complete the auditing, provided they are sufficiently independent and qualified, and have no vested interest in the audit outcome. Note that this could be someone working within the same organisation but as long as they have had no prior involvement in the specific project.

22. Your Framework Definition requires a third party to verify all project-related data. Does UKGBC recommend any specialist practices?

UKGBC is not able to recommend any consultants or members for specific pieces of work as that would cause inequity. However, the following lists of organisations have all contributed to past UKGBC pieces of work on net zero carbon buildings, so they may be a good place to start:

- <https://www.ukgbc.org/uncategorised/zerocarbon-taskgroup/>
- <https://www.ukgbc.org/ukgbc-work/renewable-energy-procurement-and-carbon-offset-guidelines/>
- <https://www.ukgbc.org/ukgbc-work/whole-life-carbon-roadmap-steering-group-and-task-groups/>

23. When verifying a project that is using performance targets from industry bodies, is any allowance made for the targets being updated and becoming more stretching over time?

UKGBC does not currently have any specific guidance or targets around embodied carbon for projects, and recommends looking at industry guidance such as that available from RIBA, LETI and CRREM. These targets are revised and strengthened over time, and in some cases they will change between the design and practical completion stages of a project. The third-party audit and verification process should verify the building in question against the targets used during the detailed design phase (i.e. the level of performance that was recommended at the time of design), or up to RIBA Stage 3.

24. What will happen to net zero carbon claims under the framework upon release of the Net Zero Carbon Buildings Verification Standard?

The verification standard mentioned previously will aim to clarify any requirements to transition to more stretching performance targets over time. This will cover how existing projects can still be verified as net zero carbon despite evolving targets.

APPENDIX A: Net Zero Carbon Buildings Resource List

Supplementary UKGBC resources

See the [Advancing Net Zero homepage](#) for the latest UKGBC updates.




UKGBC Delivery Enablers – developed to support the business case and practical delivery of net zero carbon buildings.

- Cost evaluation studies:
 - [Building the Case for Net Zero: A case study for low carbon residential developments](#)
 - [Building the Case for Net Zero: A feasibility study into the design, cost and delivery of new net zero carbon buildings](#)
- [Unlocking the Delivery of Net Zero Carbon Buildings](#)
- [Innovation Insights: Reducing operational carbon](#)
- [One Click LCA Planetary – Embodied Carbon Tool](#)

Net Zero Carbon Buildings Commitment – developed by WorldGBC, the Commitment provides a unified goal for organisations to achieve net zero carbon in operation for their owned and occupied buildings by 2030.

- [Net Zero Carbon Buildings Commitment](#)
- [Net Zero Carbon Buildings Commitment Forum](#)
- [Climate Commitment Platform](#)

Other UKGBC Resources

- [Whole Life Carbon Roadmap](#)
- [Guide to Scope 3 Reporting in Commercial Real Estate](#)
- Policy:
 - [Interactive Policy Map](#)
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 - [Commercial New Build Policy Playbook](#)
- [Advancing Net Zero](#) webinar series:
 - #1 What is a Net Zero Carbon Building?
 - #2 What are Scope 3 Emissions in the Built Environment?
 - #3 What Does Leading Action on Net Zero Look Like?
- [Taskforce on Climate-related Financial Disclosures \(TCFDs\)](#) webinar series:
 - #1 Introduction to TCFDs
 - #2 Transition risks
 - #3 Physical risks
- [Building a Just Transition to Net Zero](#)
- [Circular Economy programme](#)
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- [Course Mail – Advancing Net Zero](#)
- [Case studies](#)
- [Solutions Library](#)

Online Guides

- [Climate Framework](#)
- [Net Zero Carbon Guide](#)

Supplementary UKGBC resources

Performance Targets - developed across the industry to set ambitious energy and embodied carbon levels of performance.

- [Carbon Risk Real Estate Monitor](#)
- [LETI Climate Emergency Design Guide](#)
- [LETI Carbon Alignment](#)
- [RIBA 2030 Climate Challenge](#)

Embodied Carbon Guides - a set of guidance and tools that build understanding and enable measurement of embodied carbon for buildings.

- [Built Environment Carbon Database](#)
- [Buro Happold Embodied Carbon: Structural Sensitivity Study](#)
- [BS/EN 15978:2011 Sustainability of construction works - Assessment of environmental performance of buildings - Calculation method](#)
- [CIBSE TM65: Embodied carbon in building services: A calculation methodology](#)
- [LETI Embodied Carbon Primer](#)
- [LETI Carbon Alignment](#)
- [IStructE Lean design: 10 things to do now](#)
- [RICS Whole life carbon assessment for the built environment](#)

Practical delivery

- [Better Buildings Partnership's Green Lease Toolkit](#)
- [The Chancery Lane Project's Net Zero Toolkit](#)

Reports

- [IPCC \(2021\) AR6 Climate Change 2021: The Physical Science Basis](#)
- [World Economic Forum \(2021\), The Global Risks Report 2021](#)
- [National Grid ESO \(2021\), Future Energy Scenarios 2021](#)
- [WorldGBC \(2021\) Whole Life Carbon Vision](#)
- [Climate Change Committee \(2020\), Sixth Carbon Budget](#)
- [WorldGBC \(2019\) Bringing Embodied Carbon Upfront](#)
- [IPCC \(2018\), Special Report: Global Warming of 1.5°C](#)
- [UNFCCC \(2015\), The Paris Agreement](#)

Carbon Management/Standards

- [BBP Climate Commitment](#)
- [BBP Real Estate Environmental Benchmark](#)
- [Carbon Disclosure Project \(CDP\)](#)
- [GRESB The ESG Benchmark for Real Estate](#)
- [ISO 50001 Energy Management](#)
- [Science Based Targets initiatives](#)
- [Task Force on Climate Related Financial Disclosures \(TCFD\)](#)
- [The Climate Group](#)

