

Consultation on a Definition for Net Zero Carbon Buildings in the UK

February 2019

With thanks to the UKGBC Advancing Net Zero programme partners

Lead Partners:



Programme Partners:



Contents

Introduction.....	3
Background.....	3
Consultation Details	6
Framework Overview	8
Recommended Principles	
1. Disclosure.....	11
2. Energy Efficiency.....	14
3. Renewables.....	15
4. Offsets.....	16
5. Whole Life	18
Adoption	21

Introduction

The UK Green Building Council (UKGBC) has convened an industry task group to develop a definition for net zero carbon buildings in the UK. The aim of the project is to build consensus in the construction and property sectors on a high-level definition which will allow the whole building value chain to work towards a consistent outcome in tackling climate change.

The task group has developed initial proposals for a framework definition which are set out in this consultation paper. On behalf of the task group, we invite businesses and stakeholders from across the industry to provide feedback on these proposals in order to truly build consensus.

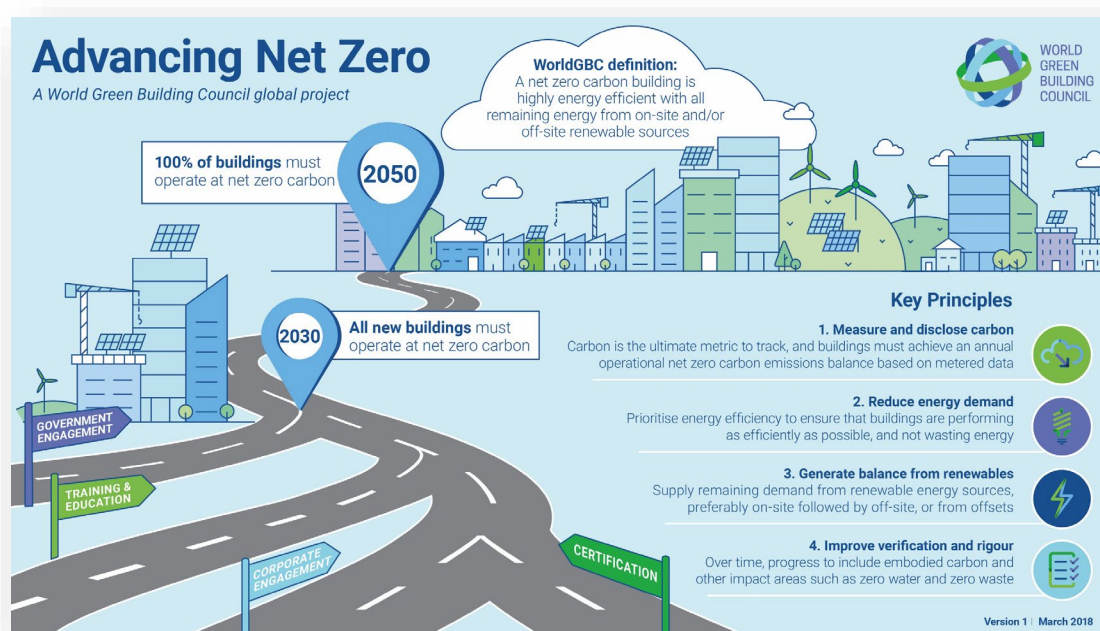
The consultation is open for feedback from **Monday 4th February until Friday 1st March**. See below for details of how to feed in your views. Once the consultation closes, the task group will finalise the definition taking into consideration the input received and will publish the final framework definition at the end of April 2019.

Background

Advancing Net Zero Campaign

The Paris Climate Agreement represented a turning point in efforts to tackle climate change with a commitment to limit global temperature rises to between 1.5 and 2 degrees. To meet this challenge, the World Green Building Council (WorldGBC) established the [Advancing Net Zero](#) Campaign in 2016 which is calling for a net zero carbon built environment. The campaign has developed high-level principles for net zero operational carbon buildings and has set targets for new buildings to meet this standard by 2030 and for all buildings to achieve this level by 2050¹.

UKGBC has launched a major new [Advancing Net Zero programme](#) to help drive this transition to a net zero carbon built environment in the UK. The programme is kindly supported by Lead Partners the Redevco Foundation and Programme Partners BAM Construct UK, Berkeley Group, Grosvenor Britain & Ireland, Hoare Lea and JLL.



¹ Definition set out in WorldGBC report *From Thousands to Billions*: <http://www.worldgbc.org/news-media/thousands-billions-coordinated-action-towards-100-net-zero-carbon-buildings-2050>

Net Zero Carbon Buildings Task Group

In October 2018, UKGBC convened an industry task group to build on the WorldGBC net zero principles and develop a more detailed definition for the UK market. The task group is being supported by the following trade associations, professional institutions and non-profit organisations that are represented on the group:

Better Buildings Partnership (BBP)	Passivhaus Trust
British Property Federation (BPF)	Renewable Energy Association (REA)
Building Services Research and Information Association (BSRIA)	Revo
Chartered Institute for Building Services Engineers (CIBSE)	Royal Institute of British Architects (RIBA)
Good Homes Alliance	Royal Institution of Chartered Surveyors (RICS)
London Energy Transformation Initiative (LETI)	Sustainable Energy Association (SEA)
	Solar Trade Association (STA)

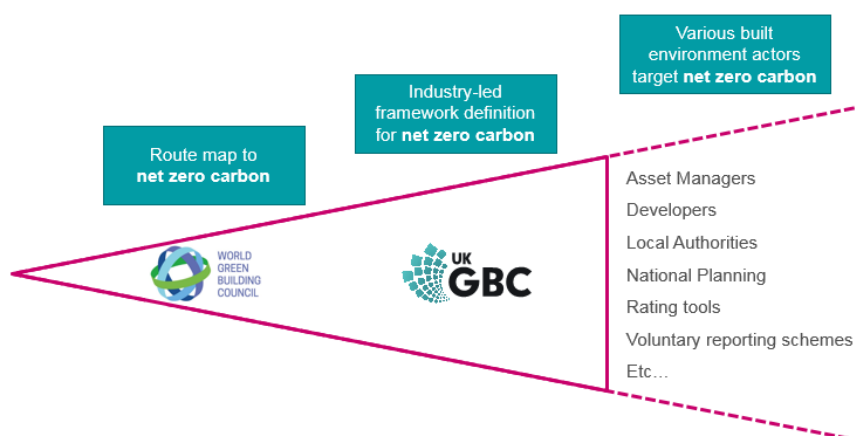
The task group participants include representatives from the following organisations:

Acclaro Advisory	Derwent London	Lendlease
AECOM	EcoEnergy Insights, UTC	Max Fordham LLP
Allies and Morrison	Elementa	Redevco
Arup	Greengage Environmental	Skanska
Atelier Ten	Grosvenor Britain & Ireland	Skidmore, Owings & Merrill LLP
BAM Construct UK	Haringey Council	Targeting Zero LLP
Berkeley Group	Hawkins Brown Architects	The Carbon Trust
Bioregional	Hoare Lea	Turley
BRE	Hodkinson Consultancy	Twinn Sustainability Innovation
BuroHappold Engineering	HTA Design LLP	Verco
Carbon Credentials Energy Services	JLL Ltd	Willmott Dixon
Cundall	Kingspan Insulation Ltd	
Currie & Brown	Landsec	

A Framework Definition for Net Zero Carbon Buildings

The task group is developing a framework definition which will set out the principles for a net zero carbon building in the UK. The framework is intended to be freely available for building developers, designers, owners and occupiers to help inform decisions and drive positive action. These different stakeholders may interpret the framework for their own purposes, but central to the framework will be industry consensus, enabling a common understanding of how net zero should be defined.

The framework should provide a consistent approach that can be integrated into voluntary reporting initiatives, building rating tools, planning requirements and, over time, into building regulations. The intention is to build upon recognised third-party verification schemes and reporting mechanisms where possible, removing the need for undergoing additional assurance processes.



Framework development towards industry integration

Task Group Proposals

This consultation document sets out the initial proposals that have been developed by the task group. It is divided into two main sections setting out the proposed framework and opportunities for market adoption.

The proposed framework

The framework is formed of a set of high-level principles, separated into an overview and points on five specific topic areas. There are questions under each principle where you may input your feedback. The principles set out the expectations for buildings seeking to achieve net zero carbon under each of these topic areas:

1. Disclosure
2. Energy Efficiency
3. Renewables
4. Offsets
5. Whole Life

Changes to the framework will be needed over time with improvements in available data, tools and techniques. The expected changes will be recommended as 'Future Developments' throughout the framework. These requirements would be voluntary in the short term, with the expectation that the definition would expand over time to include these as knowledge and understanding of these areas improves.

Given the final output of this work is intended to provide a net zero carbon building definition which can be adapted by different stakeholders in the UK, the framework definition is hereafter referred to as '*the framework*'.

Market adoption

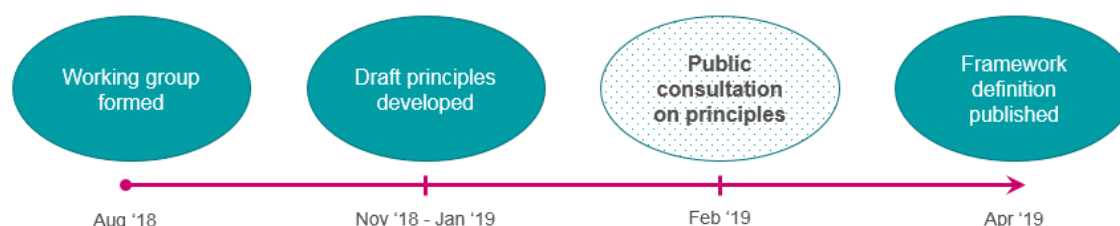
A separate section is included on the industry initiatives and policy options that could be used for implementing the framework into the market. This includes proposals on the verification route for buildings achieving net zero carbon and an overview of existing market mechanism that could help to support this. A summary of policy options also sets out how the framework could potentially align with current and future regulatory drivers, helping to further embed the framework into the market.

Consultation Details

UKGBC is seeking broad industry input on the draft principles developed by the task group in order to truly build industry consensus. This consultation paper allows you to share your feedback to refine the principles of the industry-led framework.

The consultation period is open from **Monday 4th February until Friday 1st March**.

All feedback received will be reviewed by UKGBC and used to help finalise the framework with the task group. The review of feedback and refinement of the framework will take place in March with outputs published in April.



Process for developing the framework

How to Provide Feedback

As you read this paper, you will be asked to provide feedback as either a polling response or open-text response. Feedback prompts are presented as follows:

1.2 A net zero carbon building should report annual consumption in energy (kWh) and carbon dioxide equivalent (CO₂e).

Energy consumption in kWh should be made equivalent across all fuel types (e.g. grid electricity, gas) as determined by the energy measured at the utility meter.

Carbon dioxide equivalence (CO₂e) equates greenhouse gases into a common unit of carbon dioxide. Through multiplying each greenhouse gas (GHG) by a global warming potential (GWP) factor the resultant is the equivalent amount of carbon dioxide (CO₂) from that GHG. The [UK Government's conversion factors](#) should be used.

☐ Strongly agree (5)
 ☐ Agree (4)
 ☐ Neutral/Don't know (3)
 ☐ Disagree (2)
 ☐ Strongly disagree (1)

Please explain your answer:

Please provide your feedback in as great or as little amount of detail as you like. There is no requirement to provide feedback at every prompt – you can respond to as many as you wish. Some additional text boxes will be provided where you can make general comments or suggestions about the issues covered in that section.

Your contact details and any responses you provide will not be published. Your contact details will only be used by UKGBC to provide updates on the project and your responses will only be reviewed by UKGBC staff and its representatives.

Once you finish providing feedback, please click the 'submit form' button. This will send us an email with your comments. If you are unable to submit your feedback using the text boxes or have additional documents that you would like to share with us, please save this PDF and email to karl.desai@ukgbc.org.

Questions?

If you have any additional queries or concerns around the consultation process, please email us at karl.desai@ukgbc.org and we are happy to help.

Your Details

Name

Email

Job Title

Organisation

Respondent Type

Framework Overview

Two Tier Definition

The proposed definition for net zero is divided into two tiers: **net zero operational carbon** and **net zero whole life carbon**, as per Diagram 1 below. This approach should offer flexibility and allow the framework to be relevant to all types of new and existing buildings.

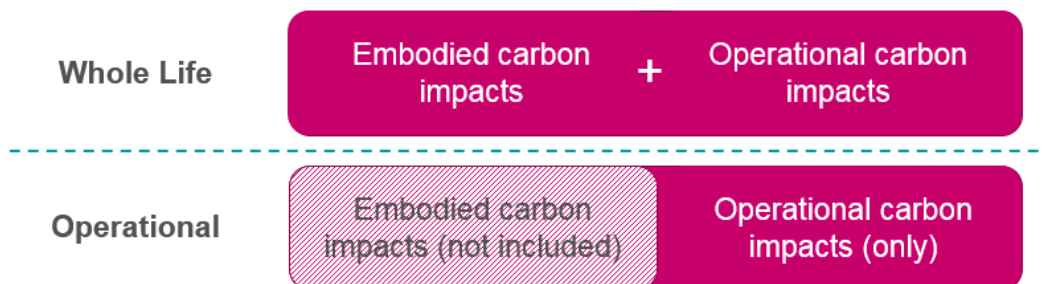


Diagram 1: Two tier definition for net zero carbon buildings

All net zero buildings would need to meet the requirements for **net zero operational carbon**, but buildings seeking to achieve **net zero whole life carbon** would also need to meet additional requirements for reducing and offsetting embodied carbon impacts. The below table sets out the principles in this paper and the relevance to each definition:

	Net zero operational carbon	Net zero whole life carbon
1. Disclosure	✓	✓
2. Energy Efficiency	✓	✓
3. Renewables	✓	✓
4. Offsets	✓	✓
5. Whole Life	✗	✓

In the long term, it is expected that the **net zero operational carbon** definition will be phased out and all buildings would be required to consider their embodied carbon impacts using the **net zero whole life carbon** definition. This will be necessary to transition to a net zero carbon built environment that is in line with the ambitions of the Paris Climate Agreement. However, this will need to be enabled by a wider transition to a net zero carbon economy as well as significant improvements in the accuracy and reporting of embodied emissions.

Do you agree with the two-tier definition?

Strongly agree (5)

Agree (4)

Neutral/Don't know (3)

Disagree (2)

Strongly disagree (1)

Please explain your answer:

Net Zero Carbon Hierarchy

The framework follows an overarching net zero carbon hierarchy, as per Diagram 2 below:

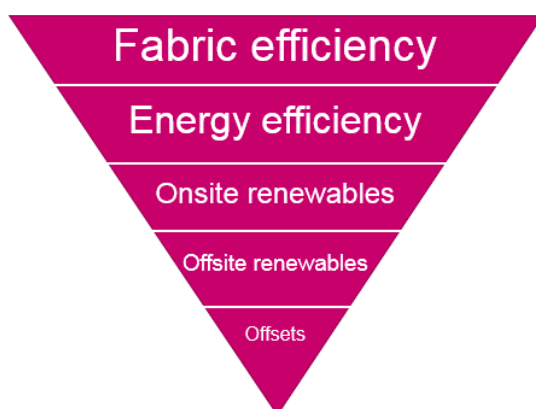


Diagram 2: The net zero carbon hierarchy

The intention of the hierarchy is to encourage demand reduction and onsite renewable energy, but also to also provide flexibility for offsite and offsetting solutions where these would be more appropriate.

Do you agree with the net zero carbon hierarchy?

Strongly agree (5)

Agree (4)

Neutral/Don't know (3)

Disagree (2)

Strongly disagree (1)

Please explain your answer:

Verification

The framework recommends that any data being used in the net zero calculation is third-party assured, in order to achieve a verified outcome. This will improve the standing of any building that achieves a net zero carbon outcome and reduce the likelihood of inaccurate self-reported claims. In the absence of a single, market-accepted means of verification, the framework points to several 'Market Mechanisms' that may be used to embed a verification process in the first instance, detailed in the 'Adoption' section of this paper.

For 'Market Mechanisms', the framework recommends that a net zero carbon building outcome should be achieved either through a third-party verification scheme or audit process. The scheme used will determine the building's reporting scope and boundaries. This should be clearly disclosed e.g. 'Net Zero Carbon Operational for Whole Building via NABERS'.

Using this approach enables flexibility in the pathway chosen to achieve a net zero carbon building. Additional benefits of this approach include:

- Reduces duplicated effort,
- Builds on existing practices,
- Enables flexibility in the scheme chosen, and
- Provides sector and building-type specific guidance.

The framework will increase demand for verification schemes that address the constituent principles. This may, in turn, lead to the development of a new verification scheme responsible for verifying net zero carbon buildings in the UK. For existing schemes, there may be additional requirements in order to demonstrate the net zero carbon outcome. This 'gap analysis' may be outlined over time, in partnership with the scheme operator e.g. the net zero carbon building framework + NABERS addendum.

It is acknowledged that the varying reporting scopes and boundaries of different verification schemes will reduce comparability between net zero carbon buildings. However, in the absence of a single market-accepted verification scheme, this is deemed currently acceptable.

Do you agree with the principles set out for verification?

Strongly agree (5)

Agree (4)

Neutral/Don't know (3)

Disagree (2)

Strongly disagree (1)

Please explain your answer:

Please see the 'Adoption' section of this paper for additional detail on 'Market Mechanisms' and 'Policy Opportunities'.

1. Disclosure – recommended principles

1.1 A net zero *operational* carbon building should be defined as:

“When the amount of carbon dioxide emissions associated with a building’s operational energy on an annual basis is zero or negative. Using WorldGBC’s definition, a net zero operational carbon building is highly energy efficient and fully powered from on-site and/or off-site renewable energy sources and offsets.”

This has been adapted from the WorldGBC’s globally-accepted definition for a net zero carbon building. Assessing a building’s operational carbon emissions over an entire year considers seasonal variances in energy supply and demand.

Additionally, reporting on an annual basis for in-use performance provides a robust mechanism for verification, rather than modelled or predicted energy use. Currently, there is a lack of third-party verification schemes for in-use performance in the UK – the framework will help drive demand for these.

Please see sections ‘3. Renewables’ and ‘4. Offset’ in this paper for additional detail.

*Please see principle 5.1 for the net zero **whole life** carbon building definition.*

Strongly agree (5)

Agree (4)

Neutral/Don’t know (3)

Disagree (2)

Strongly disagree (1)

Please explain your answer:

1.2 A net zero carbon building should report annual consumption in energy (kWh) and carbon dioxide equivalent (CO₂e).

Energy consumption in kWh should be made equivalent across all fuel types (e.g. grid electricity, gas) as determined by the energy measured at the utility meter.

Carbon dioxide equivalence (CO₂e) equates greenhouse gases into a common unit of carbon dioxide. Through multiplying each greenhouse gas (GHG) by a global warming potential (GWP) factor the resultant is the equivalent amount of carbon dioxide (CO₂) from that GHG. The UK Government’s conversion factors² should be used.

Strongly agree (5)

Agree (4)

Neutral/Don’t know (3)

Disagree (2)

Strongly disagree (1)

Please explain your answer:

1.3 The annual net zero carbon calculation should be broken down into the following:

- Renewable –onsite (generated and exported) and offsite (imported)
- Onsite fossil fuel consumption
- Offsets

Renewable energy generated onsite and imported from offsite should each be disclosed annually. The definition of renewable energy should be determined by existing frameworks, which should be clearly disclosed.

Onsite fossil fuel based power generation may be required e.g. a back-up generator. In these cases, the use of these fuels should be estimated at design stage and in-use generation disclosed annually. The

² <https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2018>

energy generation should be recorded as energy consumption attributed to the building and equivalent carbon emissions should be offset.

Over time, the framework should develop to exclude any form of fossil fuel based power generation, in line with the recommendations of the IPCC to phase out these types of fuels.

Carbon offsets represent the least attractive measure on the net zero carbon hierarchy for achieving a net zero carbon building. Therefore, the contribution of carbon offsets should be reported separately for comparability across buildings.

This breakdown within the annual reporting aligns with other disclosure requirements in the framework and provides visibility about the in-use performance of the building. This will be used to determine the building's annual net zero carbon calculations. Please see Diagram 3 below.

Strongly agree (5) Agree (4) Neutral/Don't know (3) Disagree (2) Strongly disagree (1)

Please explain your answer:

Source	Energy (kWh)	Carbon (CO ₂ e)
Energy ¹ (grid electricity, gas, other)	xx	+xx
Onsite fossil fuel	xx	+xx
Renewable – offsite (imported)	xx	N/A
Renewable – onsite ² (generated)	xx	N/A
Renewable – onsite (exported)	-xx ³	-xx ⁴
Offsets	N/A	-xx
Building Total	xx	0 (net zero carbon)

¹ include all energy consumed except from onsite fossil fuels (separate)

² include all onsite energy generation – used on site and exported

³ any energy generated onsite that is exported will be subtracted for the building's total energy consumption

⁴ based on delivered savings relative to the carbon intensity of the electricity grid

Diagram 3: Net zero carbon calculation - please note this is an illustrative example

Future Development

1.4 Over time, the level of reporting annual energy consumption should be increased to cover:

- Heating and cooling energy consumption (separated)
- Regulated energy consumption (separated by end use)
- Unregulated energy consumption

This improved level of reporting will increase the understanding of how a building is operating and where energy savings can be realised.

The ability to report at these levels is dependent on specific metering and data collection provisions being in place. It is acknowledged that this provision is limited within the current building stock and therefore these principles may be introduced over time.

Appropriate metering and data collection provisions should be introduced (i.e. for new buildings/fitouts or major renovations) to enable the achievement of a net zero carbon outcome in the future e.g. 'net zero carbon ready fitout'.

Strongly agree (5)

Agree (4)

Neutral/Don't know (3)

Disagree (2)

Strongly disagree (1)

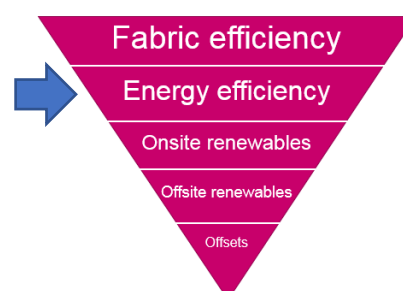
Please explain your answer:

For future development of the net zero operational carbon outcome, please see recommendation 5.6 under the '5. Whole Life' section of this paper.

2. Energy Efficiency – recommended principles

2.1 Energy efficiency should be encouraged as part of the net zero carbon hierarchy:

Following a hierarchy would offer flexibility in the approach to net zero carbon and allow the most cost-effective route to be taken for a particular building or site. New buildings already have minimum energy efficiency requirements from building regulations, and in some areas through supplementary local planning policies. More extensive and accurate data will be needed to develop a set of minimum standards based on in-use performance for all types of existing buildings.



Strongly agree (5) Agree (4) Neutral/Don't know (3) Disagree (2) Strongly disagree (1)

Please explain your answer:

2.2 Indoor air quality and overheating should not have specific requirements included in the framework.

Setting requirements around these areas was considered but rejected in order to maintain a strict focus on energy and carbon. Good quality design would nonetheless require the appropriate consideration of such factors alongside this framework.

Strongly agree (5) Agree (4) Neutral/Don't know (3) Disagree (2) Strongly disagree (1)

Please explain your answer:

Future Development

2.3 Minimum levels of energy efficiency should be developed for the net zero carbon framework.

Setting minimum energy efficiency standards for net zero carbon buildings would provide the strongest driver towards energy demand reduction. This would also potentially encourage a consistent approach to measuring in-use energy performance across different types of buildings. But extensive further data and research are required for levels to be set for new build and existing buildings, and across different use types.

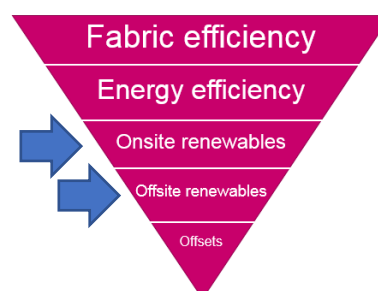
Strongly agree (5) Agree (4) Neutral/Don't know (3) Disagree (2) Strongly disagree (1)

Please explain your answer:

3. Renewables – recommended principles

3.1 Net zero carbon buildings should work towards an energy hierarchy with a preference for onsite and then offsite renewable generation:

The net zero carbon hierarchy prioritises demand reduction followed by onsite renewable energy and then offsite solutions. Offsite renewable energy procurement would include Power Purchase Agreements (PPAs), preferably where these would provide additionality in renewable generation. Assurances over the retirement of renewable energy credits should be provided to avoid double-counting.



Strongly agree (5) Agree (4) Neutral/Don't know (3) Disagree (2) Strongly disagree (1)

Please explain your answer:

3.2 The net export of onsite renewable energy generation can be used to offset building emissions.

Buildings that can demonstrate a net export of renewable energy annually can use this to offset other building emissions, for example any embodied impacts or on-site fossil-fuel power generation. The net exported energy should be converted to a carbon saving based on the carbon intensity of the electricity grid and be used to offset an equivalent carbon impact.

Strongly agree (5) Agree (4) Neutral/Don't know (3) Disagree (2) Strongly disagree (1)

Please explain your answer:

3.3 No minimum onsite renewable energy generation requirements should be included in the framework.

All opportunities for on-site renewable generation should be considered and incorporated wherever feasible. But it is not recommended that the framework include specific targets for minimum renewable energy generation on-site. This will allow a flexible approach to renewable energy solutions based on an evaluation of each specific building or site.

Strongly agree (5) Agree (4) Neutral/Don't know (3) Disagree (2) Strongly disagree (1)

Please explain your answer:

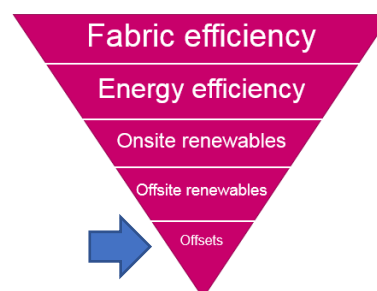
Future Development

None recommended.

4. Offsets – recommended principles

4.1 Offsets should be used as the final option in the net zero carbon hierarchy:

If demand reduction and renewable energy solutions are not feasible for a building to achieve net zero carbon, offsets can be utilised to cover the remaining carbon impacts.



Strongly agree (5)

Agree (4)

Neutral/Don't know (3)

Disagree (2)

Strongly disagree (1)

Please explain your answer:

4.2 Offsets for operational emissions should either be procured directly, or via recognised existing offsetting frameworks, on an annual basis.

Operational energy emissions should be disclosed annually, and the verification of offsets should align with this frequency. The use of direct procurement or offsetting frameworks should both include verification processes which demonstrate that offsetting solutions have delivered required carbon savings. This should help to prioritise additionality and avoid double-counting of emissions reductions.

The type and number of offsets procured, and the frameworks utilised should be disclosed annually (also see principle 1.3).

Strongly agree (5)

Agree (4)

Neutral/Don't know (3)

Disagree (2)

Strongly disagree (1)

Please explain your answer:

4.3 Embodied carbon can be offset either through the procurement of equivalent offsets at the point of completion and/or utilising the net export of on-site renewable energy during operation.

To cover the embodied impacts from new construction or a major renovation, there are two available offset routes:

- A. A one-off payment can be made at the point of completion on direct offset procurement or via an existing offset framework for an equivalent number of carbon credits; or
- B. The net export of on-site renewable energy generation can also be used to offset embodied impacts during operation, based on the delivered savings relative to the carbon intensity of the electricity grid. Annual disclosure of net energy exports is required to ensure that the expected level of offsetting is achieved.

These two offset routes can be used together, and the intended approach should be disclosed.

Strongly agree (5)

Agree (4)

Neutral/Don't know (3)

Disagree (2)

Strongly disagree (1)

Please explain your answer:

Future Development

None recommended.

5. Whole Life – recommended principles

5.1 A net zero *whole life* carbon building should be defined as:

“When the amount of carbon emissions associated with a building’s embodied AND operational impacts over the life of the building, including its disposal, are zero or negative.”

This has been adapted from the WGBC's globally-accepted definition for net zero *operational* carbon building definition. This definition includes the whole life impacts of a building, beyond operational energy.

To assess whether a building is a ‘net zero whole life carbon building’, Modules A, B, C and D (of EN 15978) should all be assessed at the design stage. Module D implies potential future reuse (circular) benefits, and although these are assessed separately, they are relevant to a net zero calculation.

A whole life carbon assessment recognises that embodied and operational emissions are interlinked. Actions with operational carbon benefits may also have embodied carbon costs. Considering these together means that a building’s whole life carbon impacts can be mitigated most efficiently.

*Please see principle 1.1 for the net zero **operational** carbon building definition.*

Strongly agree (5)

Agree (4)

Neutral/Don’t know (3)

Disagree (2)

Strongly disagree (1)

Please explain your answer:

5.2 Carbon impacts for the construction of the building (either new build or major renovation) should be reported and offset at the point of practical completion – Modules A1 to A5 of EN15978.

The LCA for Modules A, B, C and D should be undertaken in line with EN 15978 *Sustainability of construction works – assessment of environmental performance of buildings*, with detailed guidance from the RICS Professional Statement *Whole life carbon assessment for the built environment*.³ The life cycle impacts for Modules A1 to A5 should be reported in carbon dioxide equivalent (CO₂e) and offset. See Diagram 4 below.

Strongly agree (5)

Agree (4)

Neutral/Don’t know (3)

Disagree (2)

Strongly disagree (1)

Please explain your answer:

5.3 Carbon impacts for the Use, Maintenance, Repair, Refurbishment and Replacement stages (Modules B1 to B5 of EN 15978) together with the operational carbon impacts (Module B6) should be reported annually and offset for a net zero whole life carbon building.

Whilst the initial LCA might be undertaken for the building, in-use performance for these lifecycle stages should be reported and offset on an annual basis. This will verify both the operational and the embodied emissions in use performance over the initial design stage models. Additionally, this will allow the industry to gain a holistic understanding of a building’s complete carbon impacts. See Diagram 4 below.

³ RICS ‘Whole Life Carbon Assessment for the Built Environment’: <https://www.rics.org/uk/upholding-professional-standards/sector-standards/building-surveying/whole-life-carbon-assessment-for-the-built-environment/>

Strongly agree (5)

Agree (4)

Neutral/Don't know (3)

Disagree (2)

Strongly disagree (1)

Please explain your answer:

5.4 Carbon impacts at the end of life, including deconstruction, demolition, waste processing and disposal will be assessed and offset when this occurs.

These are EN15978 Modules C1-C4. At this stage Module D (Reuse, recovery, and recycling potential) can be assessed and offset against Modules C1-C4.

Strongly agree (5)

Agree (4)

Neutral/Don't know (3)

Disagree (2)

Strongly disagree (1)

Please explain your answer:

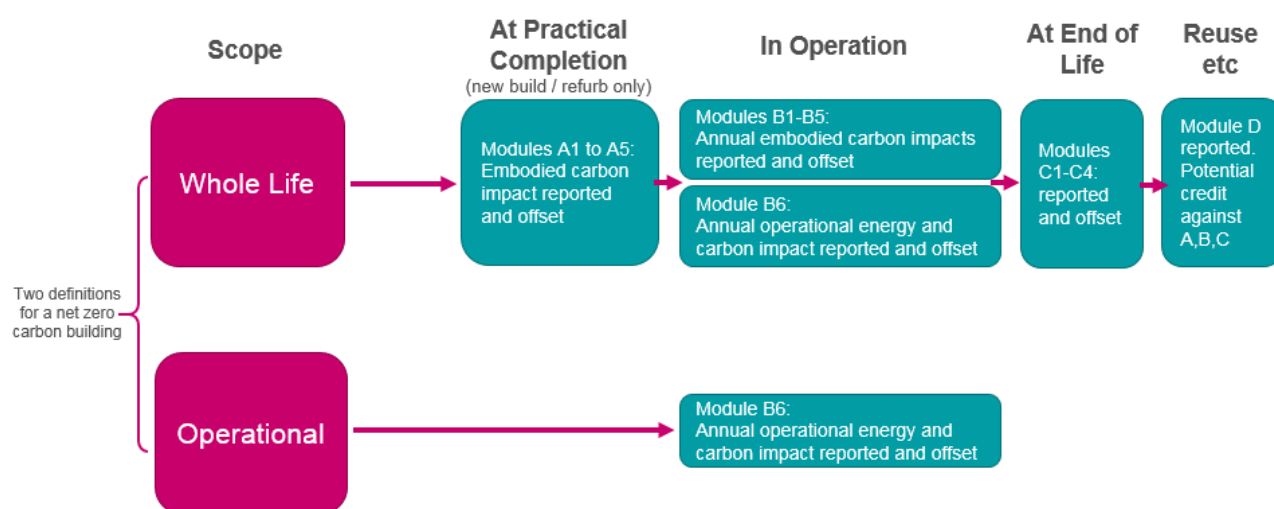


Diagram 4: Reporting and offset requirements

5.5 New buildings or buildings undergoing major refurbishment should target a net zero whole life carbon achievement. A building undergoing normal operations can target either a net zero operational or net zero whole life carbon achievement.

	Net zero operational carbon	Net zero whole life carbon
New building or major refurbishment	✗	✓
New building or major refurbishment – after transition period	✓	✓
Existing building – under normal operation	✓	✓

For new buildings and major renovations, understanding the whole life carbon impacts at the design stage improves delivery and all subsequent life cycle stages. A transition period should be in place for any new buildings to achieve a net zero whole life carbon outcome, to avoid new buildings targeting a net zero operational carbon outcome only.

For existing buildings undergoing normal operation, annual embodied emissions from maintenance, repair, replacement, waste and refrigerant can optionally be assessed alongside operational emissions and offset to achieve a net zero whole life carbon outcome. Carbon impacts from construction (Modules A1 to A5) do not

need to be considered for existing buildings, as the opportunity to minimise these impacts are likely to have passed.

Strongly agree (5)

Agree (4)

Neutral/Don't know (3)

Disagree (2)

Strongly disagree (1)

Please explain your answer:

For offsetting whole life carbon impacts, please see recommendation 4.3 under the '4. Offsets' section of this paper.

Future Development

5.6 Over time, the net zero operational carbon definition should be phased out to ensure a building's total carbon impacts, including embodied, are measured and reported upon.

The operation of a building also has carbon impacts outside of energy, including refrigerant use, repair, replacement, maintenance and refurbishment. Over time, these carbon impacts should be integrated into the framework, by only having a net zero whole life carbon definition. See Diagram 4 above.

Strongly agree (5)

Agree (4)

Neutral/Don't know (3)

Disagree (2)

Strongly disagree (1)

Please explain your answer:

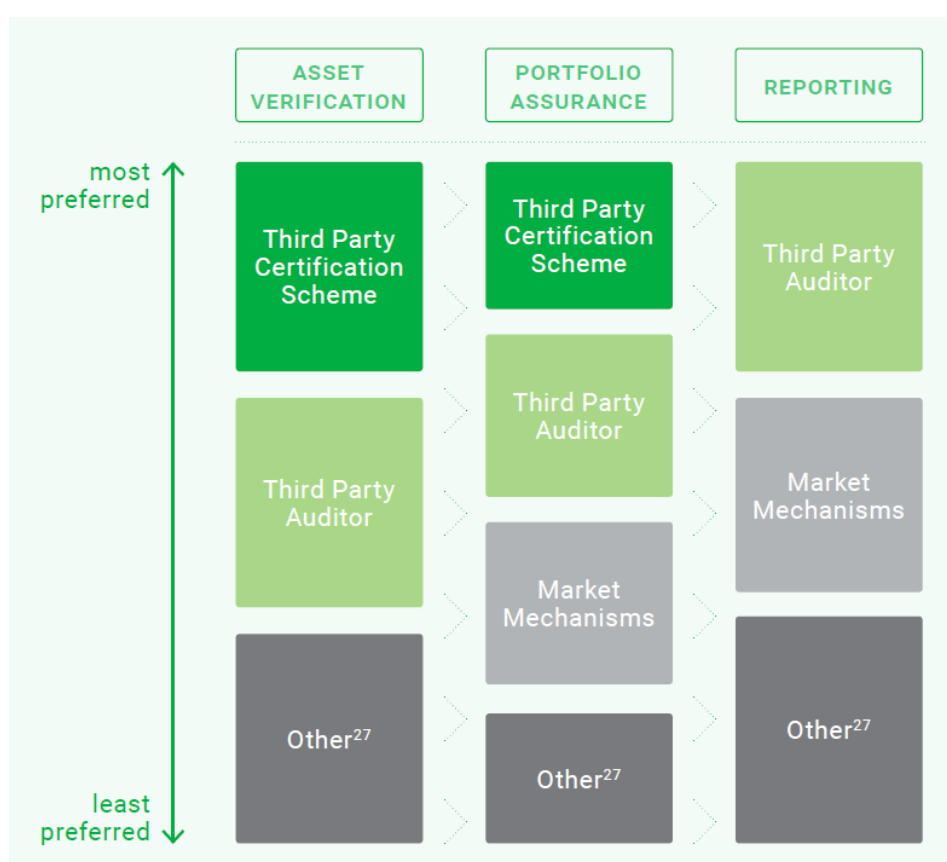
Adoption

Verification

The aim of the framework is to catalyse the uptake of net zero carbon buildings in the UK. The verification of a net zero carbon building should take place through existing (or new) third-party schemes. Using existing third-party schemes is preferred as this reduces barriers to entry for buildings seeking to demonstrate the achievement of a net zero carbon building.

This framework sets out the principles that should be followed to achieve a net zero carbon building, however does not prescribe any third-party verification schemes. The framework will increase demand for verification schemes (new or existing) that address the principles in this framework.

The diagram below outlines the proposed approach to verification. There is a preference to apply third-party verification schemes over bespoke ("other") approaches to achieve verification. This will help build the industry's capacity to verify net zero carbon buildings.



Adapted from 'WorldGBC Net Zero Carbon Buildings Commitment', WGBC 2018

Strongly agree (5)

Agree (4)

Neutral/Don't know (3)

Disagree (2)

Strongly disagree (1)

Please explain your answer:

Market Mechanisms

The below table outlines current third-party schemes which are proposed to be used to verify net zero carbon buildings. There may be requirements over and above those in the current scheme to demonstrate equivalency with the framework. These may be detailed in partnership with the scheme operator in future.

Overarching Net Zero Carbon Buildings Framework Definition		
Verification Route	Operational	Whole Life
All	<ul style="list-style-type: none"> BREEAM In-Use Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard. ISO 14064-1:2018 Greenhouse gases - Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals Third-party audit process 	<ul style="list-style-type: none"> BREEAM New Construction Third-party audit process
All - portfolios	<ul style="list-style-type: none"> CDP GRESB 	N/A
Office	<ul style="list-style-type: none"> DECs (whole building only) NABERS / DfP (tenancy, base building or whole building) BBP REEB Passivhaus 	Guidance only, not verification: <ul style="list-style-type: none"> RICS Professional Statement RIBA Guidance
Industrial	<ul style="list-style-type: none"> Passivhaus 	
Public Buildings	<ul style="list-style-type: none"> DECs Passivhaus 	
Residential	<ul style="list-style-type: none"> EnergieSprong HQM Passivhaus / Passivhaus Plus 	
Retail	<ul style="list-style-type: none"> Passivhaus 	

Strongly agree (5)

Agree (4)

Neutral/Don't know (3)

Disagree (2)

Strongly disagree (1)

Please explain your answer:

What other mechanisms might be used to increase the uptake for net zero carbon buildings?

Policy Opportunities

Voluntary use by the industry is likely to be the primary route for adoption of the framework in the short term. But there will clearly be a role for policy and regulation if we are to meet the UK's climate change commitments and transition towards all new and existing buildings being net zero carbon.

The task group will not be developing specific policy recommendations to publish alongside the framework, but it will nonetheless be important for the project outputs to acknowledge the role that policy will need to play in adoption. This will include setting out some potential policy options which could be explored in detail in the future.

The tables below set out some of the existing and potential policy levers at a national and local level that could align with the net zero carbon buildings framework. The various policy mechanisms have been set out against the five areas of the framework (disclosure, energy efficiency etc.) to indicate their relevance to encouraging the specific outcomes of the framework. The 'Potential' policy options are suggested future regulatory requirements and further work would be needed on the detail for these to become clear policy recommendations.

We invite feedback on the proposed mechanisms below and comments on any additional relevant policy options that are not highlighted here.

National policy options		
	Existing policy	Potential new policy
Disclosure	<ul style="list-style-type: none"> Display energy certificates for public buildings 	<ul style="list-style-type: none"> Requirements in Building Regulations for reporting of operational performance of new buildings e.g. sampling of buildings for compliance Mandatory disclosure of operational energy performance for all commercial buildings Use of smart meter real-time data to inform the ratings of Energy Performance Certificates
Energy Efficiency	<ul style="list-style-type: none"> Target Energy Efficiency Rate in Building Regulations Part L Minimum energy efficiency standards for private rented properties Clean Growth Grand Challenge Mission to halve energy use from new buildings by 2030 	<ul style="list-style-type: none"> Alignment of energy efficiency standards in Building Regulations Part L with minimum levels developed in future for net zero carbon Transition to operational energy ratings as the basis of minimum energy efficiency standards for commercial rented properties
Renewables	<ul style="list-style-type: none"> Target Emissions Rate in Building Regulations Part L National Planning Policy Framework (NPPF) 2018 Planning Policy Guidance (PPG) on Climate Change 	<ul style="list-style-type: none"> Recognition of offsite renewable energy procurement as carbon abatement measure within Building Regulations Updates to NPPF and new PPG on Climate Change and Renewable Energy could require 'net zero' for all new developments
Offsetting	<ul style="list-style-type: none"> Infrastructure Act 2015 provision on allowable solutions mechanism 	<ul style="list-style-type: none"> National offset framework or fund in line with Infrastructure Act provisions
Whole Life		<ul style="list-style-type: none"> Requirement through Building Regulations for whole life carbon assessments of new buildings and major renovations Requirement through NPPF for whole life carbon assessments of new buildings and major renovations

Please provide your feedback on the above proposed mechanisms:

Local policy options		
	Existing policy	Potential new policy
Disclosure	<ul style="list-style-type: none"> Local Plan requirements for monitoring and reporting energy performance in operation of major new developments: <ul style="list-style-type: none"> GLA Draft London Plan: <i>requirement for first five years of operation</i> 	<ul style="list-style-type: none"> Extension of Local Plan requirements for monitoring and reporting energy performance to all new developments
Energy Efficiency	<ul style="list-style-type: none"> Local Plan requirements for carbon and energy performance above Building Regulations: <ul style="list-style-type: none"> GLA Draft London Plan, Reading Draft Local Plan: <i>35% carbon reduction including 10% from energy efficiency</i> Ipswich, Cambridge, Brighton and Hove: <i>Adopted Local Plans requiring 19% carbon reduction over Part L 2013.</i> Additional emerging local plans⁴ 	<ul style="list-style-type: none"> Tightening of Local Plan requirements for energy efficiency to align with future minimum standards for net zero carbon framework Local Plan requirements for compliance with minimum energy efficiency standards based on in-use performance
Renewables	<ul style="list-style-type: none"> Local Plan requirements for carbon and energy performance above Building Regulations (examples as above) Adopted and draft local plans requiring a percentage of renewable energy onsite (Merton Rule), ranging from 10%-20%: <ul style="list-style-type: none"> Milton Keynes draft Local Plan Greater Manchester (GM) Draft Spatial Framework Oxford draft Local Plan 	<ul style="list-style-type: none"> Local Plan requirements for minimum onsite renewable energy Local Plan requirements for offsite renewable energy solutions as a route to achieving zero carbon where onsite generation is not feasible
Offsetting	<ul style="list-style-type: none"> Local Plan requirement for new developments to be 'zero carbon' or 'net zero' and offset funds: <ul style="list-style-type: none"> GLA Draft London Plan Reading draft Local Plan Milton Keynes draft Local Plan Greater Manchester (GM) Draft Spatial Framework (by 2028) Oxford (by 2030) 	<ul style="list-style-type: none"> Consistent national framework for local offset funds to improve consistency and transparency
Whole life carbon	<ul style="list-style-type: none"> Local Plan requirements for modelling of whole life carbon impacts for major new developments: <ul style="list-style-type: none"> GLA Draft London Plan Greater Manchester (GM) Draft Spatial Framework 	<ul style="list-style-type: none"> Extension of Local Plan requirement for modelling of whole life carbon impacts to all new developments Extension of Local Plan 'zero carbon' requirements to cover whole life carbon, including offsetting of these impacts.

Please provide your feedback on the above proposed mechanisms:

⁴ See UKGBC Planning Policy Playbook for examples of relevant emerging Local Plans: <https://www.ukgbc.org/ukgbc-work/sustainability-standards-new-homes/>

Thank you

Thank you for reviewing this consultation paper and providing your feedback.

Please visit the UKGBC's [Advancing Net Zero webpage](#) to stay updated on this project.