Reading Borough Council:

Net zero carbon local plan policy support – draft TER-based fallback policies as an option to replace EUI-based policies on the Inspector's request

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Version 1

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Glossary of terms and acronyms

BREDEM	Buildings Research Establishment Domestic Energy Model. A methodology to estimate the energy use and fuel needs of a home based on its characteristics. BREDEM is the basis for SAP, but BREDEM retains more flexibility by allowing the user to tailor some assumptions made in the calculations to better reflect the project.
Carbon, or carbon emissions	Short for 'carbon dioxide emissions' but can also include several other gases with a climate-changing effect, that are emitted to the atmosphere from human activities (see 'GHG', below).
Carbon budget	Amount of greenhouse gas that can be emitted by an individual, organisation or geographic area. Usually set to reflect a 'fair share' of the global amount that can be emitted before reaching a level of atmospheric carbon that causes severely harmful climate change.
Carbon intensity/ carbon factors	A measure of how much carbon was emitted to produce and distribute each kWh of grid energy at a certain point in time. For electricity, this has been falling as coal-fired power stations have been phased out over years. It also varies on an hourly basis: at times of high renewable energy generation, the carbon intensity is lower than at points where gas-fired electricity dominates the generation mix.
CIBSE	Chartered Institution of Building Services Engineers.
CIL	Community Infrastructure Levy. A charge that the local authority can levy on developers to provide necessary infrastructure.
Climate change adaptation	Adaptation to climate change – acting to make human or natural systems better prepared to continue functioning throughout the impacts of the climate change that is occurring, such as preparedness for heatwaves, droughts or heavier peak rainfall.
Climate change mitigation	Mitigation of climate change means acting to reduce the degree of impact that human activity has in changing the climate. This means reducing the total amount of greenhouse gas that is emitted or increasing the amount of that is sequestered.
CO_2	Carbon dioxide. Often shortened to 'carbon'.
CO_2e	Carbon dioxide equivalent. The sum of a mixture of gases, in terms of their climate-changing impact in a 100-year period expressed as the amount of CO_2 that would have the same effect. Often shortened to 'carbon'.
Embodied carbon	Carbon that was emitted during the production, transport and assembly of a building, infrastructure, vehicle or other product before the product is in use, and also emissions from maintenance/refurbishment across its use period and end of life demolition/disposal. As opposed to 'operational carbon' which is emitted due to energy use when operating the building / infrastructure / vehicle / other product.
EUI	Energy Use Intensity, a measure of how much energy a building uses per square metre of floor space. Expressed in kilowatt-hours per square metre of floor space per year.
FHS / FBS	Future Homes Standard / Future Buildings Standard. These are updated versions of Part L of Building Regulations, expected to be implemented from 2025.
GHG	Greenhouse gas (CO_2 and several other gases: methane, nitrogen dioxide, and fluorinated refrigerant gases). Often collectively referred to as 'carbon'; see above.
ICROA	International Carbon Reduction and Offset Alliance.
ICVCM	Integrity Council for Voluntary Carbon Markets.
IPCC	Intergovernmental Panel on Climate Change. An international entity set up via the United Nations, of which the UK is one of the 195 member states. The IPCC's role is to assess the consensus within the global scientific studies on climate change, including the extent and effects of climate change and future predictions about how much climate change will occur depending on how much greenhouse gas is emitted.
LETI	Low Energy Transformation Initiative. A coalition of built environment professionals working to establish and achieve the energy performance needed for net zero.
LPA	Local Planning Authority.
m^2	Square metre. In this context, m^2 refers to building floor space in most cases, but sometimes refers to building footprint area.
MVHR	Mechanical Ventilation with Heat Recovery
NPPF	National Planning Policy Framework. A central government document laying out how the planning system should function, including plan-making and decisions.
Operational carbon	Greenhouse gas emissions that occur due to operation of the building / infrastructure / vehicle / other product. Primarily associated with energy use.
Part L	Building regulations section that sets basic legal requirements regarding buildings' energy and CO_2 emissions, for a certain scope of buildings' energy use.
Performance gap	The difference between the amount of energy a building is predicted to use during design, versus the actual amount of energy it uses. The gap is due to poor prediction methodologies, errors in construction, and unexpected building user behaviour.
PV	Photovoltaics: solar panels that generate electricity.
PHPP	Passivhaus Planning Package: A tool to accurately predict a building's energy use. It is used to design buildings that seek Passivhaus certification, but can equally be used to improve any building design process even without pursuing certification.

Regulated energy or carbon	Carbon emissions associated with energy uses that are 'regulated' by Building Regulations Part L. This covers permanent energy uses in the building, (space heating, space cooling hot water, fixed lighting, ventilation, fans, and pumps).
RIBA	Royal Institute of British Architects.
SAP	Standard Assessment Procedure – the national calculation method for residential buildings' energy and carbon, used to satisfy building regulations Part L. SAP is based on the BREDEM model, but with fixed assumptions and thus less flexibility.
SAP Appendix L	An appendix to the SAP (explained above) which estimates unregulated energy use, whereas the main body of SAP estimates only regulated energy use. Appendix L was created when it was anticipated that national regulations would require fully zero carbon homes from 2016, which in fact never was enacted. As Appendix L has not since been updated, it overestimates unregulated energy demand because it was based on older data about the energy efficiency of household appliances.
SBEM	Simplified Buildings Energy Model – the national calculation method for non-residential buildings' energy and carbon, used to satisfy building regulations Part L.
Section 106	A section of the Town & Country Planning Act 1990. Section 106 of that Act enables the Local Planning Authority to require contributions from developers towards projects that are necessary to mitigate the impact of that development. In 'net zero carbon' policy this has often been used to raise carbon offset funds where a new development is technically unable to reach net zero on site.
Sequestration	Removal and storage of greenhouse gases from the atmosphere, to prevent their harmful climate-changing role. Currently only achieved at scale by trees/plants/soil.
SHD or Space heat demand	A measure of the amount of energy needed to heat a building to a comfortable temperature, as a result of the building's design and occupancy. Expressed in in kilowatt-hours per square metre of floor space per year.
TER	Target Emission Rate – a limit set by Part L of building regulations on CO_2 emissions per square metre of floor space, from regulated energy use in the building.
TPER	Target Primary Energy Rate – limit set by Part L of building regulations on 'primary energy' use per square metre of floor space. Unlike metered energy, 'primary energy' takes into account energy lost to inefficiencies during power generation and distribution.
TFEE	Target Fabric Energy Efficiency – limit on space heat energy demand per square metre of floor space, set by Part L of building regulations. Based only on fabric; not affected by building services like heating system, lighting, ventilation.
TM54	A method to accurately calculate buildings' energy use. Devised by CIBSE (as above).
UKNZCBS	UK Net Zero Carbon Buildings Standard. A voluntary standard devised by a coalition of all the major standard-setting organisations in the UK buildings industry. It sets targets for operational energy use, space heat demand, renewable energy, and embodied carbon, among other topics. Its targets are differentiated for new build, existing building retrofit, building type, and year. Its name reflects that it would make buildings' energy performance compatible with the UK's carbon reduction trajectory to net zero 2050, but please note that it does not necessarily make a building net zero carbon in itself simply by meeting the targets that are set within the standard.
Unregulated energy or carbon	Carbon associated with energy use in a building or development but which is not covered by Building Regulations Part L. Includes plug-in appliances, lifts, escalators, external lighting, and any other use not covered by Part L.
Up-front embodied carbon	(First, see 'embodied carbon') All of the embodied carbon emissions that occur up to the point of completion of a building, piece of infrastructure, or other product.
Whole-life carbon	The total greenhouse gas emissions that are caused by the creation of a new building (from material extraction to completion of the building), the entire period of its existence (including energy use, water use, and maintenance/refurbishment) and its eventual demolition. 'Whole-life embodied carbon' refers to all of the above excluding the emissions associated with operational energy use and water use.
WMS (for example, WMS2023)	Written Ministerial Statement. A statement of national policy made by a minister in writing. These can be part of the body of national policy with which Local Plan-making is expected to be broadly consistent. Where a number is attached, e.g. "WMS2023", this relates to the year in which a particular WMS was made.
ZEV mandate	Zero Emissions Vehicle mandate. A piece of national legal regulation that requires a certain proportion of new vehicles sold to have zero tailpipe emissions by certain dates (reaching 100% in 2035).

Introduction

Purpose of this document

1. This document is provided to Reading Borough Council (RBC) in response to a request to support enacting the recent request by the Planning Inspector to provide a draft alternative version of the Council's proposed energy and operational carbon standards for new buildings in their draft new local plan which is currently at examination.

2. It is understood that the Council's original draft submitted plan expressed its 'net zero' policy in terms that included energy efficiency metrics of EUI and SHD. It is understood that the Inspector has requested that the council provide an alternative version of the policy that would be in line with the stipulations of one particular national policy (the Written Ministerial Statement of 13th December 2023; WMS2023). That WMS2023's stipulation is that energy efficiency standards should be expressed in terms of % reduction on Building Regulations Part L TER (Target Emissions Rate), using a "specified version of SAP".

    a. We note that SAP is a residential-only methodology. Therefore, the WMS2023 can only be logically interpreted to apply to residential policies. However, RBC has requested that we provide a TER-based alternative to the non-residential policy as well as the residential. We therefore provide both, but **please note that given the lack of existing evidence on what TER-based energy efficiency standard is achievable in non-residential buildings and what the cost uplift of this would be for viability testing, the non-residential TER-based policy is far weaker than the original proposed EUI-based policy and than the residential policy.**

3. In this current document we express the TER-based alternative policy in terms of changes made into a copied/pasted version of the policy from the May 2025 submission draft in the local plan examination library. We indicate the tracked changes as follows:

    a. ~~Red strikethrough text~~ indicates a deletion

    b. Green underlined text indicates an insertion

    c. Blue text indicates where text has been moved around from elsewhere in the original draft submitted policy

    d. Light grey text indicates parts of the policy that we have not touched as they are not relevant to energy/carbon (which is the scope of our appointment).

4. The relevant policies in RBC's submitted draft local plan that contained references to EUI and SHD were:

    a. Policy H5, "Standards for new housing": This draft policy utilised EUI and SHD targets in relation to new-build housing.

    b. Policy CC2, "Sustainable design and construction": This draft policy utilised EUI and SHD targets for non-residential development (both new build, conversions to residential, and implicitly also in applications relating to existing non-residential buildings).

5. Policy policies H5 and CC2 also set various other requirements or expectations for issues other than energy and operational carbon (for example water efficiency, accessibility and embodied carbon). These are out of the scope of what can be expressed in terms of TER %. However, we reproduce these in light grey text to make clear that we are not here proposing that they should be removed.

6. For the residential policy (Policy H5), the standard suggested is as follows:

    a. 100% TER reduction, as a step towards which there should be a 10% improvement on the Part L 2021 TFEE (fabric efficiency), and

    b. Onsite renewable energy generation to equal 100% of total predicted annual energy demand, or if this should be proven unfeasible for the specific proposed development then the shortfall should be offset.

7. This reflects a standard that our separate recent analysis (for another neighbouring local authority) has demonstrated is feasible via SAP modelling of detached houses and semi-detached houses, and is largely feasible in apartment blocks other than a need for some offsetting of renewable energy shortfall (rather than necessarily meeting this entirely with onsite renewable energy). That separate analysis also identified the cost uplift of this (4.5% to 8%), which is very similar to that of meeting RBC's original proposed EUI-based net zero standard as quoted in RBC's viability assessment (6.0% to 7.7%).

    a. That analysis for RBC's neighbouring local authority is not yet published; however, the energy modelling will be equally relevant to RBC area as both are in the same 'climate zone' (which affects space heating and cooling demand and output of solar panels due to sunlight levels). The costs in RBC area are likely to also be very similar, but we intend to investigate this in the next phase of our appointment, which includes producing a concise evidence report to support the fallback policies.

8. **Please note: Our provision of these requested TER-based alternative policies does not consist of an endorsement of the TER-based standard instead of RBC's originally proposed EUI-based policy standard.** The EUI-based standard would be far more effective in terms of climate mitigation and most likely would be simpler to implement as the EUI-based standard would not require a differentiation between regulated and unregulated energy (whereas the TER-based standard firstly requires a reduction in regulated carbon, which will need both energy efficiency and renewable energy improvements, and then *additional* renewable energy to match unregulated energy use). These points will be made in the separate 'evidence report' that we are appointed to produce for RBC. That report will collate the evidence on the feasibility and costs of the TER-based alternative policy, but will also collate the evidence and arguments that the EUI-based policy would be far more effective, simpler, and feasible.

Draft fallback policies on carbon (TER-based)

TER-based energy/carbon policy as edited version of policy H5 (Standards for New Housing)

"Standards for New Housing H5: STANDARDS FOR NEW HOUSING (Strategic policy)

New build housing should be built to the following standards, unless it can be clearly demonstrated that this would render a development unviable:

a. All new build housing outside the Central Area as defined on the Proposals Map will comply with the nationally-described space standard.

b. All new build housing will be built to achieve water neutrality, where possible. As a minimum, all water fittings and appliances within new-build housing should be compliant with the 'optional' standard outlined in Table 2.2 Part G of the Building Regulations which requires a fittings approach.

c. All new-build housing of one or more dwellings will be required to achieve net-zero development as defined in Policy CC2 and to achieve the following (calculated using a methodology proven to accurately predict a building's actual energy performance:

i. Site average ~~space heating demand of 15-20kWh/m^2 /annum~~ improvement (reduction) on Building Regulations Part L 2021 TFEE (Target Fabric Energy Efficiency): 10%

ii. Site average ~~of total energy demand less that 35kWh/m^2 /annum~~; improvement (reduction) on Building Regulations Part L 2021 TER (Target Emissions Rate): 100%, of which the majority should be from energy efficiency and heating system improvements

iii. ~~No single dwelling unit to have a total energy demand in excess of 60kWh/m^2 /annum, irrespective of the amount of on-site renewable energy production;~~ and

iv. After achieving the required 100% TER reduction (above), incorporate sufficient *additional* ~~0~~ on-site renewable energy generation to match the building's unregulated energy use[1] over the course of the year, such that the building's total annual energy demand is annually matched with renewable energy, with a preference for roof-mounted solar PV.

Exceptional basis clause: In cases where the above points cannot be met for technical, viability or other policy reasons (such as heritage), the highest possible standards are required. In these cases, an applicant must demonstrate the extent to which the requirements ~~can~~ will be met, disclosing the degree of performance improvement in terms of the same metrics used above (TFEE % improvement, TER % improvement, and onsite renewable energy generation as a % of buildings' energy demand). For major developments of 10 dwellings or more, applicants must also either:

v. Enter into a legal agreement to provide renewable energy generation infrastructure off-site equivalent to at least offsetting the ~~additional~~ amount by which the building's annual energy use exceeds its annual renewable energy generation ~~requirement~~, ~~not achieved on site~~; or

vi. Provide a financial contribution to the LPA of a value sufficient[2] ~~enough~~ to offset the amount by which the building's annual energy use exceeds its annual renewable energy generation ~~(a minimum contribution of £5K and a maximum contribution of £15K per dwelling unit will be required)~~; or

vii. Demonstrate the buildings will be connected to a heat network; or

viii. Demonstrate that the proposal is compliant with Passivhaus Plus or Premium or Passivhaus Classic supplemented with evidence of meeting on-site renewable generation requirements (or equivalent accreditation scheme that is demonstrated to be consistent with the requirements of the policy). Where the proposal commits to achieving Passivhaus certification or the following optional performance targets calculated using PHPP methodology, this would be a further improvement on the policy's TER and TFEE targets and thus will be afforded further material weight in favour of the development:

1. Energy use intensity of <35kWh/m$^{2\ floorspace}$/year (site-wide average, with no individual dwelling exceeding 60kWh/m$^{2\ floorspace}$/year)
2. Space heat demand of <20kWh/m$^{2\ floorspace}$ /year

ix. In cases where the points cannot be met for reasons of viability, an Energy Statement must set out in full the degree to which the requirements can and will be met (expressed in the same metrics as the above policy targets) ~~in order to~~ while enable~~e~~ing the development to ~~become~~ remain viable.

d. An Energy Statement should include pre-built estimates. Prior to occupation, ~~and~~ the applicant should then submit as-built calculations disclosing the impact (on TFEE, TER, % of energy use met with new renewable energy generation capacity, and any other performance metrics given at application stage) of any relevant changes to specification or

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[1] Please note that this requirement only covers the energy use within the building itself. It is not required to match the energy of electric vehicle charging; however, where the developer proposes to do so this will be seen as a material benefit of the development. The unregulated energy should preferably be calculated using an accurate energy use prediction methodology. The Building Regulations Part L calculation methodology, SAP, is used to calculated TER and TFEE and also contains an "Appendix L" which purports to estimate unregulated energy use; however, applicants should be aware that Part L Appendix L overestimates unregulated energy use due to being based on outdated appliance data. Therefore if SAP is used to estimate unregulated energy use applicants may find themselves overproviding PV compared to if the energy use were estimated using a more accurate methodology such as PHPP or CIBSE TM54.

[2] The price to be paid will be in proportion to the amount of renewable energy not provided on site, reflecting the estimated cost of renewable energy capacity installation that the local authority would need to deliver in order to mitigate the development's energy demand impact (and thus carbon). Therefore this price may change over time to reflect changing costs of PV installation or other suitable renewable energy generation technology; however, the starting price will be £1753/kWp or 1.90kWh. This reflects nationally estimated PV installation prices (average of the past 5 years; installations sized from 4-50 kW) plus a 10% margin to allow for the administrative burden that the Council will incur in managing this fund.

construction compared to the calculation made at application stage ~~prior to occupation~~. Weight will be given to proposals ~~which~~ that demonstrate a commitment to on-going monitoring post-occupation ~~which~~ that can be clearly communicated to the occupier.

e. All new build housing will be accessible and adaptable in line with M4(2) of the Building Regulations, unless it is built in line with M4(3) (see below).

f. On developments of 20 or more new build dwellings, at least 10% of dwellings will be wheelchair user dwellings in line with M4(3) of the Building Regulations. Any market homes provided to meet this requirement will be 'wheelchair adaptable' as defined in part M, whilst homes where the Council is responsible for allocating or nominating an individual may be 'wheelchair accessible'."

Supporting text to Policy H5

9. Having reviewed the existing draft supporting text to the original draft EUI-based Policy H5 (submitted local plan paragraphs 4.4.39 – 4.4.50, with special focus on paragraph 4.4.47 on "Emissions"), we have not identified any critical need to amend this supporting text as a result of changing to the TER-based policy. The draft supporting text as submitted did not make any specific reference to energy metrics or calculation methods, which would be the key difference in the TER-based policy versus the EUI-based original draft policy.

10. We have suggested some quite lengthy new footnotes in the TER-based policy alternative above, shown in green text. If RBC feels that these new footnotes are unwieldy, RBC could alternatively insert that content as additional supporting text rather than as footnotes.

11. Additionally, RBC could *optionally* add the following further paragraphs to the supporting text (and points to this effect will also be made in the forthcoming evidence report for the TER-based policy):

    "The standard for operational energy and carbon performance expressed in this policy (in terms of TER, TFEE and renewable energy) is not incompatible with the incoming Building Regulations Future Homes Standard. The Future Homes Standard will seek a ~63% improvement on Part L 2021 TER, which is expected to include a heat pump (instead of gas) and some amount of PV, according to the latest consultations and government communications on the FHS. These are also expected to be key elements of the means to meet the policy's requirements. Beyond the FHS, the achievement of the policy's targets would require some improvement to fabric (insulation, glazing and/or airtightness) to achieve the TFEE target, and the addition of further renewable energy to achieve the overall net zero target, likely to be in the form of additional rooftop PV panels."

    "The fabric improvement target of 10% reduction on Part L 2021 TFEE is well within the range of improvement[3] that would have been made by an earlier iteration of the FHS that national government consulted upon in 2019-2021. The inclusion of this target in the policy is designed to make the home more suitable for the required heat pump to run efficiently (as heat pumps achieve their optimal efficiency where the building is very well insulated), reducing stress on the energy grid and also reducing the risk of fuel poverty. This is a key step in making sure that the transition to net zero is done in a way that looks after the needs of Reading's residents, given that one of the FHS options in the more recent FHS consultation – which did not include these fabric improvements – was found to have heating and hot water bills nearly double those of a home built to today's standard (Part L 2021). Improvements to fabric also make the net zero new homes more equitable for residents, because better fabric reduces heating bills, which are more impactful for people who spend more time at home which is likely to include a higher-than-average rate of people with characteristics protected under equalities law".

    "No additional offsetting will be necessary where the standard is met on site. Costs to achieve an even higher standard of performance on site (true net zero including tighter energy efficiency targets) have been tested within Reading's local plan viability assessment."

[3] Future Homes Hub "Ready for Zero" – Appendix F. In the row "Fabric Energy Efficiency", see the difference between "Ref 2021" (representing Part L 2021, today's standard) compared to "Ref 2025" (representing the Government's original FHS specification). The difference in the "Ref 2025" figure ranges from a 9% to a 30% improvement on the "Ref 2021" figure, with the average across all house types being 13% and the average across both apartment types being 27%.

Associated tracked changes to Policy CC2 (Sustainable Design and Construction)

"Sustainable Design and Construction CC2: SUSTAINABLE DESIGN AND CONSTRUCTION (Strategic policy)

Proposals for new development, including the construction of new building(s) and the redevelopment and refurbishment of existing building stock, will be acceptable where the design of building(s) and site layouts use energy, water, minerals, materials and other natural resources appropriately, efficiently and with care and take account of the effects of climate change.

All non-residential new-build developments ~~or conversions to residential~~ are required to achieve net-zero development defined as "a scenario in which the quantity of anthropogenic greenhouse gas emissions arising from the development's operational energy use on an annual basis is zero or negative, and where whole-life emissions are reduced through sustainable design measures." Net zero building status must be achieved through the application of the following energy hierarchy:

i. Minimise and manage operational energy demand through building design, fabric performance and servicing measures;
ii. Use local low carbon energy resources (such as secondary heat) wherever possible to meet residual demands;
iii. Meet remaining residual energy demands by producing, storing and using renewable energy on-site; and
iv. Monitor and report on energy performance[4].

Major proposals that relate to either works to existing non-residential buildings or conversion to residential should demonstrate that the energy hierarchy has been followed as far as practicable and viable. These are not required to reach net zero but should apply the energy hierarchy in the design process as per points i-iii above, demonstrate the resulting improvement via the provision of energy and/or carbon performance figures that would occur before and after the proposed works. Accepted metrics for these figures include Part L metrics (Building Emissions Rate, Fabric Energy Efficiency, Primary Energy Rate) calculated using SAP, SBEM or HEM; renewable energy generation per annum; or space heat demand and energy use intensity calculated using accurate energy prediction methodologies such as PHPP or CIBSE TM54.

All new-build non-residential development proposals for 100m^2 floorspace or more must include an energy statement which confirms that the proposal~~s~~:

v. Has followed the energy hierarchy in the design process, as expressed in steps i-iv above (and in major development, demonstrate what improvement is made on Part L 2021 TER at each step)
vi. Will achieve an overall improvement on the Building Regulations Part L 2021 Target Emission Rate (TER), given as a % reduction (and also comparing this against the TER of Part L in force at the time of application, to make clear whether any improvement is made on the national standard)
vii. Will not use fossil fuel on site for heating or other building systems other than safety-critical backup power
viii. Can generate at least the same amount of renewable electricity on-site (and preferably on-plot) as they demand over the course of the year (reasonable estimates of regulated and unregulated use[5]) using a methodology proven to accurately predict post-occupancy performance[6].~~; and~~

Exceptional basis clause: In cases where the above points on energy and carbon performance cannot be met for technical, viability or other policy reasons (such as heritage), ~~the highest possible standards are required. In these cases, an~~ the applicant must demonstrate that the applicable requirements will be met to the fullest viable reasonably practical ~~the~~ extent ~~to which the requirements can be met~~. In such cases in~~ For~~ major developments of 1000 sqm or more, applicants must also either:

i. Enter into a legal agreement to provide renewable energy infrastructure off-site that is equivalent to at least offsetting the additional energy requirements not achieved on site; or
ii. Provide a financial contribution to the LPA of a value sufficient ~~enough~~ to offset the ~~remaining performance not achieved on site~~ amount by which the building's annual energy use exceeds its annual renewable energy generation[7] ~~(with this being a minimum contribution of £5k and a maximum of £100k per 1,000 sq m)~~[8]; or
iii. Demonstrate the building(s) will be connected to a heat network.~~; or~~
iv. See also the expectation around BREEAM certification below.

Additional material weight in favour of the development will be given where a proposal demonstrates that it will achieve:

- A~~chieve~~ a site average space heating demand of 15-20kWH/m^2 /yr and

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[4] This net-zero definition and mitigation hierarchy represents industry best-practice as defined by the UK Green Building Council
[5] Please note that this requirement only covers the energy use within the building itself. It is not required to match the energy of electric vehicle charging; however, where the developer proposes to do so this will be seen as a material benefit of the development.
[6] Please note that in Part L 2021, non-residential buildings of over 1,000m^2 are already legally required to conduct 'energy forecasting' using an accurate methodology, of which the only specific methodology named in Part L is CIBSE TM54.
[7] The price to be paid will be in proportion to the amount of renewable energy not provided on site, reflecting the estimated cost of renewable energy capacity installation that the local authority would need to deliver in order to mitigate the development's energy demand impact (and thus carbon). Therefore this price may change over time to reflect changing costs of PV installation or other suitable renewable energy generation technology; however, the starting price will be £1753/kWp or 1.90kWh. This reflects nationally estimated PV installation prices (average of the past 5 years; installations sized from 4-50 kW) plus a 10% margin to allow for the administrative burden that the Council will incur in managing this fund. ~~As~~ When the grid is eventually decarbonised, the Council may in future adjust this approach so that financial contributions ~~will~~ would be linked to residual carbon emissions rather than energy demand.
[8] ~~Index linked, with the prices in the policy being 2024 prices.~~

- a site average total energy demand of 70kWH/m^2 /yr, within which ~~N~~no unit ~~shall~~ exceeds a total energy demand of 90kWH/m^2 /yr, ~~irrespective of the amount of on-site renewable production~~. ('Total energy demand' means the amount of energy used as measured by the metering of the building with no deduction for renewable energy generated on site).[9]

An energy statement should include pre-built estimates and as-built calculations prior to occupation[10]. Weight will be given to proposals which demonstrate a commitment to on-going monitoring post-occupation ~~which~~ that can be clearly communicated to the occupier.

All non-residential development or conversions to residential must be designed to be water efficient and reduce water consumption in accordance with the 'fittings approach' detailed within the Building Regulations[11]14.

Proposals that achieve water neutrality[12] will be particularly supported. Both residential and non-residential development should include recycling greywater and rainwater harvesting where systems are energy- and cost-effective.

The demolition of an existing building should be accompanied by a full justification for demolition[13] and demonstrate how 95% of all construction waste will be diverted away from landfill[14]. For non-listed buildings, demolition will only be acceptable where:

• The building is in such a poor state that it is not practical or viable to refurbish or re-use;

• Such refurbishment or re-use would result in a similar amount or a greater amount of embodied carbon generation; or

• Such refurbishment or re-use would result in a building with poor thermal efficiency resulting in a greater lifetime carbon emissions than would arise from a re-build.

All applications for new-build commercial floorspace of 5000m^2 or more must include an embodied carbon assessment. This assessment must demonstrate that a score of less than 800kg/m^2 of carbon can be achieved within the development for the substructure, superstructure and finishes.

Exceptional basis clause: In cases where the above ~~points~~ applicable requirements on energy, water efficiency, demolition or embodied carbon cannot be met for technical, viability or other policy reasons (such as heritage), ~~the highest possible standards are required. In these cases, an~~ the applicant must demonstrate that the applicable requirements will be met to the fullest viable reasonably practical ~~the~~ extent ~~to which the requirements can be met~~. In such cases in ~~For~~ major developments of 1000 sqm or more, applicants must also ~~either: • D~~demonstrate that the proposal is compliant with BREEAM Outstanding or Excellent (or equivalent certification method)."

Supporting text to Policy CC2:

"4.1.2. "The amount of new development taking place within Reading has the potential to impose a large environmental footprint in terms of consumption of resources and materials, the use of energy and the associated emission of greenhouse gases that contribute to climate change. As such, the incorporation of sustainable design and construction techniques are essential in order to minimise this impact. The Reading Climate Emergency strategy (2020-25)20 seeks to achieve a net zero carbon Reading by 2030. New development has a significant role to play in achieving these aims and will ensure buildings are fit to exist without replacement for many years.

"4.1.3. The general principle of this policy in terms of new development applies to both residential and non-residential uses. For non-residential uses (including non-C3 forms of accommodation) and for conversions to residential, this policy incorporates mandatory carbon performance reporting metrics from Building Regulations Part L (TER) and on-site renewable energy generation, and additionally encourages the use of new metrics ~~which stand alone from BREEAM for on-site renewables,~~ of space heating demand and total energy demand. While these are expressed in the policy as being separate from the expectations around BREEAM standards, applicants should note that improvements in Part L TER, renewable energy, and the new metric of EUI can both help earn credits in the BREEAM system towards any given BREEAM rating. BREEAM gives credits not only for improvement on national standards of regulated energy and carbon performance (the TER improvement sought by the policy), but also going beyond net zero regulated carbon (such as via the policy's requirement for renewable energy to match unregulated as well as regulated energy use) and for the use of accurate energy prediction exercises in the design process, of which EUI would be an output. The BREEAM standards remain a useful guide and cover a wide range of matters including building fabrics and materials, energy and water use, amenity areas and ecology, waste recycling, the location and accessibility of developments, daylighting, sound insulation etc. However, the current standards give high scores to development in urban areas to which use previously developed land that is close to services, amenities and public transport routes. Developments in Reading will therefore naturally score relatively highly before any consideration of the impact of development itself. Additionally, all BREEAM ratings of 'excellent' or better require some degree of TER improvement OR accurate energy modelling, but the credits for going beyond zero regulated carbon are optional in BREEAM. As such, a BREEAM rating alone does not guarantee a sufficiently low-carbon building (and certainly not net zero), therefore Reading Borough Council requires that development must demonstrate climate change mitigation through specific reductions in greenhouse gas and other polluting emissions and reducing energy demand, regardless of what BREEAM rating is sought.

[9] Applicants should refer to the LETI Climate Emergency Design Guide for specific guidance with regard to different types of non-residential buildings, such as schools on commercial offices: https://www.leti.uk/_files/ugd/252d09_3b0f2acf2bb24c019f5ed9173fc5d9f4.pdf

[10] Applicants should refer to CIBSE TM54: Evaluating Operational Energy Use at Design Stage.

[11] All water fittings and appliances installed must be compliant with Table 2.2 'fittings approach' as outlined within Part G of the Building Regulations.

[12] Water neutral development is development which does not increase the rate of water abstraction for drinking water supplies above existing levels. For every new development, water demand should first be minimised and then any remaining water demand offset, so that the total demand on the public water supply is the same after development as it was before.

[13] Sites allocated within the Local Plan are not subject to the requirement for full justification for demolition.

[14] Applicants should refer to the RICS Professional Standard Whole Life Cycle Assessment as a preferred methodology. Additional guidance can also be found at https://www.london.gov.uk/sites/default/files/circular_economy_statements_lpg_0.pdf

"4.1.4. Additional expectations for performance of new-build homes in terms of emissions are set out in policy H5 on housing standards. An existing Sustainable Design and Construction Supplementary Planning Document[15] is in place and, and the general principles, where in compliance with the overall policy, will continue to apply.

"4.1.5. Particular attention should be paid to historic buildings. As historic buildings continue to change, they must contribute to a net zero future and be fit for future users. The achievement of UK's legislated carbon budgets and net zero 2050 goal will need the residential and non-residential buildings sectors to reach nearly net zero emissions at source in the mid-to-late 2040s without offsetting, as shown in the UK's latest carbon budget report[16], and therefore historic buildings will need to play their role in this. Through sensitive adaptation and keeping buildings in use, historic buildings can make an important contribution to reducing carbon emissions and energy costs. Applicants should refer to advice from Historic England on adapting historic buildings for energy and carbon efficiency[17]. The LETI Climate Emergency Retrofit Guide23[18] is also a useful resource for applicants."

[15] The Sustainable Design and Construction SPD can be viewed on the Council's website at Sustainable-Designand-Construction-SPD-Adopted-December-19.pdf (reading.gov.uk)
[16] Committee on Climate Change (2025), *The seventh carbon budget*. See figure Figure 3.6 Sectoral emissions in the Balanced Pathway. https://www.theccc.org.uk/publication/the-seventh-carbon-budget/#:~:text=Sectoral%20emissions%20in%20the%20Balanced%20Pathway
[17] Historic England Advice Note 18
[18] LETI Climate Emergency Retrofit Guide