This document has been collated to support the development of planning policy in the West of England. It is a summary of the local energy planning policy landscape in 2021 and collates recent evidence commissioned in support of net zero Local Plan policies in the region.

Where relevant, policy recommendations have been provided based on the conclusions of these studies.

Request this report in an accessible format

This report has been prepared and is issued by the South West Energy Hub. Reliance on any recommendations provided by the South West Energy Hub shall be taken entirely at the readers own risk.
1. Summary

In 2006, UK Government introduced the Code for Sustainable Homes, announcing that by 2016 all new development would be net zero carbon. Today, approaching two decades since developments such as BedZED demonstrated this possibility at scale, both policies have been scrapped leaving the industry in a legislative limbo, reliant on building standards now 10 years old and a supply chain ill fit for the future.

In 2019, Government set out its intentions for a Future Homes Standard (FHS) and Future Building Standard (FBS) to resolve this - a flagship programme that will level up construction practice across the country. Whilst both are welcomed, they are not without challenges. They will not come into force until 2025 at the earliest, are limited in scope to reduce the performance gap (and therefore protect against high fuel bills) and will not in themselves meet net zero construction by 2030.

In the South West, less than 1% of new buildings since 2018 have achieved best practice energy ratings. If the region is to meet its 2030 climate policies, these buildings will face retrofit costs of between £15,000 and £25,000 each; a cost that could be avoided if net zero policy is brought in earlier. Taking action now will also save a skills cliff edge leading up the FHS/FBS implementation, instead positioning the region as a leader in low carbon goods and services.

The cost of this Building better can deliver operationally net zero buildings for an average uplift of 2-4%. This is equivalent to around two to four months of house price inflation in return for comfortable, future proofed housing with opportunities for energy bill savings. This low cost has driven the market start to deliver in the absence of policy, however policy is needed to set a consistent retirement across all development.

The goal at a local level is to set a set of requirements that deliver net zero whilst existing in harmony with the many changes afoot in the market and in national policy. Crucially, local policies across England must dovetail if they are to drive the industry forward; a challenging task in a rapidly changing market.

This report reviews the state of the market today (Autumn 2021) and extensive local policy research that has been undertaken in recent years. It provides a suite of policy considerations to ensure a practical transition to net zero. All recommendations have been developed to co-exist alongside recent industry guidance, other local plans across England and the FHS/FBS.

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Policy Guidance

<table>
<thead>
<tr>
<th>Modelling</th>
<th>A1</th>
<th>Provide clear targets that can be accurately modelled and monitored. For major developments this should go beyond Building Regulations compliance modelling.</th>
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<tbody>
<tr>
<td>A2</td>
<td>Ensure modelling approaches dovetail with national reporting requirements (Building Regulations/ FHS/FBS).</td>
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<tr>
<td>A3</td>
<td>Where local plans come into force ahead of the FHS/FBS, or where the FHS/FBS does not deliver net zero development, implement policy that reflects a four-principle approach of no fossil fuels, energy use targets (space heating &amp; EU) and onsite renewable generation to match residual energy demands.</td>
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<thead>
<tr>
<th>Operational Energy</th>
<th>B1</th>
<th>Implement policy that sets clear pathway towards agreed net zero levels of performance by 2030, referencing the CCC recommendation for 15-20kWh/m² limits for space heating and cooling by 2025 at the latest.</th>
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<tbody>
<tr>
<td>B2</td>
<td>Undertake local viability testing to assess appropriate EUI targets for the year of policy implementation. Where stepping stone targets are required, provide commitment to the date and target level for true net zero compliance.</td>
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<td>B3</td>
<td>Where EUI targets cannot be all encompassing (such as for non-residential typologies) or where the risk of performance gaps are considerable (e.g. direct electrically heated buildings) require compliance with recognised accreditation schemes and frameworks suited to these typologies.</td>
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<tr>
<td>B4</td>
<td>Where BREEAM is used as a policy tool for operational energy, target minimum ‘Outstanding’ levels for Ene01 as well as post-occupancy exemplar credits to reduce performance gaps.</td>
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<tr>
<th>District Heating</th>
<th>C1</th>
<th>New development should meet energy efficiency and space heating targets regardless of DHN connection.</th>
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<tr>
<td>C2</td>
<td>Developments should make all reasonable efforts to meet net zero onsite emissions prior to connecting to a DHN.</td>
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<tr>
<td>C3</td>
<td>Where net zero EUI cannot be met onsite, consider an exemption for DHN connections where there is a clear and demonstrable net zero transition plan prior to 2030.</td>
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<table>
<thead>
<tr>
<th>Whole Life Carbon</th>
<th>D1</th>
<th>Require a WLC assessment to be carried out using a RICS recognised assessment tool (limited to a ‘one-click’ tool for minor developments), reporting against LETI A++ to G benchmarks.</th>
</tr>
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<tbody>
<tr>
<td>D2</td>
<td>Consider the introduce a backstop kgCO₂/m² target covering upfront emissions for major developments, setting out how and when future targets will increase in scope.</td>
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<tr>
<td>D3</td>
<td>Use data gathered through WLC assessments to inform industry wide development of more robust planning targets.</td>
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<tr>
<th>Existing Buildings</th>
<th>E1</th>
<th>Consider policy appetite to increase fabric requirements above and beyond the proposed interim update to Part L.</th>
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<tr>
<td>E2</td>
<td>Assess how current policy uplifts for existing buildings compare to the proposed standards laid out in the FBS and EUI and heat demand metrics being considered for new build. Ensure policy alignment with new metrics.</td>
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<tr>
<td>E3</td>
<td>If amending policy, consider alignment with the consequential improvements requirements of Welsh Building Regulations, seeking legal guidance on powers for delivering such measures through local plans.</td>
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<table>
<thead>
<tr>
<th>Offsetting</th>
<th>F1</th>
<th>Offsetting is not compatible with Climate Emergency declarations and should not be permitted where possible.</th>
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<tr>
<td>F2</td>
<td>Operational emissions should only be offset for a generation shortfall; energy use targets should be met and onsite renewables maximised. Offsetting should not be allowed for greenfield sites.</td>
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<tr>
<td>F3</td>
<td>Offsetting should be development linked, prioritising site-wide compliance then reducing supply chain (i.e. embodied) emissions. Payments into funds or power purchase agreements should not be encouraged.</td>
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<tr>
<td>F4</td>
<td>Quantified savings from a heat network may be considered for offsetting where the principles in F2 remain met.</td>
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<tr>
<td>F5</td>
<td>The term ‘net-zero’ should be associated only with developments whose offsetting extends to whole life emissions.</td>
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<tr>
<th>Monitoring</th>
<th>G1</th>
<th>Implement a process for requiring, reviewing and monitoring energy demands through Planning Energy Statements and alignment with a post occupancy reporting scheme.</th>
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<tbody>
<tr>
<td>G2</td>
<td>Avoid policies that cannot easily be measured in the real world, or sole reliance on methodologies that will change within the timeframe of new policy (e.g. Building Regulations).</td>
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</table>
2. National Policy

Heating and powering buildings currently accounts for 40% of the UK’s total energy usage. Although the demand for new development in isolation is a small proportion of this, the influence of the construction sector and its supply chains is significant, linked to almost half of all UK emissions. It is therefore the most important catalyst for the wider industry.

The UK is a signatory to the 2015 Paris Agreement, a legally binding international treaty which commits the UK and other signatories to limit global warming to well below 2°C, preferably to 1.5°C. In 2019, the UK Government committed to bring all greenhouse gas emissions to net zero by 2050, with some sectors, including construction, taking the lead well before this as part of the UK’s system of carbon budgeting.

Although climate resilience and adaptation are equally important to such commitments, and to co-benefits if healthy, resilient communities should not be underestimated, this paper refers solely to climate mitigation i.e. the reduction of emissions.

Building Regulations

Nationally, energy performance in new buildings is principally regulated by the requirements of Part L and Part F of the Building Regulations. This is made up of the following Approved Documents:

- L1A/B: Conservation of fuel and power in new dwellings / existing dwellings.
- L2A/B: Conservation of fuel and power in new buildings other than dwellings / existing buildings other than dwellings.
- F: Ventilation

The Part L documents were published in 2010 and updated in 2013. Despite these amendments, many of the requirements of these regulations are now widely considered outdated and out of step with current good practice (see section 5).

The Future Homes Standard (FHS)

In October 2019 the government launched the FHS consultation to be introduced in 2025 and require ‘new build homes to be future-proofed with low carbon heating and world-leading levels of energy efficiency’. The consultation also considered the potential for Part F in order to increase the energy efficiency requirements for new homes before 2025. The following are key commitments made in response to the consultation:

2022 interim uplift: An interim uplift to Part L will come into force in June 2022 subject to the second Part L consultation. It will be regulated for in December 2021.

- This will only apply to new homes.
- An average home will produce 31% less CO2 than current standards.
- Fabric Energy Efficiency Standard will be one of four performance metrics to ensure a fabric first approach.
- Gas boilers direct electric heating can still be installed.
- The transitional period will be one year and transitional arrangements will apply to individual homes rather than an entire development.
- No target for unregulated energy.

2025 uplift: The technical specification for the FHS will be consulted on in 2023, legislated for in 2024 and implemented in 2025. They will target that:

- New homes will not be built with fossil fuel heating (a performance based standard will be used to deliver this commitment, rather than banning technologies).
- No further energy efficiency retrofit will be necessary to enable homes to become zero-carbon as the electricity grid continues to decarbonise.
- Measures will be put in place to reduce the performance gap.
- An average home will produce at least 75% lower CO2 than one built to current standards.
- A draft national building specification has been published - this not final and will be subject to further technical work and consultation.
- A full technical spec. will be consulted on in 2023.
- Existing homes will be subject to higher standards with a “significant improvement” on the standard for extensions. Replacements and repairs will also have to be more energy efficient.
- No policy around embodied carbon.

The Future Buildings Standard (FBS)

The Future Buildings Standard consultation ran from January to April this year (2021). It builds on the FHS by setting out energy and ventilation standards for non-residential buildings and existing homes as well as including proposals to mitigate against overheating in residential buildings. Key considerations of the FBS consultation include:

2022 interim uplift for non-residential buildings:

- The Government’s preferred option to uplift energy efficiency standards for new non-residential buildings in 2021 which is intended to deliver a 27% reduction in carbon emissions an average per building compared to the existing Part L standard.
- Improvements to the non-residential energy modelling methodologies.
- Improvements to standards when work is carried out in existing non-residential buildings.

An expectation that the proposed increase in carbon and primary energy targets in the 2021 standard will drive a large proportion of developers to phase out fossil-fuels now, ahead of the introduction of the Future Buildings Standard.

An expectation that the new system is designed to run at 55°C.

Why not wait?

While both standards will reduce CO2 emissions associated with new buildings compared to existing regulations, there are a number of reasons that LPAs who have declared a climate emergency must take supplementary action.

- Interim uplifts fall short of or are only comparable to current best practice in the market and other low carbon proxy or practice.
- The technical specification of the standard are only notional and may be changed.
- The implementation timeline is able to slip.
- The current Part L modeling methodology leads to a large performance gap that cannot be monitored (there is a risk that energy bills may be high as a consequence).
- A reliance on electricity grid decarbonisation allocated this supply away from other harder to treat sectors.
- The FBS/FHS intend to cover the same scope as Building Regulations excluding key areas such as embodied energy.

Options for addressing these issues without losing the benefits of the FHS/FBS are explored in more detail throughout this document.

2025 uplift for residential buildings:

- Proposed improvements to standards when work is carried out in existing homes.
- Reconsulting on the Fabric Energy Efficiency Standard, as well as other standards for building services in new homes and guidance on the calibration of devices that carry out air tightness testing.

- A proposed requirement that when a whole wet heating system is replaced, including both the heating appliance (e.g. a boiler) and the emitters (e.g. radiator), that the new system is designed to run at 55°C.
3. Legal background

Historically there have been conflicting messages surrounding the ability of Local Planning Authorities (LPAs) to set energy and carbon targets beyond national requirements, in part as messaging has changed in recent years (see adjacent legal timeline).

The differences between national and local policy can be traced back in part to the UK Government’s U-turn on zero carbon homes in 2015. This decision left an unexpected gap in policy, stagnating the market and supply chain. Some local policies already in draft (notably the 2016 London Plan) retained this commitment, in London’s case enacting zero-carbon homes from 2016 and for all other buildings from 2019.

At the time of writing a policy gap continues, with Government stating in its response to the FHS consultation that “new planning reforms will clarify the longer-term role of LPAs in determining local energy efficiency standards”. To provide some certainty in the immediate term, this response has also signalled that it will not amend the Planning & Energy Act 2008 (see timeline) to restrict LPA action.

At the highest level, the Climate Change Act (2008) has a legally binding requirement to deliver net zero by 2050, delivered in step with the UK’s carbon budgets. The evidence for meeting the sixth carbon budget (which has now been ratified by UK Government) suggests that in order to meet this goal, all new development should target next zero as soon as practically possible to avoid additional emission and catalyse wider decarbonisation required to hit 2050 targets. This is the case regardless of net zero target dates being considered locally (between 2030 and 2050).

As of writing, at least 17 Local authorities have set policies above Code for Sustainable Homes (CfSH) Level 4, although this remains below the Government’s ambition. In particular, London Boroughs continue to set policies that go beyond minimum national policies, for example by setting statutory energy and carbon reduction conditions on plans for historic homes. The differences between national and local policies are significant and need to be considered.

The planning inspector in this case highlighted that the 2050 carbon budget and the Government’s climate change policy framework are not always aligned, and that “Local planning authorities should adapt proactive strategies to mitigate and adapt to climate change.”

To clarify, the framework does not prevent local authorities from using their existing powers under the Planning and Energy Act 2008 or other legislation where applicable to set higher ambition. In particular, local authorities are not restricted in their ability to require energy efficiency standards above Building Regulations.

The Government published its FHS response in August 2021, which in summary states that: ‘To provide some certainty in the immediate term, this Government will not amend the Planning & Energy Act 2008, which means that local planning authorities will retain powers to set local energy efficiency standards for new homes.’

Case study #1: Swale Borough Council

In May 2021, the housing secretary rejected Swale Borough Council’s attempts to impose stringent carbon reduction conditions on plans for historic homes at Sittingbourne, Kent, ruling that the conditions were not reasonable because they ‘went beyond current and emerging national policy’.

This decision went again the advice of the Planning Inspector, who argued that “the planning regime has a role to play and cannot leave climate change to other regimes to deal with, particularly when those regimes have not kept pace with the requirement to take urgent and material action”. The “scale and urgency of the climate change emergency” was a material consideration that justified more stringent conditions, he advised.

Crucially, this example is a case where the authority looked to impose a requirement through guidance in absence of an underlying LPA policy. It demonstrates the importance of core policies related to the Climate Emergency. Where policies have been viability tested, consultation respondents oppose the adoption of CfSH Level 4. Some go beyond Code for Sustainable Homes standard for all new homes through an amendment to the Housing and Planning Bill. Amendment defeated by four votes.

Government publishing the revised National Planning Policy Framework: Any local requirements for the sustainability of buildings should reflect the Government’s policy for national technical standards.

2004 Planning and Compulsory Purchase Act sets out a duty to include in plans policies to tackle climate change.

2006 Zero Carbon Homes (ZCH) future policy announced by then PM Gordon Brown

2008 Planning and Energy Act allows Local Plans to include “reasonable requirements” for energy efficiency standards that exceed Building Regulations.

2012 National Planning Policy Framework (NPPF) states that the planning system should “secure radical reductions in greenhouse gas emissions” and that “Local planning authorities should adopt proactive strategies to mitigate and adapt to climate change”.

In light of forthcoming ZCH standard Written Ministerial Statement (WMS) by Eric Pickles [link] sets out if set out that Local Plans should not set out technical standards or be expected to set policies above Code for Sustainable Homes Level 4, deemed equivalent to a 19% improvement on the Part L 2013 standard.

ZCH standard scrapped [set to be brought into law in 2016], A WMS was taken as a precursor to ZCH, significant uncertainty on how it should now be interpreted.

Government publishes FHS response - 86% of consultation respondents oppose the commencement to amend the Planning & Energy Act and were in favour of retaining local planning authorities’ flexibility to set standards. As such the government clarified that: ‘To provide some certainty in the immediate term, this Government will not amend the Planning & Energy Act 2008, which means that local planning authorities will retain powers to set local energy efficiency standards for new homes.’

From 2015 Some LAs go beyond requirements. A number of LAs put into place local standards that are above Building Regs but equivalent to Code for Sustainable Homes (CfSH) Level 4. Some go further.

2018 Revised National Planning Policy Framework: Any local requirements for the sustainability of buildings should reflect the Government’s policy for national technical standards.
4. Measuring impacts

Building Regulations (Part L) require that the energy and carbon intensity of a building is measured against a National Calculation Model (NCM). This is most commonly done using UK Government’s SAP and SBEM tools for residential and non-residential buildings respectively. This is the same methodology also used to generate Energy Performance Certificates (EPCs). These tools generate a notional building design with standard features and compares these to the building design being considered. To pass, the Dwelling Emission Rate (DER) must be less than the Target Emission Rate (TER).

Benefits of SAP/SBEM

- Ubiquitous: well understood by the industry and used for all new developments in the country
- Limited to regulated emissions only, making buildings less reliant on speculation of fit-out use
- Not overly onerous meaning it can be used early at the design stage and by large and small volume builders alike.
- Backed by UK Government and currently under review – will continue to be used in the Part L 2021 update and the 2023 FHS.
- Ease of compliance checking owing to its simplicity
- Datasheets allow a range of metrics to be analysed beyond DER/TER
- Sets clear requirements: through the notional building methodology, supporting designers who are not low carbon experts.

Unregulated energy is energy that cannot be easily controlled at the design stage, typically reliant on occupant behaviour. It includes plug loads such as IT equipment and fridges, but also lifts, external lighting and cooking appliances. For some buildings such as offices, unregulated energy can be up to 50% of a building’s energy demand.

Limitations of SAP/SBEM

- Large performance gap. Tools use metrics that do not relate to how energy is measured in real life. This can encourage a culture of false reporting and does not lead to best practice.
- Inaccuracies: SAP consistently underestimates heating demand (typically half that of real life) and overestimates unregulated power use (as appliance efficiencies are outdated).
- Post construction verification not possible as neither unregulated energy or absolute performance are measured.
- Efficient designs lack reward. The notional building has the same shape, orientation and, up to a point, the same proportions of glazing as the actual building (though not always the case for non-residential buildings). This can neutralise the impact of improving thermal performance of a dwelling by reducing heat loss area, the number of junctions or by optimising glazing layout. These are essential components of an energy efficient design. Removing this incentive allows inefficient designs to appear ‘good’.

Whilst it is not for LPAs to mandate the use of a particular third party software, it may be appropriate to require the validation of SAP until the point at which it is updated. Not addressing this issue of SAP modelling could allow developers to avoid improving real life performance through a reporting loophole. Conversely, requiring minor developments to use third party modelling software may not be time or cost effective.

Work is ongoing to assess how these issues can be addressed through supplementary guidance, “top-up” allowances and tools to map different software outputs against each other.

Policy Considerations

A1. Provide clear targets that can be accurately modelled and monitored. For major developments this should go beyond Building Regulations compliance modeling.

A2. Ensure modeling approaches dovetail with national reporting requirements (Building Regulations/ FHS/FBS).

For non-residential buildings it is also true that real world energy consumption is not well correlated with Part L modelling. Summing the outputs from a non-residential Part L model (i.e. regulated energy + equipment energy + server energy) would not fully cover compliance gap elements, before addressing the performance gap elements highlighted in Figure 2.

The large variance between non-residential building types means that it is harder to apply rules or tools to existing methodologies that could be a one size fits all. Standardised driving conditions such as setpoints, hours of occupancy and occupancy density will always differ and be hard to predict fully at the planning stage. Whist an important metric for the industry as a whole, this makes total energy use, or Energy Use Intensity (EUI) (see section 5) a hard target to enforce or viability test through policy.

Regardless of outcome, it important that any primary policy is designed to real life requirements and efforts made to improve modelling, rather than the other way round. Where inaccurate modelling can have a worse impact on resident bills (such as the modelling of direct electric heating), policy should take a firmer line.
5. LETI Net Zero 1-Pager

Following diverging views on best metrics to drive net-zero design, six industry bodies across the built environment came together in 2019 to establish an agreed approach that would be resilient to changes in national policy. This work culminated in a 1-Pager summary published by LETI (adjacent) that has since become a common goalpost across the industry. It is reflected in other prominent design guides including the UKGBC New Homes Policy Playbook and the RIBA 2030 Climate Challenge.

The building fabric target has also been reflected in the Committee on Climate Change Evidence that underpins the UK’s Sixth Carbon Budget.

Moving away from carbon. Predicting carbon emissions accurately is becoming harder as grid electricity becomes increasingly supplied by renewables. This causes the time of day and weather conditions to have a large bearing on emission levels, leading to complex carbon calculations that can risk masking poor underlying design principles. The LETI approach instead focuses on best practice energy demands limits that are applicable in any net zero ready building. As carbon is not assessed, this also means the LETI principles can be followed alongside Part L and the Future Homes Standard without conflict; these metrics do calculate carbon use.

Unintended consequences. The LETI approach is dependent on all principles being followed as they are interrelated. Implementing an EUI target without a space heating target would risk high fuel bills, implementing both targets without an onsite fossil fuel ban would allow gas to be used to meet the other targets. It is also reliant on software which can model real life consumption accurately.

Policy Considerations

Where local plans come into force ahead of the FHS/FBS, or where the FHS/FBS does not deliver net zero, implement policy to reflect a four-principle approach of no fossil fuels, energy use targets (space heating & EUI) and onsite renewable generation to match residual energy demand.

This figure is reproduced from www.leti.london/one-pager
6. Operational energy targets: residential buildings

Following the discussion points in section 5 and subsequent LETI guidance, much LPA evidence since 2019 has focussed on implementing policy that follows four overarching principles.

1. No use of fossil fuels for heating
2. A kWh/m² limit for operation energy use (EUI) for each building type (STI)
3. An A kWh/m² limit for space heating demand
4. Maximised onsite renewable generation

For net zero buildings the on-site renewable generation must match the energy use intensity (EUI) on balance over the year.

Timelines. Whilst there is broad agreement on aligned targets by 2030, there is divergence on the rate at which these should be implemented. This is made more complicated for authorities who must act now for a policy that will remain valid in five years’ time.

Residential EUI targets. Figure 3 highlights this impact of divergence for residential EUI targets. Most relevant to the WOE authorities is Cornwall Council’s Climate Emergency DPD, which is currently under consultation and will come into force in 2022. The underlying evidence for this work found that an EUI of 40kWh/m²/yr was a cost viable transition point towards broad industry agreement by 2030.

Another interim target has been suggested by the UKGBC, this is 70 kWh/m²/yr as a ‘stretch target’ prior to 2030 (but with no date given) Ongoing work is being undertaken to assess this; until this is completed it is considered too loose a target, derived in part from a top down assessment of historic rather than new buildings.

“For context, the 1990’s semi in live in has an EUI of around 60kWh/m²/yr. It has no floor insulation, 20mm PIR in the walls, 300mm of wool in the loft, cheap double glazing and an air tightness of 10m³/hr. It is heated by an air heat pump and has direct electric water heating. If this can achieve 60kWh, then we can clearly do much better than 70kWh in new builds” - Cornwall resident

Residential space heating target. Industry agreement over a residential space heating is sooner than for EUI, this reflects the Committee on Climate Change position targeting a maximum heat demand of 15-20 kWh/m²/yr by 2025 at the latest. In Cornwall, where policy will pre date this, an interim target of 30kWh/m²/yr has been set to allow a smooth transition.

Non-residential targets. The LETI targets for non-residential energy use have been put forward for consideration in Lincolnshire and Cambridgeshire local plans. In Cornwall, where non-residential development is far less prevalent than residential, there was insufficient time to test the viability of such a policy in time for the DPD draft. Instead, a requirement for BREEAM Excellent was set.

Cost assessment. The costs of meeting a range of targets has been assessed by consultants Currie Brown in support of research for the Cornwall Council DPD. The specifications for each example building type are set out in the accompanying report. The assessment is limited to residential buildings and the following target level comparisons:

- Part L 2013/21/25: typical levels of performance required for the ‘national building’ in current regulations and draft national building specification provided in the PHS consultation.
7. Operational energy target: non-residential buildings

Whilst an energy metric for non-residential buildings holds the same appeal as for residential, it has much more variance on a case by case basis and is highly dependent on building design and fit-out after a development has passed through the planning system. Non-residential building types vary from hotels to leisure centres, cinemas to data centres. A one size fits all approach at a planning stage is therefore very challenging (see section 4).

Space heating & cooling targets
Despite large sector variance, space heating can be less of a constraint for non-residential buildings and the CCC’s overarching target of 15-20kWh/m² may therefore be appropriate for all building types as suggested in section 5. As the cost of space heating and EUI targets have not been split out in recent non-residential evidence reports20; more empirical data may be required to justify this as a planning requirement. Likewise, cooling (a larger use in non-residential buildings) may merit inclusion within a heating target but more evidence required to justify this.

EUI targets
Both RIBA and LETI set EUI recommendations for offices (55kWh/m²) and schools (65 kWh/m²) but acknowledge that such a target is tricky for other building typologies, instead recommending a Display Energy Certificate (DEC) of B, DECs are generated at the operational phase and based on metered energy use; not a design stage tool predictive DECs can be generated at the design stage where required. The Dutch Green Building Council (DGBC) have developed the “Paris Poort” concept and reported that the targets should consider the use of the building:
• Office 50 kWh/sqm/yr
• Retail 80 kWh/sqm/yr
• Education 65 kWh/sqm/yr
• Care 90 kWh/sqm/yr
• Industrial 50 kWh/sqm/yr

Although not covering all building and not considered for the UK, these limits can nevertheless provide a useful benchmark for developers and planners to measure against.

The performance gap
The performance gap can be particularly acute for non-residential buildings, especially at the planning stage. Building fit-out can be speculative at this point with a lack of controls over tenant requirements. Building Regulation (Part L) modelling is not intended to model of real-world energy use, exacerbating the issue. Using these modelling tools to measure EUI targets can be inaccurate.20

This combination of issues has led some policy makers to look elsewhere for non-residential targets, either reverting from energy metrics stepped improvements on building regulations (see Case Study #2) or to other performance accreditations schemes (examples below).

EUI: Office: Care 90 kWh/sqm/yr
Retail 80 kWh/sqm/yr
Office 55 kWh/sqm/yr
Deep Plan, Nat. Vent.
Deep Plan, Air-Conditioned

Further guidance
Beyond BREEAM, further details of these schemes covered in Figure 4 are not discussed in this report.

Guidance on modelling real world performance at the design stage is being published with increased frequency and alignment with external guidance can be a useful tool where core policy remains limited in its ability to keep up with changes in the market.

Examples and links to relevant guidance at the time of writing include:
• CIBSE TM54 (operational energy design)
• CIBSE TM52 (overheating design guidance)
• BREEAM GN32 (prediction & post occupancy)
• BSRIA Soft landings (implementation framework)
• NABERS UK (best practice for offices)

Policy Considerations
B2 Undertake local viability testing to assess appropriate EUI targets for the year of policy implementation. Where stepping stone targets are required, provide commitment to the date and target level for true net zero compliance.
B3 Where EUI targets cannot be all encompassing (such as for non-residential typologies) or where the risk of performance gaps are considerable (e.g. direct electrically heated buildings) require compliance with recognised frameworks and accreditation schemes suited to these typologies.

Cost Assessments
A one size fits all cost assessments of non-residential buildings is not possible, however evidence is available from many individually assessed buildings. As part of the FSB Impact Assessment, UK Government has considered two options for its Part L 2021 update, the preferred of which (Option 2) delivers an average 27% improvement over Part L 2013 levels21. As with residential buildings, these costs are now considered a new baseline – many developers are already meeting these levels22 which will become mandatory in the short term.

Recent work by WSP23 has assessed the cost uplift from this baseline to net zero for two buildings. These were:
• Office building: 3-storey, mech. ventilated and cooled
• School, 2-storey, naturally ventilated with no cooling

In this study, offsite offsetting was permitted at a cost of £95/tCO₂. Alongside Part L 2021 (Option 2) fabric standards, more stringent fabric standards were also tested. A summary of this analysis is given below, however it cannot be considered equivalent to achieving net-zero operational energy as it did offset unregulated emissions, nor did it target a minimum energy use requirement.

Policy Considerations
B2 Undertake local viability testing to assess appropriate EUI targets for the year of policy implementation. Where stepping stone targets are required, provide commitment to the date and target level for true net zero compliance.
B3 Where EUI targets cannot be all encompassing (such as for non-residential typologies) or where the risk of performance gaps are considerable (e.g. direct electrically heated buildings) require compliance with recognised frameworks and accreditation schemes suited to these typologies.
8. BREEAM

BREEAM is only one of many third-party accreditation schemes for non-residential buildings, however it is the most ubiquitous in the UK and referred to in the local plans of 193 authorities. Managed by the BRE, it is a credit-based framework across a range of sustainability criteria with a mix of mandatory and tradable credits.

In itself BREEAM does not mandate net-zero energy or carbon, however this can be still be demonstrated and checked through a mix of compulsory and innovation credits. BREEAM also has credits relating to construction materials and embodied carbon.

BREEAM ‘Excellent’ is the most commonly level of performance referred to, both in policy and corporate strategies. Typical energy reduction of meeting this level of performance is approximately aligned to a 25% reduction over current Building Regulations\(^2\), and like building regulations, does not consider unregulated energy as a minimum requirement. Beyond BREEAM Excellent, BREEAM Outstanding is the next highest level of accreditation.

Tackling the performance gap

BREEAM’s calculation methods do rectify some performance gap issues that can arise as a consequence of trying to legislate non-residential operational energy without influence beyond planning controls.

The BRE maintain an oversight and audit role beyond planning, and provide periodic updates (e.g. alternative methodologies for SAP carbon factor fees\(^1\)). The trading of credits also means that where a building’s form or use might make an EUI target level unobtainable, efforts must be made elsewhere under the set guidance of BREEAM (including for embodied energy), rather than a need for local authority enforcement officers to evaluate the merits of technical viability in every non-compliant case.

These principals also apply for the Home Quality Mark and NABERS UK schemes which are also overseen by the BRE.

<table>
<thead>
<tr>
<th>Costs of BREEAM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicative BREEAM costs relate to overall performance; energy reduction alone cannot be isolated. Table 2 related to BREEAM 2014 standards, however a more recent assessment found that the impact of current BREEAM standards are similar(^2).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 2 Increase in BREEAM capital costs(^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>School</strong></td>
</tr>
<tr>
<td><strong>Industrial</strong></td>
</tr>
<tr>
<td><strong>Office</strong></td>
</tr>
<tr>
<td><strong>Mixed Use</strong></td>
</tr>
</tbody>
</table>

The requirement to have a dedicated and accredited BREEAM assessor onboard throughout project development is a strength of the scheme but will also carry a cost. For minor developments, the administrative requirement of BREEAM may be considered unjustified.

Beyond mandatory credits: net-zero

BREEAM Excellent at least 3 points to be scored in “Ene01” credits which cover reduction of emissions. Credits beyond this are not compulsory but are often sought as an easier route to overall compliance than picking up more credits elsewhere. While there is not an explicit net-zero BREEAM standard, this would be met when achieving three exemplary credits under Ene01. Further exemplary credits can be achieved through maximum energy monitoring credits in criteria Ene02.

Required Ene01 exemplary credits can be key to overcoming performance gap risks that cannot be controlled through planning.

Table 3 Ene01 BREEAM credits (mandatory)

<table>
<thead>
<tr>
<th>Ene01 Criteria</th>
<th>Credits</th>
<th>Excellent</th>
<th>Outstanding</th>
<th>Net zero</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy Performance</td>
<td>2</td>
<td>mandatory</td>
<td>mandatory</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Prediction of operational energy consumption</td>
<td>2</td>
<td>additional</td>
<td>additional</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Exemplary (unregulated emissions)</td>
<td>2</td>
<td>additional</td>
<td>additional</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Exemplary (monitoring)</td>
<td>4</td>
<td>additional</td>
<td>additional</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
</tbody>
</table>

Relation to EUI targets

To complete a BREEAM assessment it is necessary to calculate space heating and energy use and so energy and carbon targets can work well in parallel. It is not recommended that BREEAM standards are used in lieu of any EUI reporting requirements.

Policy considerations

To meet net zero emissions (including unregulated energy) through BREEAM would require all credits in Ene01 to be achieved. There is no known precedent for this and so the viability of this would need to be assessed, for a range of non-residential building designs.

9. District heating

Where the policies set out in this document are followed it may not be necessary to implement a heating hierarchy (i.e. a preferential order of heating technologies). An agnostic approach leaves flexibility for the market to develop the best solutions within set parameters. LPAs may still wish to set a hierarchy if the risk of unintended consequences is seen as too high. Unintended consequences could include large performance gaps between the rated and actual performance of specific technologies or wider environmental risks such as high embodied carbon supply chains or inefficient types of heat pump. Such guidance could be supplementary to main planning considerations.

Heating hierarchies are also used to manage competing priorities between supplying district heating (a wider infrastructure priority) and reducing heat demands. This document does not consider infrastructure policy, however where district heating networks (DHNs) are promoted through policy, this should not be at the detriment of energy efficiency.

<table>
<thead>
<tr>
<th>Policy Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1 New development should meet minimise energy efficiency and space heating requirements regardless of DHN connection.</td>
</tr>
<tr>
<td>C2 Developments should make all reasonable efforts to meet net zero onsite emissions prior to connecting to a DHN.</td>
</tr>
<tr>
<td>C3 Where net zero EUI cannot be met onsite, consider an exemption for DHN connections where there is a clear and demonstrable net zero transition plan to 2030.</td>
</tr>
</tbody>
</table>
10. Whole Life Carbon

Whole Life Carbon (WLC) emissions are those resulting from the construction and use of a building over its entire life, including its demolition and disposal. They capture both operational and embodied carbon emissions, i.e. those associated with raw material extraction, manufacture and transport of building materials, construction, maintenance, repair replacements, dismantling, demolition and eventual material disposal (see Case Study #2). A WLC assessment provides a true picture of a building’s carbon impact on the environment but is often not undertaken in detail as the embodied carbon element has not historically been assessed in planning.

An increasing importance

Around 10% of UK emissions are thought to be associated with the embodied carbon from new construction. As operational emissions increasingly reduce, embodied emissions will make up a greater proportion of total carbon from the whole life of a building. Work carried out for RICS suggests that embodied carbon currently makes up 35-51% of a building’s total emissions, rising to 70% as operational energy decarbonises.

A true net zero building is operationally net zero, made from 100% reused materials, and 100% of the materials can be reused again at the end of its life (assuming that construction, transport and disassembly are carried out with renewable energy). In practice this is extremely hard to achieve in the current UK market and so some embodied emissions are unavoidable. Those remaining should be reduced as far as is possible through good design and planning, with accounting in place for those emissions that are unavoidable.

Existing requirements

National. There are currently no national Government requirements for embodied carbon assessments.

Industry. Embodied carbon is a key part of the RIBA 2030 Climate Challenge where there are targets for 2025 and 2030. LETI have also set design targets for 2025 and 2030 and have worked with the GLA who require a full assessment of embodied carbon for replaceable schemes. UKGBC have published targets for embodied energy and are due to launch a Net Zero Whole Life Carbon Roadmap for COP 26. LETI have produced a helpful guide and reporting tool for how these targets align, based on a A++ to G rating system.

Local. A number of local authorities include embodied carbon requirements in their local plans including:

- GLA: “…should calculate whole life cycle carbon emissions through a nationally recognised Whole Life Cycle Carbon Assessment and demonstrate actions taken to reduce life cycle carbon emissions” and;
- GMCA: “…include a carbon assessment to demonstrate how the design and layout of the development sought to maximise reductions in whole life CO2 equivalent carbon emissions”.

In both cases the focus is on calculating WLC in a recognised way and then demonstrating how they will be reduced. Data gathered will serve as the basis for the introduction of carbon reduction targets in due course.

A number of Local Authorities are considering the introduction of embodied carbon benchmarking targets in the near future, with B&NES currently consulting on a minimum target of 900kg CO₂e/m². As targets in policy develop, the ongoing work by LETI and others on target alignment will be critical in setting well understood and measurable targets.

Cost implications

Significant reductions in embodied carbon can be achieved at no net additional cost! This can be achieved through better design (including durability to replacements), better onsite management (to avoid wastage), better choice of materials (with lower embodied carbon) and through the removal of unnecessary finishes.

A recent study by WSP for B&NES Council has suggested that there would be no cost uplift to comply with the RIBA 2020 embodied carbon targets (for four building typologies considered) aside from the modelled semi-detached house where a 3% cost uplift was estimated. For future standards (e.g. RIBA 2025/2030 and LETI 2030) a cost uplift of 7-15% was estimated dependant on the building typology.
Although encouraging, it should be noted that study did not include all elements of an embodied carbon assessment. It focussed on the Substructure (RICS 1), Superstructure (RICS 2) and Finishes (RICS 3) as WSP considered these to be the areas of highest carbon, the most commonly considered at an early design stage, and with datasets which the consultant had available for modelling. This work did not include services, external works, fittings or stages B1 to B3 and B5 to B7 (see Case Study #3).

Any policy made in reference to the WSP findings cannot test the viability of emissions beyond those modelled. As cost evidence is limited in this sector it does however provide a basis for initial policy and a mandate to request through planning more data on other scopes to inform future policy.

### Reporting tools

There are a number of tools for carrying out planning assessments in line with BS EN 15978: 2011 and the RICS Professional Statement. The most popular of these are hosted by

- **One Click LCA**, including collaborated with RICS, the GLA and the UKGBC to provide a number of tools through varying levels of detail. For more limited assessments, UKGBC’s One Click LCA Planetary tool covers modules A1-A5 of the RICS methodology but can be used as a free tool to assess the impact of key construction materials.

Reporting and targeting of construction emissions is also covered in BREEAM requirements, under ‘Materials’ credits. This includes the need for a lifecycle assessment, designing for durability and resilience and the responsible sourcing of products. Although not directly overlapped with the RICS methodology, but assessments require similar input data.

### Policy options

Two policy options have been set out. These should be considered in light of the best available evidence at the time of implementation, noting that the construction industry is making rapid advances in embodied carbon reporting.

**Option 1: Reporting & monitoring focus, broad scope**

- Promote WLC design principles which encourage low embodied carbon design. Articulate best practice through supplementary planning guidance and an embodied carbon checklist
- Require a RICS compliant Whole Life Carbon Assessment for major developments with results published against LETI benchmark (see below)
- Require use of and reporting against the UKGBC One Click LCA Planetary tool for all other development
- Provide a policy roadmap for all development to include a RICS compliant assessment as well as introduction of targets in line with the RIBA 2030 Climate Challenge.

Risks associated with this approach:

- **Assessment cost implication**: WSP estimate licence costs of software (that is RICS compliant) to be £3,000 per year with 3-4 weeks of time associated with assessment.
- Small development will not be compliant with the RICS methodology and RIBA/LETI targets
- No targets being in place will allow poor performance with only the risk of public and council perception driving good practice

**Option 2: target focussed, restricted scope**

This option uses the WSP ‘cost neutral’ evidence to set an immediate kgCO2e/m² target for large developments. This would require benchmarking against only partial implementation of the RICS methodology as well as assessment and reporting on this basis. This option could be implemented in parallel to option 1, however they are not directly comparable.

Risks associated with this approach:

- Requesting full of a RICS assessment risks confusion in the future and misalignment amongst UPAs
- Reported figures cannot be compared to Error! Reference source not found. or other metrics as the scope of emissions do not align (although this could be clarified in guidance)
- Design decisions could be distorted by only asking for a partial assessment as those being assessed will be focussed on in lieu of others e.g. building services.

### Product certification

Calculating embodied energy becomes easier as the supply chain reacts to requirements from designers; products easier to report on gain a competitive advantage in the market. This is already common sense with BRE’s where companies such as Kingspan align their product with the credit requirements of the scheme. Mitsubishi have also recently updated their product data sheets to report on embodied carbon in line with CIBSE’s 1.4.5.1.3 calculation methodology. Where new policy sets requirements for embodied carbon, it is highly likely that the market will react to make reporting easier – this also stresses the importance for aligned methodologies across the industry.

### Circular Economy

Circular economy is a broader topic than whole life carbon, including the way that waste and water are used. Circular Economy Statements including WLC considerations may be appropriate as a requirement for minor developments, where separate reporting on a range of sustainability criteria in not codified appropriate.

### Policy Considerations

- **D1** Require a WLC assessment to be carried out using a RICS recognised assessment tool (limited to a ‘one-click’ tool for minor developments), reporting against LETI A++ – G benchmarks.
- **D2** Consider the introduce a backstop kgCO2e/m² target covering upfront emissions for major developments; setting out how and when future targets will increase in scope.
- **D3** Use data gathered through WLC assessments to inform the industry wide development of more robust planning targets.
11. Existing Buildings

80% of the buildings that will be in existence in 2050 are already built. This includes 2.5 million homes and 181,000 non-residential buildings in the South West alone. Most of these are of poor energy efficiency standards, with 59% of recorded properties below an EPC band “C”. Most are fitted with fossil fuel based or inefficient electrical heating.

While it is recognised that building regulation gives the scale of the challenge in the existing stock. While the Future Homes Standard (i.e. by 2025) timetable for the Future Homes Standard (i.e. by 2025) and tightening of these standards in line with the logic behind this approach is that this helps to offset the increase in carbon emissions associated with extension/conversion as well as potential mitigating potential increases in energy costs.

A proposal to make this a requirement was made in the FBS consultation and suggested that “The Part F requirement that ventilation should be “no worse” than before the works is highly inadequate, as many homes are not well ventilated. The works should be “net zero ready”, and a longer-term plan should be produced for the building, to reduce operational, embodied, and financial expenditure now and in the future. It is the approach promoted in PAS 2035, which regulations should build on.”

Consequential improvements

Consequential improvements is the term used to describe additional energy efficiency improvements that should be undertaken to the existing building when it is extended or part of the building is converted. This means that not only does any new extension (or partial conversion) need to be built to higher energy efficiency and lower carbon standards, but as part of approval a requirement is made to make bring the remainder of the existing building up to improved standards as well. The logic behind this approach is that this helps to offset the increase in carbon emissions associated with extension/conversion as well as potential mitigating potential increases in energy costs.

A proposal to make this a requirement was made in the draft 2006 revision of Part L of the Building Regulations. However, the Government at the time chose to limit the provision to premises larger than 1,000m2 effectively restricting it in practice to large commercial premises. This is not the case in Wales, where the requirement was retained (see case study box).

In their response to the Future Homes Standard Government have currently clarified that “For the purposes of improving the energy efficiency of existing homes, we do not intend to introduce new requirements or regulations into the Building Regulations through the 2021 Part L uplift beyond those that are set out in this consultation and the Future Homes Standard consultation, including extending where consequential improvements may apply. Improving the energy efficiency of the existing housing stock will be the subject of other government consultations.”

An opportunity remains for consequential improvements to be used as part of the wide range of tools to address the significant challenges in the existing stock - a strong case has already been made for a light touch version of this in Wales, with opportunities to go further as residential retrofit policies evolve.

Whilst consequential improvements are an important part of reducing demand through the planning portal, it should be noted that it is considered beyond the reach of local plan powers to do this by many. As noted previously, recent net zero commitments make this a grey and untested area.

Policy Considerations

E1 Consider policy appetite to increased fabric requirements above and beyond the proposed interim update to Part L1B (or focus efforts on programmes outside of the planning system)

E2 Assess how current policy uplifts for existing buildings compare to the proposed standards laid out in the PBS and EU and heat demand metrics being considered for new build. Ensure policy alignment with new metrics.

E3 If amending policy, consider aligning this policy with the introduction of a consequential improvements requirement that mirrors the requirements of Part L1B in Wales. Seek legal guidance on powers for delivering such measures through local plans.

CASE STUDY #4 Welsh Building Regulations

In Wales the provision for consequential improvements is included within Building Regulations for all major works. This requires additional energy efficiency improvements to be undertaken when an existing building is extended or part of the building is converted to provide fixed heating in a previously unheated space, increasing the conditioned volume.

Required measures are limited to cavity wall insulation, loft insulation and hot water cylinder insulation to ensure that any required improvements are in proportion to the scale and cost of the triggering work. The below extract is taken from Approved Document L1B:

4.2.1 Where an existing dwelling is extended or converted, as a result increasing the habitable area by more than 10 m²; if there is no loft insulation or it is less than 200 mm thick, provide 250 mm of loft insulation or increase it to 250 mm.

4.2.2 Where an existing dwelling is extended or converted, as a result increasing the habitable area by more than 10 m², the following energy efficiency improvements should be undertaken:

a. if the dwelling has uninsulated or partially insulated cavity walls, fill with insulation where suitable (cavity wall insulation may not be suitable for sites exposed to driving rain); and b. if there is no loft insulation or it is less than 200 mm thick, provide 250 mm insulation or increase it to 250 mm; and c. upgrade any hot water cylinder insulation as follows: i. if the hot water cylinder is uninsulated, provide a 160 mm insulated jacket; or ii. if the hot water cylinder has insulated jacket less than 100 mm thick, add a further insulated jacket to achieve a total thickness of 160 mm; or iii. if the hot water cylinder has factory-fitted solid foam insulation less than 25 mm thick, add an 80 mm insulated jacket.

4.2.3 Where the consequential improvement to increase the thickness of the loft insulation to 250 mm is triggered by a loft conversion, the consequential improvement is still necessary as there are likely to be some areas of the loft floor remaining around the new heated volume, for example near the eaves.
12. Energy & carbon offsetting

Various forms of offsetting have been used by local authorities in the UK for over 10 years. These schemes have provided a mechanism to enable buildings that cannot technically achieve net zero carbon on site to be deemed compliant with planning policy.

Despite this, many existing offset mechanisms are not fit for purpose to achieve net zero carbon. The UK’s total capacity for offsetting is already required for hard to treat sectors such as aviation and agriculture; new development cannot add to this burden whilst remaining compatible with climate emergency declarations.

In London, the GLA’s carbon offset fund (administered by the London Boroughs) has been successful in spending £13.8m since 2016, increasing as adoption spreads. Whilst this spend is significant it remains a small percentage of total payments and the adoption curve and delayed expenditure must be weighed up against the benefit of emissions that could be saved at the date of construction.

**Carbon vs. Energy offsetting**

As with operational emissions, there are pros and cons of choosing to account either energy or carbon as a metric to demonstrate net zero emissions. Typical arrangements of each are:

- **Carbon offsetting**
  - A fixed price in £/tCO₂ is set based on the avoided cost of generating equivalent savings locally. This is usually set as the cost of solar PV installations or local retrofit.
  - Pros: A recognised metric by investors that can be linked to universal carbon pricing
  - Easily compared (and therefore traded) between non-energy sectors e.g. peat restoration.
  - Compatible with embodied energy offsetting
  - Cons: Greater risk of sector leakage through trading
  - Not directly comparable with EU metrics
  - Cannot account for changes in grid carbon
  - Can backtrack action (CO₂s from tree planting can take 20 years to materialise)

**Energy offsetting**

This mechanism aligns with the energy metrics discussed in this report, where as a last resort a kWh shortfall can be matched with an equal kWh of generation “credits” offsite. There is no fixed cost associated with this approach; the emphasis is on the developer to evidence additional investment in offshore generation at the time of construction.

- Pros: Easy to check and monitor at the planning stage, directly match to onsite kWh reporting
  - Agnostic to changes in UK grid decarbonisation
  - No fixed cost associated, dependant on locality
  - Less risk of carbon leakage, focus on zero kWh balance
  - Compatible with backstop kWh targets beyond which viability cannot be negotiated

- Cons: Not aligned with historic LPA approaches or unified carbon pricing
  - Requires conversion to translate to £/tCO₂
  - Lack of fixed cost makes alignment with an LPA offset fund more complex
  - Likely that low hanging fruit will be taken from other sectors

**Backstop requirements**

Where offsetting is permitted it is crucial that this is limited to very specific circumstances; if backstop conditions are not met it is likely that building will need further retrofit within the next decade. Backstop requirements should include all energy demand targets set in policy and an embargo on onsite fossil fuels.

**Embodied carbon offsetting**

Offsetting all emissions from operation and construction is widely accepted as not yet cost viable. From an enforcement perspective this is hindered by a lack of agreed reporting and monitoring standards. As a stop gap, new policy should focus on reporting embodied carbon emissions (see section 10) and setting minimum standards. For example, offsets should only be associated with developments that have addressed this impact.

**Offsetting measures**

Retaining backstop measures ensures that offsetting is restricted to small volumes of carbon. It is therefore not thought practical or timely to set up new carbon offset funds for local authorities. This is echoed in recent research undertaken in the WoE.

Recent studies also highlight the significant accounting risks of permitting offset measures to offset onsite responsibilities. This allows hard but necessary measures to be subsisted by low having fruit required to decarbonise existing rather than new emissions.

A good practice offsetting policy should focus only on emissions relating directly to the development. This limits the role of double counting, accounting loopholes, delayed implantation and enforcement issues. A suggested offsetting hierarchy is set out below: the quantum of savings should be equal to the shortfall in generation to meet a net zero energy balance. Where offsetting measures are in tCO₂ rather than kWh, guidance should set out appropriate conversion factors.

1. Maximized onsite generation
2. Onsite carbon capture and storage (e.g. direct air capture)
3. Connection to a local district heating network (apportioned savings quantified)
4. Offset emissions directly linked to the project, through its construction supply chains (beyond embodied carbon policy requirements).

This hierarchy does not permit offsetting outside of a development and its supply chains as in the current market there remains ample opportunity to reduce scope 3 construction emissions. By 2050 (or earlier where declared as part of Local Authority Climate Emergencies) both operational and whole life carbon must reduce to zero and so this approach to offsetting policy would need to be kept under review.

The strictness of implementing offsetting policy should align with the timescale of development, the relevance of alternative compliance pathways (see section 13) and whether the development is being taken forward on a greenfield (i.e. less constrained) site.

*Policy Considerations*

- **F1** Offsetting is not compatible with Climate Emergency declarations and should not be permitted where possible.
- **F2** Operational emissions should only be offset for a generation shortfall; energy use targets should be met and onsite renewables maximised. Offsetting should not be allowed for greenfield sites.
- **F3** Offsetting should be development linked, prioritising site-wide compliance then reducing supply chain (i.e. embodied) emissions. Payments into funds or power purchase agreements should not be encouraged.
- **F4** Quantified savings from a heat network may be considered for offsetting where the principles in F2 remain met.
- **F5** The term ‘net-zero’ should be associated only with developments whose offsetting extends to whole life emissions.
13. Policy Implementation

Effective implementation and monitoring of net zero policies is as important as policy itself – without this there is a high risk that otherwise progressive policies could further exacerbate existing gaps between reporting and real-world change. This can add to the burden for developers without making a meaningful difference to building performance.

Setting targets

It is important that targets in policy are set as part of a trajectory with clear implementation dates. If not possible today, policy should still set out the broad requirements and dates at which policy will require true net zero emissions to be met. This gives confidence to the market over the trajectory, shows long term alignment across the industry and allows for a smooth transition from existing practice. Where viability testing has not been undertaken for longer term targets, it should be noted that these will be subject to confirmation, setting out the period when this will occur.

Table 5 Example policy table - residential operational energy

<table>
<thead>
<tr>
<th>Operational energy use (kWh/m²/year)</th>
<th>Building Regulations assessment</th>
<th>Operational Energy assessment</th>
<th>Justification where targets is not met</th>
</tr>
</thead>
<tbody>
<tr>
<td>From</td>
<td>Residential</td>
<td>Operational Carbon assessment</td>
<td>Reporting n/a if mandatory</td>
</tr>
<tr>
<td>1st Jan '21</td>
<td>No target above Building Regulations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st Jan '22</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st Jan '25</td>
<td>15-20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st Jan '30</td>
<td>15-20</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Collecting data

The collection and storing of data is crucial to the development of future policies, guidance and the monitoring of building energy performance in operation. Where developers report planning requirements via the Energy Hub reporting portal, this can be compared against practice across the UK and used as a tool to map development progress as it comes forward. The Energy Hub is also working with CIBSE to ensure that data collected through this portal is linked to CIBSE Energy Benchmarking Tool, for the measurement of subsequent energy demands during operation.

Performance checks & validation

Performance checks are crucial to ensure that responsibility is taken at the design stage to minimise the performance gap. Whilst this can go beyond the powers of a planning authority, some control can be levered either through planning conditions (See GLA ‘Be Seen’ example) or alignment with external accreditation schemes (e.g. BREEAM, Passivhaus, BSRIA Soft Landings) that administer post occupancy requirements in themselves. As a minimum, the LPA should take a role in collecting and publicly publishing data at the planning stage so that other organisations can hold developments to account during operational phases.

14. Building Energy Performance

Table 4 Example summary reporting: non-residential buildings

<table>
<thead>
<tr>
<th>Operational Carbon assessment</th>
<th>Building Regulations assessment</th>
<th>Operational Energy assessment</th>
<th>Justification where targets is not met</th>
</tr>
</thead>
<tbody>
<tr>
<td>Floor area (GIA m²)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Space heating (kWh/m²)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Space cooling (kWh/m²)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total energy use (kWh/m²)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Predicted DEC rating</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CO₂ savings</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Whole life carbon assessment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emissions (kgCO₂/m²)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

GLA ‘Be Seen’ Policy

The GLA’s ‘Be Seen’ guidance supports the London Plan energy policies and is the most detailed guidance produced by a planning authority to document and reduce the performance gap. It sets out requirements for data reporting at different stages of the design process (before and after planning), at practical completion and during the first 5 years of a building’s life. A template contract is provided alongside the guidance to ensure that commitments remain binding where a building developer hands over the site to a third-party post construction.

Alternative compliance pathways

Alternative compliance pathways can be a tool to account for buildings that cannot meet a policy target but can demonstrate equivalence via another means. This approach gives space for the market to champion the best accreditation schemes and to develop these beyond the limitations of planning policy.

This practice is most commonly used to allow flexibility in policies that restrict electric heating. Although not inherently bad, electric heating combined with poor performing buildings can drive up fuel bills and emissions. Some authorities (such as Bristol City Council) allow electric heating if Passivhaus accreditation is demonstrated as an alternative compliance pathway. The use of alternative compliance pathways becomes increasingly relevant as operational carbon targets become more and more stringent relative to other sustainability criteria that can be less easily measured or enforced.

In allowing for alternatives it is crucial that backstops are set (see section 12) and that accredited schemes are checked for equivalence and for their ability to be checked and enforced. Developers should not be permitted to submit alternative approaches that have not been approved through planning guidance.

Example compliance pathways

Acceptable alternative pathways will dependant on accreditation schemes active at the time of writing and the exemption being sought by the developer. Examples may include BREEAM Whole Life Carbon level 3, Home Quality Mark 5 Stars, Passivhaus Plus, NABERS Base Build 6, PAS 2060

Sub-regional priorities

Where policy priorities vary within a region, zoning can be used to set a boundary on where to apply different approaches. This is used to good affect through the London Plan’s Heat Network Priority Areas. Areas earmarked for heat networks require new development to facilitate connections; outside of these areas there is no such policy requirement. In this case an interactive map is used by planners and developers alike to determine the rules applied to a new applicant.

Policy Considerations

F4 Implement a process for requiring, reviewing and monitoring energy demands through Planning Energy Statements and alignment with a post occupancy reporting scheme.

F5 Avoid policies that cannot easily be measured in the real world, or sole reliance on methods that will change within the timeframe of new policy (e.g. Building Regulations).
14. References


10. It is generally lesser of 1.5m high window across full façade width or 40% of exposed facade area.


14. LETI, UK Green Building Council, Better Buildings Partnership, RIBA, CIBSE, Good Homes Alliance

15. LETI stands for the London Energy Transformation Initiative and is a voluntary network of over 1,000 built environment professionals. In was originally formed to give the industry a combined voice in response to the 2017 London Plan consultation. It’s role since has been to continue to find and give a voice where there is consensus. More about LETI and its publications can be found here.


20. A Part L DSM model can significantly underestimate the cooling demand of a mechanically ventilated and cooled space because fresh air is assumed to be supplied to the space at outside air temperature (see paragraph 47 of the NCM Modelling Guide).


22. Buro Happold London plan report looking at applicant levels


27. London Plan Policy SI 2 sets out a requirement for developments to calculate and reduce WLC emissions. This requirement applies to planning applications.


