# Policy Alternatives for Residential Energy Standards:

*Assessment of Options for Wokingham Borough Council's Local Plan Update Policy CE3*

Wokingham Borough Council

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Final version

Written by: Jimin Oh & Marina Goodyear
Checked & edited by: Adam Lane & Marina Goodyear

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# 0. Executive Summary

Please note that for the purpose of brevity, this executive summary does not provide references, which are instead provided in full as footnotes throughout the main body report.

## 0.1 Purpose and Structure of the Report

0.1.1 The purpose of this report is to explore the scope for "net zero carbon new homes" policy alternative options to Wokingham's existing submitted draft policy CE3 if the Inspector deems that the existing draft policy CE3 is not sound. This study is produced in reaction to a piece of national policy (The Written Ministerial Statement 2023 on energy efficiency, WMS2023). That WMS2023 purports to stipulate a specific metric to be used in any local plan policy standards on energy efficiency in new homes. That metric is TER, the Target Emission Rate set by national Building Regulations Part L, which is calculated using a methodology named SAP (the Standard Assessment Procedure). TER is in fact not an energy efficiency metric, and is not accurate in reflecting actual building performance, which is why Wokingham's existing submitted draft policy CE3 had instead used the more effective metrics of EUI (Energy Use Intensity) and SHD (Space Heat Demand) alongside a requirement for 100% renewable energy.

0.1.2 It is considered unlikely that that policy should be found unsound, given that Wokingham's existing evidence in favour of that existing draft CE3 policy is already very strong and mirrors that of other local plans' similar policies that have recently successfully passed examination (named in the main body of this report). However, in the event that Wokingham's inspector differs in their judgement compared to those other recent precedents, this report aims to provide the justification, evidence and recommended standards to be used in a fallback alternative policy if needed.

0.1.3 This report therefore:

- Explores the powers and duties of the local plan to mitigate climate change as imposed by legislation and national policy
    - The finding is that the headline national policy instruction is to mitigate climate change "in line with the Climate Change Act", which includes net zero by 2050 but also legislated carbon budgets for each 5-year period between 2008 – 2050. It is identified that all sectors will need to undergo drastic changes in order to deliver those carbon budgets. Within this, the performance needed in new build homes specifically has been identified to include the performance standards that Wokingham's existing draft submitted policy CE3 requires, and national building regulations calculation methodology (which produces the TER metric that the WMS2023 stipulates) is not suitable to ensure those performance standards, even with the Future Homes Standard. Meanwhile, many other parts of the required sectoral changes have been lagging behind and thus it cannot be assumed that improvements elsewhere will mitigate any shortfall in the performance of new homes.
    - It is noted that local authorities still hold the power to require improved energy efficiency and renewable energy standards, via the Planning & Energy Act 2008, as well as being legally obliged to mitigate climate change by the Planning & Compulsory Purchase Act 2004 section 19 (a duty more recently reiterated in the Levelling Up & Regeneration Act).
- Interrogates the content and implications of that individual national policy (WMS2023) that purports to limit how such local plan policies define their required energy efficiency improvements – including consideration of how the WMS2023 pulls against other relevant national policies and the legal duty to mitigate climate change, and outlining how the Inspector has weighed these issues up in the recent successful examinations of other similar policies
- Identifies several ways that an alternative "net zero carbon" policy could be formulated to be consistent with the WMS2023 if the Inspector deems it necessary to do so
- Uses highly accurate energy modelling, alongside SAP calculations of potential TER targets, to reveal the impact of such a policy revision on the actual energy performance of new homes in Wokingham, compared to the existing submitted draft policy CE3– and provides commentary on the feasibility and other impacts of each of the possible alternative policy options, such as in relation to grid infrastructure. SAP is used to identify building specifications that would achieve a given TER target, while PHPP reveals that specification's actual impacts. Much of this detail is in the appendices.
- Provides estimated cost uplifts for each of the possible policy alternatives, compared to that of Wokingham's existing policy CE3 evidence base (and for consistency with Wokingham's existing evidence base, the costings in this current report are by the same cost consultant as the previous evidence base for the existing draft submitted policy CE3). Again, costing detail is in the appendices.
- Provides a recommendation for which of the alternative options (policy CE3 alternative 3) would be the next best option if the Inspector deems it necessary to follow the WMS2023's stipulated metric rather than prioritising the climate mitigation duty. However, this report identifies that the existing draft policy CE3 is the most effective for climate mitigation in line with the legal duty and national policy priorities, and for reducing occupant energy bills and stress on local energy infrastructure. Relating to viability, the analysis finds that the existing draft policy CE3 would nevertheless have a build cost uplift that is similar to (or in some home types, even smaller than) that of alternative 3. The feasibility of building to existing draft policy CE3 is also better than that of alternative 3 because existing draft policy CE3 uses effective energy metrics to keep energy use low and thus does not require many solar panels to equal this annual energy demand. By contrast, TER-based policies are less able to minimise energy use and therefore a much larger amount of solar panels is needed, which in the case of alternative 3 might not always be feasible to fit on the available roof space of every new home, especially terraced houses or flats. This is an inherent characteristic of using the WMS2023's stipulated TER metric as opposed to the existing draft policy CE3's more effective metrics (EUI and SHD).

0.1.4 A glossary is also provided at the end of this document.

# Introduction

Link to glossary

# 1. Introduction

1.0.1. This report has been prepared as part of an appointment to support Wokingham Borough Council (WBC) in addressing the carbon reduction opportunities available through the Local Plan. The two main aims of the commission are:

- To clarify WBC's legal powers and duties to address carbon emissions through the local planning process, including how these powers are shaped by national policy and how they have been used by other local authorities; and
- To provide the Council with a robust set of policy options for carbon reduction that could be pursued in the Local Plan, alongside the evidence required to support them.

## 1.1. Purpose and Context

1.1.1. This technical evidence base presents an alternative approach to Policy CE3 of the Wokingham Borough Local Plan Update 2023 - 2040 Proposed Submission Plan that complies with the Written Ministerial Statement (WMS) on local energy standards published in December 2023. The WMS purports to require that any local energy efficiency standards go beyond national policy only through the national building regulations Target Emission Rate (TER) metric, which is a carbon metric. As a result, this study explores alternative policy formulations expressed as percentage improvements on thatnational TER, rather than space heating demand (SHD) or energy use intensity (EUI) limits in kWh/m²/year (which are utilised by WBC's originally preferred net zero policy approach as per Policy CE3 in the original submitted version of the plan).

1.1.2. The study draws methodological inspiration from the October 2024 **West of England TER Study**, which set out a structured approach to modelling TER-based policy options. It also builds on WBC's existing 2024 **Net Zero Evidence Base**, which explored space heating demand (SHD) and energy use intensity (EUI) based targets through Policy CE3. This new study outlines a carbon-focused policy pathway that remains consistent with national planning constraints while still delivering meaningful improvements over Building Regulations minimum performance standards. While the alternative Policy CE3 approach introduced in this report does not deliver the equivalent benefits that Policy CE3 as submitted delivers, it aims to approximate those benefits as closely as possible with robust evidence.

## 1.2. Scope of Assessment

1.2.1. The analysis focuses on the following residential typologies: detached houses, semi-detached houses, and low-rise flats. It also includes commentary on mid-terrace dwellings. These three typologies correspond with those studied in WBC's 2024 Net Zero Evidence Base and align with common forms of residential development likely to come forward in the borough.

## 1.3. Report Structure

1.3.1. To support the development of revised carbon policies, the report first sets out the legal and policy context in which local planning authorities must operate. This includes a review of statutory duties, national constraints, and the implications of the 2023 WMS for future policymaking.

1.3.2. The structure of the report is as follows:

- **Section 1** summarises the Council's legal powers and duties to address carbon emissions through the Local Plan.
- **Section 2** explains the implications of the 2023 Written Ministerial Statement, and how it affects the scope of locally set building performance standards.
- **Section 3** presents carbon and cost modelling results of alternative policy options and provides commentary on their technical and financial feasibility and implementation.

# Full Report

# 2. Why must the local plan act on climate change?

## 2.1 Legal Duty to Mitigate Climate Change Through The Plan

2.1.1. The local plan is legally obligated to design its policies "to secure that the development and use of land in the local planning authority's area contribute to the mitigation of, and adaptation to, climate change" (Planning & Compulsory Purchase Act, Section 19[1]). This duty is further underscored by similar wording in the more recent Levelling Up & Regeneration Act 2023[2] in which the obligation is to design the plan, not just the individual policies, to achieve that goal.

2.1.2. The National Planning Policy Framework (NPPF) defines climate change mitigation as:

> ***"Action to reduce the impact of human activity on the climate system, primarily through reducing greenhouse gas emissions".[3]***

2.1.3. Therefore, the local plan's duty is not simply to minimise the amount of *new* emissions that new development adds to the borough, but rather to ensure that its local plan reduces the ***overall*** amount of carbon emissions of the borough. This means that the more carbon new development is permitted to emit, the greater the reductions that will be needed in *existing* buildings, business, industry, transport, energy production, and land use within the borough in order to fulfil that duty to deliver an overall mitigation.

2.1.4. Given that the local plan can only ensure change via the granting or refusal of planning permissions (and raising of funds as a condition of permission), it cannot force changes to existing buildings, transport, industrial/business operations, or land use. Its only certain route to climate mitigation, therefore, is in ensuring that proposed developments are designed and located to actively reduce the amount of emissions associated with the borough.

2.1.5. Standalone renewable energy can actively mitigate the borough's carbon emissions, as can provision for public transport, walking and cycling. New buildings, however, will only help to actively mitigate the borough's carbon emissions if the new building exports more renewable energy than they consume in grid energy, or if it replaces an existing building that had greater carbon emissions. This is therefore a strong argument that new buildings are only logically compatible with the duty to mitigate climate change if they are, at least, net zero carbon in their own right or are delivered in step with sufficient renewable energy to match or exceed that building's energy demands.

## 2.2 What Degree of Mitigation is Justifiable?

**Extent of mitigation stipulated in the NPPF**

4.4.1. The NPPF provides detail illustrating the extent to which this mitigation should go:

- "The planning system should support the transition to a low carbon future … shape places in ways that contribute to radical reductions in greenhouse gas emissions, [and] encourage the reuse of existing resources, including the conversion of existing buildings; and support renewable and low carbon energy" (Paragraph 157[4]).
- "Plans should take a proactive approach to [mitigation] … In line with the objectives and provisions of the Climate Change Act 2008" (Paragraph 158 and footnote 56).

4.4.2. Logically therefore, a local plan should aim to proactively facilitate the changes necessary to hit the carbon targets set by the Climate Change Act 2008. That Act sets the legally binding net zero target for 2050 and requires fixed carbon budgets for each 5-year period between 2008 and 2050. These are devised by the Committee on Climate Change (CCC), derived from the global carbon budget for a safe climate, using expert insight into what is technically feasible between now and 2050. Parliament then passes these carbon budgets into law. The first six budgets have been legislated, through to the end of 2037. The CCC emphasises[5] that one of its aims in these targets was to align with a UK share of the global carbon budget compatible with the Paris Agreement that the UK has signed. That international agreement commits to limit climate change to no more than 2°C above pre-industrial global average temperatures, and to pursue a lower limit of 1.5°C.

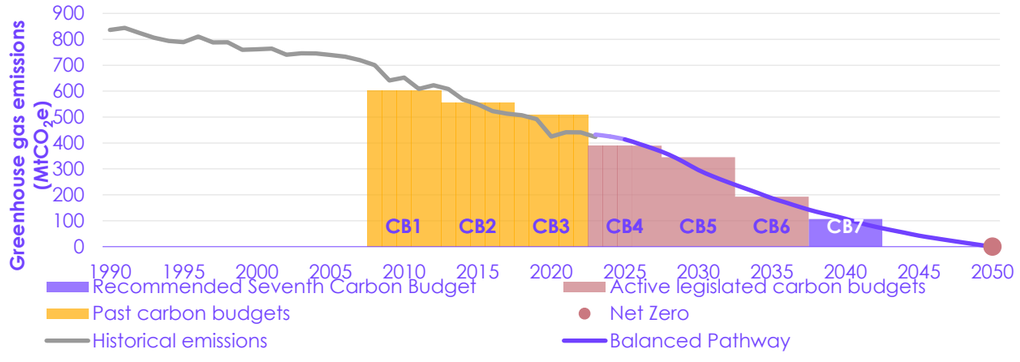


*Figure 1: Committee on Climate Change (2025). The Seventh Carbon Budget.*

[1] Planning & Compulsory Purchase Act 2004 section 19. https://www.legislation.gov.uk/ukpga/2004/5/section/19

[2] Levelling Up & Regeneration Act 2023, Schedule 7. https://www.legislation.gov.uk/ukpga/2023/55/schedule/7

[3] National Planning Policy Framework (December 2023), Annex 2: Glossary. https://assets.publishing.service.gov.uk/media/65a11af7e8f5ec000f1f8c46/NPPF_December_2023.pdf#page=68

[4] Of the December 2023 version of the NPPF, the version against which the Local Plan Update will be examined. All references to the NPPF, unless stated, are to the 2023 version.

[5] Committee on Climate Change (2020), The Sixth Carbon Budget: The UK's path to net zero. https://www.theccc.org.uk/wp-content/uploads/2020/12/The-Sixth-Carbon-Budget-The-UKs-path-to-Net-Zero.pdf

## 2.3 Sectoral Performance Needed for Mitigation In Line With The Climate Change Act 2008

2.3.1. Supporting the legislated carbon budgets, the CCC analysis also identifies a range of pathways towards achieving them, of which the most reasonable is termed the 'Balanced Pathway'. That represents a combination of changes to all sectors in the UK between now and 2050 (described overleaf). The pathway is therefore split out into individual sectoral trajectories. The Balanced Pathway sectoral trajectory shows that the sectors of buildings, energy and transport – i.e. the sectors that the local plan can influence – will need to reach zero sectoral emissions by the mid-to-late 2040s (see Figure 2).

2.3.2. This is because the vast majority of the UK's limited capacity for carbon removals through afforestation and carbon capture technology will be needed to balance the emissions of the sectors that are not able to reach zero emissions (agriculture; aviation; waste; meaning effectively none is available for buildings; see Figure 3). This includes the optimistic assumption that carbon removal technology will be developed in future in a form that can be deployed at scale. If this technology does not emerge (or emerges too late), then the UK will need even steeper reductions from the sectors where reductions are possible (including buildings, energy and transport) to meet the balanced pathway.

2.3.3. Because the carbon budgets to date were achieved largely through decarbonisation of energy supply, the CCC analysis[6] shows that in the plan period (to 2040) much more of the reduction will need to come from buildings and transport (see Figure 4 / footnote 6).

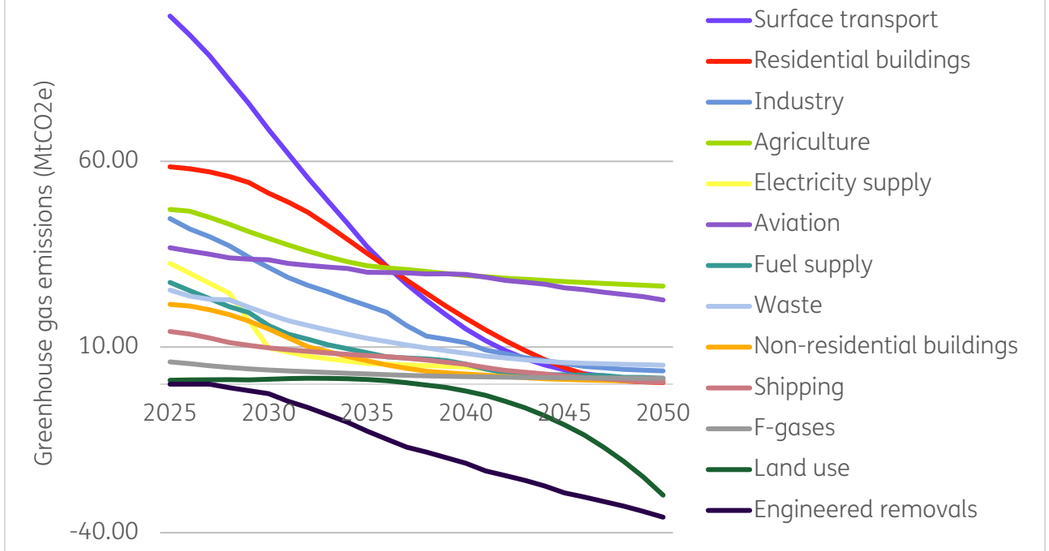


*Figure 2: Chart showing how each UK sector's emissions must fall in the 'balanced' pathway to net zero in 2050. Adapted from: Climate Change Committee, 7th Carbon Budget report, 2025 charts & data download.*

2.3.4. Overleaf are described the changes that the CCC analysis shows will be necessary (for this balanced pathway and carbon budgets) in sectors that the local plan could influence.

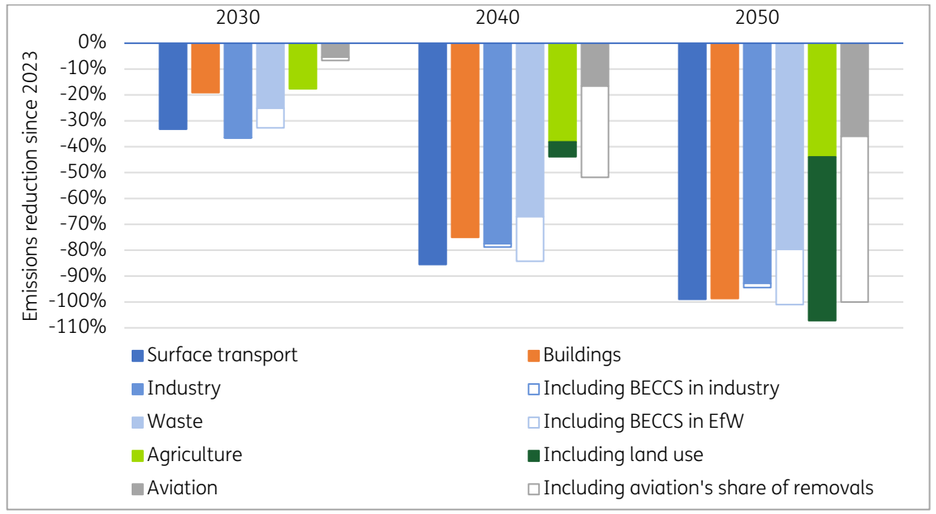


*Figure 3: Chart of each sector's necessary emissions reduction in the 'Balanced Pathway' to net zero, including sectors' allocated share of carbon capture or natural sequestration.*
*"BECCS" = Bioenergy with carbon capture and storage. EfW = energy from waste. From: Climate Change Committee, 7th Carbon Budget report, 2025.*

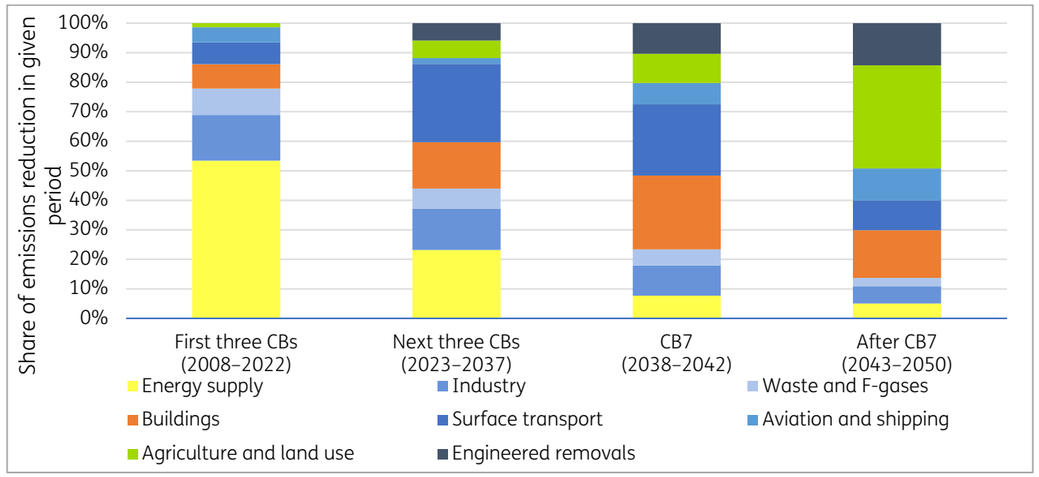


*Figure 4: Share of emissions reduction in each carbon budget period that will need to come from each sector. "CB" = carbon budget period. From: Climate Change Committee, 7th Carbon Budget report, 2025.*

[6] Climate Change Committee (2025), *Progress in reducing emissions – 2025 report to Parliament*. https://www.theccc.org.uk/wp-content/uploads/2025/06/Progress-in-reducing-emissions-2025-report-to-Parliament.pdf#page=34

2.3.5. The CCC identifies a wide range of more detailed actions and performance changes which will be needed in order to deliver sectoral pathways in alignment with the overall balanced pathway to net-zero.

2.3.6. We here summarise a few of these actions most relevant to the sphere of influence of the local plan (note that all of these are taken from the Sixth Carbon Budget[7] unless signified by a different endnote reference):

- New homes built from 2025 onwards to achieve[8]:
  - No more than 15-20kWh/m²/year space heating demand
    - *[Note: Recent energy modelling[9] shows that this would equate to a 69 to 82% reduction on the space heating energy demand of a building which meets Part L 2021, or a 59 to 78% reduction on that of a home that meets the Future Homes Standard, even when assuming the indicative FHS fabric specification released by government in 2021 as opposed to the much weaker fabric proposed in the two options from the most recent FHS consultation[10]. This demonstrates the major gap between Building Regulations and the national legislated net zero goals.]*
  - No connection to the gas grid,
  - Have low-carbon heating system such as a heat pump,
  - Ideally be net zero carbon in operation,[11]
  - Reduced whole-life carbon impact including embodied and sequestered carbon.
- Increased energy efficiency, material efficiency and substitution, to achieve low carbon manufacturing and construction – reducing new builds' embodied carbon. The manufacturing & construction sector as a whole needs to hit a milestone of 70% emissions reduction by 2035 (within the local plan period) from a 2018 baseline.[12]
- Dramatically increase the rollout of electrical heat/heat pumps to existing buildings, so that 100% of heat system sales are low carbon from 2033.
- Transport[13]: Decreasing car travel (6% reduction in car kilometres by 2030 and 17% by 2050) alongside increased acceleration of electric vehicle uptake, further rollout of rail electrification and linear increase in rail passengers and rail freight.
- Increase in renewable energy generation capacity to reach 60% of total grid electricity generation by 2030 and 80% by 2050, at the same time as meeting a doubling in the amount of electricity demand (occurring due to the aforementioned necessary switch from fossil fuel to electricity in existing buildings, transport, and many industrial processes), and phasing out unabated gas power stations by 2035.
- Forest cover to reach 18% by 2050[14], whereas the 2020 baseline was 13%.

2.3.7. It is vital to understand that for the 'balanced pathway' to be realised, *all of the above* changes must be achieved *in combination,* not either/or. This is because there are many interdependencies, and each sector faces such a large challenge in addressing its own emissions that no sector can be reasonably expected to have reliable capacity to pick up slack from others that underperform.

2.3.8. Local plan policy that would effectively deliver any of these changes is thus justified (in being a proactive approach to climate mitigation in line with the Climate Change Act, as per the NPPF mandate), so long as these policies are demonstrated viable and feasible. The justification to go further than national actions is further strengthened by the following circumstances:

a. Where the Climate Change Committee analysis[15] shows that national progress has been insufficient to date, which includes but is not limited to:
   i. Too slow rollout of heat pumps to homes and buildings, instead of gas
   ii. Failure to address embodied carbon/ material efficiency in building regulations
   iii. Too slow expansion of solar energy generation capacity

b. Where the Climate Change Committee analysis finds that nationally stated future policies are at risk of not delivering that performance, including but not limited to:
   i. Need to reduce the relative cost of electricity compared to gas.
   ii. Cancelled commitment to phase-out gas boilers by 2035.
   iii. Long-term incentives for heat pump rollout and building energy efficiency.
   iv. Delay in introducing and enforcing the Future Homes Standard.

c. Where other evidence shows that current or future national policy/regulation (in particular the FHS space heat demand; see 2.3.6; 3.1.6 – 3.1.19) will not deliver the performance needed in buildings: Wokingham's previous evidence explored this, and the current report explores it further, including the likely building standard that would arise if local policy adheres strictly to the energy efficiency metric stipulated by the Written Ministerial Statement 2023 national policy.

[7] Climate Change Committee (2020), The Sixth Carbon Budget https://www.theccc.org.uk/wp-content/uploads/2020/12/The-Sixth-Carbon-Budget-The-UKs-path-to-Net-Zero.pdf
[8] Climate Change Committee (2019), *UK Housing: Fit for the future?* https://www.theccc.org.uk/publication/uk-housing-fit-for-the-future/
[9] Bioregional and Transition by Design on behalf of South Oxfordshire & Vale of White Horse District Councils (2023), *Feasibility Study: Energy modelling.* https://www.southoxon.gov.uk/wp-content/uploads/sites/2/2024/01/NZCS_Task_3_accessible_Dec_2023.pdf#page=26
[10] Department for Levelling Up, Housing and Communities (2023/ 2024), *The Future Homes and Buildings Standards: 2023 Consultation*. https://www.gov.uk/government/consultations/the-future-homes-and-buildings-standards-2023-consultation/the-future-homes-and-buildings-standards-2023-consultation
[11] Climate Change Committee (2020), *Sixth Carbon Budget Sector Summaries: Buildings*. https://www.theccc.org.uk/wp-content/uploads/2020/12/Sector-summary-Buildings.pdf#page=40
[12] Climate Change Committee (2020), *Sixth Carbon Budget Sector Summary: Manufacturing & construction*. https://www.theccc.org.uk/wp-content/uploads/2020/12/Sector-summary-Manufacturing-and-construction.pdf
[13] Climate Change Committee (2020), *Sixth Carbon Budget Sector Summary: Surface transport*. https://www.theccc.org.uk/wp-content/uploads/2020/12/Sector-summary-Surface-transport.pdf#page=33
[14] Climate Change Committee (2020), *The Sixth Carbon Budget Sector Summary: Agriculture and land use, land use change and forestry*. https://www.theccc.org.uk/wp-content/uploads/2020/12/Sector-summary-Agriculture-land-use-land-use-change-forestry.pdf#page=39
[15] Such as Climate Change Committee annual progress reports in 2023 (pages 20-21, 140, 141, 145, 147-8, 161, 192, 204-5, 427) 2024 (8, 9, 12, 50, 52, 55, 56, 58, 60, 62, 63, 66, 83, 84, 87 and recommendations on p93 & 94], 97) and 2025 (15, 49, 51, 54, 60, 61, 78, 88, 89, 103 and recommendations on p120).

# 3. Legislation that defines powers that local plan may use for carbon reduction

## 3.1 Operational Energy And Carbon: Building Regulations Part L (and The Future Homes Standard)

3.1.1. **Building Regulations Approved Document L (known as "Part L") sets the minimum national standard of operational energy and carbon performance of new buildings. It only covers "regulated energy uses":** space heating, hot water, fixed lighting, fans, pumps and ventilation. It does not regulate other energy uses in the building, for example appliances or plug-in lighting. These *unregulated* energy uses can be 50% of a building's total energy use[16], or between 23%-54% of a building's operational carbon,[17] with cooking accounting for 12.8% of fuel consumption (kWh/yr).[18]

3.1.2. **The current version of Part L in place is Part L 2021**, which came into force in June 2022. Prior to this, Part L 2013 was in place from 2013-2022. The next update due to Part L is the Future Homes Standard (FHS) (or Future Buildings Standard, FBS, for non-residential buildings) which Government has indicated will be published in 2025 but will have a further transition period of up to two years before being fully enforced.

3.1.3. **Part L works by modelling an imaginary ('notional') building** of the same shape and size as the proposed building, with a certain standard set of criteria applied to the various different building elements (such as the amount of insulation, airtightness, the type of heating system, and the amount of solar panels). This sets the target limits for energy use and carbon emissions that the proposed building must meet. This means the targets vary significantly, as building shape and size strongly affect how much heat is lost through external walls, roofs and joins.

3.1.4. Compliance with these targets is established through a calculation method titled Standard Assessment Procedure (SAP), in homes, or Simplified Building Energy Model (SBEM) in non-residential buildings (see glossary). Part L sets the following targets:

- **TER, Target Emission Rate:** A carbon emissions metric. All building types (residential and non-residential) are subject to a TER.
- **TPER, Target Primary Energy Rate:** A measure of energy consumption of the building, taking into account the 'raw' energy that was used up in order to generate and transmit the energy used by the building (including the losses in converting one type of energy to another – for example burning gas in power stations to produce electricity – and the losses that occur in transmission of gas or electricity through the grid before it reaches the home). TPER also applies to all building types.
- **TFEE, Target Fabric Energy Efficiency:** A measure of energy demand for *heating and cooling*, based only on the building's fabric, irrespective of the heating system efficiency. TFEE only applies to residential building types.

3.1.5. Additionally, the SAP or SBEM calculation methods can provide other estimated data points for a building, such as space heating demand or total energy use (for example, both of those were estimated using SAP 10.2 in the 2023 modelling by the Future Homes Hub). However, these other data points are not compliance metrics that Part L requires.

### What will the Future Homes Standard change within Part L?

3.1.6. The FHS will update the standards in the Part L 'notional' building – including a heat pump instead of gas. In December 2023 – March 2024, Government ran a further consultation[19] on the forthcoming FHS. As a consultation only, looking at multiple options, it presumably does not yet constitute a formal statement of national policy with which a local plan would need to be consistent (as per the NPPF tests of soundness explained later), but the consultation response could. No response has been released as of 26 September 2025.

3.1.7. The FHS is intended to ensure new homes are:

- "Zero-carbon ready" in that they use only electricity and therefore will reach net zero when the electricity grid is fully decarbonised,
- Built without fossil fuel heating systems.

3.1.8. Government has also claimed that the FHS will make new homes compatible with the UK's net zero 2050 target without future retrofit, but this is in question in light of the evidence explored later in this report (especially around fabric and calculation method).

### Key Technical Features of the FHS

3.1.9. Proposed FHS changes will:

- Remove **gas boilers** as default; encourage **heat pumps** and **electric heating,**
- Possibly *very slightly* raise **minimum fabric standards** (though far short of the best practice Passivhaus or LETI[20]-aligned levels, thus far short of what is needed for the UK's carbon budgets as identified by the Climate Change Committee previously noted),
- Almost certainly include some degree of solar panels (as recently announced by national Government) although it is not yet known whether this will be more or less than the amount that is already in today's Building Regulations (Part L 2021).

[16] CIBSE (2018), *Unregulated energy – why we should care*. https://www.cibsejournal.com/opinion/unregulated-energy-why-we-should-care/

[17] UKGBC (2019), *Net Zero Carbon Buildings: A Framework Definition*. For carbon graphics on regulated and unregulated carbon as a share of whole life carbon, see page 19 (10th page of PDF). https://ukgbc.org/wp-content/uploads/2019/04/Net-Zero-Carbon-Buildings-A-framework-definition.pdf

[18] Department for Energy Security & Net Zero (2023), Lighting, cooking, electrical appliances and incidental heat losses in the Home Energy Model: FHS assessment wrapper. https://assets.publishing.service.gov.uk/media/65785c43095987001295ded5/hemfhs-tp-04-fhs-appliances-assumptions.pdf

[19] Department for Levelling Up, Housing and Communities (2024), The Future Homes and Buildings Standards: 2023 consultation. https://www.gov.uk/government/consultations/the-future-homes-and-buildings-standards-2023-consultation

[20] LETI: Low Energy Transformation Initiative. A coalition of built environment professionals working to establish and achieve the energy performance needed for net zero. LETI's Climate Emergency Design Guide (CEDG) outlines design principles to meet climate change targets, representing industry best practice.

Link to glossary

### Transition from SAP to the Home Energy Model (HEM)

3.1.10. The UK government has announced a planned transition from the Standard Assessment Procedure (SAP) to a new calculation tool, the **Home Energy Model**[21] **(HEM),** as the compliance method for the new Future Homes Standard. SAP has long been the default methodology, relying on monthly average data. By contrast, HEM will use an **hourly-based dynamic model**, allowing more realistic simulations and better representation of operational energy use. Specifically, HEM is designed to more accurately estimate operational energy and to better capture **heat pump dynamics**, solar generation, and occupant behaviour.

3.1.11. The HEM is expected to **align more closely with performance-based metrics** such as kWh/m²/year, which makes it more consistent with the metrics used in Policy CE3 as submitted. Consultation outcomes have indicated that HEM will continue to offer the same metrics as the current Part L (TER, TFEE, TPER), initial documentation indicates that HEM will also be capable of **covering both regulated and some unregulated energy uses**. In this way it is anticipated to serve as a step towards **true whole-building energy performance assessment**. However, as only an early-stage consultation version of HEM has been released, it remains to be seen whether HEM will avoid the inaccuracies of SAP.

3.1.12. In the interim, analysis in this report will be conducted using the SAP 10.2 software, as HEM is not yet available in a usable form. However, the analysis is expected to have some longevity because SAP 10.3, recently announced by the government, is understood to be an update to the SAP methodology that still relies on the information and guidance provided in Appendix L. The government has confirmed that both SAP 10.3 and HEM will be used to calculate compliance with the FHS for a limited but unspecified period after the FHS is introduced, as part of a phased transition for new build homes.

### Are Part L 2021 or the Future Homes Standard suitable to sufficiently mitigate climate change – and if not, what are the best alternatives standards or metrics?

3.1.13. Unfortunately, even for the regulated energy uses, SAP and SBEM are not accurate predictors of a building's actual performance. Buildings have been repeatedly shown to use far more energy[22,23,24] than the SAP or SBEM methods predicted. This difference between SAP/SBEM-predicted energy performance and *actual* performance in use is termed the 'Energy Performance Gap'. This is not common knowledge for home renters or purchasers, who may rely on the EPC certificate (which is based on the SAP calculation). In particular, space heating demand is dramatically underestimated by SAP[25,26]. This is a real problem for climate mitigation given the aforementioned importance of the 15-20 kWh/m²/year space heat demand within the UK's route to hit its legislated carbon goals.

3.1.14. Both Part L 2021 and the FHS compliance targets (TER, TFEE and TPER; see glossary) ignore unregulated energy use, which (as previously noted) can form a significant proportion of the total energy use of a home, and the relative proportion of unregulated energy becomes ever larger as the thermal performance and other regulated systems efficiency is improved. It is therefore ever more important to address unregulated energy.

3.1.15. Although unregulated energy is not part of the Part L compliance metrics, the SAP calculation tool does also contain 'Appendix L' that estimates unregulated energy use for illustrative/informational purposes only, but this overestimates the unregulated energy use[27] because it is based on outdated data on appliances' energy use which was collected years ago and does not reflect today's much more efficient typical appliances. Still, the *over*estimation of unregulated energy use does not balance out SAP's *under*estimation of space heat demand and total energy use.

3.1.16. These inaccuracies in SAP's energy performance predictions go directly against the Climate Change Committee's strong message[28] of several years that, in order to be compatible with the UK's legislated carbon goals, building performance "metrics and certification [must be reformed] to reflect real-world performance … committing developers to the standards they advertise".

3.1.17. The current Part L 2021 and FHS do not deliver the 15-20kWh/m²/year space heat demand found to be necessary by the Climate Change Committee as previously noted. To achieve that limit, improved fabric would be needed. This is true whether calculated

[21] Department for Energy Security and Net Zero (2024), Home Energy Model: replacement for the Standard Assessment Procedure (SAP): https://www.gov.uk/government/consultations/home-energy-model-replacement-for-the-standard-assessment-procedure-sap

[22] CIBSE (no date), *Carbon Bites: The Performance Gap*. https://www.cibse.org/media/a1skdgsi/cb11.pdf

[23] CIBSE (2021), *Module 175: Towards the closing of the building performance gap*. https://www.cibsejournal.com/cpd/modules/2021-02-tm61/

[24] Etude, CIBSE, Levitt Bernstein, Elementa, WSP, Clarion Housing Group & UCL (2021). Making SAP and RdSAP 11 fit for Net Zero. https://www.levittbernstein.co.uk/site/assets/files/3670/making_sap_and_rdsap_11_fit_for_net_zero-full_report.pdf

[25] Currie & Brown and Etude on behalf of Cornwall Council (2021), *Technical evidence base for policy sec 1 - new housing technical appendices*. https://www.cornwall.gov.uk/media/dxchs1xq/eb042-1-20200359-climate-emergency-dpd-residential-energy-technical-evidence-base-appendices-rev-g.pdf

[26] Mitchell, R and Natarajan, S (202), *UK Passivhaus and the energy performance gap*. https://www.sciencedirect.com/science/article/abs/pii/S0378778820313918

[27] Currie & Brown and Etude on behalf of Cornwall Council (2021), *Technical evidence base for policy sec 1 - new housing technical appendices*. https://www.cornwall.gov.uk/media/dxchs1xq/eb042-1-20200359-climate-emergency-dpd-residential-energy-technical-evidence-base-appendices-rev-g.pdf

[28] Climate Change Committee (2019), *UK Housing: Fit for the future?* https://www.theccc.org.uk/wp-content/uploads/2019/02/UK-housing-Fit-for-the-future-CCC-2019.pdf

with SAP (for example see the Future Homes Hub 'Ready for Zero' report and appendix[29]) or a more accurate energy prediction method[30,31] (and it is not yet certain whether HEM will be more accurate). The 'Ready for Zero' report appendix on SAP analysis shows that Part L 2021 fabric would result in a space heat demand of up to 47kWh/m$^2$/year depending on home type, even before taking into account SAP's underestimation of this. As the most recent government consultation[32] (2023-24) shows two possible FHS options which have little-to-no fabric improvement, the FHS space heat demand cannot be assumed to be lower than that of today's Part L 2021 (up to 47kWh/m$^2$/year as above). Concerningly, the 'Ready for Zero' report had also posited two further possible specifications with even worse fabric (resulting in a SAP-estimated space heat demand of up to 54kWh/m$^2$/year), although government has given no indication of pursuing those.

3.1.18. **Despite the Committee on Climate Change recommendation for "rapid and forceful pursuit of zero-carbon new-build"[33], the current Part L 2021 and the FHS do not result in net zero carbon buildings**. Government has described the FHS as "zero carbon ready", but this only means the building will be all-electric (no gas) and thus will eventually get to net zero only when the national electricity grid is entirely zero carbon. It is important to note that net zero carbon does not address fuel poverty, nor does it promise adaptation or occupant health resilience, as this all-electric status does not inherently mitigate overheating or indoor damp and mould (which, by contrast, highly efficient building fabric can help to mitigate). Healthy building principles encompass more than low-carbon operation; they seek to ensure indoor air quality, comfort, ventilation, moisture control and mental wellbeing via comprehensive design.

3.1.19. The latest FHS consultation (2023-24 as above) also shows that one of the options under consideration would result in heating bills twice as high as a current new build home, due to switching from gas to electric heating without improving fabric at all. The table shown here provides an overview of comparative performance in the existing building regulations and the two FHS options from the most recent consultation, compared to what is necessary in new build homes for the achievement of the UK's legislated carbon budgets. This table combines information from the 2023-24 FHS consultation, third-party analysis of building performance, and Committee on Climate Change analysis of the necessary sectoral changes for the UK's carbon budgets. As shown in the table, Option 1, despite being more stringent, still falls short of achieving net-zero carbon. Nevertheless, considering both emissions reduction and financial performance, Option 1 emerges as the preferable choice of these two FHS options.

*Table 1: Comparison of current and anticipated future building regulations standards against what is known to be needed in new homes as part of the achievement of the UK's legislated carbon targets in the Climate Change Act*

| Element | Current Part L | FHS Option 1 | FHS Option 2 | What is needed for national carbon goals? |
|---|---|---|---|---|
| **Fabric** | Basic levels of insulation, glazing & airtightness | All U-values (insulation & glazing) identical to Part L 2021. Small improvement to airtightness. | No improvement on Part L 2021 | Significant improvement in U-values and/or airtightness to meet space heat demand target shown below |
| **Heat system** | Gas boiler + Wastewater heat recovery | Air-source heat pump + waste-water heat recovery | Air-source heat pump only | Low carbon heat – heat pump or similar from 2025 |
| **Solar PV provision** | PV panel area m$^2$ equal to 40% of ground floor | Same as Part L 2021. | None *[note: ruled out by 2025 govt announcement]* | Enough to make the building net zero carbon (match 100% of energy use) |
| **Resulting space heat demand in kWh/m$^2$/year** | 13-47 kWh/m$^2$/year (citation; before correcting SAP's underestimation of this metric) | Exact figure not known but will be slightly less than that of Part L 2021 due to airtightness gain | Same as Part L 2021, as fabric is the same | ≤15-20 kWh/m$^2$/year from 2025, in actual performance (citation) |
| **Resulting annual heat+hot water bill (citation)** | £640 | £520 | £1,220 | n/a |
| **Resulting annual $CO_2$ emissions (citation)** | 1.4 tonnes/year | 0.05 tonnes/year | 0.1 tonnes/year | Zero carbon (various citations) |

[29] Future Homes Hub (2023) *Ready for Zero: Evidence to inform the 2025 Future Homes Standard Task Group Report. Appendix F - SAP10.2 modelling results.* https://irp.cdn-website.com/bdbb2d99/files/uploaded/Appedix%20F%20-%20final.pdf

[30] Currie & Brown and Etude on behalf of Cornwall Council (2021), *Technical evidence base for policy sec 1 - new housing technical appendices*. https://www.cornwall.gov.uk/media/dxchs1xq/eb042-1-20200359-climate-emergency-dpd-residential-energy-technical-evidence-base-appendices-rev-g.pdf

[31] Bioregional and Transition by Design on behalf of South Oxfordshire & Vale of the White Horse District Councils (2023), *Feasibility Study: Energy modelling.* https://www.southoxon.gov.uk/wp-content/uploads/sites/2/2024/01/NZCS_Task_3_accessible_Dec_2023.pdf#page=26

[32] HM Government Department for Levelling Up, Housing and Communities (2023), *The Future Homes and Buildings Standards: 2023 consultation*. See Table 4.2 for cost increase to occupant energy bills and to developer build cost. https://www.gov.uk/government/consultations/the-future-homes-and-buildings-standards-2023-consultation/the-future-homes-and-buildings-standards-2023-consultation

[33] Committee on Climate Change (2023), *2023 Progress Report to Parliament. Chapter 4: The urgent need for action and strategy*. https://www.theccc.org.uk/wp-content/uploads/2023/06/Progress-in-reducing-UK-emissions-2023-Report-to-Parliament-1.pdf#page=27

**What effect will the introduction of the FHS mean for local plan policies that use current building regulations metrics?**

3.1.20. A critical issue in this context is baseline misalignment. Historical TER-based plan policies, such as a 100% improvement over TER, depend on the baseline TER set by current Building Regulations (Part L 2021), calculated using SAP 10.2. Once FHS and HEM enter force, the TER baseline will change. However, there is currently **no published methodology** for converting or comparing the two baselines, and no uplift equivalence is available between SAP 10.2 (current) and HEM-based TER. This absence of guidance presents a substantial risk: any TER-based policies adopted now may become ambiguous or unworkable post-FHS unless they are clearly future-proofed. For Wokingham Borough Council, this reinforces the case for continuing to pursue CE3's absolute energy targets instead of options that express uplift against TER.

3.1.21. The adoption of the FHS and HEM may occur after or during Wokingham's Local Plan examination (anticipated in late 2025). This creates a risk that local policy could be quickly superseded by national regulation. By contrast, existing draft Policy CE3 as submitted uses absolute metrics and performance-based verification, which would have greater longevity than policies based on current Building Regulations. HEM will also[34] output more future-relevant metrics of total energy use (also termed Energy Use Intensity, EUI) and Space Heating Demand (SHD) even if these are not FHS compliance metrics. This strengthens the rationale for Policy CE3 as submitted, which may offer greater long-term policy stability by being ahead of the national curve rather than behind it, but this is not recognised in the WMS2023 which stipulates[35] the use of "a specified version" of SAP.

3.1.22. Planning authorities could therefore consider whether policy standards can be expressed using SAP, but also use other metrics to avoid becoming irrelevant once HEM and FHS are in place. This dual approach would support a plan period through to 2045 or 2050.

3.1.23. The local plan policy life cycle (e.g. to 2040 or beyond) will overlap more with the period when the new FHS and HEM will be in place than with the last few years of the incumbent Part L 2021, SAP and SBEM. As such, policies based on absolute energy performance using accurate calculation methodologies, such as CE3's kWh/m²/year thresholds, are more likely to remain valid and comparable for the vast majority of the plan period. These policies also align more closely with longer-term climate change targets (as per the aforementioned Climate Change Committee stipulation that buildings' energy performance metrics should reflect real performance; see 3.1.15).

3.1.24. Finally, planning policy guidance has not yet clarified how TER-based policies should be adapted or rescaled once the TER benchmark and calculation methodology changes. No guidance on this issue is currently available from the Ministry of Housing, Communities and Local Government (MHCLG) or the Planning Advisory Service (PAS).

[34] Department for Energy Security & Net Zero (2023), "*The Home Energy Model: Future Homes Standard assessment Using the Home Energy Model to demonstrate compliance with the Future Homes Standard*". https://assets.publishing.service.gov.uk/media/65f86671ce4c150011a1508b/home-energy-model-future-homes-standard-assessment-consultation.pdf#page=37

**What alternatives are there to Part L/FHS and the national compliance metrics?**

3.1.25. Beyond Part L compliance, there are other more accurate methods that are used in the more forward-thinking parts of the buildings industry to more realistically predict the energy performance of a given building design (and to improve it):

- PHPP: Passivhaus Planning Package. Can be used for any building. Does not require the pursuit of Passivhaus certification; can be used as a standalone tool for residential operational energy estimation.
- CIBSE TM54 (Technical Memorandum 54 by the Chartered Institute of Building Services Engineers). Intended for use primarily with non-residential buildings.

3.1.26. The use of PHPP outside the cutting-edge of the sector is in the minority, but growing. While CIBSE TM54 is not part of the core compliance methodology in Part L, it is referenced in **Part L 2021 guidance** as an appropriate method for the 'energy forecasting' that is now mandatory[36] for non-residential buildings of 1,000m² or greater size. This means TM54 may meet the Planning & Energy Act definition of 'energy efficiency standards' as ones that are 'endorsed or laid out by the Secretary of State'. However, it is important to clarify that Part L's *compliance targets* (TER, TPER, and TFEE, as previously noted), are not directly linked to these energy forecasts. Instead, compliance is based on regulated energy use under a set of fixed assumptions via the SAP or SBEM calculation, which do not fully reflect actual performance in use.

## 3.2 Planning & Energy Act 2008

3.2.1. The **Planning** & Energy Act is the source of the local plan's most important power to influence the energy and carbon performance of development. It grants the local planning authority the power to set 'reasonable requirements'[37] for:

- Energy efficiency standards higher than those set by building regulations,
- Renewable or low carbon sources 'in the locality of the development' to supply a proportion of energy used at the development.

3.2.2. The Act defines 'energy efficiency standards' as ones that are set out or endorsed by the Secretary of State. This may imply the methods used to demonstrate compliance with Part L of Building **Regulations** (SAP or SBEM despite their aforementioned shortcomings, or TM54). However, other standards may also meet the 'endorsement' criterion:

- As CIBSE TM54 is one of the energy calculation methods endorsed by Part L as of 2021, it appears the Act would therefore permit local energy efficiency to account for *total* energy use, not just regulated (see glossary).

[35] Baroness Penn (13th December 2023), Written Ministerial Statement UIN HLWS120. "Planning - Local Energy Efficiency Standards Update". https://questions-statements.parliament.uk/written-statements/detail/2023-12-13/hlws120

[37] Planning and Energy Act 2008, Section 1. https://www.legislation.gov.uk/ukpga/2008/21/section/1

- The National Model Design Code[38] (2021) implicitly endorses the use of metrics/ methods other than Part L SAP and SBEM, in that it confirms that sustainability standards "can be incorporated into ... policy (and) might include ... Whole life-cycle carbon". The only method for accounting for buildings' whole life carbon in the UK is the RICS Whole Life Cycle Carbon Assessment (WLCA), which follows the relevant British/European Standard BS/EN15978. RICS WLCA requires that operational energy must be assessed using CIBSE TM54, PHPP, NABERS, ASHRAE, or equivalent energy prediction method, and specifically that "Part L 2021 calculations must not be used under any circumstances, as they are not a prediction of energy consumption."

3.2.3. The Act does not define 'energy used at the development'. It thus appears to empower the local plan to require renewable energy to meet a proportion of the new building's *total* energy, not just 'regulated' energy (glossary). In that case a method would need to be chosen to account for unregulated energy, ideally in a way that works alongside the regulated energy calculation. Several methods could suit: TM54 (as above), BREDEM, or SAP Appendix L. PHPP could also be used but not directly integrate with SAP/ SBEM.

3.2.4. The Act stipulates that policies set using these powers "must not be inconsistent with the relevant national policies" for energy efficiency or for renewable/low carbon energy as applicable to the type of local plan policy proposed.

3.2.5. The Act does not define 'renewable energy', 'low carbon', or 'in the locality of development'. Presumably therefore the local planning authority is free to define these[39].

3.2.6. The Act furthermore does not specify whether these powers can be used in *new* or *existing* development. The implication therefore is that these powers could be used to set local plan policy that applies to proposals regarding existing buildings, not only new development. However, this would still be subject to the requirement to be 'reasonable'.

3.2.7. The Act does *not* define 'reasonable requirement'. A logical interpretation could be that the policies should be feasible, effective in fulfilling the climate mitigation duty (and/or other stated objectives set by the plan to fulfil local needs), and specific enough to be viability-tested so they do not prevent fulfilment of the borough's stated housing targets.

3.2.8. We interpret this to mean that a policy could require renewable energy to supply a 'reasonable proportion' of the *total* energy use of the development, not just the share that is 'regulated' by Part L of building regulations. This could arguably be a 100% proportion, if it can be shown why this requirement is 'reasonable' – for example in its necessity or effectiveness to meet the duty for climate mitigation, with evidence of its technical feasibility and its cost for viability testing. A requirement for most or all of a development's energy use to be met through renewable energy generation will be most effective in conjunction with requirements to first reduce demand as far as possible as per the requirements of Policy CE3.

[38] HM Government (2021), *National Model Design Code: Part 1 – The Coding Process.* https://assets.publishing.service.gov.uk/media/611152f98fa8f506ca458925/NMDC_Part_1_The_Coding_Process.pdf

[39] Unless a definition has been established in any relevant case law. This consultant team is not aware of any such case law but please note this team do not claim to be qualified legal professionals.

## 3.3 Town & Country Planning Act 1990 (T&CP Act)

3.3.1. This Act's Section 106 has particular relevance in the formulation of net zero carbon buildings policy. Section 106[40] empowers the local plan to require payments from new development to mitigate its impacts. These must be reasonable, proportional to the development, and necessary to make the development acceptable.

3.3.2. This S106 mechanism has sometimes been used in various precedent local plan policies[41] as a mechanism requiring developer payments to offset new developments' emissions or energy use. A requirement for carbon offset payments was pioneered by Milton Keynes in 2008, followed in 2012 by Ashford and Islington, then across London in 2016, Reading in 2019, and others. These funds are meant to deliver actions that will prevent or remove the same amount of carbon that the buildings will emit over a certain number of years.

3.3.3. Please note that in addition to the T&CP Act Section 106, some other local plans have instead used the Community Infrastructure Levy (CIL) mechanism to collect offset payments. CIL was established in the Planning Act 2008 section 11[42]. However, CIL is more restricted in what it can be charged for (i.e. only to fund infrastructure that the development will rely on, as opposed to S106 which can be for any necessary mitigation of development impacts). S106 is thus more suitable for offsetting policies.

3.3.4. Several key differences arise in how this kind of policy can work:

- **Calculation and scope**
- **Pricing**
- **Collection and spending.**

These are discussed in the next paragraphs.

### Calculation and scope

3.3.5. Key differences here are:

- Whether to offset only regulated emissions as calculated by SAP or SBEM (national calculation methods) or also unregulated emissions (and how to calculate these if so).
- Number of years of carbon emissions that the developer should pay for (e.g. in London and Milton Keynes, this figure is 30 years).
- When the calculation should be performed – i.e. at the time of planning application, or on completion or post-occupation to ensure the offset amount reflects reality.

3.3.6. Some local planning authorities in London and elsewhere also seek offsets for unregulated emissions. Where local plans require *carbon* offsetting to 'net zero' we have not found any examples that use any method other than SAP / SBEM to calculate the *regulated* portion of the carbon emissions that must be offset (although some seek offsetting of the *unregulated* portion using a different method). However, some energy-based policies that offset energy and not carbon use tools such as PHPP when calculating the amount of offsetting required for policy compliance ('energy offsetting').

[40] Town & Country Planning Act 1990, Part III: Control over development – other controls over development. https://www.legislation.gov.uk/ukpga/1990/8/section/106

[41] National Energy Foundation (2016), *Review of Carbon Offsetting Approaches in London.* Page 30. https://www.london.gov.uk/sites/default/files/gla_cof_approaches_study_final_report_july_2016.pdf

[42] Planning Act 2008, Section 11. https://www.legislation.gov.uk/ukpga/2008/29/part/11

Link to glossary

**Pricing**

3.3.7. Pricing of offset payments can vary by being:

- Either tied to a **nationally recognised 'carbon price'** such as the BEIS carbon valuation,
- Or the **cost of delivering local projects** that would remove or prevent the same amount of carbon (or generate an amount of renewable energy equal to the shortfall in the amount provided on-site by the development).

3.3.8. London's recommended offset price is based on a 2017 study by AECOM. This explored a range of costs to enact carbon-saving projects, minus the amount of 'copayment' that can be secured (e.g. if homeowners pay part of the cost towards insulating their home, and the fund pays the rest). These projects mostly consisted of retrofitting existing buildings with insulation or renewables. It concluded:

> "Given the wide variability in the costs and carbon savings for potential carbon offsetting projects combined with the uncertainty in the percentage copayments that could be secured, it would be difficult to assemble sufficient evidence … to … derive a robust [London-wide] carbon price based on the cost of offsetting projects. As such, the approach adopted in this study is to … base [offset] prices … on a **nationally recognised carbon pricing mechanism**".

3.3.9. The AECOM study on pricing notes that offsetting [within the London Plan policy approach] could be varied by the location in the same way that CIL zones differ. The London Plan 2021 lets boroughs set their own price, noting that "a nationally recognised non-traded price of £95/tonne has been tested as part of the viability assessment for the London Plan". However, that 'nationally recognised non-traded price' of carbon is updated annually[43] – and would today (2024) be £403/$tCO_2$ if that AECOM exercise were repeated today. 2018 Mayoral guidance notes some LPAs have based their price on the average cost of local projects to save carbon, e.g. Lewisham (£104/tonne), which is re-tested in a local viability assessment. In all cases in London this is multiplied by 30 years (emulating the approach first pioneered in Milton Keynes).

a. Please note that the reason offsetting costs were relevant to viability in the London case is because the London policy is written with the anticipation that only ~35% of the required carbon emissions reduction is delivered on-site and the remainder is met through offsetting. By contrast, where a local plan policy requires net zero to be met through improvements entirely on-site (based on evidence that this is feasible in the majority of cases) and where the costs of meeting this entirely on site have been factored into the viability study, there should be no logical need to further viability-test an offsetting cost. Such a policy would only allow offsetting in exceptional cases for feasibility reasons, meaning that the offsetting cost amount would reflect the amount that 'should' have been spent on-site – a cost which would have been factored into the onsite cost uplift in the viability assessment.

3.3.10. We note that it is important that viability assessments must not 'double count' the cost impact of net zero carbon policy: that is, the viability assessment should prioritise consideration of the cost of meeting the policy's required carbon reduction on-site through improvements to the building, and then only apply a cost for offsetting of any *remaining* carbon if it is assumed (and evidenced) that developments will largely not be able to meet that required reduction on-site.

- It has not been possible to identify any analysis comparing the cost of per-tonne carbon offsetting with the cost of meeting policy's overarching carbon reduction targets on-site in the London case (or similar policy cases like Milton Keynes and Reading). However, where a policy's evidence base suggests it is feasible for the vast majority of development to meet the requirements on-site and the policy's offsetting mechanism is designed to reflect the cost of 'what should have been spent on-site' (for example the cost of a shortfall in the 100% renewable energy requirement) – like Wokingham's original submitted CE3 policy – then it is reasonable for the viability assessment to assume only the costs of meeting the policy requirements fully on-site.

3.3.11. **Where carbon offsetting is one of the mechanisms within the net zero carbon policy approach, the cost per tonne of carbon is set by various rationales.** London's £95/$tCO_2$ rate matched a previous national carbon value, set annually by BEIS (as of 2023 this national value has risen to £378/$tCO_2$). By contrast, some other plans have used a per-home payment (see Central Lincolnshire in this table) with lower and upper bounds reflecting the amounts of funding that would be needed to install renewable energy sufficient to offset the typical new building's emissions.

3.3.12. **However, there is a vanguard of newer pioneering local plans that are moving away from Building Regulations metrics and taking a more effective route of energy use limits and/or 100% renewable energy.** Examples are given in the table here, outlining their differences and comparing them to the London Plan 2021 which is based on Building Regulations as previously noted.

[43] HM Government Department for Energy Security and Net Zero (updated annually), *Green Book supplementary guidance: valuation of energy use and greenhouse gas emissions for appraisal*. https://www.gov.uk/government/publications/valuation-of-energy-use-and-greenhouse-gas-emissions-for-appraisal

### Collection and spending of offset payments

3.3.13. London mayoral guidance (2018) notes that offset payments should be collected via Section 106 agreements in the usual way and by the same team, and that:

> "LPAs generally choose to take **payment on commencement of construction** on site. Some choose to **split the payment**, with 50 per cent paid post-construction and 50 per cent prior to occupation. This is up to the LPA to determine. However, taking payment later than commencement of works can mean a high degree of uncertainty as to when funding will be received and is unlikely to enable carbon savings from the offset fund to be delivered before the development is occupied, creating a delay in offsetting a development's carbon impact. LPAs should also **note the time limits that apply to discharging Section 106 agreements and ensure funds are collected and spent in this time period**."

### Other potentially relevant parts of the Town & Country Planning Act 2004

3.3.14. Section 61[44] of the same 2004 Act enables Local Development Orders (LDOs) – a tool used to achieve specific objectives by granting certain types of development fast-track permission (or certainty of permission). LDOs have been used to promote renewable and low-carbon energy, for example in Swindon and Hull[45]. However, we do not here go into detail on that as it does not relate directly to the purpose of this current report, i.e. the formulation of net zero carbon policy options for buildings, using specific metrics.

| Residential new-build requirement | London Plan (2021) | Milton Keynes (2019) | Central Lincolnshire (2023) | B&NES and Cornwall (2023) | Tendring Colchester Borders Garden Community DPD (2025) |
|---|---|---|---|---|---|
| **Scope of emissions that must be 'net zero'** | Regulated carbon as per Part L (some boroughs also include unregulated) | Regulated carbon as per Part L | Total operational carbon emissions from all energy use (regulated and unregulated) | Total operational carbon emissions from all energy use (regulated and unregulated) | Total operational carbon emissions from all energy use (regulated and unregulated) |
| **Minimum reduction in on-site carbon emissions (vs Building Regulations Part L 2013)** | 35% | 39% (19%, plus a further 20% by renewable energy) | n/a | n/a | n/a |
| **Energy use limits in homes** (EUI = Energy Use Intensity; see glossary) | n/a | n/a | 35-60 kWh/m²/year (EUI)<br>15 kWh/m²/year (space heating demand) | 40 kWh/m²/year (EUI)<br>30 kWh/m²/year (space heating demand) | 40 kWh/m²/year (EUI)<br>30 kWh/m²/year (space heating demand) |
| **On-site net zero (i.e. 100% on-site renewable energy supply)** | No | No | Yes, through 100% renewable energy, but with exceptions for feasibility | Yes, through 100% renewable energy | Yes, through 100% renewable energy, but with exceptions for feasibility |
| **Offset price** | Recommend £60-£95/$tCO_2$, but decision by borough (e.g. Lewisham, £104/$tCO_2$) (*ibid*) | £200/$tCO_2$ | £5-15k/dwelling, or direct provision of offsite renewable energy equivalent to dwelling usage | £373/$tCO_2$ (B&NES)<br>11.7p/kWh x 30 years (Cornwall) | DPD specifies energy offsetting, but omits price. We anticipate likely to use Essex £1.82/kWh. |
| **Years' worth of emissions to be offset** | 30 | 1 | n/a | 30 | n/a |

[44] Town & Country Planning Act 1990, Part III: Control over development; Section 61: Local development orders. https://www.legislation.gov.uk/ukpga/1990/8/part/III/crossheading/local-development-orders

[45] Royal Town Planning Institute (2018), *Practice advice. RENEWABLE ENERGY: Planning's role in delivering renewable energy in the new low carbon economy.* https://www.rtpi.org.uk/media/1834/renewableenergypracticeadvice2018.pdf

## 3.4 Levelling Up & Regeneration Act 2023 (LU&R Act)

3.4.1. This Act makes provision for amendments to the planning system, of which relevant to carbon:

3.4.2. Section 106 & Community Infrastructure Levy (CIL) was originally intended to be replaced by 'Infrastructure Levy' on gross development value (GDV) under the previous (Conservative) government. However, the new (Labour) government indicates[46] that it will not implement the Infrastructure Levy and will instead "focus on improving the existing system of developer contributions". Notably, the Act does not scrap S106 but empowers Government to limit S106 uses.[47] This may alter the scope to use S106 as a carbon/energy offsetting mechanism.. The local authority would still have to set the new Levy charging schedule and infrastructure delivery strategy of how it will be spent. It may apply to permitted development as well as full plans[48].

- The Act itself does not directly end Section 106 or CIL. Rather, Schedule 12 (Part 1) empowers the Secretary of State to "make regulations providing for … a charge to be known as Infrastructure Levy (IL)" and that these IL regulations "may include provision about *how* the following powers are to be used":
  - a. Community Infrastructure Levy
  - b. "section 70 of TCPA 1990 (planning permission),"
  - c. "section 106 of TCPA 1990 (planning obligations)"
  - d. "section 278 of the Highways Act 1980 (execution of works)."
- A consultation in 2023[49] proposed to keep S106 for "matters that cannot be conditioned for"[50], infrastructure provision as payment-in-kind of the new Levy, or where GDV cannot be calculated. It also proposed to phase-in the new Levy over several years, and noted it may set a national 'offset' reduction to the Levy for example "new buildings that go beyond national or local environmental policy could have the value of sustainable technologies offset against Levy liabilities". No consultation response has yet been published at the time of writing.

3.4.3. New 'national development management policies' (NDMP) with which local plan policies must not be inconsistent. The Act does not confirm the content of the DM policies, but rather only states that (Chapter 2, point 94):

- "A "national development management policy" is a policy (however expressed) of the Secretary of State in relation to the development or use of land in England, or any part of England, which the Secretary of State by direction designates as a national development management policy".
- Before making, modifying or revoking an NDMP, the Secretary of State must:
  - Consult with relevant parties on this unless it is a) an immaterial change to the NDM policy or b) it is 'necessary, or expedient …to act urgently'.
  - "Have regard to the need to mitigate, and adapt to, climate change".

3.4.4. A 2022-23 consultation[51] suggested that an NDMP for carbon emissions measurement and reduction could be set. The consultation response[52] summarises the commentary received but gives no clarity on the erstwhile Government's resulting decision, noting only a continued interest in this topic, an intent "to review national planning policy … to make sure it contributes to climate change mitigation as fully as possible", and that the erstwhile Government was researching the "economic, practical, and technical impacts of measuring and reducing embodied carbon" to inform potential future policy decisions.

3.4.5. Meanwhile, carbon is not mentioned at all in the Act text as passed. The new (Labour) Government's Summer 2024 planning consultation[53] confirms the intent to create NDMPs, but gives no insight on whether these may cover carbon/ energy. Therefore, it is not yet determinable whether the NDMP regime will affect the ability of LPAs to set their own standards for buildings' carbon or energy use. Consultation is expected at some point in 2025.

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[46] HM Government Ministry of Housing, Communities and Local Government (2024), *Open consultation: Proposed reforms to the National Planning Policy Framework and other changes to the planning system.* https://www.gov.uk/government/consultations/proposed-reforms-to-the-national-planning-policy-framework-and-other-changes-to-the-planning-system/proposed-reforms-to-the-national-planning-policy-framework-and-other-changes-to-the-planning-system

[47] Local Government Association Planning Advisory Service (no date). *Levelling-up and Regeneration Bill: Delivering Infrastructure*. https://www.local.gov.uk/pas/our-work/levelling-and-regeneration-bill#:~:text=The%20Levelling%20Up%20and%20Regeneration,a%20charge%20on%20development%20for

[48] Levelling Up, Housing and Communities Committee (2022), Letter to Secretary of State for DHLUC, 24th August 2022. https://committees.parliament.uk/publications/28460/documents/171233/default/

[49] HM Government Department for Levelling Up, Housing & Communities (2023), *Technical consultation on the Infrastructure Levy*. https://www.gov.uk/government/consultations/technical-consultation-on-the-infrastructure-levy/technical-consultation-on-the-infrastructure-levy

[50] Chapter 1. "Use of S106"

[51] HM Government Department for Levelling Up, Housing & Communities (2022), *Levelling-up and Regeneration Bill: reforms to national planning policy*. https://www.gov.uk/government/consultations/levelling-up-and-regeneration-bill-reforms-to-national-planning-policy/levelling-up-and-regeneration-bill-reforms-to-national-planning-policy#chapter-10--national-development-management-policies

[52] HM Government Department for Levelling Up, Housing & Communities (2023), *Government response to the Levelling-up and Regeneration Bill: reforms to national planning policy consultation*. https://www.gov.uk/government/consultations/levelling-up-and-regeneration-bill-reforms-to-national-planning-policy/outcome/government-response-to-the-levelling-up-and-regeneration-bill-reforms-to-national-planning-policy-consultation

[53] HM Government Ministry of Housing, Communities and Local Government (2024-45), *Proposed reforms to the National Planning Policy Framework and other changes to the planning system.* Consultation and response. https://www.gov.uk/government/consultations/proposed-reforms-to-the-national-planning-policy-framework-and-other-changes-to-the-planning-system

3.4.6. A new 'Environmental Outcomes Report' to replace the existing system of Sustainability Appraisals, Strategic Environment Assessments and EU Environmental Impact Assessment. The outcome topics are not yet clarified but may conceivably include carbon emissions.

- The LU&R Act as passed in 2023 (Part 6) establishes that "Regulations made by an appropriate authority … may specify outcomes relating to environmental protection in the United Kingdom or a relevant offshore area that are to be 'specified environmental outcomes'".
  - 'Appropriate authority' is defined as the Secretary of State and/or a devolved authority.
  - "'Environmental protection' means … protection of the natural environment … from the effects of human activity".
  - The definition of 'natural environment' names 'living organisms … their habitats … [unbuilt] land, air and water … and the natural systems, cycles and processes through which they interact". This could logically be implied to include the climate – as this is a natural cycle or process.
  - However: Neither climate nor carbon is specifically mentioned anywhere in Part 6.
- Well before the Act was passed, there was a 2023 consultation on Environmental Outcomes Reports[54]. Paragraphs 4.9-4.10 give a "list of potential matters that could be reflected as outcome[s]". While this list includes air quality, which may be indirectly influenced by fossil fuel use in homes, it does not explicitly reference carbon emissions or energy use. However, paragraph 4.10 notes that "The government expects that the matters not in [that] list … will be picked through regime specific outcomes" and later paragraph 4.29 goes on to state that the Government is "reviewing how EORs could be used effectively to help support efforts to reduce the carbon impact of development … [to] allow us to best consider the role tools like environmental assessment should play in … crucial issues like the challenges of transitioning to net zero". No response to that consultation has yet been published.
- An early 2024 (erstwhile) Government response[55] to a review of environmental assessment regimes did not mention carbon/energy. The new Government's Summer 2024 NPPF consultation[56] material did not mention environmental outcomes and nor does the since published NPPF 2024.
- Therefore, as yet, there is no immediate indication that the Act's 'Environmental Outcomes' approach will affect the way the local plan can choose to pursue climate change mitigation and adaptation to be achieved or demonstrated by developments.

3.4.7. Supplementary Planning Documents (SPDs) to be replaced with "Supplementary Plans"

- Until the LU&R Act, the production of supplementary documents with significant but less material weight than the formal development plan documents (local plan itself) was established in the Town and Country Planning (Local Planning) (England) Regulations 2012.
- The LU&R Act does not specifically mention SPDs, but provides for the creation of a new type of document, 'Supplementary Plans', which the Government's 2023 consultation[57] explains are intended to replace SPDs entirely. (However, no response to this consultation has yet been published, and the text of the Town & Country Planning Regulations 2012, cited above, still refers to SPDs and is stated on its website to be up to date with all known changes implemented to date).
- That consultation (2023, as above) notes that Supplementary Plans will have the same weight as the rest of the development plan and therefore will be subject to similar consultation and examination requirements. However, they "are not intended to be used routinely", instead the priorities should be addressed as far as possible within the main local plan document and the Supplementary Plan route should only be used to "react and respond positively to … exceptional or unforeseen circumstances that need resolving between plans", giving the example of "an unexpected regeneration opportunity or introducing new site-specific policies including in relation to design, infrastructure or affordable housing".
- (Erstwhile) Government's pre-LU&RA consultation (as above) noted that existing "SPDs will remain in force until planning authorities adopt a new style local plan".
- Therefore, any extant SPD will remain valid so long as its content remains relevant to policies adopted in the new WBC local plan.

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[54] HM Government Department for Levelling Up, Housing & Communities (2023), *Environmental Outcomes Report: a new approach to environmental assessment.* https://www.gov.uk/government/consultations/environmental-outcomes-reports-a-new-approach-to-environmental-assessment

[55] [55] HM Government Department for Levelling Up, Housing & Communities and Department for Environment, Food & Rural Affairs (2024), *Government response to the Office for Environmental Protection's review into the implementation of environmental assessment regimes.* https://www.gov.uk/government/publications/review-of-the-implementation-of-environmental-assessment-regimes-in-england-government-response/government-response-to-the-office-for-environmental-protections-review-into-the-implementation-of-environmental-assessment-regimes

[56] HM Government Ministry of Housing, Communities and Local Government (2024), *Consultation: Proposed reforms to the National Planning Policy Framework and other changes to the planning system.* https://www.gov.uk/government/consultations/proposed-reforms-to-the-national-planning-policy-framework-and-other-changes-to-the-planning-system/proposed-reforms-to-the-national-planning-policy-framework-and-other-changes-to-the-planning-system

[57] HM Government HM Government Department for Levelling Up, Housing & Communities (2023), *Levelling-up and Regeneration Bill: consultation on implementation of plan-making reforms.* https://www.gov.uk/government/consultations/plan-making-reforms-consultation-on-implementation/levelling-up-and-regeneration-bill-consultation-on-implementation-of-plan-making-reforms

# 4. National policy relevant to how the local plan may use its powers for carbon reduction

## 4.1 National Planning Policy Framework December 2023

4.1.1. Please note: This Local Plan Update was submitted in accordance with the transitional arrangements contained at paragraph 234b of the NPPF 2024 and therefore will be examined against the NPPF December 2023. Content here is therefore cited from NPPF 2023, but see also appendix at section 11 for comparison with the 2024 NPPF.

4.1.2. The NPPF (Paragraph 35) establishes that, to be 'sound', the plan must pass four tests (with detail here where relevant to carbon emissions reduction):

- **Positively prepared:** Proactively aiming to meet objectively assessed housing need.
- **Justified:** Having considered reasonable alternatives, with proportionate evidence.
- **Effective:** Deliverable within the plan period and with cross-boundary joint working.
- **Consistent with national policy:** "enabling the delivery of sustainable development in accordance with [the NPPF] and other [relevant] statements of national planning policy".

4.1.3. Alongside the 'four tests of soundness', the NPPF also instructs that:

- Paragraph 5: "National policy statements form part of the overall framework of national planning policy, and may be a material consideration in preparing plans"
- Paragraph 6: "Other statements of government policy may be material when preparing plans or deciding applications, such as relevant Written Ministerial Statements"
- Paragraph 159: "New development should be planned for in ways that … help to reduce greenhouse gas emissions, such as through its location, orientation and design", yet requirements for the sustainability of buildings are expected to "reflect the Government's policy for national technical standards"
    - However, there is no guidance in the NPPF about which priority to follow if it is evident that the Government's preferred "national technical standards" are unsuitable to deliver the radical reductions in carbon in line with the Climate Change Act as previously outlined.

4.1.4. Beyond what was already noted in section 3.2 (on the extent of mitigation in line with the Climate Change Act), and above, the NPPF further establishes the following points relevant to *how* powers can be appropriately used to mitigate climate change:

- Paragraph 160: "To help increase the use and supply of renewable and low carbon energy and heat, plans should … provide a positive strategy for energy from these sources … consider identifying suitable areas for [these] sources, and supporting infrastructure … [and] identify opportunities for development to draw its energy supply from … [these]".
- Paragraph 164: "Give significant weight to the need to support energy efficiency and low-carbon heating improvements to existing buildings … especially … where these do not already benefit from permitted development rights"

4.1.5. The NPPF is relevant to the plan's legislated powers in that the NPPF contains most of the 'national planning policies for England' with which local policies must be consistent in order to rely on the Planning & Energy Act powers previously described. However, a 2022 national policy statement 2022[58] notes that the NPPF "does not set out an exhaustive list of the steps local authorities might take to meet the challenge of climate change and they can go beyond this".

4.1.6. As a whole, for Wokingham, this supports continued ambition in developing local energy standards, provided they align with the overall body of national policy and are supported by a robust, locally relevant evidence base. Alignment with national policy is a matter of careful balanced judgement given that parts of national policy pull in different directions e.g. the tension between the aforementioned NPPF instruction to reduce carbon in line with the Climate Change Act, versus constraints set out in the 2023 Ministerial Statement (discussed later).

## 4.2 Written Ministerial Statement of 25th March 2015 (WMS2015)

4.2.1. A Written Ministerial Statement was made in 2015 in the context of the Deregulation Act and the withdrawal of the Code for Sustainable Homes. The Deregulation Act had made provision for the removal of the local plan's power to set requirements for improved energy standards (a power in the aforementioned Planning and Energy Act). However, that part in the Deregulation Act was never enacted, thus local authorities still hold that power.

4.2.2. That WMS2015 anticipated a new national policy standard from 2016 that would require zero carbon homes from 2016 (which in fact never happened). On that premise, the WMS2015 stated that the Government expected that local planning authorities not "set conditions with requirements above a Code Level 4 equivalent". Code Level 4 was equivalent to a 19% reduction in regulated carbon emissions compared to the Target Emission Rate[59] (TER) set by Building Regulations Part L 2013. This was often interpreted to mean that local plan policies should not go beyond that level, although the WMS2015 only mentioned *conditions*, not policies.

4.2.3. The WMS2015's purported 19% limit was outstripped by Building Regulations Part L 2021 (which equates to a 31% TER reduction on Part L 2013) and Government confirmed that via the FHS Consultation Response 2021 that local planning authorities still hold the power to set higher standards than building regulations. Thus the **WMS 2015 has been obsolete since 2021**, a view confirmed in several planning inspectors' reports noting that the WMS2015 has been 'overtaken by events'.[60] Also, the WMS2023 (discussed later) specifically states that the WMS2023 replaces the WMS2015 and that National Planning Policy Guidance would be updated to reflect this.

[58] HM Government Department for Levelling Up, Housing & Communities (2022), Policy paper: Local government and the path to net zero: government response to the Select Committee report. https://www.gov.uk/government/publications/local-government-and-the-path-to-net-zero-government-response-to-the-select-committee-report/local-government-and-the-path-to-net-zero-government-response-to-the-select-committee-report

[59] For explanation of TER please see glossary or previous subchapter "Building Regulations Part L".

[60] Estelle Dehon KC to Essex County Council (2024). Updated open legal advice re: Ability of local planning authorities to set local plan policies that require development to achieve energy efficiency standards above Building Regulations. https://www.essexdesignguide.co.uk/media/2966/updated-open-advice-re-energy-policy-building-regs-26-2-24-final.pdf

## 4.3 National Planning Policy Guidance (NPPG)

4.3.1. The NPPG is a resource of further guidance to help interpret various sources of government policy regarding planning, including written ministerial statements and the NPPF.

4.3.2. The NPPG section on climate change[61] still echoes the WMS2015 supposed limit on energy/carbon reduction policies (i.e. no more stringent than Code for Sustainable Homes Level 4). However, as explained above regarding the WMS2015, that limit is now obsolete and should be considered irrelevant. We note that this section of the NPPG has not been updated since 2019 (despite the change of Government in July 2024) and is thus outdated. This is further evidenced in that it refers to the "national target to reduce the UK's greenhouse gas emissions by at least 80% (from the 1990 baseline) by 2050" – this is now incorrect as the target is now a 100% reduction, as established by the 2019 update to the Climate Change Act.

4.3.3. In contrast to its obsolete advice on housing energy standards, the NPPG section on climate change confirms that local plans "are not restricted or limited in setting energy performance standards above the building regulations for *non-housing* developments" (emphasis added).

4.3.4. It also emphasises that where local plan standards for buildings' sustainability or carbon are set, they must be "based on robust and credible evidence and pay careful attention to viability."

4.3.5. Regarding energy improvements to *existing* buildings, the NPPG does not clarify how local policy should approach these, but notes that the planning authority "should ensure any advice to developers is co-ordinated to ensure consistency between energy, design and heritage matters", and notes that many energy improvements may not need planning permission.

## 4.4 The Written Ministerial Statement of 13th December 2023

4.4.1. On 13th December 2023, Government released a **Written Ministerial Statement (WMS)** that undermined many recent precedents for effective local plan policy on carbon. It was made by Lee Rowley (Housing minister) with Baroness Penn (Under Secretary of State for Levelling Up, Housing and Communities). Its topic is "Planning - Local Energy Efficiency Standards".

4.4.2. This WMS was released without prior consultation. Moreover, subsequent legal correspondence[62] confirms that this WMS was made without a basis in any evidence about the existence of the problem that the WMS purports to remedy, and without an Environmental Principles Assessment or Public Sector Equality Duty Assessment (both of which are mandatory for national policy, and were subsequently completed retrospectively after pre-action legal letters were sent to the Secretary of State querying the WMS' lawfulness).

### Content of the 13th December 2023 Written Ministerial Statement

4.4.3. The new WMS seeks to place quite stringent new limitations on the exercise of existing powers held by local planning authorities to require improvements in the energy and carbon performance of proposed new buildings in their area. The WMS does not remove the ability to set improved local standards, but it seeks to limit them in the following ways:

- Energy efficiency policy must be expressed as percentage reductions on the Building Regulations Part L TER (Target Emissions Rate), using a "specified version of SAP".
- Policies that exceed building regulations should be "applied flexibly … where the applicant can demonstrate that meeting the higher standards is not technically feasible, in relation to … local energy infrastructure … and access to … supply chains."

4.4.4. The above will, if rigidly adhered to, affect how the plan can exercise its power to require energy efficiency standards beyond those of building regulations (a power granted by the Energy & Planning Act 2008).

4.4.5. This WMS conflicts with several local plans that were adopted earlier in 2023, which used other more effective metrics to deliver buildings suitable for the UK's carbon goals, such as energy use intensity and space heat demand (Cornwall Climate Emergency DPD, Bath & North-East Somerset Local Plan Partial Update, and Central Lincolnshire Local Plan).

4.4.6. The WMS also emphasises that any such policies must have a "well-reasoned and robustly costed rationale that ensures that development remains viable, and the impact on housing supply and affordability is considered in accordance with the National Planning Policy Framework". This is not really 'new' with local plans routinely supported by viability evidence that takes into account all relevant policies, and local and national standards as required by the NPPF and NPPG. We would therefore expect any new policy on any topic to need to provide such justification, and there is extensive evidence in the public domain of the costs and feasibility of meeting various types of enhanced energy standard (to be found in the evidence bases of precedent local plans that have adopted such policies). Still, this reiteration in the WMS is likely to bring additional scrutiny upon the evidence put forward.

4.4.7. Although the WMS uses the terms "homes" and "buildings" interchangeably, its accompanying documentation (Environmental Principles Assessment and Public Sector Equalities Assessment) make it clear that its focus is on homes specifically. Additionally, its stipulated calculation method, SAP, is only available for homes and thus the WMS2023 cannot logically apply to buildings other than homes.

### How does a Written Ministerial Statement affect the planning system and what is its status versus other national policy or legislation?

4.4.8. Written Ministerial Statements are one of the 'statements of national policy' that local plan-making must take into account, according to the NPPF. This is linked to the NPPF's aforementioned four 'tests of soundness' which include consistency with national policy, i.e. ": "enabling the delivery of sustainable development in accordance with [the NPPF] and other [relevant] statements of national planning policy". Further relevant NPPF wording includes:

[61] HM Government Department for Levelling Up, Housing & Communities and Ministry of Housing, Communities and Local Government (2014-2019), *Guidance: Climate change.* https://www.gov.uk/guidance/climate-change

[62] This pre-action legal correspondence was shared with the authors of the current report by the recipient. It is not under any legal restrictions on its sharing, but has not yet been published by any entity as far as the current report's authors are aware. The authors are working with relevant parties to get that correspondence published along with a legal interpretation of it.

- "National policy statements form part of the overall framework of national planning policy, and may be a material consideration in preparing plans" (Paragraph 5)
- "Other statements of government policy may be material when preparing plans or deciding applications, such as relevant Written Ministerial Statements" (Paragraph 6)

4.4.9. The WMS of December 2023 includes a sentence self-confirming its own status as a relevant statement of national planning policy (although not specifically a "policy for national technical standards" as worded in NPPF paragraph 159 as previously cited).

4.4.10. Thus, this WMS is a 'material consideration', i.e. *one of the relevant considerations that the plan must take to account* in order to be sound, despite that a WMS can be (and this one was) made unilaterally without consultation. However, a WMS, like the NPPF, is not an inviolable rule. Open legal advice[63] notes case law establishing that a WMS "cannot lawfully … frustrate the effective operation of any … relevant statutory power" (e.g. the climate change mitigation duty and the power to set higher local standards) and that "any WMS must lawfully be applied subject to relevant statutory powers, and … justifiable local exceptions, rather than in a blanket fashion".

4.4.11. However, different pieces of national policy pull in different directions. It thus may not be possible to achieve consistency with *every* relevant piece of national policy, when the WMS2023's stipulations inhibit consistency with priorities expressed in the wider body of national policy e.g. the NPPF's clearly expressed climate mitigation imperative previously noted.

4.4.12. The NPPF is a well-established piece of national policy that undergoes consultation each time it is updated. By contrast, a WMS is typically ad-hoc and without consultation. The NPPF contains 'national planning policies for England' with which any local energy efficiency or renewable energy policies must be consistent (Planning & Energy Act). Yet, another national policy statement (2022[64]) notes that the NPPF "does not set out an exhaustive list of the steps local authorities might take to meet the challenge of climate change and they can go beyond this".

4.4.13. Therefore: To deviate from the WMS2023 can be sound if other material considerations, including the broader thrust of other relevant national policies, hold more weight. For example:

- Salt Cross AAP was originally found unsound in 2022 for deviating from a previous WMS2015, by using standards and metrics that went beyond the limits that WMS2015 set. However, that rejection was overturned in the High Court in 2024 for incorrectly interpreting the relevance of the WMS2015 having been overtaken by newer national policy (new NPPFs), withdrawal of national policies that formed the rationale for the WMS2015 (Code for Sustainable Homes), new building regulations, and the 2019 update to the Climate Change Act that tightened the UK's 2050 carbon goal to net zero. On re-examination, Salt Cross AAP's EUI-based policies were accepted in 2025 by the new Inspector[65], on the rationale that the WMS2023 "is a material consideration" but should "be read in the context of wider national policy and legislative consideration"; specifically "reducing carbon emissions and supporting the transition to net zero forms a central part of the [NPPF] in line with the … Climate Change Act".
- Tendring & Colchester Borders Garden Community DPD contains EUI-based net zero policies like that of Salt Cross and Cornwall. The DPD was submitted in September 2023, examined in 2024, and found sound in 2025[66] with the reasoning that "whilst the [WMS2023] is a material consideration of significant weight", the plan must meet the legal duty to mitigate climate change and has the power to require higher standards via the Planning & Energy Act, and that the policies had been viability-tested and were supported by the lead developer.
- Uttlesford Local Plan contains similar policies to the above. In July 2025 the Inspector confirmed no intent to amend them. The rationale is yet to be published (September 2025).
- Winchester Local Plan: Similar policies as above, accepted in September 2025 by the Inspector who gives a rationale very similar to that of Salt Cross above (with some identical language).

4.4.14. Furthermore, legislation (and the powers it grants or duties it imposes) holds primacy over national policy statements. Thus, it should be possible to diverge from the WMS where following the WMS would prevent the local authority from fulfilling its legal obligation to 'contribute to the mitigation of climate change' set by the Planning & Compulsory Purchase Act, or where the WMS would inhibit the UK's ability to fulfil its duties under the Climate Change Act

4.4.15. If interpreted literally and rigidly, the WMS' stipulations would make it much harder to fulfil the local plan's legal duty to mitigate climate change (duty set by the Planning & Compulsory Act 2004, section 19) as well as the national policy expectation to support "radical reductions in greenhouse gas emissions … tak[ing] a proactive approach … in line with the objectives and provisions of the Climate Change Act 2008" (NPPF, paragraphs 157-158 and footnote 56).

4.4.16. The main way the WMS make this duty harder to fulfil is that its stipulated metric, TER, is not suitable to ensure a building has the energy efficiency performance needed for the UK's legally binding carbon goals, as previously described. That unsuitability is why several recently adopted precedent local plans (as above) have used alternative metrics that are much more effective for delivering energy efficiency and defining whether a building is 'net zero'.

4.4.17. Government has not published an assessment of how the WMS23 affects the ability to fulfil those mandates, nor advised which has priority in a conflict. Case law[67] establishes there is no legal reason why a WMS cannot contradict the NPPF, and that a WMS is not necessarily 'lesser', but is silent on which to follow if one contradicts the other e.g. where the WMS23's stipulations inhibit abilities to meet the NPPF priority of reducing carbon *in line with the Climate Change Act.*

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[63] Estelle Dehon KC on behalf of Essex County Council (2024). *Updated open legal advice re: Ability of local planning authorities to set local plan policies that require development to achieve energy efficiency standards above Building Regulations.* https://www.essexdesignguide.co.uk/media/2966/updated-open-advice-re-energy-policy-building-regs-26-2-24-final.pdf

[64] HM Government Department for Levelling Up, Housing & Communities (2022), *Policy paper: Local government and the path to net zero: government response to the Select Committee report*. https://www.gov.uk/government/publications/local-government-and-the-path-to-net-zero-government-response-to-the-select-committee-report/local-government-and-the-path-to-net-zero-government-response-to-the-select-committee-report

[65] H Hockenhull, Planning Inspectorate (2025), *Examination of the Remitted Part of the Salt Cross Village Area Action Plan*. https://www.westoxon.gov.uk/media/vzkb3lbi/ed16-salt-cross-post-hearing-letter-1-aug-25.pdf

[66] G Wyatt, Planning Inspectorate (2025), *Report on the Examination of Tendring Colchester Borders Garden Community Development Plan Document*. https://legacy.tendringdc.gov.uk/sites/default/files/documents/planning/Planning_Policy/Garden_Community/Inspectors%20Report.pdf

[67] Honourable Mr Justice Holgate (2004), decision from High Court in case: Mead Realisations Ltd vs Secretary of State for Levelling Up, Housing and Communities, and North Somerset Council. https://www.bailii.org/ew/cases/EWHC/Admin/2024/279.html

**What challenges does the WMS bring for effective "net zero" local plan policymaking?**

4.4.18. Policy CE3 of Wokingham Local Plan Update as submitted follows a more effective policy option for climate change mitigation in buildings – that is, using best practice absolute energy targets to ensure that buildings are truly net zero carbon in operation. The main difficulties now presented by the WMS to this approach are summarised as follows.

### Stipulating the use of a carbon emissions metric, when the goal is energy efficiency

4.4.19. The biggest problem is that the WMS asks for energy efficiency policies to be expressed using the Part L TER metric – but TER is in fact not an energy efficiency metric. As the acronym suggests, it is instead a *carbon emissions* metric. It is unclear why this choice was made in the WMS, given that the Part L methodology (SAP) does also contain two energy efficiency metrics: the TFEE (Target Fabric Energy Efficiency) and TPER (Target Primary Energy Rate).

4.4.20. In the absence of the WMS, the ideal policy approach most effective for climate change (and reduction of energy bills) would have required the use of actual energy efficiency metrics: 'space heating demand' (SHD) and 'energy use intensity' (EUI), as used in Wokingham existing submitted draft policy CE3. These metrics are considered more effective for their essential role in delivering buildings fit for the net zero carbon transition, as previously noted, to remedy the weaknesses of the Building Regulations metrics and scope and reduce the risk of an energy performance gap.

4.4.21. The WMS does not actually *prohibit* the use of such alternative metrics *alongside* TER. However, these metrics are in fact so different from each other as to not be directly comparable because:

- The Part L TER takes into account many other factors other than energy efficiency (such as carbon intensity of grid electricity, and on-site renewable energy generation).
- The Part L TER is calculated using the methodology SAP, which, as previously noted, drastically underestimates homes' actual energy usage and carbon emissions (partly because SAP ignores all plug-in devices including cooking equipment and partly because SAP is simply not effective at predicting buildings' actual thermal or total energy). While there are tools such as the SAP conversion tool developed by Etude, which have been used by authorities like B&NES and Cornwall to approximately convert Part L specification inputs into energy efficiency metrics, these approaches do not attempt to deal with the TER metric as TER is irrelevant to actual energy use which is the tool's object. This tool also relies on a number of simplifying assumptions and default scenarios. Hence, although useful, it does not offer a fully precise or universally applicable translation from operational energy performance (e.g. EUI or kWh/m²/year) to TER reduction. The methodological differences between these metrics remain significant, making one-to-one comparability challenging, particularly in the context of robust policy formulation or enforcement.

4.4.22. We note there are recent precedents adopted post-WMS2023 that use other Building Regulations energy metrics – such as Warwick Net Zero Carbon DPD policy NZC2(A) and West Berkshire Local Plan Review policy DM4, which require an improvement on the Part L TFEE (Target Fabric Energy Efficiency) metric as well as a TER improvement. TFEE, rightly, is an energy efficiency metric, unlike TER. The wording of the WMS2023 does not appear to have allowed for use of TFEE. However, TFEE does come from the same methodology that the WMS cites (Part L SAP) and is a metric that developers have to use anyway to obtain Building Control consent.

Those Districts' successful argument to the Inspector was that the TFEE metric was consistent with, and a step towards the achievement of, the policy's TER percentage reduction target. Hence, TFEE metric-based local planning policy targets would follow the general intent of the WMS, which is stated to be to avoid a "proliferation of multiple local standards" through instead using "nationally applied standards [that] provide … clarity and consistency for businesses".

### Forcing the use of a 'specified version of SAP' to calculate the energy efficiency target

4.4.23. SAP is the method used to calculate all target metrics set by Part L of Building Regulations, including the TER metric named by the WMS.

4.4.24. SAP is periodically updated, more often than Part L is updated. Updates to SAP can include anything from changes to the assumptions about the baseline building characteristics or the performance of standard types of equipment therein, through to changes in the assumption made about the carbon intensity of grid electricity. The current version is SAP10.2 which came into force in June 2022.

4.4.25. Some precedent local plans had previously overcome this issue by stating that calculations must simply use 'the latest available version' of SAP or similar. That way, the policy does not go out of date each time a new version of SAP is released and so is future-proofed as is standard in planning policy formulation.

4.4.26. The WMS does not make clear whether policy wording specifying 'the latest version of SAP' would count as a 'specific version', or if it would have to be 'SAP10.2' or similar. If the latter, then the WMS will require the policy to be written in a way that will go out of date very quickly.

4.4.27. Beyond this, we have already noted that SAP is due to be replaced with a new model, HEM (Home Energy Model) in 2025 when the Future Homes Standard (FHS) is introduced. Although SAP 10.3 will be used temporarily alongside HEM during a transitional period, HEM will become the primary methodology for national regulatory compliance for the majority of the plan period. This is a further way in which the WMS' instruction to use a 'specified version of SAP' would force local policies to be written in a way that will go out of date unduly quickly. The HEM was recently out for consultation alongside the FHS consultation. HEM's final form, function and outputs are not yet known. Thus it is not yet possible to write a policy that uses HEM metrics, as it could not currently be robustly assured that these would be feasible or their cost uplifts assessed, even if the WMS had not failed to acknowledge HEM's imminent introduction.

### Creating a generally hostile climate towards policies aimed at improving energy efficiency and reducing carbon emissions – thus impeding the legal duty to mitigate climate change

4.4.28. Beyond setting constraints on how policy is expressed and implemented, the WMS also sets a tone that is generally discouraging (albeit not prohibitive) towards any local policy that goes beyond "current or planned building regulations", stating that the government does not "expect" local policy to do this.

4.4.29. However, the WMS does not actually prohibit the use of such policies so long as they are well-justified. Recent court cases against the WMS2023 (explained elsewhere in this section) have reconfirmed the general principle that local policy can diverge from national policies like the WMS2023 where justified .

### What risks are involved in pivoting to a WMS-compliant local plan policy?

4.4.30. As previously noted, the critical issue is that such a policy would become obsolete almost immediately. The TER is set by Building Regulations (currently Part L 2021), calculated using SAP 10.2. But because Building Regulations is being updated imminently with the Future Homes Standard and because SAP is being replaced by HEM as previously noted, that TER baseline will become immediately redundant some time between 2025-2027 (potentially before Wokingham's local plan update comes into force). Also previously noted, There is currently **no published national methodology** for converting or comparing the two baselines, This absence of guidance presents a substantial risk: any TER-based policies devised now may become unworkable early in the plan period. It appears that the drafter of the WMS2023 did not think of this fact that following its stipulations would result in near-immediate policy ineffectiveness.

4.4.31. By contrast, because existing draft Policy CE3 as submitted uses absolute metrics and performance-based verification, it would have greater longevity than policies based on current Building Regulations. HEM is also expected[68] to output the same metrics of total energy use that existing draft policy CE3 uses (Energy Use Intensity, EUI) and Space Heating Demand (SHD) even if these may not be FHS compliance metrics. This strengthens the rationale for Policy CE3 as submitted, which may offer greater long-term policy stability by being ahead of the national curve rather than behind it.

4.4.32. Due to the aforementioned ineffectiveness of TER as an energy efficiency metric (and the ineffectiveness of the SAP calculation in ensuring any real-world outcomes), there is also the risk of failing to meet the legal duty to mitigate climate change and becoming inconsistent with the more clearly expressed broader climate mitigation priorities in the NPPF as previously noted. By contrast, CE3's kWh/m²/year thresholds align closely with longer-term climate change targets (as per the previously noted Climate Change Committee stipulation that buildings' energy metrics should reflect real performance; see 3.1.15).

### Legal challenges against the WMS2023

4.4.33. A legal challenge to the WMS2023 has been brought by the same community organisation that successfully won the Salt Cross AAP case as previously outlined. The challenge put forward that the WMS2023 is unlawful on the following grounds:

- Ground 1: Failure to fulfil the Environment Act 2021 duty to have regard to the Environmental Principles Policy Statement (EPPS), as no EPPS assessment was released until after the WMS was made and a separate pre-action letter challenged that lack.
- Ground 2: That the WMS2023 unlawfully purports to restrict local authorities' exercise of powers granted to them by statue (specifically the Planning & Energy Act, but also the Planning & Compulsory Purchase Act which establishes the climate mitigation duty and the statutory presumption in favour of the application of adopted development plan policies).
- Ground 3: That the WMS2023 unlawfully misleads the reader about decisionmakers' legal powers.

4.4.34. This case was heard at the High Court on 18 June 2024[69] but was not successful[70]:

- Ground 1 was rejected because the judge followed other case law that had established that the assessment can come after the national policy itself so long as the assessment is still "done in substance, with rigour and an open mind".
- Grounds 2 and 3 were rejected because the Planning & Energy Act contains a clause within it that local policies must not be inconsistent with relevant national policy, therefore as the WMS is such a relevant national policy, it is in accordance with the Act. However, the judgement does not evaluate the point about whether the WMS' stipulations inhibit the ability to fulfil the separate legal duty to mitigate climate change.

4.4.35. This case was then taken appeal in June 2025 (only on grounds 1 and 2). That Court of Appeal also rejected the grounds[71], with key reasons being:

- Ground 1: Rejected because even if the WMS2023 were legally overturned on the basis of lack of EPPS assessment during its formulation, the Government would be free to simply re-adopt the WMS2023 having considered the retrospective EPPS that it had by then produced. That retrospective EPPS assessment included a Government assumption that the FHS would be aligned with the required performance for the achievement of the Climate Change Act carbon goals, which the judges conclude was a genuinely held rationale by the relevant Minister at the time whether correct or not. Also, the EPPS assessment duty does not bind the government to cancel national policy that has negative environmental effects and thus the government is free to prioritise the policy's assumed protection of housing delivery (albeit in

[68] Department for Energy Security & Net Zero (2023), *"The Home Energy Model: Future Homes Standard assessment Using the Home Energy Model to demonstrate compliance with the Future Homes Standard"*. https://assets.publishing.service.gov.uk/media/65f86671ce4c150011a1508b/home-energy-model-future-homes-standard-assessment-consultation.pdf#page=37

[69] Good Law Project (2024), *We have a date in court to demand greener, better homes*. https://goodlawproject.org/update/we-have-a-date-in-court/

[70] Mrs Justice Lieven (2024), Decision on High Court case: Rights Community Action Ltd v Secretary of State for Levelling Up, Housing and Communities. https://www.ftbchambers.co.uk/images/uploads/documents/R_%28Rights_Community_Action_Ltd%29_v_SSLUHC__2024__EWHC_1693_%28Admin%29.pdf

[71] Rights: Community: Action Ltd, R (On the Application Of) v Secretary of State for Housing, Communities and Local Government [2025] EWCA Civ 990. https://www.bailii.org/cgi-bin/format.cgi?doc=/ew/cases/EWCA/Civ/2025/990.html

this case, the assumed impact on housing delivery appears to have been purely based on developer commentary submitted via the FHS consultation, not on the basis of any independent unbiased analysis of the housing delivery impact of such policies).

- Ground 2: Rejected because the judges were not convinced that the WMS2023 interfered with the Planning & Energy Act powers for similar reasons described in the 2024 judgement (above) and because the judges were not convinced that the WMS2023's stipulated metric (of TER) would count as a 'standard', given that when making the Planning & Energy Act, "the language used by Parliament does not limit 'energy efficiency standards' to a choice of metric.".

4.4.36. However, the appeal judgement also reiterates the following relevant points that could be interpreted to support the setting of policies whose energy efficiency standards go beyond – or even diverge from – Building Regulations:

- "For reasons which are unclear, s.1(4) of the [Planning & Energy Act] makes [the energy efficiency standard-setting power] subject to s.19 of the [Planning & Compulsory Purchase Act legal obligation for the local plan to mitigate climate change]. However, if s.19 provides the source of power … to [set] a more onerous standard than one endorsed by the Secretary of State, such as the draft FHS, it could be said that a [local planning authority] has no need to rely upon [the Planning & Energy Act] at all and the restraints in that provision upon setting standards that exceed the requirements of building regulations could be circumvented".
- The judges were therefore "left with the impression that the draftsman [of the Planning & Energy Act] did not think through the tension between the intention to use national measures to [restrict] how far a [local plan] may set standards exceeding building regulations and the well-established legal principle that a [local plan] can [set] a local policy [that] conflicts with national policy [where] justified".
- The judgement clarifies that this legal decision does not pass any judgement on the relative merit of the WMS' stipulated metrics versus others (like those of Wokingham's draft policy CE3 as submitted): "judicial review is not a proper forum for resolving the dispute as to whether one metric is preferable to another".

4.4.37. The Court of Appeal's 2025 decision still only means that the WMS2023 is *not in itself unlawful* (in that it is not incompatible with the Planning & Energy Act and that it was acceptable that the required environmental assessment was retrospective. The judgements do not increase the material weight of the WMS2023 versus other national policy.

4.4.38. Neither the 2024 nor 2025 judgement substantively engages with whether the WMS2023 inhibits local plans' ability to fulfil their legal duty to mitigate climate change in practice. Concerningly, the Court of Appeal judgement paragraph 37, when considering how the WMS2023 was made, includes potentially misleading wording that "homes built to the FHS would be compatible with the UK's 2050 Net Zero Target for carbon emissions in the Climate Change Act 2008". This would indicate a lack of understanding that such homes would in fact not be compatible with the Act's legislated carbon budgets (as explained elsewhere in the current report). The lack of commentary on this may indicate that such evidence was not put before the courts. However, that wording may simply be the judge's recounting of the Government's purported rationale in making and assessing the WMS2023, rather than a statement of actual fact; this reading is supported by paragraph 95 which states that "The Government's view [when conducting its environmental assessment of the WMS2023] is that the forthcoming FHS will set national standards for residential development in line with the Climate Change Act 2008 … [but] It is not a matter for the court in an application for judicial review to say whether those conclusions are right or wrong". That paragraph (95) is in the section of the judgement relating to whether Government had met its legal duty to environmentally assess such policies, not the section on whether the WMS2023 interferes with the local plan's legal powers and duties.

# 5. Considering ways that Wokingham Draft Policy CE3 could be reformulated in light of the WMS2023

## 5.1 Review of Existing Draft Policy CE3 (as submitted) Wording and Objective

5.1.1. Policy CE3, as in the existing draft submitted, sets out ambitious but achievable performance-focused energy efficiency standards for new residential development in Wokingham Borough. The policy applies specifically to new-build homes. Compliance must be evidenced through an Energy and Sustainability Statement. The policy approach reflects best practice policies in recent successful plans elsewhere as noted earlier: the three that pre-date the WMS2023 (Cornwall, Bath, Central Lincolnshire) and three that passed examination since the WMS2023 (Tendring & Colchester Garden Community DPD, Salt Cross AAP, and Uttlesford Local Plan).

5.1.2. At its core, CE3 focuses on making new homes 'net zero' by ensuring total energy use is equalled by new renewable energy generation. As a vital step to enable this, the policy sets absolute limits on energy use (in kWh/m²/year), rather than a relative improvement over notional benchmarks such as the Target Emissions Rate (TER). The policy includes unregulated energy and requires performance to be calculated via accurate energy prediction methods both before and after construction, beyond the requirements of the current Building Regulations. Importantly, CE3 aligns with best practice industry standards, including those of LETI and the Passivhaus Institute. The UK Net Zero Carbon Buildings Standard also uses the same metrics.

5.1.3. This approach supports Wokingham Borough Council's Net Zero ambitions in several ways: it prioritises a fabric-first approach to energy efficiency, with residual energy demand met by on-site renewable energy generation wherever possible; it promotes transparent and verifiable outcomes and encourages long-term reductions in energy demand through active engagement with residents and real performance monitoring. CE3's standards also reflect what is needed in homes from 2025 as a vital component of achieving the UK's legislated carbon budgets in that:

- CE3's space heat demand limit is the figure stipulated by the Committee on Climate Change,
- CE3's EUI target is based on the efficiency of a heat pump, thus ensuring low carbon heat,
- CE3's renewable energy requirement makes the home truly net zero carbon in operation.

### Core Requirements

5.1.4. Policy CE3, point 1a, stipulates that residential developments must generate at least as much renewable electricity on-site (preferably on-plot) as their total annual energy demand, including regulated and unregulated energy. To enable that, point 1b sets clear limits on energy demand:

- Site average space heating demand of around 15–20 kWh/m²/year
- Site average total energy use intensity (EUI) of ≤35 kWh/m²/year (and no individual dwelling should exceed 60 kWh/m²/year, regardless of how much renewable energy is generated).

These figures relate to total actual metered energy use and are based on actual energy demand, rather than modelled Building Regulations compliance scores. This is necessary for the aforementioned transparency/verification and ease of monitoring (outlined next).

5.1.5. **Emphasis on Predictive Accuracy and Verification (paragraph 2):** The required Energy and Sustainability Statement must include two elements. Firstly, it must provide pre-construction estimates of energy performance using a methodology proven to accurately predict actual building performance. Suitable methods include CIBSE TM54 or the PHPP. Other methods may also be considered if they can demonstrate sufficient accuracy. Secondly, it must include post-construction 'as built' calculations of actual energy performance. This must be verified prior to occupancy and include a non-technical summary for first occupants. These requirements reflect a shift away from compliance-based modelling and toward approaches that better capture real operational performance and are thus more useful to residents for estimating energy bills.

5.1.6. Monitoring **(paragraph 3):** Policy CE3 requires that proposals commit to post-occupancy energy monitoring. This enables notification of occupiers of high energy usage, and corrective actions. It reinforces the policy's focus on real outcomes, rather than just on-paper compliance.

5.1.7. The policy offers exceptions **and flexibility (paragraph 4)** including that:

- **Clause 1: Technical or Policy Barriers**
  - If full compliance with paragraphs 1a (renewable energy) or 1b (energy demand limits) is not feasible due to site conditions (e.g. shading, heritage constraints), the applicant must:
    - Offset residual energy performance via off-site renewables, a financial contribution to a carbon offset fund, or
    - Connect to a decentralised energy network.
- **Clause 2: Accredited Certification Pathway**
  - Applicants *may* demonstrate compliance with paragraphs 1a and 1b through certification under schemes such as:
    - Passivhaus Plus / Premium
    - Passivhaus Classic (with evidence of meeting paragraph 1a)
    - Other accredited schemes if aligned with policy intent.
- **Clause 3: Viability on Previously Developed Land**
  - Acknowledges that some brownfield developments may face viability barriers to full compliance with paragraphs 1a (renewable energy) and 1b (energy demand limits)
  - In that case, applicants' statements should show that they meet requirements to the fullest extent possible within the viability constraints.

### Evidence from elsewhere on how similar policies might be alternatively formulated

5.1.8. Other local areas have recently produced analysis to devise a suggested TER % reduction that could act as a fallback option if their original EUI-based policies (like CE3) are not accepted by the Inspector. However, due to Policy CE3's credentials described above, the existing draft policy is more effective in ensuring carbon reduction aligned with the UK's carbon goals than any of the TER-based alternatives (1B–1D) set out in that third-party study (discussed next). Notably, CE3 includes unregulated energy, sets absolute energy demand thresholds rather than relative percentage improvements, and requires ongoing monitoring. CE3 has flexibility clauses yet still maintains a high level of ambition even when exceptions are invoked.

5.1.9. Any alternative policy must be evaluated not only on its on-paper percentage carbon savings, but also on its ability to replicate whole-site energy balance, use of accurate predictive modelling, and the level of accountability it offers via performance verification and monitoring.

## 5.2 West of England TER Study in response to WMS2023: Overview and Relevance to WBC

5.2.1. In response to the 2023 Written Ministerial Statement, several local planning authorities have sought to explore how they could revise their local energy efficiency policies to align with the WMS stipulation for the TER metric and viability-tested justification. The **West of England TER Study[72] (2024)** stands out as one of the most comprehensive and regionally coordinated responses to this policy shift. That study offers a clear, structured methodology for developing TER-based alternatives to absolute energy targets. As such, this Wokingham-specific evidence base report is inspired by that West of England TER study's methodology and outputs.

5.2.2. The West of England (WoE) TER Study's purpose is to identify technically and economically viable TER-based alternatives to local plan policies containing absolute energy efficiency targets. The study responds directly to the 2023 Written Ministerial Statement (WMS), which stipulates that any local plan energy efficiency policy should be expressed as a percentage uplift over TER and have a robust costed rationale. The WoE study serves as evidence to inform local plans being developed by WECA's four constituent local planning authorities: Bath & North- East Somerset Council (B&NES), Bristol City Council, North Somerset Council, and South Gloucestershire Council (although B&NES had already adopted policy that uses EUI targets instead of TER, like Wokingham's draft policy CE3, prior to the publication of the WMS).

5.2.3. The study provides a structured approach to developing WMS-compliant energy policies while still pursuing meaningful emissions reductions. It has become part of the evidence base for Bristol's Local Plan (2025; exam library item EXA037), but is not in the latest evidence bases of South Gloucestershire nor North Somerset, as which (policy LP24 and policy DP6 respectively) still use absolute energy use metrics instead of pivoting to a TER policy. B&NES 'local plan reset' (commenced February 2025 due to new housing targets) is at too early a stage for evidence.

5.2.4. The West of England TER Study evaluates four alternative policy approaches for residential energy performance standards that are framed as uplifts over the Target Emissions Rate (TER) (see Figure 5):

- **Option 1A:** A 70% improvement over TER, with no requirement for offsetting or addressing unregulated emissions. Intended as the minimum uplift that could still represent a meaningful local standard.
- **Option 1B:** A 100% improvement over TER (i.e., net zero regulated carbon emissions) achieved through on-site measures. Where full on-site compliance is not technically feasible, carbon offsetting is permitted to bridge the gap.
- **Option 1C:** Builds on Option 1B by adding a 10% improvement over Building Regulations TFEE (Target Fabric Energy Efficiency), ensuring higher building fabric standards to support long-term thermal performance and occupant comfort.
- **Option 1D:** Extends Option 1C by requiring developments to address unregulated emissions[73] – such as cooking and plug-in appliances – through on-site renewable generation or additional offsetting. This represents the most ambitious option in terms of whole-building energy demand, and closest to true net zero.

5.2.5. The West of England study models those four options across seven residential typologies – detached houses, semi-detached homes, and low-rise apartment blocks – with performance and cost outcomes assessed for each.

5.2.6. Each typology was tested using **SAP 10.2** in the four policy option scenarios. The output metrics included:

- % improvement over **TER** (regulated carbon emissions)
- % improvement over **TFEE** (fabric efficiency)
- Performance data for individual energy measures and packages

5.2.7. As well as the SAP modelling, policy options were also evaluated for **cost uplift**, and feasibility commentary also covered buildability, developer impact, and potential for **carbon offsetting**.

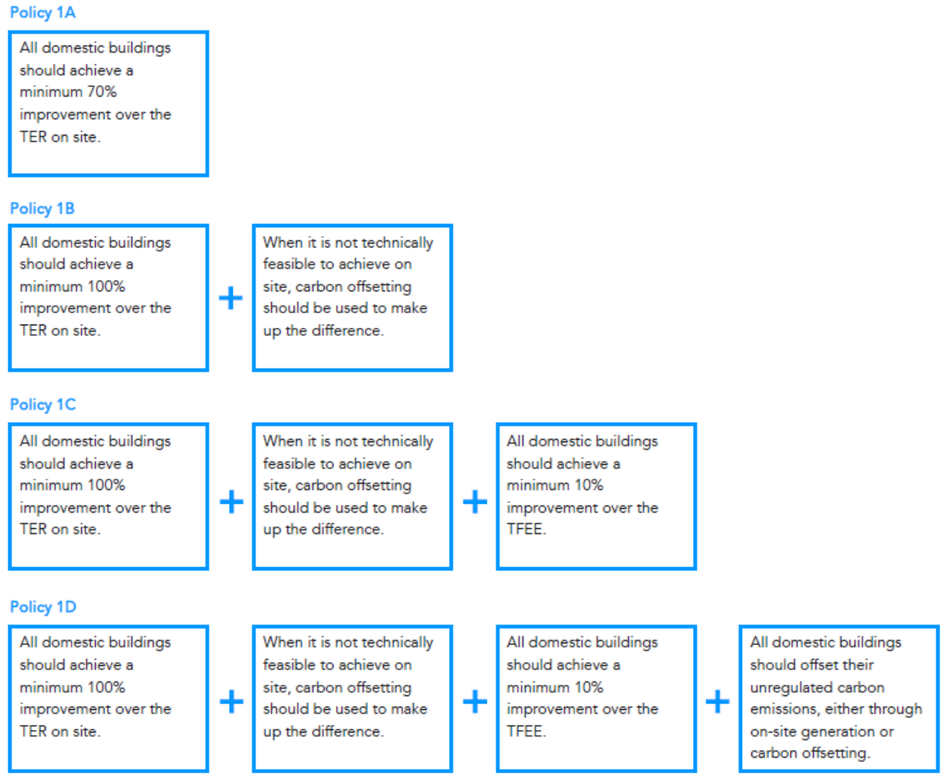


*Figure 5: West of England TER Study Policy Options (2024)*

[72] Etude and Currie & Brown on behalf of local councils of Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire (2024), *West of England TER Study Technical Evidence Base*. https://www.bristol.gov.uk/files/documents/8856-exa037-west-of-england-ter-study-october-2024-rev-e/file

[73] These *unregulated* energy uses can be 50% of a building's total energy use, or between 23%-54% of a building's operational carbon, with cooking accounting for 12.8% of fuel consumption (kWh/yr).

Link to glossary

### West of England TER study: Implications for this Wokingham study

5.2.8. The West of England (WoE) TER Study is highly relevant to Wokingham Borough Council's (WBC) current review of Policy CE3 in its Local Plan Update. In light of the WMS 2023, WBC seeks to understand how it could best replace its original absolute energy performance targets with robust, TER-based alternatives, *if* the Inspector at Wokingham's plan examination deems it is necessary to do so.

5.2.9. Key reasons for the WoE study's relevance include:

- Typology alignment: The West of England study covers a broad range of residential typologies, including detached houses, semi-detached houses, and low-rise flats, which are the three typologies identified as most relevant to WBC in its 2024 Net Zero Policy Technical Evidence Base prepared by Currie & Brown, Introba and Etude. Terraced houses were also modelled in the West of England study, but were not included in the WBC-specific analysis. Instead, performance for mid-terrace homes was inferred by drawing comparisons with the semi-detached typology.
- Policy framing: The WoE study's three policy options (1B–1D) align with the direction of potential CE3 revisions under discussion at WBC and provide a ready-made framework for structuring alternative policies that satisfy WMS2023 expectations, if this is required.
- Evidence structure: The West of England study presents a clear combination of:
  - TER/TFEE modelling outputs
  - Fabric specification benchmarks
  - High-level cost analysis
  - Technical feasibility narrative

  This current WBC evidence intends to replicate this approach in a more concise, locally tailored format, to inform decisions between alternative versions of CE3.
- Transferability: The West of England study shares the South of England context with WBC and covers a range of development typologies that are also relevant to the types of development anticipated to come forward through the Wokingham emerging Local Plan period. While the West of England study uses regional assumptions (e.g. in construction costs, baseline specifications, offsetting mechanisms), its structure, modelling logic, and policy rationale are directly transferable. Our task on behalf of WBC in the current study will be to adjust assumptions using local cost data, building characteristics, and policy context drawn from WBC's existing 2024 Technical Evidence Base and relevant stakeholder input.

# 6. Energy modelling for a TER-based policy in Wokingham: Methodology and Assumptions

6.0.1. The methodology draws on and builds upon the modelling logic presented in the West of England TER Study, while incorporating locally relevant development typologies, specification baselines, and costing inputs from Wokingham's 2024 Net Zero Evidence Base. The study uses both **SAP and PHPP modelling in parallel** to evaluate the performance and feasibility of three TER-based policy options that all align with the WMS 2023 stipulations previously described.

## 6.1 Policy Options Assessed

6.1.1 The following three options were selected for assessment based on their prominence in the West of England TER Study and alignment with objectives of Policy CE3 as submitted. These three options are, from lowest to highest level of ambition:

- **Alternative 1 (equivalent to West of England TER Study's 1B)**: 100% improvement over TER (regulated emissions), delivered on-site, with offsetting permitted where infeasible.
- **Alternative 2 (equivalent to West of England TER Study's 1C)**: As per 1B, with an additional 10% improvement over TFEE (fabric efficiency).
- **Alternative 3 (equivalent to West of England TER Study's 1D)**: As per 1C, with an added requirement to offset **unregulated emissions** (e.g. appliances and cooking), using **Appendix L of SAP** to estimate loads.

These were selected for their legal defensibility under the WMS, technical credibility, and comparability with Policy CE3 as submitted. While these alternatives seek to replicate the submitted Policy CE3's approach, they will not have the same holistic benefits for reasons outlined previously. Please note this Wokingham study did not further explore West of England TER Study option 1A because 1A was too low-ambition, barely exceeding the imminent national Future Homes Standard and falling too far short of the intent of policy CE3 as submitted.

## 6.2 Residential Typologies Studied

6.2.1 Modelling was carried out for the three residential typologies identified as most representative of development in Wokingham Borough:

- **Detached house** (approx. 142m²)
- **Semi-detached house** (approx. 93m²)
- **Low-rise flatted block** (672m² total floor area)

6.2.2 In addition, **mid-terrace houses were not modelled directly**, but performance commentary is provided based on the **terraced typology results from the West of England TER Study**. These are used as a **performance proxy**, on the basis that mid-terrace homes typically sit between semi-detached and flatted blocks in terms of energy demand and external envelope exposure.

6.2.3 All typologies used geometrically are aligned with the WBC Net Zero Technical Evidence Base (2024) prepared by Currie & Brown, Introba and Etude. The PHPP files that sit behind this as well as the baseline assumptions and results were made available to Bioregional for the purposes of this study.

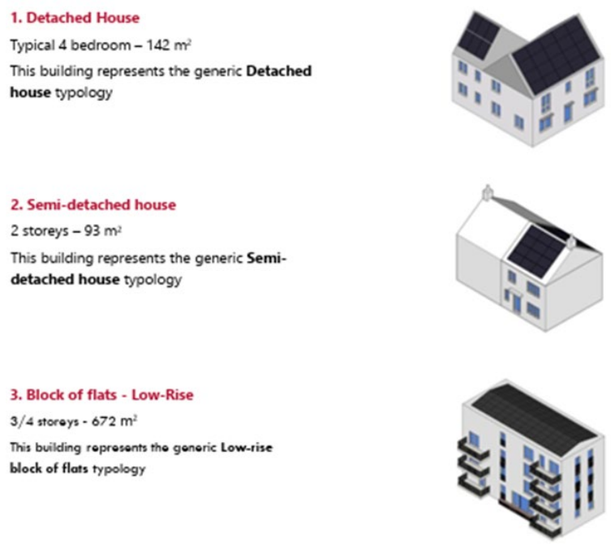


*Figure 6: Residential typologies tested*

## 6.3 Process Followed to Generate Insights

6.3.1 In order to not only produce TER- and TFEE-based targets that could form the basis for a revised Policy CE3, but also to allow Wokingham to understand the *actual* impact that this revised policy would have on energy and carbon performance, the following steps were performed:

1. Feeding the original WBC 2024 study's 'true net zero' building specifications into SAP, to identify what the TER and TFEE % reductions would be in homes that meet the original performance targets of policy CE3 (EUI, SHD and renewable energy to cover 100% of total use).
2. Identifying other building specifications that developers may likely deploy to achieve those TER and TFEE targets, generating a new specification to model.
3. Feeding that new specification back into the more accurate building energy prediction tool of PHPP, to get a more realistic picture of what those buildings' energy use and carbon emissions performance would actually be as a result of adopting a policy expressed in TER and TFEE.

6.3.2 Step 2 in this process follows the approach of the West of England study. Steps 1 and 3 then reveal the impact on actual energy consumption and emissions that would occur in new homes in Wokingham, if the policy uses TER instead of EUI and SHD. This can be used to weigh up the relative merits of the two policy options, in terms of meeting the legal duty and NPPF expectation to proactively mitigate climate change in line with the Climate Change Act. This fulfils the NPPF test of soundness requirement to consider reasonable alternatives using proportionate evidence.

6.3.3 The main body of this report summarises the proposed back-up TER-based policy options and results. The original NZC Policy performance (assessed via SAP and PHPP) and the relative performance for the back-up TER/TFEE Policy (assessed via PHPP) are located in the appendices.

## 6.4 Performance Metrics

6.4.1 Three primary metrics were used to evaluate policy performance in this study, which would also form the metrics by which these new alternative policy options would be expressed in order to align with the aforementioned stipulations of the WMS2023. These metrics, which all come from the Building Regulations SAP methodology (as stipulated by the WMS2023), were:

- Performance against the **Target Emission Rate (TER)** which measures regulated carbon emissions;
- Performance against the **Target Fabric Energy Efficiency (TFEE)** which reflects the thermal performance of the building fabric;
- and **unregulated energy use** estimated using SAP Appendix L figures for appliance and cooking energy demand.

6.4.2 To supplement these, additional PHPP (Passive House Planning Package) modelling was carried out for select SAP-derived specifications. This provided further insights into:

- **Energy Use Intensity (EUI)**, representing the total site energy demand in kWh/m²/year;
- **Space Heating Demand (SHD)**, which quantifies heating demand attributable solely to the building fabric; and
- **On-site PV generation potential**, determined by cross-referencing assumed system sizes with actual site constraints and known grid capacity limitations.

As previously noted, PHPP is far more accurate at predicting buildings' actual energy performance, whereas SAP underestimates regulated energy use but overestimates unregulated energy use (typically adding up to a significant underestimation as a whole). The use of PHPP is therefore to provide a more realistic assessment of the policy options' actual impact.

## 6.5 Cost and Feasibility Methodology

6.5.1 Cost assessment of this study is based on 2024 data, aligning with the Q3 2024 data used for the earlier Net Zero Policy evidence base for the purpose of comparability. Feasibility was assessed through a combination of approaches, including technical feasibility by building typology (accounting for fabric upgrades, available roof space for renewables, and other physical constraints), and cost uplift analysis provided by Currie & Brown. Currie & Brown's cost assessment covered:

- Fabric interventions (e.g., insulation, airtightness improvements);
- Heating system upgrades; and
- On-site photovoltaic panel installation.

6.5.2 The combined output from these assessments informed both the feasibility of each policy option by typology and broader recommendations on viable policy design for WBC.

Link to glossary

# 7. Energy modelling for a TER-based policy in Wokingham: Results for Policy scenarios tested

## 7.1 Summary of Carbon Savings Achievable Under Each Policy Approach

7.1.1 For the purpose of modelling, we translated WBC policy into policy 1B, 1C, and 1D of the West of England study. Corresponding clauses are colour coded:

- Policy CE3 alternative 1 (Equivalent to WE Option 1B)
- Policy CE3 alternative 2 (Equivalent to WE Option 1C)
- Policy CE3 alternative 3 (Equivalent to WE Option 1D).

**1. 100% improvement over TER (regulated emissions), delivered on-site, with offsetting permitted where 100% improvement infeasible.**

Brief commentary:

7.1.2 This alternative policy option only uses the TER metric, therefore does not include a requirement for fabric improvement (as the TER metric wraps together all different parts of the building specification, not just fabric). The assumed specification therefore utilises poorer thermal performance inputs than Policy CE3 as submitted, instead aiming to align with current house builder practice as well as closer alignment to the anticipated FHS standard notional dwelling (which, as previously noted, will have similar or identical fabric to today's existing building regulations, according to the latest national FHS consultation which took place in 2023-24).

7.1.3 To achieve 100% TER reduction across the three typologies, more photovoltaic panels would therefore need to be installed in most cases (compared to existing draft policy CE3 as submitted):

- Detached House: 5.3kWp (compared to vs. 4.2kWp for the existing draft policy CE3).
- Semi-Detached: 5.1kWp (compared to 3.4kWp for the existing draft policy CE3).
- Low-rise Block: 26.5 (compared to 27.7 kWp for the existing draft policy CE3).

7.1.4 The modelled house typologies require more PV panels than Policy CE3 as submitted, despite only offsetting the regulated energy, whereas Policy CE3 as submitted covers total energy demand. This is because:

- The TER metric fails to keep actual energy use low, whereas the existing draft policy CE3 as submitted uses the EUI metric to set energy use limits which result in less PV being needed to match energy use.
- While the existing draft policy CE3 considers energy use and energy generation on an equal basis per kWh, the TER-based policy is assessed using SAP which assigns higher carbon emissions per kWh of energy *use* than it assigns in carbon *savings* per kWh of PV generation. SAP includes an estimate for "self-use factor" for calculation of CO2 emissions, for electricity used within the dwelling it applies the normal import emissions factors whereas for the electricity exported, it applies the factors for 'electricity sold to grid, PV' which vary month to month and are 15-20% lower in prime summer months where generation is highest.

7.1.5 For the detached and semi-detached typologies, it is feasible to fit the required amount of PV on the roof of the modelled buildings' given the available roof space.

7.1.6 If we reflect on how a mid-terrace typology might be impacted by this scenario, the terrace property may not have the roof space available on the optimised orientation to accommodate any uplift in PV that's likely to be required to meet this particular TER-based policy option.

7.1.7 The flatted typologies require less PV than Policy CE3 as submitted, due to only offsetting the regulated energy. However, in low rise apartment blocks the accommodation density and occupancy mean the proportion of unregulated energy is larger than in the house typologies.

*Table 2: Summary of building specification and SAP improvement results for Policy CE3 "alternative 1" in each home typology*

| | TYPOLOGY – Alternative 1 | Detached house | Semi-detached house | Low rise apartment block (7 apartments) |
|---|---|---|---|---|
| Input Summary | Building fabric parameters<br>Floor (U-Value W/m²K)<br>Wall (U-Value W/m²K)<br>Window (U-Value W/m²K & g-Value)<br>Roof (U-Value W/m²K)<br>Thermal Bridging Y-Value | <br>0.12<br>0.15<br>1.20/0.55<br>0.11<br>0.04 | <br>0.12<br>0.15<br>1.20/0.55<br>0.11<br>0.05 | <br>0.12<br>0.15<br>1.20/0.55<br>0.11<br>0.06 (Ave) |
| | Infiltration (m³/m²h)<br>Ventilation System | 5.00<br>Intermittent Fans | 5.00<br>Intermittent Fans | 5.00<br>Intermittent Fans |
| | Heating & DHW system | 7kW Monobloc ASHP | 5kW Monobloc ASHP | 3.5kW Monobloc ASHP (per apartment) |
| | Photovoltaics (PV) | 5.3 kWp | 5.1 kWp | 26.5 kWp |
| Results Summary | **% Improvement over Part L 2021 TER** | **100.1** | **100.2** | **100.7** |
| | % Improvement over Part L 2021 TFEE | 2.1 | 2.4 | 1.8 |

**2. 100% improvement over TER (regulated emissions) on site, with at least 10% improvement over TFEE (fabric efficiency), with offsetting payments permitted where the 100% improvement on the TER is unfeasible.**

*Table 3: Summary of building specification and SAP improvement results for Policy CE3 "alternative 2" in each home typology*

| | TYPOLOGY – Alternative 2 | Detached house | Semi-detached house | Low rise apartment block (7 apartments) |
|---|---|---|---|---|
| Input Summary | Building fabric parameters<br>Floor (U-Value W/m²K)<br>Wall (U-Value W/m²K)<br>Window (U-Value W/m²K & g-Value)<br>Roof (U-Value W/m²K)<br>Thermal Bridging Y-Value | <br>0.09<br>0.12<br>1.20/0.55<br>0.10<br>0.04 | <br>0.09<br>0.12<br>1.20/0.55<br>0.10<br>0.06 | <br>0.09<br>0.12<br>1.20/0.55<br>0.10<br>0.06 (Ave) |
| | Infiltration (m³/m²h)<br><br>Ventilation System | 3.00<br><br>Continuous MEV system | 3.00<br><br>Continuous MEV system | 2.50<br><br>Continuous MEV system[74] |
| | Heating & DHW system | 7kW Monobloc ASHP | 5kW Monobloc ASHP | 3.5kW Monobloc ASHP (per apartment) |
| | Photovoltaics (PV) | 5.2 kWp | 4.9 kWp | 25.6 kWp |
| Results Summary | **% Improvement over Part L 2021 TER** | **100.7** | **100.3** | **100.4** |
| | % Improvement over Part L 2021 TFEE | 11.2 | 11.1 | 10.5 |

Brief Commentary:

7.1.8 This alternative policy option (2) utilises better thermal performance inputs than alternative option 1 (previous page), but this is still a poorer specification than Policy CE3 as submitted. However, thanks to the inclusion of a TFEE improvement target in this policy option, thermal performance exceeds current typical house builder practice in some respects as well as further betterment to the anticipated FHS standard notional dwelling.

7.1.9 To achieve 100% emissions reduction relative to the TER and 10% reduction relative to the TFEE across the three typologies, less photovoltaics are required to be installed than policy option 1:

- Detached House: 5.2kWp (compared to 4.2kWp for the existing draft policy CE3).
- Semi-Detached: 4.9kWp (compared to 3.4kWp for the existing draft policy CE3).
- Low-rise Block: 25.6 (compared to 27.7 kWp for the existing draft policy CE3).

7.1.10 Modelling shows that house typologies require less PV in option 2 than option 1, but still more PV than Policy CE3 as submitted, despite only offsetting the regulated energy, whereas Policy CE3 as submitted covers total energy demand. This is for the same reasons as in option 1 – that is, because TER is not an energy efficiency metric and therefore is not effective at limiting energy use, thus failing to avoid the need for generous PV provision to reach a 100% TER reduction. The use of the TFEE target helps to somewhat reduce energy demand but not to a drastic extent.

7.1.11 For the detached and semi-detached typologies it is feasible to fit the required amount of PV on the roof of the modelled buildings' given the available roof space.

7.1.12 If we reflect on how a mid-terrace typology might be impacted by this scenario, the terrace property may require further thermal performance increases to meet the 10% reduction against the TFEE requirement due to a lower heat losses parameter. In essence the terrace typology has lower external surface area and therefore heat loss area, so when fabric measures are applied they have a reduced impact on carbon emissions in comparison to semi-detached and detached typologies.

7.1.13 The flatted typologies require less PV than the existing draft policy CE3 as submitted, due to only being required here to cover the regulated emissions (whereas existing draft policy CE3 as submitted requires renewable energy to cover total energy use, both regulated and unregulated). However, in low rise apartment blocks the accommodation density and occupancy mean the unregulated energy contingent is larger than those calculated for the housing typologies.

[74] Mechanical Extract Ventilation (MEV) systems remove stale and moist air from wet rooms (e.g. bathrooms, kitchens) and are typically installed to support improved airtightness and indoor air quality. Centralised MEV (c-MEV), commonly used in new builds, connects multiple rooms to a single extraction unit via ducting. While the submitted Policy CE3 as submitted, required Mechanical Ventilation with Heat Recovery (MVHR), MEV offers an alternative approach to controlled ventilation where full heat recovery may not be feasible.

**3. 100% improvement over TER (regulated emissions) on site, with at least 10% improvement over TFEE (fabric efficiency), with an added requirement to offset unregulated emissions (e.g. appliances and cooking), either via on-site generation or offsetting payments. Offsetting payments also permitted where the TER target is unfeasible.**

*Table 4: Summary of building specification and SAP improvement results for Policy CE3 "alternative 3" in each home typology*

| | TYPOLOGY – Alternative 3 | Detached house | Semi-detached house | Low rise apartment block (7 apartments) |
|---|---|---|---|---|
| Input Summary | **Building fabric parameters**<br>Floor (U-Value W/m²K)<br>Wall (U-Value W/m²K)<br>Window (U-Value W/m²K & g-Value)<br>Roof (U-Value W/m²K)<br>Thermal Bridging Y-Value | <br>0.09<br>0.12<br>1.20/0.55<br>0.10<br>0.04 | <br>0.09<br>0.12<br>1.20/0.55<br>0.10<br>0.06 | <br>0.09<br>0.12<br>1.20/0.55<br>0.10<br>0.06 (Ave) |
| | Infiltration (m³/m²h)<br><br>Ventilation System | 3.00<br><br>Continuous MEV system | 3.00<br><br>Continuous MEV system | 2.50<br><br>Continuous MEV system |
| | Heating & DHW system | 7kW Monobloc ASHP | 5kW Monobloc ASHP | 3.5kW Monobloc ASHP<br><br>(per apartment) |
| | Photovoltaics (PV) | 5.2 + 1.9kWp | 4.9 + 1.6kWp | 25.6 + 10.5kWp |
| Results Summary | **% Improvement over Part L 2021 TER** (before the additional PV to meet unregulated energy use) | 100.7 (plus 5-10% further reduction | 100.3 (plus 5-10% further reduction | 100.4 (plus 5-10% further reduction) |
| | % Improvement over Part L 2021 TFEE | 11.2 | 11.1 | 10.5 |

7.1.14 This policy utilises the same thermal performance inputs as option 2 (previous page) but still poorer than Policy CE3 as submitted.

7.1.15 The level of photovoltaics required to achieve a 100% TER reduction and full offset of unregulated energy across the house and flatted typologies is greater than that required under Policy CE3 as submitted and its alternatives 1 and 2. As a result, compared to existing draft policy CE3 and alternatives 1 and 2, this specification is more likely to exceed typical on-site geometrical (roof space) or in some cases may exceed grid capacity constraints to take the PV export at peak generation times, meaning that full on-site feasibility cannot be assumed in all cases (and in those cases the shortfall would be dealt with via offsetting instead).

- Detached House: 7.1kWp (compared to 4.2kWp for the existing draft policy CE3).
- Semi-Detached: 6.5kWp (compared to 3.4kWp for the existing draft policy CE3).
- Low-rise Block: 36.1kWp (compared to 27.7kWp for the existing draft policy CE3).

7.1.16 For the detached and semi-detached typologies it is potentially feasible to fit the required amount of PV on the roof of the modelled buildings given the available roof space however this may be reliant on applying PV to more than one roof slope so there may be pushback on this from some applicants, for example from volume housebuilders if their standard home designs' roof elevations and orientations differ to the modelled typologies. Still, the developer is in control of the design and has the ability to design and orient the roof optimally for the site.

7.1.17 If we reflect on how a mid-terrace typology might be impacted in this scenario, the terraced house may not have the roof space available on the optimised orientation to accommodate any uplift in PV generation which is likely to be required.

7.1.18 Note: For this alternative option (3), the performance results shown for flatted blocks, detached, and semi-detached homes are the same as those under alternative 2. This is because the additional PV capacity required under alternative 3, denoted in brown text in this table, was considered unlikely to be feasible on most sites. As such, no revised SAP modelling was undertaken; however, indicative performance improvements of approximately 5–10% (DER/TER) are estimated based on the additional PV assumed.

7.1.19 The additional PV generation noted in brown text is based on unregulated energy use of: ~1800kWh for a detached dwelling, ~1500kWh for semi-detached dwelling and ~1350kWh per apartment (average). These figures come from Policy CE3 as submitted, as the official SAP Appendix L estimates were considered unrealistically high due to outdated data. To calculate how much extra solar capacity is needed, we first looked at how much energy the proposed solar panels would generate. This was done by dividing the total regulated energy they produce (in kWh) by the total size of the system (in kWp), giving us an average yield of around 925 kWh per kWp per year based on typical sunlight levels in the region. We then divided the estimated unregulated energy use by this figure to work out how much more solar panel capacity (in kWp) is needed to cover that extra demand. For context, a typical solar panel capacity is around 420 watts (0.42 kW). This means that every 1 kWp of additional solar capacity means roughly 2.4 panels, or about 4 to 5 m² of roof space depending on panel efficiency and layout. This helps to visualise the spatial implications of offsetting unregulated energy use on-site.

# 8. Cost modelling for TER-based policy options in Wokingham, and discussion of feasibility

## 8.1 Cost implications by typology and option

8.1.1 This section reflects the technical assumptions made in the previous section required for achieving the various policy options and have been costed to understand viability. (Terraced houses were modelled in the West of England study, but were not included in the WBC-specific analysis. Instead, performance for mid-terrace homes was inferred by drawing comparisons with the semi-detached typology).

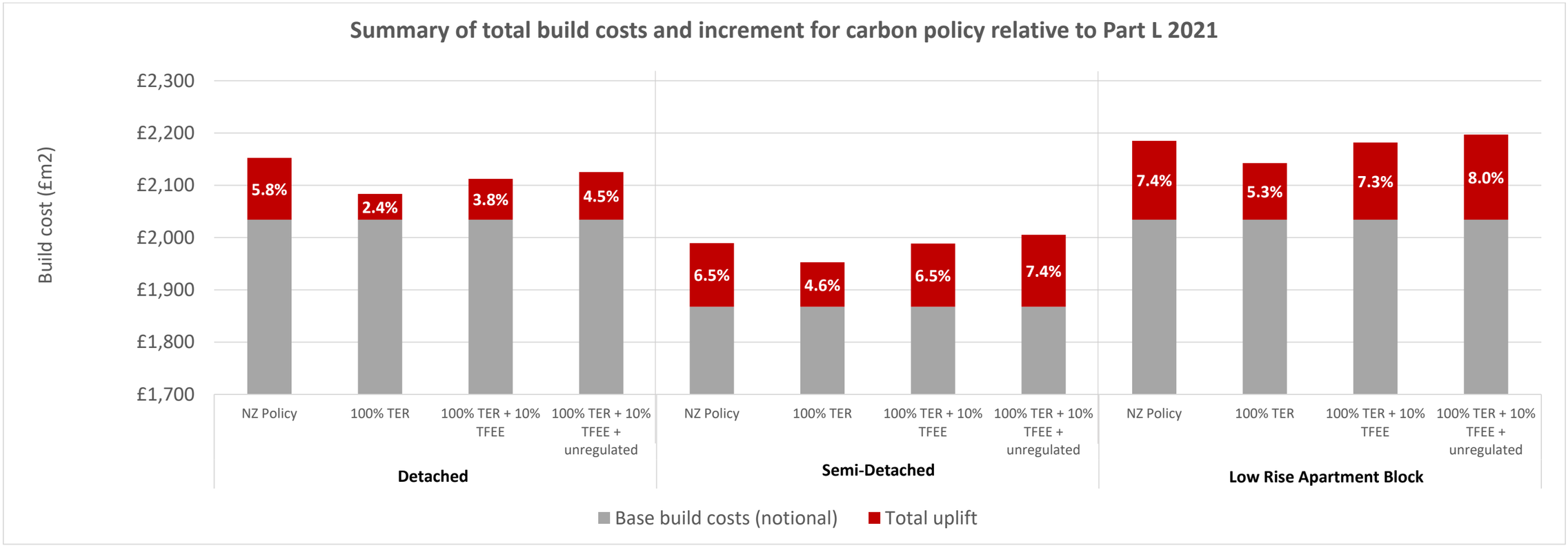


*Figure 7: Summary of total build costs and increment for carbon policy relative to Part L 2021*

8.1.2 Please note:

- "NZ policy" is the existing submitted draft policy CE3.
- "100% TER" is the previously described "alternative 1".
- "100% TER + 10% TFEE" is the previously described "alternative 2".
- "100% TER + 10% TFEE + unregulated" is the previously described "alternative 3".

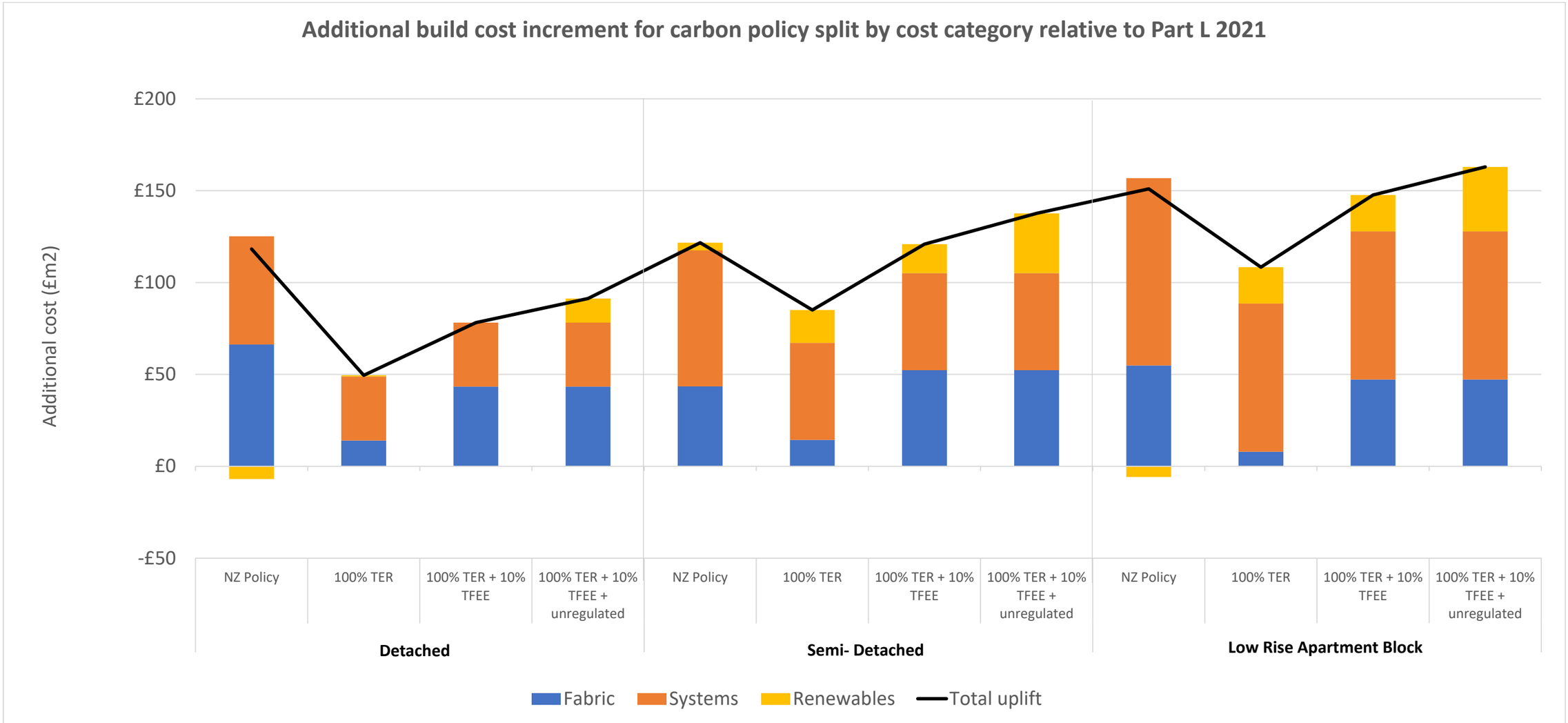


*Figure 8: Additional build cost increment for carbon policy split by cost category relative to Part L 2021*

8.1.3 To evaluate the financial implications of the proposed alternative policy approaches, a cost modelling exercise was undertaken to compare three policy variants - policy alternative 1 (100% TER), policy alternative 2 (100% TER and 10% TFEE), and policy alternative 3 (100% TER, 10% TFEE, and unregulated energy target) - against the current national Building Regulations baseline for minimum performance, Part L 2021. This analysis estimates the capital cost uplift relative to minimum allowable standards, required to meet each policy scenario across three residential typologies: detached houses, semi-detached homes, and low-rise flats.

8.1.4 All cost uplifts are on the Part L 2021 baseline (today's building standard, and thus the uplifts would be much lower over the imminent Future Homes Standard). The total build cost uplift ranges from approximately 2.4% to 8.0% depending on typology and specification. Among detached homes, the lowest uplift is observed under alternative 1 at 2.4%, while alternative 3 incurs a moderate 4.5% increase. Semi-detached homes show slightly higher uplifts, with a peak of 7.4% in alternative 3. Low-rise flats experience the highest cost pressures overall, with alternative 3 producing an 8.0% uplift. These higher percentages in flats and semi-detached homes are attributable to less favourable surface-to-floor ratios and more concentrated mechanical and electrical system demands per unit area (and this greater energy demand per building footprint results in a greater demand for additional PV in the policies compared to the amount of PV that is already in today's Building Regulations Part L 2021 baseline, which Part L expresses in relation to the building's footprint not to its energy demand). It is also important to

note that Part L 2021 represents the minimum regulatory standard; in practice, many developments already build to slightly higher performance specifications, meaning the real-world uplift relative to typical delivery may be lower than modelled. Additionally, national Government has confirmed the incoming Building Regulations from 2025/26 (FHS) will include PV[75], albeit without clarifying on how much.

8.1.5 Breaking down the drivers of cost increases, building systems, primarily for mechanical ventilation and low-carbon heating, are consistently the largest contributor, especially for low rise flats. For example, the systems-related uplift reaches £81/m² for flats for all policy alternatives, compared to £53/m² for detached homes.

8.1.6 The addition of an unregulated energy performance metric in alternative 3 leads to an increase in total PV capacity required. Consequently, the renewable energy cost component rises across all typologies under alternative 3, with the uplift from PV systems peaking at £35/m² in flats. This is in contrast to the lower PV costs or even net-negative PV contributions seen under submitted Policy CE3, which requires less PV than the Part L notional building. Overall, the estimated total uplift per square metre ranges from £50 to £163 depending on alternative policy and typology. This aligns with uplift ranges observed in other local authority assessments, such as the West of England Net Zero study, and falls within viability tolerances for most medium-scale residential development. When the same typologies are assessed against the anticipated **Future Homes Standard (FHS) Option 1 and 2** baselines, the total cost uplift will decrease significantly because both FHS options include a heat pump, which makes up a significant proportion of the cost uplift for the policy options versus Part L 2021's gas boiler.

**Viability considerations**

8.1.7 While the modelled figures assume a notional baseline build that meets Part L 2021, it is important to note that actual build costs will vary by context. For example, bespoke, self-build, or small-scale brownfield developments may face higher-than-average uplift due to reduced efficiencies in procurement, design, or layout constraints. Previously developed (brownfield) sites present an opportunity for sustainably located development (typically with lesser impacts on areas like ecology) so it is appropriate that Policy CE3 offers flexibility to encourage development of brownfield sites. Conversely, volume housebuilders operating on greenfield sites may achieve lower costs through standardisation and fewer constraints. This underscores the importance of maintaining policy flexibility that is justified by site-specific technical or viability evidence. From an end-user perspective, higher capital investment in building fabric and systems can result in **long-term energy savings**, particularly through reduced heating demand and durable construction. As national energy prices continue to fluctuate, the value of resilient, low-energy homes is expected to rise, supporting improved affordability and energy security (and there is evidence that this effect is already occurring as shown in homes' average sale price by EPC band[76]). By promoting the construction of homes with significantly reduced energy demand, local plans can continue to support the development required to meet housing needs, while reducing the likelihood of energy security issues such as delayed grid connections.

## 8.2 Technical Feasibility Summary

8.2.1 Wokingham Borough's predominantly suburban housing mix, characterised by a high proportion of detached and semi-detached dwellings and relatively few flats, means that achieving the same percentage uplift over the Target Emissions Rate (TER) can require materially different design responses than in more urban authorities which rely heavily on apartments. In cases where developments aim for 100 % on-site improvement over the TER, there may still be constraints that necessitate residual carbon offsetting if full compliance cannot be met through on-site measures such as PV and fabric upgrades. By contrast, existing draft policy CE3 as submitted uses EUI metrics to keep energy use very low and consequently the amount of PV needed to make the building net zero is reduced, sometimes to an amount less than that which is already part of Building Regulations Part L 2021 (which is likely to continue into the Future Homes Standard given that national government has confirmed the FHS will include PV, as previously noted; see 8.1.4). As a result, that existing EUI-based draft policy CE3 as submitted would help to avoid the feasibility constraints of grid capacity or roof space availability for PV.

8.2.2 Incorporating **on-site battery storage** can mitigate issues with energy export ceilings by time-shifting excess PV output and smoothing demand peaks, thereby reducing distribution network (DNO) reinforcement risk. According to MCS, battery storage can increase household self-consumption of generated solar energy from around 50% to over 70%, depending on usage patterns and system size.[77] Battery performance is expected to continue to improve; consequently, battery readiness is highlighted as a component of best-practice climate resilient development and is particularly important for the goal of minimising the need for off-site offset purchases.

8.2.3 Existing draft Policy CE3 (as submitted) includes several built-in flexibility mechanisms designed to accommodate site-specific circumstances without undermining net zero ambition. They remain fully relevant and applicable for any of the TER-based policy alternatives 1-3, preserving essential site-specific flexibility in implementation. Flexibility through exceptional basis clauses is consistent with approaches taken elsewhere and found sound by Planning Inspectors, for example in the cases of Policy S7 of the Central Lincolnshire Local Plan adopted April 2023, Policy SCR6 of the Bath & North East Somerset Local Plan (Core Strategy and Placemaking Plan) Partial Update adopted January 2023, and Policy SEC1 2b of the Cornwall Climate Emergency Development Plan Document adopted February 2023.

8.2.4 Circumstances that are **not** considered to constitute a technical constraint under the CE3 exceptional basis clauses include:

[75] HM Government Department for Energy Security and Net Zero, Ministry of Housing, Communities and Local Government, Matthew Pennycook MP and The Rt Hon Ed Miliband MP (2025), *Rooftop solar for new builds to save people money*. https://www.gov.uk/government/news/rooftop-solar-for-new-builds-to-save-people-money

[76] Lloyds/Halifax (2021), *Homebuyers pay a 'green premium' of up to £40,000 forthe most energy efficient properties*. https://www.lloydsbankinggroup.com/assets/pdfs/media/press-releases/2021-press-releases/halifax/halifax-green-homes-premium-press-release.pdf

[77] MCS (2022). *Solar PV Self-Consumption*. *https://mcscertified.com/wp-content/uploads/2022/04/MGD-003-Solar-PV-Self-Consumption-Issue-2.0-Final.pdf*

- **Roof orientation:** While south-facing arrays are optimal for solar energy generation, east- and west-facing panels can still produce substantial amounts of electricity and are therefore viable alternatives when south-facing roofs are not available. Although less efficient, even north-facing panels can make a meaningful contribution to overall electricity output. Additionally, even if the building's frontage must face a certain direction due to plot layout, developers are still in control of the designs and thus have the ability to orient roofs to optimise solar generation (for example rotating the roof pitch or an asymmetric roof).
- **Typical shading from garden trees or neighbouring dwellings** can often be mitigated through panel layout or power optimisers; only extreme overshadowing (e.g. protected mature woodland, Tree Protection Orders, or neighbours' very tall buildings/trees very close to the proposed building) would trigger a flexibility mechanism.
- **Heritage protection** should only be a constraint where statutory designations explicitly restrict renewable energy technologies like solar panels; general streetscape arguments should not typically be a technical barrier. As the policy only applies to new builds, these will not themselves be heritage assets and therefore this constraint would only apply where the restriction on such technologies also extends to the *setting* of the designated heritage asset.

## 8.3 Implementation Considerations

8.3.1 The 2024 Net Zero Policy – Technical Evidence Base[78] noted the importance of developer buy-in, skills availability, and the need for clear, robust compliance pathways to ensure successful application of Policy CE3 as submitted. These comments remain relevant for policy alternatives 1–3. Under alternative 3, the inclusion of unregulated emissions and a higher TFEE threshold may increase the burden of evidence and design optimisation for applicants. In contrast, alternative 1 would fall significantly short of delivering the benefits offered by Policy CE3 as submitted, including reduced energy bills for occupiers and broader carbon savings.

8.3.2 Wokingham's emerging Local Plan encourages connection to decentralised energy networks where feasible, and this continues to offer a key compliance route under the proposed policies. Policy CE3 (as submitted) explicitly allows connection to a decentralised energy network as a fallback means of compliance where on-site performance targets cannot be met. While alternatives 1–3 of this study do not mandate such connections, the same principle of integration applies. Decentralised systems, particularly those using low-carbon heat sources, could play a role in achieving the required TER reduction in all alternatives 1-3 and also in offsetting regulated and unregulated emissions under alternatives 2 and 3, especially on sites where on-site renewables are constrained. However, policy design should bear in mind that not all 'decentralised' energy systems are necessarily lower-carbon than the typical alternative – for example, gas-fired heat networks will not be lower-carbon than electrical air-source heat pumps which will be the standard heating system in Building Regulations when the Future Homes Standard comes into force (very close to the anticipated adoption of the Wokingham Local Plan Update).

8.3.3 As the reliance on rooftop solar PV increases to meet the requirements of alternatives 2 and 3, local electricity network capacity may become a limiting factor. The West of England TER study observed that achieving net-zero regulated emissions in some cases required PV systems exceeding 3.68kWp. This is important because 3.68kWp is the maximum size allowed under the G98 connection rule, which is a simplified process for connecting solar panels to the electricity grid.[79] If a system exceeds this size, it may trigger more complex approval requirements from the local grid operator (this is not an impossible barrier, but adds somewhat to developers' admin burden). This concern is particularly relevant to WBC, where extensive low-density housing may result in higher aggregate demand on constrained grid infrastructure. All three TER-based policy options in this report were assumed to be met by PV systems above that size.

8.3.4 WBC will retain core flexibility mechanisms from the original CE3 policy in the case of alternative wording being proposed. These include exceptions for technical constraints (e.g. shading, heritage assets), alternative means of compliance via accredited certification schemes (e.g. Passivhaus Plus), and viability exceptions for development of brownfield land. Such clauses will remain essential to manage case-by-case deviations without undermining the core ambition of alternatives 1-3 to align with local and national carbon reduction requirements. The offsetting mechanism is also inherently a flexibility mechanism.

**Offsetting scheme**

8.3.5 Wokingham Borough Council is in the process of developing a local carbon offsetting scheme to complement the implementation of its revised net zero policy options. In policy alternative 1, offsetting may be used where achieving 100% reduction on the Target Emissions Rate (TER) through on-site improvements proves unfeasible. Alternative 2 extends this by incorporating a 10% uplift over the Target Fabric Energy Efficiency (TFEE) standard, but this does not affect the offsetting scope because offsetting relates to carbon (the TER metric) whereas the TFEE metric is not suited to an offsetting approach as there is no clear way to price a shortfall in TFEE. However, policy alternative 3 further requires developers to account for unregulated energy use, such as cooking and plug-in appliances, which may also be subject to offsetting if not addressed through additional on-site generation. Offset contributions would be considered on a case-by-case basis, with WBC aiming to channel these funds into local decarbonisation projects that directly benefit the community. However, following best practice principles as outlined in the West of England study, WBC maintains that offsetting should only be used as a last resort. Developers will be expected to prioritise on-site reductions in all cases, and offsetting will not be accepted as a substitute for meeting minimum performance thresholds where compliance is otherwise achievable.

[78] Wokingham Borough Council (2024). https://www.wokingham.gov.uk/sites/wokingham/files/2024-09/Wokingham%20-%20Net%20Zero%20Evidence%20Base%20Final%20Report.pdf

[79] National Grid. *Micro generation (G98)*. https://connections.nationalgrid.co.uk/get-connected/solar-and-wind/micro-generation-single-g98/

# 9. Policy Evaluation and Conclusions

## 9.1 Evaluation of Alternative Policy Options

9.1.1 The policies below have been modelled to provide fallback options should Policy CE3 as submitted be found unsound due to its divergence from the Written Ministerial Statement (WMS). Policy CE3 remains the preferred and most effective option in terms of climate mitigation. However, in the event that it cannot be retained, the following alternatives provide a graduated series of next-best options with varying degrees of ambition and feasibility.

**Policy CE3 alternative 1**

9.1.2 Bioregional has modelled each of the typologies against alternative 1, showing a potential route to policy compliance. The detached house, semi-detached house and small-scale flatted block are all able to meet the policy requirements and achieve a 100% reduction over the TER on site. In all cases, the performance of the building itself has been improved over a Part L 2021 compliant specification being closer to likely FHS performance that is forming the current business-as-usual approach for mass housebuilders who are able to achieve these results whilst remaining within suitable spatial limits for PV generation. These improvements are modest, involving minor fabric efficiency enhancements and the use of heat pumps.

- Cost implications: The cost uplift over the Part L 2021 baseline ranges from 2.4% to 5.3% to meet this policy requirement. Compared to the anticipated Future Homes Standard (FHS) 2025 baseline, the cost impact ranges from -0.4% to 0.6% in alternative 1, and from 2.2% to 4.4% in alternative 2.)
- Comparison with Policy CE3 as submitted: Alternative 1 uses **poorer thermal performance inputs** than Policy CE3 as submitted and aligns more with current mass housebuilder practice. Despite only offsetting regulated energy, the **modelled housing typologies require more PV** than under Policy CE3 as submitted, which covers total energy demand. This results in a **less efficient specification** with greater reliance on PV.
- Risks: Applicants are likely to focus on including PVs (and potentially paying offsetting charges) over implementing measures that reduce the energy demand of the building via building fabric improvements. This is likely to lead to buildings which are not as energy efficient and low carbon as they could be, increasing the need for retrofitting in the future. Poorer building fabric performance relative to the specification proposed in Policy CE3 as submitted, will increase the reliance on PV panels to meet emissions targets. This raises the likelihood of exceeding grid connection constraints, particularly the **G98 limit (3.68kWp)** for PV on single-phase systems, which may constrain feasibility and undermine climate resilience objectives.

**Policy CE3 alternative 2**

9.1.3 Bioregional has modelled each of the typologies against alternative 2, showing a potential route to policy compliance. Changes to the specification from alternative 1 have been highlighted in bold. All typologies meet the policy requirement to achieve a 100% improvement over the TER through on site measures, with any residual regulated emissions offset. The specification of each typology has also been able to achieve a 10% improvement over the TFEE, showing an improvement to the performance of the buildings themselves primarily through U-value performance and airtightness improvements.

- Cost implications: The cost uplift over the Part L 2021 baseline ranges from 3.8% to 7.3% to meet this policy requirement. Compared to the anticipated Future Homes Standard (FHS) 2025 baseline, the cost impact ranges from 1.0% to 2.5% under Option 1, and from 4.2% to 6.3% under Option 2.
- Comparison with Policy CE3 as submitted: Alternative 2 incorporates **better thermal performance** than alternative 1, and exceeds typical current housebuilder practice and FHS notional dwelling in some areas. However, it still remains **below the performance level of Policy CE3 as submitted**. For all typologies, alternative 2 **requires more PV** than under Policy CE3 as submitted, despite only offsetting regulated energy.

**Policy CE3 alternative 3**

9.1.4 Policy CE3 alternative 3 includes all requirements from alternative 2 and adds the offsetting of unregulated energy demand, based on estimates of Policy CE3 as submitted. As shown in the tables above, the specifications have changed very little for each of the typologies compared to their specifications to meet alternative 2. Generation through PV has been maximised to reduce the amount of potential carbon to be offset.

- Cost implications: The cost uplift over the Part L 2021 baseline ranges from 4.5% to 8.0% to meet this policy requirement. Compared to the anticipated Future Homes Standard (FHS) 2025 baseline, the cost impact ranges from 1.7% to 3.4% under alternative 1, and from 4.9% to 7.2% under alternative 2. Policy CE3 alternative 3 also considers unregulated energy, which becomes a higher proportion of a building's energy consumption as building performance improves. If the additional PV uplift is based on the Part L Appendix L estimate this value will be 2-2.5 times larger leading to unfeasibly large PV arrays or offsets required. This is due to the Appendix L being based on outdated data about the efficiency of appliances, as discussed earlier.
- Comparison with Policy CE3 as submitted: Like alternative 2, this option uses thermal performance specifications that are **still poorer than Policy CE3 as submitted**. However, alternative 3 applies those standards to both regulated and unregulated energy. To achieve this, **all typologies require more PV** than both Policy CE3 and alternatives 1 and 2. For two of the three typologies, the cost uplift of compliance with this policy would actually be higher than for achieving the net zero requirements of Policy CE3 as submitted.

Link to glossary

### Commentary on performance of other typologies not considered in this study

9.1.5 For suburban or semi-rural authorities like Wokingham the modelled typologies are considered representative but there will be instances where other typologies are delivered, most likely mid-terrace housing with some potential for larger low/mid-rise blocks closer to central Wokingham. In these cases the **Part L compliance patterns** may differ in the following ways:

- **Terraced housing:** Possible space constraints of roof top PV generation. For the terraced house, the airtightness of the building and its fabric performance could be improved to reduce the amount of carbon to be offset but it's possible only a 85-90% reduction against the TER (based on Part L 2021) might be feasible. This is also a fair estimate of the reduction against the TER possible within the modelled housing typologies if **G98 limit** grid constraints effectively restrict on site renewable energy generation. If battery storage were installed, this could facilitate addition PV installation whilst staying below the export threshold. The increased array size would improve SAP performance, but the battery itself wouldn't greatly improve SAP performance because SAP would simply increase the "self-use factor", taking account of battery storage, and this resulting in a lower surplus be exported to the grid. This doesn't greatly effect/improve the DER but may improve the SAP rating and EPC due increased self-consumption and operational cost reduction.

- **Larger low/mid-rise flats:** It is envisaged the small scale block (of 7 apartments) achieves a 100% improvement over the TER, however if slightly larger low rise blocks (e.g. of 16 apartments), or mid-rise blocks (e.g. of 34 apartments) are developed for more suburban sites these are likely to be unable to achieve a 100% improvement over the TER on site; a more realistic expectation here is that a 75-85% reduction in TER might be possible based on the West of England TER study and therefore there will be more residual carbon emissions that will need to be offset. While these typologies could improve their specifications to reduce residual carbon emissions further, it may be cheaper for a developer to pay into an offsetting fund depending on the £/tonne level set.

## 9.2 Recommendations for Policy Approach in WBC Local Plan

**A TER-based policy is a compromise on consistency with different parts of national policy**

9.2.1 While a TER-based policy is not as robust as a policy based on absolute energy performance metrics, this study seeks to design a TER-based approach that aligns with the **intent and ambition** of an energy-based policy as closely as possible, while following the stipulations of **the Written Ministerial Statement 2023 (WMS2023).** Compared to the originally submitted draft policy CE3's EUI energy efficiency metrics, any TER-based policy is inherently less effective at fulfilling the local plan's aforementioned legal duty to mitigate climate change, certainly not to the aforementioned extent specified by the NPPF (i.e. that mitigation should be in line with the objectives of the Climate Change Act). A TER-based policy therefore is only appropriate if the Inspector deems that the WMS2023 holds more material weight than the NPPF and/or that there is some other more relevant definition of how far that legal duty should be pursued.

**Preferred policy approach: policy CE3 as submitted**

9.2.2 Bioregional continues to recommend that **policy CE3 as submitted**, which uses absolute metrics and includes both regulated and unregulated energy, is the most **effective and robust** option for delivering net zero-aligned homes. This policy sets a **stronger trajectory for climate mitigation**, supports long-term energy cost reductions for occupants, reduces the need for future retrofit, and minimises the stress placed on the electrical grid from energy demand and energy export. It thus far better fulfils the plan's previously explained legal climate duty and national policy priority that this mitigation should align with the Climate Change Act.

**Fallback recommendation: policy alternative 3**

9.2.3 If the examining Inspectors of the Local Plan Update are not persuaded that the proposed EUI approach of Policy CE3 as submitted is appropriate under current national policies, **policy alternative 3** is recommended as the **next best option**. This policy includes:

- 100% reduction over TER;
- 10% improvement over TFEE;
- Offsetting unregulated emissions either through on-site delivery or offset payment to local authority offset fund (ringfenced for delivery of carbon reduction/renewable energy projects).

9.2.4 However, there is a risk that offsetting unregulated carbon emissions varies significantly depending on calculation methods. It also results in higher build cost uplift than Policy CE3 as submitted for semi-detached homes and low-rise flats, because of the need for more solar PV.

9.2.5 Therefore, if there are concerns about the compliance risk of offsetting unregulated emissions, **policy alternative 2** may be the next most appropriate fallback. This approach maintains:

- 100% reduction over TER;
- 10% improvement over TFEE.

9.2.6 While policy alternative 2 still uses poorer fabric specifications than CE3, it still reflects an improved performance over typical housebuilder practice, and build cost uplift remains modest relative to baseline. However, this option would deliver weaker climate benefits (that would not be aligned with the UK's legislated carbon budgets), higher energy bills for occupants (than existing draft CE3 or alternative 3), and greater need for future retrofit.

Link to glossary

# 10. Appendix A: Internal Design Note: Data Tables / Modelling Outputs by Typology

10.0.1 Policy alternative 3 includes additional photovoltaic (PV) capacity to offset unregulated energy use, building on the specification used for Policy 2. However, this additional PV was not modelled through SAP to calculate a revised DER/TER score. This is because, in practice, the PV required to achieve full offset of unregulated energy is unlikely to be feasible on-site for many developments, particularly in constrained roofscapes typical of low-rise housing and flats.

10.0.2 The additional PV capacity was estimated based on anticipated unregulated energy demand, so that it could be costed and form the basis for carbon offset contributions where on-site provision is not viable. Given this feasibility constraint, there was little value in generating a new SAP score for a specification that could not reasonably be delivered on most sites. Therefore, the DER/TER performance results for policy alternative 3 remain the same as those presented under alternative 2, with only the likely uplift in cost and PV requirements noted for reference.

10.0.3 Specifications and outputs begin overleaf, and continue for the following several pages.

Link to glossary

## 10.1 Detached House: Draft Wokingham NZC 142m² – SAP Inputs

**1. Detached House**

Typical 4 bedroom – 142 m²

This building represents the generic **Detached house** typology

*Table 5: SAP Inputs for detached house*

| Building element | Unit | Policy CE3 as submitted | Policy CE3 alternative 1 | Policy CE3 alternative 2 |
|---|---|---|---|---|
| External Wall U-value | (W/m²K) | 0.12 | 0.15 | 0.12 |
| Sheltered Wall U-value | (W/m²K) | | | |
| Flat Roof U-value | (W/m²K) | 0.10 | 0.11 | 0.10 |
| Pitched Roof U-value (insulated at ceiling level) | (W/m²K) | 0.10 | | |
| Pitched Roof U-value (insulated at rafter) | (W/m²K) | | | |
| Basement Floor U-value | (W/m²K) | | 0.12 | 0.09 |
| Ground Floor U-value | (W/m²K) | 0.09 | | |
| Exposed Floor U-value | (W/m²K) | | | |
| Sheltered Floor U-value | (W/m²K) | | | |
| Glazing U-value | (W/m²K) | 0.80 | | |
| Window U-value | (W/m²K) | 1.13 | 1.20 | 1.20 |
| Window g-value | - | 0.55 | Not Stated | Not Stated |

Link to glossary

| | | | | |
|---|---|---|---|---|
| Rooflight U-value | (W/m²K) | 0.80 | 1.20 | 1.20 |
| Rooflight g-value | - | 0.55<br>(0.46 South Facing) | 0.55<br>(0.46 South Facing) | 0.55<br>(0.46 South Facing) |
| Door U-value | (W/m²K) | 1.00 | 1.00 | 1.00 |
| Air permeability | (m³/m².hr @50Pa) | 0.48 | 5.00 | 3.00 |
| Thermal Bridging Y-Value | (W/m²K) | 0.03 | 0.04 | 0.045 |
| Ventilation | | MVHR | Nat Vent with Intermittent Fans | MEV System |
| SFP | (W/L/S) | 0.86 | - | 0.35 |
| Heat Recovery Efficiency | % | 88% | - | - |
| Heating and DHW System | | Monobloc ASHP | Monobloc ASHP | Monobloc ASHP |
| Efficiency Heating and DHW | SCOP | Split summer 171.63/winter 279.42<br>Vaillant Arotherm 7Kw to rads & ufl | Split summer 171.63/winter 279.42<br>Vaillant Arotherm 7Kw to rads & ufl | Split summer 171.63/winter 279.42<br>Vaillant Arotherm 7Kw to rads & ufl |
| Assume Shower Flow Rate | L/min | 8 | 8 | 8 |
| Assume DHW Cylinder Standing Losses | kWh/day | 1.18 | 200l cylinder with 120mm jacket insulation | |
| Lighting Efficiency | Lm/w | 120 | 120 | 120 |
| PV Installation | kWp | 10No at 420W at 30⁰<br>Little or No shading 4.2 kWp at 45 degrees | 5.3 kWp | 5.2 kWp |

## 10.2 Detached House: Draft Wokingham NZC 142m² – SAP Results

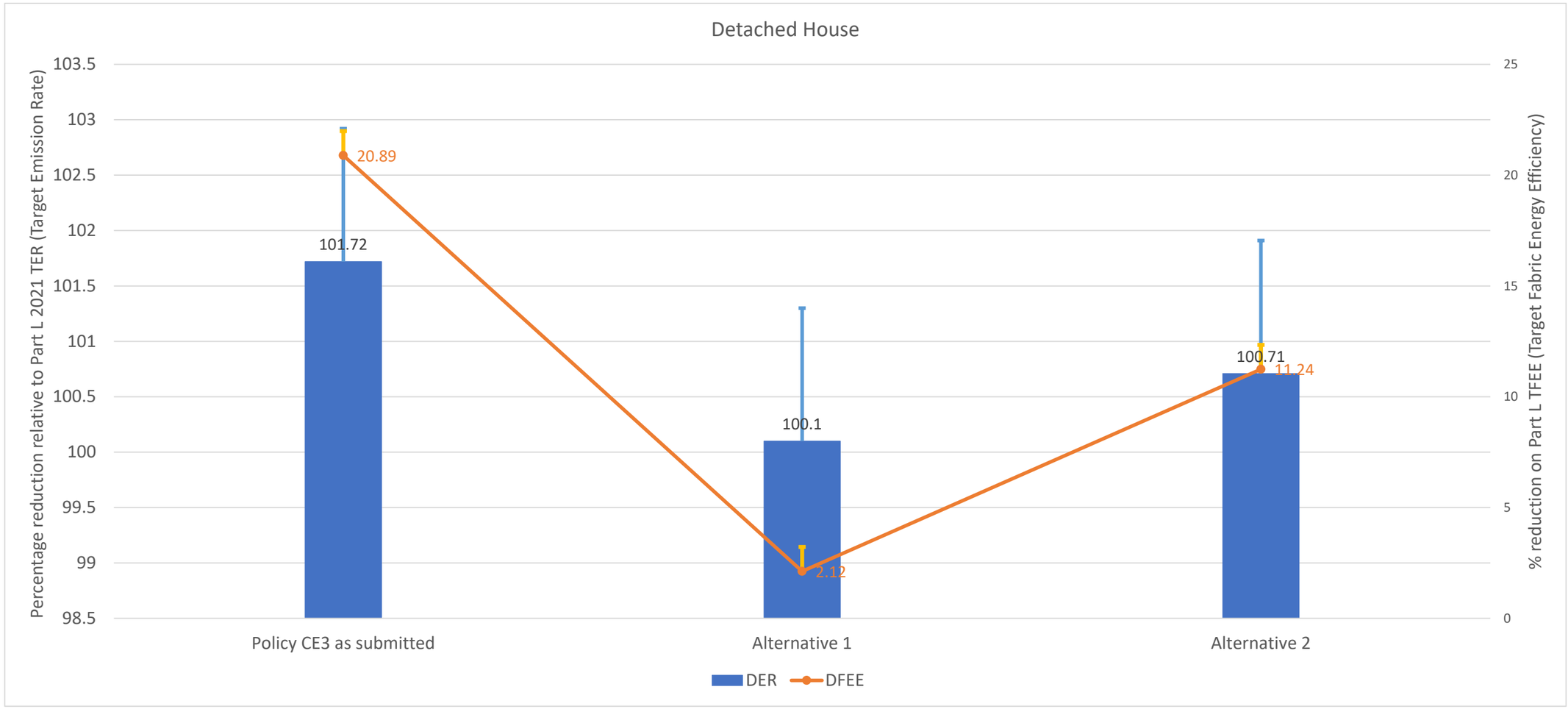


*Figure 9: SAP results of a detached house, showing the % improvement on Building Regulations Part L 2021 TER and TFEE that would be made in each policy scenario.*

## 10.3 Comparison of Policy CE3 as Submitted and Policy Alternatives: Detached House: Draft Wokingham NZC 142m² – Relative PHPP Performance

10.3.1 This section compares policy CE3 as submitted, against policy alternatives 1 and 2/3, in a detached house typical of the new build homes seen in Wokingham. As part of this, PHPP models of 3 typologies were used to understand and communicate the effects of the back-up policy iterations on space heating demand (SHD), energy use intensity (EUI) and photovoltaic (PV) generation.

10.3.2 The graph below (Figure 10) shows that neither of the TER-based policies would achieve space heat demand anywhere near as low as 15-20kWh/m²/year, which as previously noted is the level that the Committee on Climate Change has shown is needed in new homes from 2025 in order to be compatible with the achievement of the UK's legislated carbon targets. In the TER policy option that does not have a TFEE % improvement ("policy alternative 1"), space heat demand will be more than three times the necessary limit. The TER-based policy that *does* seek a TFEE improvement ("policy alternative 2") achieves a significant space heat demand improvement compared to alternative 1, but still does not reach the aforementioned level necessary for the UK's carbon goals.

10.3.3 By contrast, Wokingham's policy CE3 as submitted achieves below that 20kWh space heat demand level. Recent modelling elsewhere[80] has also shown that this 15-20kWh level would equate to a 69 to 82% reduction on the space heat demand of a building that meets today's Part L 2021, or a 59 to 78% reduction on that of the indicative FHS specification released by government in 2021 as opposed to the much weaker fabric standard proposed in the most recent FHS consultation that took place in 2023-24[81].

10.3.4 EUI is also significantly higher (worse) in both of the TER-based alternatives compared to existing draft policy CE3, and consequently both TER-based alternatives also have much more solar PV.

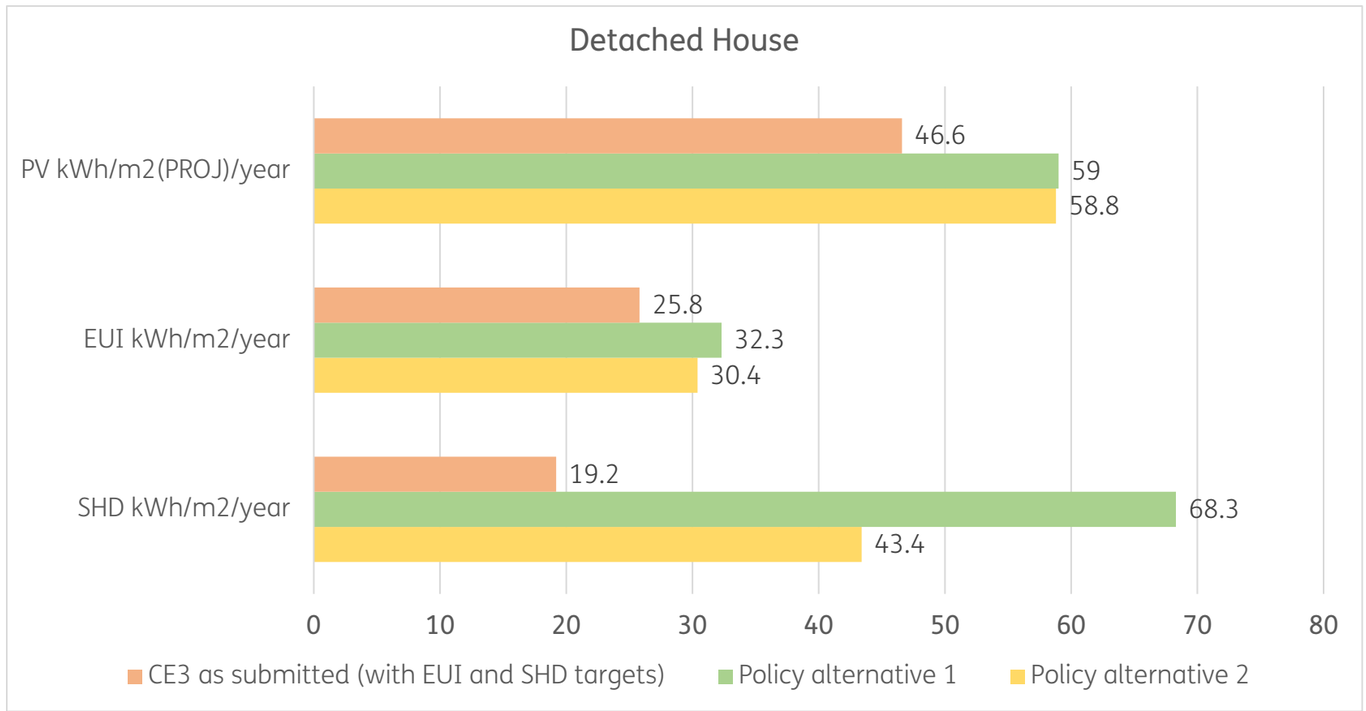


*Figure 10: Relative PHPP performance of a detached house in three possible policy scenarios.*
*Please note that the renewable energy figure is per "m²(PROJ)" = square metres of projected building footprint area. This is in contrast to the m2 figures for EUI and SHD which relate to building floor area.*

[80] Bioregional and Transition by Design on behalf of South Oxfordshire & Vale of the White Horse District Councils (2023), *Feasibility Study: Energy modelling.* https://www.southoxon.gov.uk/wp-content/uploads/sites/2/2024/01/NZCS_Task_3_accessible_Dec_2023.pdf#page=26

[81] Department for Levelling Up, Housing and Communities (2023/updated 2024), *The Future Homes and Buildings Standards: 2023 Consultation*. https://www.gov.uk/government/consultations/the-future-homes-and-buildings-standards-2023-consultation/the-future-homes-and-buildings-standards-2023-consultation

Link to glossary

## 10.4 Semi-Detached House: Draft Wokingham NZC 93m² – SAP Inputs

**2. Semi-detached house**

2 storeys – 93 m²

This building represents the generic **Semi-detached house** typology

*Table 6: SAP Inputs for a semi- detached house*

| Building element | Unit | Policy CE3 as submitted | Policy CE3 alternative 1 | Policy CE3 alternative 2 |
|---|---|---|---|---|
| External Wall U-value | (W/m²K) | 0.12 | 0.15 | 0.12 |
| Sheltered Wall U-value | (W/m²K) | | | |
| Flat Roof U-value | (W/m²K) | 0.10 | 0.11 | 0.10 |
| Pitched Roof U-value (insulated at ceiling level) | (W/m²K) | 0.10 | | |
| Pitched Roof U-value (insulated at rafter) | (W/m²K) | | | |
| Basement Floor U-value | (W/m²K) | | 0.12 | 0.09 |
| Ground Floor U-value | (W/m²K) | 0.09 | | |
| Exposed Floor U-value | (W/m²K) | | | |
| Sheltered Floor U-value | (W/m²K) | | | |
| Glazing U-value | (W/m²K) | 0.80 | | |

Link to glossary

| | | | | |
|---|---|---|---|---|
| Window U-value | (W/m²K) | 1.14 | 1.20 | 1.20 |
| Window g-value | - | 0.55<br>(0.42 South Facing) | 0.55<br>(0.42 South Facing) | 0.55<br>(0.42 South Facing) |
| Rooflight U-value | (W/m²K) | 0.80 | 1.20 | 1.20 |
| Rooflight g-value | - | 0.55 | Not Stated | Not Stated |
| Door U-value | (W/m²K) | 1.00 | 1.00 | 1.00 |
| Air permeability | (m³/m².hr @50Pa) | 0.48 | 5.00 | 3.00 |
| Thermal Bridging Y-Value | (W/m²K) | 0.04 | 0.05 | 0.065 |
| Ventilation | MVHR | | Nat Vent with Intermittent Fans | MEV System |
| SFP | (W/L/S) | 0.86 | - | 0.35 |
| Heat Recovery Efficiency | % | 88% | - | - |
| Heating and DHW System | Monobloc ASHP | | Monobloc ASHP | Monobloc ASHP |
| Efficiency Heating and DHW | SCOP | Split summer 163.62/winter 263.31<br>Vaillant Arotherm 5Kw to rads & ufl | Split summer 163.62/winter 263.31<br>Vaillant Arotherm 5Kw to rads & ufl | Split summer 163.62/winter 263.31<br>Vaillant Arotherm 5Kw to rads & ufl |
| Assume Shower Flow Rate | L/min | 8 | 8 | 8 |
| Assume DHW Cylinder Standing Losses | kWh/day | 1.18 | 200l cylinder with 120mm jacket insulation 1.8 | |
| Lighting Efficiency | Lm/w | 120 | 120 | 120 |
| PV Installation | kWp | 8No at 420W at 30⁰ Little or No shading<br>3.36 kWp at 45 degrees | 5.1 kWp | 4.9 kWp |

Link to glossary

## 10.5 Semi-Detached House: Draft Wokingham NZC 93m² – SAP RESULTS

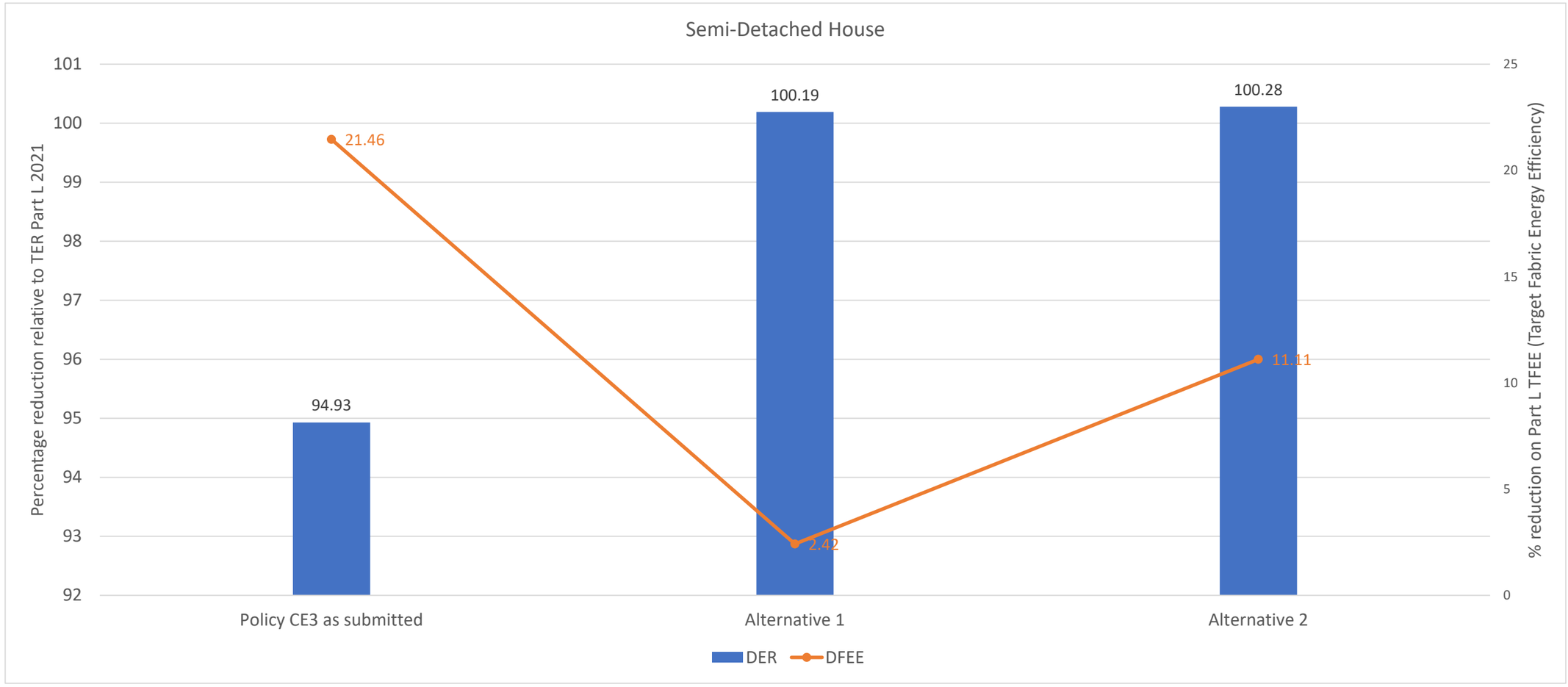


*Figure 11: SAP results of a semi-detached house*

## 10.6 Comparison of existing draft CE3 and Policy Alternatives: Semi-Detached House: Draft Wokingham NZC 93m2 – Relative PHPP Performance

10.6.1 This section compares existing draft policy CE3, against policy alternatives 1 and 2/3, in a semi-detached house typical of the new build homes seen in Wokingham. As part of this, PHPP models of 3 typologies were used to understand and communicate the effects of the back-up policy iterations on space heating demand (SHD), energy use intensity (EUI) and photovoltaic (PV) generation.

10.6.2 The graph below (Figure 12) shows that neither of the TER-based policies would achieve space heat demand anywhere near as low as 15-20kWh/m$^2$/year, which as previously noted is the level that the Committee on Climate Change has shown is needed in new homes from 2025 in order to be compatible with the achievement of the UK's legislated carbon targets. In the TER policy option that does not require a TFEE % improvement ("policy alternative 1"), space heat demand will be more than three times the necessary limit. The TER-based policy that *does* seek a TFEE improvement ("policy alternative 2") achieves a significant space heat demand improvement compared to alternative 1, but still does not reach the aforementioned level necessary for the UK's carbon goals.

10.6.3 By contrast, Wokingham's existing draft policy (CE3 as submitted) achieves below that 20kWh/m$^2$/year space heat demand limit.

10.6.4 EUI is also significantly higher (worse) in both of the TER-based alternatives compared to existing draft policy CE3, and consequently both TER-based alternatives also have much more solar PV.

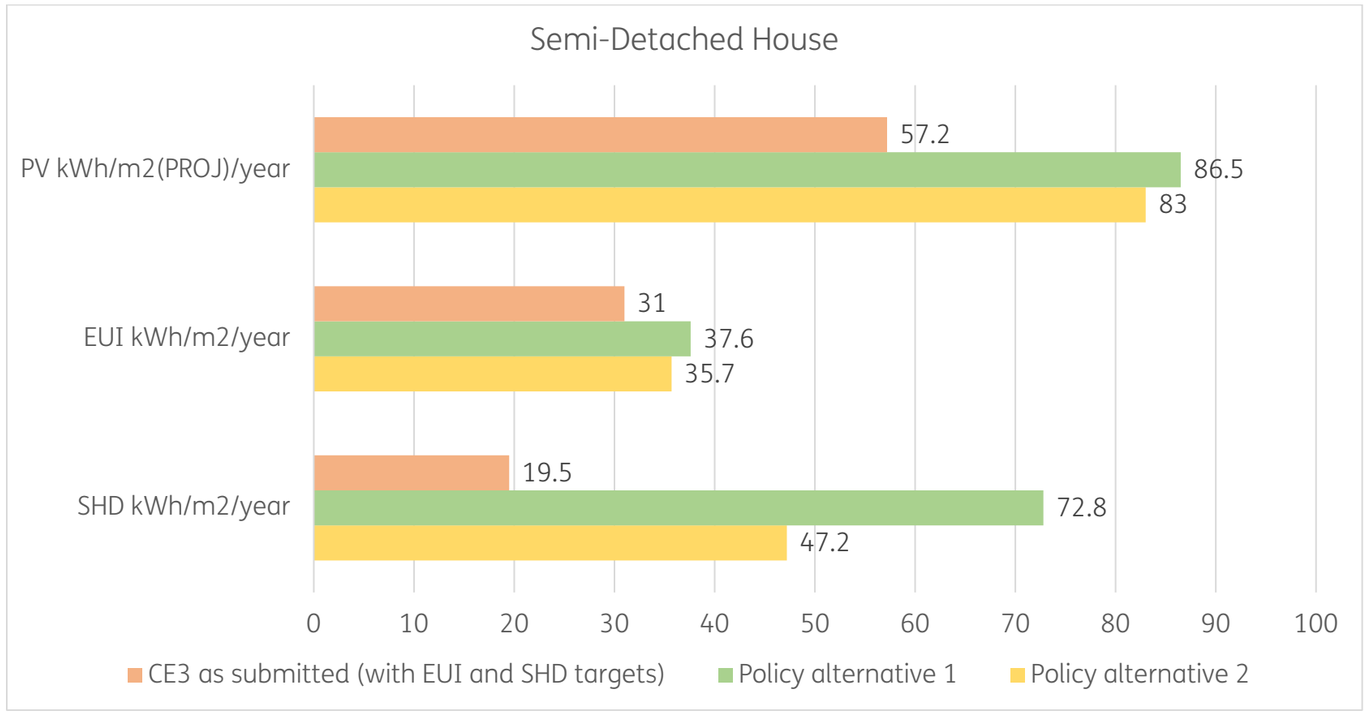


*Figure 12: Relative PHPP performance of a semi-detached house.*
*Please note that the renewable energy figure is per "m$^2$(PROJ)" = square metres of projected building footprint area. This is in contrast to the m2 figures for EUI and SHD which relate to building floor area.*

Link to glossary

## 10.7 Low-rise 4 Storeys Flatted Block: Draft Wokingham NZC 672m² – SAP INPUTS

**3. Block of flats - Low-Rise**

3/4 storeys - 672 m²

This building represents the generic **Low-rise block of flats** typology

*Table 7: SAP Inputs for a flatted block*

| Building element | Unit | Policy CE3 as submitted | Policy CE3 alternative 1 | Policy CE3 alternative 2 |
|---|---|---|---|---|
| External Wall U-value | (W/m²K) | 0.12 | 0.15 | 0.12 |
| Sheltered Wall U-value | (W/m²K) | 0.12 | | |
| Flat Roof U-value | (W/m²K) | 0.10 | 0.11 | 0.10 |
| Pitched Roof U-value (insulated at ceiling level) | (W/m²K) | | | |
| Pitched Roof U-value (insulated at rafter) | (W/m²K) | 0.11 | | |
| Basement Floor U-value | (W/m²K) | | 0.12 | 0.09 |
| Ground Floor U-value | (W/m²K) | 0.09 | | |
| Exposed Floor U-value | (W/m²K) | 0.12 | | |
| Sheltered Floor U-value | (W/m²K) | | | |
| Glazing U-value | (W/m²K) | 0.80 | | |
| Window U-value | (W/m²K) | 1.04 | 1.20 | 1.20 |
| Window g-value | - | 0.55<br>(0.48 South Facing) | 0.55<br>(0.48 South Facing) | 0.55<br>(0.48 South Facing) |

Link to glossary

| | | | | |
|---|---|---|---|---|
| Rooflight U-value | (W/m²K) | 0.80 | 1.20 | 1.20 |
| Rooflight g-value | - | 0.55 | Not Stated | Not Stated |
| Door U-value | (W/m²K) | 1.00 | 1.00 | 1.00 |
| Air permeability | (m³/m².hr @50Pa) | 0.68 | 5.00 | 2.50 |
| Thermal Bridging Y-Value | (W/m²K) | 0.02 | Varies | Varies |
| Ventilation | MVHR | | Nat Vent with Intermittent Fans | MEV System |
| SFP | (W/L/S) | 0.86 | - | 0.35 |
| Heat Recovery Efficiency | % | 88% | - | - |
| Heating and DHW System | Monobloc ASHP | | Monobloc ASHP | Monobloc ASHP |
| Efficiency Heating and DHW | SCOP | GF and MID Floor Split summer 171.19/winter 252.16 Arotherm 3.5Kw to ufl<br>TOP floor Split summer 163.62/winter 264.0<br>Vaillant Arotherm 5Kw to ufl | Split summer 171.19/winter 252.16 Arotherm 3.5Kw to ufl<br>TOP floor Split summer 163.62/winter 264<br>Vaillant Arotherm 5Kw to ufl | Split summer 171.19/winter 252.16 Arotherm 3.5Kw to ufl<br>TOP floor Split summer 163.62/winter 264<br>Vaillant Arotherm 5Kw to ufl |
| Assume Shower Flow Rate | L/min | 8 | 8 | 8 |
| Assume DHW Cylinder Standing Losses | kWh/day | 1.18 | 200l cylinder with 120mm jacket Insulation 1.8 | |
| Lighting Efficiency | Lm/w | 120 | 120 | 120 |
| PV Installation | kWp | 66No at 420W at 10⁰ Little or No shading – 27.7kWp | 26.5kWp | 25.6 kWp |

## 10.8 Low-rise 4 Storeys Flatted Block: Draft Wokingham NZC 672m² – SAP RESULTS

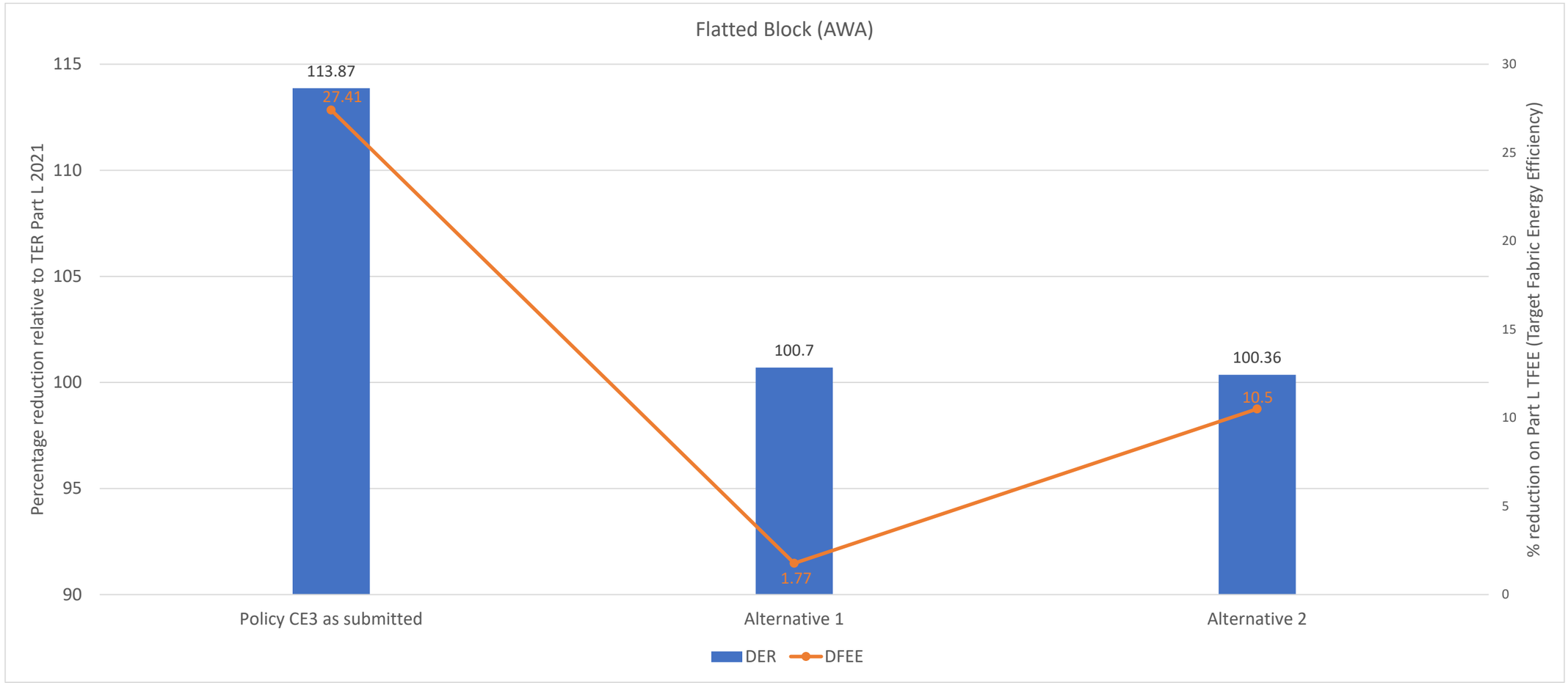


*Figure 13: SAP results of a flatted block*

Link to glossary

## 10.9 Comparison of existing draft CE3 and Policy Alternatives: Low-rise 4 Storeys Flatted Block: Draft Wokingham NZC 672m2 – Relative PHPP Performance

10.9.1 This section compares existing draft policy CE3, against policy alternatives 1 and 2/3, in a block of flats typical of the new build homes seen in Wokingham. As part of this, PHPP models of 3 typologies were used to understand and communicate the effects of the back-up policy iterations on space heating demand (SHD), energy use intensity (EUI) and photovoltaic (PV) generation.

10.9.2 The graph below (Figure 14) shows that neither of the TER-based policies would achieve space heat demand anywhere near as low as 15-20kWh/m$^2$/year, which as previously noted is the level that the Committee on Climate Change has shown is needed in new homes from 2025 in order to be compatible with the achievement of the UK's legislated carbon targets. In the TER policy option that does not have a TFEE % improvement ("policy alternative 1"), space heat demand will be nearly three times the necessary limit (or more than three times, if we assume that flats should be aiming towards the lower end of the range at 15kWh/m$^2$/year rather than 20kWh/m$^2$/year).

10.9.3 The TER-based policy that *does* seek a TFEE improvement ("policy alternative 2") achieves a significant space heat demand improvement compared to Alternative 1, but still does not reach the aforementioned level necessary for the UK's carbon goals.

10.9.4 By contrast, Wokingham's existing draft policy (CE3 as submitted) achieves well below that 15-20kWh/m$^2$/year space heat demand level.

10.9.5 EUI is also significantly higher (worse) in both of the TER-based alternatives compared to existing draft policy CE3.

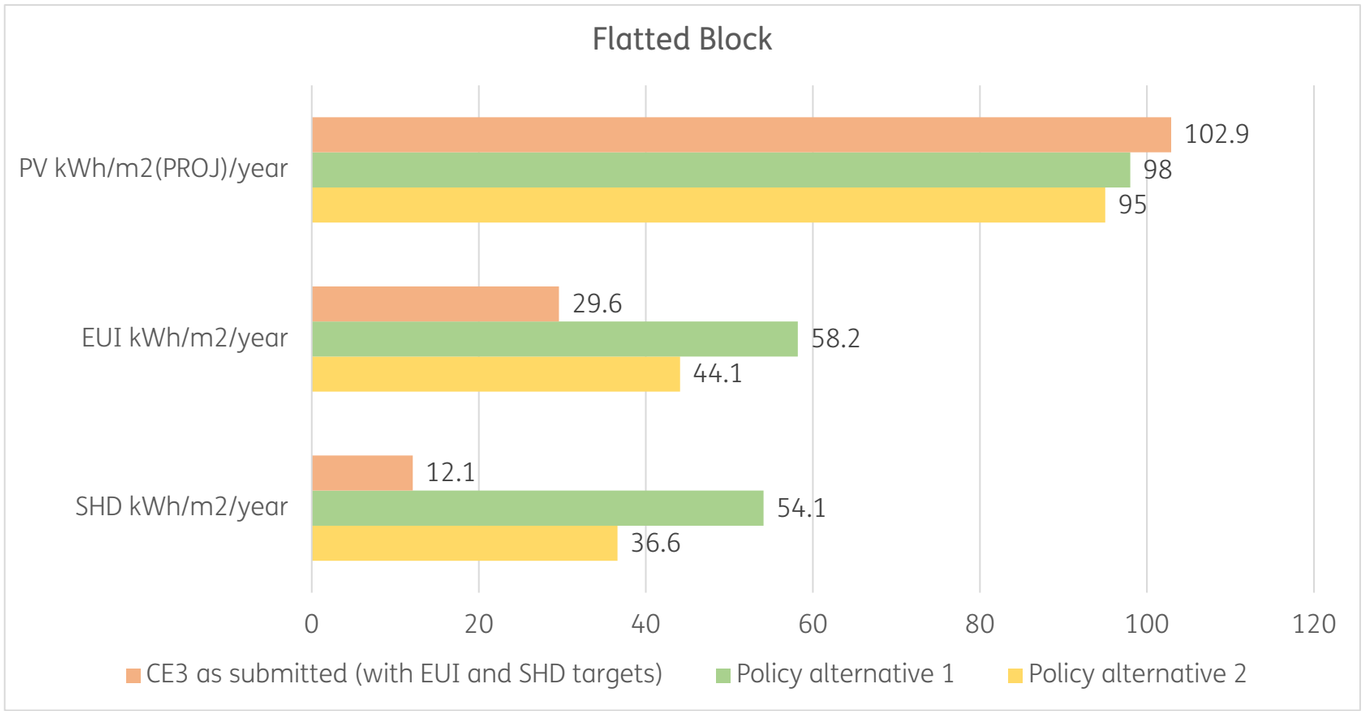


*Figure 14: Relative PHPP performance of a flatted block.*
*Please note that the renewable energy figure is per "m$^2$(PROJ)" = square metres of projected building footprint area. This is in contrast to the m2 figures for EUI and SHD which relate to building floor area.*

*Table 8: ASHP SCOP (Air Source Heat Pump Seasonal Coefficient of Performance) data table for reference.*
*Source: https://www.vaillant.co.uk/product-systems/heat-pumps/arotherm-plus/*

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 3.5kW | -3°C | 4.6 | 4.41 | 4.4 | 4.03 | 4.3 | 3.65 | 4.2 | 3.37 | 4 | 3.10 |
| | 0°C | 4.7 | | 4.7 | | 4.6 | | 4.5 | | 4.4 | |
| | 2°C | 4.9 | | 4.9 | | 4.9 | | 4.7 | | 4.6 | |
| 5kW | -5°C | 6.3 | 4.48 | 6 | 4.13 | 5.6 | 3.77 | 5.5 | 3.41 | 5.4 | 3.06 |
| | -3°C | 6.8 | | 6.4 | | 6.1 | | 5.9 | | 5.8 | |
| | 0°C | 6.9 | | 6.7 | | 6.6 | | 6.4 | | 6.2 | |
| | 2°C | 7.1 | | 7 | | 6.9 | | 6.7 | | 6.5 | |
| 7kW | -5°C | 8.2 | 4.36 | 8.1 | 4.13 | 8 | 3.91 | 7.5 | 3.65 | 7 | 3.39 |
| | -3°C | 8.8 | | 8.6 | | 8.4 | | 7.9 | | 7.4 | |
| | 0°C | 9.5 | | 9.3 | | 9.1 | | 8.6 | | 8.1 | |
| | 2°C | 10 | | 9.8 | | 9.6 | | 9 | | 8.5 | |
| 10kW | -5°C | 9.9 | 5.03 | 9.7 | 4.58 | 9.4 | 4.13 | 9.1 | 3.85 | 8.8 | 3.58 |
| | -3°C | 10.7 | | 10.3 | | 10 | | 9.6 | | 9.2 | |
| | 0°C | 11.9 | | 11.6 | | 11.3 | | 10.7 | | 10.2 | |
| | 2°C | 12.8 | | 12.5 | | 12.1 | | 11.5 | | 10.9 | |
| 12kW | -5°C | 13.1 | 4.88 | 12.8 | 4.55 | 12.5 | 4.21 | 11.7 | 3.92 | 10.8 | 3.63 |
| | -3°C | 13.9 | | 13.4 | | 12.9 | | 12.1 | | 11.2 | |
| | 0°C | 15.2 | | 14.6 | | 14.1 | | 13.2 | | 12.3 | |
| | 2°C | 16 | | 15.5 | | 14.9 | | 13.9 | | 13 | |

10.9.6 Please note: The figures in the table screenshot above relate to how efficiently a heat pump is able to run depending on what temperature it is being set to delivery, whether as hot air or hot water. Lower operating temperatures allow higher efficiency (more heat output per kWh of electricity use).

10.9.7 Below is shown a comparison of differing estimates of unregulated energy use, and the corresponding amount of solar panel capacity that would be needed to match this. This is relevant to **policy alternative 3's** requirement for residential development to offset regulated & unregulated emissions through on-site generation or carbon offsetting). The table below shows (in grey) the appraisal using Appendix L estimates for catering and appliance allowances, versus (in green) the allowance made in calculations for Policy CE3 as submitted, for each typology.

- Please note: Fixed lighting is part of the regulated energy, so this shows the calculation of energy required for catering and appliances required for each typology and estimate of PV required to match the kWh consumed. Part L1A compliance metrics do not include unregulated energy, but the Part L SAP tool does include an appendix that attempts to estimate the unregulated energy use (albeit based on old appliance data that does not reflect today's typical appliance efficiencies, hence the SAP Appendix L estimate of unregulated energy shown here is so much higher than the more accurate PHPP figure). Regardless of SAP Appendix L's obsolete data, unregulated energy is a significant proportion (up to 50%) of the energy consumed by new homes.

*Table 9: Unregulated Energy Estimate Comparison – SAP Appendix L estimate of unregulated energy vs. that of PHPP Calculation for existing draft policy CE3 as submitted*

| Typology | TFA ($m^2$) | N Occupants | Catering (kWh) | Appliances (kWh) | Catering + Appliances PV Yield (kWh) | PV (kWp) | PHPP Unregulated Estimate (kWh) | PV (kWp) |
|---|---|---|---|---|---|---|---|---|
| Detached | 145.98 | 2.92 | 485.06 | 3611.56 | 4096.62 | 4.45 | 1771 | 1.9 |
| Semi Detached | 93.08 | 2.55 | 423.84 | 2738.80 | 3162.64 | 4.63 | 1437 | 1.6 |
| Apartment ground floor | 57.38 | 1.39 | 230.63 | 1636.84 | 1867.47 | 2.45 | | |
| Apartment MID FLOOR | 57.38 | 1.39 | 230.62 | 1636.84 | 1867.47 | 2.45 | | |
| Apartment TOP FLOOR | 112.64 | 2.79 | 464.21 | 3127.39 | 3591.6 | 4.72 | | |
| Total Apartment Block | | | 1848 | 12944 | 14792 | 19.4 | 9637 | 10.5 |

# 11. Appendix B: NPPF 2024 relevant content that demonstrates continued national policy intent for local plan climate action

11.0.1 Although as previously noted, this Wokingham local plan will be examined against the December 2023 NPPF under the transitional arrangements, we here summarise what changed and what remained the same in the subsequent NPPF 2024 in relation to the extent and suitable means of climate mitigation. These serve to underline that the latest national policy direction continues to support greater climate change mitigation standards in local plans.

11.0.2 The 2024 NPPF[82] retains (and in some cases strengthens) the climate-focussed content found in previous versions of the NPPF regarding the duty of local plans (and whole planning system) to mitigate climate change and support the growth of renewable energy. It is recognised that the Local Plan Update has been submitted in accordance with the transitional arrangements contained at paragraph 234b of the NPPF 2024 and therefore will be examined against the NPPF December 2023. The 'Meeting the challenge of climate change, flooding and coastal change' chapter of the NPPF 2024, and in particular the section titled 'Planning for climate change' has seen moderate updates from the 2023 and 2024 versions. On that basis, the most relevant paragraphs, as they are numbered in the NPPF 2024, are:

- **Paragraph 161 (previously Paragraph 157):** "The planning system should **support the transition to net zero by 2050** … contribute to radical reductions in greenhouse gas emissions … encourage the reuse of existing resources … and support renewable and low carbon energy and associated infrastructure". **This 'net zero' wording is new**, as older NPPF versions only mentioned a 'low carbon economy'.
- **Paragraph 162 (previously Paragraph 158)+footnote 61:** "Plans should take a proactive approach to mitigating … climate change … In line with the objectives and provisions of the Climate Change Act 2008".
- **Paragraph 164:** "New development should be planned for in ways that … help to reduce greenhouse gas emissions, such as through its location, orientation and design". However, paragraph 164 of the consultation draft, which stated that Councils 'should support' planning schemes for all forms of renewable and low carbon development, has been removed.
- **Paragraph 165:** "To help increase the use and supply of renewable and low carbon energy and heat, plans should … provide a positive strategy for energy from these sources … consider identifying suitable areas for renewable and low carbon energy sources, and supporting infrastructure, where this would help secure their development … [and] identify opportunities for development to draw its energy supply from … renewable or low carbon energy".

11.0.3 As in the previous NPPF versions, to meet the above imperative for carbon reductions in line with the Climate Change Act would logically mean taking action to achieve the intermediate 5-yearly carbon budgets, as well as the 2050 net zero goal that is now explicitly referred to in paragraph 161 (an addition to the equivalent paragraph in the NPPF 2023).

11.0.4 Although the 2024 National Planning Policy Framework (NPPF) introduces a number of significant changes, with the most substantive revisions focused on housing delivery, Green Belt reform, and strategic cooperation between authorities, the provisions relating to operational energy and climate change remain broadly consistent with the 2023 version. Local planning authorities are still required to support energy efficiency and low-carbon heating improvements (paragraph 164), and significant weight continues to be given to renewable energy development (paragraph 168[a]).

11.0.5 Overall, while the energy and climate content of the NPPF 2024 retains the substance of 2023, the shift in tone, such as the prominent mention of net zero, suggests a more definitive policy direction. For Wokingham, this supports continued ambition in developing local energy standards, provided they align with national requirements such as those set out in the 2023 Written Ministerial Statement and are supported by a robust, locally relevant evidence base.

11.0.6 Importantly, the **2024 NPPF no longer contains the insurmountable barriers to onshore wind power** that had been present since 2015 (whereby onshore wind could be vetoed by any single local objector). Now, it only states that once a local plan has identified suitable areas for *any* renewable energy, proposals outside those areas should show that they meet the same criteria as the suitable areas. This is consistent with the Policy statement on onshore wind published by government on 8 July 2024 with the intention of "immediately removing the de facto ban on onshore with in England".[83]

11.0.7 The 2024 NPPF's shift to 'vision-led' transport planning may also give a vital new foothold for climate action:

- **Paragraph 109:** "Transport issues should be considered from the earliest stages … **using a vision-led approach** to identify transport solutions that deliver … sustainable … places. This should involve … identifying and **pursuing opportunities to promote walking, cycling and public transport use** … taking into account the environmental impacts of traffic and transport infrastructure – including … opportunities for avoiding and mitigating any adverse effects"
  - **The new NPPF glossary** defines **'vision-led approach' as "an approach to transport planning based on setting outcomes for a development** based on achieving well-designed, sustainable and popular places, and **providing the transport solutions to deliver those outcomes** as opposed to predicting future demand to provide capacity".
  - This gives the local plan vital scope to pivot away from providing for business-as-usual car-led development Instead, 'vision-led transport planning' **gives scope to require transport provision that actively causes modal shift.** The Climate Change Committee analysis shows modal shift is urgently needed for the UK's binding carbon goals.
  - Paragraph 109 is not directly relevant to buildings policies, but illustrate the general strengthening of support for local plan approaches to ensuring sustainable outcomes.

[82] HM Government Ministry of Housing, Communities & Local Government (December 2024), *National Planning Policy Framework*. https://assets.publishing.service.gov.uk/media/675abd214cbda57cacd3476e/NPPF-December-2024.pdf

[83] HM Government Ministry of Housing, Communities & Local Government, Treasury, Department for Energy Security, and Department for Levelling Up, Housing & Communities (2024). https://www.gov.uk/government/publications/policy-statement-on-onshore-wind/policy-statement-on-onshore-wind

Link to glossary

## 12. Appendix C: Glossary of terms

| | |
|---|---|
| ASHP | Air source heat pump. ASHP transfers heat from the outside air to the water in the central heating system for heating via radiators or underfloor heating. |
| BREDEM | Buildings Research Establishment Domestic Energy Model. A methodology for estimate calculations of the energy use and fuel requirements of a home based on its characteristics. BREDEM is the basis for SAP (see elsewhere in this glossary) but BREDEM retains more flexibility by allowing the user to tailor some assumptions made in the calculations to better reflect the project. |
| Carbon | Short for 'carbon dioxide' but can also include several other gases that warm the climate. 'Carbon emissions' is when human activities emit these gases to the atmosphere. |
| 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. |
| Carbon offsetting | Often shortened to 'offsetting'. A practice that allows individuals or organisations to compensate for their carbon emissions by investing in environmental projects or funds that reduce or remove emissions elsewhere. |
| CCC | Climate Change Committee |
| CE3 | Policy CE3 in Wokingham's draft local plan. This is the policy that relates to the energy and carbon performance of new buildings. |
| CIBSE | Chartered Institute of Building Services Engineers |
| $CO_2$ | 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'. |
| Decentralised energy systems | As distinguished from centralised energy generation and distribution of the national grid and its associated power stations. The term 'decentralised energy' has often been used without a strong logical definition, but may be broadly best understood as any energy system that produces and distributes energy closer to the point of use, compared to the typical alternative source of that type of energy. Most building-scale renewable energy systems would qualify. |
| DER | Dwelling Emission Rate. A metric from Part L of building regulations estimating the proposed home's annual $CO_2$ emissions per square metre of floor, from regulated energy use in the home. Must not exceed TER (see TER definition in this glossary). |
| DNO | Distribution Network Operator. A licensed company that distributes electricity in the UK. |
| 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. As opposed to 'operational carbon' which is emitted due to energy use when operating the building / infrastructure / vehicle / other product. |
| Energy efficiency | The amount of energy use needed to perform a given task – in the case of this report, that task is to operate a home. Higher energy efficiency means lower energy use per square metre of floorspace. Importantly, energy efficiency is a separate topic from renewable energy. |
| EOR | Environmental Outcomes Report. A new proposed approach to environmental assessment, which could replace traditional methods such as Environmental Impact Assessments (EIAs) and Strategic Environmental Assessments (SEAs) and streamline planning processes. |
| EUI | Energy use intensity, a measure of how much energy a building uses per square metre of floor. Expressed in kilowatt-hours per square metre of floor space per year. |
| FHS / Future Homes Standard | A set of building regulations that is expected to be introduced to reduce carbon emissions of new homes and improve energy efficiency. |
| GHG | Greenhouse gas ($CO_2$ and several other gases: methane, nitrogen dioxide, and fluorinated refrigerant gases). Often collectively referred to as 'carbon'. |
| g-value | The g-value measures how much solar radiation passes through glazing into the building. It is expressed as a decimal between 0 and 1 (e.g., 0.6 = 60% solar gain). A higher g-value allows more solar energy to enter. The effect on the building's final energy efficiency varies: solar gain can lower space heating demand, but if it is too high then it can cause overheating which may increase use of fans or air conditioning. |

Link to glossary

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| HEM | The Home Energy Model. When Future Homes Standard is introduced, HEM will replace the existing Standard Assessment Procedure (SAP) for the energy rating of dwellings. |
| LDO | Local Development Order. A tool used to achieve specific objectives by granting certain types of development fast-track permission (or certainty of permission). |
| LPA | Local Planning Authority |
| MEV | Mechanical Extract Ventilation (MEV) systems. MEV systems remove stale and moist air from wet rooms (e.g. bathrooms, kitchens) and are typically installed to support improved airtightness and indoor air quality. Centralised MEV (c-MEV), commonly used in new builds, connects multiple rooms to a single extraction unit via ducting. |
| MVHR | Mechanical Ventilation with Heat Recovery |
| NPPF | National Planning Policy Framework. A document that forms the key expression of national policy regarding the planning system, including how local plans should be devised and what they should achieve. Government periodically updates the NPPF. |
| Part L | Building regulations section that sets basic legal requirements regarding buildings' energy and $CO_2$. |
| Performance gap | The 'energy performance gap' is 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. |
| Psi-Value | The Ψ-value (linear thermal transmittance) quantifies heat loss at junctions between building elements (e.g., where floors meet walls or roofs meet walls). Lower Ψ-values help reduce overall heat loss. |
| PV | Photovoltaics: solar panels that generate electricity. |
| PHPP | Passivhaus Planning Package – a tool to accurately calculate a building's energy use. It is used to design buildings that seek Passivhaus certification, but can be used 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). |
| 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 BREDEM model, but with fixed assumptions and thus less flexibility. |
| SBEM | Simplified Buildings Energy Model – the national calculation method for non-residential buildings' energy and carbon, used to satisfy building regulations Part L. |
| SCOP | Seasonal Coefficient of Performance. This is the typical rating given to describe how efficient a heat pump is. It represents approximately how many units of heat the system will deliver per unit of electricity that it consumes. |
| Sequestration | Removal and storage of carbon dioxide (or other GHGs) so that it cannot perform its harmful climate-changing role in the atmosphere. Currently only achieved by trees/plants and soil. May be achieved by technologies in future. |
| SHD | Space heat demand. A measure of how much heat energy a building will need to stay at a certain temperature. Typically expressed in kilowatt-hours per square metre per year. The amount of space heat demand depends on how well-insulated and airtight a building is, how much heat it gains from sunlight exposure, how much internal heat is generated by occupants and equipment, and the external average air temperature across the course of the year. |
| Space heat demand | Amount of energy needed to heat a building to a comfortable temperature. 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 annual $CO_2$ emissions per square metre of floor, 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. Unlike metered energy, 'primary energy' takes into account energy lost to conversion inefficiencies during power generation and distribution. |
| TFEE | Target Fabric Energy Efficiency – limit on space heat energy demand per square metre of floor, set by Part L of building regulations. Based only on fabric performance; not affected by building services like heating system, lighting, ventilation[84]. |

[84] AECOM & Zero Carbon Hub (2012), *Fabric energy efficiency for Part L 2013*. https://www.zerocarbonhub.org/sites/default/files/resources/reports/Fabric_Standards_for_2013-Worked_Examples_and_Fabric_Specification.pdf

Link to glossary

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| TM54 | A method to accurately calculate buildings' energy use. Devised by Chartered Institution of Building Services Engineers (CIBSE). |
| 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. |
| U-Value | The U-value measures how well a building element (such as a wall, roof, or window) conducts heat. It represents the rate of heat loss through a square metre of a structure for every degree of temperature difference between inside and outside. Lower U-values indicate better insulation performance and reduced heat loss. |
| WMS (and WMS2023) | Written Ministerial Statement. Made by a government minister, forming an official statement of national policy on a specific topic. 'WMS2023' specifically refers to a WMS made on 13th December 2023 about local plan energy efficiency policies. |
| Y-Value | The Y-value is a simplification used in SAP to represent the combined effect of all thermal bridging (junctions) in a building. It is calculated from the sum of all Ψ-values multiplied by the lengths of junctions and divided by total building envelope area. |

## 13. References (other than those already provided in footnotes throughout)

Appendix L: https://files.bregroup.com/SAP/SAP%2010.2%20-%2017-12-2021.pdf