



Maidenhead Neighbourhood Plan 2024-2039:

Evidence base to support net zero policy

8 November 2024



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Glossary of terms and acronyms

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.	GLA	Greater London Authority. Cited as a well-established example of a planning authority that has developed one type of net zero carbon buildings policy and produced implementation guidance for this.
B&NES	Bath & North East Somerset [local plan]. Cited as a recent successful precedent example of innovative and highly effective net zero carbon planning policy.	kW	Kilowatt. A unit of energy generation capacity.
Carbon, or carbon emissions	Short for 'carbon dioxide emissions' but can also include several other gases with a climate-changing effect, that are emitted to the atmosphere from human activities (see 'GHG', below).	kWh	A unit of energy, which can be either generation or usage.
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.	kWp	Kilowatt-peak. A measure of energy generation capacity typically used to describe the size of a solar PV array in terms of the maximum amount of energy it can generate under optimum conditions.
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.	LETI	Low Energy Transformation Initiative. A coalition of built environment professionals working to establish and achieve the energy performance needed for net zero.
CIBSE	Chartered Institution of Building Services Engineers.	MNP	Maidenhead Neighbourhood Plan
CO₂	Carbon dioxide. Often shortened to 'carbon'.	NPPF	National Planning Policy Framework. A central government document laying out how the planning system should function, including plan-making and decisions.
CO₂e	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'.	Part L	Building regulations section that sets basic legal requirements regarding buildings' energy and CO ₂ .
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.	Performance gap	The difference between the amount of energy a building is predicted to use during design, versus the actual amount of energy it uses. The gap is due to poor prediction methodologies, errors in construction, and unexpected building user behaviour.
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.	PV	Photovoltaics: solar panels that generate electricity.
GHG	Greenhouse gas (CO ₂ and several other gases: methane, nitrogen dioxide, and fluorinated refrigerant gases). Often collectively referred to as 'carbon'; see above.	PHPP	Passivhaus Planning Package – a tool to accurately predict a building's energy use. It is used to design buildings that seek Passivhaus certification but can 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.



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.
Space heat demand	Amount of energy needed to heat a building to a comfortable temperature. Expressed in kilowatt-hours per square metre of floor space per year.
TER	Target Emission Rate – a limit set by Part L of building regulations on CO ₂ emissions per square metre of floor, 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 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; not affected by building services like heating system, lighting, ventilation ⁱ .
TM54	A method to accurately calculate buildings’ energy use. Devised by CIBSE (as above).
UKGBC	UK Green Building Council.
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	A measure of how much heat is transmitted through a building element, such as the walls, floor, roof, windows or doors. Lower U-values mean a greater retention of heat within the building.
WMS	Written Ministerial Statement. A formal statement made by a Government minister that can form a relevant statement of national policy that needs to be a material consideration in the creation and examination of local plan policies. In this report, where appended by a year (e.g. ‘WMS15’, ‘WMS2015’, ‘WMS2023’) this denotes a specific written ministerial statement made in that year that has been referred to and explained in a prior paragraph of this report.



Introduction

The Maidenhead Neighbourhood Plan (MNP) (2024-2039) is being developed for Maidenhead by local residents to put forward their vision of the neighbourhood for approval by the Royal Borough of Windsor and Maidenhead (RBWM). The MNP sets out the residents' vision to support sustainable growth, protect its heritage and address the climate and ecological emergencies.

To support the MNP deliver on delivering its objectives, Bioregional has been appointed to provide evidence and advice on the development of net zero policies for new build allocations.

The area that the MNP applies to is set for significant housing growth over the plan period, which must be supported by robust policies that deliver truly net zero homes to ensure the emissions contribution from the built environment in Maidenhead does not hinder local or national net zero targets.

The current RBWM Local Plan has a policy gap of requiring net zero new buildings, which the MNP aims to address in its absence. Whilst the RBWM Local Plan takes precedence over the MNP, the neighbourhood plan will hold material weight when assessing planning applications in the MNP area. Therefore, setting robust net zero policy on new buildings in Maidenhead can play a key role in moving the neighbourhood and wider borough to becoming net zero.

To support such policy development, this report covers the following:

1. Literature review including:

- a. Why the MNP must act on climate change?
- b. Legislation that defines powers that the MNP may use for carbon mitigation
- c. Review of the 2023 Written Ministerial Statement
- d. Precedents of best-practice net zero policies

2. Policy scenario comparison of cumulative carbon emissions expected from new housing in the MNP period

Literature review

Why must the MNP act on climate change?

Whilst the MNP is not a local plan, the assessment of the MNP in its validity will be based on the legislative basis that applies to local plans. The duties, powers and potential limitations from local plan legislation are likely to apply for the MNP. Therefore, the following literature review primarily focuses on legislation directly related to local plans, but should be read as equally appropriate to the MNP as a neighbourhood plan.

Legal duty to mitigate climate change through the plan

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 19ⁱⁱ). This duty is further underscored by similar wording in the more recent Levelling Up & Regeneration Act 2023ⁱⁱⁱ in which the obligation is to design the plan, not just the individual policies, to achieve that goal.

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”.

Therefore, the local plan's duty is not simply to minimise the amount of new emissions that new development adds, but rather to ensure that its local plan reduces the overall amount of carbon emissions. 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 council in order to fulfil that duty to deliver an overall mitigation.

Standalone renewable energy can actively mitigate the Maidenhead's carbon emissions, as can provision for public transport, walking and cycling. New buildings, however, will only help to actively mitigate Maidenhead'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.

As the MNP sits under the RBWM Local Plan, it is justified to assume that the MNP has an equal legal duty to effectively deliver on climate change mitigation, particularly requiring that new buildings are net zero in operation.

What degree of mitigation is justifiable?

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

- “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).

- “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).

Logically, therefore, a local plan should aim to proactively ensure 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. The Climate Change Act 2008 commits the UK 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.

The Committee on Climate Change (CCC) identifies a wide range of more fine-grained actions and performance changes that will be needed in order to reach net zero. We here summarise a few of the most relevant to the sphere of influence of the MNP (note that all of these are taken from the Sixth Carbon Budget^{iv} unless signified by a different endnote reference):

- **New homes built from 2025 onwards to achieve^v:**
 - No more than 15-20kWh/m²/yr space heat demand
 - Not be connected to the gas grid
 - Have low-carbon heating such as a heat pump, not gas
 - Be net zero carbon in operation^{vi}
 - Reduced whole-life carbon impact including embodied and sequestered carbon.
- **Increased material efficiency, energy efficiency and material substitution**, to achieve low carbon manufacturing and construction – reducing new buildings' embodied carbon. The manufacturing & construction sector as a whole will need to hit an interim milestone of 70% emissions reduction by 2035 from a 2018 baseline.^{vii}
- **Dramatically increase the rollout of electrical heat/heat pumps to existing buildings**, so that low carbon heating systems reach 100% of heat system sales from 2033.
- **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.

Legislation that defines powers that the MNP may use for carbon reduction

Planning & Energy Act 2008

The Planning & Energy Act is the source of the MNP'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' for:

1. [Energy efficiency standards](#) higher than those set by building regulations
2. [Renewable or low carbon sources 'in the locality of the development'](#) to supply a proportion of energy used at the development.

The Act notes that policies made using these powers "must not be inconsistent with relevant national policies for England". This means the NPPF, according to NPPF (2023) Paragraph 1^{viii}.

The Act defines 'energy efficiency standards' as ones that are set out or endorsed by the Secretary of State. This may imply only the methods used to demonstrate compliance with Part L of Building Regulations (SAP or SBEM despite their aforementioned shortcomings, or TM54). As TM54 is one of the 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](#)).

The Act does not define 'energy used at the development'. It therefore appears to empower local policy to set requirements for renewable energy to meet a proportion of the new building's *total* energy, not just 'regulated' energy (see [glossary](#)). In that case a method would need to be chosen to account for that unregulated energy, ideally in a way that works alongside the calculation for regulated energy. Several methods could be used: TM54 (as above), BREDEM, and SAP Appendix L. PHPP could also be used but may not directly plug into SAP/SBEM.

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 policy proposed.

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 policy that applies to proposals regarding existing buildings, not only new development. However, this would still be subject to the requirement to be 'reasonable'.

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 to ensure they do not prevent the achievement of the Council's stated housing and development targets.

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.

National Planning Policy Framework

The NPPF (December 2023 edition) reaffirms various ways in which it is appropriate to pursue carbon reduction policies or other undefined sustainability improvements through the local plan, which also applies to the MNP:

- [Paragraph 159b](#): "New development should be planned for in ways that ... reduce [carbon] emissions, such as [via] location, orientation and design ... Local requirements for [buildings'] sustainability should reflect the Government's policy for national technical standards".
- [Paragraph 160a-b](#): "Plans should ... provide a positive strategy for energy from [renewable and low carbon] sources ... consider identifying suitable areas for [these] and supporting infrastructure ... [and] identify opportunities for development to draw its energy supply from [these sources]".
- [Paragraph 196](#): "Set out a positive strategy for the conservation and enjoyment of the historic environment, including ... putting [heritage assets] to viable uses consistent with their conservation". This may be relevant in that a building's energy efficiency affects whether use of that building is viable.

National Planning Policy Guidance (NPPG)

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.

The NPPG section on climate change^{ix} still echoes the now superseded WMS2015 supposed limit on energy/carbon reduction policies (i.e. no more stringent than Code for Sustainable Homes Level 4).

However, that limit is now obsolete and should be considered irrelevant. We note that section of the NPPG has not been updated since 2019 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% ... 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.

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).

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."

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.

Written Ministerial Statement 23rd December 2023 (2023 WMS)

Background context

On 13th December 2023, Government released a **Written Ministerial Statement (WMS)** that 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](#)”.

The WMS places stringent new limitations on the existing powers held by local planning authorities to require improvements in the energy and carbon performance of new buildings in their area. The WMS does not remove the ability to set improved local standards, but it limits 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.”

The above will 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).

Several recent adopted local plans that 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, Bath & North-East Somerset, and Central Lincolnshire).

The WMS 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 ‘new’ – as we would 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).

Although the WMS uses the terms “homes” and “buildings” interchangeably, its accompanying documentation ([Environmental Principles Assessment and Public Sector Equalities Assessment](#)) makes it clear that the additional requirements the 2023 WMS sets out **is focused on homes specifically**.

What impact does the 13th December 2023 Written Ministerial Statement have on local climate mitigation efforts?

For new buildings, the stipulations of the 2023 WMS make it much harder to fulfil local authorities’ legal duty to mitigate climate change (Planning & Compulsory Act 2004) and the expectation laid on them to support “radical reductions in greenhouse gas emissions ... [taking] a proactive approach ... in line with the objectives and provisions of the Climate Change Act 2008” (National Planning Policy Framework).


The main reasons the WMS makes this duty harder to fulfil are:

1. **The use of a carbon metric, when contrarily the goal is energy efficiency.** The WMS asks for energy efficiency policies to be expressed using the Building Regulations Part L TER (Target Emissions Rate) metric – but TER is not an energy efficiency metric. As the acronym suggests, TER is instead a carbon emissions metric. It is unclear why this choice was made in the WMS, given that the Building Regulations Part L methodology (Standard Assessment Procedure, or commonly known as SAP) also contains two energy efficiency metrics: the TFEE (Target Fabric Energy Efficiency) and TPER (Target Primary Energy Rate).
2. The SAP methodology is perceived by the industry to be **poor at estimating the actual energy performance of a building** – space heating demand in practice can be [up to 4 times higher than estimated within SAP](#) – and therefore any of the SAP metrics would not reliably ensure that buildings have the absolute energy efficiency performance that is known to be a necessary part of the UK’s legally binding carbon goals. Moreover, SAP fails to account for unregulated energy, which essentially neglects up to 50% of a building’s energy use and associated carbon emissions. The unsuitability of SAP metrics is why several recently adopted precedents (Cornwall, Bath & North-East Somerset, and Central Lincolnshire) use alternative metrics that are effective for delivering energy efficiency and measuring whether a building is ‘net zero’
3. **Forcing the use of a ‘specified version of SAP’ for the required metric:** Standard Assessment Procedure (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. SAP is updated more often than Part L. SAP updates can include anything from changes to the assumptions about the baseline building characteristics, to the performance of standard types of equipment to changes in the carbon intensity of grid electricity. The current version is SAP10.2. Some precedent local plans had previously overcome this issue by stating that calculations must simply use “the latest available version” of SAP. That way, the policy does not go out of date each time a new version of SAP is released.
 - a. The WMS does not make clear whether it would be acceptable to say, ‘the latest version of SAP’, or if it would have to be ‘SAP10.2’ or similar. If the latter, then the WMS would create a scenario where policy would be at risk of going out of date very quickly.
 - b. SAP is due to be replaced with a new model, HEM (Home Energy Model) in 2025 when the Future Homes Standard (FHS) is introduced. This too would put local policy out of date unduly quickly if written only for a ‘specified version of SAP’ to placate the WMS. The HEM recently underwent consultation alongside the FHS consultation – therefore HEM’s final form, function and outputs are not yet known. Thus, it is not yet possible to write a policy that uses HEM metric for targets, as it could not currently be robustly assured that these would be feasible or their cost uplifts assessed, even if the WMS had acknowledged HEM’s imminent introduction.

How does a Written Ministerial Statement affect the planning system?

Written Ministerial Statements are one of the ‘statements of national policy’ that local plan-making must take into account, according to the NPPF.

The NPPF forms the overarching set of principles by which the Inspector will conduct the Examination in Public of the submitted local plan, to see if the plan can be considered ‘sound’, before it can be



adopted. The 2023 WMS includes a sentence self-confirming its own status as a relevant statement of national planning policy. The NPPF is also taken into account in individual planning decisions, alongside the local plan itself. The NPPF establishes that, to be ‘sound’, the plan must pass four tests (with detail here where relevant to carbon):

- **Positively prepared:** Proactively aiming to meet objectively assessed needs.
- **Justified:** Having considered reasonable alternatives, with proportionate evidence.
- **Effective:** Deliverable within the plan period and based on 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”.

Alongside the ‘four tests of soundness’, the NPPF also instructs that:

- “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)
- Specifically, requirements for the sustainability of buildings are expected to “reflect the Government’s policy for national technical standards” (Paragraph 159)

Therefore, this WMS is a ‘material consideration’, i.e. *one of the relevant considerations that the plan must take to account* in order to be found sound and adopted. However, a WMS (like the NPPF) can be departed from if it can be sufficiently justified. Open legal advice notes that case law establishes that a WMS “cannot lawfully countermand or frustrate the effective operation of any ... relevant statutory power” (such as the duty to mitigate climate change and the power to require 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”.

To deviate from the WMS may be possible if an argument can be made that identifies other material considerations that hold more weight than the WMS. The 2015 WMS on a similar topic had sometimes caused Inspectors to find local plans unsound where the content of those local plans went against that WMS, sometimes years after the WMS was made and overtaken by other pieces of policy. However, at least one high-profile example of such a [rejection was overturned in the High Court](#) in 2024 on the basis of having unlawfully interpreted the WMS in question (Salt Cross AAP’s energy metric based policies, rejected on the basis of the 2015 WMS).

What is the status of the Written Ministerial Statement versus other national policies or legislation?

Legislation (and the powers it grants or duties it imposes) holds primacy over national policy statements.

If interpreted literally and rigidly, the **WMS’ stipulations would make it much harder to fulfil the MNP’s legal duty to mitigate climate change** (duty set by the Planning & Compulsory Act 2004, section 19) and the expectation laid on them to support “radical reductions in greenhouse gas emissions ... [taking] a proactive approach ... in line with the objectives and provisions of the Climate Change Act 2008” (NPPF, paragraphs 157-158 and footnote 56).

The main way the WMS makes 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 elsewhere had used alternative metrics that are much more effective for delivering energy efficiency and defining whether a building is ‘net zero’.

The government has not indicated how the WMS would affect the ability to fulfil those mandates, nor advised which should take priority where they are in conflict. [Case law establishes](#) that there is no legal reason why a WMS cannot contradict the NPPF, and that a WMS is not necessarily ‘lesser’ than the NPPF, but does not confirm which should be followed when one contradicts the other (for example where the WMS’ stipulations inhibit the ability to meet the NPPF expectation for carbon reduction *in line with the Climate Change Act*).

Legislation holds significantly more weight than a WMS. Thus, it should be possible to diverge from the WMS if a strong case can be made that 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 Climate Change Act.

The most robust way to make such a case would be to produce modelling to evidence the difference that would occur as a result of following the WMS stipulations as opposed to using the more accurate energy metrics – that is both of the following:

- The difference in carbon emissions, and whether this moves the buildings sector’s carbon reduction trajectory even further from what it needs to be within the ‘Balanced Pathway to Net Zero’ as analysed by the Committee on Climate Change to comply with the UK’s legislated carbon budgets (set under the aegis of the Climate Change Act)
- The difference in energy efficiency compared to what the Climate Change Committee has shown to be necessary as part of the UK’s wider energy system transition needed for all sectors (not just buildings) as part of those legislated carbon budgets as above.

Legal challenges against the 13th December 2023 Written Ministerial Statement

A legal challenge to the 2023 WMS has been brought by the same community organisation that successfully won the Salt Cross AAP case, the Good Law Project. The [challenge](#) put forward that the WMS 2023 is unlawful on the following grounds:

1. Failure to fulfil the duty (Environment Act 2021) 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
2. That the WMS 2023 unlawfully purports to restrict local authorities’ exercise of powers granted to them by statute (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)
3. That the 2023 WMS unlawfully misleads the reader about decisionmakers’ legal powers.

This case was [heard at the High Court on 18 June 2024](#) but was not [successful](#):



- **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.

Despite the unsuccessful legal challenge, it is our view that LPAs should remain committed to developing ambitious net-zero policies for new buildings. There should be an emphasis on the importance of robust, evidence-based approaches that demonstrate the effectiveness of stricter energy efficiency standards. While the WMS is a factor to be considered during policy development, LPAs can justify alternative approaches when supported by compelling data.

Existing legislation, such as Schedule 7 (15C) of the Levelling Up and Regeneration Act 2023, mandates LPAs to contribute to mitigating climate change, and the Planning and Energy Act 2008 explicitly grants them the power to set stricter energy efficiency standards than those dictated by Building Regulations.

In conclusion, the WMS is a material consideration for plan-making. However, our view is that it can be departed from if the evidence demonstrates and justifies an alternative approach that is more appropriate to local circumstances.

This was confirmed in [correspondence](#) between a coalition of local authorities and the Secretary of State for Levelling Up, Housing and Communities, who confirmed that, “Section 38(6) allows for material considerations to be taken into account in the application of development plan policies. The 2023 WMS is simply “a material consideration that the decision maker can consider and apply as he or she sees fit in the particular circumstances of a case”.

This communication clarifies the role of evidence in local authority net zero policies. Local development plans must still be informed by robust carbon reduction evidence.

As set out in recent legal advice from Estelle Dehon KC, “the 2023 WMS is policy guidance to which regard must be had, but from which deviation can be justified in so long as there is clear evidence which provides the reasons for so doing, and which demonstrates the viability of policies based on [LETI metrics]”.

What can the MNP still do if the 13th December 2023 Written Ministerial Statement were strictly interpreted?

The WMS only relates to energy efficiency policies, not to policies on renewable energy, embodied carbon, or overall carbon reductions. Therefore, policies on renewable energy could still:

- **Require a certain proportion of energy use to be met with on-site renewable energy provision.**
 - Define ‘energy use’ to mean total energy use, not just the regulated energy use as calculated by building regulations

- Support this with feasibility and cost evidence – noting that several other local plans’ similar requirements have been shown to be feasible, albeit those required that energy efficiency targets were met before calculating the amount of renewable energy needed.
- **And policies on embodied carbon could still (with suitable feasibility and viability evidence):**
 - Require reporting of embodied carbon, and/or
 - Require new development to stay within certain target limits on embodied carbon
- Support this with suitable feasibility and cost evidence – either from the local context or pointing to suitably relevant data from other recent local plans’ evidence bases.
- These embodied carbon requirements might need to apply over a certain threshold to ensure the cost of the embodied carbon assessment itself is not prohibitive and that smaller sites are not held back by any shortage of professionals able to undertake the calculation.



Precedents of net zero policies

Setting absolute targets for energy use intensity, space heating and on-site renewable energy generation

There is a growing number of local authorities pursuing the industry-recommended approach to achieving genuine net zero new build development. The approach does not use baselines and % reductions based on previous iterations of Part L, as [previously explored](#), and instead sets threshold limits on energy use. A policy that follows this approach sets three key requirements:

1. **Energy use intensity (EUI)** – the predicted total amount of regulated and unregulated energy used.
2. **Space heating demand** – the amount of energy required to heat the building.
3. **On-site renewable energy generation** – must match total energy to be a net zero building.

Comparison of targets for residential development

Space heating demand (kWh/m ² /year)	Energy use intensity (kWh/m ² /year)	Target referenced
30	40	Cornwall Climate Emergency DPD
		Bath & North East Somerset Local Plan Partial Update
15-20	35	Central Lincolnshire Local Plan
		Greater Cambridgeshire Draft Local Plan
		Committee on Climate Change
15	35	London Energy Transformation Initiative
		CIBSE
		Good Homes Alliance

The EUI target includes all energy used by the building, importantly accounting for unregulated energy, which Part L does not. EUI does however exclude contributions from renewable energy generation and does not consider electric vehicle charging in the calculation. Reducing the energy used by the building is the primary aim of the EUI approach, which can then be supplemented to net zero by the renewable energy generation requirement that supplies the energy demand of the building.

Following an **energy metric approach ensures more control over the fabric and systems** installed in buildings. For example, high performance U-values are essential to achieve space heating demand targets set out above. Part L of Building Regulations does not however guarantee such high-performance since absolute energy targets are not set for certain building typologies. An additional benefit of this assessment is that **EUI can be easily monitored and verified in practice from meter readings**.

Additionally, the **EUI target essentially bans the use of on-site fossil fuels**, and more specifically, gas boilers for heating. Although explicitly stating the ban of gas boilers in policy wording may cause concern, the EUI target does this implicitly since gas boiler efficiency (c. 90%) will likely result in too large a contribution of overall energy use to result in a compliant EUI value. Contrarily, the **superior efficiency of heat pumps makes achieving the EUI target significantly easier**, as the technology can produce over 3 units of heat per 1 unit of electricity used.

Particularly **for more stringent EUI and space heating demand targets**, as proposed by Central Lincolnshire and Greater Cambridgeshire, more than just the installation of a heat pump and high fabric efficiency will be required to achieve such targets. **To meet the more stringent targets, decisions must be made at an early stage of the development process to make appropriate decisions on form factor, glazing ratios and building orientation, which encompasses a fabric first approach.** These decisions will contribute towards the maximisation of energy demand reductions and the ability of the renewable energy generation system to create an on-site net zero energy balance.

This remedies a key weakness in Building Regulations, which fail to incentivise applicants to design a building with an inherently thermally efficient form or orientation because all of the Part L targets are not fixed targets but are set in relation to a building of the same size and shape as the proposed building.

To further strengthen a policy informed by this approach, a **robustly accurate energy modelling methodology will need to be used**. SAP 10.2, used for Part L compliance, is currently unable to accurately assess unregulated energy since the relevant equation is based on 1998 appliances, which clearly does not reflect modern efficiencies. It is therefore more difficult to comply with an EUI target using SAP because the proportion of unregulated energy, which can be up to 50%, is severely overestimated. SAP also frequently underestimates space heat demand by up to 270%, and SBEM has also been shown to generally underestimate overall energy use.

To mitigate such inaccuracies, an alternative energy modelling methodology is required to ensure design-stage performance values correspond to the as-built performance of the building. The industry-**recommended energy modelling method** to minimise such a performance gap is Passive House Planning Package (PHPP), which is used for the leading Passivhaus standard. Contrary to common misconceptions, PHPP can be used without needing to pursue the stringent Passivhaus certification process. An alternative accurate energy modelling calculation method, if used correctly, is **CIBSE TM54**. TM54 works by starting with the SBEM calculation and making adjustments to the inputs to reflect how the building will be used based on reasonable adjustments about occupancy and so on.

On-site renewable energy generation must match the EUI (multiplied by the floor space) to reach an on-site net zero energy balance. In the majority of cases, this has been shown to be technically feasible for EUI targets up to 40 kWh/m²/year. The taller the building, the less likely it is that there will be sufficient roof space to match EUI. However, even for such taller, more shaded buildings, façade-mounted panels and other ground-mounted renewable energy technology should be considered.

Several examples are explored in this section, which, although they take a similar approach, have received varied reactions from their respective Inspectors during examination.

A difference between standards set between residential and non-residential development may be noted in these examples. This is an important aspect of the energy-based policy approach. The typical usage of residential buildings is less variable therefore relatively easy to predict and understand, whereas non-residential buildings can vary significantly in terms of energy use. For example, an office with computers at each desk (and potentially a computer server bank) will have a far higher energy consumption than a retail unit that primarily consumes energy only through lighting and heating.

Therefore, non-residential buildings need to be treated in isolation of the archetype assessed because the whole scope of non-residential buildings involves a very wide range of energy consumption levels associated with the unique activities of the occupier. Setting specific energy use limits per archetype is one approach that has been used, whilst setting a level of BREEAM certification acts as another. The latter approach may not be as stringent on energy use (as BREEAM does not set absolute targets for energy use or renewable energy and does not guarantee net zero carbon schemes), but ensures a wider range of sustainability issues are considered and addressed (for example, materials, management, water, biodiversity and other issues beyond energy use).

Example: Cornwall Climate Emergency DPD 2023 (adopted)

The [Cornwall Climate Emergency Development Plan Document](#) (DPD) was adopted in February 2023 and retained all key elements of its net zero carbon policies.

Policy SEC1 (Sustainable Energy and Construction) includes that (paraphrased):

1. Major non-residential development (over 1,000m²) to achieve **BREEAM Excellent** (or “equivalent or better methodology”)
2. New residential development to achieve all of the following:
 - i. **Space heating demand of <30kWh/m²/year**
 - ii. **Total energy consumption of <40kWh/m²/year**
 - iii. **On-site renewable generation to match the total energy consumption**, with a preference for roof-mounted solar PV. Where it is not feasible or viable to include enough renewable energy generation to match total energy consumption, the development should pursue the following:
 - Renewable energy generation to be maximised as far as possible
 - Connection to an existing or proposed district energy network
 - **Offset the residual energy demand** by a contribution to Cornwall Council’s Offset Fund.

This is supported by evidence in the form of energy modelling analysis¹ by expert green building engineers. This analysis used accurate energy modelling method (PHPP) to identify a range of energy performance targets that are feasible in Cornwall and can reach the net zero carbon target in a variety of ways (different combinations of fabric / energy efficiency and renewable energy measures). This evidence piece also compared the proposed ‘net zero carbon’ building performance options against how a building would perform if it simply met the Future Homes Standard.

The analysis included cost information for each modelled building that was then used in the viability assessment for the DPD. That viability assessment found that most residential development scenarios remained viable with the policies applied, and that the majority of the cost uplifts over the 2013 Building Regulations will be incurred by developers anyway in order to meet the new 2021 building regulations, even without the local plan carbon policy.

Contrarily to the Salt Cross AAP, [the Inspector’s report](#) positively stated that the 2015 WMS has clearly been overtaken by more recent events.

Example: Bath & North East Somerset Local Plan Partial Update (adopted)

The [Local Plan Partial Update](#) (LPPU) was adopted in January 2023 and became the first local plan in the UK to set net zero energy standards for new housing.

Policy SCR6 sets identical standards to Cornwall for residential development and was informed by the same technical evidence base. As set out in the [Sustainable Construction Checklist Supplementary Planning Document](#), PHPP is required for major development, whilst an option to use SAP with the Energy Summary Tool is available for minor residential development. The Energy Summary Tool adjusts outputs from SAP to reflect in practice performance. These options reflect the same approach as Cornwall. It is however important to note that the calculation approaches were not tested at examination as the requirements are set out in supplementary guidance.

A specific technical study for the Bath & North East Somerset (B&NES) area was not seen as necessary because Cornwall and B&NES share the same prominent housing typologies and climate patterns that influence the efficiency of solar PV to provide an on-site net zero energy balance.

A key piece of evidence that assisted B&NES to successful adoption was a [letter received from DLUHC](#), which reiterated the fact that local authorities are able to set standards that exceed Building Regulations i.e. that exceed the standards set out in the 2015 WMS. The 2015 WMS was not explicitly stated in this correspondence from government, yet the clarification on exceeding Building Regulations all but confirms that the 2015 WMS is no longer relevant.

This view was directly stated in the [Inspector's report](#):

"The WMS 2015 has clearly been overtaken by events and does not reflect Part L of the Building Regulations, the Future Homes Standard, or the legally binding commitment to bring all greenhouse gas emissions to net zero by 2050.

*I therefore consider that the **relevance of the WMS 2015 to assessing the soundness of the Policy has been reduced significantly**, along with the relevant parts of the PPG on Climate Change, given national policy on climate change. The NPPF is clear that mitigating and adapting to climate change, including moving to a low carbon economy, is one of the key elements of sustainable development, and that the planning system should support the transition to a low carbon future in a changing climate. Whilst NPPF154b sets out that any local requirements for the sustainability of buildings should reflect the Government's policy for national technical standards, for the reasons set out, that whilst I give the WMS 2015 some weight, any inconsistency with it, given that it has been overtaken by events, **does not lead me to conclude that Policy SCR6 is unsound, nor inconsistent with relevant national policies.**"*

The logical view provided by the B&NES Inspector appropriately summarises the context of local authority powers to set their own energy efficiency standards. In contrast, the West Oxfordshire Inspectors' views represent inconsistency in decision making on net zero policies at PINS. As more local authorities propose ambitious policies that will need to be weighed against consistency with national policy, increased consistency should become apparent.

Example: Central Lincolnshire Local Plan (adopted)

The [Central Lincolnshire Local Plan](#) was adopted in April 2023¹. The adoption of this plan is significant as the energy requirements for Policy S7 and S8 are aligned with recommendations from LETI and the Committee on Climate Change.

Policy S7 (Reducing Energy Consumption - residential) includes that:

"Unless covered by an exceptional basis ... all new residential development proposals must include an Energy Statement which confirms in addition to the requirements of Policy S6 that all such residential units:

1. Can generate at least the same amount of renewable electricity on-site (and preferably on-plot) as the electricity they demand over the course of a year, such demand including all energy use (regulated and unregulated), calculated using a methodology proven to accurately predict a building's actual energy performance; and
2. To help achieve point 1 above, target achieving a space heating demand of around 15-20kWh/m²/yr and a total energy demand of 35 kWh/m²/yr ... No unit to have a total energy demand in excess of 60 kWh/m²/yr [which means] the amount of energy used as measured by the metering of that home, with no deduction for renewable energy."

The policy also includes a clause to address the energy performance gap:

"The Energy Statement must include details of assured performance arrangements. As a minimum, this will require:

- A. The submission of 'pre-built' estimates of energy performance; and
- B. Prior to each dwelling being occupied, the submission of updated, accurate and verified 'as built' calculations of energy performance. [This] should also be provided to the first occupier ... Weight will be given to proposals which demonstrate a deliverable commitment to on-going monitoring of energy consumption ... which has the effect ... of notifying the occupier [if] their energy use appears to significantly exceed the expected performance of the building, and explaining to the occupier steps they could take to identify the potential causes."

Policy S8 (Reducing energy consumption - non-residential) replicates the clauses except with a higher permitted total energy demand of 70-90kWh/m²/year. The assured performance clause is also mirrored.

If a non-residential proposal can demonstrate why the metrics are not achievable, it can instead source renewable energy from off-site, pay the local authority to deliver equivalent renewable energy or other offsite infrastructure to deliver the appropriate carbon saving, or connect to a decentralised energy scheme.

Alternatively, a non-residential proposal may demonstrate achievement of BREEAM Excellent or Outstanding, instead of complying with the energy metrics.



Emerging example: Merton New Local Plan (draft 2022)

In April 2023, the inspectors expressed concerns in the Post-Hearings Letter^x around the viability of policies set out below, particularly for smaller development, that may negatively impact delivery. This relates to potential issues for small housebuilders in that required expertise in energy efficient construction may not be widespread.

The currently proposed draft **with main modifications after the inspectors' first comments**^{xi,xii} sets **Policy CC2.3**, which includes the following maximum **Energy Use Intensity** targets from Jan 2025 – this is likely to change now following the Post-Hearings Letter:

- Residential and multi-residential – 35 kWh/m²/year
- Offices, retail, GP surgery, hotels and higher education – 55 kWh/m²/yr
- Schools – 65 kWh/m²/yr
- Leisure – 100 kWh/m²/yr
- Light industrial uses – 110 kWh/m²/yr

Supporting text paragraph 2.3.18 explains that major developments should calculate these with (CIBSE) TM54, (PHPP) methodology or equivalent. Minor residential schemes are permitted to instead calculate these with Part L SAP. 5-year post occupancy monitoring is also required for major development.

The targets match those developed by the London Energy Transformation Initiative to be consistent with achieving national net-zero carbon targets (paragraph 2.3.21) and proven feasible by energy modelling for another emerging local plan. In contrast, paragraph 2.1.14 notes that typical current Part L EUI is 140/kWh/m²/yr.

The policy also includes the following **space heat demand** targets, with SAP:

Development type	Until 31/12/2022	01/01/2023 – 31/12/2024	From 01/01/2025
Block of flats & mid-terrace house	<43 kWh/m ² /year	39 kWh/m ² /year	15 kWh/m ² /year
Semi-detached, end-terrace & detached house	52 kWh/m ² /year	46 kWh/m ² /year	20 kWh/m ² /year
Non-residential (target flexible)	-	-	15 kWh/m ² /year

Supporting text paragraphs 2.3.9 – 2.3.13 explain that the gradual uplift allows time for developers to adapt, and that the 2022-24 targets reflect the Zero Carbon Hub ‘interim fabric energy efficiency standard’ and ‘full fabric energy efficiency standard’ which have been demonstrated to be feasible, viable, and achieved in several schemes in Merton.

In **Policy CC2.4**, proposals must use low carbon heat. Proposals must demonstrate “how the proposal has made the best potential use of roof space” to maximise renewable energy generation, which should meet “100% of energy demand ... where possible”.

Emerging example: Winchester Draft Local Plan (draft 2022)

This proposed submission underwent Regulation 19 consultation in March-May 2022^{xiii}.

Proposed Policy CN3 (Energy efficiency standards to reduce carbon emissions) requires that all residential development must demonstrate the following:

- **No on-site fossil fuels** for space heating, hot water or cooking.
- Space heating demand of **15 kWh/m²/year**.
- Energy consumption (EUI) of the building(s) to less than **35 kWh/m²/year**.
- **Passive House Planning Package or CIBSE TM54** to be used for predicted energy modelling.
- On-site renewable energy generation to provide 100% of the energy consumption required by residential buildings.

It appears in the Draft Plan that there is no option to offset shortfalls to the renewable energy generation and/or EUI target. No other authority has proposed the EUI approach without a last resort option to offset, although most evidence studies prove that the absolute energy requirements are technically feasible for the majority of housing typologies and therefore offsetting may not be required.

High-rise flat block is the primary typology that may struggle to meet on-site renewable energy requirements since there is limited roof space relative to the internal floor area. Given the housing mix in Winchester is unlikely to include this typology, this could explain why offsetting is not currently included in the Plan.

Emerging example: Greater Cambridge Local Plan (First Proposals 2021)^{xiv}

Policy CC/NZ will require and guide net zero carbon new builds. This will include:

- Space heat demand of 15-20 kWh/m²/year in all new developments
- No new developments to be connected to the gas grid; all heating low-carbon
- Total energy use intensity targets to be achieved as follows:
 - Dwellings including multi-residential: 35 kWh/m²/year
 - Office, retail, higher education, hotel, GP surgery: 55 kWh/m²/year
 - School: 65 kWh/m²/year
 - Leisure: 100 kWh/m²/year
 - Light industrial: 110 kWh/m²/year
- Proposals should generate at least the same amount of renewable energy (preferably on-plot) as they demand over the course of a year [including] all energy use (regulated and unregulated), calculated using a methodology proven to accurately predict a building's actual energy performance.

The need and deliverability of this policy is evidenced by a suite of net zero carbon evidence reports including:

- Local area carbon reduction targets that would represent a fair local contribution to the national net zero carbon transition and Paris Agreement
- Expert analysis by the Committee on Climate Change and various building industry experts about what must happen in the buildings sector to deliver the national net zero goal and interim carbon budgets – including proposed targets for heat demand, total energy use, and on-site renewable energy generation – and explaining how/why this is not delivered by building regulations (current or incoming)
- Technical feasibility studies which modelled whether it was possible to reach the proposed zero carbon energy balance in the typical types of development expected to come forward in the plan period (based on applying a range of energy improvement measures to real recent development proposals that received permission) – this showed that the targets were feasible
- Cost modelling to show the cost uplifts to meet the modelled energy improvement measures, as above, for inclusion in the viability assessment.

The supporting text notes that the alternative – having no policy and relying instead on incoming uplifts to building regulations – would fail to fulfil the plan's statutory duty to help fulfil the Climate Change Act and would fail to play Greater Cambridge's role in helping the UK fulfil its commitment to the Paris Agreement to limit climate change to 1.5C or 2C.

The plan is [still in its relatively early stages](#) as of May 2022. It completed its First Proposals/Preferred Options consultation in December 2021, from which issues are being explored. A draft of the local plan itself is expected to be released in 2023.

Emerging example: Leeds City Council Draft Local Plan (2023)^{xv}

Policy EN1 Part B requires new development to be operationally net zero.

All development must demonstrate a space heating demand of 15 kWh/m²/year.

Energy use intensity required targets vary significantly between typologies, as set out below:

- All residential development – 35 kWh/m²/year
- Offices, retail, GP surgery, hotels and university facilities – 55 kWh/m²/year
- Schools – 65 kWh/m²/year
- Leisure – 100 kWh/m²/year
- Light industrial uses – 110 kWh/m²/year
- Research facility – 150 kWh/m²/year

On-site renewable energy generation is to deliver an annual net zero carbon balance (including regulated and unregulated emissions).

Additional secondary requirements:

- Calculations must be carried out using an approved building modelling software such as IES-VE, SBEM and PHPP.
- Gas boilers and direct electric resistive heating will not be supported.
- Expected official UK government electricity grid carbon intensity values to be used instead of static SAP10.2 factors.
- Offsetting at a cost of £248/tCO₂ – rising to £280 by 2030 to reflect further predicted grid intensity reductions.

Policy EN1 Part B goes further than similar recently adopted policies, since it prescribes EUI targets for non-residential typologies alongside residential. The policy is also explicitly refers to the use of gas boilers, whereas other policies rely on the energy targets themselves to rule out gas boilers and direct electric heating.



Emerging example: Bristol City Council Draft Local Plan (Publication version November 2023)^{xvi}

Policy NZC2 requires new development to be operationally net zero based on absolute energy limits.

All development will be expected to:

- Achieve a maximum 15-20 kWh/m²/year space heating demand
- Achieve a maximum 35 kWh/m²/year energy use intensity – new homes and other forms of accommodation
- Comply with operational energy/carbon requirements of BREEAM ‘Excellent’ – major non-residential
- Provide on-site renewable electricity generation with an output equivalent to at least the annual energy consumption of the development
- Development should provide onsite renewable energy of 105 kWh/m²fp/year

In the case of Policy NZC2, offsetting is a last resort option for energy use intensity instead of on-site renewable energy generation – price set at £99/MWh or 9p/kWh. See [previous section](#) for further information.

The key policy element here that is unique to similar emerging examples is the expectation of a certain amount of renewable energy based on the footprint of the building. Best practice for this metric is currently 120 kWh/m²fp/year. Setting a target for this ensures that it is easy for planning officers to assess whether a development has truly maximised all available roof space. In most cases, if on-site roof top solar PV generation is predicted to be lower than the target set out, it can be assumed that all opportunities for generation have not been maximised from the earliest stage of the scheme.

Now that confirmed examples and emerging policies have been explored thoroughly, it is clear what the MNP can achieve. The successfully adopted examples above show that the equivalent Maidenhead Neighbourhood Plan policies could include standards on:

- Energy Use Intensity
- Space heating demand
- On-site renewable energy generation
- Potentially an additional technical certification for non-residential buildings such as BREEAM

Emerging example: South Oxfordshire and Vale of White Joint Local Plan (Regulation 19 version October 2024)

The [South Oxfordshire and Vale of White Horse Joint Local Plan](#) (JLP) Regulation 19 version was published in October 2024. The development of this plan is significant as the energy requirements for Policy CE2 is aligned with recommendations from LETI and the Committee on Climate Change.

Proposed Policy CE1 (Net Zero Carbon Buildings) includes the following key requirements:

- Achieve a maximum 15-20 kWh/m²/year space heating demand
- Achieve a maximum energy use intensity of:
 - 35 kWh/m²/year – new homes, warehouses and retail
 - 55 kWh/m²/year – offices and schools
- Where unregulated energy loads for the specific use of a non-residential building may result in a total energy use that exceeds the limits set out above, and this is accepted by the council, applicants are required to demonstrate that regulated energy is limited to 30 kWh/m²/year. Unregulated loads must be justified in an energy statement demonstrating they are as efficient as is reasonable for the use.
- Other building types not listed above are required to achieve a regulated total energy use cap of 40kWh/m²/year. Unregulated loads must be justified in an energy statement demonstrating they are as efficient as is reasonable for the use.
- On-site renewable energy generation is to generate at least the same amount of energy consumption on-site. If on-site net zero balance is not achieved, the on-site renewable energy generation must equate to at least 120 kWh/m²fp/year.
- Energy offsetting as a last resort, to be determined by any shortfall in on-site renewable energy generation.

Additional policy components address:

- Addressing the performance gap through requiring use of Passivhaus Planning Package, CIBSE TM54 and other reputable energy modelling tools.
- Assured performance process to ensure high construction standards.
- Consideration of energy demand management systems.

Policy scenario comparison

To determine what cumulative carbon emissions will arise from different policy scenarios from new housing growth in Maidenhead, this section tests different policy scenarios at various levels to understand what the carbon implications are from not setting a net zero new build policy in the MNP.

Scenarios tested

Energy modelling has been undertaken to determine the cumulative carbon emissions from three policy scenarios, outlined below. The emissions values are derived from internal energy models held by Bioregional.

The two policy specifications proposed in the [Future Homes Standard \(FHS\) 2023 consultation](#) are selected as two of the three policy scenarios to be tested to determine cumulative emissions expected from housing growth in Maidenhead during the Neighbourhood Plan period. Future Homes Standard Options 1 and 2 (FHS1 and FHS2) both include a heat pump, but it is only FHS2 that specifies on-site solar PV. Please see Appendix for details on emissions per year for both FHS scenarios.

In contrast, a policy scenario achieving on-site net zero, which does not wholly align with the requirements of the 2023 WMS because it does not use the Target Emissions Rate metric, is tested as an ambitious and ideal policy scenario. This scenario represents Policy CL-1 from the [draft MNP](#) and is aligned with industry best practice absolute energy metrics and represents a true net zero operational carbon policy by requiring that on-site renewable energy generation is equal to total energy consumption. Although Policy CL-1 does not define precise numerical targets under the current draft edition, it does reference best practice metrics and requires that true on-site net zero is required.

Policy CL-1 has been developed with regard to the RBWM Local Plan [Part 2, 2.1] policy SP2, the March 2021 RBWM Position statement on sustainability and Energy Efficient Design [Part 2, 2.16] and follows the principles in NPPF [Part 2, 1.1] paragraphs 157, 159, 160, 161, 162 and 164.

All policy scenarios will be modelled for a flat archetype and a semi-detached archetype. The semi-detached archetype is assumed to be representative of average emissions of detached, semi-detached and terraced housing. Subsequently, the semi-detached archetype is used to calculate the cumulative emissions of houses in Maidenhead.

For the purpose of this study, it is assumed that all policy scenarios are delivered entirely on-site and there is no use of offsetting to compensate for a lack of on-site mitigation measures. Additionally, this study assumes that all development sites are complete from 2024 as data is not available on when these sites will be operational. Although this will not occur in practice, it ensures that an even comparison of cumulative emissions between policy scenarios is provided.

	FHS Option 1	FHS Option 2	Policy CL-1
Metrics used	Target Emissions Rate (or similar under Home Energy Model ¹)	Target Emissions Rate (or similar under Home Energy Model)	Energy Use Intensity (EUI) and space heating demand
On-site renewable energy generation (i.e. solar PV panels)	40% of ground floor area	None	To match EUI (i.e. total energy consumption)
Net zero building?	Once the grid is fully decarbonised	Once the grid is fully decarbonised	Yes, from year 1
Fully aligned with the 2023 WMS?	Yes	Yes	No

WMS-compliant approach (FHS1 and FHS2)	Policy CL-1 approach
<ul style="list-style-type: none"> Target Emissions Rate metric based on % improvement, not absolute values, which makes comparison difficult due to different baselines used Only considers emissions of regulated energy only (heating, cooling and lighting), not unregulated energy (plug-in appliances) SAP is a compliance tool and does not accurately model energy use Cannot be verified during operation to understand potential energy performance gap between designed and as-built building Not fit for development of true net zero buildings due to modelling inaccuracy 	<ul style="list-style-type: none"> Uses absolute energy-based targets that directly limit energy consumption, which are measurable post-construction by the building occupier at the meter Uses a predictive energy modelling tool (Passivhaus Planning Package) that is proven reduce energy performance gap Supported by industry evidence as a best-practice approach to deliver true net zero buildings Easier to predict impact of design and construction choices on resident's energy bills Prioritises renewable energy on-site, rather than through standalone renewable energy schemes (e.g. solar farms)

¹ It is proposed that SAP will be replaced by the Home Energy Model once the Future Homes Standard is implemented. It is not yet clear whether the Home Energy Model will retain the Target Emissions Rate or not. Whatever the metric used, both FHS options will represent national technical standards.

Housing growth numbers

BLP	Sites within Neighbourhood Plan Area	Allocation	% Built	Not yet built	
				Flats	Houses
AL1	Nicholsons Centre	500	0%	500	0
AL2	Land between High Street and West Street	300	50%	150	0
AL3	St Mary's Walk	0	0%	0	0
AL4	York Road	450	50%	225	0
AL5	West Street Opportunity Area	240	0%	240	0
AL6	Methodist Church, High Street	50	0%	50	0
AL7	Maidenhead Railway station	150	0%	150	0
AL9	St Cloud Way	550	100%	0	0
AL10	Stafferton Way Retail Park	350	0%	350	0
AL12	Land to East of Braywick Gate, Braywick Road	50	50%	25	0
AL13	Desborough, Harvest Hill Road	2600	0%	1170	1430
AL23	St. Mark's Hospital	45	0%	0	45
AL25	Spencer's Farm	331	0%	149	182
AL26A	Osbornes Garage St Marks Road	20	100%	0	0
Windfall housing allowance for Maidenhead ²		1000	0%	700	300
Total		6,335		3,009	1,657
				4,666	

² The overall windfall allowance for the Royal Borough of Windsor and Maidenhead is 1800. The relative contribution from Maidenhead is assumed to be 1000. The 70:30% split of flats and houses for the windfall allowance is based upon the % split of flats and houses from the site allocations in the Neighbourhood Plan Area.

Carbon emissions

Metric	Unit	Apartment (one unit)			Semi-detached		
		FHS 1	FHS 2	CL-1	FHS 1	FHS 2	CL-1
EUI balance after PV (year 1)	kWh/yr	411	3,903	0	1901	4236	0
Net annual carbon (year 1 - 2024)	kg CO ₂ /yr	65	624	0	299	666	0
Total operational carbon emissions (2024-2039)	kg CO ₂	645	6,126	0	2,984	6,649	0

	FHS1	FHS2	Policy CL-1
Cumulative carbon emissions of all housing growth 2024-2039 (kt CO₂)	6.87	29.45	0

Cost uplift estimates

	FHS1	FHS2	Policy CL-1
Capital cost uplift from Part L 2021	4%	1%	5.75%

Capital costs for the policy scenarios were derived from the [FHS 2023 consultation document](#) for FHS1 and FHS2, whilst the costs for the on-site net zero scenario are taken from [Task 4](#) of work previously undertaken for South Oxfordshire and Vale of White Horse District Councils. The net zero scenario costs are determined through initially testing the feasibility of various archetypes ([Task 3](#)) with set specifications to achieve a certain energy performance. The components of the specifications set to achieve the energy performance aligned with Policy CL-1 were costed by consultants Currie & Brown according to current supply chains. Capital cost uplifts vary slightly between archetypes, which can be assessed in the documents linked above.



Discussion

As seen from the results in the table above, both FHS policy scenarios result in significant cumulative carbon emissions from housing growth in Maidenhead from 2024-2039. As Policy CL-1 is a true net zero policy, and the modelling assumes no use of offsetting, there are no net cumulative emissions from this policy scenario, which aligns with the Climate Change Committee Balanced Pathway to Net Zero assumed policy component that all new homes must be net zero by 2025 to be aligned with the UK's 2050 net zero target.

FHS scenarios could eventually be net zero, given they are fully electrified due to the use of a heat pump. However, this will only occur once the UK electricity grid is decarbonised, which cannot be expected to occur before 2030 at the earliest. Industry expectation is that a target date of 2035-2040 is more realistic, yet this is not guaranteed.

Peer-reviewed papers and reports generally suggest that the UK grid could achieve full decarbonisation to net zero by 2035 under optimal conditions. However, this target is contingent on significant policy support, technological advancements, and accelerated deployment of renewable energy sources. For instance, a [report](#) by Aurora Energy Research outlines that achieving net zero by 2035 is possible but requires extensive policy intervention and market reforms.

Therefore, it cannot be relied upon for the FHS scenarios to deliver net zero homes in Maidenhead at the rate required to align with a net zero UK by 2050. This is because the built environment, particularly new buildings, is a sector that is expected to achieve net zero on its own, with little or no carbon offsetting. Subsequently, it is essential that the new build sector does not produce excessive emissions beyond what it should be apportioned in the overall UK carbon budget, given that other sectors are significantly more challenging to fully decarbonise, such as aviation, agriculture and heavy industry.

Given the major challenge of decarbonising the UK's existing building stock, the new build sector must be controlled by the policy that requires net zero emissions as this is a feasible and viable option in most parts of the UK now. Without a robust and effective net zero new build policy, the burden on hard-to-abate sectors will grow increasingly, further exacerbating pre-existing challenges in achieving a net zero UK by 2050.



Appendix: Calculation of cumulative emissions for Future Homes Standard scenarios

Year	Grid carbon intensity (kgCO ₂ e/kWh)	Flat archetype				Semi-detached house archetype			
		Flat energy consumption (FHS1, PV) (kWh/a)	Flat operational carbon emissions (FHS1, PV) (kgCO ₂ e)	Flat energy consumption (FHS2, no PV) (kWh/a)	Flat operational carbon emissions (FHS2, no PV) (kgCO ₂ e)	Semi-detached energy consumption (FHS1, PV) (kWh/a)	Semi-detached operational carbon emissions (FHS1, PV) (kgCO ₂ e)	Semi-detached energy consumption (FHS2, no PV) (kWh/a)	Semi-detached operational carbon emissions (FHS2, no PV) (kgCO ₂ e)
2024	0.157	411	65	3,903	614	1,901	299	4,236	666
2025	0.156	411	64	3,903	608	1,901	296	4,236	660
2026	0.142	411	58	3,903	553	1,901	269	4,236	600
2027	0.127	411	52	3,903	497	1,901	242	4,236	540
2028	0.113	411	47	3,903	442	1,901	215	4,236	480
2029	0.099	411	41	3,903	387	1,901	189	4,236	420
2030	0.100	411	41	3,903	390	1,901	190	4,236	424
2031	0.095	411	39	3,903	371	1,901	181	4,236	402
2032	0.090	411	37	3,903	351	1,901	171	4,236	381
2033	0.085	411	35	3,903	332	1,901	162	4,236	360
2034	0.080	411	33	3,903	312	1,901	152	4,236	339
2035	0.075	411	31	3,903	293	1,901	143	4,236	318
2036	0.070	411	29	3,903	273	1,901	133	4,236	297
2037	0.065	411	27	3,903	254	1,901	124	4,236	275
2038	0.060	411	25	3,903	234	1,901	114	4,236	254
2039	0.055	411	23	3,903	215	1,901	105	4,236	233

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