Sandwell Metropolitan Borough Council

Carbon policy support

Evidence base and policy recommendations

Rev 4.0

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Introduction

Bioregional is appointed to provide Sandwell Metropolitan Borough Council (Sandwell MBC) with an assessment of options available within the local planning system to address climate change in Sandwell MBC to inform Local Plan policy.

Our appointment to support Sandwell MBC in this effort comprised of the following workstreams:

1. **Output 1: Literature review of powers, precedents, existing local carbon and climate strategies – completed**

2. **Output 2: Policy Risk Matrix outlining potential policy options and their associated risks, for example to climate change, planning powers, national technical standards and cost – completed**

A meeting was held on the 3rd July 2024 to review the policy options and the Council subsequently outlined the policy option they wanted progress. This report represents the recommended policy wording and the evidence base to support the recommended policy to support the formation of policy in Sandwell's Local Plan.

The remaining appointment therefore includes:

3. **Output 3: Recommended policy wording and supporting evidence (including an executive summary of the literature review (Output 1)). This report**

4. **Output 4: Offsetting report outlining the considerations Sandwell MBC should consider when setting up any carbon or energy offsetting in combination with net zero planning policy.**

Glossary of terms and acronyms

BRE	Buildings Research Establishment. The UK's building science research institution which develops and/or tests various building products, techniques, standards, and qualifications and data. Originally a UK civil service body, but now independent.
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.
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.
Carbon, or carbon emissions	Short for 'carbon dioxide emissions' but can also include several other gases with a climate-changing effect, that are emitted to the atmosphere from human activities (see 'GHG', below).
Carbon budget	Amount of greenhouse gas that can be emitted by an individual, organisation or geographic area. Usually set to reflect a 'fair share' of the global amount that can be emitted before reaching a level of atmospheric carbon that causes severely harmful climate change.
Carbon intensity/ carbon factors	A measure of how much carbon was emitted to produce and distribute each kWh of grid energy at a certain point in time. For electricity, this has been falling as coal-fired power stations have been phased out over years. It also varies on an hourly basis: at times of high renewable energy generation, the carbon intensity is lower than at points where gas-fired electricity dominates the generation mix.
Sandwell MBC	Sandwell Metropolitan Borough Council
CIBSE	Chartered Institution 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'.
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.

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.
GHG	Greenhouse gas (CO_2 and several other gases: methane, nitrogen dioxide, and fluorinated refrigerant gases). Often collectively referred to as 'carbon'; see above.
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.
IAS	International aviation and shipping. One of the sectors into which carbon emissions are often categorised.
kW	Kilowatt. A unit of energy generation capacity.
kWh	A unit of energy, which can be either generation or usage.
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.
LETI	Low Energy Transformation Initiative. A coalition of built environment professionals working to establish and achieve the energy performance needed for net zero.
MVHR	Mechanical Ventilation with Heat Recovery
MW	Megawatt. A unit of energy generation capacity.
NPPF	National Planning Policy Framework. A central government document laying out how the planning system should function, including plan-making and decisions.
Part L	Building regulations section that sets basic legal requirements regarding buildings' energy and CO_2.
Performance gap	The difference between the amount of energy a building is predicted to use during design, versus the actual amount of energy it uses. The gap is due to poor prediction methodologies, errors in construction, and unexpected building user behaviour.
PV	Photovoltaics: solar panels that generate electricity.
PHPP	Passivhaus Planning Package – a tool to accurately predict a building's energy use. It is used to design buildings that seek Passivhaus certification but can 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).
RIBA	Royal Institute of British Architects.
RICS	Royal Institute of Chartered Surveyors.
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.
SEA	Strategic Environmental Assessment.
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 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.

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Executive Summary of Literature Review

Why must the local plan act on climate change?

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 19[ii]). This duty is further underscored by similar wording in the more recent Levelling Up & Regeneration Act 2023[iii] 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 to the district, but rather to ensure that its local plan reduces the overall amount of carbon emissions of the district. 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.

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 District.

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

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 local plan (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 space heat demand
    - *[Note: Recent energy modelling[vi] shows that this 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 a home that meets the Future Homes Standard, assuming the fabric standard expressed in the indicative FHS specification released by government in 2021 as opposed to the much weaker fabric standard proposed in the two options from the most recent FHS consultation[vii]]*
  - Not be connected to the gas grid
  - Have low-carbon heating such as a heat pump, not gas
  - Ideally be net zero carbon in operation[viii]
  - 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. [ix]
- 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.
- Transport[x]: 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[xi], whereas the 2020 baseline was 13%.

Legislation that defines powers that the local plan may use for carbon reduction

Planning & Energy Act 2008

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' 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.

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[xii].

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 the local plan 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 plan policy proposed.

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.

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'.

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 Borough's stated housing 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:

- 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.

Written Ministerial Statement 23rd December 2023 (WMS2023)

On 13th December 2023, Government released a Written Ministerial Statement (WMS) that undermined many recent precedents for effective local plan policy on carbon, including precents set in Bath and Northeast Somerset and Cornwall.

The new WMS purports 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 purports 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."

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".

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[xiii] 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.

Balance of power between legislation, NPPF and Ministerial Statements

Legislation, and the powers granted or duties imposed by it, cannot legally be undone by national policy.

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 role of the WMS2023 in Local Plan formation is as 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, despite the fact that a WMS can be (and was in this case) made unilaterally without consultation. However, a WMS is not an inviolable requirement. Open legal advice on this topic notes that it has been established in case law 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 what extent is the necessary mitigation being delivered by national regulation or the wider industry, thus negating the need for local plan policies?

Operational energy and carbon: Building Regulations Part L (and the Future Homes Standard)

Building Regulations 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[xiv], or between 23%-54% of a building's operational carbon[xv].

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) which Government has indicated will be introduced in 2025.

Part L works by modelling an imaginary ('notional') building of the same shape and size as the proposed building, with a certain minimum set of building elements applied (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 by the shape and size of the building, as shape and size strongly affect how much heat is lost through external walls, roofs and joins. The FHS will update the standards in that 'notional' building – for example a heat pump instead of gas. However, the latest consultation[xvi] shows it might not improve the insulation or airtightness.

Compliance with these targets is established through a calculation method titled 'SAP', in homes, or '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.

Additionally, the SAP or SBEM calculation methods can be used to extract other pieces of estimated data for a building, such as space heat demand or total energy use (for example, both of those were estimated using SAP10.2 in the 2023 modelling by the Future Homes Hub). However, these other data points are not part of the compliance metrics that Part L requires.

Unfortunately, even for the regulated energy uses, SAP and SBEM are not accurate predictors of a building's actual performance. In operation, buildings have been repeatedly documented to use far more energy than the SAP or SBEM methods predicted[xvii,xviii,xix]. This difference between SAP/SBEM-predicted energy performance and *actual* performance in use is termed in industry the 'Energy Performance Gap'. This is not common knowledge for home renters or purchasers, who may rely on the EPC certificate (which reflects the building's SAP calculation). In particular, space heat demand is dramatically underestimated by SAP[xx,xxi]. This is a real problem for climate mitigation given the aforementioned importance of the 15-20kWh/m^2/year space heat demand within the UK's route to hit its legislated carbon budgets.

Although SAP also contains an 'Appendix L' that tries to calculate unregulated energy use too, this overestimates the unregulated energy use[xxii] because it is based on outdated data about the efficiency of appliances. That data was collected many years ago and does not reflect the much more efficient typical appliances of today. Still, the *over*estimation of unregulated energy use does not fully balance out SAP's *under*estimation of space heat demand and total energy use.

Government has stated that when the Future Homes Standard is introduced, SAP will be replaced with a new model named HEM. As only an early-stage consultation version of HEM has been released to date, it remains to be seen whether HEM will avoid the inaccuracies of SAP.

The current Part L 2021 and FHS do not deliver the 15-20kWh/m^2/year space heat demand limit found to be necessary by the Committee on Climate Change as previously noted. To achieve that limit, improved fabric would be needed. This is true whether calculated with SAP (for example see the Future Homes Hub Ready for Zero report and appendix[xxiii]) or a more accurate energy prediction method[xxiv,xxv]. The 'Ready for Zero' work shows that a building fabric similar to that of the recent FHS consultation would result in a space heat demand of up to 54kWh depending on home type, even before taking into account SAP's underestimation of this.

Despite the Committee on Climate Change recommendation for "rapid and forceful pursuit of zero-carbon new-build"[xxvi], the current Part L 2021 and the FHS do not make buildings net zero carbon. 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. Also, the latest FHS consultation[xxvii] shows that one of the options under consideration would have heating bills twice as high as a current new build home, due to switching from gas to electric heating without improving fabric at all.

Additionally, data on the EPCs (Energy Performance Certificates) of recent new homes in Sandwell shows that Part L 2021 has not so far delivered the promised 31% reduction in carbon emissions compared to the standard that was in place beforehand (Part L 2013), In fact, in Sandwell new build homes, carbon emissions rates since the introduction of Part L 2021 (which came into force in mid-2022) have been on average higher than the period immediately beforehand. The emissions rate remains higher than the level that might have been expected from a projection of the downward trajectory that had followed for the preceding 3 years. See graph, figure 1 below.

There has not been a long period of data and so this trend may change – and the regulations' transitional arrangements and construction lead times mean that a certain time lag is to be expected between introduction of new building regulations and their impact. However, these figures so far fail to lend confidence that Part L uplifts will deliver on their promises, underscoring the need for local policy to go beyond these regulations in order to bring about effective mitigation of climate change.

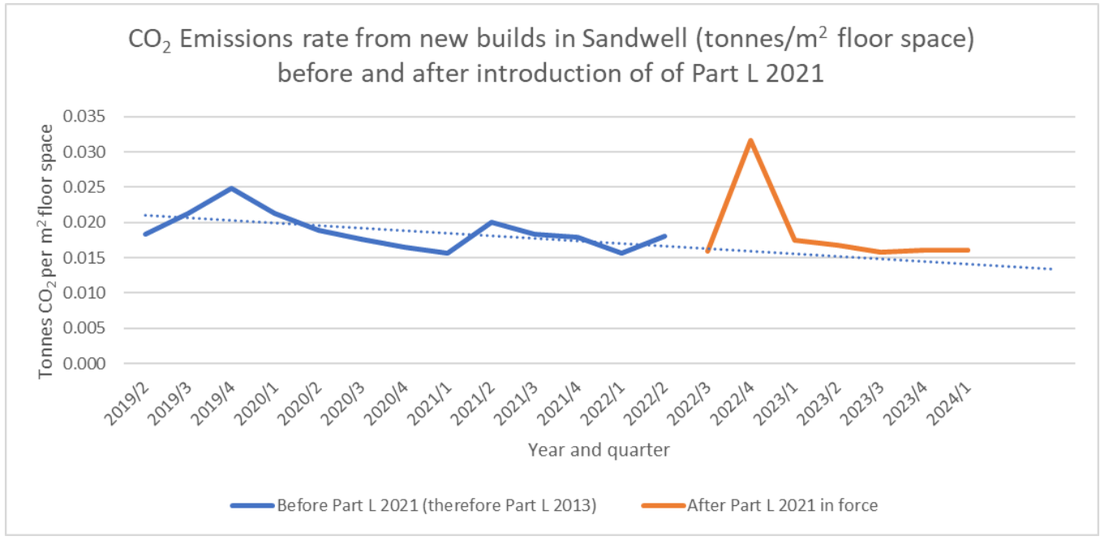


Figure 1: EPC Data from Sandwell MBC's new build completions Q2 2019 – Q1 2024.

Beyond Part L compliance, there are other more accurate methods that are used in the more forward-thinking parts of the buildings industry to better 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.
- CIBSE TM54 (Technical Memorandum 54 by the Chartered Institute of Building Services Engineers). Intended for use primarily with non-residential buildings.

The use of PHPP outside the cutting-edge of the sector is in the minority, but growing. However, TM54 is recognised in Part L 2021 as a suitable method for the 'energy forecasting' that is now legally mandatory for non-residential buildings of 1,000m^2 or greater size[xxviii]. This means TM54 can be said to comply with the Planning & Energy Act definition of 'energy efficiency standards' as ones that are 'endorsed or laid out by the Secretary of State' (paraphrased). However, Part L 2021's requirement for energy forecasting is not linked to the achievement of the actual *targets* set by Part L (TER, TPER, and TFEE, as previously noted).

Regarding embodied or whole-life carbon of buildings: National Government has continued to neglect this despite opportunities to implement it. For example, a forward-thinking industry coalition in the development sector drafted and proposed a "Part Z" to building regulations. This was then put forward by a House of Lords member as an amendment to the Levelling Up & Regeneration Act but was never debated and thus never implemented.

In the absence of any action by national government to introduce mandatory standards for whole-life carbon, the industry has acted to develop these. There is a single formal established standard for the accounting of whole-life carbon (BS/EN15978) and this has been translated into a methodology or 'Whole Life Carbon Assessment' by RICS. In turn, forward-thinking bodies and coalitions within the industry have developed benchmarks and targets using that RICS methodology, differentiated by building type. The prominent examples are the RIBA and LETI aligned carbon targets[xxix]. Given that target-setting policy is necessary on embodied carbon in order to fulfil the UK's carbon budgets, and given the absence of any national government standard with which local policy needs to be consistent, there is a clear role for the local plan to play and no reason why the LETI/RIBA targets could not be adopted if feasible and viable.

Two main types of approach to net zero carbon buildings policy – and their variations, strengths and weaknesses

There are two broad categories of policy that extant and emerging local plans in other local authorities fit into with regards to requiring enhanced energy and carbon performance in new buildings:

- Policy type 1, Using building regulations metrics: Policies that require a % improvement on the Target Emissions Rate that is set by Part L of building regulations (in some cases is a 100% reduction) and/or improvements to be demonstrated in other Part L metrics.
    - Adopted examples: London Plan 2021 policy SI 2; Milton Keynes 2019 policy SC1; Reading 2019 Policy H5, Warwick Net Zero Carbon DPD 2024; many others.
- Policy type 2, 'True net zero operational carbon' using energy-based metrics: Policies set fixed energy efficiency targets in terms of 'space heat demand' and 'total energy use intensity' (EUI), and renewable energy provision to match 100% of the development's total annual energy use. This follows the recommendations of expert green building coalitions LETI and UKGBC.
    - Adopted examples: Cornwall, Bath & North East Somerset; Central Lincolnshire.

In addition to the operational carbon policy types described above, there is one adopted and several emerging local plans that require reporting and/or specific targets in embodied carbon. That is the carbon emitted in order to construct the building (including material extraction, product manufacturing, transport of materials to site, use of energy during construction). In some cases, the 'embodied carbon' can also include the maintenance and eventual demolition/disposal of the building at end of life – in which case the scope is termed 'whole life embodied carbon'. If the 'embodied carbon' scope is only considered up to building completion, that is termed 'up-front embodied carbon'.

There is no current national building regulation that regulates embodied carbon, nor any nationally described standard for reporting it. However, the industry has developed its own standards for reporting on embodied carbon (the RICS Whole Life Carbon Assessment methodology). The London Plan is the most well-known adopted example that requires whole-life carbon reporting, yet it does not set any targets that must be met. The only precedent plan that we are aware of that sets such a target is Bath & North East Somerset (B&NES) Local Plan Partial Update (adopted 2023).

Sandwell MBC's current carbon emission and trajectory

Tyndall Centre local area carbon dioxide budgets (and SCATTER trajectories)

The Tyndall Centre is a climate change research organisation made up of several UK universities working to get climate science evidence into policy. It created a tool that produces municipal-level carbon budgets towards a 2˚C global climate pathway that are necessary and fair, taking into account each location's sectoral base by looking at its historical portion of the country's emissions.

These trajectories show the UK's total CO2 budget to 2100 if the UK is to pull its weight towards fulfilling the Paris Agreement (to limit global warming to 2˚C, with carbon cuts equitably distributed to each country in proportion to its technological and financial capability, its needs, and its responsibility for historic emissions). This starts with the middle-range global carbon budget likely to limit global climate change to "well below" 2˚C, determined by the IPCC. The Tyndall Centre derives the CO2 budget for the UK from this global budget, based on equity principles that account for our existing level of development and sectoral base, and the local budget is derived from the UK one. The resulting totals are split into five-yearly budgets. The Paris-compliant carbon budgets for Sandwell are shown here (Figure 1) and would be used up by the end of 2026 if emissions continue at the 2017 level.

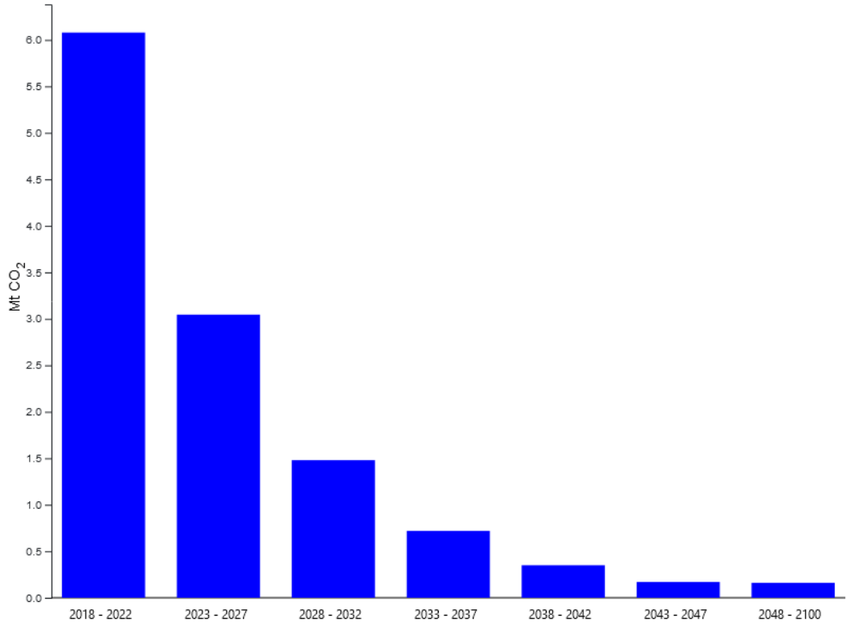


Figure 2: Sandwell's carbon budgets to 2100 (energy-only, CO2 only) compliant with the UK's commitment to the Paris Agreement. Calculated by the Tyndall Centre.[viii]

The Tyndall Centre's recommended pathways to net zero within the Sandwell carbon budgets are represented in *Figure 2, respectively*. To avoid exceeding the Tyndall carbon budget, Sandwell emissions would need to fall sharply starting from the 2018 baseline. This pathway amounts to a required annual 13.1% reduction to energy-related CO_2.

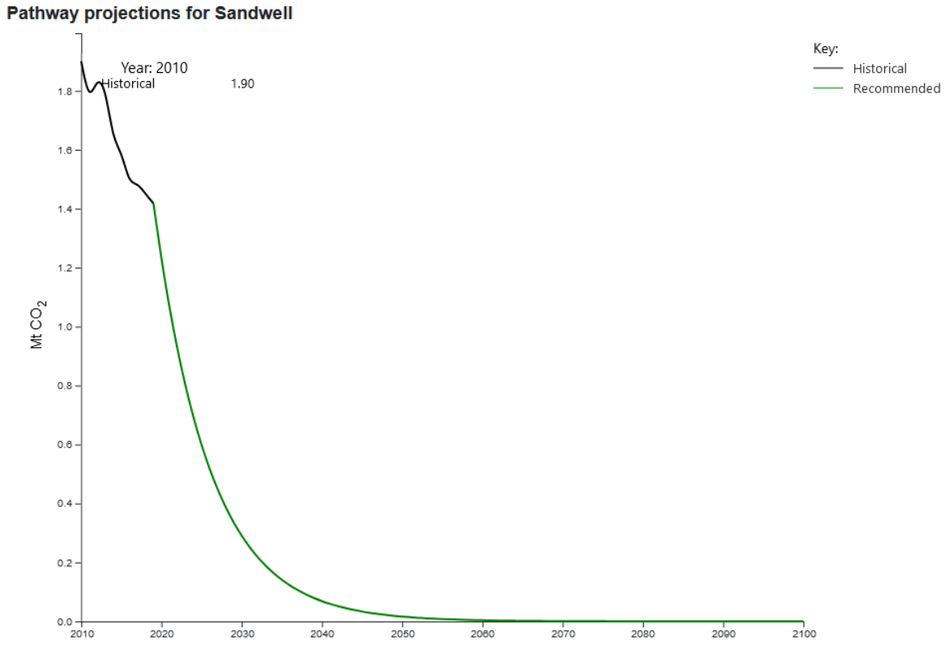


Figure 3: Emissions reduction pathway for energy-only CO2 emissions to fulfil carbon budgets for Sandwell from 2018 to 2100 compatible with the Paris Agreement. Tyndall Centre (2023).

The challenge of bringing forward net zero carbon new buildings, scaling up retrofit of existing buildings, and decarbonising transport and the wider energy system, will not be possible without the support of the local plan. By shaping what kind of development happens and where, the local plan can help to realise Sandwell's ambitions.

A local plan that achieves dramatic carbon reductions will help to avoid contributing to the risk of Sandwell's residents being impacted by financial and health-related harms that would come with climate change.

Sandwell MBC's Climate Emergency

In recognition of the urgency to tackle climate change, Sandwell Council declared a Climate Emergency in 2020. SMBC have committed to:

- be a carbon-neutral Council by 2030
- be a carbon-neutral Borough by 2041

Working together with residents of Sandwell during an eight-week public consultation on climate change and air quality in early 2020, Sandwell MBC understood that that many participants were very concerned about these topics. This helped shape Climate Change Strategy and Action Plan.

Key headlines and suggested commitments made within this Climate Change Strategy and action plan document include, of which the most relevant to planning:

- **Promoting Renewable Energy:** Integrating renewable energy measures like solar panels into new council homes
- **Climate-Conscious Procurement:** Considering climate change during council contract assessments (construction, maintenance, refurbishment) aligns with the National Planning Policy Framework (NPPF) that emphasises sustainable procurement in construction projects.
- **District Heating Exploration:** Investigating heat networks, which efficiently distribute heat from a central source, is supported by the NPPF's encouragement of low-carbon and renewable energy sources in heat provision.
- **Resident Engagement:** Continuing partnerships with energy-saving schemes for residents.
- **Private Sector Influence:** Encouraging private landlords and residents to improve the energy efficiency of their homes through grants and schemes.
- **Regional Collaboration:** Working with the Combined Authority to influence the design of new buildings and reduce the carbon impact of construction supply chains aligns with the NPPF's call for collaborative planning at a regional level.
- **Circular Economy Platform:** Creating a platform for local businesses to interact and support the circular economy aligns with the NPPF's encouragement of efficient use of resources and promoting the circular economy where feasible.
- **Eliminating Landfill Waste:** Investigating ways to eliminate the remaining 7% of landfill waste demonstrates Sandwell's commitment to diverting waste from landfills and maximising resource recovery, a key principle of the circular economy.
- **Energy Innovation Zones:** Considering the potential location of Energy Innovation Zones (EIZs) aligns with the NPPF's encouragement of innovation in low-carbon technologies and infrastructure.
- **Low-Carbon Vehicles:** Encouraging the use of lower-carbon vehicles through policies and infrastructure development
- **Vulnerability Mapping:** Developing a GIS mapping system to identify areas with the most vulnerable residents during climate events aligns with the emphasis on using spatial data to inform planning decisions and identify areas at higher risk.
- **Policy Review:** Evaluating current planning policies to ensure they align with climate adaptation objectives, including flood risk management, aligns with the NPPF's requirement for planning policies to be kept up to date and reflect the latest climate change projections.
- **Natural Capital Regulations:** Establishing regulations regarding natural capital in new developments and ensuring replacement for tree loss aligns with the NPPF's requirement for planning policies to protect and enhance biodiversity and deliver environmental benefits.

The Strategy should also be read alongside regional documents including:

- West Midlands Climate Change Adaptation Plan 2021-26[xxx] – This plan was produced by Sustainability West Midlands (a nonprofit membership organisation with members in the private, public and third sectors) in collaboration with the Environment Agency. This document's purpose is to set out "the climate change adaptation actions that should be considered for implementation by decision makers in the West Midlands, to ensure that our natural environment, people, infrastructure, buildings and businesses are prepared for the impacts of climate change, including greater incidence and severity of flooding, a higher likelihood of water scarcity and more intense and prolonged heatwaves".
- West Midlands Circular Economy Route Map (2021) – this recognises the vital role the region has to play in promoting decarbonisation of the manufacturing sector and opportunities within the green industrial revolution

The Climate Action strategy serves as a roadmap for Sandwell to make its fair contribution to tackling climate change by achieving carbon neutrality.

Summary of policy objectives

To summarise the key ingredients for a policy that would ensure it thoroughly fulfils the local plan's legal duty to mitigate climate change:

- **New development's energy demand must be minimised** so as to minimise the needed amount of new renewable energy generation and grid reinforcement, given that all other sectors' net zero transition (e.g. transport and industry) will also place high demands on the UK's finite capacity for renewable energy, and other land uses (e.g. afforestation and farming) – considering the limited land supply and the embodied carbon of new energy equipment. This energy efficiency is also vital to protect people from excessive energy bills in the ongoing cost of living crisis.

- **New development should not use fossil fuel on site** given that the UK needs to transition its building stock away from gas, not add new gas users to the grid – and also given that heat pump technology exists that is three times as efficient as gas

- **New development should ideally come with enough new renewable energy generation to 'wash its own face'**, so that it does not worsen the existing huge challenge of weaning existing buildings, transport and industry off fossil fuel to electricity – when this condition is met, the building is 'net zero carbon in operation'. Evidence found in other existing and emerging local plan precedents elsewhere (Uttlesford/Essex, Greater Cambridge, South Oxfordshire &Vale of White Horse, Central Lincolnshire, Cornwall, Bath & North East Somerset) showed this is feasible in an array of typical types of building, so long as the building is energy efficient as above. However, the extent to which this can be pursued may depend on what can be achieved within the constrained viability picture in Sandwell; this is explored later in the policy recommendations and appendix.
- **The energy/carbon metrics used in Building Regulations are unsuited to deliver the performance described above** therefore other more accurate methods are needed. As the national carbon budgets are absolute, the performance standards for new buildings should also be absolute limits, not percentage improvements on standard practice.

- **Therefore the ideal policy for climate purposes would adopt absolute targets** for space heat demand, total energy use intensity per square metre, and 100% renewable energy on site (or payment towards off-site installation), and that all of the above should be demonstrated using an energy modelling approach known to be typically accurate in predicting the building's total energy performance. This approach has been taken in several successfully examined and adopted local plan precedents (Central Lincolnshire, Cornwall, Bath & North East Somerset) albeit these were examined and adopted prior to the Written Ministerial Statement 2023.

- **In light of the Written Ministerial Statement of December 2023, the robustness and thoroughness of evidence on feasibility and viability will be even more vital** in order for any energy efficiency policies to successfully pass examination.

- **A truly comprehensive plan for buildings' climate mitigation would also include mandatory reporting and targets for embodied carbon.** Embodied carbon policies are not affected by the Written Ministerial Statement 2023. However, the local planning authority will need to exercise its own judgement on what size threshold would be reasonable to require either reporting or targets, using the local authority's insight into the typical size and type of development in the area and the viability headroom to cover the cost of an embodied carbon assessment

Policy recommendations

Sandwell MBC has been informed on a range of potential broad policy options in light of the 2023 WMS in addition to the range of other material considerations and evidence.

The previous exploration of the three different policy approaches addresses the requirement of local plans to explore reasonable alternatives prior to selecting a preferred policy suite. The approaches were assessed by on determining risk levels on the following topics:

- Planning powers
- Climate impacts
- Cost and future disruption to occupants
- Impact on grid capacity/infrastructure
- Ability of Development Management to assess policies
- Sector readiness
- Viability/capital cost
- Compatibility with national approach [e.g. policy goals, legislated goals, and technical standards]

The options that have been presented to Sandwell MBC are displayed in the diagram overleaf and contained in full in Output 2: Policy Matrix.

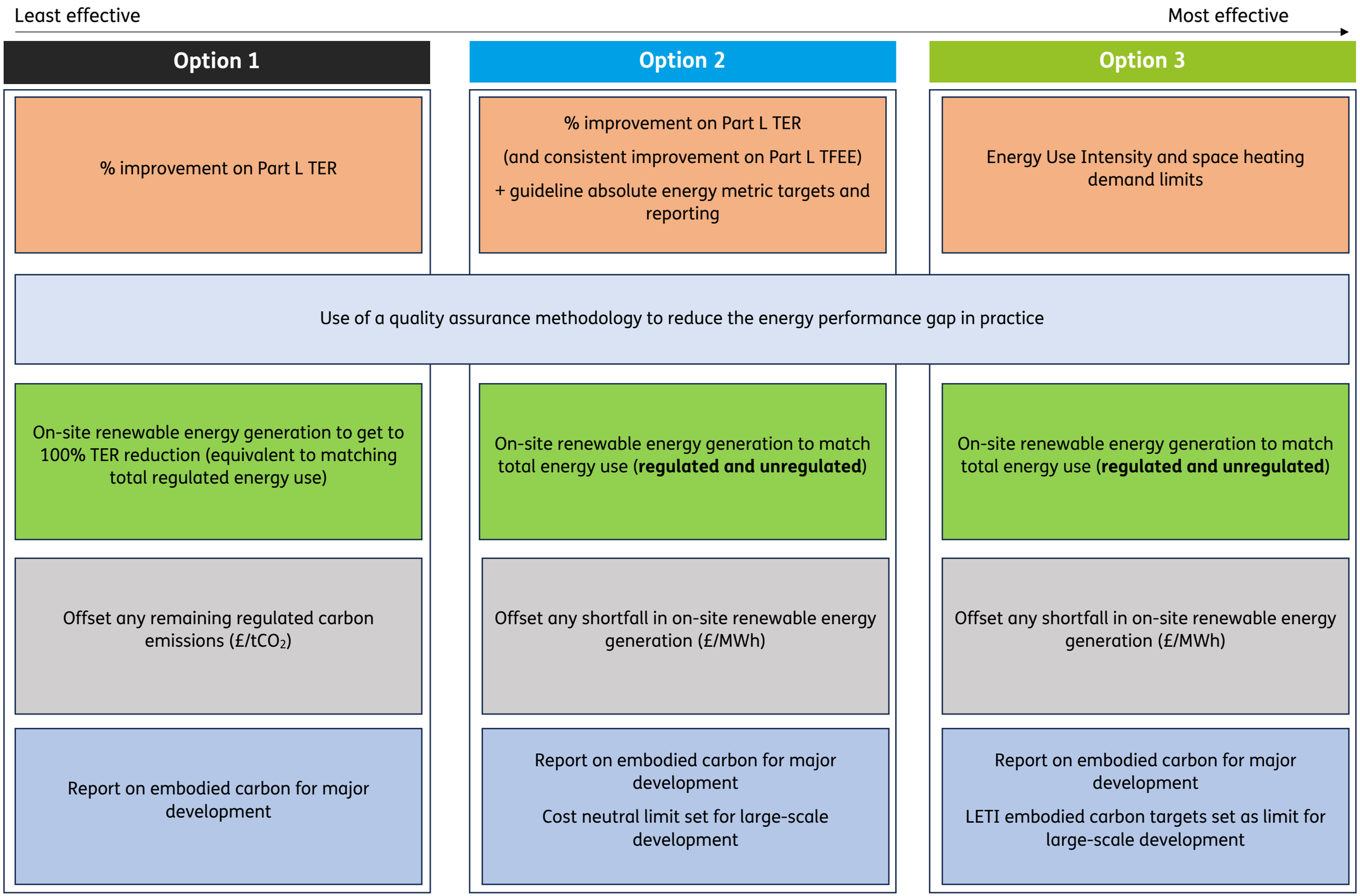
Upon review of the issued outputs and further liaison between Bioregional and Sandwell MBC, **Option 1 with some elements of Option 2 has been selected by Sandwell MBC as the preferred policy approach.**

Option 1 and elements of Option 2 was selected by Sandwell MBC as a result of balancing risk levels among topics. The decision made by the Council considered the cost of implementing each policy approach in recognition of the challenges of viability with the Borough. The Council have come to a balanced decision on the ambition of the policy approach based on the overall costs to development, and seeking to ensure that occupiers are protected from high running costs.

The Council have also balanced their decision on the policy approach against 'planning powers' and 'compatibility with national approach' particularly relating to the 2023 WMS. The significant weight given to the 2023 WMS in selecting a preferred policy approach reveals the negative impact the WMS is having on the ability of local authorities to pursue best practice policies. Such policies, as had been outlined under Option 3, are now at risk due to the release of the 2023 WMS The perceived constraints of the 2023 WMS have led Sandwell MBC to select a reasonable policy approach – Option 1. Industry consensus is that policies as per Option 3 should still be pursued and are defensible at examination. However, the current planning risks associated with Option 3, as determined by Sandwell MBC, deemed Option 3 unsuitable.

The recommendations presented in this report have since been refined from the previous indicative options, following extensive secondary evidence research. In some cases, indicative policies have been amended to ensure the requirement is feasible and likely to be viable.

Lastly, the resulting draft policies detailed later in this report represent a combination of the energy efficiency approach of Option 2, and a lesser target for renewable energy provision than this Option originally contained. This is due to the constrained viability situation within Sandwell, in which the full achievement of Policy 2 was thought to be unviable after a costing exercise was undertaken which turned out to significantly exceed the given cost uplift allowance set by Sandwell's 2023 viability assessment. The draft policies' renewable energy requirement therefore has been designed to fit within that given cost uplift allowance, after the cost of achieving the energy efficiency requirements. As a result the policy is not 'net zero' in any sense, but represents the maximum ambition that can be pursued within the given cost uplift allowance (without using metrics or standards that would unacceptably raise planning risks by diverging from the Written Ministerial Statement 2023 as previously outlined). This approach to setting the energy efficiency and PV targets, and the associated costs, are explained in a separate appendix to the current report.


Least effective
Most effective
Option 1
Option 2
Option 3
% improvement on Part L TER
% improvement on Part L TER
(and consistent improvement on Part L TFEE)
+ guideline absolute energy metric targets and reporting
Energy Use Intensity and space heating demand limits
Use of a quality assurance methodology to reduce the energy performance gap in practice
On-site renewable energy generation to get to 100% TER reduction (equivalent to matching total regulated energy use)
On-site renewable energy generation to match total energy use (**regulated and unregulated**)
On-site renewable energy generation to match total energy use (**regulated and unregulated**)
Offset any remaining regulated carbon emissions (£/tCO2)
Offset any shortfall in on-site renewable energy generation (£/MWh)
Offset any shortfall in on-site renewable energy generation (£/MWh)
Report on embodied carbon for major development
Report on embodied carbon for major development
Cost neutral limit set for large-scale development
Report on embodied carbon for major development
LETI embodied carbon targets set as limit for large-scale development

Relevant policy themes

Adaptation and Mitigation

Local planning policy can ensure that new developments mitigate against climate change by reducing the anthropogenic effects which lead to climate change, e.g. greenhouse gas emissions, and adapts to the effects of climate change by ensuring development is resilient to changes in climate.

Mitigation and adaptation can therefore be considered under a subset of topics, and ultimately forms these policy recommendations:

Operational carbon

Operational carbon is an area of policy development where the local plan can push boundaries and ensure the provision of buildings that are fit for the future, both in terms of reduced energy consumption and holistic integration of design decisions that address climate adaptation.

As already explored in this report, recent examples have detached from the previously typical CO_2 % reduction approach that had been driven by metrics used for Building Regulations compliance. However, due to newborn constraints posed by the 2023 WMS, Sandwell MBC has decided to select a policy approach based on Building Regulations and its metrics.

The key metric utilised for operational carbon is the Target Emissions Rate (TER) used for Building Regulations, which represents the annual carbon emissions from a building. Since the 2023 WMS only applies to local energy efficiency standards, not renewable energy, the policy recommendations below focus on a TER within an energy efficiency focus. The subsequent stage to assessing energy efficiency improvements through the TER is then to require that on-site renewable energy matches total regulated energy use – this effectively achieves a 100% TER reduction. Option 2 goes one step further to require that unregulated energy use is also met by on-site renewable energy generation.

As with any well-designed building, the lower the total energy use, the less on-site renewable generation is needed to reach an on-site net zero energy balance. Generation is most easily achieved via rooftop PV. A key step to maximise energy consumption mitigation is to reduce the space heating demand – closest aligned to the Dwelling Fabric Energy Efficiency (DFEE) rate in SAP – to ensure that the building is demanding as little energy as possible to comfortably heat the building. Space heating demand is agnostic to any technology that requires powering within a building; rather the space heat demand metric is a measure of how many units of heat are required to provide sufficient comfort levels for occupants of the building. Whatever technology is used, whether this is a heat pump or gas boiler, will not change the space heating demand value as it is solely based on the fabric efficiency of the building.

Due to the 2023 WMS constraints, it is not possible to confidently set a space heating demand or a DFEE requirement in policy. However, it remains essential that developers prioritise these metrics and subsequent total energy consumption to best ensure that on-site renewable energy can feasibly match total regulated energy use. If the energy use of the building is not mitigated in the first instance, on-site renewable energy generation will likely not be sufficient to deliver a net zero building.

Sustainable Design and Construction

The way in which a building is designed is integral to its performance, energy demand, occupant experience and bills, and its overall environment impact.

This is often presented as holistic design measures which include consideration to building form and orientation, passive solar design, thermal massing, fabric efficiency, air tightness, urban heat island effect, green and blue infrastructure, and material and waste management through construction.

In addition to the section on embodied carbon below, there is due consideration to the management practices of construction to minimise waste and lower embodied carbon. This would supplement other emerging policy for resource management.

Embodied carbon

Operational energy policy requirements are gradually becoming more consistently set at levels necessary to align with UK carbon budgets and its eventual 2050 net zero target. However, as operational energy and carbon are reduced, the proportion of embodied carbon becomes larger than ever as a share of the building's lifetime carbon emissions. This means that reductions to embodied carbon will require increased attention going forward.

As explored in the 'Defining net zero' chapter of this report, the definition of net zero is key when considering operational and embodied carbon, since a truly net zero carbon building (over its entire lifetime) would require zero embodied and operational carbon emissions. The vast majority of nominally 'net zero' buildings today only consider operational emissions. In working towards a wholly net zero carbon building, local plan policy would need to address embodied carbon with equal weight, if not more, than operational energy/carbon policy.

A number of local authorities have now implemented embodied carbon policies that require reporting for development above a certain threshold, typically only larger development. However, where viability allows, requirements for embodied carbon targets to be hit should be promoted and integrated into local plans.

Overheating and cooling

Similarly to embodied carbon, the link between overheating and operational energy is becoming ever important and must now be put at the forefront of local plan policy, simultaneously with operational energy and embodied carbon policies.

As climate change impacts worsen, particularly more extreme and more variable temperatures, the need for overheating assessments to be undertaken for new buildings is crucial for current and future occupant comfort. In particular, new buildings that meet ambitious space heating demand requirements (previously described) will be at increased risk of overheating due to the ability of the building to retain heat well. Clearly, throughout winter this is a key comfort benefit, yet during

summer this can result in the opposite effect if not otherwise mitigated with measures to enhance ventilation and avoid excess solar gain, in warmer months. It is therefore paramount that overheating risk is sufficiently assessed and integrated into decisions throughout design stages to ensure high fabric efficiency standards are not achieved at the detriment of internal comfort and temperature levels.

In addition to addressing overheating with building-related measures, overheating mitigation measures can also be integrated alongside blue and green infrastructure policies. Benefits here are further intertwined, whereby overheating risks can be mitigated whilst also improving the biodiversity of a site. For example, green roofs, walls and trees are effective at reducing surface temperatures through natural shading and evapotranspiration.

Overheating mitigation design work should also have consideration to the cooling hierarchy and ensuring that new development doesn't increase reliance on active and mechanic cooling systems, which in themselves require energy to power them.

Flood Risk and Drainage

Mitigating against flood risk is a key part of policy to ensure that developments are resilient to the current and future impacts of flooding.

Firstly, it is crucial that new development takes a risk-based approach to the location of new homes and employment land to ensure that future occupants are not at risk of flooding. Siting new development in locations with the lowest level of flood risk seeks to ensure that impacts from flooding is less than in more vulnerable locations, which has significant benefits to occupants, but also from a resource perspective in the need for flood defences, adapting buildings to flooding, or in rebuilding after flood events.

A key part of sustainable design is the incorporation of sustainable surface drainage. Climate change projections for rainfall estimates that rainfall events will increase in frequency and intensity as the climate warms, therefore it is essential that new development adequately manages surface water to ensure that it does not negatively impact occupiers of the development and would not increase the level of flood risk in this location or elsewhere. Sustainable drainage systems that mimic natural conditions or can limit surface water discharge are necessary to ensure that flood risk is not increased.

Outline of recommended policies

The following policy recommendations have been split up according to development type or policy theme. This mix seeks to best ensure utmost ease of policy implementation, considering the roles of developers/applicants and the Development Management team to respectively demonstrate and assess policy compliance.

This section sets out policy recommendations for:

1. **Reducing regulated operational carbon in new build residential development**
2. **Reducing regulated operational carbon in new build non-residential development**
3. **Climate-adapted design and construction, including overheating**
4. **Embodied carbon**
5. **Flood Risk**
6. **Sustainable Drainage**

Beneath each of the above policy recommendations, we provide commentary assessing the following:

- **Scope for future improvements in next local plan review**
- **Alignment with national policy (including 2023 WMS)**
- **Implementation considerations**
- **Development industry capability to deliver policies**
- **Development Management capability to assess policies**
- **Costs and feasibility**

Please note that a separate appendix also provides a summary table directly linking each policy component directly to the corresponding rationale, alignment with national policy, evidence on feasibility, and evidence on cost. This is separated into an appendix in order to avoid making the main report policy recommendations section too lengthy and unwieldy with excess detail.

In addition to policy recommendations for buildings standards and renewable energy, Sandwell MBC have also asked us to consider the other policies in the climate change chapter, which include flood risk and drainage. As such, policy recommendations for these topics are included, alongside explanation of the changes.

Lastly, to ensure that the recommended policies align more widely with emerging planning policy, the final section considers the relationship of the proposed policies with other Reg 19 policies (provided by the Council at the start of our appointment) as to inform the Council on the relationship with policies when the Local Plan is being formed or amended in the future.

Reducing operational carbon in new build residential development (SCC1)

All new build dwellings (use class C3 and C4) are required to submit an energy statement demonstrating that the development meets the following requirements:

SCC1.1. Building Efficiency - Part L % improvement	≥63% improvement (reduction) on Part L 2021 TER (Target Emissions Rate), from energy efficiency measures. Heat pumps are to be calculated as an energy efficiency measure, rather than a renewable energy measure. As a measure in aid of this TER target, achieve an improvement (reduction) on Part L 2021 TFEE (Target Fabric Energy Efficiency) as follows: • End terrace: ≥12% • Mid terrace: ≥16% • Semi detached with room in roof: ≥15% • Detached: ≥17% • Bungalow: ≥9% • Flats / apartments: ≥24% (weighted average, whole block). All of the above should be calculated using SAP10.2 or later version (or the Home Energy Model, HEM, once it is implemented).
SCC 1.2 Alternative compliance	Positive weight will be given to development proposals that demonstrate the following absolute energy metrics: • Energy Use Intensity: 35 kWh/m^2/year • Space heating demand: 15 kWh/m^2/year Performance in these targets must be evidenced using a methodology that accurately predicts buildings' operational energy use. Suitable methodologies include PHPP. Where a building achieves Passivhaus certification, it will be deemed to have complied with these targets. Where Policy SCC1.2 is demonstrated to be achieved, it will be assumed that Policy SCC1.1 is also achieved, as the Policy SCC1.2 targets reflect an improved and preferable standard that more robustly reflects actual energy performance.
SCC 1.3 Clean energy supply	The use of fossil fuels and connection to the gas grid will not be considered acceptable. Major developments (residential development of 10 or more dwellings) should include an assessment of decentralised energy networks within the Energy Statement. This assessment should outline existing or planned decentralised energy networks in the vicinity of the development and should assess the opportunity to connect to them. Where there is an existing or imminently planned network, the general expectation to pursue a connection may be waived if it can be demonstrated that the development is not suitable, feasible or viable for district heat or decentralised energy networks, or that an individualised solution would result in lower overall carbon emissions than connecting to the decentralised network, taking into account that network's carbon emissions factors. For developments over 100 dwellings, applicants are expected to identify and address: - Current or proposed major heat supply plants, or networks (for example, industrial uses, data centres) - Possible opportunities to utilise energy from waste, or waste heat from an industrial process - Opportunities for private wire electricity supply from renewable sources - Utilisation of natural and engineered heating or cooling systems.
SCC 1.4. On-site renewable energy	On-site renewable electricity generation is required to match, at a minimum, 39% of regulated energy (residual energy use in kWh after SCC1.1 has been achieved). Positive weight will be given to applicants who can demonstrate an on-site energy balance, whereby on-site renewables match regulated, and unregulated energy demand. Where full compliance with the 39% target is not feasible or viable having regard to the type of development involved and its design, proposals must demonstrate through the energy statement that renewable energy technologies have been provided to the greatest extent feasible and viable. Where for technical reasons it is not possible to meet the target of 39% described above[1], it should be demonstrated that the amount of on-site

[1] Exceptional circumstances where the renewable electricity target (as 39% of regulated energy use) is not achieved may only be found acceptable in some cases, for example with taller flatted buildings (4 storeys or above) or where overshadowing significantly impacts solar PV output.

	renewable energy generation equates to **>35 kWh/m²projected building footprint/year**. Where a building in a multi-building development cannot individually achieve the requirements of point 1.4, this shortfall is to be made up across other units on-site before carbon offsetting (point 1.5) is considered. Large-scale development (50 residential units or more) should demonstrate that opportunities for on-site renewable energy infrastructure (on-site but not on or attached to individual dwellings), such as solar PV canopies on car parks, have been explored. Regulated and unregulated energy use can both be calculated with Part L SAP or BREDEM, but a more accurate method such as PHPP is advised. Any other proposed methods are subject to Council confirmation of acceptability. The annual renewable energy generation and the annual energy use are whole-building figures, not per-m² figures (except for the renewable energy generation fallback target of 35kWh which is per m2 of building footprint, and not floor space). Renewable energy output should be calculated in line with MCS guidance for the relevant technology (expected to be PV in most cases).
SCC 1.5 Energy offsetting	Only in exceptional circumstances and as a last resort where it is demonstrably unfeasible to achieve a provision of on-site renewable electricity generation equivalent to 39% of regulated energy demand, any shortfall in on-site renewable energy generation that does not match that 39% target is to be offset via **S106 financial contribution,** reflecting the cost of the solar PV that will need to be delivered off-site. The energy offset price is set as £1.37/kWh, based on cost of solar PV data from the Department for Energy Security and Net Zero. The price should be revised annually. This is set as a one-off payment, where the annual shortfall in on-site renewable energy generation is multiplied by the energy offset price. This amount does not need to be multiplied by any number of years.
SCC 1.6 Reduced performance gap	For major development, an assured performance method must be implemented throughout all phases of construction to ensure operational energy in practice performs as close as possible to predicted levels at the design stage.
SCC 1.7 Smart energy systems	Proposals should demonstrate how they have considered the difference (in scale and time) of renewable energy generation and the on-site energy demand, with a view to maximising on-site consumption of energy generated on site and minimising the need for wider grid infrastructure reinforcement.
	Where the on-site renewable energy generation peak is not expected to coincide with sufficient regulated energy demand, resulting in a need to export or waste significant amounts of energy, major proposals should demonstrate how they have explored scope for energy storage and/or smart distribution systems. The purpose being to optimise on-site or local consumption of the renewable energy (or waste energy) that is generated by the site. Where appropriate, feasible and viable, major proposals should demonstrate that they have integrated these to optimise these carbon- and energy-saving benefits and minimise the need for grid reinforcements. This may include smart local grids, energy sharing, energy storage and demand-side response, and/or solutions that combine elements of the above.
SCC 1.8 post-occupancy evaluation	Large-scale development (50 units or more) is to monitor and report total energy use and renewable energy generation values on an annual basis. An outline plan for the implementation of this should be submitted with the planning application. The monitored in-use data are to be reported to the local planning authority for 5 years upon occupation.
SCC1.9 Viability	Where compliance with the suite of requirements in SCC1.1-SCC1.5 is unviable, applicants are expected to prioritise and deliver the fabric efficiency improvements (SCC1.1) first, before demonstrating that on-site provision of renewable energy (SCC1.4) and offsetting (SCC1.5) is unviable. Applicants are required to submit a Viability Assessment demonstrating why it is not viable to comply with SCC1.1-1.5, and outline in the Energy Statement how the policy is met to the greatest extent possible.

Supporting text and notes

Policy elements SCC1.1, SCC1.2, SCC1.3, SCC1.4 are to be addressed at design and post-completion stages, to ensure that the development has been built to intended standards. Post-completion resubmission of the original energy statement including energy performance calculations, informed by the relevant tests to systems and fabric, should be required as a condition as part of the planning application process. SCC1.6 and SCC1.8 compliance should also be demonstrated post-completion through planning condition.

SCC1.1, SCC1.4 and SCC1.9 are to be demonstrated at planning application stage through submission of an energy statement (and corresponding Viability Assessment if required), which should include associated output reports from energy modelling software (e.g. SAP, BREDEM, PHPP, or HEM when available for general use).

About fabric efficiency under step SCC1.1

Applicants are expected to target reductions in the energy demand in buildings under SCC1.1; a minimum 63% improvement is sought. Reducing the total energy demand of a building will reduce

the overall provision of renewable energy required by SCC1.4. The Council should expect applicants to deliver energy savings under SCC1.1 to the greatest extent before renewable energy provision is designed, or if offsetting is proposed.

In addition, where it is not feasible or viable to deliver the required renewable energy generation to meet SCC1.4, the Council should expect that applicants reduce the energy demand of the building(s) to the greatest extent possible. This seeks to ensure that the building reduces its energy demand first and operational costs are minimised for occupiers.

About the non-mandatory energy targets in Policy SCC1.2

Achievement of these energy efficiency performance levels will reduce the amount of solar PV required under SCC1.4. This can save the applicant costs in renewable energy provision and/or energy offsetting.

Performance against these non-mandatory targets would need to be calculated using a method that accurately predicts energy use. SAP is not suitable for this due to its poor predictive accuracy. PHPP is a suitable methodology. The Council may subsequently take a view on whether the incoming Home Energy Model (HEM) may be suitable, when HEM's final form is known.

Steps to calculating and narrating amount of renewable energy provision

Policy SCC1.4 should contain the following steps, to be expressed in an energy statement:

- First calculate the predicted annual regulated energy use in kWh for all proposed new buildings (whole buildings, after all the measures proposed in the application towards compliance with Policy SCC1.1). This is energy at point of use (not 'primary energy demand').
    - This can be modelled using SAP, BREDEM (the methodology on which SAP is based), or PHPP. PHPP is the preferred model due to its accuracy, to avoid SAP's inaccuracies at predicting actual energy use in operation (SAP underestimates space heat demand, and total energy use, but may overestimate hot water use). The Council may later take a view on whether the incoming Home Energy Model (HEM) is a suitable method for energy use prediction when the final form of HEM is available.
- Then calculate the annual renewable energy generation for whole site in accordance with the MCS guidance for the relevant renewable energy technology (anticipated to be solar PV in most cases as this is typically the most suitable technology in an urban setting). This does not have to be exclusively on the buildings themselves, and can include provision of new standalone renewable energy installations within the site. The figure does not include renewable heat delivered by heat pumps, as that would count instead towards Policy SCC1.1.
- Divide the total annual renewable electricity production by the total regulated annual energy use.
- If the result does not meet at least 39% of regulated energy, explore how to provide more on-site renewable energy (for example through an adjustment to roof orientation, and ensuring PV area provision has been explored up to at least equivalent of 15% of projected building footprint including roof overhangs and with reasonably efficient panels available on the market).
- If it proves unfeasible to increase renewable energy generation on-site to result in an annual balance of energy generation with energy use, then divide the total annual renewable energy generation by the building footprint. This result should be at least 35kWh. If this is impossible, provide evidence as to why this is not possible even with a PV area equivalent to 15% of projected building footprint (or explanation of why that cannot be provided) and reasonably efficient panels available on the market.
- Calculate the residual energy demand (whole building, not per m^2) for all proposed new buildings after all measures proposed towards policies SCC1.1-SCC1.4, then proceed to use this figure to calculate the required amount of offsetting provision in policy A4.

About the offsetting calculation

This is a one-off payment, where the annual shortfall in on-site renewable energy generation is multiplied by the energy offset price. Because the kWh energy use of the home, and the kWh of energy generation that the offset fund will install, are both annual figures, this amount does not need to be multiplied by any number of years.

The requirement for offsetting may be applied flexibly where it is demonstrated that this makes social and affordable housing unviable due to unique site circumstances that result in cost uplifts significantly higher than assessed in the Whole Plan Viability Assessment. As detailed previously, the flexibility could include a reduction in the scope of energy that has to be offset, or a reduced price per kWh if the Council is confident it can still deliver the required amount of PV for that reduced price. The per-kWh price stated in the policy reflects an average of several recent years' per-kWp median cost for PV installations sized 4-50kWp (source: national data), divided by a typical output (kWh per kWp) with Sandwell's annual average sunlight. That national data set gives costs for installations at three different sizes: 0-4kWp, 4-10kWp, or 10-50kWp. The larger-scale installations have a lower cost per kWp. If the Council chooses to allow a lower offset price, a good guideline minimum would be no lower than the lowest price stated in the most recent available version of that national data set – unless the Council can deliver the PV at an even lower price (for example, via the Council's access to more affordable sites, local supply chains or combining the PV installation with other planned works). The degree of flexibility will depend on the unique scheme characteristics and evidence submitted the local authority about what could be viably accommodated.

About assured performance methods

These are processes to follow throughout design, construction, commissioning and building handover that reduce the energy performance gap (the gap between predicted energy use and actual energy use). These not only help keep the building's actual carbon emissions to a minimum (as opposed to their predicted emissions using inaccurate methods like SAP), but they also help to ensure occupant satisfaction. Suitable methods include BSRIA Soft Landings, NEF/GHA Assured Performance Process, and Passivhaus certification. Other processes may be available or become available during the course of the plan. Alternative processes proposed by the applicant will be subject to consideration by the Council about their evidence-based merits. There are also some additional tools in the industry which are not in themselves an assured performance process but can assist in improving the energy performance of a building in-use, such as BS40101.

Applicability to outline applications

Compliance with the policies will be conditioned at outline stage and must be confirmed in detailed reserved matters. However, the Council accepts that the degree of detail provided in the outline energy strategy will be less than for full and reserved matters applications. It is also recognised that this means the outline energy calculations may be largely based on assumptions. The aim should be to demonstrate that options have been identified by which the development could comply with the policy targets, taking into account the broad mix of anticipated floorspace, typologies and site conditions. Statements made about estimated carbon and energy performance based on a high degree of assumptions at outline stage should be reassessed at detailed reserved matters, albeit the reserved matters may diverge in *how* the required compliant performance will be achieved.

Where more detail is known, it should be reflected in the outline application; for example if expecting to connect to a site-specific low-carbon energy source. For a further example, if expecting a limited number of repeated home types, then the energy modelling would ideally reflect similar archetypes and identify a specification by which they could meet the policy targets for energy efficiency and renewable energy (taking into account site conditions). The modelled homes could reflect, for example, a sample of a relevant housebuilder's 'products' most likely to be built on site. This exercise benefits the developer in that it gives an early understanding of the degree of amendment needed to their existing regular specifications, allowing them to set up supply chains and economies of scale well in advance of commencing on site, as outline proposals typically are large-scale and take several years from outline application, to detailed design, to commencement.

Outline applications' estimated offsetting contribution (if required) should be stated in the outline Energy Assessment. These will be subject to a Section 106 agreement, but not paid at the time of the outline application. In that case the offset contribution must be recalculated within the subsequent reserved matters application and paid prior to occupation.

About post-occupancy energy monitoring

The purpose of this element is to reveal the real energy performance of buildings as compared to the energy use predicted using Building Regulations calculations. This is not as a policing or enforcement mechanism but as an education mechanism for both developers and the Council, to inform future development and construction work and to inform future policy development as this data will help enable the development of local performance benchmarks. Much of the sector is not aware of the often dramatic difference between Building Regulations energy use predictions and reality, because there is currently no nation-wide feedback mechanism on actual energy performance to those who consented, designed or built the homes. This is an issue which will need to be improved in order to meet the UK's carbon targets; this policy is intended to contribute to that learning process. Similar policies have been successfully implemented elsewhere for several years.

At design stage (and therefore planning application stage), it will be important to put metering arrangements in place to enable this data collection, with as little disturbance to occupants as possible (e.g. ideally automated meters and/or meters located in an area accessible by the reporter without entering individual homes or units). Residential data should be aggregated to a level that enables anonymisation before reporting (other locations' similar policies suggest a minimum of 5 homes' data should be aggregated together before reporting). For residential data collection, households' consent should be acquired.

Scope for future improvements

The policy has been written to cater for a variety of scenarios, and where viability may be challenging. Compliance with the policy is expected to comply sequentially with policy modules, i.e. SCC1.1 fabric efficiency is expected to be delivered before applicants apply renewable energy provision under SCC1.4 or offsetting under SCC1.5. Therefore, this policy is applicable to future scenarios where viability is improving, in that applicants would deliver the requirements of SCC1 in its entirety.

Where there is improving developer viability, the amount of renewable energy being provided can also be considered and increased. The policy currently requires an applicant to provide sufficient on-site renewable electricity generation equipment to match 39% of regulated energy use; this percentage could be increased as viability, technology efficiency and technology costs continue to improve.

Furthermore, the Council could increase the renewable energy provision on-site to also meet a portion, or 100% unregulated energy, as such the development would achieve a net zero balance on-site (100% of regulated and unregulated energy from renewable technology on-site).

Outside of this, there are other alternatives which have been considered in Output 2 – Policy Matrix, and a summary of this is outlined below.

Depending on how the national planning policy evolves (in particular any changes to the status of the Written Ministerial Statement 2023 as previously described), the Council could look to strengthen policies SCC1.1 and SCC1.2 by introducing mandatory target values for Energy Use Intensity and space heating demand, as per Option 3, if found to be feasible, viable, and acceptable in planning terms, in subsequent local plan iterations.

If introduced, the target metrics which would represent best practice are as stated as guidelines in the current draft policy, that is:

- Total energy use: 35 kWh/m^2/year
- Space heating demand: 15 kWh/m^2/year

Lastly, the Council could look to introduce mandatory embodied carbon targets for development and could consider decreasing targets to drive reductions in embodied carbon through the construction of new development. However, with the current policy structure this last issue would fall into the suite of SCC4 policies rather than SCC1. Alignment with national policy

All of these policies are aligned with national policy since their implementation works towards achieving the legally-binding UK target of net zero by 2050, as set out in the Climate Change Act 2008, and carbon budgets subsequently legislated under the aegis of that Act. These associated carbon budgets are linked to the Climate Change Committee's Balanced Pathway to Net Zero report, which in turn is supported by analysis that sets out that all new buildings must be net zero by 2025.

The Planning and Energy Act 2008 sets out that local standards for energy efficiency in new homes are able to exceed those set in Building Regulations. Detail on why objections in relation to this local planning authority power are invalid is set out in detail in the Literature Review. .

In the context of the 2023 WMS, explored in detail in the Literature Review and summarised at the start of this report, the SCC1 suite of policies are fully compliant with the perceived constraints it poses.

The WMS only applies to energy efficiency standards, where it states that any standards that exceed Building Regulations must be done so using the TER metric. SCC1.1 is the only policy recommendation that relates to the energy efficiency perceived constraints of the 2023 WMS and remains within its bounds through the use of TER % reduction as the primary metric. The TFEE target is not additional to, but is a step towards, that TER target, and aligns with the building specification on which that TER target is also based, drawing on evidence from the Future Homes Hub 'Ready for Zero' report suite.

The 63% reduction target on Part L 2021 TER is set to align with national policy in that it is in line with the Future Homes Standard (as Government has stated that the FHS TER will be a ~75% reduction on the Part L 2013 TER, and that the Part L 2021 TER is a 31% reduction on the 2013 TER. This ~75% figure has remained constant through both rounds of FHS consultation to date (2019-21 and 2023/24). Correspondingly, the TFEE target is set to align with the performance of a home that achieves that TER target via the indicative FHS specification set out by Government in the 2019-21 FHS consultation. This is necessary in order to reduce the space heat demand (which is necessary for the achievement of the UK's carbon budgets). It is also necessary in order to protect the resident from excessive energy bills and potential fuel poverty, as the latest FHS consultation indicated that the FHS carbon target could be achieved just with a heat pump and no fabric improvements, resulting in heating bills approximately double those of a current new build home. See previous citations for FHS consultations throughout this report, and/or see separate summary appendix of evidence sources.

SCC1.3 is aligned to the Government's direction of travel indicated by both the options proposed in the Future Home Standard 2023 consultation, in that no fossil fuel heating systems are proposed. SCC1.5 and SCC1.5 are not impacted because they address renewable energy, which is out of scope of the 2023 WMS.

Implementation considerations

To support these policies, it is vital that supplementary guidance is provided for the benefit of Development Management officers and the development industry. This is particularly important for SCC1.1, SCC1.2, SCC1.3, SCC1.4 and SCC1.5 because specific information for policy compliance must be set such as:

- Examples of assured performance
- Acceptable scenarios where exceptional circumstances are valid for SCC1.4 and SCC1.5, this may also be useful for Sandwell in guiding developers on the steps the Council expect if viability is challenging.
- Methodologies and assumptions for energy performance calculations (this could explore in more detail the suitable methodologies outlined within the suggested policy text above).

Information on the mechanisms of energy offsetting for SCC1.5 will need to be included in a planning document that addresses planning obligations.

For SCC1.4, renewable energy installations will need to be accompanied with calculations of expected outputs required under the policy by an MCS certifier, which should be set as a planning condition. This is to ensure renewable energy technology has been correctly installed and operates at the predicted output sufficient to deliver an on-site net zero energy balance.

Industry capability

Assuming Sandwell MBC undertakes appropriate engagement with developers operating in the area throughout the local plan process, the local development industry should be well prepared to deliver on these policies. The policies require additional levels of skill to be applied through design and construction phases but do not introduce any new skills not currently known and utilised by developers.

The standard of insulation and glazing typically required to achieve SCC1.1. are aligned to those set out in the indicative specification for the Future Homes Standard (FHS). Therefore, the development industry should be well prepared to deliver on these policies, particularly as the Sandwell MBC Local Plan and the FHS are both likely to be introduced in 2025.

The target of 35kWh/m^2 building footprint/year was selected as follows: The available budget for PV in Sandwell within a cost uplift allowance (set by the Sandwell 2023 viability assessment; see Appendix 1 of the current report for details), after deducting the cost of meeting the energy efficiency target in a typical Sandwell new home. This was translated into an amount of kWp (PV system size) using national government data on the cost of solar PV installations over a five-year period matching the baseline costs period sampled by the Sandwell 2023 viability assessment. The resulting kWp figure was translated into an estimated annual amount of generation, using data on output per kWp that takes into account the amount of sunlight that Sandwell receives annually. This annual output from the assumed amount of PV was divided by the estimated footprint of the average Sandwell new build home, using national data on the floor space and type of new build homes by local authority area. The resulting figure, rounded to the nearest half-kWh, was 33.5kWh. This means that taller buildings will need to provide at least the same coverage of PV as a proportion of their roof space, as would be provided in a lower-rise building, and thus do not simply fall back to "zero PV provision" if the target of 39% cannot be met.

This is a far lower target than what is demonstrably technically feasible. Firstly, it is less than the amount of PV already included in the Part L 2021 notional building. Secondly, several other local plans' energy modelling evidence (Central Lincolnshire[xxxi], Essex[xxxii]**Error! Bookmark not defined.**, South Oxfordshire & Vale of White Horse[xxxiii]**Error! Bookmark not defined.**) has evidenced that a target of 120kWh/m^2/year in those locations with a PV area approximately equivalent to 60-70% of building footprint area using current typical PV panels (and the area required will reduce as PV technology improves in future). Noting that annual sunlight differs by geographical location and that this affects the output of PV panels, if Sandwell had chosen to mirror that more maximised PV approach, an equivalent demonstrably feasible figure could be worked out as follows: An average would be taken of the average solar irradiance[xxxiv] in the locations that the energy models applied to, and the figure of 120kWh would be scaled down in proportion to the slightly lower amount of annual solar irradiance that Sandwell MBC receives. The result is 113.4kWh. For citations, please see appendix summary of evidence by policy component. That higher target is not pursued because of the increased cost uplift that it would incur, which is thought not to be viable in Sandwell in combination with the other policy requirements. However, it does demonstrate that the selected draft policy target is easily feasible.

Development Management capability

The capability of Development Management officers to accurately assess these policies is reliant on the degree of training and guidance documents available. It is essential that officers have guidance on hand to assess policies against to ensure that compliance is achieved in accordance with methodologies set out in a subsequent guidance document. Specific upskilling of at least one officer on climate change policies to gain a technical understanding will greatly assist the overall ability of the team to assess policy compliance.

Training for Development Management officers on technical processes involved with net zero carbon development can strengthen internal capabilities to assess whether applications may have submitted over-optimistic building performance values for the sake of policy compliance. These may include:

- Understanding of modelling techniques and tools (e.g. SAP/SBEM)
- Building elements energy performance values (e.g. U-values)
- Low- and zero-carbon heating and ventilation systems/technologies
- Orientation, form factor and design features for solar PV generation

Costs and feasibility

Policies SCC1.1's overarching TER reduction, and TFEE improvement targets, are both aligned with the indicative FHS specification released by Government in 2021, which has superior fabric to the more recent consultation options that were released in December 2023. That specification is expressed as "Ref2025" within the Future Homes Hub Ready for Net Zero report (and associated Appendix F). The TFEE improvements are directly reflective of the difference in that Ready for Zero Appendix F between the current Part L 2021 and the 'Ref2025' spec. The 63% TER reduction on Part L 2021 is equivalent to a 75% reduction on Part L 2013 and is proven to be feasible through fabric and energy efficiency standards, and installation of a heat pump – i.e. no solar PV is required to achieve the % TER reduction.

In practice, these requirements have been demonstrably feasible in Warwick through local case study Gallows Hill council housing scheme (77-80% reduction on Part L 2013). This development by Vistry Partnership did include some contribution from solar PV, but the Future Homes Hub evidence cited above shows that the same reduction could still be achieved without solar PV given further fabric and energy efficiency improvements.

In the Future Homes Hub Ready for Net Zero report cited above, the following TER reductions on Part L were shown to be feasible with the least ambitious of the specifications tested in that report ("CS1"):

Type of home	% reduction on Part L 2013 TER (Future Homes Hub *Fig. 115; p154*)	% reduction on Part L 2021 TER (derived from Future Homes Hub appendix F)
End terrace	**78%**	67%
Mid terrace	**77%**	66%
Semi-detached	**76%**	67%
Large detached	**75%**	66%
Bungalow	**76%**	58%
Low-rise flat	**76%**	66%
High-rise flat	**76%**	69%

All of the above except 'Bungalow' exceed the requirement set by the draft Sandwell MBC policy. These reductions were modelled to be achieved by a building with equal or slightly worse fabric than today's Part L 2021, but have an air-source heat pump instead of a gas boiler[2].

The feasibility of Policies SCC1.1 and SCC1.3 is further evident through the tested archetype scenarios in the Future Homes Hub Report and the promotion of very similar standards in the 2023 FHS consultation (albeit that latest consultation had inferior fabric to the Sandwell draft policy, incurring increased costs for heating bills as noted below).

The draft Sandwell MBC policy includes an element of fabric improvements, to ensure that residents are not subject to a doubling of energy costs that the Future Homes Standard consultation has conceded would occur if this %TER reduction is achieved solely through the addition of a heat pump. This is still feasible (as demonstrated through the Future Homes Hub report cited above) but costs will be different from if the %TER reduction were achieved solely through electric heat. Therefore, it is proposed to test cost uplift estimates that include an element of fabric improvement as a step towards the %TER reduction. Using averages of costs estimated in various different sources (see Appendix 2 of the current report), the cost uplift over a relevant baseline[3] for **Policies SCC1.1 and SCC1.2** for **the typical Sandwell new build home** is estimated to be 1.4% for fabric measures and 1.6% for the heat pump installation, combining together to result in a **3%** cost uplift

Policy SCC1.3 is estimated to bring an **additional 0.9% cost uplift from the selected baseline**, for the typical Sandwell new build home. This is a minimal cost uplift firstly because the policy target is very modest, and secondly because the Part L 2021 baseline specification already includes approximately 40% of roof space covered by solar PV (which has been estimated in the evidence base of South Oxfordshire & Vale of White Horse[xxxv] to match approximately 60% of the total energy use of a house that meets the Future Homes Standard version released by Government in 2021, as previously cited). Therefore, the policy could be met with less PV (albeit better fabric and heating efficiency) than the current building regulations Part L 2021; yet these costs are more significant on the Part L 2013 baseline which forms the majority of the Sandwell viability assessment's baseline cost sample period (see Appendix 2 for details). This 0.9% figure is the weighted average cost uplift, reflecting the weighted average baseline which is split across Part L 2013 and 2021.

[2] This is what the Future Homes Hub termed "contender specification 1" or 'CS1'. This is very similar to the "FHS Option 2" specification that Government recently consulted upon in their Future Homes Consultation 2023-2024.
[3] Please note: Because the Sandwell viability assessment baseline costs reflect a 5-year sample that straddled a period when Part L 2013 was in place and a period when Part L 2021 was in place, all of these costs are weighted averages of the cost uplift to get to the policy standard from a Part L 2013 baseline and from a Part L 2021 baseline. See separate Appendix 2 for details.

The **overall cost uplift** for SCC1-suite policies for houses is therefore reasonably estimated to be **3.9%.** This could be rounded up to 4% (houses) to give headroom to any site-specific constraints that hinder a development's ability to meet the policy requirements. For flats, this figure will vary more as it depends strongly on the height of the building, However, the estimated cost uplift already includes a degree of headroom in that costs data sources from previous years had national average inflationary uplifts applied to them which are suspected to be in excess of the actual inflation that occurred to those individual building elements, looking at other sources of comparable cost evidence in different years (see costs Appendix 2 for details).

Please see separate cost summary appendix of this report for more detail on this cost calculation.

Feasibility of Policy SC1.3 (and in fact figures well in excess of what would be required for that policy) is demonstrated by evidence bases cited elsewhere in this report including South Oxfordshire and Vale of White Horse (2023[xxxvi]), Central Lincolnshire (2021[xxxvii]) and Essex[xxxviii]. These show that it is possible to in fact match total energy use, including unregulated, on a variety of residential building types up to about 3-4 storeys that meet best practice energy efficiency standards. They also show it is possible to do this in buildings taller than this if optimal energy efficiency is achieved and/or the roof is optimised for PV generation (for example, a monopitch roof facing south). Buildings above this height may struggle to match their own energy use on site and therefore a height over 4 storeys may be considered an acceptable reason for at least partially following the offset route rather than complying entirely on-site. The PV provision in the Oxfordshire/Lincolnshire/Essex reports cited above were far in excess of the standard sought in the draft Sandwell policy, even after accounting for Sandwell's slightly reduced level of annual sunlight. See also separate appendix summary.

The feasibility of meeting policy SCC1.3 on site may vary by the height of the building. Lower-rise buildings will find it more feasible because they have more roof space (for PV) compared to floor space. However, this should not be a problem in the vast majority of buildings, as it is estimated that the SCC1.3 policy requirement in a 2-storey typical new Sandwell home could be met with a PV area equivalent to just 14% of the roof space; therefore a home would need to be seven times as tall (14+ storeys) before it would become unfeasible (unless there is significant overshadowing or heritage reasons why PV cannot be increased). Where this becomes a problem, the policy suite offers an alternative route to compliance through Policy A4 (energy offsetting).

Finally, it is feasible to calculate energy use. Developers are familiar with providing SAP calculations for the purpose of legally complying with Part L of building regulations. Part L SAP is mainly focussed on the *regulated* part of energy use, but can also give a figure for *unregulated* energy, albeit SAP overestimates this as it is based on outdated appliance efficiency rates (see 2021 evidence of Cornwall local plan). The policy currently only requires the calculation of regulated energy use, but as outlined previously under 'scope for future improvements', a future iteration of the policy could expand the scope to also include unregulated energy use. If SAP is used to calculate the unregulated energy in such a future policy iteration, it will overstate the amount of PV needed to meet it. This may be solved in HEM, the incoming replacement for SAP. Meanwhile, other more accurate tools for modelling total energy are available including PHPP.

[4] Several different "contender specifications" were modelled in the cited Future Homes Hub 'Ready for Zero' report. The one we assume to meet the Policy A1+A2 specifications is "Ref25", which represents the FHS indicative specification published by Government in 2021, as previously cited.

The full range of regulated energy consumption calculated using SAP10.2 in the Future Homes Hub Ready for Zero report, for a home that meets the Policy SCC1.1 energy efficiency requirements[4], is 22-30kWh/m^2/year depending on the type of home. By contrast a figure of approximately 53kWh/m2/year regulated energy estimated for a home meeting the same specification modelled using PHPP in the South Oxfordshire and Vale of White Horse evidence base referenced above. That South Oxfordshire evidence also showed that total energy use (as opposed to regulated-only) would be 69kWh EUI, of which about 60% could be met just by the amount of onsite PV that is already part of Part L 2021 (an area equivalent to about 40% of the home's footprint).

Due to the 2023 WMS constraints, particularly the discouragement of the use of absolute energy metrics – Energy Use Intensity and space heating demand – the policy recommendations above do not directly limit energy use, which would have assisted developers to design towards an on-site net zero regulated balance because the amount of solar PV would be matched to the clearly stated energy use limit. However, even in the absence of these effective best-practice metrics, reducing energy use should be the main priority of the developer to best enable feasibility of sufficient solar PV to match regulated energy use. Reducing energy use directly benefits the subsequent building occupant but also the developer, as shown by a comparison of costs below.

To compare the cost differential between prioritising energy use reduction or relying on solar PV to achieve a net zero balance, we look at two scenarios for a semi-detached house:

1. On-site net zero building with energy use of **69 kWh/m^2/year** (as modelled[xxxix] in a semi-detached home that meets the FHS indicative specification released by Government in 2021**)**
2. On-site net zero building with energy use of **32 kWh/m^2/year** (as modelled[xxxix] to be feasible in a semi-detached home using best-practice fabric and heat pump).

For scenario 1 to achieve on-site net zero status, it would have to install over double the amount of rooftop solar PV than scenario 2. Scenario 2 achieves its lower energy use through better specification of U-values and improved air tightness of scenario 1. There are higher costs associated with specifying higher performance fabric values for scenario 2 compared to the inefficient energy use of scenario 1. However, the same argument applies to higher solar PV costs to achieve net zero on-site for scenario 1. Interestingly, the cost uplifts over Part L 2021 for both scenarios are extremely close at 4.8% (scenario 1) or 4.6% (scenario 2). The capital costs of scenarios 1 and 2 are respectively **£161,248 and £160,987**, in the Oxfordshire context, inferred from the South Oxfordshire and Vale of White Horse 2023 costs evidence base[xl].

While the Sandwell draft current policy does not require net zero, these examples demonstrate that actual performance improvements are technically feasible that do not always correlate perfectly with Part L reductions,

It is evident that both scenarios described above are feasible and effectively similar in cost, although the best practice scenario 2 is in fact slightly less costly. Therefore, developers have a clear incentive to design new buildings to best practice energy standards that maximise all opportunities for energy use

reduction. This shows that although the Sandwell MBC policy is expressed as % TER reduction (so as to appease the WMS2023), developers can instead make smarter choices to achieve the policy's overarching targets by making smarter choices to design according to EUI targets, rather than purely by designing for % TER reductions.

Local authorities, including Sandwell MBC, feel constrained to the perceived boundaries of the 2023 WMS and have therefore not decided to select a policy approach that uses fixed metrics that would specifically limit energy use to absolute targets (such as EUI and space heat demand). However, above we have demonstrated that reducing energy use to best practice levels can in fact result in a lower cost uplift in achieving a net zero building than if energy use reduction was neglected. Notwithstanding, a plethora of co-benefits further than just costs comes with reducing energy use, such as:

- **Reduced local grid stress**
- **Improved occupant comfort**
- **Reduced occupant bills**
- **Efficient material use and lower embodied carbon**

No additional cost uplift is assumed for SCC1.5 because the offset price is set as to the exact cost of solar PV that was assumed for the SCC1.3 cost uplift. Therefore, no change in cost is evident between installing the sufficient amount of solar PV on-site or off-site.

See separate appendix document on costs and evidence for discussion of the cost uplifts that can be assumed for other parts of the policy.

Value uplift

There is evidence that increased energy efficiency in homes, as sought by policies SCC1.1-SCC1.2, delivers a value uplift which could be offset against the cost uplift to aid the viability of the scheme. This was evidenced in a 2021 study by Lloyds/Halifax[xli], which looked at actual home sale value across all regions of England and Wales, not just surveys of willingness to pay. It expressed the sale value uplift in terms of the % difference between EPC bands. The increase is greater between EPC bands at the lower end (for example a 3.8% value increase from EPC G to EPC F) but there is still an uplift between higher bands (an uplift of 2% from EPC C to EPC B, and an uplift of 1.8% from EPC B to EPC A). All of these values are the average across England and Wales; however, the study confirms that the uplift was evident in all regions and therefore should be reasonably applicable to Sandwell MBC. The vast majority of Sandwell new builds in the most recent 5 years had an EPC B, and only 1% achieved EPC A.

Please note that increased sale value through energy efficiency would translate proportionally into reduced cost of owning and running a home, thanks to the running cost savings on energy bills that can be achieved via the improved energy efficiency (draft policy SC1.11.1 and optional targets of SCC1.2) and the on-site solar generation (draft policy SCC1.3).

Reducing operational carbon new build non-residential development (SCC2)

All new build non-domestic development over 1,000sqm of non-residential floorspace including C1, C2 and C2a and C5 are required to submit an energy statement demonstrating that the development meets the following requirements:

SCC2.1. Building Efficiency Part L % improvement	% improvement on Part L 2021TER (or equivalent reduction on future Part L updates), through on-site measures as follows: • Offices: ≥25% • Schools: ≥35% • Industrial buildings: ≥45% • Hotels (C2, C5) and residential institutions (C2, C2a): ≥10% • Other non-residential buildings: ≥35%
SCC2.2 Energy metrics guidelines	• Positive weight will be given to applicants who can demonstrate the following absolute energy metrics:Total Energy Use: 65 kWh/m^2/year • Space heating demand: 15 kWh/m^2/year Employing absolute energy metrics reduces the amount of solar PV required under SCC2.4 for an on-site net zero balance of regulated energy. Applicable methodologies to calculate this include CIBSETM54 and the Passivhaus Planning Package. At present, the Part L calculation method (SBEM) is not considered suitable as it is does not provide accurate predictions of a building's actual energy use.
SCC2.3 Clean energy supply	The use of fossil fuels and connection to the gas grid will not be considered acceptable. Major non-residential developments (over 1,000sqm of non-residential floorspace including C1, C2 and C2a and C5) should include an assessment of decentralised energy networks within the Energy Statement. This assessment should outline existing or planned decentralised energy networks in the vicinity of the development and should assess the opportunity to connect to them unless it can be demonstrated that the development is not suitable, feasible or viable for district heat or decentralised energy networks. For developments over 10,000sqm of non-residential floorspace, applicants are expected to identify and address: - Current or proposed major heat supply plants, or networks (for example, industrial uses, data centres) - Possible opportunities to utilise energy from waste, or waste heat from an industrial process - Opportunities for private wire electricity supply from renewable sources - Utilisation of natural and engineered heating or cooling systems
SCC2.4 On-site renewable energy	On-site renewable electricity generation is required to match 39% of the regulated energy demand (residual energy use in kWh after SCC2.1 has been achieved). Where full compliance with the 39% target is not feasible or viable having regard to the type of development[5], involved and its design, proposals must demonstrate through the energy statement that renewable energy technologies have been provided to the greatest extent feasible and viable. In that case of failure to meet the 39% target, it should be demonstrated that the amount of on-site renewable energy generation equates to >35**kWh/m^{2}projected building footprint/year**. Where a building in a multi-building development cannot individually achieve the requirements of SCC2.4 this shortfall is to be made up across other units on-site before carbon offsetting (SCC2.5) is considered. Large-scale development (5000 m^2 floorspace) should demonstrate that opportunities for on-site renewable energy infrastructure (on-site but not on or attached to individual dwellings), such as solar PV canopies on car parks, have been explored. Positive weight will be given to applicants who can demonstrate an on-site energy balance, whereby on-site renewables match regulated, and unregulated energy demand.
SCC2.5 Energy offsetting	Only in exceptional circumstances and as a last resort where it is demonstrably unfeasible to achieve an on-site net zero regulated energy balance, any shortfall in on-site renewable energy generation

[5] Exceptional circumstances where an on-site net zero energy balance is not achieved may only be found acceptable in some cases, for example with taller flatted buildings (4 storeys or above) or where overshadowing significantly impacts solar PV output.

	that does not match regulated energy use is to be offset via **S106 financial contribution,** reflecting the cost of the solar PV delivered off-site. The energy offset price is set as £1.37/kWh. This price is based on cost of solar PV data from the Department for Energy Security and Net Zero to enable delivery of off-site solar PV by the Council or its appointed partners. The price should be revised annually. This is set as a one-off payment, where the shortfall in annual on-site renewable energy generation is multiplied by the energy offset price.
SCC2.6 Reduced performance gap	For major development, an assured performance method must be implemented throughout all phases of construction to ensure operational energy in practice performs to predicted levels at the design stage.
SCC2.7 Smart energy systems	Proposals should demonstrate how they have considered the difference (in scale and time) of on-site renewable energy generation and the on-site energy demand, with a view to maximising on-site consumption of energy generated on site and minimising the need for wider grid infrastructure reinforcement. Where the on-site renewable energy generation peak is not expected to coincide with peak onsite energy demand, resulting in a need to export or waste significant amounts of energy, major proposals should demonstrate how they have explored scope for energy storage and/or smart distribution systems. The goal is to optimise on-site or local consumption of the renewable energy (or waste energy) that is generated by the site. Where appropriate, feasible and viable, major proposals should demonstrate that they have integrated these to optimise carbon- and energy-saving benefits and minimise the need for grid reinforcements. This may include smart local grids, energy sharing, energy storage, demand-side response, or solutions combining elements of the above.
SCC2.8 post-occupancy evaluation	Large-scale development (over 5000 m^2 floorspace) is to monitor and report total energy use and renewable energy generation values on an annual basis. An outline plan for the implementation of this should be submitted with the planning application. The monitored in-use data are to be reported to the local planning authority for 5 years upon occupation.
Supporting text and notes	

Policy elements SCC2.1, SCC2.2, SCC2.3 and SCC2.4 are to be addressed at design and post-completion stages, to ensure that the development has been built to intended standards. Post-completion resubmission of the original energy statement including energy performance calculations, informed by the relevant tests to systems and fabric, should be required as a condition as part of the planning application process. SCC2.6 and SCC2.8 compliance should also be demonstrated post-completion through planning condition.

The policy modules SCC2.1-2.5 are to be demonstrated at planning application stage through submission of an energy statement, alongside associated output reports from energy modelling software (e.g. SBEM).

About compliance with Policy SCC2.1 TER reductions

Please note that these %TER reduction targets are not limited to be solely delivered through energy efficiency measures. Therefore, there could be an element of clean energy supply or renewable energy measures included in these. However, please note that further renewable energy will be needed to subsequently meet the requirement of Policy SCC2.4, therefore applicants are advised to pursue energy efficiency measures as far as feasible in the first instance in pursuit of Policy SCC2.1, so that the subsequent Policy SCC2.4 renewable energy requirements (to match 39% of regulated energy use) are not rendered excessively expensive or unfeasible. Designing to use less energy in the first place reduces the amount of renewable energy needed to match this, and/or the amount of carbon offset payment needed. The Council therefore expects applicants to demonstrate that energy efficiency is maximised to the greatest extent that's feasible and viable, before provisioning renewable energy generation and or offsetting.

Applicants and Council development management officers should be aware that in the current Part L for non-domestic buildings, the type of heating system in the 'notional' building (from which the TER is derived) is the same as the type of heating system in the actual proposed building. Therefore, no TER improvements will be made simply by switching from a gas or oil boiler to a heat pump or other all-electric or otherwise low-carbon heat system. However, Part L does define an assumed efficiency rate for each heating system type. Therefore, TER improvements *can* be made through selecting a heating system that is *more efficient than Part L 2021's notional efficiency for that heating type*.

About SCC2.4 On-site renewable energy target

As with the residential target, this is 39% of the regulated energy demand as it would be measured at point of use, not the 'primary energy demand' target set by Part L.

This target of 39% (or fallback target of 35kWh/m^2 building footprint) reflects that of the residential policy, in order to ensure a single simple target across all schemes. This especially simplifies the process for mixed-use schemes. The 35kWh/m^2 building footprint fallback target is known to be easily feasible using only circa 14% of a typical pitched roof area (see separate appendix to evidence base). Meanwhile the 39% target is likely to be feasible in the vast majority of cases (as energy modelling evidence cited elsewhere in this report has shown that up to 100% has been found feasible in other nearby local areas), yet the policy does also include the option of offsetting instead

in unique cases where this is demonstrated not to be feasible due to the unique site constraints or unavoidable energy use profile of a particular proposed building.

About Assured Performance Processes for energy performance

Regarding assured performance processes, in addition to those mentioned in relation to the equivalent residential policy (SCC2.6) in residential, there is also one additional method for non-residential: NABERS UK (administered by CIBSE). NABERS is currently only available for offices but intended to extend to other building types in future.

About offsetting

The requirement for offsetting may be applied flexibly where it is demonstrated that this makes otherwise desirable development unviable due to the unique energy use profile of the proposed building and site characteristics. The flexibility could include a reduction in the scope of energy that has to be offset, or a discounted price per kWh if the Local Authority is confident it can still deliver the required amount of PV delivery within this price (when pooled into the offsetting fund which will primarily consist of full-price offset contributions). See also the supporting text to equivalent residential policy for notes on the available national guidance on cost of solar PV which achieve economies of scale at larger sizes of PV installation. The degree of flexibility will depend on the unique scheme characteristics and evidence submitted the local authority about what could be viably accommodated. It may also depend on the degree to which the proposed development represents a socially desirable facility that meets unmet community needs (such as for healthcare, education, or similar).

Please see also the supporting text for the equivalent residential policies (SCC1) regarding:

- **calculating renewable energy provision and offset payments,**
- **post-occupancy energy monitoring,**
- **applicability to outline applications, and**
- **assured performance processes.**

Scope for future improvements

There are several options to how the policy requirements for non-residential building could increase in the future. These have been considered in Output 2 – Policy Matrix, but a summary is outlined below.

Where there is improving developer viability, the amount of renewable energy being provided can also be considered and increased. The policy currently requires an applicant to meet 39% of regulated energy use with on-site renewable electricity generation; this could for example be later increased to 100% if viability allows.

Furthermore, the Council could increase the renewable energy provision on-site to meet 100% unregulated energy, as such the development should achieve a net zero balance on-site (100% of regulated and unregulated energy from renewable technology on-site).

Depending on how the national planning policy evolves (in particular any changes to the status of the Written Ministerial Statement 2023 as previously described), the Council could look to strengthen policies SCC2.1 and SCC2.2 by introducing mandatory target values using more effective energy metrics other than those of Building Regulations. For example, the Energy Use Intensity and space heating demand, as per the policy Option 3 that was previously considered, are currently only optional targets within Policy SCC2.2, If the national policy stance towards such metrics softens, and if found to be feasible and viable in subsequent local plan iterations, they could be made mandatory.

If introduced, the target metrics which would represent best practice are as stated in the Policy SCC2.2 guideline values:

- Total Energy Use: 65 kWh/m^2/year
- Space heating demand: 15 kWh/m^2/year

Lastly, the Council could look to introduce embodied carbon targets for development, and could consider decreasing targets to drive reductions in embodied carbon through the construction of new development. However, with the current policy structure, that would be dealt with in the SCC4 suite of policies rather than SCC2.

Alignment with national policy

All of these policies are aligned with national policy goals since their implementation works towards achieving the legally-binding UK target of net zero by 2050, as set out in the Climate Change Act 2008, and carbon budgets subsequently legislated under the aegis of that Act. These associated carbon budgets are linked to the Climate Change Committee's Balanced Pathway to Net Zero in the Sixth Carbon Budget report, which sets out that all new buildings should be zero carbon from 2025, with high levels of energy efficiency and low-carbon heat. It also found that non-residential buildings should phase out high-carbon fossil fuel boilers no later than 2026, and phase out gas boilers in 2030-33, less than 10 years from today (2024), while boilers have a typical lifetime of 15 years.

Therefore, new buildings today should not have these, to avoid the need for expensive disruptive retrofit less than 10 years after completion which would also waste embodied carbon (even if the need for 'net zero carbon new builds from 2025' did not already effectively rule out fossil fuel boilers). The policy supports these targets by prohibiting fossil fuel connection and improving energy efficiency, which mandate a heating technology similarly efficient to a heat pump (which a fossil boiler cannot meet).

It is not yet completely clear whether the missives of the 2023 WMS are relevant to non-residential development. The WMS uses the term 'local energy efficiency standards for buildings', which could be taken to mean all buildings. But on the other hand the WMS asks for the standards to be expressed in terms of SAP, which is a methodology that only applies to residential. Also, the concern that the WMS purports to address is that "multiple local standards [may] add further costs to building new *homes* ... [and therefore] the impact on *housing supply* and *affordability* [must be] considered in accordance with the National Planning Policy Framework". The NPPF only discusses affordability in relation only to homes, not any other buildings. Nevertheless, even if the WMS2023 is interpreted to apply to non-residential development too, the SCC2-suite policies remain consistent with the 2023 WMS' stipulations, given that the metric for SCC1.1 is a % reduction on TER (to be calculated with SBEM, which is the non-residential equivalent of SAP).

SCC2.1-2.3 are aligned to the Government's direction of travel indicated by both the options proposed in the Future Home Standard 2023 consultation, in that no fossil fuel heating systems are proposed. SCC2.3 and SCC2.4 are not impacted because they do not address energy efficiency but rather they address energy supply, which is out of scope of the 2023 WMS.

Implementation considerations

To support these policies, it may be necessary to provide supplementary guidance for the benefit of Development Management officers and the development industry. This is particularly important for SCC2.1, SCC2.2, SCC2.4 and SCC2.5 because specific information for policy compliance must be set such as:

- Examples of assured performance
- Acceptable scenarios where exceptional circumstances are valid for SCC2.4
- Methodologies and assumptions for energy performance calculations

Information on the mechanisms of energy offsetting for SCC2.5 will need to be included in a planning document that addresses planning obligations.

For SCC2.4, renewable energy installations will need to be accompanied with calculations of expected outputs required under the policy by an MCS certifier, which should be set as a planning condition. This is to ensure renewable energy technology has been correctly installed and operates at the predicted output sufficient to deliver an on-site net zero energy balance.

Industry capability

With appropriate engagement with developers operating in the area throughout the local plan process, the local development industry should be well prepared to deliver on these policies. The policies require additional levels of skill to be applied through design and construction phases but do not introduce any new skills not currently known and utilised by developers.

Development Management capability

The capability of Development Management officers to accurately assess these policies is reliant on the degree of training and guidance documents available. It is likely to be essential that officers have guidance on hand against on how to assess policies to ensure that compliance is achieved in accordance with methodologies set out in a subsequent guidance document. Specific upskilling of at least one officer on climate change policies to gain a technical understanding will greatly assist the overall ability of the team to assess policy compliance.

Training sessions for Development Management officers on technical processes involved with net zero carbon development can strengthen internal capabilities to assess and scrutinise applications. These may include:

- Understanding of modelling techniques and tools (e.g. SBEM)
- Building elements energy performance values (e.g. U-values)
- Low- and zero-carbon heating and ventilation systems/technologies
- Orientation, form factor and design features for solar PV generation

Feasibility

Part L 2021 operates differently between residential and non-residential buildings, primarily due to the different Part L energy modelling calculation methodologies: SAP for domestic buildings and NCM/SBEM for non-domestic buildings. It is therefore recommended that different levels of on-site carbon performance for individual non-residential typologies are required, as currently shown in draft policy SCC2.1. It is important to note that achieving a 100% reduction – a net zero building under Building Regulations framework including only regulated energy – in SBEM and SAP is more difficult than in more sophisticated modelling tools such as PHPP. Therefore, offsetting is more likely to play a significant role in Building Regulations framed policies.

The % TER reductions selected for Policy SCC2.1 are reflective of the recommended targets for 18 London Boroughs based on very recent modelling[xliv] of what is feasible using various different solutions in various different types of non-domestic building. There is no technical reason why these should be any less feasible in Sandwell MBC than they are in London (in fact they may be more feasible, given that Sandwell MBC's development is likely to be lower-rise and less complex). There may be differences in the regional sector's readiness to deliver these compared to the London market; however, there is no objective publicly available source of insight into whether this would present a valid barrier to policy achievability.

The difference in target % values for on-site TER reduction for SCC1.1 is due to differences in building shape and use. For example, offices tend to have higher energy demand than schools, whilst typically having less roof space relative to the internal floor area. Therefore, due to the typically higher energy demand but typically less available relative roof space to achieve an on-site net zero balance, a higher on-site % reduction value for the office is typically less feasible than for a school. Similarly, hotels tend to have very high and sudden hot water loads which result in an unavoidably high energy use intensity and peaks in demand that may not be easy to meet with the lowest-carbon, lowest-cost, highest-efficiency technologies. These differences are reflected in the typology-specific target % reductions given in B1.

Feasibility of the overall approach of SCC2.1 – SCC2.4 is also supported by the evidence base of West of England authorities[xlii], in which the policy approach titled 'Approach 1' achieves net zero *regulated* emissions, which assumed fabric and energy efficiency levels based on the indicative Future Buildings Standard specification. The policy scenario in the West of England report achieves net zero regulated emissions by following the fabric first hierarchy, maximising rooftop solar PV and offsetting as a last resort, aligning with the overall approach of the policy recommendations above. However, it is clear that the net zero regulated emissions can feasibly be achieved without excessive offsetting. The costs associated with Approach 1 stated in the West of England report were as follows:

- 0.9 – 1.2% uplift on Part L 2021 baseline
- 1.6 – 2.4% uplift on Part L 2013 baseline

For the office archetype tested in the West of England, only 0.1% of the cost uplift was associated with offsetting, whilst the school archetype did not use offsetting to achieve net zero regulated emissions, as per SCC2 policy recommendations.

Please note that the policy requirements of Sandwell are significantly less demanding than those modelled in West of England as above, therefore by citing those costs here it is not claimed that

these costs would apply to the Sandwell policies. We cite the West of England study in general as evidence of *feasibility* (as opposed to cost) of going beyond the Sandwell policies, thus logically demonstrating that to achieve the lower level of ambition expressed in the draft Sandwell policies is equally or more feasible. We quote the West of England study costs here merely to give a general impression of the scale of cost different that could be involved in going significantly further than the Sandwell policy.

Precedents for policies structured similarly to SCC2.1 and SCC2.4 include London Plan and Milton Keynes Local Plan policies, both implemented from 2019. The London Plan requires a 35% on-site reduction on Part L 2013, as demonstrated to be feasible since 2013 in an analysis of planning applications throughout London boroughs – this on-site % reduction is also adopted by Reading Council. The Milton Keynes policy requires that a 19% reduction on Part L 2013 is achieved on-site *before* a further 20% from renewable energy, therefore presumably the first 19% is through energy efficiency measures. This Milton Keynes target was also supported by a local analysis of Building Regulations compliance data. The authority stated that it does "not anticipate that the requirement to exceed the TER by 19% will be unduly onerous for developers, as our analysis of BRUKL data for consented schemes in Milton Keynes indicates that on average an improvement of 41% over the TER is already being achieved at the design stage". We note that while these precedents are originally from a baseline of Part L 2013 (whereas Sandwell viability study's baseline consists of four-fifths Part L 2013 and one-fifth Part L 2021), London has since updated its guidance[xliii] to clarify that the 35% reduction should now be achieved from the new Part L 2021 baseline. Additionally, the success of these policies evidence that developers are able to understand and work with policy requirements that are structured in this way.

The feasibility of the annual PV generation target figure for 35Wh/m^2 floorspace is as described for the identical residential figure. As previously noted under the residential policy, it is far less than the maximum feasible PV provision taking into account available roof area and local annual sunlight.

Estimating costs to test for viability

The requirement for a percentage of the TER reduction to be met through on-site measures acts as a backstop target to ensure that

 is not excessively and avoidably used. The % value is supported by Part L modelling undertaken for the Delivering Net Zero report[xliv]. The cost uplifts stated in that report range from as little as 0.4 – 1.1% for offices and schools, but rise to 5.5% for the industrial buildings % target.

A certain amount of PV is already included in the cost uplifts stated in the 'Delivering Net Zero' report (cited above) to reach the TER % reduction targets echoed in Sandwell MBC draft policy SCC1.1. That amount of PV provision already accounted for varies by archetype. To find the cost of installing further PV (or offsetting) to match the remaining required 39% of regulated energy use, it may be possible to calculate this based on the regulated-only portion of the energy use modelled in that report, converting this to a kWp size, then multiplying this by a nationally endorsed cost per kWp (we would suggest using the DESNZ figure used for the 'residential – flats' costs discussed previously), minus the cost of PV that would already be int the Part L 2021 baseline. This could then be converted to a % uplift on a baseline, depending on what years form the baseline cost sample. That cost for PV/offsetting could then be added to the median costs of achieving the fabric/services improvements for the required onsite TER reductions in the respective building types, as derived from the same 18 London Boroughs report from which the % TER reductions were taken. Notes on feasibility and cost of excelling beyond Sandwell MBC draft non-domestic policies

It is clear that compliance with the SCC2 policy suite can be feasibly achieved. Further to this, to inform potential future policy iterations, it is therefore also enlightening to explore what level of performance can be demonstrated feasible in non-residential buildings according to industry best practice approaches (going further than the draft Sandwell MBC policies to instead use fixed energy efficiency targets measured by non-Building Regulations methods which some local authorities do not feel confident pursuing due to the disruptive perceived constraints of the 2023 WMS). The previously referenced South Oxfordshire & Vale of White Horse evidence base presents information on level of performance feasible in non-residential buildings, where energy use reduction is directly assessed and subsequently limited before determining solar PV output to achieve net zero status.

To achieve on-site **net zero** status (**including unregulated energy, which is in fact out of scope** for the draft Sandwell MBC SSC2-suite policies), the following cost uplifts over Part L 2021 are found in the South Oxfordshire & Vale of White Horse reports cited above:

- Office: 6.1%
- School: 4.3%
- Warehouse: 0%
- Retail: 1.2%

The cost uplift in the Oxfordshire study, can be attributed to higher costs for better performance fabric and energy efficiency, alongside installing more solar PV to match unregulated energy use as well as regulated. Additionally, the modelled buildings in the Oxfordshire study are not identical to those in the 'Delivering net zero' London study that was previously cited. However, it shows that even exceeding the policy requirements of the London study (on which the Sandwell SCC2.1 targets were based) does not result in an excessive cost uplift. Value uplift

We also note that there is **evidence that improved energy performance increases the sale value** in non-residential. For example, research by Knight Frank[xlv] found a sale value uplift of 8%-18% for buildings with a 'green' rating. This uplift was 10.1%-10.5% for BREEAM (a holistic sustainability rating covering many topics) or 8.3%-17.9% for NABERS depending on how high the NABERS score is (NABERS is an energy-only rating that originated in Australia but is now available for offices in the UK). Noting that this study's UK evidence was of prime offices in the London market[xlvi], these uplifts should not be assumed to directly apply to all non-residential buildings in Sandwell MBC. However, they do provide a strong rationale for the viability assessment to assume some degree of sale value uplift for the draft policies described here (which would be likely to translate to a high NABERS rating).

Climate-adapted Design and Construction (SCC3)

All new build residential and non-residential buildings should mitigate against climate change and adapt to climate change by employing sustainable design and construction principles. The following measures should be demonstrated:

Applicants are expected to demonstrate these elements have been considered, and evidenced where appropriate by the corresponding assessment methodology, in an Energy Statement. The following measures should be demonstrated:

<table>
<tr><td>SCC3.1 BREEAM</td><td>For new non-residential developments (including C1, C2, C2a and C5) over 1,000sqm or more should achieve the following BREEAM certification, including full water credits for category Wat 01 (water efficiency):
<table>
<tr><td>Threshold</td><td>Standard</td><td>Year</td></tr>
<tr><td>1,000-5,000 sqm</td><td>BREEAM Very Good</td><td>Up to 2029</td></tr>
<tr><td></td><td>BREEAM Excellent</td><td>2029-2039</td></tr>
<tr><td>>5,000sqm</td><td>BREEAM Excellent</td><td></td></tr>
</table></td></tr>
<tr><td>SCC3.2 Sustainable Construction</td><td>All development should demonstrate consideration to reducing carbon emissions and waste through construction in accordance with SCC4.</td></tr>
<tr><td>SCC3.3 Cooling hierarchy</td><td>All development proposals should show how designs have optimised the internal and solar heat gains to balance the need to minimise space heating demand with the need to passively maintain comfortable temperatures during hot summers.

This should be shown by demonstrating that overheating risk measures have been incorporated in accordance with the cooling hierarchy which prioritises measures, as follows:
1. Minimise internal heat generation through energy efficient design and equipment selection.
2. Reduce and manage the amount of heat entering the building in summer using:
a. Building orientation
b. Shading
c. Albedo
d. Fenestration
e. Insulation.
3. Manage heat within the building through exposed internal thermal mass and high ceilings.
4. Passive ventilation, including cross ventilation through a building wherever possible
5. Natural cooling measures including green and blue infrastructure, including opportunities from the Borough’s network of canals or water bodies.
6. Mechanical ventilation (which, if it has a heat recovery function, should also have a summer bypass mode).</td></tr>
<tr><td>SCC3.4 Overheating assessment</td><td>All major residential development should complete CIBSE TM59 overheating assessment as their route to compliance with Building Regulations Part O. The simplified Part O route will not be considered acceptable.

All major non-residential development should complete CIBSE TM52 overheating assessment</td></tr>
<tr><td>SCC3.5 Resilience to climate change</td><td>All development should incorporate measures that increase resilience to extreme weather events and a changing climate, including increasing temperatures and frequency and intensity of rainfall. All developments should:
- Reduce the risk of flooding and conserve water in accordance with policy SCC5
- Employ sustainable urban drainage in accordance with policy SCC6.

Reduce the ‘heat island’ effect through the use of cool materials and green and blue infrastructure</td></tr>
</table>

Supporting text and notes

Compliance with SCC3.4 should be demonstrated within an energy statement at planning application stage, with supporting output reports from CIBSE assessments.

For BREEAM, applicants are expected to submit a BREEAM pre-assessment to demonstrate that the relevant BREEAM level has been designed into the scheme, and that more than the minimum WAT 01 credits (for the respective certification level targeted) will be achieved. A condition upon any grant of planning permission is expected to ensure that the development is completed in accordance with the BREEAM pre-assessment and that the BREEAM certification is provided once the building is completed.

Scope for future improvements

This policy focuses on the general principles of sustainable design and construction, and so there is not as many numerical targets as you would find in the energy and carbon policies above. However, BREEAM certification is included in this policy as BREEAM considers a multitude of sustainable design and construction modules under its certification scheme. There is scope to increase the level of BREEAM certification earlier, by bringing forward when BREEAM excellent comes into force, or there could be the scope to require BREEAM outstanding.

Alternatively, like with targeting the water (Wat 01) credits, there could be scope to stipulate achieving a certain level of credits within a particular module.

The design of sustainable buildings is a complex process, the recommended policy above outlines the key design principles to consider, but it does not however provide guidance on how these elements can be employed to create sustainable buildings, as this would result in an extremely long and unwieldy poilcy given the many considerations and contingencies involved in the best application of these principles to a given site. It is therefore recommended that guidance is prepared to support applicants in designing buildings whereby these elements can be balanced with other demands, such as PV provision required by policy SCC1 and SCC2, to ensure that buildings can be designed holistically. If there are resource constraints to creating bespoke guidance for Sandwell, a directory of existing publicly available resources that offer helpful guidance in this respect could be beneficial.

Alignment with national policy

Part O of Building Regulations requires overheating assessments to be undertaken in residential development, with CIBSE TM59 provided as one route to compliance for residential buildings. Therefore, SCC3.4 and SCC3.5 are aligned with national policy approaches.

However, Part O on its own does not always require that TM59 is completed, as the Simplified Method can be alternatively used for Part O compliance in most cases. Additionally, CIBSE TM52 is not referenced because Part O does not relate to non-residential buildings.

The Housing Update Written Ministerial Statement (15 December 2021) states that there is no need for local policy to duplicate Part O policy. The cooling hierarchy (SCC3.4) is not referenced in Part O and CIBSE TM59 assessment are not *required*, therefore SCC3.4 neither is a duplicate. Rather, SCC3.4 expresses a preferred route to Part O compliance, for maximum effectiveness in protecting occupants from the increasing risk of overheating in current and future years with climate change.

The extensively cited 2023 WMS does not impact SCC3 as the scope of the WMS only impacts energy efficiency standards.

Implementation considerations

Specific information on overheating assessments and the cooling hierarchy could be set out in supplementary policy guidance (or simply a directory of links to existing guidance in the industry, as previously noted)

Although mechanical ventilation is listed down the cooling hierarchy as part of SCC3.4, the use of mechanical ventilation with heat recovery (MVHR) should not be viewed negatively as this may assist compliance with operational energy policies. However, MVHR should have the ability to bypass the heat recovery function in periods of warmer weather in order to support the overheating risk mitigation goal.

Industry capability

Overheating assessments are a requirement of Building Regulations Part O (for residential), and is a common measure performed in the design of good-quality non-residential new buildings especially where a BREEAM rating is sought. Therefore, it should not inflict any significant additional burden on the development industry to deliver on SCC3.4 and SCC3.5.

BREEAM is a very commonly used and sought-after certification within the major non-residential development industry. It is required in many other local plans with generally good compliance.

Development Management capability

BREEAM certification has been required in Sandwell MBC for some time, under the Black Country Core Strategy, and such applicants and colleagues in Development Management should be familiar with BREEAM assessments in the course of determining non-residential development.

The cooling hierarchy is simple to follow and assess to grant policy compliance, assuming some officers have had training carried out and have guidance to refer to. CIBSE overheating assessments (referred to in Policy SCC3.5) give results in terms of passing or failing certain criteria (or percentage of rooms in the building that pass or fail the criteria). Those criteria vary by type of building or room. Guidance and/or training on how to interpret CIBSE overheating assessments will make policy compliance simple to grant or not.

Costs and feasibility

No evidence of costs available. Feasibility is evidenced in that Part O of Building Regulations essentially includes the TM59 process and will require some buildings to undertake that assessment even in the absence of the policy (Sandwell MBC is unlikely to be categorised as a ‘high risk location’, but TM59 is still triggered in Part O where a building exceeds certain glazing ratios). There does not seem to have been a national impact assessment covering costs for Part O in the same way there was for Part L. Therefore, presumably national government does not envision costs significant enough to inhibit viability.

No cost uplift evidence has been identified that would reflect the current (or emerging) versions of BREEAM. It should be noted that BREEAM costs will overlap with those of the SCC2-suite and SCC4-suite, as the achievement of the draft Sandwell policies’ stated energy and carbon improvements would contribute towards the achievement of BREEAM energy- and carbon-related credits. Similarly, the process of meeting Policy SCC3.4 (cooling hierarchy and CIBSE overheating risk assessment) are likely to contribute towards the achievement of BREEAM credits “Hea 04, Thermal Comfort”.

A. Embodied carbon and waste (SCC4)

Residential and non-residential buildings (thresholds given below) must meet the following requirements listed below.

Applicants are expected to demonstrate these elements have been considered, and evidenced where appropriate by the corresponding assessment methodology, in an Energy Statement.

SCC4.1 Embodied carbon reporting	All super-major new residential (50 dwellings or more) and non-residential (5000 m^2 floorspace or more) developments are required to complete a whole-life carbon assessment in accordance with **RICS Whole Life Carbon Assessment** guidance.
SCC4.2 Limiting embodied carbon	Positive weight will be given to applicants who can demonstrate embodied carbon (RICS/BS 15978 modules A1 – A5) which is limited to **600 $kgCO_2e/m^2$ GIA**.
SCC4.3 Building end-of-life	All new buildings are to be designed to enable easy material re-use and disassembly, subsequently reducing the need for end-of-life demolition.
SCC4.4. Demolition audits	All major development that contains existing buildings/structures to carry out a pre-redevelopment and/or pre-demolition audit, following a well-established industry best practice method (e.g. BRE).
SCC4.5 Narrative on embodied carbon in minor development	Proposals for new development of 1 or more homes or ≥100m2 non-domestic floor space, but below the size thresholds for embodied carbon reporting and targets as noted above, should include general narrative on options considered (and where possible, decisions made) to minimise embodied carbon of the proposed development.

Supporting text and notes

For SCC4.5, it is accepted that the level of detail will be lower the smaller the development proposal. The aim is to ensure applicants explore the topic of embodied carbon, but without setting requirements that are impractical or excessively costly at small sites. Points of narrative encouraged in the fulfilment of SCC4.5 could include, but are not limited to:

- Reuse of existing features and materials on site, where present
- Design for material efficiency (reducing the amount of material needed) such as through structural design or use of space and layouts to avoid unnecessary material use
- Substitution of low-embodied-carbon materials (such as timber) in place of higher-carbon materials (such as steel, aluminium, and unadulterated Portland cement)
- Material sourcing for reduced 'product miles' or from manufacturers with low-carbon manufacturing credentials
- Construction processes that reduce the typical rates of material wastage.

Scope for future improvements

Included within the policy under module SCC4.2 are embodied carbon targets; this has been included in policy for applicants who seek to demonstrate best practice in limited embodied carbon.

There is significant scope for future improvements for embodied carbon and waste policies, for example by making the embodied carbon target mandatory (for developments over an appropriate threshold, which could decrease over time).

These targets themselves could be differentiated by use type and progressively tightened over time, for example in line with the 2030 target set by LETI/RIBA (subject to evidence of feasibility and cost at the time of adopting such targets). The cost and feasibility of the tighter targets should improve as embodied carbon becomes integrated into local and national policy and the industry as a whole. Parts of the industry are already acting early to confront this issue that has so long been neglected, including some[xlvii] which are even setting themselves target limits on embodied carbon to be assessed using the RICS methodology. As policy is implemented on embodied carbon, industry will become better placed to deliver on ambitious policy requirements and move towards net zero embodied carbon emissions.

Alignment with national policy

Embodied carbon is not part of Building Regulations currently. Therefore on this topic, there is no particular national policy with which the local policy can be expected to align.

The industry proposal of Part Z, as an additional document to Building Regulations, has been going through the parliamentary process and could be integrated before the adoption of this local plan. This would require that whole-life carbon reporting is implemented in Building Regulations and that emissions limits are set from 2027. It is aligned with the RICS Whole Life Carbon method, the same as specified in the draft Sandwell MBC policies above. An amendment to the Levelling Up & Regeneration Act was proposed by one of the Lords in 2023, (amendment 484) which would have required Government to include embodied carbon into Building Regulations according to the same British Standard on which the RICS method is based, but the amendment was not moved[xlviii] (not debated when called, therefore neither accepted, rejected or withdrawn). More recently in early 2024, a further coalition of respected industry standard-setting bodies has released a policy paper pressuring the next Government once more to introduce Part Z or similar between 6 months to 2 years of taking office after the next election (which is due by early 2025 but is widely expected to take place in the second half of 2024).

The Environmental Audit Committee state that embodied carbon assessments are sorely needed for new development and that if embodied carbon emissions are not actively reduced, the UK will not remain within its carbon budgets nor achieve its 2050 net zero target. There is therefore a clear justification for local authorities to require embodied carbon assessments and limit emissions arising from the construction of new development.

Whilst there is no explicit reference to 'embodied carbon' in the NPPF 2023, its references to 'low carbon development' and 'low carbon economy' could readily include embodied carbon as an implicit part of the equation. Additionally, embodied carbon is a design issue and therefore should logically fall under the NPPF's instruction that "New development should be planned for in ways that … can help to reduce greenhouse gas emissions, such as through its … design". The case for addressing embodied carbon is justified by the increasing proportional importance of these emissions as a share of buildings' total carbon footprint as the power grid is decarbonised.

The previously referenced 2023 WMS is not relevant to policy SCC4, as the scope of that WMS only impacts operational energy efficiency standards.

Implementation considerations

Information and requirements on embodied carbon assessments may need to be set out in supplementary policy guidance to enable developers to sufficiently demonstrate policy compliance. Methodologies and the scope of embodied carbon assessment should be clarified, alongside other potential implications such as third-party verification.

Similarly, acceptable methodologies (i.e. RICS Whole-Life Carbon Assessments guidance) to comply with SCC4.1 and SCC4.2 should be set out in guidance.

Industry capability

The expectation set by point SCC4.3 (demonstrating ease of future building disassembly for future reuse) and SCC4.4 (pre-demolition or pre-redevelopment audit) are both within the industry's current capability in that they are part of the most common environmental certification system used across the industry (BREEAM), with widespread take-up (especially within the non-domestic sector):

- Pre-demolition or pre-redevelopment audits are not uncommon in the development sector, as they are one of the actions that developers often choose to take in order to gain certain credits within the very widespread BREEAM certification (relevant credit: BREEEAM 'Wst 01'[xlix]). The industry in London is familiar with these as part of that region's requirement for circular economy statements; as a result many of the major nation-wide built environment consultancies have had exposure to these. Alternatively, these audits are offered as a service by the BRE itself, and by some demolition contractors. Guidance on best practice is available from the BRE[l].
- BREEAM credit (Wst 06) requires the applicant to produce "a study to explore the ease of disassembly and the functional adaptation potential" of several different design options, and from that study to "develop recommendations or solutions … during or prior to concept design, that aim to enable and facilitate disassembly and functional adaptation". This would be relevant to the recommended policy point SCC4.3. Also, any industry body that is also active within London will also have gained exposure to this concept through the GLA's requirement for circular economy statements, whose guidance[li] notes that three of the six 'circular economy principles' are 'building in layers', 'designing for adaptability or flexibility', and 'designing for disassembly'. While such analysis may not be commonplace outside London, it is not unheard of, and this policy is designed to boost the practice by increasing the demand and thus encouraging the Oxfordshire industry to grow its capacity to produce this analysis that will be a vital part of the local and national transition to net zero. Other than the GLA, guidance is available from several sources online including ISO[lii] and UKGBC[liii,liv].

Development Management capability

The capability of Development Management officers to accurately assess these policies is reliant on the degree of training and guidance documents available. It is essential that officers have guidance on hand against which to assess policies to ensure that compliance is achieved in accordance with methodologies set out in a subsequent guidance document. Specific upskilling of at least one officer on climate change policies to gain a technical understanding will greatly assist the overall ability of the team to assess policy compliance. Officers could familiarise themselves with the following using existing online public resources to better understand and assess embodied carbon calculations:

- Different scopes of carbon (e.g. upfront embodied carbon vs. whole-life carbon)
- Knowledge of RICS whole-life carbon assessment guidance
- General understanding of low-carbon materials
- Good practice efficient structural design choices to reduce embodied carbon

Costs and feasibility

For Policy SCC4.1, no robust industry-wide evidence is available about the costs of the embodied carbon assessment, but please see the associated appendix to the current report for an estimated anecdotal cost that could be applicable depending on the expert judgement of the viability consultant.

Alongside testing the feasibility of operational energy policy requirements, the South Oxfordshire and Vale of White Horse evidence base also explored the feasibility and costs of embodied carbon emissions limits on the tested residential and non-residential archetypes. The limit set out under SCC4.2 has been shown to be feasible for all archetypes, as modelled under a Part L 2021 scenario.

That Oxfordshire study found that using typical materials required to comply with Part L 2021 (i.e. current industry standard), no archetype exceeded 559 $kgCO_2/m^2$ GIA. Therefore, this can be considered a cost neutral limit since the Part L 2021 scenario represents business-as-usual. The only costs therefore associated with SCC4.1 and SCC4.2 only arise from the cost of an embodied carbon assessment, which generally comes at a cost of no more than £15,000. Given that SCC4.2 is a non-mandatory guideline and not a required standard, the relative cost uplift of an embodied carbon assessment is negligible.

Flood Risk (SCC5)

The Council seek to minimise the probability and consequences of flooding from all sources by adopting a strong risk-based approach to site allocations and the granting of planning permission, in line with the National Planning Policy Framework.

SCC5.1 Flood Risk	All developments are required to undertake a site-specific flood risk assessment including: a) Site location b) Existing use c) Proposed development d) Flood Zone of the site, taking into account the most up-to-date information on sources of flooding nationally, and locally including 2020 Strategic Flood Risk Assessment (SFRA) updated in 2021 and any future updates. e) The Sequential Test (applicable to development outlined in SCC5.3 f) The Exception Test (applicable to development outlined in SCC5.4. g) All development is required to consider the impact of climate change over the lifetime of the development.
SCC5.2 Flood Risk and Surface Water Drainage Assessment	A Flood Risk Assessment and Surface Water Drainage Scheme will be required for development: a) All major development b) Where any part of the site is within Flood Zone 2 or Flood Zone 3; c) Where the site is greater than one hectare and is within Flood Zone 1; d) Where the site is a minerals or waste development; e) Where the site is within five metres of an ordinary watercourse; f) Where the site is within 20m of a known flooding hotspot; or g) Where the site is within the 1 in 100-year flood extent based on the Risk of Flooding from Surface Water Map. This can incorporate the sequential and exception test if required.
SCC5.3 Sequential Test	A Sequential Test is required for all development proposals, unless the proposal is for: a) A strategic allocation, and the Sequential Test has already been carried out by the LPA; or b) A change of use (except to a more vulnerable use); or c) A minor development (householder development, small non-residential extensions with a footprint of less than 250m2); or d) A development in Flood Zone 1, unless there are other flooding issues in the vicinity of the development (i.e., surface water, ground water, sewer flooding). The SFRA can be used to identify where there are flooding issues from sources others than rivers. For developments in Flood Zone 3: e) Where the site is in Flood Zone 3b (Functional Floodplain), all development other than essential infrastructure (subject to the Exception Test) will be refused (including extensions and intensification of use and changes of use) and opportunities to relocate development out of the floodplain should be sought; f) Where the site is in Flood Zone 3a (High Probability), new homes can only be permitted subject to the Exception Test. For developments in Flood Zone 2: g) Where the site is in Flood Zone 2 (Medium Probability), some development can be permitted, subject to a site-specific flood risk assessment; h) Highly vulnerable developments, such as caravans, mobile homes and park homes with permanent residential use can be permitted, subject to the Exception Test; For development in Flood Zone 1: i) Where the site is in Flood Zone 1 (Low Probability), the information in the 2020 SFRA should be used to assess if a development is at risk from other sources of flooding and / or if there is an increased risk of flooding in the future due to climate change. If this site is shown to be at risk, a site-specific flood risk assessment should accompany a planning application. The Sequential Test should demonstrate that all reasonable available sites that are at a lower risk of flooding (from all sources

	of flooding) have been considered before determining the suitability and acceptability of the site for the proposed development type.
SCC5.4 Exception Test	For development within Flood Zone 2 & 3 (where the sequential test has been satisfied), developments are required to undertake the exception test. Developments will need to: a) Demonstrate that wider sustainability benefits to the community outweigh flood risk. Matters such as biodiversity, green infrastructure, historic environment, climate change adaptation, flood risk, green energy, pollution, health and transport should be considered; b) prove that the development will be safe from flooding for its lifetime, taking account of the vulnerability of its users; and c) prove that the development can be achieved without increasing flood risk elsewhere, and, where possible, will result in a reduced flood risk overall.
SCC5.5 Groundwater Source Protection Zones	No development will be permitted within a groundwater Source Protection Zone that would physically disturb an aquifer. The site-specific risk assessment should demonstrate that there would be no adverse effect on water resources will be required prior to the grant of planning permission.
SCC5.6 Watercourses and flood mitigation	Watercourses are an integral part of Sandwell and management of these resources is essential to sustainable development within the district. Fluvial (river) and pluvial (surface water) poses significant flood risks to Sandwell. Development will be expected to avoid vulnerability and manage risks by mitigating against the impact of storm events and changes to our climate by: a) Where possible naturalise urban watercourses (by reinstating a natural, sinuous river channel and restoring the functional floodplain) and open up underground culverts. b) Ensure that there is no net increase to fluvial flood risk downstream and where practicable how the development could help mitigate against downstream fluvial flood risk. c) Not developing over culverted watercourses and allowing a suitable easement from the outside edge of the culvert. d) No built development within five metres of an ordinary watercourse and within ten metres of the top of the bank of a main river unless a different appropriate width is agreed by either the Environment Agency or Lead Local Flood Authority. e) Development within river catchments should reference the relevant River Basin Management Plans and consider how development supports other environmental benefits of watercourses including habitats and biodiversity.

Supporting text and notes

The cumulative assessment for the Black Country has highlighted that there is a relatively high risk that cumulative development across the region will have an impact and increase flood risk. Thresholds for reporting requirements are set throughout the policy, depending on the site's location in respect of flood risk.

All developments are expected to undertake a site-specific risk assessment which includes the relevant information as detailed in SCC5.1 which is dependent on the context of the site. To ensure that the Flood Risk Assessment is proportional to the development, and its context in relation to flood risk, we recommend that the Sandwell Council prepare guidance on what information is required either through supplementary guidance or through the validation list.

Scope for future improvement

Please note that the policy content as shown above is largely replicated from content that was already present in the previous consultation version of Sandwell's emerging local plan, as this related to recommendations from the SFRA. Notwithstanding this, the policy has been amended to be clearer on the requirements and submission documents from developers.

In the future, any amendment to the policy should be informed by local conditions and reporting undertaken by the Local Lead Loof Authority (LLFA) of the Environment Agency (EA).

It is crucial that policy reflects up to date information on flood risk, to this regard the policy references the 2020 Strategic Flood Risk Assessment (SFRA) and provision is made for updates of this report. The policy therefore directs all development to review this document to ensure that the proposed development is not at risk of any type of flooding

Alignment with national policy

The policy is based on the Sequential and Exception Test as outlined in NPPF.

Implementation considerations

As noted above, to ensure that the Flood Risk Assessment is proportional to the development, and its context in relation to flood risk, we recommend that the Sandwell Council prepare guidance on what information is required either through supplementary guidance or through updating the validation list.

Development Management capability

As the policy is based on national policy which has been in effect for some time, it is expected that Sandwell is capable of determining flood risk.

Costs and feasibility

No evidence of costs available. This policy supersedes flood policy ENV5 of the Black Country Core Strategy and as noted previously reproduces the requirements of national policy, and such costs are not assumed as were previously required for development.

Sustainable Drainage (SCC6)

To ensure that all new developments do not contribute to flood risk, are resilient to the effects of climate change and support the long-term wellbeing of their communities, development is required to:

SCC6.1 Sustainable Drainage Systems	All development should demonstrate that the design have incorporated sustainable drainage systems (SuDS) to prioritise natural drainage solutions to control surface water in accordance with the SuDS hierarchy. Preference will be given to systems that also contribute to the conservation and enhancement of biodiversity and green infrastructure of the site, and wider area, and where cross-reference can be made to show that the chosen design supports other policy expectations such as SCC3.6 about mitigating the urban heat island.
SCC6.2 SuDS in minor development	Minor development is expected: a) Implement SuDS designed in accordance with local requirements for SUDS120. b) Restrict surface water flow by a minimum of 30% over pre-development runoff rates. Surface water flow rates should never exceed the rate of discharge from the development prior to redevelopment for that event. c) Provide details of adoption, ongoing maintenance and management of SuDS. For minor development that is located within Flood Zone 2 or 3, within 5m of a watercourse, 20m within an area of known flooding, or within an area of surface water flooding, the information listed above should be included in the Flood Risk Assessment and Surface Water Drainage Scheme required by SCC5.
SCC6.3 SuDS in major development	Major development is expected to: a) Submit a Flood Risk Assessment and Surface Water Drainage Assessment Scheme in accordance with Policy SCC5. b) Implement SuDS designed in accordance with local requirements for SUDS120 / Local SuDs Standards. c) Restrict surface water flow to the equivalent greenfield rates d) Provide details of adoption, ongoing maintenance and management of SuDS.
SCC6.4 Groundwater source protection zones	A hydrogeological risk assessment is required where infiltration is proposed for anything other than clean roof drainage in a Source Protection Zone 1 & 2.

Supporting text and notes

To align with Policy SCC5 on flood risk, minor development is expected to complete a Flood Risk Assessment and Surface Water Drainage Scheme in locations which are more vulnerable to flooding, therefore details on sustainable drainage is expected to be included in this report. For all other minor developments, the level of detail for sustainable drainage will be lower, and the aim of the policy is to ensure that sustainable drainage is considered and implemented without setting requirements which are excessive on small sites outside of areas of flood risk.

For major development, a Flood Risk Assessment and Surface Water Drainage Scheme is required as part of SCC5, and such details of sustainable drainage required by this policy is expected to be included in this report. If greenfield runoff rates are not considered feasible or viable, the developer must submit evidence demonstrating what the constraints are and how the development will accommodate runoff rates that are as close as possible to greenfield rates.

Scope for future improvement

Please note that the policy content as shown above is largely replicated from content that was already present in the previous consultation version of Sandwell's emerging local plan as this has been informed by local guidance.

Surface water drainage should be informed by local conditions and reporting undertaken by local agencies or the Environment Agency (EA) accounting for up-to-date flood risk from all sources.

Local requirements, such as that referred to in SCC6.2 and SCC6.3, should be kept up-to-date based on flood risk, and account for climate change. We would also recommend that this guidance is linked within the policy (using a hyperlink or footnote) to make it easier for applicants to comply with the guidance.

There is also scope for policy to tighten the betterment sought in surface water flow rates on minor development and restrict these to greenfield rates. This approach has been adopted in Local Plan's elsewhere in England where there is critical surface water flooding, e.g. Oxford City.

Alignment with national policy

The policy is based on the requirements of NPPF, and local guidance, e.g. Staffordshire Sustainable Drainage Systems Handbook.

Implementation considerations

Clear links to external guidance, e.g. Staffordshire Sustainable Drainage Systems Handbook, or any other source is useful for applications and development management colleagues to ensure that developments have incorporated sustainable urban drainage to the best of the site's ability. This

guidance should also include the methodology to calculate discharge rates to ensure that reductions in surface water discharge meets policy requirements.

Development Management capability

It is essential that officers have guidance on hand to assess policies against to ensure that compliance is achieved in accordance with methodologies set out in guidance.

Costs and feasibility

No evidence of costs available. This policy supersedes flood policy ENV5 of the Black Country Core Strategy and as noted previously reproduces the requirements of national policy, and such costs are not assumed as were previously required for development.

Policy implementation and monitoring

Policy adoption is key, yet policy implementation is essential to ensure effective delivery of required standards. It is recommended that the Council put together a group that includes policy officers, development management officers (and conservation/heritage) and building control officers to design an effective monitoring system.

Policy compliance

Adoption of ambitious local plan policies is crucial to work towards a net zero carbon future, and to ensure that development is resilient to the effects of climate change. However, without reliable implementation and monitoring mechanisms, intended benefits of these policies will not be experienced and their reputation hindered.

Implementation is key to the success of policy delivery in practice and should be treated equally as important to policy development. Therefore, Development Management officers will need to gain an understanding of how the policies are intended to operate in practice and initially be guided through how to assess policy compliance.

To ensure that policies on operational carbon reductions, renewable energy, offsetting, embodied carbon and overheating are delivered as intended, two key stages of assessing compliance are necessary: planning application/design stage and post-completion stage. Submission of data throughout design stages is what will determine policy compliance for the full planning application, yet this must be verified with as-built data to confirm true policy compliance; this only applies for recommended policy components SCC1, SCC2 and SCC3.4 and SCC4. Pre-commencement and pre-occupation conditions must therefore be set at the planning application stage, which could include:

- Photographic evidence of building fabric, heating systems and ventilation technologies
- Air tightness tests whilst the air barrier remains accessible (to allow improvements to be made if required standards are missed)
- As-built reports for building energy performance, embodied carbon assessments and overheating measures

In cases where standards fall below required levels at the post-completion stage, it is important to have enforcement mechanisms in place to penalise non-compliant applications. This is a difficult issue to deal with as it is unlikely to be sensible to deconstruct buildings to remedy energy/carbon compliance failures unless particularly extreme, but the council should explore options with the Enforcement team on how to mitigate as-built risks.

Monitoring standards

Understanding how policies work in operation assist the future development of improved policies and informs other local authorities on what is deliverable. Sandwell MBC should develop a reliable monitoring system that enables the collation of policy performance data both for compliance at application stages and once the building is in use. This should be made available in a standardised format for ease of data input for developers and subsequent sharing of data. Sandwell MBC could look to distribute this standardised reporting form to neighbouring authorities to form a regional understanding of policy implementation. Examples of suggested monitoring indicators for new buildings and also renewable energy include:

Indicator	Source	Policy link
Average in-use Energy Use Intensity of new buildings	Development data	SCC1.2
Average on-site renewable energy generation per m^2 building footprint (kWh)	Development data	SCC1.4 and SCC2.4
MW capacity of solar PV installed on buildings (kWp)	Planning portal or MCS data	SCC1.4 and SCC2.4
MW capacity of solar PV installed as standalone scheme (above 1MW)	DESNZ Renewable Energy Planning Database (REPD) data	Other renewable energy policies (out of scope)
MW capacity of wind turbine installed as standalone scheme (above 1MW)	DESNZ REPD data	Other renewable energy policies (out of scope)
MW capacity of battery storage installed	DESNZ REPD data	Other renewable energy policies (out of scope)
Annual CO_2 emissions of new build development (split into regulated and unregulated) and %TER reduction for the regulated portion	Development data	SCC1.1, SCC1.4, and SCC2.1, and SCC2.4
Average TER % reduction delivered through energy efficiency measures	Development data	SCC1.1 and SCC2.1
£ contribution to renewable energy offsetting fund, £spent, and kWh generation delivered via the fund	Local Authority's own S106 records	SCC1.5 and SCC2.5
Number of heat pumps installed	Planning portal or MCS data	SCC1.1 and SCC2.1

Average embodied carbon of new development	Development data	SCC4.1

As required by policies SCC1 and SCC2, Post-Occupancy Evaluation (POE) is key to understanding in practice success of net zero operational energy policy. The primary purpose of undertaking POE is not for policy compliance but to better understand the performance gap between design stage energy performance predictions and the as-built performance of the building. Once the building is in use by occupants, developers cannot be penalised if reported values on energy consumption exceed the policy requirements because operational energy consumption is dependent on occupant behaviour.

Due to the influence of occupant behaviour on values reported through POE, there can be privacy concerns with residents associated with these exercises if not carefully conducted. Therefore, developers cannot force residents to participate in POE but should show to the best of their ability that the building performs as intended with a minimal performance gap with the amount of data available. Implications of this potential risk are that data collection of energy performance may not be possible and future policy iterations are less informed.

Mitigating the performance gap

UK buildings are consistently victim to a performance gap between the energy performance of the building at the design stage and operational performance. The delivery of truly net zero buildings therefore requires rigorous systems to be in place to mitigate such a gap in energy performance, which are explored below.

Often the first point of failure of below-par operational energy performance is at the modelling stage, which in the UK is led by use of inaccurate compliance tools for Building Regulations, SAP and SBEM. However, in order to appease the 2023 WMS thus reducing risks to policy adoption at examination, Sandwell MBC has selected a policy option that uses SAP (rather than PHPP).

If local policy is to more effectively deliver net zero buildings, alternative methodologies should be used to gain an understanding of building energy performance at the design stage. Proven alternatives are available for both residential and non-residential buildings:

- Residential: Passivhaus Planning Package
- Non-residential: CIBSE TM54 with Passivhaus Planning Package or IES-VE

It is also worth noting that the use of accurate energy modelling tools, like PHPP or TM54, is often a first step within process-based assured performance methods (see later subheading in this section) and can earn credits towards industry sustainability certifications including BREEAM and NABERS.

Sandwell MBC's policy implementation will be more effective where applicants are enticed or encouraged to use these (rather than SAP or SBEM) for compliance with the renewable energy requirement (whereas the TER target can only be calculated with Part L methods, SAP or SBEM, because TER is a metric only set by and used by Part L). A new residential energy modelling tool for building regulations Part L is current in development nationally: the Home Energy Model, HEM. Although efforts are being made to remedy the inaccuracies of SAP within HEM, the final form and in-practice effectiveness of HEM is not yet known. The Council is encouraged to return to this topic once HEM is well-established and its accuracy evidenced, to consider whether this would be a suitable step within efforts to reduce the performance gap and/or comply with the optional energy performance targets of SCC1.1 and SCC2.1

Accurate assessments are equally important for policies on overheating and embodied carbon. For overheating, the simplified method on offer for Part O of Building Regulations is an inaccurate tool, hence why CIBSE overheating assessments are sought in the draft Sandwell policy SCC3.4 so that more specific and accurate overheating measures specific to the at-risk building can be implemented.

Embodied carbon assessments require reliable and up-to-date data on the carbon content of various materials and products. Accurate data, a thorough scope, and reasonable modelling assumptions are key to robust embodied carbon assessments. Since embodied carbon is not a national policy requirement, there is no government-approved methodology, but the RICS Whole Life Carbon Assessment guidance is generally accepted as the industry standard. Several online databases offer the typical embodied carbon factors of specific products or of generic building materials.

Third party verification

The use of accurate assessment and modelling tools is essential to the eventual performance of building, but human inaccuracies and errors throughout stages remain a risk to exacerbating a performance gap. Therefore, requiring third-party verification mechanisms to assess the accuracy of the approach, inputs and assumptions to modelling and/or assessments can further mitigate performance gap risks. There is currently no recognised collection of third-party verification systems and should therefore be a council-led decision on what would constitute an acceptable third-party verification process demonstrated by a developer. An acceptable third-party verification approach would be the submission of an audit undertaken by a third-party consultancy who are able to undertake the calculations themselves but are independent to the development. Additionally, if the assured performance schemes (as below) are used, this would constitute an effective third-party verification process.

Assured performance

Once accurate modelling and assessments have been completed to the best of abilities, following the processes above, assured performance schemes should be employed as the final element of performance gap mitigation. These are procedural toolkits that are designed to deliver a reduction in the performance gap through following optimal steps during design and construction to make assumptions and modelling more accurate and then to deliver correctly on what was designed. Building Control at local authorities firstly do not have control over all development sites and even at those where the authority does, regular on-site checks are not always carried out. Management systems to ensure high levels of construction quality are necessary to deliver energy performance standards as predicted.

For example, air tightness and thermal bridging are key components of the net zero operational energy policies recommended in this document. These need to be checked throughout construction

phases, meaning that a simple confirmation of insulation thickness is insufficient to assess construction quality.

Acceptable schemes to demonstrate compliance with policies SCC1.6 and SCC2.6 should be set out in supplementary policy guidance. Several schemes are available and proven to be reputable, as listed below:

- **Passivhaus Certification** (residential and non-residential)
- **AECB Building Standard** (residential and non-residential)
- **NABERS UK** (non-residential)
- **Assured Performance Process** (residential)
- **National Energy Foundation** (residential).

Association with wider Sandwell MBC Reg 19 Policy

Relationship with recommended policies SCC1-SCC6

	SDS1 Spatial Strategy for Sandwell		SD2 Increasing efficiency and resilience		Policy SDS5 - Achieving Well-designed Places	Policy SDS8 - Green and Blue Infrastructure in Sandwell
Comments or changes proposed	The current policy refers to the 'minimisation and mitigation of the likely effects of climate change, and the multifunctional benefits of open spaces and green and blue infrastructure	The current policy also references promoting zero or low carbon designs, building techniques, materials and technologies	The policy outlines that development should be designed to mitigate climate change and provide adaptations that mitigate adverse effects on human health	The policy then cross refers to elements of climate mitigation and adaptation (criteria a-k).	Refers to climate change mitigation and adaptation.	Refers to climate change mitigation and adaptation.
	No change proposed	No change proposed	No change proposed	Policy will need to be amended to reference new policy references. Recommend inserting new criteria to cover off net zero requirement in all residential buildings, and for major non-residential buildings. Recommended changes to policy criteria: a – refer to passive design to minimise internal heat generation through consideration to orientation, shading, thermal mass and insultation. e & f – combine to cover utilisation of sustainable drainage systems and prioritisation into natural drainage solutions. h – remove – policy does not cover this specifically.	Policy will need to be amended to reference new policy references.	No change proposed

Relationship with recommended policies SCC1-SCC6

	Policy SNE3 – Provision, Retention and Protection of Trees, Woodlands and Hedgerows	Policy SNE6 – Canals		SHE1 –SHE4	SHW1– Health Impact Assessments	Policy SHW3 – Air Quality
Relationship with recommended policies SCC1-SCC6	Refers to the value of trees to mitigate and adapt to climate change	Refers to flood risk and utilisation in sustainable drainage systems.	Refers to adaptation of canals to help mitigate the effects of climate change	Suite of policies refers to the conservation and enhancement of designated and non-designated heritage assets	Policies refer to health impact assessment, of which includes quality of housing and mitigation and adaptation to climate change	Policies refers to energy generation in new development.
Change proposed	No change proposed	No change proposed	No change proposed	No change proposed.	No change proposed.	Recommended changes: c. Policy directs development away from fossil fuel, therefore remove reference to ultra-low NOx boilers.
Comments or changes proposed				Climate change policies are likely to interact with policies SHE1-SHE4 where new development is proximal to a historic asset, however it is considered that neither these polices, or the recommended climate change policies require alteration to ensure a successful relationship.	The relationship between the climate change policies and SHW1 is positive.	Policy will need to be amended to reference new policy references.

Relationship with recommended policies SCC1-SCC6

	SHW4 – Open Space and Recreation	SHO3 - Housing Density, Type and Accessibility	SHO4 – Affordable Housing	SHO5 - Delivering Accessible and Self / Custom Build Housing	SHO6 - Financial Viability Assessments for Housing	SHO9 – Education Facilities
Comments or changes proposed	Refers to open space's benefits to mitigating against the effects of climate change No change proposed.	The policy refers to density and type of development in relationship to design. The design of development could be impacted by climate change policies, e.g. orientation, provision of renewable energy etc. Recommend amending criteria c to include reference to mitigation and adaption to climate change.	Policy includes inclusion of, or financial contribution to affordable housing The delivery of affordable housing is subject to viability, it is acknowledged that compliance with the climate change policies may also impact some development through viability also. However, it's not considered that either this policy or the climate change policies require any further amendments as both refer to individualised viability for schemes, which the Council requires under each policy if the requirements for affordable housing, or compliance with climate change policies is unviable.	Relates to new build dwellings The threshold for climate change policy SCC1 requires that all new dwelling are net zero carbon, and such accessible and custom builds would be subject to this policy. The policy may benefit from being amended to cross refer to SCC1 as a requirement for the standard of new dwellings.	Relates to development viability and requires that if compliance with local plan policies are unviable, then applicants need to demonstrate this through a viability assessment. Paragraph 4 relates specifically to affordable housing, and not compliance with SCC1- SCC2. We consider that it is down to the Council to decide what requirements of the Local Plan is reduced or removed should developer viability be challenging, as such we recommend the Council reviews this policy.	Relates to development of educational buildings or estates No change proposed. The type of development would be subject to recommended policy SCC2 if it met the thresholds for development.

Relationship with recommended policies SCC1-SCC6

	SHO10 – Accommodation for Gypsies, Travellers and Travelling Show people	SHO11 - Housing for people with specific needs	SEC1 - 4	SWA1 – Waste Infrastructure Future Requirements	SWA4 – Locational Considerations for New Waste Facilities	SWA5 – Resource Management and New Development
Policy	Policy relates to safeguarding and meeting the future needs of gypsies, travellers and travelling showpeople	Policy relates to specific needs within new housing.	Policies relate to non-residential development	Policy refers to waste minimisation and recycling of waste through construction phases.	Policy refers to opportunities to supply heat or power from waste development	Policy refers to waste management in new development which includes minimising waste, maximising the use of materials with low environmental impacts
Changes proposed	Policy will need to be amended to reference new policy references (flooding)	No change proposed.	No change proposed.	No change proposed.	No change proposed.	No change proposed.
Comments or changes proposed	The type of development would be subject to recommended policy SCC1 and SCC2 if it met the thresholds for development.	New non-residential development would be subject to recommended policy SCC2 if it met the thresholds for development.	New development would need to comply with this policy and the requirements of SCC4.	Policies SCC1 and SCC2 refer to decentralised energy.		

Relationship with recommended policies SCC1-SCC6

	SDM1 – Design Quality	SDM2 – Development and Design Standards	Delivery, Monitoring, and Implementation
Comments or changes proposed	The policy does not refer to mitigation or adaption to climate change but does include reference to green and blue infrastructure. Recommend adding criteria j to include reference to mitigation and adaption to climate change in accordance with SCC3.	Policy outlines standards for new development including space standards and water efficiency. All new residential development will be subject to SCC1 as well as this policy. It is considered that repetition is not required, but the Council may be minded to cross reference to policy SCC1 for energy efficiency standards.	Will need to be amended to reference new policy references (flooding – policies SCC5 and SCC6)

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