Rutland Local Plan Review: Zero Carbon Policy Options for Net Zero Carbon Developments

B(ii). Risk Matrix

26 July 2023

Rev 01.2

Bioregional

Written by: Marina Goodyear (Project Manager) and Alex McCann (Senior Analyst)
Checked by: Lewis Knight (Head of Sustainable Places)

1. Introduction

Bioregional has been appointed to provide Rutland County Council with an assessment of policy options available to achieve net zero carbon developments in Rutland, to inform the emerging Rutland Local Plan review.

Local planning authorities (LPA) have a legal duty to deliver carbon reductions through the planning process in line with the objectives and provisions of the Climate Change Act. However, the LPA's ability to fulfil this duty may be somewhat constrained by the powers granted to the LPA to require exemplary carbon and energy performance by proposed developments.

The extent to which the LPA can pursue the Climate Change Act objectives may also come into tension with LPAs' other duties such as facilitating large and rapid housing delivery targets to meet 'objectively assessed' housing need (partly through enabling development to make a viable profit).

Beyond these duties around climate objectives and housing delivery, well-thought-out low carbon building policy can help to deliver further economic and quality-of-life benefits valued by both constituents and national policy, such as enabling residents to live in homes that have low bills and don't need expensive retrofit in the near future. These latter points are relevant to the National Planning Policy Framework's[i] *social* and *economic* objectives of sustainable development, as well as its *environmental* objective. This includes ensuring that homes can be delivered which "meet the needs of present and future generations".

Based on our review of the UK's trajectory to net zero carbon, planning powers, precedents, necessary measures for net zero carbon buildings, feasibility and viability (see appendices), in this report we present a suite of identified policy options and their performance in relation to delivering on relevant imperatives.

We express this in terms of 'risk': that is, the risk that a policy will fail to deliver the required outcomes in terms of carbon reductions, affordable bills and building longevity, or the risk that they may be subject to challenge by developers or the inspector on the grounds of viability, housing delivery, or pushing the boundaries of planning powers available.

Please note that this risk matrix document focuses only on potential development management policy measures for buildings, not for other topics such as transport, standalone renewable energy, or green infrastructure. This is because the carbon outcomes under those topics are better addressed through the spatial strategy site allocations and other tools such as Local Development Orders, and the risks associated with pursuing them is not so clear cut in terms of powers, impact on residents, impact on viability, compatible with national approach, and so on. These other topics have been explored in the separate document "Task A: Climate Change Legislation".

Please note that in the interests of brevity to show all policies on one page, the risk matrix uses acronyms and other short terms that are common in the sectors of climate action, planning, and low-carbon building design. A glossary of these terms and acronyms is provided overleaf.

Contents

Glossary of terms and acronyms

BREDEM	Building Regulations Domestic Energy Model. A methodology for (estimating) calculating the energy use and fuel requirements of dwellings based on their characteristics. BREDEM was the basis from which SAP was developed.
Carbon, or carbon emissions	Short for 'carbon dioxide' but can also include several other gases with a climate-changing effect (nitrous oxide, methane, refrigerants) that are emitted to the atmosphere from human activities.
Carbon budget	Amount of greenhouse gas that can be emitted before reaching a level of atmospheric carbon that causes severely harmful climate change
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 material production, transport and assembly of a building, infrastructure, vehicle or other product. Can also include carbon emitted due to the maintenance, demolition and disposal at end of life of the product or building. As distinct from '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.
GHG	Greenhouse gas (CO_2 and several other gases: nitrous oxide, methane, refrigerants). Often collectively referred to as 'carbon'.
Part L	Building regulations section that sets basic legal requirements regarding buildings' energy and CO_2.
Performance gap	The 'energy performance gap' is the difference between the amount of energy a building is predicted to use during design, versus the actual amount of energy it uses. The gap is due to poor prediction methodologies, errors in construction, and unexpected building user behaviour.
PV	Photovoltaics: solar panels that generate electricity.
PHPP	Passivhaus Planning Package – a tool to accurately calculate a building's energy use. It is used to design buildings that seek Passivhaus certification, but can be used without pursuing certification.
Regulated energy	The uses of energy within a building that are regulated by Part L of building regulations. This covers fixed energy uses in the building – mainly space heating, space cooling, hot water, permanent lighting, fans/ventilation and pumps.
SAP	Standard Assessment Procedure – the national calculation method for homes' energy and carbon, used to satisfy building regulations Part L.
SBEM	Simplified Buildings Energy Model – the national calculation method for non-residential buildings' energy and carbon, used to satisfy building regulations Part L.
TER	Target Emission Rate – limit set by Part L of building regulations on CO_2 emissions per square metre of floor.
TPER	Target Primary Energy Rate – limit set by Part L of building regulations on 'primary energy' use per square metre of floor. A new metric being introduced to building regulations from June 2022. Unlike metered energy, 'primary energy' takes into account energy lost to conversion inefficiencies during power generation and distribution, or gas combustion.
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[ii].
TM54	Method to accurately predict buildings' energy use. Devised by Chartered Institution of Building Services Engineers (CIBSE).
Unregulated energy	Energy uses within a building or its curtilage but that are not regulated by Part L of building regulations. Examples: plug-in appliances, catering, external lighting among other uses. This can represent 50% of the total energy used at a property, depending on the type and use of the building.

2. A word on Part L of Building Regulations: current and future

Many of the policy approaches, powers and precedents described in this document rest on seeking carbon and energy improvements compared to the baseline of a building that achieves basic compliance with building regulations. However, that baseline changes periodically as the building regulations are updated and subsequently puts many of the existing precedents out of date.

How does Building Regulations Part L work?

The building regulations lay out the basic standards that all buildings must meet by law. The section on energy and carbon is called Part L, which was introduced[iii] in 1985, updated in 1995, 2002, 2006, 2010, 2013 and 2021/22. It uses a set of calculations (SAP and SBEM) to estimate the building's energy use and carbon emissions. SAP and SBEM calculation methods are also periodically updated.

Based on applying a certain minimum standard of building fabric and services to a 'notional' (imaginary) building of the same size and shape as the proposed new building, Part L generates three targets that must be met:

- Target Emission Rate of carbon dioxide. Abbreviated TER. The TER is a limit on kilogrammes of carbon dioxide per square metre per year. Both homes and nonresidential buildings are subject to a TER.
- Target Fabric Energy Efficiency (only applies to homes). Abbreviated TFEE. The TFEE is a limit on kilowatt-hours of space heat energy demand per square metre per year.
- Target Primary Energy Rate, abbreviated TPER. Both homes and non-residential buildings are subject to a TPER. TPER is a somewhat complex summary measure of all 'regulated' energy uses (explained below) that takes account not only of *metered* regulated energy use, but also the energy expended and lost in the generation and distribution of the energy before it reaches the building, as well as the efficiency of the building services such as heating and lighting technologies. It is measured in kilowatt-hours per square metre per year.

Most local plan policy precedents use the Part L Target Emission Rate as the baseline, and ask proposed new buildings to achieve a set percentage reduction from that baseline.

The previous Part L – used as a baseline by most precedent local plans – was in force from 2013 to 2022. However, new Part L updates came into force in June 2022 and will change again in 2025. These updates come with upgrades to the baseline fabric and services, and updated carbon factors to reflect decarbonisation of grid electricity. Altogether, this results in a more stringent Target Fabric Energy Efficiency and Target Emissions Rate. At this point, the percentage improvements required by most precedent local plans have become obsolete because they are based on the old 2013 Part L. The updates in 2022 and 2025 will change to the Target Emission Rate as follows:

- Part L 2021 TER is approximately 31% lower than 2013 TER (in force from 15th June 2022)
- Part L 2025 TER will be approximately 75% lower than 2013 TER

  (Part L 2025 TER will be therefore approximately 64% lower than Part L 2021 TER).

Weaknesses of Part L in delivering buildings fit for a net zero carbon future

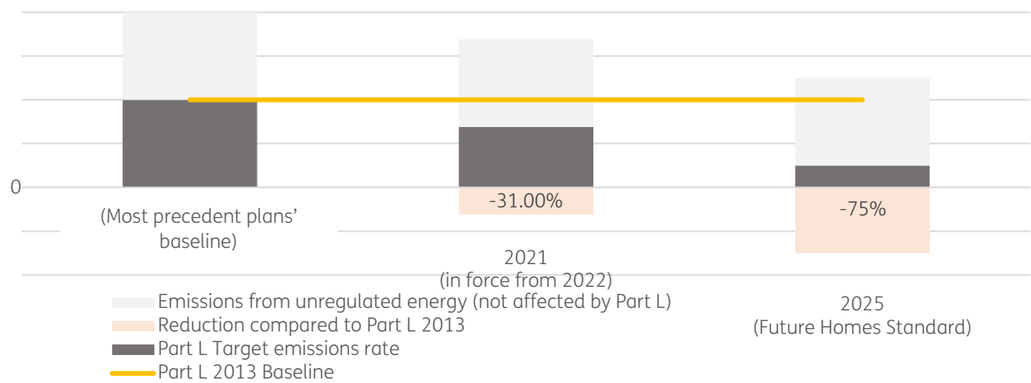
Because a building's thermal energy efficiency is affected by its shape as well as its fabric and services, this means that Part L generates a TER and TFEE that is specific to that proposed building. They are not absolute targets across all buildings, rather they are relative to the proposed building shape and size. This means Part L (and any plan policy expressed as a % reduction on Part L TER) does not incentivise the developer to create a building with an inherently thermally efficient size and shape (building form factor). An alternative way to use Part L metrics in local plan policy could be to set absolute targets in kWh/m^2/year TFEE, or kgCO_2/m^2/year TER. This would incentivise buildings to be designed with an inherently thermally efficient form factor. To successfully pass through the local plan examination process, the selected targets would need to be demonstrably feasible and viable.

Part L does not regulate all energy uses in a building, so the 'unregulated' share of emissions remain unchanged by the Part L updates in 2021 and 2025 (see Figure 1). This 'unregulated' energy and carbon is due touse of plug-in appliances, lifts, external lighting and various other devices. There is an appendix within SAP that can estimate this unregulated energy. However, the current version of SAP (10.2) overestimates *unregulated* energy[iv], as it uses a 1998 equation for appliances that does not reflect modern efficiencies. The scope of SAP11 intends to resolve this. SAP11 is however not due for release until summer 2025 at the earliest and so cannot be relied upon currently.

Overall, even for regulated energy, the current Part L calculation methods (SAP and SBEM) vastly underestimate how much total regulated energy a building will use, especially for space heating. This may or may not be rectified in future versions of SAP / SBEM. This underestimation, combined with the setting of targets that vary by building shape and size instead of universal targets, makes Part L SAP/SBEM poorly suited to ensuring new buildings will hit the absolute energy performance targets known to be necessary for fulfilment of the UK's legislated carbon budgets and net zero carbon future.

Therefore, the low-carbon buildings industry (for its own goals, not for Part L compliance) usually uses more accurate energy prediction methods such as PHPP, or CIBSE TM54 for non-residential. These methodologies were previously not nationally recognised; however Part L 2022 Non-Residential[v] now does endorse TM54 as an acceptable method for energy forecasting (a new requirement as of 2022).

*Figure 1: Changes to Building Regulations (Residential) **Target Emission Rate in** previous, current and incoming versions of Part L, and lack of changes to unregulated emissions. The actual Target Emission Rate will vary by building shape and size.*



3. Risk matrix – explanation of risk topics and policy components

Our (separate, previous) review of planning duties, powers and precedents shows that to achieve net zero carbon buildings within a net zero carbon district and UK, there are a range of different requirements that can and should be deployed within the local plan policy. These may be sorted into the following broad **themes**:

- Energy efficiency
- Efficient, fossil-free and renewable energy supply
- Carbon offsetting
- Embodied carbon

Secondary requirements to reduce the energy performance gap could consist of:

- Post-occupancy evaluation
- 'Assured performance' schemes
- On-site construction supervision
- Airtightness tests prior to completion

These themes follow the energy hierarchy, plus offsetting and embodied carbon. An effective local plan policy for zero-carbon buildings would cover all of these themes, allowing none to be neglected or concealed. Planning powers and precedents exist for all of them. To deliver the necessary actions for the scale and urgency of the climate crisis, we would need to emulate the more ambitious end of the range of precedents that exist, which have been creatively testing the boundaries of the powers available.

There is somewhat of a mismatch between local plans' *duty* to radically reduce carbon, versus the potential constraints around:

- The *extent* to which local planning authorities can wield the powers explicitly granted to them require carbon reductions,
- Local planning authorities' *duty to enable other outcomes* such as rapid housing delivery.

This mismatch has caused some ambitious carbon reduction policies to stumble at the hurdle of Examination in Public, although others have successfully passed that hurdle with very similar policies. See separate report 1a for those constraints and precedents.

The well-tested, low-risk policy precedents tend to rely on requiring moderate reductions against Building Regulations Part L. However, as noted previously, Part L is not well suited to delivering actual energy and carbon reductions in practice.

Because of this mismatch, an approach that is low-risk for planning acceptability and viability is generally high-risk for climate, as it would fail to remedy the status quo of allowing new builds to continue to add to the country's carbon burden, and expose occupants to high energy bills and cost of future retrofit that almost all existing buildings will need if the UK is to reach its net zero carbon future.

It is therefore necessary to differentiate risk across a range of topics. These topics reflect the key areas of debate arising in the literature on the low carbon transition, emerging practice in local planning, and recent experience working with local authorities and developers. The topics' scope is shown overleaf (see Table 1).

Key messages

- The local plan has a legal duty to mitigate climate change in line with the Climate Change Act 2008
- Mitigation in line with the Act 2008 would logically need to deliver the built environment changes shown to be necessary for the Act's carbon goals
- National government's current policies (including Building Regulations Part L) are insufficient to deliver the necessary changes
- There are local plan powers that can help deliver the changes
    - There are perceived limits to how far these powers can be exercised – due to definition of powers, consistency with national policies, and potential to clash with other local plan duties e.g. deliverability; viability.
    - Some adopted precedent local plans have now gone as far as necessary e.g. B&NES, Cornwall and Central Lincolnshire.
- A local plan policy could be 'low' or 'high' risk depending on whether we focus on carbon & bills, or viability & precedent
- We therefore use a 'matrix' to assess risk across multiple topics.

Table 1: Scope of risk topics for which policy options should be assessed.

Climate (2˚C carbon budgets)	Occupant energy bills	Future retrofit costs/disruption	Electrical grid readiness	Delivery / sector readiness	LPA internal capability	Viability / cost uplift (vs Part L 2021/22)	Planning powers / precedents	Compatibility with national approach
Will this policy deliver carbon and energy savings consistent with what the Committee on Climate Change has shown to be necessary for the UK to meet its legislated carbon budgets? Consider also the even more ambitious Tyndall Centre carbon budgets for climate change ≤2˚C. Any new build that is not true net zero carbon will worsen the already-huge challenge faced. Any insufficiently energy-efficient buildings will place excessive demands on the region's limited renewable energy capacity.	Might this policy permit or cause the developer to deliver a building that exposes its occupants to unnecessarily high energy costs or energy price volatility? Vice versa, is the resulting building likely to save energy bills long term?	Will this policy induce the developer to deliver a building that is fit for the UK's zero-carbon future according to the Committee on Climate Change's identified[vi] necessity for low heat demand and low-carbon heat? (i.e. heat pumps or networks) If not, how disruptive and expensive would future retrofit works be?	Will this induce the developer to minimise the burden that the new building places on the electricity grid, considering that the grid will come under huge stress from switching existing buildings and transport from fossil fuel to electricity? Will there be additional grid stress to account for any energy exports from solar PV installed, and electrification (gas-free status) of net zero carbon homes? Might this component induce the delivery of buildings that burden the grid more than they need to – beyond the grid upgrades that will need to happen anyway for the net zero carbon future?	How readily available are the materials, technologies and skills needed to comply with this – including energy calculation skills? How mainstream is this practice or level of performance, and are the relevant workers likely to understand how to deliver it?	Is there sufficient resource and capacity available internally at the local authority to accurately implement ambitious net zero policies and assess information that developers would need to submit? Is there scope to upskill individuals in planning to assess net zero carbon policies? Is it likely that external consultants will be required to assess policy compliance? Please note: all scores given in this topic are our best estimate of this challenge – Rutland itself would have greater knowledge of its own capacity to address these issues (or willingness to develop capacity).	How much more would it cost to comply with this policy, compared to a business-as-usual new build? (Based on estimates – by central government and evidence bases of various emerging local plans – of cost uplift for various elements of improved building performance, and project experience of the cost of enhanced professional services in energy & carbon.)	Is the local plan explicitly empowered to require this standard, via the Planning and Energy Act 2008, other legislation or other formal expression of government policy? Is there an existing adopted local plan precedent? If not explicitly empowered but also not explicitly prohibited: • Is there an emerging precedent for this, implying that it can be acceptable to the Inspector? • Can it be shown that this is the only way to fulfil the duty for 'radical' carbon reductions in line with the Climate Change Act? (NPPF)	To what extent would this policy component: • Use existing nationally endorsed methodologies / metrics for carbon and energy? • Help or hinder other changes that the government commits or intends to achieve with regards to carbon and energy? Such as: ○ Future Homes Standard 2025 ○ Net Zero Strategy (2021) ○ Heat and Buildings Strategy (2021) ○ Fully decarbonised electricity grid by 2035.

Beyond the **themes** themselves (previously listed), there are several different possible ways in which a local plan policy requirement could address each theme – using different mechanisms, calculations, standards, and degree of energy and carbon performance improvement that is required.

The risk level would then change again depending on:

- *How* each theme is addressed, e.g. –
    - Using national building regulation calculations for energy and carbon (lower risk in planning terms, but higher risk for climate due to these methods' inaccuracies)
    - Requiring the use of far more accurate calculation methods that exist in the industry (lower risk for climate but higher risk in planning terms, as some of these may not fall within Energy & Planning Act powers, or require specialist skills that are not abundant)
    - Replicating an existing precedent for offsetting (lower risk in planning terms)
    - Devising a more effective mechanism for offsetting (medium to higher risk in planning terms due to scarce precedents; but lower risk in terms of climate outcomes).
- *Extent to which* the improvement is required, e.g.–
    - the amount and type of on-site energy and carbon improvement,
    - the offset price per tonne of carbon payable by developers.

We therefore assess a range of potential '**policy components**' that each represent a *means* and *extent* of requirements under each theme. These are arranged along the vertical axis of our full risk matrix.

Each of these 'policy components' is scored against the full range of risk topics – climate, bills, retrofit, sectoral readiness, cost, powers/precedents, and consistency with national policies.

A short note on 'viability/cost risk'

Please note that our scoring of the viability/cost risk level for each component is more related to 'cost uplift'. This was based on whether each policy component would drive measures that other recent analyses have shown are more costly than the current building regulations minimum, i.e.:

- Heat pumps
- Fabric improvements (based on national government cost uplift figures)
- Solar panels (and how many – to meet total energy, or just regulated)
- Cost to offset any remaining residual carbon (see our separate Report 1a)
- Cost of specialist energy modelling or energy performance verification, where known.

Our 'viability/cost' risk estimation was based on the % cost uplift that these combinations of measures might bring to a typical base build cost, based on our recent experience and on data from central government and other local plans' evidence bases. The actual impact on *viability of development in Rutland* will depend on the land values, sales values, and changing industry build costs and labour.

About risks relating to a carbon offsetting policy in a local plan

Local plan offsetting usually means collecting payments from developers per tonne of carbon their building will emit, or per kWh of total energy use that is not matched with on-site renewable energy generation. This is then spent on local projects to save the same amount of energy or carbon. 'Climate' risks arise when the amount paid is not enough to deliver the required verifiable amount of carbon savings. Risks also arise in the topics 'occupant' and 'future retrofit' because offsetting may be used in lieu of creating an energy-efficient building.

About the ongoing changing situation in terms of precedents – how this affects 'planning acceptability'

Please note that several highly ambitious local plans have now been adopted with ground-breaking net zero carbon policies that have thoroughly tested existing planning powers and the limits of such powers. The most notable are the local plans of Bath & North East Somerset Council, Cornwall Council and Central Lincolnshire Council. However, some other local authorities (e.g. West Oxfordshire and Lancaster) have had similar policies rejected at examination, which suggests that risks and uncertainty remain over net zero planning powers.

Currently in Summer 2023, numerous other local authorities are either at examination or have emerging ambitious net zero carbon policies at Regulation 18 and 19 consultation stages. As these authorities work towards policy adoption, additional clarity and consistency should be secured on local authority net zero planning powers.

Technical detail behind the risk topics and policy components

Please note that more detail is given in our separate report "A. Climate Change Legislation" regarding the planning powers, climate mandate, constraints, performance measures and offsetting.
For reasons of brevity, we do not reproduce the detail here but we here signpost where to find that information in Task A. It also has a 6-page executive summary covering most of these.

The national carbon budgets, route to net zero, and measures required in the built environment to deliver this (thus delivering 'low risk' for climate if included in local plan policy):

- Executive summary – page 8
- "Why must Rutland's local plan take action towards net zero carbon" – page 12 – 16
    - "National and international commitments to address climate crisis" – page 12 – 14
    - "Rutland's role and commitments" – page 16 – 17

The extent of the local plan's duty and powers to mitigate carbon emissions:

- Executive summary – page 8 – 9
- "Legal duties of the local plan to address carbon reductions" – page 16
- "How can the Rutland local plan take action towards achieving net zero carbon?" – page 17 – 21

Various requirements for buildings' energy efficiency and renewable energy:

- See existing and emerging precedents throughout section ""How have existing local plan precedents used those powers?" – starting page 22 – 30

Carbon offsetting (as a concept, in local plan powers, and local plan precedents)

- Various approaches and precedents – page 35 – 38
- "Infrastructure Act 2015" – page 17
- "More effective offsetting schemes for new development" [emerging] – page 52 – 53

Embodied carbon:

- "Embodied carbon" [approaches and precedents] – page 45 – 47

Cost uplifts for net zero carbon buildings, which may affect viability depending on sales values:

- "Viability of required improvements to the building" – page 63
- "Viability of offsetting any remaining carbon emissions" – page 65

4. Risk matrix – all potential policy components for new buildings

		Risk topics (5 = high risk; 1 = low risk; 0 = actively reduces risk)								
		Climate (2°C carbon budgets)	Occupant energy bills	Future retrofit costs/disruption	Electrical grid readiness	Delivery / sector readiness	LPA internal capability	Viability / cost	Planning powers / precedents	Compatibility with national approach
Energy efficiency	EUI limits (using PHPP/TM54)	0	0	0	0	3	3	3	3	5
	Space heat demand limits (PHPP/TM54)	0	0	0	0	3	3	2	3	4
	Process to remedy performance gap	0	0	0	0	3	3	2	2	2
	EUI & space heat limits – using Part L SAP	3	3	3	2	1	3	1	2	1
	Future homes fabric % reduction on Part L SAP TFEE	3	3	3	0	1	2	1	1	1
	Moderate energy efficiency % reduction on Part L TER	4	3	4	3	0	2	1	1	0
Renewable & fossil-free energy supply	No new gas	0	3	0	3	2	1	2	2	2
	Onsite PV to match energy use	0	0	0	3	2	3	3	2	3
	Onsite PV per m^2 ground floor area	1	1	1	2	2	3	2	3’	2
	Renewable % reduction on Part L TER or Part L energy use	4	3	3	2	1	2	2	0	0
Offsetting	Offset only via local renewable energy	3	3	3	3	2	3	2	2	3
	Offset via S106 (various projects)	4	4	4	1	0	3	2	1	1
	Offsetting via global schemes	5	3	4	3	2	4	1	4	3
Embodied carbon	Embodied carbon – specific targets	0	No impact	No impact	No impact	4	4	3	3	4
	Embodied carbon – reporting only	3	No impact	No impact	No impact	2	4	1	1	2

5. Discussion of risk matrix and potential policy combinations

The matrix orders the policy components by theme from top to bottom according to the energy hierarchy: energy efficiency measures, energy supply measures, offsetting, and embodied carbon.

Most components have either a lower risk for climate and consumers but a higher risk for viability/ planning powers, or vice versa. This is because of the current limitations on powers explicitly granted to Local Planning Authorities, and the fact that this is a cutting-edge emerging area of practice with very few precedents that reduce carbon emissions sufficiently to be in line with the Climate Change Act.

Only two policy components have a relatively positive risk profile across the full range of risk topics:

- Requiring a process to reduce the energy performance gap: this can significantly reduce carbon emissions and occupant energy bills. National policy and legislation neither explicitly grant nor prohibit this. If this process ends at building completion (not occupation), it should be as acceptable as precedents requiring other non-national quality standards e.g. Lifetime Homes; Home Quality Mark (HQM): one precedent specifies HQM modules for energy quality assurance.
- Requiring a certain m^2 of PV panels per m^2 of building footprint – this reflects (but could expand on) a measure in the new notional building specification in Building Regulations Part L 2021.

Key reasons for policy components having higher planning risk are:

- **Setting requirements that are not based on the national calculation methodology** of building regulations (Part L and SAP) in favour of more accurate methodologies
- **Higher (or unknown) cost of certain measures** – in particular, PV solar panels and some kinds of low carbon heating – although this may change as these become more mainstream and economies of scale take effect
- **Workforce skills at scale to deliver the higher standards** – but this will improve as the industry improves its normal practice in response to demand and regulation. This is a good rationale for promoting growth of green construction skills within the district and wider region.

Key reasons for policy components having higher risk to climate and occupants are:

- **Failing to require use of accurate methodologies** to predict a building's actual carbon emissions in use
- **Requiring only percentage improvements on the carbon and energy limits set by building regulations** (which fail to account for energy used by plug-in appliances, and fail to incentivise inherently thermally efficient building shape) instead of fixed targets for energy and carbon
- **Failing to require steps to deliver energy performance as designed and predicted** (that is, failing to confront the energy performance gap)
- **Failing to ensure that the offsetting mechanism delivers** measurable and certain carbon savings that count towards the local area's carbon account and would not have happened otherwise, and that the offsetting is truly a last resort. Overly cheap offsets disincentivise the developer from making the feasible on-site energy and carbon improvements – raising the risk of new buildings that have high energy bills and need expensive, disruptive retrofit later.

The right combination of policy components is vital

It is important to note that none of these policy components is enough on its own to achieve new buildings that deliver the required energy and carbon performance that is needed to support the national and local carbon budgets. Any effective net zero carbon buildings approach in a local plan would need to adopt a suite of requirements covering all of the following topics:

- Energy efficiency improvements in design
- Energy performance gap
- Fossil-free energy supply
- Renewable energy supply
- Offsetting, if the policy does not require renewables to match 100% of a building's energy use.
- Embodied carbon.

Rutland County Council must therefore decide which combination of requirements it is willing to pursue, prioritising either the risk of challenge/delay to adoption, or the risk of failing to achieve the carbon reductions required by climate science and legislation. Four potential examples are as follows:

1. A low-risk approach in planning terms, but which would not deliver much on-site difference compared to the new building regulations from 2022, and would fail to prevent new buildings from adding to the already-huge challenge of drastically cutting existing carbon, could include:
   - 35% reduction in on-site regulated carbon (Part L 2013 baseline; well-precedented)
   - Offset regulated carbon only, at a price per tonne of CO_2 that is well-precedented but out of date and not proven to meet cost of delivering local carbon saving projects.
2. A more high-risk approach in planning terms, but with great efficacy to fulfil the climate duty:
   - Target 15-20kWh/m^2/y space heat, 35kWh/m^2/y EUI (homes), 70kWh/m^2 EUI (nonresidential), calculated via PHPP or TM54
   - Enough on-site PV to match total energy use on site (true operational net zero carbon)
   - Use of a specific energy performance gap method
   - Any offset only via local renewable energy schemes, priced to reflect the actual cost of this.
3. A medium-risk approach within the bounds of explicitly granted powers, but not 'true net zero':
   - 75% reduction in onsite Part L regulated carbon (in line with Future Homes Standard)
   - Offset remaining regulated carbon emissions at the rising nationally recognised cost of carbon over the building's lifetime, taking into account grid decarbonisation.
4. A medium-risk approach that could achieve significant carbon reductions and gently tests the boundaries of planning powers (so may need local studies on costs and feasibility) could be:
   - 15-20kWh target for Part L Fabric Energy Efficiency, and 75% reduction on Part L TER
   - Require reporting of PHPP/TM54 space heat demand and EUI *for comparison purposes only*
   - Use any proven method to address energy performance gap, and test on completion
   - Gas-free heat, and onsite PV to match *total* annual energy use (calculated with SAP/SBEM)
   - If any of the total energy demand could not be feasibly matched by onsite PV, then offset this via local renewable energy schemes, priced to match local cost of delivering these (including cost of administration and site acquisition).

These approaches are next explored in individual risk matrices below.

<u>Example approach 1:</u> Low risk for planning, high risk for climate, occupant and infrastructure.

Policy requirements	Climate (2 °C carbon budgets)	Occupant energy bills	Future retrofit costs/disruption	Electrical grid readiness	Delivery / sector readiness	LPA internal capability	Viability / cost	Planning powers / precedents	Compatibility with national approach
35 to 40% total reduction on Part L 2013 TER	5	4	5	4	1	1	1	1	0
5 to 15% TER reduction to be via energy efficiency* (*heat pumps not included)	3	3	4	3	1	1	1	1	0
Gas not ruled out	5	3	5	2	0	0	0	0	2
10% of Part L energy use met with renewable energy supply	4	4	4	2	1	1	1	1	1
Offset 30 years' worth of emissions at £60-£90/tonne via S106 fund (not tested to meet cost of local carbon saving schemes)	4	4	4	No impact	0	1	3	1	1
No requirement set in relation to embodied carbon	5	No impact	No impact	No impact	No impact	No impact	No impact	No impact	No impact

This follows the structure of several 'net zero carbon buildings' policy precedents in local plans that have passed inspection and been successfully implemented with good compliance rates (e.g. London Plan 2013 and 2021; Reading Local Plan 2019; Milton Keynes Local Plan 2019; Oxford Local Plan 2020 – noting that Milton Keynes has a higher offset price per tonne but does not multiply by 30-years).

By failing to explicitly rule out gas heating, this approach risks locking-in additional fossil fuel carbon emissions from new buildings for many years.

The 35-40% reduction in on-site carbon emissions will make very little difference from the 31% reduction that is already enforced by the new Part L uplift as of June 2022.

The 35-40% carbon reduction, and the 10% renewable energy supply, are not large enough to push the developer to use a heat pump. Therefore, the developer is likely to use gas or direct electric heating, as these are cheaper and simpler to install. As electricity is now lower carbon than gas, the developer may choose to deliver part of the 35% carbon savings by using direct electric heating. The occupant would then be hit by high energy bills, as the running cost for direct electric heat is about three times as expensive as gas or heat pump. The 10% renewable energy supply is likely to be met with a small amount of on-site PV, which is not enough to make a large difference to total carbon nor energy bills, especially as PV often generates energy at times when the household doesn't need it.

Because the 35% carbon reduction and the 10% renewable energy supply do not mandate a heat pump but would reward direct electric heating (explained above), the new buildings may place unnecessary strain on the electricity grid (direct electric heating uses approximately 1 kilowatt of electricity to produce 1 kilowatt of heat, while a heat pump can deliver 3kW of heat using just 1 kW of electricity because it works by transferring existing heat from outdoor air).

The relatively small reduction in carbon means the building will have to be retrofitted at a future date to meet the energy performance standards vital[vii] to meet the UK's legally binding carbon targets of the Climate Change Act (the retrofit measures will need to include more insulation, heat pump, perhaps also heat recovery from wastewater and ventilation). If the building has a gas boiler system, by the time that boiler breaks then the government may have ended the sale of new gas boilers (2035[viii]), in support of its legislated climate targets. The occupant will then have to replace not only the heat source, but also piping and radiators assuming they switch to a lower-temperature system such as a heat pump or network. The retrofit will be highly disruptive to the occupant, may damage the building (especially insulation[ix,x]), and will cost the future occupant three-to-five times the price it would have cost the developer to include in the first place[xi]. The future retrofit will also come with extra embodied carbon as outdated building elements are replaced (especially heating and windows).

The £60-90 offset price per tonne payable by the developer reflects the previous 2017 national value per tonne of carbon used in various existing local plans (e.g. London; Reading). In those precedents this was a justifiable price due to its alignment with national guidance for policy appraisal at the time, but is now out of date. The up-to-date equivalent 2023 price is £248-378/tCO_2 – this increase flows partly from the cost of delivering the UK's increased carbon saving targets in the Climate Change Act update

2019, but also inflation. Even the up-to-date price is unlikely to cover the actual cost of local projects that deliver measurable and demonstrably additional carbon savings – the local cost for B&NES was £652/tCO_2[xii]. Any set price should include not just the project itself, but also the administrative cost of devising projects with a measurable carbon benefit, identifying a pipeline of opportunities, project management, legal negotiation with third-party asset owners (such as buildings that are to receive energy retrofitting), fund administration, and potentially land acquisition (if the project involves tree planting or standalone renewable energy generation). Rutland may find it useful to compare the national carbon price against any recent experience it has of adding solar panels to its own estate.

<u>Example approach 2:</u> Minimal risk for climate and occupants; high risk for planning acceptability.

Policy requirements	Climate (2°C carbon budgets)	Occupant energy bills	Future retrofit costs/disruption	Electrical grid readiness	Delivery / sector readiness	LPA internal capability	Viability / cost	Planning powers / precedents	Compatibility with national approach
EUI limits using PHPP/TM54 (Homes: 35kWh/m²/year. Nondomestic: varies by type)	0	0	0	0	3	4	4	4	5
Space heat demand limit of 20kWh/m²/year (predicted with PHPP/TM54)	0	0	0	0	3	4	3	3	4
Process to remedy performance gap	0	0	0	0	3	3	2	2	2
Onsite PV to match total energy use, including unregulated (estimated with PHPP/TM54)	0	0	0	3	3	2	3	4	4
Offsetting via local renewable energy, at cost of delivering that renewable energy (S106 or direct investment)	1	3	3	3	1	2	1	3	3
Embodied carbon limit of ≤900kg/m2 in super-major developments only	3	No impact	No impact	No impact	2	4	1	3	4

This approach essentially reflects the operational net zero carbon definition proposed by the range of industry experts that form LETI (see separate report 'Task A'). Central Lincolnshire successfully adopted this policy approach in April 2023, whilst Cornwall Council and B&NES had slightly less stringent versions of this approach adopted in January 2023. Various other councils are in the process towards bringing identical or similar approaches to be tested at examination (e.g. Greater Cambridge). Where these policies have successfully been adopted, the success at examination is largely down to robust evidence bases that include feasibility[xiii] and cost[xiv] assessments on policy delivery, in addition to demonstrating the necessity for these policies in order to deliver on their duty to mitigate climate change.

The use of PHPP or TM54 energy modelling methods (to evaluate performance against the targets) reduces risk to climate, occupants and future retrofit needs, by providing a far more accurate prediction of energy use compared to the industry's usual Part L SAP.

The space heat demand limit reduces risk of in-use carbon emissions and energy costs. It also supports health and comfort as the home will be less subject to temperature fluctuations or condensation.

The EUI limit effectively mandates the use of a heat pump as these are ~300% efficient (allowing them to fulfil a 15kWh heat demand using only 5kWh of electricity, thus shrinking the overall energy use). This rules out fossil gas systems and direct electric heating, thus saving energy bills, minimising the additional demand on the electricity grid, and sparing the occupant from the disruption and cost of future retrofit. Because of the extreme efficiency of heat pumps, their running costs are typically similar to gas, but here the occupant may benefit from even lower bills because onsite solar PV is also required.

The limits on space heat demand and EUI both reduce the demand placed by the development on electrical grid capacity (however, see also commentary further down regarding the potential additional grid capacity demand that may be exerted by on-site PV).

The renewable energy target means that the building's roof must be oriented to maximise solar PV generation. This may require adjustment to volume builders' standard designs on some sites, but the target has proven achievable without changing the design or orientation of existing ordinary new builds in Greater Cambridge and Central Lincolnshire (see respective emerging plan evidence bases).

The first reason for high risk to planning acceptability is due to setting targets using PHPP, which is not a method used to fulfil national building regulations (SAP / SBEM), thus could be argued not to meet the definition of an 'energy efficiency standard' that the Energy and Planning Act empowers local plans to require. This is not to say that the local plan is explicitly banned from requiring such targets, but the question has not been consistently legally tested. Acceptability will become better understood in the next year as local authorities such as Merton wait to hear whether these calculation approaches are sound in planning terms. However, some adopted plans with this policy approach have set requirements for major development's energy target compliance to be shown using PHPP or TM54, in supplementary guidance documents at Bath & North East Somerset Council[xv] and Cornwall Council[xvi]; albeit these documents were not tested at examination. This risk primarily applies to PHPP, given that TM54 is now acknowledged in Part L 2021 (non-residential) as a suitable method for energy forecasting, thus should now be considered to have been 'endorsed … by the Secretary of State' as per the definition of an 'energy efficiency standard' laid out in the Energy and Planning Act.

This approach is also subject to risks relating to the industry's readiness to deliver all of the measures at scale – such as availability of construction materials and systems that perform well enough, and also potential constraints in the number of professionals familiar with the required skillset to design, deliver and verify such high-performing buildings. That is not to say that these skills and materials do not exist, but that further studies may help to bolster the evidence on whether this could constrain the speed of housing delivery to a point that would affect Rutland's achievement of housing targets *beyond the existing construction skills shortage that already constrains housing delivery even without the policy*.

This approach has some level of risk relating to infrastructure readiness. The extensive on-site PV will export energy to the grid at times of peak generation and low onsite energy demand. This is part of the necessary solution to net zero carbon: the export of clean energy reduces the need for fossil fuel use at power stations, balancing out the times when the building must draw power from the grid. However, in some locations, the grid may not be ready for these exports without capacity upgrades. This risk could be reduced by energy storage (batteries; hot water tanks) or other smart 'demand side response' system. It should also be noted that extensive upgrades to grid capacity and 'smart grids' will be essential as part of Rutland's (and the UK's) net zero carbon transition of the *existing* buildings and transport sectors anyway even in the absence of this local plan policy; these capacity upgrades should not be assumed to have been triggered solely by a local plan policy for new development rooftop PV.

The renewables and offsetting approach would mean that the building must have enough renewable energy capacity to generate an equal amount of energy to what the building uses per year. The policy would expect this to be delivered on-site, but if necessary it can be delivered on other buildings' roofs or separate land in Rutland. This is the most reliable and climate-safe offsetting option we have identified, as it is easily measurable, and clearly additional to what would happen without the funding.

This policy approach uses 'energy offsetting', instead of 'carbon offsetting'. This requires a p/kWh or £/MWh cost metric, which is agnostic to the carbon factor of the grid and allows more specific allocation of funds on projects based on what specifically has been offset (either residual total energy use or deficit in on-site renewable energy generation). More information on this offsetting approach is set out in the separate 'Task A' report.

Nevertheless, this offsetting approach has 'low' rather than 'zero' risk for climate. This is because the carbon budgets (see separate 'Task A' report) require such drastic cuts that all buildings and most sectors will need to become net zero carbon on their own terms, meaning that as we near the net zero carbon end-goal there will be very little room for trading carbon savings between sectors. The built environment is one sector that is expected to be able to become net zero without offsetting; the UK's capacity to generate 'carbon credits' should therefore primarily be reserved for hard-to-abate sectors, such as aviation and agriculture. This would mean that existing buildings will eventually need their own roof space to deliver their own renewable energy to eliminate their own carbon, rather than being able to lend that roof space to eliminate the carbon of new buildings. Alternatively, delivering the renewable energy generation equipment on open land would compete with other land uses vital to the UK's carbon reduction trajectory such as woodland creation to capture carbon, or local food production. Any impact on AONBs or other landscape protection designations could also potentially constrain Rutland's ability to bring forward off-site large scale renewable energy as scheme to offset new builds' carbon.

Example approach 3: Medium risk for climate and occupants; low risk for planning acceptability

Policy requirements	Climate (2 °C carbon budgets)	Occupant energy bills	Future retrofit costs/disruption	Electrical grid readiness	Delivery / sector readiness	LPA internal capability	Viability / cost	Planning powers / precedents	Compatibility with national approach
10% improvement on Part L SAP TFEE 2021 (Future Homes Fabric)	3	3	3	1	1	2	1	1	0
75% reduction on Part L 2013 SAP TER (Future Homes Standard)	4	3	3	2	1	2	2	2	0
Non-residential reduction on Part L 2013 SBEM TER: • 19% via energy efficiency measures • 35% in total.	4	3	4	3	1	2	1	1	0
Recalculate SAP figures on completion (to reflect any design changes and fabric performance) and remedy or offset any shortfall	2	2	2	2	1	2	1	1	0
Onsite renewables as far as feasible & viable, ideally to reach 'net zero regulated carbon'	3	3	2	3	3	2	2	2	3
Offset 30 years' regulated emissions (with annual national carbon price rises & electricity grid carbon falling) via S106 to fund various local carbon reduction projects	4	4	4	1	0	2	1	1	1
Embodied carbon – reporting only	3	No impact	No impact	No impact	3	3	1	1	2

This approach essentially mirrors the emerging Warwick Net Zero Carbon Buildings Development Plan Document, which has completed Examination in Public and has received the post-examination Inspector's letter requiring that a Main Modifications consultation is carried out, which ran from 5 June – 17 July 2023. Similarly to approach 2, this approach uses powers explicitly granted by the Energy and Planning Act (that is, based around Part L metrics) and builds on mechanisms that have been used in existing precedents (in particular the use of national values per tonne of carbon for offset purposes). If successful at examination, it will it will strengthen the overall body of precedents, but this approach is now arguably already outdated following the recent adoption of the more ambitious 'approach 2' at three different local authorities.

This set of requirements induces developers to deliver the national Future Homes Standard today instead of waiting until 2025. This includes matching the indicative Future Homes Standard's improved building fabric (which significantly reduces heat demand compared to Part L 2013 and 2021) and the Future Homes Standard Target Emissions Rate (TER). This means the building will be relatively thermally efficient and is almost certain to have a heat pump – given that the Government is setting the Future Homes Standard emission rate with the aim that it is not likely to be achieved without a heat pump.

Together, these standards mean that the risk of extensive future retrofit costs and disruption are dramatically reduced, compared to business-as-usual new builds in 2022. These requirements can be viability-assessed using cost uplift data from the Government (for Future Homes Fabric[xvii]) and other emerging local plan evidence bases produced by expert cost consultants[xviii].

However, the renewables requirement in this policy is not strong enough to sufficiently induce developers to make further renewable provision beyond what they would already have to do to meet the 75% carbon reduction (as heat pumps can be seen as a renewable energy measure). The only incentive to add more renewables is the requirement to offset the remaining regulated carbon. Where the developer argues that feasibility or viability prohibit further renewable energy on their particular scheme, it may be difficult for officers to determine whether this is a valid argument.

The developer must then offset any remaining regulated carbon emissions that the building would cause during 30 years of operation, via a payment to the council ringfenced to fund carbon-saving projects in the area. This approach is supported by precedents in London, Reading and Milton Keynes – but is made more effective by fine-tuning the calculation. Firstly, it includes increases to the nationally-recognised cost of carbon[xix] that will occur in those 30 years (helping to raise larger funds that are more likely to cover the cost of local carbon reduction projects). Secondly, it takes into account national projections for reductions in the carbon of grid electricity. This provides a financial incentive for developers to use all-electric systems for heating, which will gradually reach zero carbon by 2035[xx] without further action from the building owner, or sooner if the owner adds more solar PV to the roof.

The risks of climate impact, electrical grid impacts and energy bills are significantly reduced compared to business as usual, but still have 'medium' risk for several reasons:

- The policy uses the national energy and carbon calculation methodologies (Part L SAP or SBEM) which are widely recognised[xxi,xxii] to be poor predictors of the building's actual performance.
- Part L SAP figures would only cover 'regulated' energy, which means there is no policy lever to reduce or offset the carbon associated with 'unregulated' energy such as that used by plug-in appliances (unregulated energy represents about half of total energy used in homes[xxiii]).
- From 2025 the Future Homes Standard (FHS) will form the new baseline. At that point this policy's only benefit would be its requirements for offsetting, and embodied carbon reporting. It is a possibility that embodied carbon may even be included in the FHS if the Part Z proposal[xxiv] is integrated into Building Regulations. Part Z was discussed at Parliament for the third time in April 2023, as part of the committee stage debate on the Levelling Up and Regeneration Bill.
- The non-residential requirements are set to match well-precedented requirements in other local authority areas that were set when Part L 2013 was the national standard; they now do not make much improvement on the new national standard of the newly introduced Part L 2022.
- Finally, offsetting still places a burden on the Council to deliver and measure 'additional' carbon reductions, and the UK's required drastic carbon reduction trajectory may not leave room for other sectors to pick up the slack for new buildings (see appendices). Additionally, the offsetting requirement only applies to the *regulated* carbon emissions as estimated by Part L methods, which as previously noted are a dramatic underestimation of the building's actual energy demand and carbon emissions.

Example approach 4: Medium-low risk for climate; medium-low risk for planning

Policy requirements	Climate (2 °C carbon budgets)	Occupant energy bills	Future retrofit costs/ disruption	Electrical grid readiness	Delivery / sector readiness	LPA internal capability	Viability / cost	Planning powers / precedents	Compatibility with national approach
75% reduction on Part L SAP 2013 TER *before* PV is added	2	2	2	2	1	3	1	2	1
Space heat demand limit 15-20kWh/m²/year using SAP Fabric Energy Efficiency (DFEE)	2	2	3	1	1	3	2	1	1
A fixed kWh/m²/year limit on regulated energy via Part L 'Primary Energy Rate' metric (PER) – *limit to be confirmed per type of building*	Depends on target				1	3	Depends on target	1	1
PHPP / TM54 – reporting only, to compare with SAP	2	2	2	1	3	4	1	3	3
Apply any one of several named proven processes to remedy the performance gap	0	0	0	0	3	2	2	2	2
Onsite or near-site PV to match regulated energy use unless proven unfeasible	1	1	1	3	2	2	3	2	3
Offset 30 years' total residual energy use (if not met by onsite PV), via local standalone renewable energy. Unregulated energy to be calculated with BREDEM or a SAP/SBEM adjustment tool.	2	3	3	3	3	2	3	3	3
Embodied carbon – reporting only; targets to be added from 2025	2	No impact	No impact	No impact	2	2	2	2	No impact

This approach builds on the previous 'medium risk' approach while exploring further avenues to address the weaknesses of that approach. Like the previous 'medium risk' approach, it requires the building to meet the Future Homes Standard (a 75% reduction on Part L 2013 SAP carbon emissions, which essentially rules out gas as previously noted). To strengthen the approach, this policy combination then adds detailed requirements for energy use intensity, space heat demand, and PV.

An absolute space heat demand limit means the building must have an inherently thermally efficient form. This is stronger than precedents which just require a percentage improvement on the Part L baseline – because the Part L baseline is relative, not absolute: it is derived from a 'notional' building of the same size and shape. If the proposed building has a complex form with many joins and surface areas that leak heat, Part L would simply allow leeway to use more energy. Setting an absolute limit on space heat demand will remove this weakness of 'relative' improvement and move towards the level of performance vital to make new buildings compatible with the UK's net zero carbon future (albeit recognising that it would not *reach* this performance level in actual operation, due to the aforementioned fact that Part L calculation methods dramatically underestimate space heat demand). The 15-20kWh space heat demand target comes from the Committee on Climate Change and represents a ~60-70% improvement on a typical home's TFEE[xxv] with Part L 2013.

PER (Primary Energy Rate) is a metric used in Part L to reflect total *regulated* energy demand. However, this metric takes into account not only the actual metered energy, but also the losses *upstream* in generating and distributing that energy. This obscures the actual energy efficiency of the building itself, because it makes grid electricity look worse than gas (due to the inefficiencies that occur at power stations burning gas to generate electricity, and efficiencies in the electricity grid itself). This makes it a complex indicator, and one for which there are not many analyses of what would be a 'best practice' PER fit for the UK's carbon reduction trajectory. Additionally, as with other Part L metrics, it is likely to be inaccurate as a reflection of actual building performance.

Therefore it is difficult to set universal targets that a building could justifiably be asked to aim for; further complex analysis would be needed. To set the PER target limit, Rutland may need a specialist study of what the SAP or SBEM PER figure would need to be in order to fit within a best-practice *total* EUI that is feasible for the building type[xxvi]. The effort and expense involved in that analysis may not be justified by the actual level of improvement that the policy would deliver, compared to pursuing a policy that simply uses alternative calculation methods (see 'approach 2', previously noted).

Alternatively, to address the problems of inaccurate FEE and PER metrics, Rutland could explore using emerging tools such as the South West Net Zero Energy Hub SAP Energy Adjustment Tool[xxvii], which is now being utilised in practice by Cornwall Council and Bath & North East Somerset Council (titled 'Energy Summary Tool'). This tool starts with SAP calculations for a building, then adjusts these to reflect the probable actual performance (in total energy use and space heating) by remedying SAP's

underestimation of space heat demand and other regulated energy, and SAP's overestimation of unregulated energy.

As the required standards in Approach 4 are all based on the national calculation models SAP and SBEM (as used in Part L of Building Regulations), they all are safely within the Planning and Energy Act powers to set "reasonable requirements" for energy efficiency and a proportion of energy to be met with local renewable supply. Given the climate crisis and the UK's carbon budgets, it is 'reasonable' to require 100% renewable energy and extremely high thermal efficiency; it would be arguably unreasonable to require anything less.

There is still medium climate risk because of the shortcomings of SAP in terms of accurate prediction of energy use, but this weakness is somewhat reduced in the following ways:

- Requiring use of a methodology proven to reduce or eliminate the energy performance gap.
- Requiring the developer to also submit calculations that are far more accurate – that is, PHPP or TM54 calculations. The developer would not have to show that the building *achieves* the same kWh/m^2/year targets using PHPP or TM54, but these calculations would help officers (and buyers) spot where there may be unreasonably high energy bill costs, and enable more informed discussion with developers about potential improvements to the proposed scheme.
- Requiring not only regulated, but also unregulated carbon emissions to be offset (for 30 years of operation, using the time-sensitive cost calculation explained in Example Approach 3).

There is precedent[xxviii] for seeking TM54 calculations to support accuracy, and BREDEM calculations to estimate unregulated energy use. An accurate calculation of unregulated energy is crucial as this policy combination requires that to be offset too: the amount of carbon to be offset is calculated to include not only the regulated energy (using SAP) but also unregulated energy (using BREDEM). The methods are compatible, as SAP is based on BREDEM[xxix]. An alternative method to calculating the unregulated energy could be a method such as the aforementioned Energy Adjustment Tool (from the South-West Net Zero Hub) which adjusts unregulated energy estimations from SAP to reflect modern appliances, as SAP overestimates unregulated energy. However, it should be noted that unregulated energy in operation is highly variable as it is dependent on occupational behaviour.

Finally, offsetting only via standalone renewable energy projects ensures that this policy avoids forcing other sectors (land use or existing buildings) to pick up avoidable excess carbon of new buildings. This helps with overall climate outcomes, given that these other sectors will already struggle to get their own carbon emissions to net zero as needed for UK's required carbon reduction trajectory. Offsets may be made via Section 106 payments to follow precedent, or the developer could invest directly. Rutland's experience of adding solar panels to its own buildings may inform a verdict about the administrative burden of such schemes and cost per tonne of carbon saved (or the cost per kWh of new renewable energy).

Any Renewable Energy Guarantees of Origin produced by the 'offset' renewable energy farms must not be sold onwards, as their carbon savings already 'belong' to the development (sale of the REGO certificates to a third party would double-count the carbon savings).

What about existing buildings?

Existing buildings are not included in the previous risk matrices for new build policy requirements, as the potential policy requirements and risk topics must be looked at differently in existing buildings.

This is firstly because existing buildings are so varied in type, age, use, heritage value, and condition. This makes it impractical to set reasonable universal requirements for energy efficiency, low carbon heat or renewable energy. Existing powers and precedents largely focus on *new* buildings.

Secondly, local plans also have only a very limited influence on the carbon and energy performance of existing buildings, as they can exert influence only where the building owner is seeking to make a change to the building that requires planning permission.

Nevertheless, planning permission can be (rightly or wrongly) perceived as a barrier to the energy retrofit actions that are urgently needed at scale across our building stock in order for the UK to have a chance of meeting its carbon reduction goals. This problem must be addressed if the local plan is to fulfil its duty to deliver carbon reductions in line with the goals of the Climate Change Act.

In May 2022 the Government noted[xxx] that by end of 2022 it would review planning barriers to existing household installation of energy efficiency measures. This review is not available at the time of writing (June 2023).

There is at least one precedent where a local plan attempted to require greater 'consequential improvements' to existing buildings' energy efficiency when changes are made that need permission, expanding on Building Regulations requirements for the same. However, discussions with energy officers at that local authority reveal that this has not proven very effective because very few relevant proposals pass over their desk, and the improvements can only be applied to the part of the building that is undergoing works, not the whole building – which renders many retrofit measures ineffective.

The role of local planning in reducing existing buildings' carbon thus has two main strands:

1. **Removing the actual or perceived planning barriers to energy retrofit measures** – by making policy language actively permissive towards these, supported by guidance on what changes are acceptable in different settings and what changes don't need permission; perhaps also Local Development Orders for greater certainty (see Report 1a).
2. **Allocating enough land suitable for renewable energy generation & distribution to decarbonise energy used by existing buildings**– e.g. wind; solar; biogas; electrical grid upgrades; energy storage; heat networks. This de-risks the application process (improving viability) and makes energy cheaper in the long term (less reliant on volatile oil/gas prices).

Also, additional risk topics become relevant for existing buildings:

- Heritage: Is this policy approach likely to conflict with, or be overruled by, heritage concerns (including natural heritage such as AONB)? Conversely, could this approach bring forward energy improvements that keep existing heritage buildings suitable for use for longer, thus preserving viable use and avoiding the embodied carbon of replacing them?
- Enforceability: Is this policy approach likely to be applicable and enforceable in many cases? Would it help planning officers to identify compliance, whether quantitative or qualitative?

We present only one risk matrix for existing buildings, as all policy components are mutually compatible and can be applied singly or together. All components 'actively reduce' climate risk, as all help improve existing emissions (unlike new builds, which worsen the status quo unless zero carbon).

Policy component	Climate (2°C carbon budgets)	Occupant energy bills	Electrical grid readiness	Delivery /sector readiness	LPA internal capability	Viability / cost	Enforceability / implementation	Heritage	Planning powers / precedents
Actively welcome proposals that result in better energy efficiency, low carbon heat and extended fitness for use of existing buildings, and proposals for renewable energy generation (on buildings, or standalone) storage and distribution, with significant weight attached	0	0	0	1	No impact	No impact	3	3	2
Require higher 'consequential improvements' to energy efficiency in applications relating to existing buildings, building on Part L2B	0	0	0	3	2	5	4	4	2
Offer guidance on effective energy retrofit measures, clarity on when permissions are needed, and heritage-acceptable measures	0	0	0	1	3	No impact	1	0	1
Spatial strategy: allocate/identify sites for enough renewables	0	0	2	No impact	3	0	0	3	1
Spatial strategy: Allocate/identify sites for energy storage	0	0	0	No impact	3	0	0	1	1

Policy component	Climate (2°C carbon budgets)	Occupant energy bills	Electrical grid readiness	Delivery /sector readiness	LPA internal capability	Viability / cost	Enforceability / implementation	Heritage	Planning powers / precedents
Spatial strategy: Allocate/identify routes for heat networks	0	0	No impact	No impact	3	No impact	0	1	1
Local Development Order permitting retrofit, renewables or heat networks (specific measures & specific locations)	0	0	1	No impact	3	0	0	2	1

6. Potential imminent regulatory and legislative changes that may change the risk profile

This risk matrix approach was drafted in June 2023. Uncertainty remains over changes to the national planning system, which may affect the risk levels under the topics of 'planning powers' and 'compatibility with national approach'.

The key document updates are:

- Levelling Up & Regeneration Bill (passed through House of Commons)
- National Planning Policy Framework update (consultation 22 December 2022 – 2 March 2023)

Recently, a "Carbon Emissions (Buildings) Bill"[xxxi] (second reading in November 2022) has been produced and awaits further discussion at Parliament in the context on the Levelling Up and Regeneration Bill. It proposed a new 'Part Z' to Building Regulations to require reporting of whole-life carbon emissions of buildings from 2023 and set limits on their embodied carbon from 2027.

Levelling Up & Regeneration Bill

The Bill has passed through the House of Commons and, at the time of writing (May 2023), has reached the Committee stage in the House of Lords. Depending on the speed of its progression through the House of Lords, it could gain royal assent and begin to be implemented in 2024[xxxii].

The government's chief planner has confirmed[xxxiii] that when passed, the Bill's changes would not all be immediate but "will be accompanied by updates to regulations and policy … Some matters will be subject to public consultation". An accompanying 'further information' paper[xxxiv] noted next steps:

- Technical consultation on details of the new Infrastructure Levy & compulsory purchase – consultation until **9 June 2023**
- Consultation on the new system of Environmental Outcomes – consultation until **9 June 2023**
- Technical consultation on criteria for fast-tracking Nationally Significant Infrastructure Projects
- Outline a vision for the new NPPF, including an indication of the types of National Development Management Policy that it could include – consultation ended **2 March 2023**

We recommend Rutland County Council keep a close eye on the outcome of these consultations and react as it becomes clear how the Bill affects the plan's ability to deliver net zero carbon development.

The Bill's key proposals potentially relevant to climate change plan policy are as follows.

- **New system of 'Environmental Outcomes'** to replace the EU system of Sustainability Appraisals and Environmental Impact Assessment – unlikely to explicitly include carbon
- **A standardised set of data to be used** in preparation of local plans and applications
- **National Development Management Policies** that could undermine local policy
- **A new Infrastructure Levy to replace the existing system** of developer contributions (Section 106 and Community Infrastructure Levy).

The House of Commons Committee's report[xxxv] to the Secretary of State observes that the Committee is struggling to evaluate the Bill's planning impact because its proposals lack detail and rely heavily on secondary legislation whose content is unknown.

Environmental Outcomes system

A policy paper[xxxvi] released with the bill explains that it will bring in a new "process used to assess the potential environmental effects of … plans and major projects [via] 'Environmental Outcome Reports'".

The Environmental Outcomes are as yet undefined, but the Bill will come with changes to the NPPF to ensure that the **Environment Act 2021** is "embedded fully in plan-making and decisions". Examples given are biodiversity net gain and Local Nature Recovery Strategies. It is thus likely that the Outcomes may also cover the **Act's other priority areas**[xxxvii]: air quality; water quality; resource efficiency.

Carbon is not among these: in fact the text of the Act tells the new 'Office of Environmental Protection' to ensure it does not overlap with the Committee on Climate Change. Still, net zero carbon policy may be able to bolster its justification by supporting air quality – such as by banning gas boilers or reducing car use (even electric vehicles impact air quality via tire wear and road dust resuspension).

However, the consultation document[xxxviii] states that a review is taking place on how Environmental Outcome Reports '*could be used effectively to help support effort to reduce the carbon impact of development*'. Reference is also made to net zero, a positive inclusion that has not been explicitly stated previously.

A standard data approach to be used in preparing local plans

These proposals would enable the Secretary of State to regulate how planning authorities select, process and use data in local plan making[xxxix]. This relates strongly to the aim of digitising the planning system to make it accessible for more people to directly engage with the plan-making process or comment on planning applications. Part of the reason for this is that planning authorities do not follow set standards in how they store or publish local plan information. Data standards would aim to make all area's local plan information directly comparable and easier to navigate. The proposals include:

- Secretary of State to determine 'approved data standards' that planning authorities must use
- Giving local authorities the power to require other bodies to provide certain data to them
- Secretary of State empowered to require the data to be openly available, free of charge
- Secretary of State empowered to prohibit or limit the use of software for planning data.

The proposed data standards do not immediately affect our identified 'risk levels' or risk topics. We anticipate that Rutland's Local Plan Review will be complete and adopted before the Bill is passed. This would therefore become a consideration for the next local plan-making process.

In future, it may mean that certain specific data evidence might need to be provided and published in order to justify some of the more ambitious policies if those are pursued. For example, it is imaginable that any of the following could be included in the new data standards:

- Feasibility and cost of complying with local standards for buildings' energy and carbon

- Areas suitable for renewable energy or other carbon-reducing measures, and reasons for this
- Transport data used to justify site allocations from a carbon perspective.

The new standards may conceivably also affect planning applications' use of data or software, such as:

- Data and software used in energy statements (carbon and energy calculations)
- Data and software around viability.

It is however too early to pre-empt whether the Rutland Local Plan Review net zero carbon policies may be affected by the standards of data that applications may later need to submit.

National Development Management Policies

A set of national policies is intended to streamline the plan-making process by reducing the number of issues each local area has to address (also enabling developers to deal with less local variability).

- National DM Policies could override local plan policies where there is a conflict
- Initial commentary suggest that[xl]:
  - They will "be derived from the policies set out currently in the [NPPF] where these are intended to guide decision-making, but we will also identify … gaps in the issues which are covered".
  - The policies will cover "issues that apply in most areas".
- In the consultation text, it is suggested that a national DM policy for carbon reduction and measurement could be set, which could set minimum standards but still allows local authorities to set their own standards. It is however unclear how this would correlate to Building Regulations. Currently, it appears unlikely that current local powers are at risk of being undermined, yet this could change following the consultation process.

The text of the bill does not mention "energy" or "deregulation", so we assume it will not amend the Planning and Energy Act 2008 nor trigger the amendments that were part of the Deregulation Act 2015[xli] (those amendments would remove local plans' power to regulate homes' energy efficiency and renewable energy use – although not for other buildings).

Therefore, if there is a National DM Policy on energy and carbon, scope should remain for local plans to require renewable energy and higher energy efficiency than building regulations.

National Development Management Policies may change our assessed 'risk levels' as follows *only if energy and carbon do indeed get covered by one of the national DM policies*:

- Local policies on energy and carbon performance of buildings may become higher risk, impossible, or simply overruled. Misalignment with national policy is likely to be the key risk.
- Policies regarding energy and carbon may have to follow a more set structure – for example, the National DM Policy (and Approved Data Standard) might define what evidence must be submitted, or constrain the ways in which offsetting can be required or delivered.

We note that the 'Planning for the Future' White Paper (2020) appeared to suggest that the new Building Regulations Part L Future Homes Standard would drive energy standards high enough that local plans would no longer have this within their remit:

> "The planning system is only one of the tools that we need to use to [address] climate change. Last year we consulted on our proposals to move towards a Future Homes Standard [through which] we expect new homes to produce 75-80 per cent lower CO_2 emissions [and] be 'zero carbon ready' … without the need for further costly retrofitting … As local authorities are freed from many planning obligations through our reforms, they will be able to … focus more fully on enforcement".

The page for this White Paper consultation[xlii] states that the consultation outcome is expressed through the Levelling Up and Regeneration Bill accompanying Policy Paper; however, this does not mention carbon and fails to not state a clear position on local plan powers over developments' energy performance. However, the 2021 Future Homes Standard consultation response[xliii] confirmed that "*to provide some certainty in the immediate term, we will not amend the Planning and Energy Act 2008, which means that local authorities will retain powers to set local energy efficiency standards for new homes*". We assume the same is true for the Planning & Energy Act powers regarding non-residential buildings and renewable energy.

It remains to be seen whether there may be a reversal of this statement via the creation of National Development Management Policies under the aegis of the Levelling Up Bill.

Developer contributions

The Bill proposes to replace the current system of Section 106 contributions and Community Infrastructure Levy. The new Infrastructure Levy will replace CIL entirely, and S106 in most cases.

This may affect the ability to collect carbon offset payments in local plan net zero carbon policy, as S106 is the mechanism usually used for this. Details include[xliv]:

- The new 'Infrastructure Levy' will be **mandatory** (rather than the current CIL and S106, which the local planning authority does not have to set)
- The new Infrastructure Levy would be **set in relation to final gross development value** (GDV) when the development is sold, **not floor space**
- The Levy rates would apply over a certain threshold (of GDV, assumably)
- An **infrastructure delivery strategy** must outline how the new Levy will be spent
- **Section 106 agreements will still be used in some cases**
- Sites permitted before the introduction of the new Levy will still be subject to any CIL/S106

This latter point echoes the Government's May 2022 response to the Select Committee Report on the 'Planning for the Future' White Paper[xlv] which stated that Section 106 would not be entirely removed – but rather as a means to collect the new Infrastructure Levy "in limited circumstances".

It is not yet clear how the new Infrastructure Levy may change the planning acceptability risk of setting policy that requires developer contributions to offset carbon. Carbon offsetting is not

referred to in the technical consultation document. It may have no effect given that the rates will still be set locally and S106 will still remain for some purposes.

However, potential risks could arise in the following scenarios:

- If restrictions are placed on what counts as "infrastructure" and how to justify the need for this
- If there is no flexibility to charge a certain value per tonne of carbon or per kWh of electricity, rather than a % of gross development value.

Updates to the National Planning Policy Framework

It was announced (via correction[xlvi]) on 13th June 2022 that in July 2022 the Government would release an outline of proposed changes to the NPPF that will begin to explain how the new 'environmental outcomes' system (envisioned by the Levelling Up & Regeneration Bill) might be implemented.

The Government's November 2021 response[xlvii] to the Select Committee Report on the 'Planning for the future' White Paper noted that "a new set of National Development Management Policies in the NPPF will save local authorities time, removing the need to repeat things which apply universally, helping them to get plans in place quickly and allowing local leaders to focus on issues that matter most locally".

In May it was stated that the July NPPF update outline will include[xlviii] an indication of what type of National Development Management Policies will be created.

In December, later than anticipated, the document with indicative text changes to the NPPF[xlix] was released. The consultation period ran from 22 December 2022 to 2 March 2023. Proposed changes, set out in detail in Task A, most notable for the Rutland Local Plan in the consultation document were:

- Introduction of National Development Management policies
- Onshore wind development amendments
- Replacement of Supplementary Planning Documents

We note that fierce opposition to some parts of the white paper "Planning for the Future"[l] resulted in several of its more controversial suggestions being dropped (such as the new housing targets algorithm and the three-zone system to categorise all land in the country as 'growth', 'renewal' or 'protection' areas)[li]. Similarly, major concerns have been raised on a lack of positive action to relax planning constraints on the development of onshore wind, alongside negative implications associated with the replacement of Supplementary Planning Documents with 'Supplementary Plans'.

The consultation responses on changes to the NPPF may result in similar reversals of any proposals that meet with strong and justified opposition – for example if the eventually proposed National DM Policy topics appear to undermine democratic influence by removing the local planning authorities' ability to act on a strong climate action mandate from their constituents, or fail to allow flexibility to require higher standards in areas where property values deliver a larger profit margin allowing more investment in building energy performance.

    - If this happens, the local carbon offsetting fund may have a greater administration burden in finding carbon reduction projects that deliver the carbon savings at the same cost per tonne, as the developer will have instead paid an amount in relation to their gross development value, not their building's carbon emissions.

The Infrastructure Levy is to be rolled out gradually via a 'test and learn approach'. Insight from this roll-out may give an indication of whether the new system is suitable for use in carbon offsetting.

Potential impact on Risk Matrix resulting from emerging regulatory and legislative changes

<table>
<tr><th colspan="2"></th><th>Climate (carbon budgets)</th><th>Occupant energy bills</th><th>Future retrofit costs/disruption</th><th>Electrical grid readiness</th><th>Delivery / sector readiness</th><th>LPA internal capability</th><th>Viability / cost</th><th>Planning powers / precedents</th><th>Compatibility with national approach</th></tr>
<tr><td rowspan="6">Energy efficiency</td><td>EUI limits (using PHPP/TM54)</td><td rowspan="15">No change: Potential regulatory / legislative changes do not change the risk of any policy component in relation to climate impact</td><td rowspan="15">No change: Potential regulatory / legislative changes do not change the risk of any policy component in relation to energy bill impacts</td><td rowspan="3">All policies for on-site measures that avoid the need for future retrofit may be able to gain acceptability by showing that they contribute to Environment Act goals* for resource efficiency; ditto gas-free buildings and air quality (*likely to be among new ‘Environmental Outcomes’ in the planning system)</td><td rowspan="4">No change: Potential regulatory / legislative changes are not expected to change the risk relationship between electrical grid readiness and policies for energy efficiency / renewable energy</td><td rowspan="15">Potential regulatory / legislative changes will set data standards to be used by local plans and planning applications.

This may mean that the industry learns to universally report on energy and carbon. Or vice versa, the data standards may prohibit alternative calculations. It is unknown whether the data standards will apply retrospectively to plans with policies adopted beforehand.

The potential changes will also affect how housing targets work, therefore the industry’s ability to deliver at pace may be less of a concern.</td><td rowspan="15">The potential replacement of Supplementary Planning Documents, as proposed by the indicative changes to the NPPF may impact LPA internal capability to implement local policies. If the replacement is confirmed, the ability for LPA to provide supporting information and guidance on policy implementation will be reduced.</td><td rowspan="15">No change: Potential regulatory / legislative changes are not expected to change the risk relationship between viability and any policy component</td><td rowspan="6">All local policies regarding onsite energy and carbon performance may become higher risk or be completely overruled by the proposed new National Development Management Policies, although the latter is unlikely.

Alternatively: the new National DM Policies may simply constrain how energy and carbon policies should be structured.

Alternatively: the new National DM Policies may not impact local planning policy on net zero carbon, or contain inbuilt flexibility to reflect local factors, such as viability.

The indicative changes to the NPPF as set out in the consultation document do not suggest any significant negative changes that will impact the ability of local planning authorities to set local policy at ambitious levels. This however remains uncertain due to the link between proposed National DM Policies.</td><td rowspan="6"></td></tr>
<tr><td>Space heat demand limits (PHPP/TM54)</td></tr>
<tr><td>Process to remedy performance gap</td></tr>
<tr><td>EUI & space heat limits – using Part L SAP</td><td rowspan="2">No change: Potential regulatory / legislative changes are not expected to change the risk relationship between renewable energy policies and risk of needing to retrofit</td></tr>
<tr><td>Future homes fabric % reduction on Part L SAP TFEE</td></tr>
<tr><td>Moderate energy efficiency % reduction on Part L TER</td></tr>
<tr><td rowspan="3">Renewable & fossil-free energy supply</td><td>No new gas</td></tr>
<tr><td>Onsite PV to match energy use</td></tr>
<tr><td>Onsite PV per m² ground floor area</td></tr>
<tr><td rowspan="3">Offsetting</td><td>Renewable % reduction on Part L TER or Part L energy use</td><td rowspan="3">New Infrastructure Levy may provide opportunities to use offset fees for retrofit or energy system upgrades</td><td rowspan="3">Offsetting policies may be constrained by proposed changes to S106 and new Infrastructure Levy.

Local offsetting policies may or may not be constrained by a new National</td></tr>
<tr><td>Offset only via local renewable energy</td></tr>
<tr><td>Offset via S106 (various projects)</td><td>No change</td><td>No change</td></tr>
<tr><td></td><td>Offsetting via global schemes</td></tr>
</table>

		Climate (carbon budgets)	Occupant energy bills	Future retrofit costs/disruption	Electrical grid readiness	Delivery / sector readiness	LPA internal capability	Viability / cost	Planning powers / precedents	Compatibility with national approach
						By 2025 (Future Homes Standard) the industry will have to be universally ready for good fabric and heat pumps.			Development Management Policy (as above).	
Embodied carbon	Embodied carbon – specific targets			No change	No change				The recently proposed Part Z, an amendment to Building Regulations to integrate embodied carbon, is currently going through the parliamentary process. Regardless of whether the amendment is made, this discussion will contribute towards acceptability of embodied carbon requirements in policy.	
	Embodied carbon – reporting only									

References and Endnotes

[i] HM Government Ministry of Housing, Communities & Local Government (2021), *National Planning Policy Framework*. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf

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

[iii] Modern Building Services (2013), *Tracing the continuing development of Part L*. https://modbs.co.uk/news/fullstory.php/aid/12062/Tracing_the_continuing_development_of_Part_L.html

[iv] South West Net Zero Hub (2021), *Net Zero New Buildings: Evidence and guidance to inform planning policy*. https://www.westofengland-ca.gov.uk/wp-content/uploads/2022/01/Spatial-Development-Strategy-Net-zero-new-buildings-Evidence-and-Guidance-to-inform-Planning-Policy-Jan-2022.pdf

[v] The Building Regulations. *Conservation of fuel and power, Volume 2: Buildings other than dwellings*. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1133081/Approved_Document_L__Conservation_of_fuel_and_power__Volume_2_Buildings_other_than_dwellings__2021_edition_incorporating_2023_amendments.pdf

[vi] Committee on Climate Change (2019), *UK Housing: Fit for the future?* https://www.theccc.org.uk/publication/uk-housing-fit-for-the-future/

[vii] Committee on Climate Change (2019), *UK Housing: Fit for the future?* https://www.theccc.org.uk/publication/uk-housing-fit-for-the-future/

[viii] HM Government Department for Business, Energy, Innovation & Skills (BEIS) (2021), *Heat and Buildings Strategy*. https://www.gov.uk/government/publications/heat-and-buildings-strategy

[ix] BRE (2016), *Solid wall heat losses and the potential for energy saving*. Appendix A: Summary of major 29 unintended consequence categories.

[x] BRE & Constructing Excellence in Wales (2017), *Post Installation Performance of Cavity Wall & External Wall Insulation*. http://www.cewales.org.uk/files/3014/7671/0110/Post_Installation_Performance_of_Cavity_Wall__External_Wall_Insulation.pdf

[xi] Currie and Brown (2019), *The Costs and Benefits of tighter standards for new buildings*. See page 4 (9th page of the PDF) for reference to the cost of retrofit being five times the cost of including these measures during initial construction. https://www.theccc.org.uk/wp-content/uploads/2019/07/The-costs-and-benefits-of-tighter-standards-for-new-buildings-Currie-Brown-and-AECOM.pdf

[xii] South West Energy Hub. *Adapting London Plan Offsetting Rates for 2022 Building Regulation Updates, Evidence for Bath & North East Somerset Council*. https://beta.bathnes.gov.uk/sites/default/files/CD-RCC028%20SWEH%20BNES%20Offsetting%20Evidence.pdf

[xiii] Bioregional, Etude and Currie & Brown. *Central Lincolnshire Local Plan: Climate Change Evidence Base, Task G – Feasibility Assessment (2021)*. https://www.n-kesteven.gov.uk/sites/default/files/2023-03/CLC006%20Task%20G%20-%20Feasibility.pdf

[xiv] Bioregional, Etude and Currie & Brown. *Central Lincolnshire Local Plan: Climate Change Evidence Base, Task H – Cost Implications (2021)*. https://www.n-kesteven.gov.uk/sites/default/files/2023-03/CLC007%20Task%20H%20-%20Cost%20Implications.pdf

[xv] Bath & North East Somerset Council. *Sustainable Construction Checklist Supplementary Planning Document (2023)*. https://beta.bathnes.gov.uk/sites/default/files/2023-01/Sustainable%20Construction%20Checklist%20SPD%20%28PDF%29.pdf

[xvi] Cornwall Council. *Climate Emergency Development Plan Document Policy Guidance (2023)*. https://www.cornwall.gov.uk/media/bvphj2or/policy-guidance-climate-emergency-dpd-v5-25-april.pdf
[xvii] HM Government Ministry of Housing, Communities & Local Government (2019), *The Future Homes Standard consultation impact assessment*. https://www.gov.uk/government/publications/the-future-homes-standard-consultation-impact-assessment
[xviii] Currie & Brown and Etude on behalf of Cornwall Council (2021), *Cornwall Council Climate Emergency DPD: Energy review and modelling*. www.swenergyhub.org.uk/wp-content/uploads/2021/04/20200359-Climate-Emergency-DPD-Energy-review-and-modelling-Rev-H.pdf
[xix] HM Government Department for Business, Energy & Industrial Strategy (2021) *Green Book Supplementary Guidance: valuation of energy use and greenhouse gas emissions for appraisal*. For carbon values per tonne, and for grid energy reductions, see downloadable 'data tables 1-19'. https://www.gov.uk/government/publications/valuation-of-energy-use-and-greenhouse-gas-emissions-for-appraisal
[xx] HM Government Department for Business, Energy & Industrial Strategy (2021), *Press release: Plans unveiled to decarbonise UK power system by 2035*. https://www.gov.uk/government/news/plans-unveiled-to-decarbonise-uk-power-system-by-2035
[xxi] Etude, CIBSE, Levitt Bernstein, Elementa, WSP, Clarion Housing Group, and UCL (2021), *Making SAP and RdSAP 11 fit for Net Zero: 15 minute summary. A report for the Department of Business, Energy and Industrial Strategy*. https://www.etude.co.uk/wp-content/uploads/2021/06/Making-SAP-and-RdSAP-11-fit-for-Net-Zero-Summary.pdf
[xxii] UK Green Building Council (2021), *Net Zero Whole Life Carbon Roadmap: A pathway to Net Zero for the UK Built Environment*. https://www.ukgbc.org/wp-content/uploads/2021/11/UKGBC-Whole-Life-Carbon-Roadmap-A-Pathway-to-Net-Zero.pdf
[xxiii] Centre for Sustainable Energy/Currie + Brown (2018) *Cost of carbon reduction in new buildings: Final report*. The document states that in homes, unregulated energy typically adds an additional 80 to 95% to a home's regulated energy load, making it 45-49% of the total. https://www.bathnes.gov.uk/sites/default/files/sitedocuments/Planning-and-Building-Control/PlanningPolicy/LP20162036/cost_of_carbon_reduction_in_new_buildings_report_publication_version.pdf
[xxiv] An industry-proposed amendment to the Building Regulations 2010. https://static1.squarespace.com/static/60d9f44f29825255def91a2f/t/626b989761a39b380fa2d58c/1651218584753/AD-Z+Proposal+26-04-2022+rev1.pdf
[xxv] AECOM & Zero Carbon Hub (2012), *Fabric energy efficiency for Part L 2013*. https://www.zerocarbonhub.org/sites/default/files/resources/reports/Fabric_Standards_for_2013-Worked_Examples_and_Fabric_Specification.pdf. Please note this AECOM document considers two potential TFEE levels that were being considered in 2012 for inclusion in the 2013 building regulations. Government later confirmed that the 'interim TFEE' option was the one adopted in Part L 2013.
[xxvi] While 35kWh/m2/year is considered the cutting edge best practice energy use intensity figure for homes, other various types of nonresidential building will need to have different targets for energy use intensity that reflect their different uses. For examples, see targets from LETI, RIBA, and evidence bases of emerging local plans in Cornwall, Central Lincolnshire and Greater Cambridge referenced elsewhere in this document.
[xxvii] South West Energy Hub (2021 – onwards), *SAP Energy Adjustment Tool*. https://www.swenergyhub.org.uk/seat/
[xxviii] Greater London Authority (2021), *London Plan Guidance Documents: 'Be Seen' energy monitoring guidance*. https://www.london.gov.uk/what-we-do/planning/implementing-london-plan/london-plan-guidance/be-seen-energy-monitoring-guidance

[xxix] HM Government Department for Business, Energy & Industrial Strategy (2021), *Guidance: Standard Assessment Procedure*. https://www.gov.uk/guidance/standard-assessment-procedure

[xxx] HM Government Department for Business, Energy & Industrial Strategy (2022), *Policy Paper: British energy security strategy*. https://www.gov.uk/government/publications/british-energy-security-strategy/british-energy-security-strategy#energy-efficiency

This commitment is also repeated by the *Government response to the Levelling Up, Housing and Communities Select Committee report on The Future of the Planning System in England*. https://www.gov.uk/government/publications/future-of-the-planning-system-in-england-government-response-to-the-select-committee-report/government-response-to-the-levelling-up-housing-and-communities-select-committee-report-on-the-future-of-the-planning-system-in-england

[xxxi] UK Parliament (2022) *Carbon Emissions (Buildings) Bill: Private Members Bill (under the Ten Minute Rule)*. https://bills.parliament.uk/bills/3107

[xxxii] HM Government Department for Levelling Up, Housing & Communities (11th May 2022), *Policy Paper: Levelling Up and Regeneration: Further Information* https://www.gov.uk/government/publications/levelling-up-and-regeneration-further-information/levelling-up-and-regeneration-further-information

[xxxiii] HM Government Department for Levelling Up, Housing & Communities (13th May 2022), *PLANNING NEWSLETTER: Follow-up: DLUHC Broadcast on "Planning in the Levelling Up and Regeneration Bill"*. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1075274/Chief_Planners_Newsletter_LURB_Technical_Brief_Follow-up.pdf

[xxxiv] HM Government Department for Levelling Up, Housing & Communities (11th May 2022), *Policy Paper: Levelling Up and Regeneration: Further Information* https://www.gov.uk/government/publications/levelling-up-and-regeneration-further-information/levelling-up-and-regeneration-further-information

[xxxv] Levelling Up, Housing & Communities Committee (24th August 2022), Letter to Rt Hon Greg Clark MP. Re: Levelling-up and Regeneration Bill. https://committees.parliament.uk/publications/28460/documents/171233/default/

[xxxvi] HM Government Department for Levelling Up, Housing & Communities (11th May 2022), *Policy Paper: Levelling Up and Regeneration: Further Information* https://www.gov.uk/government/publications/levelling-up-and-regeneration-further-information/levelling-up-and-regeneration-further-information

[xxxvii] *Environment Act 2021*. https://www.legislation.gov.uk/ukpga/2021/30/enacted

[xxxviii] HM Government Department for Levelling Up, Housing & Communities (17th March 2023), *Environmental Outcomes Report: a new approach to environmental assessment (consultation)*. https://www.gov.uk/government/consultations/environmental-outcomes-reports-a-new-approach-to-environmental-assessment/environmental-outcomes-report-a-new-approach-to-environmental-assessment

[xxxix] HM Government (2022), *Levelling up and regeneration bill: Explanatory notes*. https://publications.parliament.uk/pa/bills/cbill/58-03/0006/en/220006en.pdf

[xl] HM Government Department for Levelling Up, Housing & Communities (11th May 2022), *Policy Paper: Levelling Up and Regeneration: Further Information* https://www.gov.uk/government/publications/levelling-up-and-regeneration-further-information/levelling-up-and-regeneration-further-information

[xli] UK Parliament House of Commons Library (2015), *Planning Update: Statement made on 25 March 2015*. https://questions-statements.parliament.uk/written-statements/detail/2015-03-25/HCWS488

[xlii] HM Government Department for Levelling Up, Housing & Communities (published 2020 and 2021; accessed 17/06/22) *Closed Consultation: Planning for the Future*. https://www.gov.uk/government/consultations/planning-for-the-future

[xliii] HM Government Ministry of Housing, Communities and Local Government (2021), *The Future Homes Standard: summary of responses, and government response.* https://www.gov.uk/government/consultations/the-future-homes-standard-changes-to-part-l-and-part-f-of-the-building-regulations-for-new-dwellings

[xliv] HM Government Department for Levelling Up, Housing & Communities (11th May 2022), *Policy Paper: Levelling Up and Regeneration: Further Information* https://www.gov.uk/government/publications/levelling-up-and-regeneration-further-information/levelling-up-and-regeneration-further-information

[xlv] HM Government Department for Levelling Up, Housing and Communities (2022), *Government response to the Levelling Up, Housing and Communities Select Committee report on The Future of the Planning System in England*. https://www.gov.uk/government/publications/future-of-the-planning-system-in-england-government-response-to-the-select-committee-report/government-response-to-the-levelling-up-housing-and-communities-select-committee-report-on-the-future-of-the-planning-system-in-england

[xlvi] Gove , M. (2022), *Letter of correction from the Secretary of State for Levelling Up, Housing and Communities and Minister for Intergovernmental Relations, the right hon. Member for Surrey Heath (Michael Gove).* Hansard records of parliamentary debates and corrections. https://hansard.parliament.uk/Commons/2022-06-13/debates/B7B5E134-FA02-47E3-BC76-7275A27797C4/HousingCommunitiesAndLocalGovernment

[xlvii] HM Government Department for Levelling Up, Housing and Communities (2022), *Government response to the Levelling Up, Housing and Communities Select Committee report on The Future of the Planning System in England*. https://www.gov.uk/government/publications/future-of-the-planning-system-in-england-government-response-to-the-select-committee-report/government-response-to-the-levelling-up-housing-and-communities-select-committee-report-on-the-future-of-the-planning-system-in-england

[xlviii] HM Government Department for Levelling Up, Housing & Communities (11th May 2022), *Policy Paper: Levelling Up and Regeneration: Further Information* https://www.gov.uk/government/publications/levelling-up-and-regeneration-further-information/levelling-up-and-regeneration-further-information

[xlix] HM Government Department for Levelling Up, Housing & Communities (December 2022), *National Planning Policy Framework: draft text for consultation.* https://www.gov.uk/government/consultations/levelling-up-and-regeneration-bill-reforms-to-national-planning-policy

[l] UK Parliament House of Commons Library (February 2022), *Research briefing: Planning for the Future: planning policy changes in England in 2020 and future reforms*. https://commonslibrary.parliament.uk/research-briefings/cbp-8981/

[li] UK Parliament House of Commons Library (June 2022), *Research briefing: Levelling Up and Regeneration Bill 2022-23*. https://commonslibrary.parliament.uk/research-briefings/cbp-9558/