



Local Plan Update

Leeds Local Plan

Development Plan Document

Pre-Submission Changes - Carbon Reduction Background Paper

October 2023

INTRODUCTION

The Carbon Reduction policies of the Local Plan Update aim to minimise energy demand and meet all demands for heat and power without increasing carbon emissions to allow Leeds to meet its climate emergency ambition of zero carbon by 2030.

Leeds City Council (LCC) has declared a Climate Emergency and has an ambition to achieve net zero carbon emissions across the city by 2030 through the adoption of science-based targets. The current version of the targets, the Net Zero Carbon Roadmap for Leeds, identifies and evaluates carbon reduction opportunities and sets out a league table of the most carbon-effective options for Leeds, emphasising the importance of focusing on housing, public and commercial buildings in achieving net zero. According to the latest available data, the city of Leeds emitted 3.8 mtCO₂ in 2019, reflecting a 33% reduction since 2005 whilst experiencing an 8% increase in population. Whilst this is good progress, with annual decreases of around 114 ktCO₂/year at the current trajectory, carbon emissions across the city would remain around 2.6 mtCO₂ in 2030. Buildings account for around a third of the carbon emissions from the city of Leeds¹.

There is a legal duty under section 19(1A) of the Planning and Compulsory Purchase Act 2004 to ensure that climate change mitigation and adaptation is a core objective of a local authorities' planning policy. Section 182 of the Planning Act 2008 puts a legal duty on local authorities to include policies on climate change mitigation and adaptation in Development Plan Documents.

Additionally, para 148 of the NPPF requires the planning system to help to:

"Shape places in ways that contribute to radical reductions in greenhouse gas emissions, minimise vulnerability and improve resilience; encourage the reuse of existing resources, including the conversion of existing buildings; and support renewable and low carbon energy and associated infrastructure."

It is therefore essential for this legal and policy requirement to be addressed in the Local Plan.

The Local Plan currently has several policies that help reduce and mitigate against the impacts of climate change. However, these policies were written and adopted prior to the Council declaring its Climate Emergency. Therefore, it is essential to update and add new policies, using up to date evidence, to help Leeds meet its zero carbon goal by 2030.

¹ BEIS. Emissions of carbon dioxide for Local Authority areas. *Emissions of carbon dioxide for Local Authority areas* <https://data.gov.uk/dataset/723c243d-2f1a-4d27-8b61-cdb93e5b10ff/emissions-of-carbon-dioxide-for-local-authority-areas> (2021).

DEFINITIONS

To provide clarity throughout the remainder of the Local Plan Update it is first necessary to establish clear definitions for what zero carbon means in the context of new development. To this end we will follow the framework definition by UKGC for net zero carbon buildings. The framework sets out two definitions for net zero carbon buildings – net zero carbon- construction and net zero carbon -operational.

Net zero carbon – construction is when the amount of carbon emissions associated with a building’s product and construction stages up to practical completion is zero or negative, through the use of offsets or the net export of on-site renewable energy.

A building is recognized as being **net zero carbon - operational** when the amount of carbon emissions associated with the building’s operational energy on an annual basis is zero or negative. A net zero carbon building is highly energy efficient and powered from on-site and/or off-site renewable energy sources, with any remaining carbon balance offset ². Figure 1 details the steps expected from new development to achieve net zero.

² UKGBC. Net Zero Carbon Buildings: A Framework Definition <https://ukgbc.s3.eu-west-2.amazonaws.com/wp-content/uploads/2019/04/08141151/Net-Zero-Carbon-Buildings-A-framework-definition-print-version.pdf> (2019)

Steps to Achieving a Net Zero Carbon Building

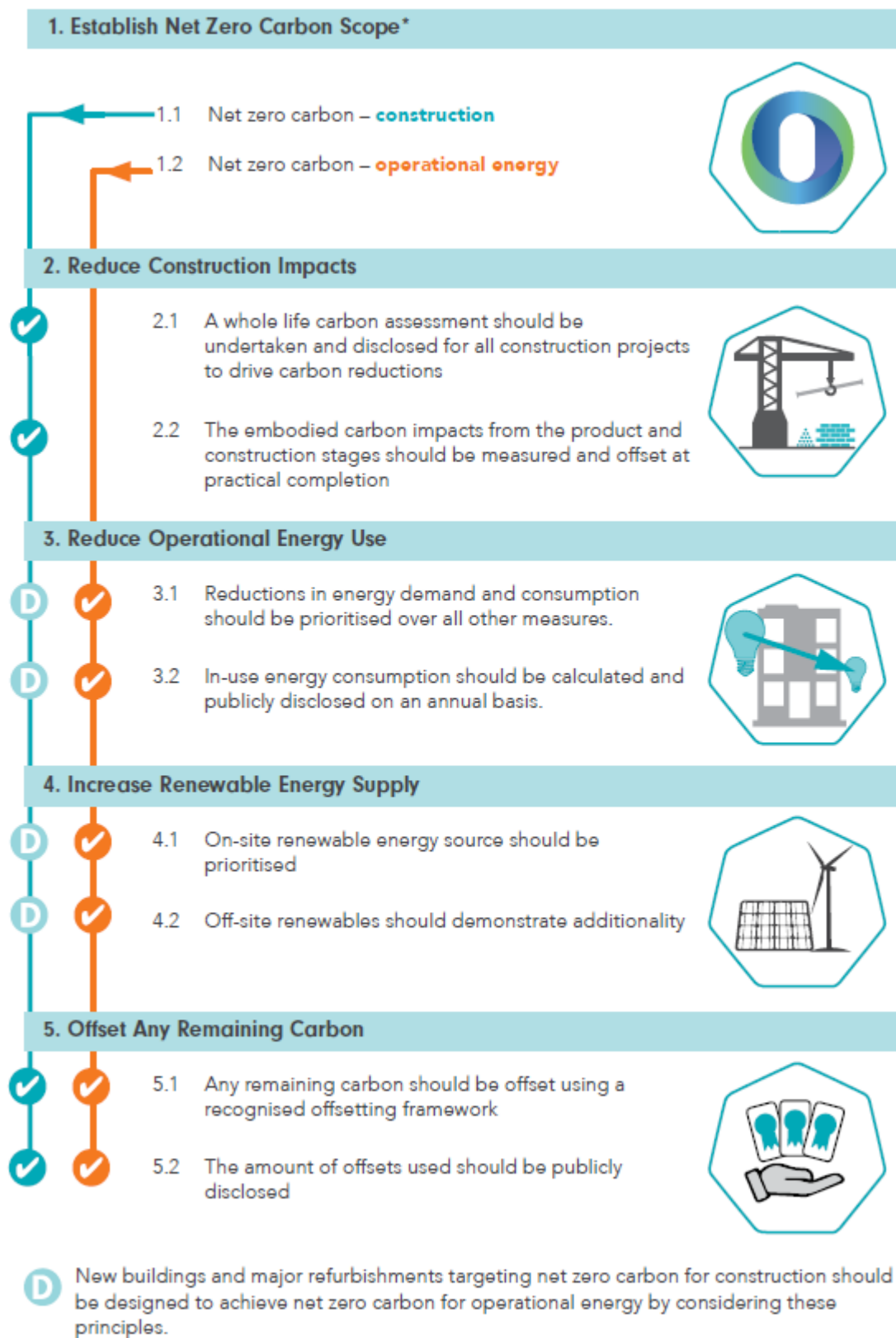


Figure 1 UKGBC diagram to demonstrate how to achieve carbon net zero buildings

POLICY EN1A: WHOLE LIFE CYCLE CARBON ASSESSMENTS

WHY IS THE POLICY NEEDED?

Whole life cycle carbon emissions and ‘embodied carbon’ refers to the carbon emissions resulting from the construction and use of a building over its entire life, including the carbon that is emitted from the operation of a building once it is complete and its end of life demolition and disposal. Embodied carbon can represent around 50% of total emissions over a building's lifetime³.

Our current planning policy approach is focussed on reducing operational carbon but we don't at present ask for any reduction or calculation of the embodied carbon which is emitted through construction materials and the processes used to create them and transport them and the maintenance of buildings, repair and replacement as well as dismantling, demolition and eventual material disposal.

Section 4 of the Study on The Carbon Reduction of Buildings by the University of Leeds, found within the Council's evidence base, sets out what whole life cycle carbon assessments are, and why they are necessary to truly understand the carbon emissions associated with the construction and use of buildings. Figure 2 demonstrates how we can reduce emissions by considering the implications of the cost of carbon at earlier stages in the design process.

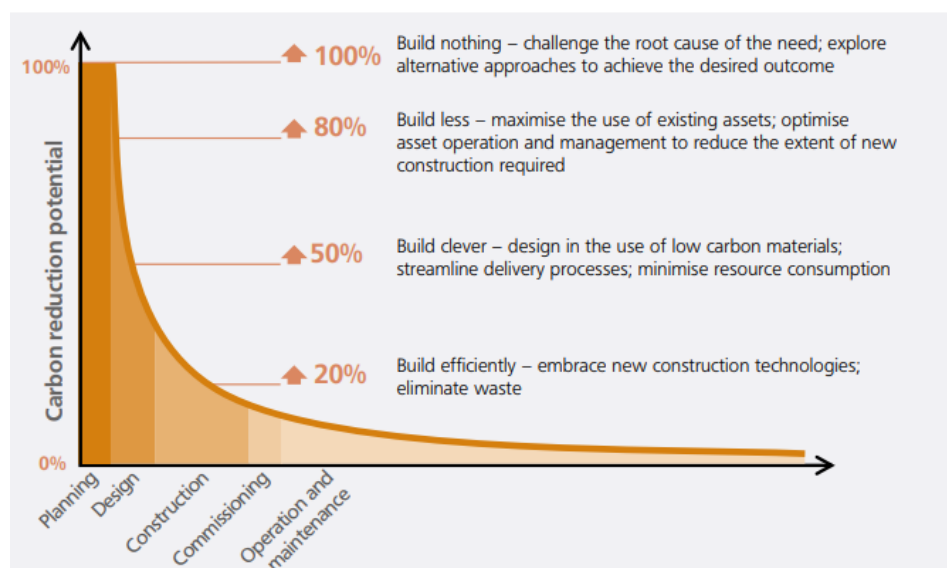


Figure 2 Graphic representation of how opportunities for carbon emissions reductions exist earlier in the development process⁴.

³ <https://www.ukgbc.org/wp-content/uploads/2021/01/New-Homes-Policy-Playbook-January-2021.pdf> (2021).

⁴ UKGBC. *Embodied Carbon: Developing a Client Brief*. <https://www.ukgbc.org/wp-content/uploads/2017/09/UK-GBC-EC-Developing-Client-Brief.pdf> (2017).

POLICY OBJECTIVES

The policy is seeking new development to acknowledge the carbon cost of a development over its entire lifetime. As demonstrated above, the embodied carbon of a building can be responsible for up to 50% of its lifetime carbon emissions and often reusing a building could be an appropriate process to deliver a scheme. However, through consultation and stakeholder workshops, there are industry concerns about the resources and skill base required to deliver a whole life cycle carbon assessment to a Leeds set target. Therefore, the Council is only proposing that major developments will have to provide an assessment which demonstrates actions to reduce its embodied carbon. Minor developments will have to provide information for how the scheme has considered basic principles set out in the Council's whole life carbon guidance. The policy also supports the reuse and repurposing buildings by requiring the impacts associated with demolition and deconstruction to be included in the whole life carbon assessment. The Council's whole life carbon guidance is being developed and aimed at all applications.

EVIDENCE

The University of Leeds has provided a study on the carbon reduction of buildings which explores the justification for the introduction of whole life cycle carbon assessments (section 4). To summarise that section of the report, it explains how embodied carbon represents around 50% of total emissions over a building's lifetime⁵ and how current national guidance and planning policy does not require developments to account for this. Figure 2 demonstrates the relationship between operational carbon and embodied carbon in the construction and lifecycle of buildings, and how there is a significant amount of carbon used during the construction, refurbishment and demolition of a building.

⁵ <https://www.ukgbc.org/wp-content/uploads/2021/01/New-Homes-Policy-Playbook-January-2021.pdf> (2021).

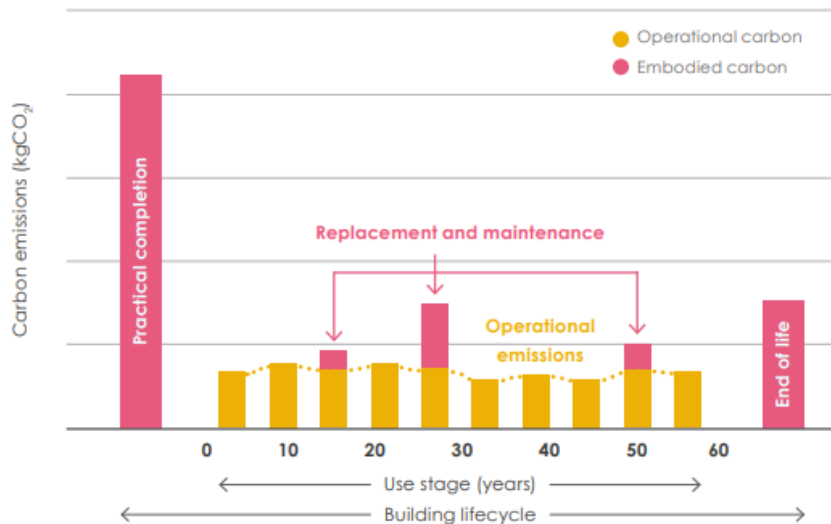


Figure 3: Embodied and operational carbon emissions within the whole lifecycle of a development, indicative⁶.

Paragraph 4.6 of the Study on The Carbon Reduction of Buildings by the University of Leeds details how taking WLC approach may offset the costs of undertaking a whole life cycle carbon assessment:

A focus on embodied carbon emissions of materials and construction practices as part of WLC assessment and emissions reduction is likely to be a challenge for the sector, and supplementing current materials and products with like-for-like replacements will likely result in higher costs⁷. However, taking a WLC approach from the outset may realise potential cost savings through:

- *Promoting recovery and reuse of existing structures over demolition and new construction.*
- *Designing to use less construction material from the outset of a development project*
- *Construction methods (such as modular construction) which can deliver embodied carbon savings and higher levels of efficiency⁸.*

It will be important that potential cost savings are recognised during viability assessment as well as likely cost increases which occur through the selection of lower carbon products and materials.

Whilst the report recommends the assessments for new development demonstrate that the scheme will be zero carbon (including offsetting), the Council believe that

⁶ LETI Climate Emergency Design Guide.

https://www.leti.london/files/ugd/252d09_3b0f2acf2bb24c019f5ed9173fc5d9f4.pdf (2019).

⁷ Pitman, K. Lowering embodied carbon: five trends in building design and construction. *RICS World Built Environment Forum* <https://www.rics.org/uk/wbef/megatrends/urbanisation/lowering-embodied-carbon-five-trends-in-building-design-and-construction/>

⁸ Delahunty, S. MMC cut carbon emissions by up to 45%, research finds. *Inside Housing* (2022).

this is unlikely to be achievable in the short-term. This is echoed in other Local Authorities, where it is believed that the industry has a way to go in reporting and reducing embodied carbon whilst offsetting emissions for construction is not viable at this moment⁹. However, it is expected that the building industry’s experience and knowledge of whole life carbon assessments will rapidly improve over the next 3-5 years, and therefore aligns with the policy approach of monitoring assessments up until a review of the policy.

NPPF CONSISTENCY

Whilst the current version of the NPPF (July 2021) does not contain any specific reference to embodied carbon or whole life cycle carbon assessments, the environmental objective of the NPPF states that “*minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy*” is one of the ways in which achieving sustainable development should be pursued. Paragraph 20 also details how strategic objectives should be delivered through strategic policies, of which “*planning measures to address climate change mitigation and adaptation*” is included. Paragraph 154 part b also requires new development to be planned in ways that “*can help to reduce greenhouse gas emissions, such as through its location, orientation and design*”. The introduction of a whole life cycle carbon assessment policy would comply with the NPPF requirements above, by encouraging the reuse of materials and buildings and reducing the amount of greenhouse emissions through new development’s design.

MONITORING

The policy itself directly refers to monitoring of the policy as no target has been set for whole life cycle carbon assessments to meet. This allows for a transitional period where developers can understand the methodology and the ways in which they can reduce the embodied carbon of a development. The Council will capture the results of the assessments, which would help set a target through a future plan review. The following indicators will be used to assess the policy:

Indicator	Reason
CO2 reduction	Applicants will have to consider, and subsequently publish, their assessments which may lead to lower embodied carbon and more energy efficient schemes. Therefore, new buildings will have lower CO2 emissions.
EPC Ratings	Applicants considering the whole life cycle carbon of a building may lead to more energy efficient buildings, and subsequently improved EPC ratings.

⁹ [Spatial-Development-Strategy-Net-zero-new-buildings-Evidence-and-Guidance-to-inform-Planning-Policy-Jan-2022.pdf \(westofengland-ca.gov.uk\)](https://www.westofengland-ca.gov.uk/spatial-development-strategy-net-zero-new-buildings-evidence-and-guidance-to-inform-planning-policy-jan-2022.pdf)

IMPLEMENTATION

The policy requires major applications to submit a whole life cycle carbon assessment using the latest version of RICS methodology¹⁰. Paragraph 4.8 to 4.29 of the Study on The Carbon Reduction of Buildings by the University of Leeds looks at potential methods to calculate the whole life cycle carbon of a building, however the Council has required the RICS Whole Life Carbon Assessment for the Built Environment assessment as it is a nationally recognised method and therefore provide consistency at a national level once more Local Authorities introduce assessments.

There are several reporting tools available for applications, both major and minor, to use:

- One Click LCA, which includes collaborations with RICS, the GLA and the UKGBC to provide a variety of tools
- UKGBC One Click Planetary tool covers A1-A5 of the RICS methodology and can be used for free to assess the embodied carbon of key construction materials.
- Leeds City Council whole life cycle carbon assessment guidance

¹⁰ <https://www.rics.org/uk/upholding-professional-standards/sector-standards/building-surveying/whole-life-carbon-assessment-for-the-built-environment/>

POLICY EN1B: OPERATIONAL CARBON

WHY IS THE POLICY NEEDED?

The Council has a planning policy that goes beyond national building regulations ever since the core strategy was introduced. Core Strategy Policy EN1¹¹ requires major development to be 20% more energy efficient than the Building Regulations standard and requires 10% of the energy needs of the development to come from renewable or low carbon energy sources. The objective is also met by Core Strategy Policy EN2 which requires major commercial development to be built to the BREEAM Excellent standard (which includes mandatory energy standards).

Section 1 of the Planning and Energy Act 2008 gives local planning authorities the power to set energy efficiency performance standards that exceed those required in Building Regulations and for proportion of energy used in the development to be from low carbon or renewable sources¹². Whilst this power will be amended by Section 43 of the Deregulation Act 2015, the Government has confirmed that it has no current plans to commence Section 43 of the Act. In 2019, the Climate Change Act (2008) was amended to reflect the Government's commitment to phase out carbon emissions by 2050. This sets a reasonable expectation that local plans have not only the ability but a legal obligation to adopt policies that would be consistent with the Act. Several Local Planning Authorities have also gone beyond minimum national energy requirements¹³.

The Government has clarified its position on local authorities going beyond the energy requirements set by Building Regulations, stating that¹⁴:

“To clarify, the Framework does not prevent local authorities from using their existing powers under the Planning and Energy Act 2008 or other legislation where applicable to set higher ambition. In particular, local authorities are not restricted in their ability to require energy efficiency standards above Building Regulations. The Government remains committed to delivering the clean growth mission to halve the energy usage of new buildings by 2030”

The response to the Future Homes Standard consultation detailed how 86% of consultation respondents oppose the commencement to amend the Planning & Energy Act and were in favour of retaining local planning authorities' flexibility to set standards. The above sets out the national planning and legal context for why Local Planning Authorities should seek to go beyond building regulations to ensure that new development meets the Government's and Leeds' net zero targets.

¹¹ [Core Strategy Adoption \(leeds.gov.uk\)](https://leeds.gov.uk/core-strategy-adoption)

¹² [Planning and Energy Act 2008 \(legislation.gov.uk\)](https://legislation.gov.uk)

¹³ [Interactive policy map - Jan 2021 - UKGBC - UK Green Building Council](#)

¹⁴ [Government confirms local authorities can set energy standards beyond Part L in NPPF - UKGBC - UK Green Building Council](#)

It is estimated that buildings will face retrofit costs of between £15,000 and £25,000¹⁵ to meet the South West's 2030 climate objectives, and similar costs would be expected in Leeds. Therefore, in order to reduce the need for buildings to retrofit moving forward, it is in Leeds' best interests to ensure that as many new developments are net zero carbon operationally moving forward. By acting before, and going beyond, Building Regulations will help Leeds position the City as a leader in low carbon goods and services.

POLICY OBJECTIVES

The policy is seeking to reduce the energy demand for all new development with an aim to achieve net zero operational carbon emissions. This would be in line with the hierarchy of minimising carbon emissions, using renewable energy and low carbon energy sources onsite and as a last resort offsetting through a contribution. The policy would not support the use of fossil fuels onsite. This policy also necessitates planning applications to be supported by energy statements that demonstrates measures undertaken to meet net zero operational carbon. A target has been set for energy use intensity and space heating demand and all applications would be expected to present performance metrics at design stage and pre-occupation within these targets.

INSERT TRANSITION INFO

EVIDENCE

NET ZERO OPERATIONAL ENERGY

LCC have undertaken consultation on a requirement for developments to achieve zero or net negative carbon emissions during the operational phase of a building's lifecycle. Such a measure will be critical to Leeds meeting its science-based targets and 2030 net zero carbon goal.

The Climate Change Committee (CCC) recommends that no new gas boilers should be sold beyond 2033. Supply chains for heat pumps will need to scale up to replace this, with over a million heat pumps being installed each year by 2030, up from around 20,000 per year today. No new gas boilers will be installed in new homes from 2025¹⁶.

SCATTER¹⁷ provides local authorities and city regions with the opportunity to standardise their greenhouse gas reporting and align to international frameworks, including the setting of targets in line with the Paris Climate Agreement. Factoring in direct and indirect emissions and with no change to current technology for heating homes in Leeds the pathway will resemble figure 5. By 2050, if most heating comes from ground source heat pumps, community scale combined heat pumps and some by district heating, then there is a significant decline in our carbon emissions as seen

¹⁵ [The-costs-and-benefits-of-tighter-standards-for-new-buildings-Currie-Brown-and-AECOM.pdf \(theccc.org.uk\)](https://theccc.org.uk/wp-content/uploads/2020/07/The-costs-and-benefits-of-tighter-standards-for-new-buildings-Currie-Brown-and-AECOM.pdf)

¹⁶ See CCC (2020). Local Authorities and the Sixth Carbon Budget

¹⁷ <https://scattercities.com/>

in figure 4. It is to be noted that our ambition as a city is to reach net zero by 2030 and the no fossil fuel strategy is part of a larger set of measures to reach that goal.

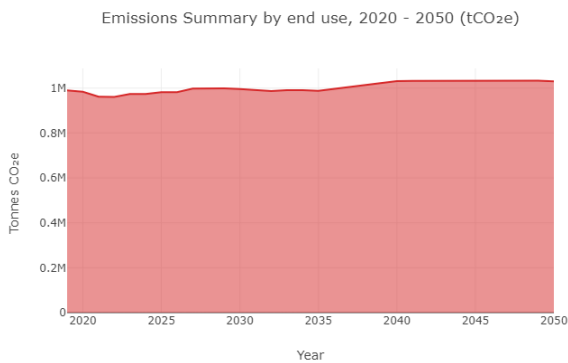


Figure 5: Carbon emissions SCATTER pathways – Business as usual

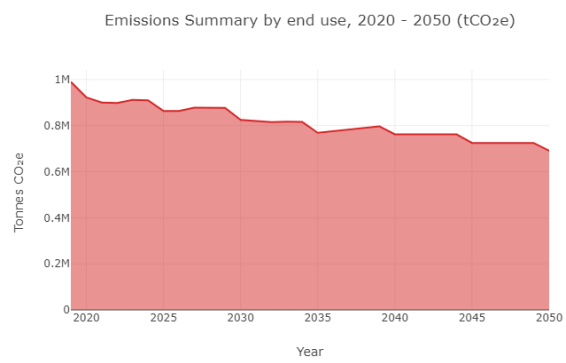


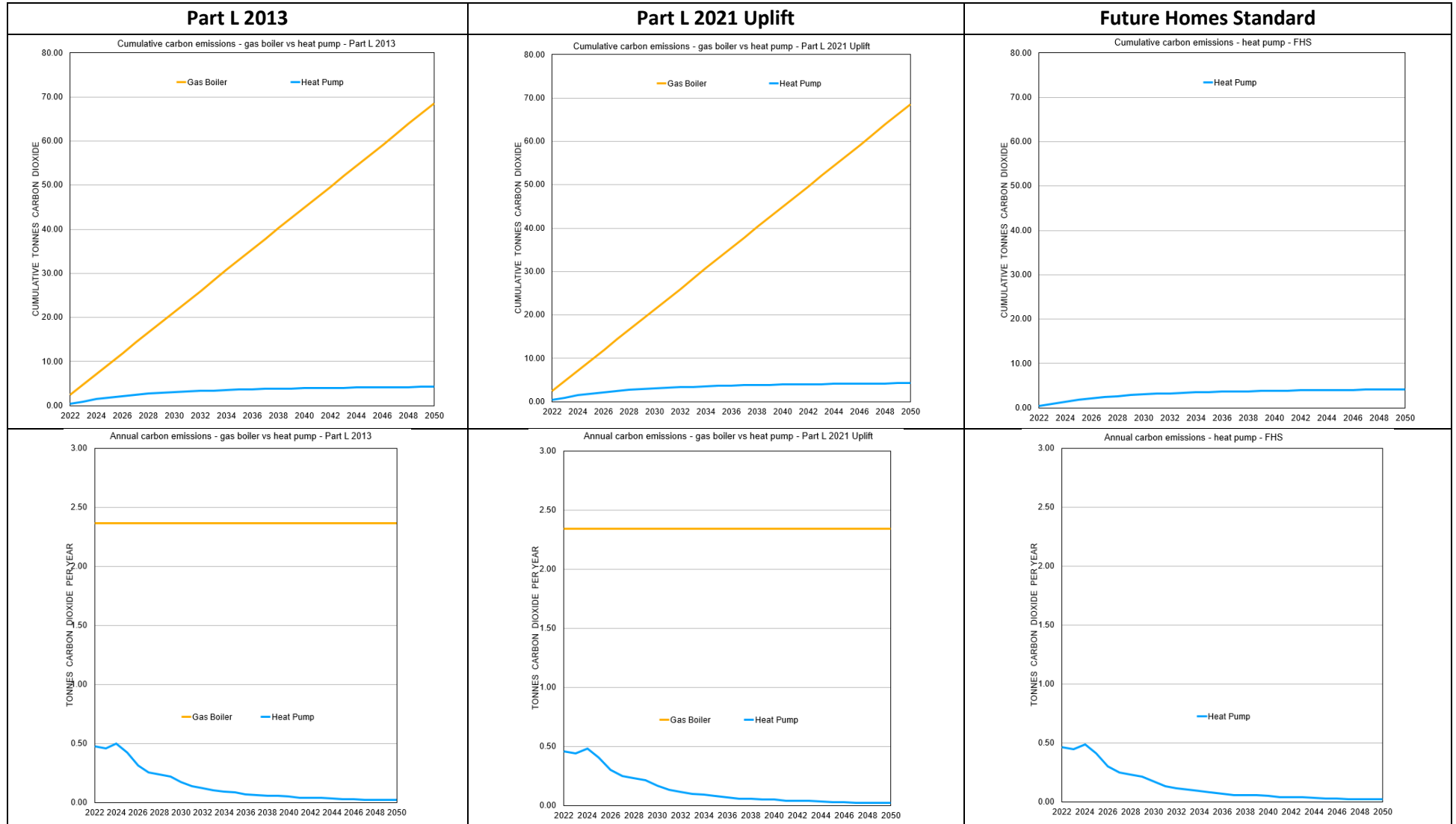
Figure 4: Carbon emissions SCATTER pathways - no gas boilers by 2050

In the Study on the Carbon Reduction of Buildings by the University of Leeds, table 1 and 2 demonstrates how far changes to building standards and grid decarbonisation (if a heat pump rather than a gas boiler is installed) will go in delivering that. This was illustrated through the model runs for a typical home presented in Table 2. This evidence demonstrates why gas boilers are not an eligible heating option when zero carbon operational emissions are targeted. Beyond this, Tables 1 and 2 illustrate that under any building regulations scenario, carbon emissions remain which will need to be addressed if net zero operational emissions are to be achieved.

Table 1: Summary of cumulative carbon emissions by 2030 and 2050 for a typical 3 bedroom detached house with ‘notional dwelling’ characteristics under Building Regulations Part L 2013, 2021 Uplift and FHS (expected)

	2030, gas boiler	2030, heat pump	2050, gas boiler	2050, heat pump
Part L 2013	19.5 tCO ₂	2.9 tCO ₂	68.1 tCO ₂	4.24 tCO ₂
Part L 2021 Uplift	18.7 tCO ₂	2.8 tCO ₂	65.5 tCO ₂	4.09 tCO ₂
Future Homes Standard	N/A	2.83 tCO ₂	N/A	4.16 tCO ₂

Table 2: Cumulative and annual carbon emissions to 2050 for a typical 3 bedroom detached house with 'notional dwelling' characteristics under Building Regulations Part L 2013, 2021 Uplift and FHS (expected)



Paragraph 5.13 of the Study on the Carbon Reduction of Buildings by the University of Leeds uses the expected dwelling construction figures of the Core Strategy to compare the carbon impacts of a Leeds City Council net zero operational policy:

*Based on the expected dwelling construction figures in the Core Strategy, and assuming a linear housebuilding increase onwards to 2050, the total operational carbon emissions (for homes only) without an LPU policy to require net zero operational emissions in Leeds would be:*¹⁸¹⁹

- *Scenario 1 – Part L 2021 Uplift remains in force but Future Homes Standard with accompanying ban on gas boilers not introduced: **2.87m tonnes of carbon by 2050.***
- *Scenario 2 – Future Homes Standard implemented with accompanying gas boiler ban from 2025 onwards: **104,700 tonnes of carbon by 2050.***

The cumulative carbon emissions figures above illustrate the importance of a local policy requiring net zero operational carbon emissions from development to ensure that LCC targets can be met. This would become even more important should central government decisions be made not to pursue future upgrades to building regulations

TRANSITION PERIOD

Leeds City Council is committed to achieving net zero in operation by 2030. Policy EN1B is an important mechanism for delivering that commitment. However, we recognise that building to net zero will be a significant change for many developers and we want to give them a period of time to adjust to new building practices and technology.

Up until the end of the transition period in 2027, applications will have to demonstrate how they have maximised fabric efficiency and onsite renewable energy generation with an aim to meet the transitional EUI and Space Heating Demand targets found within the policy. The Council understands that the heating technologies, supply chains and skill base may not currently be at the required national level to deliver all buildings in all locations to the standards detailed in the policy. The importance of heat pumps on delivering net zero EUIs can be found within the Delivering Net Zero²⁰ document, which demonstrates how with good practice (design and fabric efficiency) and heat pumps, net zero EUIs can be delivered. However, this is a fast-moving area and the development industry has told the council that it is committed to net zero so there is a need for a transition approach.

During the transition period developers will not have to pay an offset cost if the development can't meet net zero in operation. They will still be required to achieve the transitional Energy Use Intensity Targets (EUI) and space heating targets. The transition period will give time for developers to become acquainted with these

¹⁸ Model developed by Rod Holt, Otley 2030, and used with permission within the Study on the Carbon Reduction of Buildings by the University of Leeds

¹⁹ Approximate figures which relate to a standard detached 3 bedroom home.

²⁰ [delivering net zero - main report.pdf \(levittbernstein.co.uk\)](https://www.levittbernstein.co.uk/delivering-net-zero-main-report.pdf)

different performance metrics and for the policies to embed whilst still ensuring that Leeds is doing all it can to reduce carbon emissions.

ENERGY USE INTENSITY AND SPACE HEATING TARGETS

A decarbonising grid will mean that carbon emissions will decrease significantly, operational carbon emissions may become less useful over time in assessing the quality of developments in terms of energy efficiency and demand reduction. Other operational building performance metrics like the energy use intensity (EUI) will gain importance in such a situation.

EUI includes all the energy consumed in the building including regulated energy (heating, hot water, cooling, ventilation and lighting) and unregulated energy (plug loads and equipment e.g. kitchen white goods, ICT and AV equipment). It is calculated as the annual kWh/ m², where area is taken as the gross internal area.

Although it can vary considerably by building type, unregulated energy can form up to 50% of total operational energy. The lack of consideration of unregulated energy at a regulatory level can lead to drastically different consumption to that estimated at the design stage. Furthermore, UKGBC recommended that the Government set out a trajectory for tightening Building Regulations to ensure that by 2030 all new buildings operate at net zero carbon for regulated and unregulated energy including embodied carbon. In their Net Zero Whole Life Carbon Roadmap Summary for Policy-Makers, UKGBC also urges that the EUI calculation should include unregulated and regulated energy use.

The council registers that predicting unregulated energy is a challenge given that it is reliant on the owner preferences in terms of appliances and end-user consumption behaviour. To this end it would provide a detailed guidance on acceptable assessment methodology in its Energy Assessment Guidance.

Energy Use Intensity (EUI) targets which describe a building's operational energy targets on a maximum kWh/m²/year basis are one way of addressing this²¹. The policy proposes two sets of EUI and Space Heating Demand targets, one for the transition period referred to as Transitional targets and one after referred to as the Net Zero targets. EUI and Space Heating Demand targets have been encouraged by several organisations and successfully adopted by Central Lincolnshire, Cornwall and Bath and North East Somerset Councils. Examples of those targets can be found below:

²¹ <https://www.ukgbc.org/wp-content/uploads/2021/11/UKGBC-Whole-Life-Carbon-Roadmap-A-Pathway-to-Net-Zero.pdf>

SOURCE	RESIDENTIAL kWh/m2/y	NON RESIDENTIAL kWh/m2/y
RIBA 2030	2025: 60 2030: 35	<u>Offices</u> 2025: 75 2030: 55 <u>Schools</u> 2025: 70 2030: 60
Cornwall Climate Emergency DPD	40	
Bath & North East Somerset	40	
Central Lincolnshire (Draft)	35	
Greater Cambridgeshire (Draft)	35	<ul style="list-style-type: none"> • Multi-residential/ Student accomm. - 35 kWh/m2/yr. • Office/ Retail / Hotel - 55 kWh/m2/yr. • GP surgeries/ HE Teaching facilities: 55 kWh/m2/yr. • Schools – 65 kWh/m2/yr. • Leisure – 100 kWh/m2/yr. • Light industrial – 110 kWh/m2/yr. • Research facility – 150 kWh/m2/yr
UNGBC Stretch target	70	
Leti Net Zero Operational Carbon	35	<u>Schools</u> 65 <u>Commercial</u> 70 <u>Offices</u> 55
Better Buildings Partnership	35	
CIBSE	35	
Good Homes Alliance	35	
Passivhaus	60 (classic) 45 (plus)	

	30 (premium)	
GMCA (proposed)		
Delivering Net Zero (London Boroughs)	35	<p>Student or keyworker accommodation, care homes, extra care homes 35</p> <p>Warehouses and light industrial units 35</p> <p>Schools 65</p> <p>Offices, Retail, HE Teaching facilities, GP surgeries 70</p> <p>Hotels 160</p>
SOURCE	RESIDENTIAL kWh/m2/y	NON RESIDENTIAL kWh/m2/y
Committee on Climate Change: UK housing: Fit for the future? (2019)	15-20	
Cornwall Climate Emergency DPD	30	
Bath & North East Somerset	30	
Central Lincolnshire (Draft)	15-20	Not for offices/schools
Greater Cambridgeshire (Draft)	15-20	
UNGBBC Stretch target	15-20	
Leti	15	15
Better Buildings Partnership	15	
CIBSE	15	
Good Homes Alliance	15	
GMCA (proposed)	<p>2021 – 2025: Houses 30 Flats 25 2025 onwards</p>	

	Houses 20 Flats 15	
Delivering Net Zero (London Boroughs)	15-20	15

Whilst it is anticipated that future changes to the Building Regulations through the Future Building and Homes Standards will introduce EUIs into their framework, it is too early to confirm those intentions and understand what the notional targets would be. Therefore, the Council has decided to use the following targets, based on the targets above, as part of the policy:

TRANSITIONAL TARGETS FOR PRE TRANSITION PERIOD

Development Type	Energy Use Intensity Target (kWh/m ² /year)	Space Heating Demand (kWh/m ² /year)
Housing (including student accommodation)	40	30
Commercial (Offices, retail, hotels, education)	75	30
Leisure	100	30
Industrial	110	30
Research Facility	150	30

NET ZERO TARGETS FOR POST TRANSITION PERIOD

Development Type	Energy Use Intensity Target (kWh/m ² /year)	Space Heating Demand (kWh/m ² /year)
Housing (including student accommodation)	35	15
Commercial (Offices, retail, hotels, education)	55	15
Leisure	100	15
Industrial	110	15
Research Facility	150	15

The Council believes that the EUIs and Space Heating Demand required by the policy provide a reasonable adjustment to the adoption of full net zero EUIs in 2027.

Passive design principles such as the list below are the first steps that can help developers meet EUI targets:

- Building orientation to maximise winter heat gain and minimise summer overheating.
- Fabric efficiency
- High levels of thermal insulation and air tightness to reduce heat demand.
- Use of Mechanical Ventilation & Heat Recovery (MVHR) in winter to capture internal warmth whilst maintaining ventilation.
- Hot water demand reduced e.g. by limiting shower flow rates.
- Designing out the need for additional mechanical cooling e.g. through optimised glazed area and associated solar gain, and use of natural ventilation in summer.

The UKGBC urges as an immediate priority to set up energy use intensity (EUI) targets. The future development of a market for Green Mortgages is also likely to result in an increased emphasis on measuring in-use performance of properties.²²

The Carbon Risk Real Estate Monitor (CRREM)²³ pathways support real estate market participants in formulating, setting, and implementing science-based targets to reduce operational carbon emissions of buildings by analysing property-specific energy consumption data, and then directly benchmark the results against the target paths (towards achieving a 1.5°C goal). CRREM tools and pathways rely on the EUI metric for evaluating existing buildings in operation. Using EUI as a metric to inform the planning process will only make the transition towards monitoring in operation smoother.

Implementing an EUI target without a space heating target would risk high fuel bills, implementing both targets without an onsite fossil fuel ban would allow gas to be used to meet the other targets²⁴. The policy therefore also introduces a space heating target of 30 kWh/m²/yr during the transition period, where as a target of 15 kWh/m²/yr will have to be met after the transition period ends. This is derived from Passivhaus and the LETI net zero operational requirement²⁵. By ensuring homes have low space heating demand targets, this increases the affordability of heat, addressing fuel poverty and helping to create a healthier environment.

OFFSETTING

It is important to understand the true cost of carbon if the option of carbon offset payments is to be offered to developers in Leeds. Offsetting should be seen as a last resort

²² See EeMAP (2018). Creating an Energy Efficient Mortgage for Europe – Towards a new market standard. [online] Available at <https://eemap.energyefficientmortgages.eu/04-downloads-2/>.

²³ <https://www.crrem.org/pathways/>

²⁴ <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>

²⁵ [leti-climate-emergency-design-guide.pdf](https://www.leti-climate-emergency-design-guide.pdf) ([levittbernstein.co.uk](https://www.levittbernstein.co.uk))

A new building with net zero operational carbon does not burn fossil fuels, is 100% powered by renewable energy, and achieves a level of energy performance in-use in line with the targets. This means that an operational carbon balance is met, see Figure 6 below.

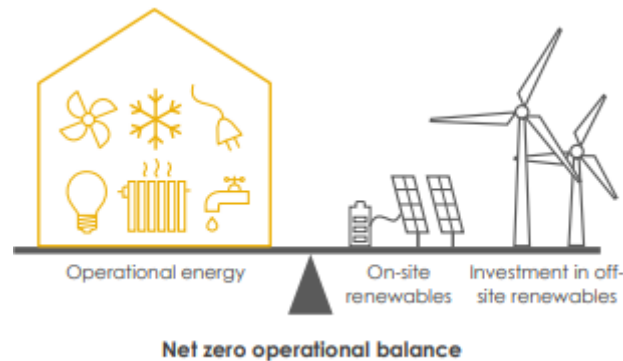


Figure 6: An operationally net zero development (LETI, 2020²⁶)

The offsets that can be used as a last resort to achieve this balance is to be as investment in additional renewable energy capacity locally. The need for the offset arises as some building types, such as small scale residential, 100 % of the energy consumption can be met on-site with roof mounted PV panels but taller buildings have a smaller proportion of roof area to floor area, therefore investment in ‘additional’ renewable energy off-site but still local to Leeds will be required. The policy will require developments to financially offset any remaining energy imbalance that cannot be delivered onsite. This is a similar mechanism to other Local Authorities (Cornwall and Bath and North East Somerset) that have linked to contribution to the delivery of offsite solar panels. The offset value will be calculated using the following methodology:

$$\text{Shortfall between annual energy and renewable energy generation onsite (kWh/m}^2\text{)} \\ \times \text{Cost of PV installation offset figure}$$

The financial offset multiplier is linked to the Government’s solar photovoltaic cost dataset and the cost per kW for 10-50 kW installations. The Council will provide an annual update of the offsetting value to reflect any amendments to the Government’s cost dataset with. As of September 2023, the offset price is £1.35/kWh/yr, and is updated annually by the Government. The offset price applied through the policy as of 2027 will be in accordance with the figure provided by the Government, and this will be subject to an annual update. The offset figure above includes a 10% uplift, to reflect the administering and managing of the PV funding process as recommended within the Delivering Net Zero for London Boroughs main report²⁷.

The contributions in lieu will be used to deliver Council run projects that help reduce carbon across the district. These may include:

- Upgrading and retrofitting of existing housing stock

²⁶ [252d09_3b0f2acf2bb24c019f5ed9173fc5d9f4.pdf \(leti.uk\)](https://www.leti.uk/wp-content/uploads/2020/09/252d09_3b0f2acf2bb24c019f5ed9173fc5d9f4.pdf)

²⁷ [delivering net zero - main report.pdf \(levittbernstein.co.uk\)](https://www.levittbernstein.co.uk/wp-content/uploads/2023/09/delivering-net-zero-main-report.pdf)

- Generating and supporting renewable and low carbon energy and heat projects
- Energy projects for community buildings
- Carbon sequestration projects (including tree planting)

The above projects are not exhaustive, and liable to change as the Council continues to support and introduce new carbon reducing projects. The annual sum of commuted sums collected will be monitored through the AMR, which will also detail the projects that receive financial assistance through this mechanism.

POLICY EXEMPTIONS

Whilst the Council supports every application reducing its embodied and operational carbon as much as it can, it is understood that it would be unreasonable for every type of application to be subject to the policy, as the burden of delivering a net zero operational building may not be possible. Those developments are:

1. Buildings exempt from building regulations
2. Alterations and extensions to buildings of up to 1,000 square metres
3. Ancillary buildings that stand alone and cover an area less than 50 square metres
4. Buildings which have an intended life of less than two years
5. Gypsy and Traveller and Showpeople pitches and plots

The above developments have been identified as exceptions as it may create too much of a burden on cultural practices or may be impossible to achieve within existing buildings (which would also promote the reuse of existing buildings).

NPPF CONSISTENCY

Paragraph 154 of the NPPF states new development should be planned for in ways that:

a) avoid increased vulnerability to the range of impacts arising from climate change. When new development is brought forward in areas which are vulnerable, care should be taken to ensure that risks can be managed through suitable adaptation measures, including through the planning of green infrastructure; and

b) can help to reduce greenhouse gas emissions, such as through its location, orientation and design. ***Any local requirements for the sustainability of buildings should reflect the Government's policy for national technical standards***

However, in the Government's summary response²⁸ to the draft revised NPPF consultation it stated that:

²⁸ [Title \(publishing.service.gov.uk\)](https://www.gov.uk/government/consultations/nppf-consultation)

*“A number of local authority respondents stated the view that the text in the revised Framework restricted their ability to require energy efficiency standards above Building Regulations. **To clarify, the Framework does not prevent local authorities from using their existing powers under the Planning and Energy Act 2008 or other legislation where applicable to set higher ambition. In particular, local authorities are not restricted in their ability to require energy efficiency standards above Building Regulations.** The Government remains committed to delivering the clean growth mission to halve the energy usage of new buildings by 2030”*

In response to the revisions to the Part L of the Building Regulations, the government confirmed that:

“To provide some certainty in the immediate term, the Government will not amend the Planning & Energy Act 2008, which means that local planning authorities will retain powers to set local energy efficiency standards for new homes”

The wording of this response makes clear that local authorities can go further than the equivalent of Code for Sustainable Level 4. Therefore, Leeds requiring that new development goes beyond building regulations is legal and consistent with national guidance.

MONITORING

The UKGBC recognizes the requirement for monitoring and reporting energy performance of new developments for first years of operation as an opportunity area for local policy towards net zero carbon – operational.

The following indicators will be used to assess the policy:

Indicator	Reason
Air Quality	New buildings will promote the use of renewable energy, or provide financial contributions through offsetting, that can help improve Leeds air quality.
CO2 reduction	New buildings will be net zero operational energy, or offset to other carbon reduction schemes, which will help decrease the amount of CO2 emissions within Leeds.
EPC Ratings	As buildings will be built to net zero operational energy and meet EUI targets, EPC ratings should improve in new domestic and non-domestic buildings.
Renewable Energy generation	The policy requires new development to provide renewable energy onsite, and therefore should result in an increase in

	the amount of renewable energy delivered within Leeds.
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The annual sum of commuted sums collected through carbon offsetting will also be monitored through the AMR, which detail the projects that receive financial assistance through this mechanism.

IMPLEMENTATION

Measures undertaken to reach net-zero operational need to be already set out at the pre-assessment or outline stage with detailed modelling results furnished during a full application.

EUI targets can be assessed at design stage through the planning process through PHPP/ BREDEM/ CIBSE TM54 modelling, as well as measure in-use to support as-built monitoring through EPC reports or equivalent.

The Council recognises that policy EN1 requires a systemic change and is working on a suite of guidance documents to aid this transformation. Apart from helping applicants prepare strategies and compliance documents these will also be aimed at monitoring progress against the climate mitigation policies and the collection of carbon offset funds annually.

The Energy Assessment Guidance will provide information for planning applicants on how to comply with the carbon reduction policies. The council is in the process of preparing its Carbon and Energy Reporting Template (CERT, Version 1) to aid standardizing submission of information for compliance of current Core Strategy policy EN1. The next steps for this through Version 2, would be rolled out in conjunction to the adopted Local Plan Update.

The Whole Life-Cycle Carbon Assessments Guidance will explain how to comply with the requirement in Policy EN1A for all referable planning applications to calculate and reduce whole life-cycle carbon (WLC) emissions to fully capture a development's carbon impact. Carbon Offset Guidance will be available at the Examination and updated at the end of the transition period clearly specifying calculation and investment mechanisms.

POLICY EN2: SUSTAINABLE CONSTRUCTION STANDARDS

WHY IS THE POLICY NEEDED?

Leeds City Council wants all development to be built to a high standard across a range of sustainability measures. To achieve this we adopted Policy EN2 in our Core Strategy to require specific construction standard ratings to be achieved, and adopted the Building for Tomorrow Today— Sustainable Design and Construction Supplementary Planning Document (SPD) to help developers design and construct sustainable developments within Leeds. For major residential development it was required to be built to Level 6 of the Code for Sustainable Homes and major commercial development to be built to BREEAM excellent standard.

However, in 2015 the Government abolished the Code for Sustainable Homes and consequently the Council amended Policy EN2 accordingly through the Core Strategy Select Review (2019). Policy EN2 currently still asks for BREEAM Excellent for non-residential development but for residential development it only asks for a water consumption standard (in line with the Government's Technical Standards).

As set out above, our current policies for sustainable construction have been limited by changes to national guidance and are not as ambitious as was originally intended. Whilst we have not been able to set policy to encourage all development to achieve these standards where we are able (e.g. through our own development) we have sought to go further.

Energy efficiency is a key component of most sustainable construction standards but the options proposed now for development to achieve zero carbon across the whole life cycle of a development need to improve even more. One way of helping to achieve this is through measuring of the improvement through accreditation by a sustainable construction rating method, which provides a standard against all of the different sustainable construction factors. Sustainability standards also provide a system of accountability and monitoring for intentions and measures set out during the application stage.

POLICY OBJECTIVES

As set out above, our current policies for sustainable construction have been limited by changes to national guidance and are not as ambitious as was originally intended. Whilst we have not been able to set policy to encourage all development to achieve these standards where we are able (e.g. through our own development) we have sought to go further.

The policy is seeking to ensure that all new development (non-domestic and residential) is delivered to a high standard. To achieve this, all residential development will have to meet Level 4 Home Quality Mark (HQM) and non-domestic to meet a minimum BREEAM Excellent. Non-domestic developments aiming for a higher BREEAM or HQM rating

The Home Quality Mark ²⁹³⁰ certification scheme from BRE awards a 1-5 star rating for new homes against a set of criteria which include living costs, health and wellbeing and environmental footprint.

Indicators include reducing energy and carbon emissions, improving biodiversity, home security and recreational space, flood risk, internal noise and temperature. Promotion of public or active travel options and access to local amenities would support reductions in household carbon emissions outside of the scope of the buildings themselves.

Credits can be obtained from a range of indicators within three indicator bands - 'my costs', 'my wellbeing' and 'my footprint'. A minimum number of credits have to be achieved in each to obtain a 1-5 star rating. By requiring a 4 star rating, it ensures that 'a home is designed and built to have very low running costs, many positive impacts upon your health and wellbeing, all with an extremely low impact upon our environment'³¹.

The HQM involves a two-stage assessment to ensure principles are incorporated at design stage and to verify the standard has been met post-construction. Assessment is undertaken by independent assessors, trained and licensed by BRE. According to a UKGBC (UK Green Building Council) project in association with Core Cities UK, HQM can also help minimise performance gap related issues in the following ways:

- Calculation methodologies are intended to be more accurate than standard practices, particularly in relation to energy and carbon calculations (see opposite)
- A focus on better inspection, commissioning and testing including detailed planning and scheduling to ensure homes are being reviewed throughout the whole delivery process
- Requirements which reward smart home solutions, better aftercare, accessible controls and home information for occupiers to encourage good in-use behaviours
- An integrated approach to project preparation and post occupancy evaluation; helping encourage the transfer of learning from one site to the next
- Outcome focused assessment criteria and an 'each home' certification process whereby every home has its own certificate which represents its individual ratings and indicator scores reducing the risk of averaged assumptions³²

BREEAM New Construction 2018 is the UK version of BRE's international sustainable building standard for non-domestic buildings. This includes commercial, office, retail, education, healthcare, and public buildings, as well as short and long stay residential institutional buildings such as hotels, care homes, and sheltered accommodation etc.,

²⁹ <https://www.homequalitymark.com/wp-content/uploads/2018/09/HQM-ONE-Technical-Manual-England.pdf>

³⁰ [HQM-Guide-document_BRE_115302_0120-v2.3.pdf \(homequalitymark.com\)](https://www.homequalitymark.com/wp-content/uploads/2018/09/HQM-Guide-document_BRE_115302_0120-v2.3.pdf)

³¹ [Ratings and Stars - Home Quality Mark](https://www.homequalitymark.com/wp-content/uploads/2018/09/Ratings-and-Stars-Home-Quality-Mark.pdf)

³² [Slide 1 \(goodhomes.org.uk\)](https://www.goodhomes.org.uk/)

and can include part new-build, part refurbishment projects. BREEAM is referred to by over 190 Local Authorities within their Local Plans across the UK, so is standard that national developers will have experience of using.

Assessment and certification must be carried out by a licensed BREEAM Assessor and includes a range of evidence and site inspection. The criteria include reducing energy and carbon emissions, sustainable materials and construction practices, health and wellbeing of building users, accessibility and sustainable transport options.

Ultimately, developments attaining accreditations for HQM and BREEAM from independent experts will give householders and end users confidence that their buildings are well designed and built, whilst being cost effective to run.

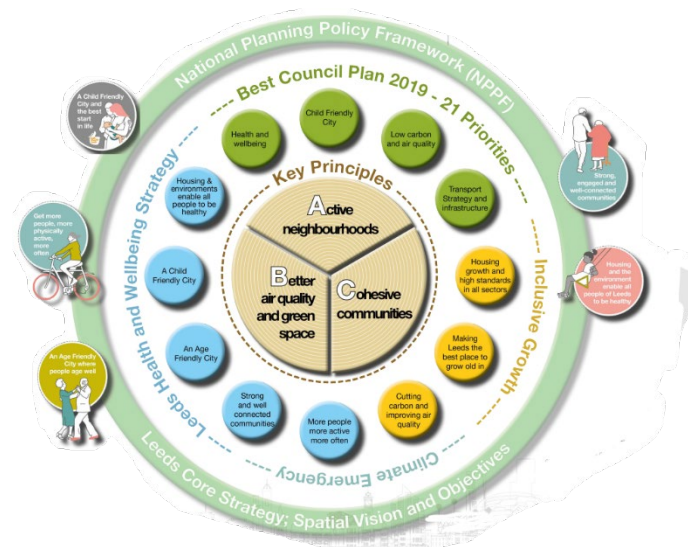
There are other sustainable construction standards and targets that applications can achieve as of 2022, these include the Passivhaus Standard, Living Building Challenge and RIBA 2030 targets. Whilst the Council will support applications meeting these standards, they may not include a holistic approach to sustainable design that the Home Quality Mark and BREEAM assessments require.

EVIDENCE

The policy will result in high quality, sustainable development. The evidence on high quality and sustainable places is qualitative however the many reports on climate mitigation and adaption return to quality of place being central to achieving well designed places that respond to the impacts of climate change through mitigation (reducing greenhouse gas emissions and minimising embodied energy) and adaptation (such as rising temperatures and increased risk of flooding).

There is also much research on the relationship between planning and good design and health benefits (Public Health England (2017³³) that share the benefits of addressing climate change (mitigation and adaption) through improvements to the layout and form of buildings and spaces and better use of resources that has clear physiological and psychological health benefits. This is reflected locally in the Leeds 2014 Director of Public Health Report “Planning a Healthy City: housing growth in Leeds” which considered the detailed ways that Leeds could plan a healthy city around housing growth reflecting on the need to connect the public health benefits of good urban design and planning to people, place and the planning process.

³³ [Spatial Planning for Health: an evidence resource for planning and designing healthier places \(publishing.service.gov.uk\)](https://publishing.service.gov.uk)



Following the 2014 Planning a Healthy City report, the Council has established a Planning and Design for Health and Wellbeing and Climate Change group looking at influencing the built environment and has drawn together the key principles diagram above. These three principles promote:

- **Active neighbourhoods** – promoting cycling and walking, reducing car usage and improving children’s opportunities for independent mobility.
- **Better air quality and green space** – using green and blue infrastructure to provide opportunities for outdoor recreation and promote mental wellbeing.
- **Cohesive communities** – encouraging co-located services and high-quality neighbourhood spaces to encourage social interaction and combat isolation.

The HQM and BREEAM standards also promote the delivery of energy efficient buildings that consider the carbon cost of the materials and construction process. The justification for requiring new development to deliver to that standard can be found within Carbon Reduction Whole Life Cycle Carbon Assessment and Operational Carbon section of the background paper.

The scoping consultation, and alternative policy options, assessed whether Leeds City Council should require set standards or offer a flexible approach, which includes standards such as Passivhaus and targets such as RIBA 2030³⁴. However, with policies such as the proposed EN1 covering energy efficiency targets, it was decided that a standard which would cover a holistic design approach would be the most appropriate standard to require. As both the HQM and BREEAM are nationally recognised standard and ensure the delivery of development that will have a reduced effect on the environment, improve health and wellbeing and cost less to run, they were chosen as Leeds’ standards to meet.

³⁴ [2030 Climate Challenge \(architecture.com\)](https://www.architecture.com/2030-climate-challenge)

HOME QUALITY MARK

The Council recognises the importance of setting requirements to deliver sustainable buildings and have had success with the delivery of commercial BREEAM Excellent Buildings since adoption of EN2 within the Core Strategy. The Town and Country Planning Association (TCPA) highlight the importance of adopting sustainable construction standards within their “*A Guide for Local Authorities on Planning for Climate Change*” document and promotes the use of the Home Quality Mark. The TCPA has also recognised how HQM is being increasingly recognised by Local Authorities, with Havant, the London Borough of Camden, and Ipswich referencing the standard within their emerging Local Plans. Other positive aspects of adopting the HQM include³⁵:

- Guarantee of quality homes, with a focus on customer experience and aftercare.
- HQM enables developers to show how they have used best practices in new home construction, promoting higher standards of design and construction for the benefit of homeowners
- It is aligned with Environmental, Social, and Governance (ESG) principles
- HQM-rated homes can open opportunities for green finance, as they meet the high sustainability standards often required by green mortgages and loans
- promotes energy-efficient design and construction, encouraging the use of renewable energy, reducing carbon emissions, and improving energy performance

Whilst the TCPA promote Level 5 HQM, the Council has required residential developments to meet Level 4 within the policy. This allows some flexibility within HQM for developers to meet the Level 4 standard whilst still ensuring a quality and sustainable product is delivered.

NPPF CONSISTENCY

The NPPF Consistency section of the Operational Carbon aspect of this background paper outlines this policy’s consistency with national policy and demonstrates how this sound and legal approach supported by the latest Government statements on technical standards.

MONITORING

The policy will be measured using the following indicators:

Indicator	Reason
Air Quality	The policy promotes development to be located in sustainable locations and ensure that there are sustainable travel options to and from the site. This would result in more journeys through

³⁵ [HQM Guide 06-07-23.pdf \(bregroup.com\)](#)

	sustainable transport measures (walking/cycling/public transport) which would improve the air quality within Leeds.
Renewable Energy generation	BREEAM Outstanding and the HQM Level 4 both require credits in energy efficiency. Delivering onsite renewable energy generation to power and heat developments will help developments secure those credits.
EPC Ratings	BREEAM Outstanding and the HQM Level 4 both require credits in energy efficiency. As a result, EPC ratings should improve as new residential and non domestic buildings are delivered.

IMPLEMENTATION

The HQM involves a two-stage assessment to ensure principles are incorporated at design stage and to verify the standard has been met post-construction. Assessment is undertaken by independent assessors, trained and licensed by BRE. Applicants will be expected to deliver a design stage report as part of their application and will be required (by condition) to provide a post-construction assessment once the development has been delivered. At both stages, the reports will have to have been independently assessed by an accredited assessor.

Non-domestic buildings are expected to deliver an ‘Outstanding’ rating. This should ensure the delivery of very high-quality non-residential developments which reduce their environmental impact and provide a much better environment for those working within them. Again, applicants will be expected to deliver a design stage report as part of their application and will be required (by condition) to provide a post-construction assessment once the development has been delivered. At both stages, the reports will have to have been independently assessed by an accredited assessor.

If an applicant seeks to build to another standard, such as the standards detailed in section 3 of the Carbon Reduction of Buildings report by the University of Leeds, then they will have to justify how the development would deliver a high quality and sustainable development that would be equal to Home Quality Mark 4 or BREEAM Outstanding. The justification should be detailed as part of the energy statement at both design and post completion stage and demonstrate how the development aligns with a minimum BREEAM Excellent/HQM Level 4 technical standards³⁶³⁷.

³⁶ [Standard - Home Quality Mark](#)

³⁷ [BREEAM Technical Standards - BRE Group](#)

POLICY EN3: RENEWABLE ENERGY

WHY IS THE POLICY NEEDED?

National policy recognises the role of the planning system to ‘support renewable and low carbon energy and associated infrastructure’ (para 148). To promote the use of renewable energy to reduce carbon emissions at a local and national level, and also to increase Leeds’ energy security, the Local Plan Update needs to promote the development of renewable energy generation, and its associated infrastructure, within the Leeds district. The UK Government’s Energy Security Strategy³⁸ has an ambition for 95% of the UK’s electricity generation to be low-carbon by 2030 and for unabated fossil-fuelled electricity generation to come offline by 2035. In order for Leeds to meet these ambitions, then an updated renewable energy policy that encourages renewable energy development in the right locations is required.

POLICY OBJECTIVES

There have been no planning applications for wind energy development in Leeds since 2015. This follows the Government’s 2015 changes to planning policy relating to onshore wind development, combined with the withdrawal of subsidies for renewable energy generation. Those Government changes have meant that our existing Local Plan maps showing the wind resource across Leeds will not be a sufficient basis for the consenting of wind farm applications.

Consequently, if Leeds is to give any further consents for wind turbines the wind speed map in the Core Strategy will need to be replaced with a map showing areas with potential for wind energy development, which would then be shown on the Policies Map.

A similar approach is taken for solar farms. This approach would ensure that Leeds was maximising opportunities for local renewable energy generation and reduce reliance on fossil fuels ahead of the Government’s plans for decarbonisation of the grid by 2050.

Local renewable energy generation helps Leeds to be more energy secure, it avoids the inefficiencies associated with loss of energy during its transmission (which is greater the further it has to go), it creates local jobs and it can provide opportunities for community benefits. Furthermore, local renewable energy generation, such as solar farms, may provide opportunities for new developments to be directly powered by them and therefore achieve zero carbon in their operational energy use.

An increase in renewable energy generation would also require new energy storage infrastructure to help support renewable energy development and the national grid.

Renewable energy can sometimes result in energy being produced when it is not needed and therefore can be lost. Energy storage can help reduce this loss by storing this energy for future use. Whilst storage can take a number of different forms, the

³⁸ [British Energy Security Strategy - House of Commons Library \(parliament.uk\)](https://www.parliament.uk/library/publications/default.asp?docID=10242)

most commonly used for electricity is the chemical battery. Storage has the following benefits:

- Storage of renewable energy for use later when it's needed
- Provide backup power when blackouts occur
- Provide voltage stabilisations or other grid balancing services

Ultimately, the policy aims to promote the delivery of renewable energy and its associated infrastructure in the right places. These right places will be assessed against the opportunity area mapping and criteria based policies that ensure minimum harm to the local community.

EVIDENCE

AECOM's Renewables Areas for LCC Local Plan Update report, which can be found within the evidence base, provides evidence for the following;

- Detailed mapping illustrating opportunity areas for large scale solar photovoltaic installations should be identified.
- Detailed mapping illustrating opportunity areas for onshore wind turbine installations should be identified.
- Consideration of the potential for other renewable energy generation (e.g. anaerobic digestion, hydro (maps to be provided by LCC), waste, biomass, hydrogen etc.) should also be considered as justification for potential criteria based policy.
- To advise on how much energy storage may be needed in Leeds. From both a strategic capacity perspective (i.e. grid demands and potential for different connection methods and different renewable technologies arising from installed capacity) and a local demand. Opportunity mapping for significant areas i.e. where grid connection is strategically important. This may include guidance on electricity storage, current technologies and business models.
- Identify for the strategic potential the preferred site characteristic and importance of grid connection proximity and capacity.
- Requirement 6: Quantitative figure for technical potential for each energy type.

Section 3 of the report provides the methodology for the solar and wind opportunity area mapping. The opportunity maps are created by factoring out areas that are unsuitable for that energy type adding constraints onto the map. These constraints consider physical factors, such as protected woodland and buildings, existing and future development, and biodiversity constraints such as bird flight paths and protected landscape areas. A list of all constraints used can be found in Appendix A of the AECOM Renewables Areas for LCC Local Plan Update report. The study also considers the potential energy generation on brownfield land, all land excluding Green Belt and all land including Green Belt. As the scenarios show, most of the potential for solar and wind within Leeds is found within the Green Belt.

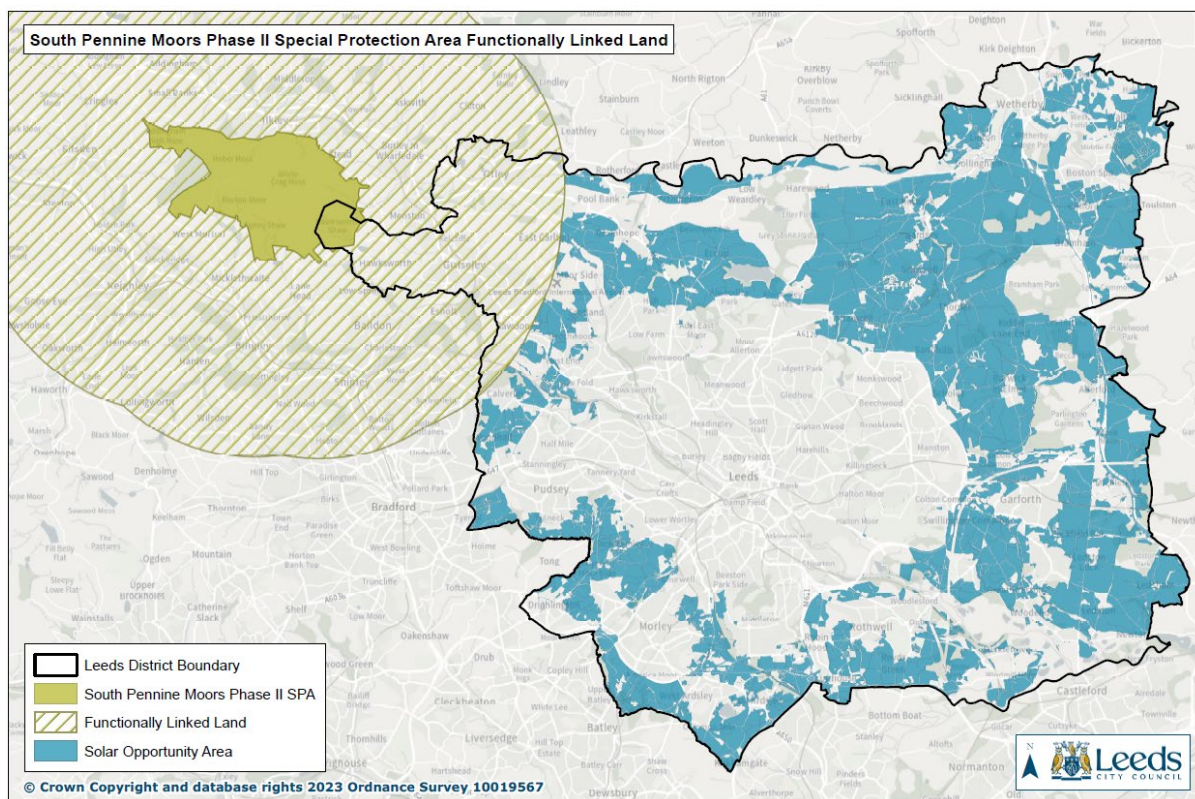
Section 4 looks at other renewable energy sources, such as anaerobic, energy from waste, hydro-electric and provides information on how to assess and plan for those types.

According to the UK Battery Storage Project Database Report³⁹, the UK has The UK has 1.3GW of installed battery storage capacity with a further 16.5 GW in the pipeline. Section 5 covers energy storage, and what criteria are necessary to consider when determining a planning application and how much may be required for Leeds depending on certain scenarios.

Section 7 looks at the energy potential. Assuming an extensive build-out of the following technologies, to generate:

- Energy from waste (EfW) plants: 360,000 MWh/yr
- Anaerobic digestion CHP plants: 3,060 MWh/yr
- Hydro-electric plants: 2,260 MWh/yr
- Solar PV farms: 2,000,000 MWh/yr
- Wind farms: 380,000 MWh/yr

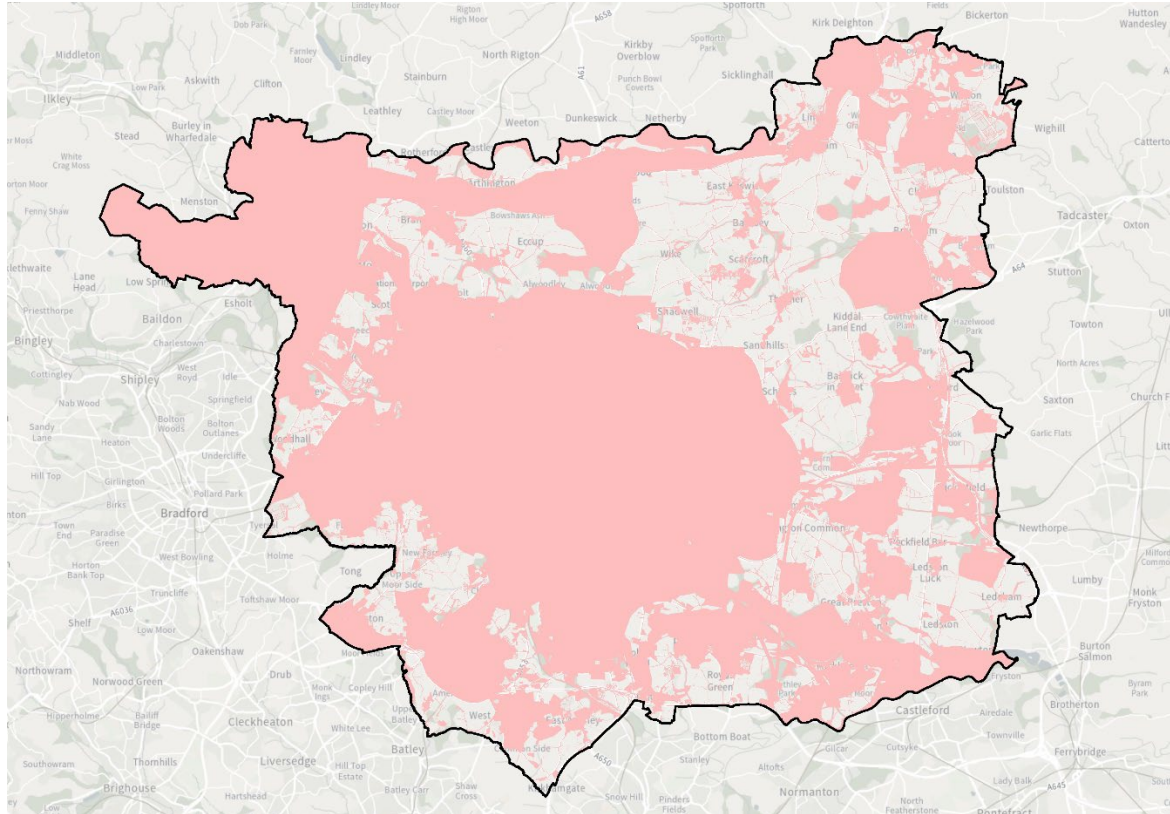
Following consultation comments from Natural England on the potential impact of renewable energy opportunity areas on functionally linked land, further assessment has been undertaken, which is detailed at appendix 1. The effect of this further work is to propose an alteration to the solar opportunity areas to include a 7.5km buffer to the South Pennine Special Protection Area, as shown in the following map:






³⁹ [UK Battery Storage Project Database Report – Solar Media Market Research](#)

This has the effect of deleting the following map from the Local Plan Update and replacing it with the map below it, incorporating the larger buffer.

Now deleted and to be replaced with:



Key

-  Leeds District Boundary
-  Area Not Suitable for Ground Mounted Solar Farms
-  Opportunity Area for Ground Mounted Solar Farms

For further details on this assessment and designation change please see appendix 1 and the Local Plan Update Habitats Regulations Screening document.

NPPF CONSISTENCY

Section 2 of AECOM's Renewables Areas for LCC Local Plan Update report sets out the Key International and UK legislation that supports the adoption of these policies. This includes how the policy aligns with the objectives of the Paris Agreement 2015, COP26, the Environment Bill, Climate Change Act of 2008 and Planning and Compulsory Purchase Act.

The NPPF requires Local Plans to demonstrate how they are addressing Climate Change. Chapter 14 details how planning policy can help mitigate, and adapt to, climate change, flooding, coastal change, water supply, biodiversity, landscapes, and the risk of overheating from rising temperatures.

Paragraph 152 states that *“The planning system should support the transition to a low carbon future in a changing climate, taking full account of flood risk and coastal change. It should help to: shape places in ways that contribute to radical reductions in greenhouse gas emissions, minimise vulnerability and improve resilience; encourage the reuse of existing resources, including the conversion of existing buildings; and support renewable and low carbon energy and associated infrastructure.”*

Paragraph 153 of the NPPF states that *“policies should support appropriate measures to ensure the future resilience of communities and infrastructure to climate change impacts, such as providing space for physical protection measures, or making provision for the possible future relocation of vulnerable development and infrastructure”*.

And most importantly, Paragraph 155 states that:

To help increase the use and supply of renewable and low carbon energy and heat, plans should:

- a) provide a positive strategy for energy from these sources, that maximises the potential for suitable development, while ensuring that adverse impacts are addressed satisfactorily (including cumulative landscape and visual impacts);*
- b) consider identifying suitable areas for renewable and low carbon energy sources, and supporting infrastructure, where this would help secure their development; and*
- c) identify opportunities for development to draw its energy supply from decentralised, renewable or low carbon energy supply systems and for co-locating potential heat customers and suppliers*

Finally, Paragraph 156 states that:

Local planning authorities should support community-led initiatives for renewable and low carbon energy, including developments outside areas identified in local plans or other strategic policies that are being taken forward through neighbourhood planning.

MONITORING

The policy will be measured using the following indicators:

Indicator	Reason
Renewable Energy generation	The policy will encourage the delivery of renewable energy and its infrastructure in the most appropriate places. This should result in an increase of renewable energy across the district.

IMPLEMENTATION

Proposals for new renewable energy development will be expected to comply with the criteria detailed within Policy EN3. Where development falls within the Green

Belt, the application will be expected to demonstrate Very Special Circumstances as required by the NPPF.

POLICY EN4: HEATING NEW DEVELOPMENT

WHY IS THE POLICY NEEDED?

Leeds City Council and its partners Vital Energi are constructing a heat network, via underground pipes, around Leeds City Centre which re-uses the heat produced from the Recycling and Energy Recovery Facility (RERF) to supply a low carbon form of heat in the urban area to local homes and businesses.

When complete, the network will connect nearly 2,000 homes and businesses providing low carbon heat and hot water, equating to a saving of 11,000 tonnes of carbon emissions per year.

Core Strategy Policy EN4 asks for developments to connect into the heat network where possible and, in areas that are too far away from the heat network, to create a new district heat network serving the development. In all cases development should be designed to be ready to connect to a future heat network. This policy has been successful and is addressed by developers. The Local Development Order for the district heating network was renewed in February 2022.

However, where it may not be technically viable or appropriate for the development to connect to, or create a district heating network then there is only so much a development can be expected to do. This policy requires developers to use low carbon sources to heat new development.

POLICY OBJECTIVES

The policy's key objective is to ensure that new development is heated through low carbon and cost-effective energy production. This will help meet the Council's and the nation's climate objectives by prioritising low carbon energy generation and helping to reduce the cost of living crisis by providing cheap and reliable heat to homes and businesses.

Applicants must also be made aware of potential changes to national guidance and the introduction of heat network zoning. Paragraphs 7.28 to 7.32 covers the potential introduction of these zones and the implications for developments within them.

EVIDENCE

Section 7 of the Carbon Reduction of Buildings report by the University of Leeds details how heat networks can provide low carbon heat to development and a review of other current heating technologies.

The council has recently conducted a benchmarking exercise with other operators of DHNs fed by EfW plants, and used this to refine the approach to calculating the carbon factor for the heat supplied through the DHN. This is now done using the methodology created by the Building Research Establishment (BRE) for use in SAP assessments for planning and Building Regulations. This is based upon establishing the amount of grid electricity and gas that has been displaced by the DHN, utilising up to date carbon factors for both. Therefore, as the grid decarbonises, so the CO₂ factor for the DHN reduces.

Details of the BRE methodology can be found within the BRE technical note “Recognition of energy from waste in SAP assessments”⁴⁰

The carbon factor of grid electricity is now quoted at 0.136 kg CO₂/kWh, which means that the carbon factor of the Leeds PIPES network is 0.031403 kg CO₂/kWh.

However, if not possible to connect to a heat network, then the Table 4, taken from the Carbon Reduction of Buildings report by the University of Leeds details how air source heat pumps, ground source heat pumps and shared ground heat exchanges should be prioritised through policy over gas boilers and direct electric resistive heating.

Table 3: Summary of heating technology options

Heating technology	Energy source	Advantages	Disadvantages	Eligible system
Air source heat pumps	Electricity (grid or locally generated) + air	Highly efficient, net zero compliant as grid decarbonises, price competitive with natural gas when designed and operated effectively	High capital costs, requires outside space for fan unit and inside space for thermal storage, efficiency reduces in colder weather	Yes
Ground source heat pumps	Electricity (grid or onsite) + ground heat	Highly efficient, net zero compliant as grid decarbonises, price competitive with natural gas when designed and operated effectively	High capital costs, require outside space for ground heat exchanger and inside space for TES	Yes
Shared ground heat exchange	Electricity (grid or onsite) + environmental energy (ground)	Highly efficient, can be installed where there is no or little outside space, net zero compliant as grid decarbonises	High capital costs, requires inside space for thermal storage, requires pipework and borehole installation	Yes
Heat network	Multiple, but going forwards should be on net zero carbon trajectory	Can make use of a range of low carbon heat sources which could otherwise not be exploited, can offer low running costs to users	High capital costs, cost and complexity of metering and billing users	Yes
Individual gas boiler	Natural gas (methane)	Well-liked by users, established supply	No path to net zero carbon, will need to be	No

⁴⁰ [BRE Technical Note-Energy from Waste Facilities \(ERF\) 1.0.pdf \(bregroup.com\)](#)

Heating technology	Energy source	Advantages	Disadvantages	Eligible system
		chains, low capital cost	replaced at household expense	
Direct electric resistive heating	Electricity (grid or locally generated)	Easy to install, low capital cost	Inefficient, can lead to higher energy bills, grid impacts	No
Hydrogen boiler	Hydrogen generated by renewable electricity or methane + CCS	Will be more of a like-for-like replacement for gas boilers	Very low efficiency (c18%), hydrogen leaks could increase global warming, no hydrogen network available	No
Biomass boiler	Wood, wood pellets / chips	Operates in a similar way to a typical gas boiler	Potential air pollution, health impacts	In limited rural settings

NPPF CONSISTENCY

Section 182 of the Planning Act 2008 puts a legal duty on local authorities to include policies on climate change mitigation and adaptation in Development Plan Documents. Section 14 of the National Planning Policy Framework (NPPF) details how the planning system should meet the challenge of climate change, flooding and coastal change. Paragraph 153 requires the planning system to help to:

Shape places in ways that contribute to radical reductions in greenhouse gas emissions, minimise vulnerability and improve resilience; encourage the reuse of existing resources, including the conversion of existing buildings; and support renewable and low carbon energy and associated infrastructure.

Paragraph 154 states that new development should be planned for in ways that:

a) avoid increased vulnerability to the range of impacts arising from climate change. When new development is brought forward in areas which are vulnerable, care should be taken to ensure that risks can be managed through suitable adaptation measures, including through the planning of green infrastructure; and

b) can help to reduce greenhouse gas emissions, such as through its location, orientation and design. Any local requirements for the sustainability of buildings should reflect the Government's policy for national technical standards.

Paragraph 155 states that to help increase the use and supply of renewable and low carbon energy and heat, plans should:

a) provide a positive strategy for energy from these sources, that maximises the potential for suitable development, while ensuring that adverse impacts are addressed satisfactorily (including cumulative landscape and visual impacts)

b) consider identifying suitable areas for renewable and low carbon energy sources, and supporting infrastructure, where this would help secure their development; and

c) identify opportunities for development to draw its energy supply from decentralised, renewable or low carbon energy supply systems and for co-locating potential heat customers and suppliers.

Paragraph 156 requires:

Local planning authorities should support community-led initiatives for renewable and low carbon energy, including developments outside areas identified in local plans or other strategic policies that are being taken forward through neighbourhood planning.

The revision of Core Strategy EN4 is consistent with the NPPF paragraphs referred to above.

MONITORING

The impact of policy will be measured using the following indicators:

Indicator	Reason
Renewable Energy generation	The policy will encourage the delivery of low carbon heat. This should result in an increase of renewable energy across the district.

It would also be helpful to understand the annual carbon emissions and running costs of new developments so to allow developers and assessors compare carbon emissions and end-user costs to choose the most balanced option.

IMPLEMENTATION

The current district heating policy refers to the Department of Energy and Climate Change's (DECC) heat map for England, which helps to identify areas of high heat demand and potential sources of heat supply. The highest priority within this is to connect to the district heating network. If that is not possible then, owing to the hierarchical nature of the policy, the use of a site wide low and zero carbon energy source must be explored. If that is not possible then, attempts must be made to collaborate with neighbouring development sites or existing heat loads/ sources to develop a viable shared District heating network. The last aspect of the policy in case all the others are infeasible calls for futureproofing for a district heating connection at a later stage.

For developments taking place within officially designated heat network zones, connection to a heat network is likely to be mandatory under the legislation to be implemented by 2025.

For development located outside of a district heating area, then the policy requires applications to deliver a low cost and low carbon heating source. This may be through heat or air source heat pumps. Paragraph 7.37 – 7.39 of the Carbon Reduction of Buildings report by the University of Leeds sets out how LCC officers can properly assess planning applications:

In order that LCC officers can properly assess planning applications, the policy could require developers to model a range of options and present the results of that modelling, against two primary criteria:

- 1. Annual carbon emissions each year for 30 years, using the government's official electricity grid carbon intensity factors.*
- 2. Annual running costs for occupants each year for 30 years, using the government's official retail fuel costs.*

Both (1) and (2) are available from HM Treasury Green Book Supplementary Guidance⁴¹ and are updated regularly. The most up-to-date figures should be used.

The results of the analysis should be presented clearly for planning officers to be able to assess and verify the predicted carbon and fuel cost figures. If a developer chooses an option which does not deliver the lowest carbon and cost combination, they must provide a sound justification for this decision, with planning officers retaining the right to refuse on this basis.

⁴¹ HM Treasury Green Book Supplementary Guidance
<https://www.gov.uk/government/publications/valuation-of-energy-use-and-greenhouse-gas-emissions-for-appraisal> (carbon factors: Table 1, grid average; retail fuel prices: Tables 4-8 'High' scenario)

COUNCIL'S CORPORATE OBJECTIVES

The Council has adopted several holistic plans and strategies that aim to make Leeds the best it can be. The Carbon Reduction Local Plan Update policies will help the Council meet its ambitions through the following ways:

The **Best City Ambition's**⁴² mission is to tackle poverty and inequality and improve quality of life for everyone who calls Leeds home. It aims to achieve this through improving outcomes across the 3 Pillars of the Best City Ambition which are:

- health and wellbeing
- inclusive growth
- and zero carbon.

As part of the Council's approach to net zero, Leeds will focus on addressing the challenges of housing quality and affordability, improving energy efficiency, tackling fuel poverty and creating vibrant places where residents have close access to services and amenities. It also prioritises inclusive green jobs, and how the Council can promote a whole city approach to better harness our collective capital investments, not least those aimed at pursuing our shared net zero carbon targets.

Policy EN1, which introduces whole life cycle carbon assessments and the requirement of net zero operational buildings, will both help deliver more energy efficient homes which cost less to use and heat. It would also help drive the local green economy, by promoting skills such as assessing the whole life cycle carbon of a building and constructing zero carbon homes at a local level before these standards are required nationally.

The intention of Policy EN2 is to improve the quality of all new development in Leeds. Using the HQM and BREEAM standards ensures that new development will be sustainably delivered. This will again promote investment in skills and services within the green economy and ensure quality housing is delivered, in line with the Best City Ambition.

Policies EN3 and EN4 promote the use and delivery of renewable energy. Policy EN4 requires the use of low carbon and low cost heating technologies, which will help with tackling fuel poverty and providing energy security. Promoting the delivery of renewable energy generation schemes in Leeds will also promote investment in the local renewable energy sector and green economy whilst making the region more energy secure.

The Council's **Affordable Warmth Strategy** aims to make sure all homes in the city are of a decent standard and that everyone can afford to stay warm. The strategy aims to increase the average SAP rating of housing in Leeds to band C by 2020 as a whole, and to ensure that no properties are below band E by 2030. Policy EN1 will ensure that new houses are as energy efficient as possible, which will reflect in better EPC ratings upon completion and less energy to use.

⁴² [Best City Ambition \(leeds.gov.uk\)](https://leeds.gov.uk/best-city-ambition)

EQUALITY IMPACT ASSESSMENTS

EN1: Whole Life Cycle Carbon Assessments and Net Zero

The policy is split into Part A and Part B. Part A requires major applications to submit a whole life cycle carbon assessment that details the carbon emissions associated with the development over its entire lifetime including construction, materials, operation and demolition. It also requires minor applications to consider the materials and construction methods used.

Part B requires all applications to be net zero from 2027 with regards to the energy required to operate the building. To achieve this, it is recommended that developments are as energy efficient as possible and use onsite renewable generation to supply the remaining energy needs (both pre-and post the 2027 transition). If not technically possible to deliver the above requirements, then an offsetting through a financial contribution will be sought (from 2027).

Whilst the policy only effects new development, and therefore inhabitants and users of new dwellings and buildings, it will result in a positive outcome for all protected characteristics as they all will inhabit and use new buildings. These new buildings will be more energy efficient and therefore require less energy to use and heat, which will especially help those who experience fuel poverty during the winter months. As a last resort, the policy will also collect financial contributions that could go toward retrofitting existing Council housing stock or provide money towards renewable energy generation schemes. Again, this will help those who have trouble with energy costs connected to heating their homes.

EN2: Sustainable Construction Standards

The policy requires all new major residential development to meet Level 4 of the Home Quality Mark and all new major non-domestic application to meet a minimum of BREEAM Excellent. The above standards ensure that new development in Leeds is delivered to a high quality in the following sustainable credentials:

- Energy: building operational energy and CO2 emissions
- Management: management policy, commissioning, site management and procurement
- Health and Wellbeing: indoor and external issues (noise, light, air, quality, etc.)
- Materials: environmental impacts of building materials
- Transport: transport-related CO2 and location-related factors
- Water: building consumption and efficiency
- Waste: construction and operational waste management
- Pollution: water and air pollution
- Land Use & Ecology: site and building footprint and ecological value and conservation

The policy will ensure that all new development across Leeds is delivered to a consistent high-quality standard that addresses the above sustainability credentials. Whilst it will only impact new development, it will equally have a positive impact on all

of the protected characteristic groups who inhabit and use new buildings. The positive impacts will include more energy efficient buildings, that will require less energy to use and heat, and developments that deliver high quality amenity areas and less pollution, which will have a positive impact on people's health.

EN3: Renewable Energy

The policy promotes the delivery of renewable energy generation, and its infrastructure, in appropriate places within Leeds. The list of criteria that new development will have to meet ensures that new renewable energy generation schemes do not create significant harm on the environment and local communities.

The desired outcome of this policy is to increase the amount of renewable energy being generated and stored in Leeds. Whilst some of the renewable energy may directly feed into Leeds buildings, energy generated from larger schemes will more than likely feed into the national grid and therefore the direct positive results may not be delivered within Leeds. Where the energy is generated and delivered within Leeds, those using the energy will experience greater energy security from a more sustainable energy supply, which may also be cheaper than reliance upon the national grid and gas. This would be a positive impact for all protected characteristics who use and inhabit the buildings that utilise the energy from Leeds based low carbon renewable sources.

EN4: District Heat Network

The policy has been amended from the current Core Strategy (2019) EN4 policy. The policy is unchanged where it requires new development, where technically feasible and appropriate, to connect or design for future connection to a heat network. The amendment to the policy introduces a list of heating technologies that should be used if outside of a viable heat network. These alternative heating technologies include air source heat pumps, ground source heat pumps and shared ground heat exchanges and the policy requires new development to preference to the technology that balances the lowest cost for inhabitants and the lowest carbon used.

The outcome of this policy should see more connections made to the district heating network, a low carbon source of energy, and more sustainable and lower cost heating technologies being implemented in new builds. Whilst the previous version of the policy focussed on areas that could connect to the heat network, which is primarily found within the City Centre boundary, the new version now promotes low carbon and cost heating technology across the whole Leeds district. This results in the positive outcomes of this policy now having the potential to impact all protected characteristics across Leeds, where new buildings connect or use a low carbon heat source.

Appendix 1:

SUPPLEMENTARY NOTE TO POLICY EN3: AN ASSESSMENT OF POTENTIAL EFFECTS ON FUNCTIONALLY LINKED LAND SUPPORTING THE SOUTH PENNINE MOORS PHASE II SPA AND NORTH PENNINE MOORS SPA

INTRODUCTION

The South Pennine Moors Phase II Special Protection Area (SPA) covers the northern part of the South Pennine Moors, including a small area that falls within the Leeds district. The moorland includes typical upland mires, heaths and oak woodlands. The designated area supports an internationally important breeding bird assemblage typical of moorland upland habitats. The following are qualifying features of the SPA:

- breeding merlin,
- breeding golden plover,
- breeding bird assemblage including: common sandpiper (*Actitis hypoleucos*), short eared owl (*Asio flammeus*), dunlin (*Calidris alpina*), twite (*Carduelis flavirostris*), snipe (*Gallinago gallinago*), curlew (*Numenius arquata*), wheatear (*Oenanthe oenanthe*), golden plover (*Pluvialis apricaria*), whinchat (*Saxicola rubetra*), redshank (*Tringa tetanus*), ring ouzel (*Turdus torquatus*) and lapwing (*Vanellus vanellus*).

The northern end of the South Pennine Moors SPA is within 10 km of the North Pennine Moors SPA which supports a similar assemblage of upland breeding species.

These birds are given protection under the Conservation of Habitats and Species Regulations 2017 (as amended by The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019) ('the Habitats Regulations'). The Regulations require planning authorities to consider whether 'alone or in combination with other plans or projects' a proposal will have a 'likely significant effect' on the integrity of the SPA. This decision then determines whether or not a more detailed 'Appropriate Assessment' will be needed where the planning authority needs to be satisfied that the proposal will not adversely affect the integrity of the SPA. Proposals to identify opportunity areas for renewable energy generation and battery storage in the Local Plan Update have been considered for any potential impacts through HRA Screening in the Leeds Local Plan Habitats Regulation Assessment (HRA) September 2022. This is an additional note to consider if the proposals for opportunity areas for renewable energy generation would lead to likely significant effects (LSEs) to the functionally linked land supporting the protected sites.

FUNCTIONALLY LINKED LAND

As well as consideration of the likely significant effects to protected sites, the Habitats Regulations Assessment also needs to consider potential impacts from the loss of, or

disturbance to, functionally linked land. Functionally linked land (FLL) is areas of land occurring outside a designated site which are considered to be critical to, or necessary for the continuing survival, reproduction and viability of a mobile species which may need to travel from a protected site to such areas in order (for example) to forage, feed or roost. These habitats are frequently used by SPA species and support the functionality and integrity of the designated sites for these features.

The identification of FFL uses evidence from existing bird records and other data about the behaviour of the relevant bird species to create maps showing important supporting habitats that maintain and enhance the integrity of the SPA sites.

Details of the qualifying species of the SPA can be found in the supplementary advice provided by Natural England, available here: [UK9007022_SouthPennineMoorsPhase2SPA_COSA_Formal_Published_19_Nov_18.doc.pdf](#)

Evidence from the British Trust for Ornithology states that a number of qualifying features of the South Pennine Moors Phase II SPA are mobile species and will use areas outside the SPA boundary to forage at certain times of the year. This is particularly the case with some of the wading birds such as golden plover (*Pluvialis apricaria*) and curlew (*Numenius arquata*) which will forage in areas outside the SPA. Lapwing (*Vanellus vanellus*) will seek out cultivated fields after ploughing (Milsom et al. 1985). During late to mid-winter, there is some evidence that golden plover may forage on grassland for soil invertebrates (R.J. Fuller unpubl.; Milsom et al. 1985; Shrubbs 1988).

Although the golden plover breed on moorland, they are known to forage in the enclosed fields beyond the SPA boundary. Berthinussen (2018) states that a range of commuting distances have been reported, with differences between females (which typically forage during the day) and males (typically foraging at night) as a result of shared incubation duties. Berthinussen 2018 states that 'most studies report a preference for enclosed flat fields with a short sward height maintained by grazing (Ratchliffe 1976, Whittingham et al. 2000, Pearce-Higgins & Yalden 2003, Whitfield & Thomas 2006). A previous study in the South Pennines found that arable and improved fields were used the most (Pearce, Higgins & Yalden 2003). Field choice appears to be highly selective with only a small proportion of available fields used and site fidelity is high (Whittingham et al. 2000, Pearce-Higgins & Yalden 2003, Whitfield & Thomas 2006)'. It is therefore important to identify an appropriate foraging distance for the golden plover that takes account of its behaviour, so that it can be properly assessed in the HRA Screening.

Golden plover, curlew, lapwing, ring ouzel and twite all could be affected by impacts to the quality or availability of supporting habitat with implications for the SPA population and the potential to undermine the conservation objectives. Risks such as the direct loss of supporting habitat or issues such as infrastructure (power lines), lighting, disturbance, drainage might affect the suitability for the relevant species. The Supplementary Conservation Advice for the South Pennine Moors Phase II SPA recognises the extent and distribution of supporting breeding habitat for golden plover as an attribute and sets a target to restore the extent, distribution and availability of

suitable breeding habitat for all necessary stages of its breeding cycle (courtship, nesting, feeding). The explanatory notes clearly state that the objective applies to any critical supporting habitat which is known to occur outside the site boundary. The notes state that golden plover may travel up to 4km from their nesting sites to feed. Marginal pastures adjacent to the SPA are also known to be likely important feeding grounds for the birds. Where this supporting habitat is regularly used and 'functionally-linked' to the SPA, it will be key to breeding success on the moorland.

Of the bird species associated with the South Pennine Moors Phase II SPA and the North Pennine Moors SPA, the golden plover and the curlew are the species that are most likely to travel to forage. The HRA prepared to support a recent planning application at Leeds Bradford Airport referenced a Risk Assessment Summary (RAS) which states that of the qualifying species of the SPA only golden plover were considered for inclusion in the RAS.

Bradford District Council have collated evidence on how far the SPA birds roam from the moorland breeding sites in the South Pennine Moors SPA/SAC Supplementary Planning Document 2022. This shows that it is golden plover that are the most relevant species and most likely to be using fields well away from the moorland edge.

Table 2: Examples from the literature on the relevant species and use of wider areas during the breeding season

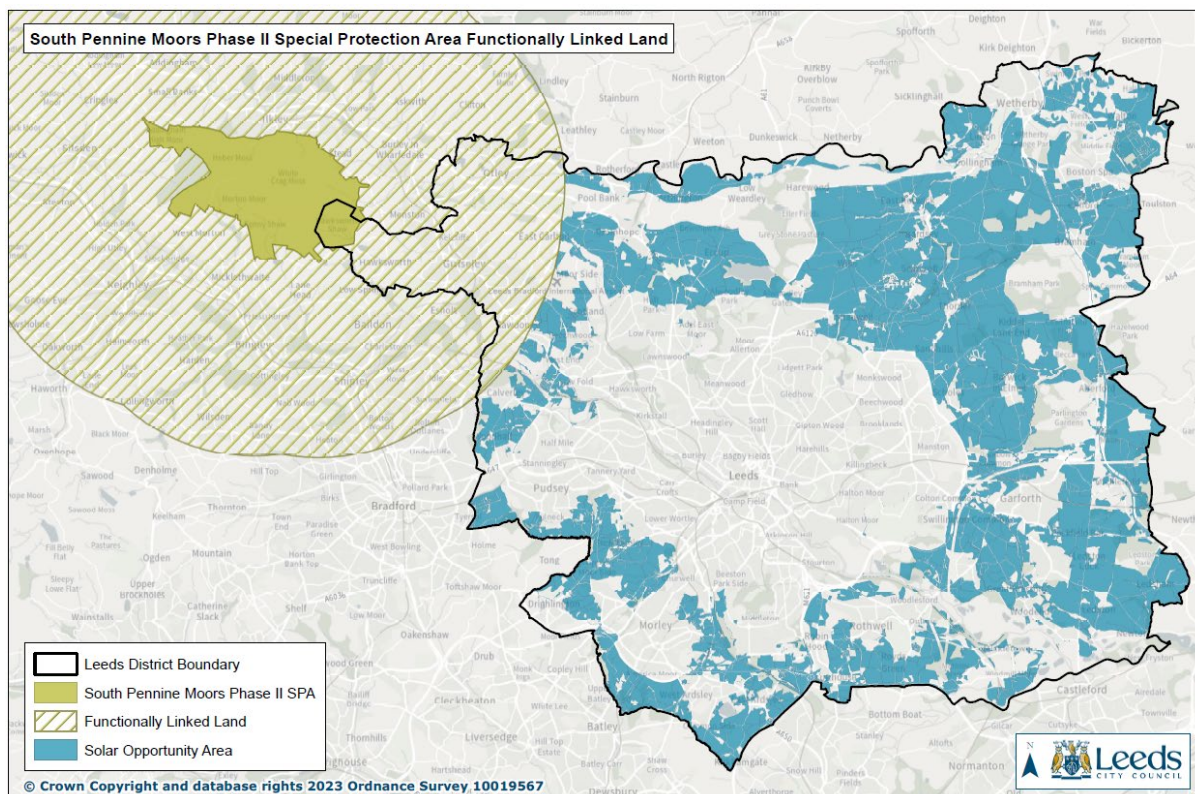
Species	Distance measures relating to likely use outside European site boundaries	Habitat use and other additional information	Reference
Golden Plover	Foraging birds 1.1-3.7km from nest. Fields used by foraging birds were 0.43km-2.02km from the moorland edge.	Birds breeding on moorland radio-tracked and shown to use limited number of enclosed pasture fields, selecting calcareous grassland with high earthworm density (lots of molehills), particularly large fields, away from roads.	Whittingham <i>et al.</i> (2000)
Curlew	Foraging birds using fields around 500m from moor	Larger fields preferred for foraging and those closest to the nest	Robson (1998)
Twite		1km squares around moorland edge with high percentage cover of vegetation above 5cm and where length of river or reservoir shore is large	Brown <i>et al</i> (1995)
Twite	Usually feed up to "several kilometres" from the nest		Langston <i>et al.</i> (2006)
Lapwing		Much lower density and levels of use on improved fields (i.e. those that were drained/fertilised/reseeded).	Baines (1988)
Ring Ouzel	Up to 500m from nest sites to feed	Breeding birds feed in short grass swards or heather/grass mosaics with high earthworm abundance	Burfield (2002)

Bradford District Council have adopted a zonal policy in their Core Strategy which recognises 2.5kms as the foraging distance for golden plover and applies a 7km buffer distance for seeking financial contributions from residential development. The distances are based on the Pennine Fringe Habitat Survey 2014. Conversely, the HRA Screening for a planning application at Leeds Bradford Airport states that functionally linked land would not exceed a distance of 500metres from the SPA on the basis that the SPA is predominantly surrounded by agricultural land and some built up areas. However evidence on the behaviour of the golden plover suggests that at certain times of the year they will forage on cultivated land during the early part of the winter (source:

https://www.bto.org/sites/default/files/shared_documents/publications/research-reports/1999/rr224.pdf)

In 2018 Natural England produced ‘Habitat Suitability Modelling for foraging European Golden Plover (*Pluvialis apricaria*) that breed on the South Pennine Moors Special Protection Area (Dr Anna Berthinussen, 2018)’. This used existing golden plover records to develop a Habitat Suitability Model for summer daytime foraging golden plover across an area extending to 7.5 km around the SPA boundary.

To summarise, the conservation advice for the SPA suggests a foraging distance of 4kms from the SPA boundary, Bradford’s evidence suggests a distance of 2.5kms is appropriate however the Natural England golden plover model uses a distance of 7.5kms. Given the lack of recent bird survey data it is considered best to take a precautionary approach and apply a 7.5km buffer from the boundary of the SPA to define the extent of functionally linked land. This is shown on the attached map.



PRODUCED BY CITY DEVELOPMENT, LOCATION INTELLIGENCE TEAM, LEEDS CITY COUNCIL Date: 12/09/2023

ASSESSMENT OF POTENTIAL EFFECTS

Natural England advises that the potential for loss of functionally linked land and/ or construction/operational impacts from wind and solar development, including collision risk (mortality resulting from collisions with wind turbines or ancillary infrastructure) and disturbance and displacement (including disruption to flight lines resulting from avoidance action associated with wind development) of birds on functionally linked land, should be assessed in more detail in the HRA.

West Yorkshire Ecology list the following birds as target species for the South Pennine Moors Phase II SPA; golden plover, twite, curlew, ring ouzel and lapwing. These birds need to be considered in the HRA Screening, however of this list golden plover is possibly the most crucial and most likely to travel to forage. The density of breeding golden plover on the SPA is high compared to other regional populations in northern England and Scotland (292 breeding pairs representing 1.2% of the British breeding population; JNCC 2015). This population is also the most southwestern in the world making the SPA crucial in maintaining the breeding range of this species (Berthinussen, 2018). It is important that policies which would encourage an increase in wind and solar farms in the district are assessed against any likely significant effects on the 7.5kms of functionally linked land.

Leeds has declared a climate emergency and wants to do all it can to reach zero carbon by 2030. An important step towards achieving this is to make the most of opportunities for renewable energy generation in the district. To this effect the Local Plan includes areas which have been identified as potential opportunities for renewable energy generation. Outside of these opportunity areas applications for renewable energy generation will not be supported. Policy EN3 proposes criteria which applications for renewable energy generation must meet.

By ensuring that the areas identified as an opportunity for wind and solar energy generation exclude the 7.5kms of functionally linked land it is highly unlikely for planning applications to gain consent for renewable energy generation in the functionally linked land. This means there are no likely significant effects to the birds associated with the SPA from collision with wind turbines or ancillary infrastructure and no risk from disturbance and displacement. The boundary of the North Pennine Moors Special Protection Area is well beyond the 7.5kms distance from Leeds and it can therefore be concluded that there will be no likely significant effects to that SPA either.

The opportunity area for wind energy generation already includes a buffer of 12kms from the South Pennine Moors SPA and therefore ensures that the functionally linked land is excluded. However the buffer for solar energy generation is 2.5kms and therefore it is recommended that this buffer be extended to 7.5kms and the map be redrawn to ensure that the opportunity areas for solar energy generation also excludes functionally linked land. In this way the assessment of Policy EN3 can be considered to rule out any likely significant effects on the birds associated with the SPA.

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Bradford District Council data available at: [South Pennine Moors Supplementary Planning Document \(bradford.gov.uk\)](#)

West Yorkshire Ecology data available at: [20201217-spa-bird-survey-methodology.pdf \(wyjs.org.uk\)](#)