EPOA
Essex Planning Officers Association

Operational Energy & Carbon (GE1)

Planning Policy Statement - October 2025

Revision v1.1 – April 2026

Delivering healthy, efficient, climate resilient homes and buildings in Greater Essex.

This **Operational Energy and Carbon Planning Policy Statement** is published by the Essex Planning Officers Association on the Essex Design Guide and **Policy GE1: Operational Energy and Carbon in Homes and Buildings** is recommended for Local Authorities in Greater Essex to embed in their Local Plans and other policy, strategy and guidance documents.

The preparation of the Policy Statement has been led by the Built Environment Planning Unit at Essex County Council, under the guidance of the Essex Planning Officers Association, and in collaboration with officers from the Local Authorities in Greater Essex.

It provides a consistent policy approach to **delivering healthy, affordable to run, climate resilient, energy efficient homes and buildings in Essex**. In doing so, it responds to the work of the Essex Climate Action Commission and aims, objectives and targets of Essex County Council and other Greater Essex Local Authorities.

The Policy is underpinned by strong and robust evidence established for Greater Essex and published on the Essex Design Guide. The Policy is based on the recommendations of the **Essex Energy and Carbon Policy Study**. Much of the evidence is also relevant, and therefore can be used and relied upon, by local authorities outside Essex.

This Policy Statement updates the '*Planning Policy Position for Net Zero Carbon Homes and Buildings in Greater Essex November 2023' by* taking on board new and updated evidence, responses to consultations on local plans, feedback from industry organisations, scrutiny at local plan examinations and Inspectors' Reports. The policy sits alongside **Policy GE2** set out in the **Embodied Carbon and Circular Economy Planning Policy Statement (October 2025).**

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Website: Essex Built Environment Quality | Essex Design Guide

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1. Planning for resource efficient, sustainable and healthy communities

To deliver sustainable and healthy communities in Greater Essex, we need to make sure homes and buildings are designed to be highly energy efficient, have low running costs, incorporate renewable energy technologies, use materials and resources efficiently and are resilient to changes in climate.

They should be built using high quality, natural and local materials where possible, and be designed to be re-used and adaptable in future. Building in this way means that we deliver wider objectives including energy security, reducing fuel poverty, stimulating local economic growth, minimising waste, and improving the health, comfort, and wellbeing of people living and working in Essex.

Context

Essex is increasingly exposed to environmental pressures. For example:

- Flooding: The number of homes at risk could double by 2050.
- Water scarcity: Demand is rising while supply is under pressure.
- Heatwaves: Urban areas are vulnerable to overheating and poor air quality.

Essex County Council (ECC), the Greater Essex Local Authorities and the Essex Climate Action Commission recognise that urgent action through planning policy is needed to address these risks and support the development of homes and places that are affordable, resilient, and future-ready. The local planning authorities, through the Essex Planning Officers Association (EPOA) led by the Built Environment Planning unit at ECC, have worked together to establish evidence-led planning policies, guidance and advice, which is all published on the Essex Design Guide.

So far, we have developed the following policies:

- GE1: Operational Energy and Carbon in homes and buildings (presented in this document); and
- GE2 Embodied Carbon and Circular Economy in homes and buildings.

The policies are recommended to be embedded in local plans, strategies and other planning documents that guide development in Greater Essex.

Why Energy Efficiency in Planning Matters

Planning policy GE1 enables low energy use and higher energy performance standards in new developments which ensures:

- Cheaper energy bills for residents, helping to tackle fuel poverty.
- Reduced demand on national energy infrastructure, improving energy security.
- Comfortable, healthier homes that stay warm in winter and cool in summer.

Energy-efficient buildings also:

- Require less heating and cooling, reducing pressure on local energy networks.
- Improve indoor air quality, supporting public health.

- Are more resilient to climate extremes, such as heatwaves and cold snaps.

The Role of Renewable Energy Technologies

Integrating renewable energy systems, such as solar panels and heat pumps (as per Policy GE1) into buildings is essential to:

- Generate clean energy on-site, reducing reliance on fossil fuels.
- Minimise and stabilise energy costs for households and communities.
- Support local energy resilience, especially during peak demand or supply disruptions.

These technologies complement energy efficiency measures by:

- Enabling buildings to meet their own energy needs.
- Reducing pressure on the grid.
- Supporting Essex's transition to a more secure and sustainable energy future.

Supporting Health, Comfort and Wellbeing

Well-designed, energy-efficient homes, contribute directly to residents' wellbeing with:

- Consistent ambient indoor temperatures, reducing stress and illness, especially for older people and young children.
- Superior ventilation and air quality, lowering the risk of respiratory conditions.
- Maintained thermal comfort which improves mental health and productivity.
- Reduced noise and overheating, enhancing quality of life in urban areas.

Planning policies that prioritise these outcomes help create homes and buildings that support physical and mental health, reduce healthcare costs, support economic productivity, and foster stronger, more resilient communities.

Benefits for Essex Communities include:

- Homes that are affordable to run, with no future retrofit burden.
- Healthier living environments, especially for vulnerable residents.
- Resilient neighbourhoods that can adapt to future climate and energy challenges.
- Local economic benefits through investment in sustainable design and construction skills.

Alignment with Essex's Strategic Goals

These planning policies support the Essex Climate Action Commission's recommendations; Local Development Plans, Climate Strategies and other planning strategies and documents; and National objectives around energy efficiency, fuel poverty, housing affordability, and climate resilience.

They are:

- technically achievable, financially sound, and legally justified;
- designed to be consistent across Greater Essex using evidence and advice published on the Essex Design Guide, helping developers and planners deliver high-quality outcomes;
- and in line with national and international standards.

2. Legislative and Technical Evidence Context

The greenhouse gas emissions from operational energy used to heat, cool and power buildings, accounted for 17% of total UK emissions, 76 MtCO2e (76 million tonnes of carbon dioxide equivalent) in 2022[1]. The proportion of emissions from the built environment is substantially higher when emissions embodied in the materials and construction process of new buildings are included.

The UK has a statutory target to reduce greenhouse gas emissions to net zero by 2050 (as set out in the Climate Change Act 2008, as amended). The Climate Change Act also sets, through the Carbon Budgets[2], a further legal target of a 78% reduction in emissions by 2035, which builds upon the commitment to reduce emissions by 68% from 1990 levels by 2030. These 'Carbon Budgets' seek to limit carbon in the atmosphere to levels needed to stabilise the climate. They also set out the changes that need to occur in each sector to achieve that target, for example, continuing the successful transition to a clean energy system, and heating homes with more efficient systems that use renewable energy.

The Climate Change Committee (CCC)[3], however, warns that the UK is off target and rapid and deep cuts to emissions must be made in all sectors. It also highlights that policies on energy efficiency in buildings are missing or incomplete[4].

It is therefore imperative that new homes and buildings in Greater Essex are built to achieve an operational energy balance on-site, where renewable energy generated on-site matches average annual energy demand at the outset (also described as 'net zero energy and carbon in operation'). For a building to achieve this, it must be an ultra-low energy building that meets high building fabric and energy efficiency standards, and it must not use fossil fuel and should maximise renewable energy generation, for example through the use of rooftop solar photovoltaics (PV). See Figure 1.

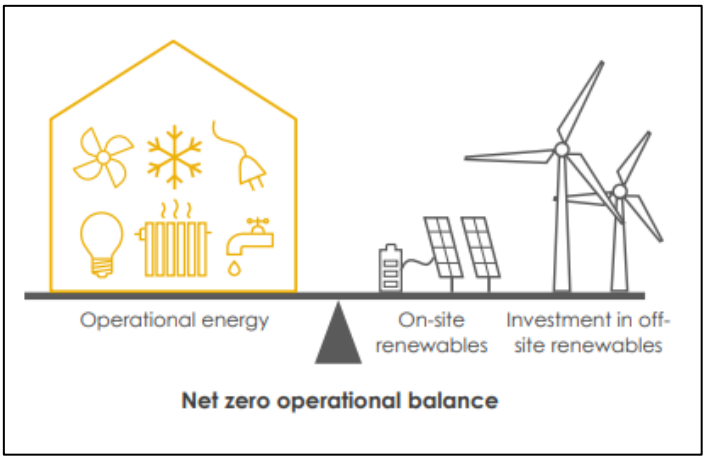

Figure 1 – Operational Energy Balance ('net zero' carbon)

Source: LETI Climate Emergency Design Guide

[1] Climate change committee Progress in reducing UK emissions - 2023 Report to Parliament (page 140)
[2] Carbon Budget order 2021 - https://www.gov.uk/guidance/carbon-budgets#setting-of-the-sixth-carbon-budget-2033-2037
[3] https://www.theccc.org.uk/wp-content/uploads/2022/06/Progress-in-reducing-emissions-2022-Report-to-Parliament.pdf
[4] Climate Change Committee Progress in reducing UK emissions - 2023 Report to Parliament (page 71)

Retrofitting new homes later down the line, to meet a better energy efficiency standard is more disruptive, costly and time consuming than designing buildings to achieve operational energy balance (and hence be 'net zero energy and carbon in operation') at the outset.

Furthermore, in Greater Essex, a target for all planning permissions for new buildings to be net zero carbon by 2025 and carbon positive by 2030 was recommended by the Essex Climate Action Commission (ECAC) in July 2021[5] and endorsed by Essex County Council (ECC) in November 2021. The ECAC recommendations form the basis of the ECC Climate Action Plan[6] and are relevant to all Essex Local Planning Authorities (LPAs).

Evidence commissioned by ECC on behalf of all the Greater Essex Local Authorities and in response to the work of the ECAC, demonstrates that building to meet the requirements set out in **Policy GE1** (and be 'net zero energy and carbon in operation') is:

- **Technically feasible** *(Report 1: Essex Net Zero Policy – Technical Evidence Base by Introba, Etude, Currie & Brown, July 2023 (Updated September 2025))*;

- **Financially viable** *(Net Zero Carbon Viability Study for Essex by Three Dragons, August 2022; supplemented by each LPA's local plan viability study using costs from Report 1: Essex Net Zero Policy – Technical Evidence Base (Introba et al, July 2023 updated September 2025) or later updates)*; and

- **Legally justified** *(Essex Open Legal Advice – Energy policy and Building Regulations by Estelle Dehon KC, Cornerstone Barristers, 6th May 2025 plus Addendum October 2025).*

The evidence underpinning Policy GE1 for Essex is available on the Operational Energy and Carbon evidence pages of the Essex Design Guide (EDG) and is supplemented by each Essex LPA's local plan evidence base.

To complement this evidence, practical design advice is provided (and being added to) on the EDG which focuses on how to design developments (of all scales and types) to meet the operational energy and carbon standards, mitigate potential overheating risk and to address other inter-related sustainability issues. The aim is to ensure new development mitigates, adapts and is resilient to a changing climate.

The Building Regulations 2021 and 2026 update (which includes the Future Homes Standard) do not adequately address operational energy efficiency or operational carbon emissions from new development. Operational carbon emissions come from two categories of energy use - those that are regulated and unregulated (see Figure 2). About 50% of a building's total operational energy use comes from 'unregulated' uses which the current Building Regulations do not address.

[5] https://www.essexclimate.org.uk/sites/default/files/DS21_7178%20ECAC_Commission_Report-Final.pdf
[6] Essex Climate Action Plan

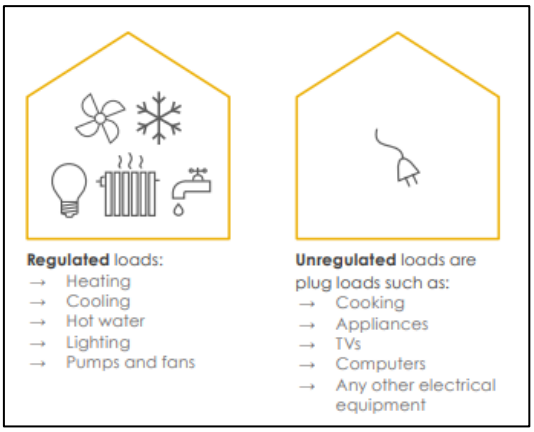

Figure 2 – Regulated and Unregulated Energy loads

Source: LETI Climate Emergency Design Guide

It is for this reason that the planning system, and local planning authorities through their local plans must address operational energy to ensure new development addresses operational energy efficiency and the associated carbon emissions, in a way that aligns with local and national climate targets, mitigates and adapts to climate change and delivers the best outcomes for people (e.g. lower energy bills, and healthier homes). This is supported through primary legislation, including the Planning and Compulsory Purchase Act 2004, and national policy (including the NPPF) which require local plans to include policies to secure development that mitigates and adapts to climate change.

Taking forward Policy GE1, will enable LPAs to take a proactive approach to climate change which is in line with the objectives and provisions, and hence legally binding targets, of the Climate Change Act 2008 *(NPPF Dec 2024, para 162, Footnote 61)*.

3. Policy GE1: Operational Energy and Carbon in Homes & Buildings

POLICY GE1: OPERATIONAL ENERGY AND CARBON IN HOMES AND BUILDINGS

A) New build development (residential and non-residential)

All new buildings must be designed and built to be Net Zero Energy and Carbon in operation. They must be ultra-low energy buildings, fossil fuel free, and generate renewable energy on-site to at least match predicted annual energy use.

All new buildings (1 dwelling and above for residential; 100m² floorspace and above for non-residential) are required to comply with requirements 1 to 5 as set out below:

1. **Requirement 1: Space heating demand limits**
   a. **Residential buildings (apart from 1 storey bungalows) and non-residential buildings must achieve a space heating demand of 15 kWh/m² GIA (gross internal floor area)/year or less.**
   b. **Bungalows must achieve a space heating demand of 20 kWh/m² GIA/year or less.**

2. **Requirement 2: Fossil fuel free**
   a. **No new buildings shall be connected to the gas grid; and**
   b. **Fossil fuels must not be used on-site to provide space heating, domestic hot water or cooking.**

3. **Requirement 3: Energy Use Intensity (EUI) limits**
   a. **Residential buildings (Use Class C3 and C4) must achieve an Energy Use Intensity (EUI) of no more than 35 kWh/m² GIA/year.**
   b. **On larger sites in exceptional circumstances this may be met on each individual phase as a site-wide residential average (weighted by floor area) provided that no single dwelling has an EUI greater than 45 kWh/m2 GIA/year.**
   c. **The following non-residential buildings must achieve an Energy Use Intensity (EUI) of no more than the following (where technically feasible) by building type or nearest equivalent:**
      - **Offices – 70 kWh/m² GIA/year**
      - **Schools – 65 kWh/m² GIA/year**
      - **Light Industrial – 35 kWh/m² GIA/year**
   d. **For other residential and non-residential buildings, that are not covered by a) and c) above, applicants should report their energy use intensity but are not required to comply with a certain limit.**

4. **Requirement 4: On-site renewable energy generation**
   Renewable energy must be generated on-site for all new developments by rooftop solar PV energy (electricity) generation and the amount of energy generated in a year should match or exceed the predicted annual energy use of the building, i.e.

Renewable energy generation (kWh/m²/year) = or > predicted annual energy use (kWh/m²/year)*

***For development proposals where it is demonstrated to the satisfaction of the Local Planning Authority that meeting Requirement 4 is not technically feasible then renewable energy generation on-site should be maximised and the residual amount of renewable energy generation (equivalent to the shortfall in meeting the annual energy use of the building in kWh/year) must be offset by a financial contribution (to cover the administration, purchasing and installation of a solar PV renewable energy (electricity) system elsewhere in the plan area or County, which is able to generate a similar amount of energy) and be paid into the Council's offset fund.**

The offset price is set at £1.82 per kWh or the most recent updated version published on the Essex Design Guide and the contribution shall be calculated at the time of planning application determination.**

****https://www.essexdesignguide.co.uk/climate-change/essex-energy-carbon-evidence/**

5. **Requirement 5: As-built performance confirmation and in-use monitoring**
   a. **All developments must submit as-built performance information at completion and prior to occupation; and**
   b. **In-use energy monitoring is required on a minimum of 10% of dwellings for development proposals of 100 dwellings or more, for the first 5 years of operation.**

Development proposals must have regard to guidance, including Design Guide(s) and/or Design Code(s) produced to amplify the policy requirements.

Alternative routes to meeting policy requirements.

Proposals that are built and certified to the Passivhaus Classic or higher Passivhaus standard are deemed to have met Requirements 1 and 3. Requirements 2, 4 and 5 must also be met to achieve policy compliance.

Minor residential development proposals (less than 10 dwellings) that are designed and built to the fabric and systems specifications (the 'minimum standards approach') set out in Table 2 (or successor) are deemed to have met Requirements 1 and 3. Requirements 2, 4 and 5a must also be met to achieve policy compliance.

B) Extensions and Conversions

Applications for residential extensions and conversions affecting existing buildings (but excluding Listed Buildings) are encouraged to meet the 'minimum standards approach' fabric specifications set out in Table 2 and maximise renewable energy generation where practical and feasible.

4. Supporting Text / Reasoned Justification

The policy requirements under Part A of Policy GE1 apply to new build residential development (1 dwelling and above) and non-residential development (100m^2 floorspace and above). For the purposes of the policy 'residential buildings' means dwellinghouses and flats (C3), houses in multiple occupation (C4), and developments of self-contained residential units such as extra-care (C3). This also includes the residential element of any new mixed-use buildings. Non-residential buildings include Use Classes C1 (Hotels), C2 /C2A (Residential Institutions) and those falling within use classes B, E, F and Sui Generis. For any other residential and non-residential buildings, the policy should be applied in a proportionate manner where relevant and appropriate through the Development Management process.

To meet the requirements 1- 5 of this Policy GE1, developments will need to be designed in a way that prioritises a fabric first approach to building design and embeds the energy hierarchy (see Figure 3). This means improving building fabric and energy efficiency to ensure energy demand is minimised and then installing renewable energy generation capacity to meet or exceed demand where possible, followed by offsetting residual energy, if required as a last resort.

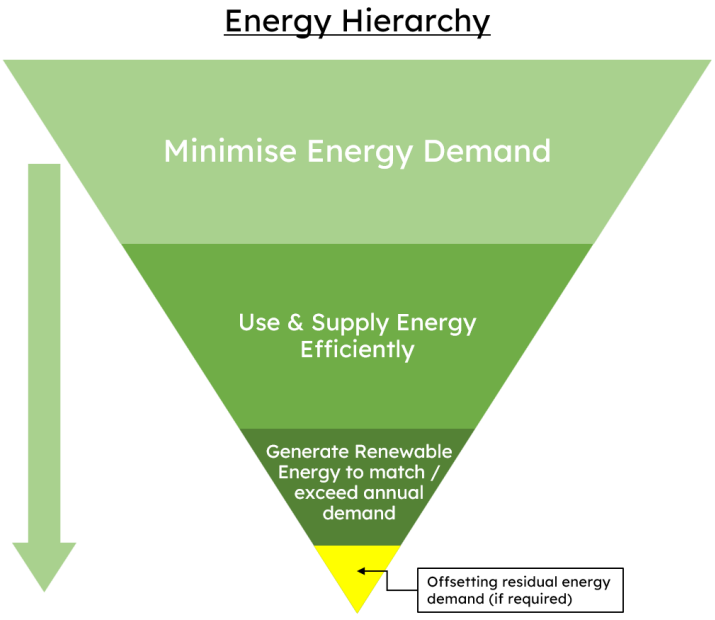

Figure 3: Energy Hierarchy

Designing new development to be net zero carbon and net zero energy in operation needs to be addressed at both building level and site level at the earliest possible stage so that factors such as the orientation, built form, building fabric, site layout and landscaping measures can be taken into account to minimise energy demand. These factors also influence the renewable energy generation potential of a site and through good design, can help make a development more resilient to a changing climate, for example, through using landscaping measures and green/blue infrastructure to mitigate potential overheating risk to the comfort and well-being of occupants.

It is important when designing homes and buildings to meet their own operational energy needs on average over a year (hence achieving 'net zero'), that this is done in a holistic

manner that considers wider sustainability objectives and issues. *Report 2: Essex Net Zero Policy – Summary of Policy, Evidence and Validation Requirements (July 2023, updated September 2025)* contains a 1-page high level design guide for a terrace block and low-rise apartment block. Also the Essex Design Guide EDG contains practical advice on good solar design which focuses on balancing the needs of daylighting, useful solar gain and mitigating overheating risk. To support delivery, the Essex Building Specifications Guidance provides technical information and outline 'packaged solutions' which meet the policy requirements.

4.1 Requirement 1: Space heating demand

The space heating demand (SHD) is the amount of heat energy needed to heat a home or building over a year in a particular climate and is expressed in kWh/m^2/year. The measure expresses the building's elements annual efficiency, so how effectively they are resisting heat transfer. All design and specification decisions affect space heating demand including building form, orientation, insulation, airtightness, windows, doors and the ventilation system. The Essex Building Specifications Guidance provides more information.

Reducing space heating demand to the target levels identified is necessary to minimise energy demand and achieve a net zero energy and carbon (in operation) building which aligns with recommendations from the Climate Change Committee, Royal Institute of British Architects (RIBA), Low Energy Transformation Initiative (LETI) and the UK Green Building Council (UKGBC). It is also beneficial to residents and building users as it directly reduces energy costs.

Space heating demand in all buildings of major development proposals should be demonstrated using predictive energy modelling, for example Passivhaus Planning Package (PHPP) or the Chartered Institute of Building Services Engineers (CIBSE) TM54. The space heating demand figure is an output of the modelling software once all data has been input.

The space heating demand target applies to all residential and non-residential buildings designed to be used by people (i.e. not agricultural buildings).

4.2 Requirement 2: Fossil fuel free

New buildings must not burn fossil fuels for heating, hot water and cooking if Essex, and the UK, is to stay within carbon budgets and successfully transition to a low carbon, healthier, more resilient society. Alternatives are available. For example, heat pumps can provide both space heating (and cooling) and hot water and can serve individual homes or communal heating systems. They use renewable heat sources such as air, ground or water. The key benefit of heat pumps is their efficiency. Efficiencies vary but are typically around 250- 400% for an Air Source Heat Pump. Direct electric heating systems are less efficient, typically 100%, and are therefore more expensive to run. Solar thermal panels, which turn solar energy into heat can help with space and water heating too.

The Environment Agency regulates ground source heating and cooling systems, and these may require an abstraction licence and environmental permit although exemptions may apply. Further guidance can be found on the gov.uk website[7]

Heating provided through wood burners and biomass boilers has a negative impact on air quality and are therefore discouraged.

4.3 Requirement 3: Energy Use Intensity

Energy Use Intensity (EUI), or metered energy use, is the total energy needed to run a home or building over a year (per square metre). It is a measure of the total energy consumption of the building (kWh/m^2/year). Reducing total energy use of buildings to the target level identified is necessary to minimise energy demand and align with climate targets. It is also beneficial to residents and building users as it would directly reduce energy costs.

Energy Use Intensity in all buildings of major development proposals should be demonstrated using predictive energy modelling.

The EUI of a building covers all energy uses (regulated and unregulated): space heating, domestic hot water, ventilation, lighting, cooking and plug-in loads e.g. appliances, computers etc. However, electricity used for electric vehicle charging is excluded from the calculation. Whether the energy is sourced from the electricity grid or from onsite renewables does not affect the calculation.

The EUI target set in the policy for dwellings is based on modelling undertaken in the technical evidence base *(Report 1: Essex Net Zero Policy – Technical Evidence Base, July 2023, updated September 2025)* and includes both regulated and unregulated energy uses. For clarity, the EUI target set out in 3a) applies to residential uses which include: dwellinghouses, flats, self-contained residential units (C3) and houses of multiple occupation (C4).

For non-residential buildings, the EUI's for the uses listed (office, school and light industrial) are based on gross internal floor areas (GIA) and include regulated and unregulated energy loads. Buildings which represent these generic typologies have been modelled in the evidence *(Report 1: Essex Net Zero Policy – Technical Evidence Base, July 2023 updated September 2025)* and appropriate EUI limits identified.

For other residential and non-residential typologies (that are not covered under 3a or 3c), applicants are expected to comply with all other policy requirements, except Requirement 3: Energy Use Intensity limits. Instead, applicants are expected to only report their energy use intensity. However, applicants are recommended to seek to meet the limits being developed by the UK Net Zero Carbon Building Standard initiative.

4.3.1 District Heat Networks

Developments connected to a district heat network are expected to meet the proposed EUI limits. The limits set for EUI for each building should be the same irrespective of the heating

[7] Guidance on Closed loop systems: https://www.gov.uk/guidance/closed-loop-ground-source-heating-and-cooling-systems-when-you-need-a-permit
and open loop systems: https://www.gov.uk/guidance/open-loop-heat-pump-systems-permits-consents-and-licences

system that is proposed, to allow a fair comparison between different heating options. The EUI calculations for a scheme connected to a district heat network would have to include the energy consumption of the district heating heat generation plant. This means that the EUI includes the heat losses of the district heating system.

4.4 Requirement 4: On-site renewable energy generation

New development presents opportunities for integrating renewable energy technology into a proposal, including renewable electricity generation. The evidence recommends that in Essex currently the most suitable and cost-effective technology is rooftop solar photovoltaic panels.

Evidence *(Report 1: Essex Net Zero Policy – Technical Evidence Base (July 2023 updated September 2025))* shows that it is technically feasible for a building to generate sufficient renewable energy to match or exceed its predicted annual total energy use and thereby achieve an operational energy balance on-site ('net zero energy'). For clarity, the predicted annual total energy consumption of a building includes both regulated and unregulated energy uses, but excludes energy used for electric vehicle charging.

The policy requires renewable energy generation to at least match the predicted annual energy use of a building.

The *Report 1: Essex Net Zero Policy – Technical Evidence Base July 2023 updated September 2025* sets out some worked examples, and guidance on roof design and orientation is provided in Appendix 2 of that report, which will help applicants maximise renewable energy generation. The renewable energy generation output should be calculated following the Microgeneration Certification Scheme (MCS) guidance[8] method including the impact of shading.

Matching or exceeding predicted total annual energy use on site with renewable energy generation achieves an on-site energy balance and hence a net zero energy and carbon development in operation from the outset. As well as helping progress towards climate targets, there are other benefits for ensuring new build development maximises renewable energy generation. For example, it would generate 'free' electricity close to its point of use and help deliver significant energy cost savings for residents and building users. It would also aid the transition to a more sustainable energy system by contributing to the significant increase in renewable energy generation required between now and 2050 in the UK and make efficient use of land and resources.

4.4.1 Renewable Energy Offsetting Mechanism

There may be circumstances where it is not technically possible to match on-site renewable energy generation with annual average energy demand. An offsetting mechanism is therefore provided to enable these developments achieve policy compliance.

For the offset mechanism to be triggered, the applicant must justify and demonstrate, to the satisfaction of the Local Planning Authority (LPA), why it is not technically possible for the development to achieve policy compliance with Requirement 4. To do this, applicants

[8] https://mcscertified.com/standards-tools-library/

should refer to, and meet, the minimum information requirements for policy compliance set out in *Report 2: Essex Net Zero Policy –Summary of Policy, Evidence and Validation Requirements (July 2023 updated September 2025)*. The information will be critically reviewed by the LPA, particularly as evidence shows that it is technically possible to achieve all the policy requirements and at a reasonable cost in most development typologies. It is generally only high-rise blocks of flats that would need to use the offsetting mechanism.

If the offsetting mechanism is justifiably triggered by non-compliance with Requirement 4, then the development proposal must still meet the other Policy requirements 1, 2, 3 and 5, and maximise on-site renewable energy generation. By considering solar PV at the very earliest of design stages, it is possible to optimise roof shape and orientation to maximise output. How well a roof space is designed and utilised for PV can be expressed in kWh of energy generated per m^2 of building footprint. The Solar Design Guide (Sept 2022) on the Essex Design Guide provides further advice on how to maximise solar PV on buildings.

The offset mechanism is expressed as a renewable energy offset and the price is set in £/kWh, which will be reviewed at least every 3 years and updated for Essex (and published on the Essex Design Guide[9]). The price (as of September 2025) is set at £1.82 per kWh and has been calculated using a robust methodology based on the cost of providing roof top solar PV in Essex and incorporating an allowance for maintenance and administration. The calculation of the contribution required will be made at the point a planning application is determined using the most up to date offset price (£/kWh) for Essex.

The offset contribution will be used to fund additional renewable energy capacity elsewhere in the plan area or County. The aim is to make up for the shortfall in renewable energy that cannot be generated on-site. The offset mechanism is purposely limited in role and scope and is only intended for use as a last resort.

The offsetting mechanism meets the legal tests for Section 106 in that it is: (i) necessary to make the development acceptable in planning terms; (ii) directly related to the development; (iii) fairly and reasonably related in scale and kind to the development.

Further information on how the offsetting mechanism will operate is available in the Renewable Energy Offsetting Framework[10] published on the Essex Design Guide. Current proposals are for a countywide funding mechanism to be administered by ECC. The Offset tariff will be secured through a planning obligation. It is initially envisaged that the payments will be used to provide roof top solar PV on public amenity facilities (to be determined). Spending of the offset fund is preferred to be within reasonable distance of the original development, and within the same plan area as the development. However, pooling may be necessary to enable installation of sufficient scale schemes.

4.4.2. Other roof top uses

There may be certain circumstances where it is considered more appropriate for uses other than solar PV on rooftops to be delivered. Consideration should be given to the co-benefits

[9] https://www.essexdesignguide.co.uk/climate-change/essex-energy-carbon-evidence/
[10] Available on the implementation resource page: https://www.essexdesignguide.co.uk/climate-change/essex-policy-implementation/

of this on a case-by-case basis in accordance with wider sustainability objectives, but it is envisaged to likely be only in exceptional circumstances.

4.5 Requirement 5: As-built performance confirmation and in-use monitoring

In order for Policy GE1 to be effective, it is important that new buildings deliver their intended performance.

Using predictive energy modelling, such as Passivhaus Planning Package or the Chartered Institution of Building Services Engineers (CIBSE) TM54 (which is a requirement for major applications), will help improve accuracy of energy performance assessments and reduce the potential gap between the design and actual in-use energy. Also, excellent detailed design needs to be matched by high quality construction and commissioning in order for the 'energy performance gap' to be minimised.

The information that must be submitted at completion stage of a development (prior to occupation) to demonstrate to the satisfaction of the LPA that the building / development has been built to the approved design and energy standards, is set out in *Report 2: Essex Net Zero Policy –Summary of Policy, Evidence and Validation Requirements (July 2023 updated September 2025)* and includes the indicators listed in Table 1 below:

#	**Table 1: As-built stage performance indicators** (Required information to be submitted at completion, prior to occupation)
1	**Update parameters** • Use or typology • GIA (m^2) • Energy supply (fossil fuel free?)
2	**Update performance modelling** • Space heat demand using predictive energy model (kWh/m^2/year) • Energy Use Intensity using predictive energy model (kWh/m^2/year) • As Built stage EPCs (U-values and airtightness check) • Draft DEC for non residential (regardless of user)
3	**Confirm renewable energy installation** • Installed solar PV (kW_p) • Any other installed renewable (i.e solar thermal)
4	**Update offset contribution** • Assess energy balance based on data supplied and confirm whether any offset payment is required, and how much
5	**Confirm process for collecting 'in use' data** • Confirm if in-use monitoring and reporting will be carried out • If yes, state what monitoring strategy is in place and confirm how data collected will be published

**Note* *that for performance modelling (indicator 2), Minor applications following the "minimum standards approach" (without an energy model), do not have to report their space heat demand, energy use intensity and offset contribution at as-built stage. Applications instead need to re-confirm the specifications to which the development has been built to. Further guidance is provided below under 'Reporting and Modelling'.*

In-use energy monitoring (also known as post occupancy evaluation) is recommended to be carried out on new developments so that a building can be evaluated to ascertain whether the energy targets aimed for in the design have been met in practice.

For residential development proposals of 100 dwellings or more, the Council requires in-use energy monitoring to be undertaken on a representative sample of at least 10% of homes for a period of 5 years. The information must be evaluated to understand how buildings are performing, minimise the performance gap, and to aid the learning, innovation and skills development in the design and construction industry. Qualitative feedback from building users via occupant satisfaction questionnaires should also be undertaken to assess

performance post occupation. This information can be used to enhance the training and advice given to residents / occupiers of new homes and buildings.

4.6 Reporting and Modelling

Policy compliance will need to be demonstrated through the submission of an appropriate energy assessment, which for major development proposals should be in the form of an Energy Strategy and for minor development proposals the applicable Essex Energy Reporting Spreadsheet (which is available to download from EDG). Minimum information requirements and checklists for Major and Minor development proposals at each stage of the planning process are set out in *Report 2: Essex Net Zero Policy –Summary of Policy, Evidence and Validation Requirements (July 2023 updated September 2025)*.

Major Development proposals are:

- For housing development - where 10 or more homes will be provided, or the site has an area of 0.5 hectares or more.
- Non-residential development - an additional floorspace of 1,000m2 or more, or a site of 1 hectare or more.

Minor Development is less than 10 dwellings or less than 1000m^2 of additional floorspace.

With regards major development proposals, predictive energy modelling, such as Passivhaus Planning Package (PHPP) or CIBSE TM54, should be used. This will provide the necessary assurance to the LPA of the accuracy of the energy assessment information and will help reduce any potential energy performance gap issues, which is where in-use energy does not match the design standard.

To support the transition of small / medium developers who may have not yet invested in predictive energy modelling software, the Essex Energy Tool[11] has been developed as an interim measure. This tool can accommodate the outputs of the Building Regulations compliance software (known as SAP – Standard Assessment Procedure) and turn them into an appropriate format to indicate whether compliance with the policy requirements has been achieved. It is available to download from the Essex Design Guide.

With regards minor development proposals, applicants may use predictive energy modelling, or the Essex Energy Tool as outlined above, or follow a 'minimum standards approach' which sets out the specifications that the development must be designed and built to. These fabric and systems specifications are presented in Table 2 (below). By following this approach (i.e. without an energy model), minor applications do not have to report the space heating demand, energy use intensity and offset contribution, but they do need to re-confirm on completion the specifications that the development has been built to and the solar photovoltaic system installed.

[11] Available on the implementation resource page: https://www.essexdesignguide.co.uk/climate-change/essex-policy-implementation/

Table 2 – Minimum Standards Approach Specifications (Residential)

Residential Developments		Block of Flats – Low Rise	Detached, Semi-Detached and Terraced Houses	Bungalow
Fabric	Floor U-Value	≤ 0.10	≤ 0.10	≤ 0.10
	External Wall U-Value	≤ 0.14	≤ 0.13	≤ 0.12
	Roof U-Value	≤ 0.11	≤ 0.11	≤ 0.10
	Windows U-Value	≤ 0.90	≤ 0.90	≤ 0.90
	Windows G-Value*	0.45 - 0.55	0.45 - 0.55	0.45 - 0.55
	External Doors** U-Value	≤ 1.2	≤ 1.2	≤ 1.2
	Thermal bridging (W/m^2K)	≤ 0.04	≤ 0.04	≤ 0.04
	Air Permeability	≤ $1m^3/m^2h$ @ 50 pascals	≤ $1m^3/m^2h$ @ 50 pascals	≤ $1m^3/m^2h$ @ 50 pascals
System	Ventilation System (VS)	Mechanical Ventilation with Heat Recovery	Mechanical Ventilation with Heat Recovery	Mechanical Ventilation with Heat Recovery
	VS Heat Recovery Efficiency	≥ 90%	≥ 90%	≥ 90%
	VS Specific Fan Power (W/l/s)	≤ 0.85	≤ 0.85	≤ 0.85
	Space Heating System (SHS)	Heat Pump	Heat Pump	Heat Pump
	SHS Flow Temperature	≤ 45°C	≤ 45°C	≤ 45°C
	Domestic Hot water system	Heat Pump	Heat Pump	Heat Pump
	Lighting Efficacy (lm/W)	≥ 95	≥ 95	≥ 95

**The specified G-value range (0.45–0.55) allows for design flexibility to account for variations in window specifications, façade orientation, and shading strategies. **External door refers to a door that leads directly to the outside, not to an unheated internal corridor.*

Source: Report 2 - Essex Net Zero Policy Study–Summary of Policy, Evidence & Validation Requirements (July 2023, updated September 2025)

4.7 Alternative routes to policy compliance

4.7.1 Passivhaus

Passivhaus[12] is an international energy standard for buildings. It sets stringent standards on energy consumption for heating and overall energy demand and design requirements to control the quality of the internal environment.

In recognition of the high sustainability standards required to achieve a Certified Passivhaus Classic standard (or higher) scheme and the rigorous quality assurance process that must be followed to achieve certification, Passivhaus is considered an acceptable alternative route to compliance with policy requirements 1 and 3.

Proposals seeking to follow this route will be required to provide evidence from an accredited Passivhaus Certifier that the proposed design would be capable of and is expected to achieve the full certified Passivhaus Classic standard (or higher). The proposals would still be required to meet policy requirements 2, 4 and 5.

4.7.2 BREEAM

The use of BREEAM[13] is encouraged in terms of addressing broader sustainability objectives and providing a level of independent quality assurance for development. However, the use of BREEAM as an alternative approach to policy compliance will not be accepted.

4.8 Extensions and Conversions affecting Existing Buildings (except Listed Buildings)

Development proposals involving existing buildings offer an opportunity for measures to be taken to reduce energy use and carbon emissions, and also to generate renewable energy.

Encouraging proposals for extensions and conversions to be built to the minimum fabric standards (residential) set out in Table 2 (above), will improve the energy efficiency of the existing building and contribute to meeting climate targets. Incorporating and maximising renewable energy generation technology will enhance this further. However, there may be some circumstances where this is not practical and/or feasible, such as a small extension or where the building is overshadowed.

4.8.1 Heritage Assets

Retaining, reusing, refurbishing and retrofitting historic buildings can contribute to meeting climate targets. There are sensitive issues that need to be addressed when it comes to improving the energy efficiency and climate resilience of heritage assets, including potential impact on their setting. Any schemes should have regard to the specific advice and guidance provided in the Essex Design Guide - [Climate Change and the Historic Environment | Essex Design Guide.]

[12] https://www.passivhaustrust.org.uk/what_is_passivhaus.php
[13] https://bregroup.com/products/breeam/

4.9 Monitoring and Implementation

To support the implementation of Policy GE1 in Greater Essex, the County Council will publish Implementation and Monitoring Guidance[14] which will include simple proformas and templates for applicants to use when submitting their energy information. The guidance will help ensure that meeting the requirements of the policy is demonstrated efficiently, effectively and consistently. The Built Environment Planning Unit at ECC is available as a consultee to provide support to Local Authorities with implementing the policy. Arrangements for monitoring compliance of permissions granted will also be published, to give confidence that new homes and other buildings are built to the standards granted consent.

As a minimum, the following indicators will be monitored on new development proposals:

- Space Heating Demand – has the limit been met? (Policy Requirement 1)
- Fossil fuel – is the development fossil fuel free? (Policy Requirement 2)
- Energy Use Intensity – has the limit been met? (Policy Requirement 3)
- Renewable energy generation – is it maximised? And does it at least match predicted annual energy demand? (Policy Requirement 4)
    - Renewable energy offsetting mechanism – is this being used to achieve policy compliance? And has this been justifiably triggered?
- In-use energy monitoring – is this being carried out? What percentage of homes and for how long?

The use of assured performance standards (e.g. Passivhaus) that are accredited and certified independently will also be monitored.

[14] Available on the implementation resource page: https://www.essexdesignguide.co.uk/climate-change/essex-policy-implementation/

5. Mitigating Overheating Risk

When designing new buildings, national planning policy also requires the potential for overheating risk from a changing climate, and the impact this has on the comfort, health and wellbeing of occupiers to be considered.

It is important to take a design-led approach to the consideration of overheating risks, including evaluating the impact of different building materials and features around a building, such as green infrastructure. The Good Homes Alliance have produced a useful tool and guidance[15] to help design teams to identify and mitigate overheating risks at an early stage.

Overheating risk in new residential buildings has partly been addressed by amendment to the Building Regulations in June 2022 (Part O: Overheating Mitigation). Since the compliance tools for Building Regulations are not intended to accurately evaluate overheating, major development proposals are encouraged to use the CIBSE (Chartered Institute of Building Service Engineers) standards TM52 for non-residential development and TM59 for residential development.

Measures to mitigate overheating risk from both current and future climate should be incorporated into the design of the development to help ensure the future comfort, well-being and health of occupiers. Further advice and guidance on good solar design is provided on the Essex Design Guide[16].

[15] https://goodhomes.org.uk/overheating-in-new-homes

[16] Solar orientation | Essex Design Guide and https://www.essexdesignguide.co.uk/media/2565/20220474-essex-solar-design-guide-rev-b.pdf

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