

Hub Guide 12 - Planning and Zero Carbon Development: Challenges and Solutions

This guide sets out some of the problems that local planning authorities face. It aims to bring forward some solutions to drive up development standards in the absence of zero-carbon planning policies. The guide does not aim to address policy development, although there are issues and solutions included that overlap.

This guide has been prepared following a webinar run by the Greater South East Energy Hub in October 2020. Thirty-nine local authority delegates drawn from across the Energy Hub region, working in the fields of local planning, housing, energy, and sustainability, participated in a problems and solutions-sharing session. The Guide reflects the discussion undertaken during the session, along with insights provided through follow-up interviews with some of the participants, and supporting information gathered by the Energy Hub team.

The Greater South East Energy Hub would like to acknowledge and thank the local authorities that have participated and shared their experience, and [BRE](#) for its specific contribution to the guide.

The Energy Hub has developed a series of Hub guides on other topics, which are available on our website www.energyhub.org.uk. If you have any further enquiries after reading the guides, please contact info@energyhub.org.uk.

NOTE: For ease of use, [hyperlinks](#) to key references are embedded within the text.

1. The Challenge

The ability to secure low carbon development, when planning policies and developer building standards have yet to align with local or national net zero carbon commitments.

2. Background

In 2019, the Government signed into law a 2050 net zero carbon target. The [Climate Emergency UK](#) website shows that over 300 local authorities have declared climate emergencies of various shapes, and to varying delivery timescales. Moreover, the number of local authorities with ambitions to cut greenhouse gas emissions, whether from their own property or through their influence in local place-shaping, is likely to be higher than this figure, given the rising profile of climate change as a political issue.

The challenge to shift buildings away from fossil fuels is considerable, whether in the existing stock, or in new build. The [Net Zero Technical Report](#), published by the Climate Change Committee in 2019, reveals that when indirect greenhouse gas emissions are included, buildings account for 26% of total UK emissions. Direct emissions from residential property account for 13%. Direct emissions in buildings result primarily from the use of fossil fuels for heating. Around 75% of the UK's heating demand in buildings is met by natural gas, 8% by oil, with most of the remainder from electricity.

The [Sixth Carbon Budget](#), published by the Climate Change Committee in December 2020, highlights that “the historical failure to ensure that new homes are built to high zero-carbon standards has meant that over a million homes have been built that will require more expensive retrofit in later years and that have higher than necessary energy bills for their occupants.”

Policy context

The energy and carbon national policy landscape is highly dynamic. Statements and publications include: the proposed changes to Part L (conservation of fuel and power) and Part F (ventilation) of the Building Regulations in the [Government’s response to its consultation on the Future Homes Standard](#) in January 2021, the November 2020 [Government’s Ten Point Plan](#) for a green recovery, the Government’s December 2020 [Energy White Paper](#), and proposed changes to the National Planning Policy Framework.

In its response to the Future Homes Standard consultation, the Government states its intention to introduce a performance standard at a level that means new homes will not be built with fossil fuel heating from 2025. An additional interim uplift in Part L standards is expected to produce 31% less carbon emissions compared to current standards, as a stepping-stone to the Future Homes Standard. In its response, the concept of “zero carbon ready” homes has been introduced, with the rationale that “in the longer term, no further retrofit work for energy efficiency will be necessary to enable them to become zero-carbon homes as the electricity grid continues to decarbonise.”

At present, local planning authorities may include policies in their local plans, that require developers to comply with energy-efficiency standards for new homes, that exceed the minimum requirements of the Building Regulations. However, a Ministerial Statement was published in 2015, which prevented local planning authorities setting energy efficiency standards above Level 4 of the now-withdrawn Code for Sustainable Homes, equivalent to a 19% improvement on the Part L 2013 standard.

The Government’s response to the Future Homes Standard consultation has indicated that in future, developers would be required to build to a single, higher standard to be applied consistently across England, and that “it is less likely that local authorities will need to set local energy efficiency standards in order to achieve our shared net zero goal.” It is worth noting that this position is at odds with recommendations from the Climate Change Committee in its December 2020 report, [Local Authorities and the Sixth Carbon Budget](#), which states that national government should be engaging with local authority zero-carbon delivery strategy, “to align and clarify national, sub-national, regional and local delivery roles and areas for collaboration. It should provide clear outcomes and direction to reduce uncertainty, provide additional powers where needed, identify public and private investment, and enable flexible delivery at the faster pace of ambitious areas. This should allow them to set higher standards through the planning system.”

Evidence put forward by some local authorities in the Greater South East Energy Hub region, and others nationally, calls into question the longer-term effectiveness of the proposed Future Homes Standard to deliver net zero development. Meanwhile, in the short term, a gap exists between what developers will be able to build to up to and beyond 2025, and the net zero carbon ambitions of local authorities. This gap will place an additional retrofit burden onto the already huge challenge of improving the existing housing and commercial property stock.

It is also recognised that, where the planning process could be used to influence net-zero development standards, the policy-making process works according to a set cycle and pace, which may not synchronise with national or local net-zero policies.

However, in the context of new development, there is still benefit in considering what action local authorities can take to improve energy and carbon performance, using their existing interactions with developers, as an opportunity to push standards higher than current planning policies or Building Regulations.

What are local authority officers saying to the Energy Hub?

In their day-to-day work, planning officers face developers across the negotiating table and see proposals which in some cases barely meet current Building Regulations. Yet planning officers know that local politicians have declared far more ambitious commitments to achieve net zero carbon reduction ahead of the national target. It is evident from the Energy Hub's discussions with local authority officers, all of whom are involved in negotiating new-build standards, that without the planning policies and tools to meet these higher ambitions being available to them, they face a significant challenge.

What benefits are offered by building to higher standards?

- New developments help to secure area-wide net zero carbon commitments by not adding to an area's carbon budget.
- Energy consumers use less fossil-fuel energy and thereby reduce greenhouse gas emissions.
- More thermally efficient homes and business properties reduce energy costs, with particular benefit gained by vulnerable households and businesses, whose proportion of energy spend compared to total household budget or operating cost is higher.
- Vulnerable households and businesses have reduced impact on the public sector (national and local) budgets and service delivery needed to support them.
- The need to retrofit, and the associated higher net cost and intrusive disturbance to properties, infrastructure, and the public realm, is avoided.

There is also clear evidence set out in Climate Change Committee's report, [Local Authorities and the Sixth Carbon Budget](#), that addressing the challenge of delivering low-zero carbon development can help to alleviate fuel poverty and improve air quality and health.

3. Issues Faced by Local Planning Authorities

In the context of current development control policy and Building Regulations, a gap exists between the ambition of local authority zero carbon commitments and the actuality of current standards adopted by some developers.

The need to close the gap between current planning policy and zero carbon ambitions has been echoed by the UK Green Building Council, which has expressed a call to action for planning officers to challenge developer building standards. It is worth noting that the UK Green Building Council has recently updated its [New Homes Policy Playbook](#).

The following cases studies illustrate the challenges faced by some local planning authorities:

Case Study 1: Residential Development

The development is 1,375 dwellings as part an urban extension. The local authority does not have a policy which specifically requires standards above Building Regulations. However, it does have a policy which states that developments should incorporate the principles of sustainable design and construction, in accordance with recognised, appropriate national standards and codes of practice, to cover energy and carbon emissions, seeking, where feasible and viable, carbon neutral development, low carbon sources and decentralised energy generation.

There are four phases to the proposed development. Phase 1 has been put forward by the developer with a design that that complies with the prevailing Building Regulation standard for carbon emissions. The first phase of 291 houses will be heated by gas. The developer is proposing a single 24kWp solar array on one building in the first phase, to achieve the Target Emissions Reduction required under Code L of the regulations. The developer claims that future development phases would bring the standards up towards net zero, predicated on improvements to Building Regulation standards over time. However, the developer has not made any formal commitment to ensure that these standards will be achieved.

What was requested of the developer and what standard did the local planning authority wish to achieve?

The local planning authority wanted to meet their net zero ambitions, and for the development to be designed with improved thermal performance and without gas heating.

During negotiations, the local planning authority asked the developer how it would achieve the wider national and local context of a net zero ambition. However, the developer stuck to their proposal for compliance with prevailing Building Regulations only. The local planning authority then highlighted to the developer the UK Green Building Council Policy Playbook and the Code of Sustainable Homes (now defunct although still widely acknowledged as a relevant benchmark). The authority also pointed to a publication that the developer had sponsored on how to achieve zero carbon development.

What the response of developer?

The developer is promising that it is going to address the local planning authority's concerns, but the authority has not received any evidence of that yet. The developer has stated that it would make the homes "heat-pump ready" with changes to the central heating distribution system. However, the developer has not considered the need for additional space requirements to accommodate the heat pump and thermal store, nor the changes that would be required to the electrical design. The developer said that they would leave any other measures to the homeowner to take forward post-occupancy.

How did that impact on the development?

Local planning authority-developer negotiations are still ongoing. The local planning authority hopes that the developer will deliver on its promises.

Wider learning

Planners are required to have a broad general knowledge, but rarely have the depth of technical understanding of energy-related issues to be able to negotiate on a level playing field. This case study demonstrated the value of being able to call upon technical expertise to challenge the developer's resistance to adopting higher standards and to influence the developer's thinking. In the words of the local planning authority case officer, "such specialist knowledge helped to shine a light on the shortcomings of the scheme."

BRE accords with this view, stating that it is vital that local authority planners have some understanding of energy-related issues and how they relate to development planning and place-shaping. This is to enable planners to confidently uphold local plan policy where such standards like [BREEAM](#) are being applied. A [briefing on the legislative and policy requirements concerning planning and climate change](#) by the [Royal Town Planning Institute](#), the [Town and Country Planning Association](#) and [Client Earth](#), is available to local planning authorities.

Case Study 2: Commercial Development

The proposal is to develop commercial units across a site. Part of the land also benefits from Enterprise Zone status. An outline planning consent was granted across the site, which sought to allow flexibility to the developer to respond to market conditions and self-determine the mix of uses.

What was requested of the developer and what standard did the local planning authority wish to achieve?

The outline consent included a condition for the development to be constructed to at least BREEAM Very Good standard or equivalent. Another condition required submission of an energy strategy as part of the reserved matters, to identify and include, where feasible, low carbon and renewable energy

technologies in respect of any building, to ensure energy and resource efficiency practices would be incorporated into the development. This latter condition was attached to reflect what had been agreed in the design code, which was also in place.

What the response of developer?

The developer submitted an energy strategy as requested. This did set out what is referred to as “Be Lean and Be Clean” measures, but proposed no “Be Green” measures, that is no integration of any low or zero carbon technologies, despite the strategy saying that there were feasible options.

The developer argued that since this was a speculative build model, the requirement of the individual occupiers was unknown. Therefore, the integration of any low or zero carbon technologies would be left to the tenant. The view of the local planning authority was that there would be little incentive for tenants to do this on a long-lease arrangement, and by discharging the planning condition, the local planning authority would have no further control over ensuring that this happened.

The local authority also tried to encourage the developer to consider the energy strategy in context of national and local industrial strategies, the locally-declared climate emergency, and the potential for the development to be jointly promoted as an exemplar business park development.

How did that impact on the development?

The local authority could not hold up development, and from a technical perspective the developer was adhering to the wording of the design code and planning conditions. The local authority decided to take a pragmatic approach and accepted the developer’s proposal to encourage tenants to install low or zero carbon technologies during fit-out. The local authority agreed to work with the developer as part of ongoing support for tenants, for example by putting forward green lease options for the current phase, noting that this was outside of the planning process. Furthermore, the local authority stated its expectation that the developer should commit to providing low or zero carbon technologies as part of shell and core build in future phases, to which the developer agreed.

Wider learning

This question of whether low or zero carbon technologies should be considered in the scope of speculative projects (shell only or shell and core developments) is one that often gets asked of BREEAM’s technical support service, in relation to the Low Carbon Design issue in some of the BREEAM schemes. BRE currently takes the view that low or zero carbon technologies should be included within the scope of a shell and core and fully-fitted development, and award credits on this basis, even when installed capacity is modest. For shell-only buildings, BRE has published a [note on compliance](#) on its online Knowledge Base.

Building Regulations

Although not directly relevant to the planning process, it is worth noting the impact of current Building Regulations standards where they are being applied, whether correctly or possibly otherwise, to new housing developments. In [SAP 10](#), the upcoming version of the current [Standard Assessment Procedure SAP 2012](#), many of the fuel types recognised in SAP 2012 have had their fuel prices, carbon and primary energy factors changed, with the most significant being the updating of the electricity-related carbon emissions factor, reducing from 0.519 kgCO₂/kWh to 0.233 kgCO₂/kWh, compared to mains gas at 0.210 kgCO₂/kWh. This reflects the increased influence of renewable energy technologies in grid connected power generation. There may also be issues with the incorrect use of emission factors, with some calculations being based on out-of-date values, following the adoption of SAP 2012 methodology.

This has encouraged developers to shift away from gas to electric heating, which leads to the conclusion that developers are achieving the carbon target set for the new home in Building Regulations by using electric heating, but with minimal additional fabric efficiency or onsite low or zero carbon heating and power technologies. Given the higher costs of direct electric compared to gas heating, this runs the risk of increasing occupants' energy costs.

Standard Assessment Procedure can have a material influence on technology uptake through the technologies it includes and excludes from the methodology. For example, whilst technologies such as solar photovoltaics are incorporated, solar thermal is not yet fully valued in the Standard Assessment Procedure methodology. As a result, local planning authorities are seeing some developers 'cherry pick' measures to achieve emission reduction, rather than taking a fabric first approach.

Taxation and revenue generation from renewables

One local authority cited the fact of business rates being applied to solar photovoltaics as a disincentive to developers as part of shell and core build out. Since April 2017, there have been substantial increases in business rates for organisations with their own rooftop solar. The Government has been consulting on business rates and considering various proposals on how the business rates system might support decarbonisation. The outcome of the consultation is awaited.

Part of the reason why developers may resist installing renewable technologies is that, in the opinion of some, the energy performance of a property may not attract a premium on the building purchase or rental value, despite the fact that if low or zero carbon technologies are well designed and maintained, they should help to reduce the running costs to the occupier. Furthermore, it is generally not in the business model of most developers to retain a long-term financial relationship with the buyer.

There is some evidence, for example in [a case study produced by BRE](#) and from the [financial-services sector](#), which shows that higher energy-efficiency standards have a positive financial impact on the running costs and sales value of buildings.

The EU-wide [REVALUE](#) project demonstrated the need for real estate valuations to better reflect energy performance, to better inform the market. Furthermore, the study refers to recent academic work, which indicated that there is indeed a link between energy efficiency levels and residential property transaction values, with more efficient stock commanding higher rents and sale values. Papers by [CIBSE](#), [BRE](#) and the [UK Green Building Council](#) have also highlighted that more sustainable build standards can add value to commercial property.

Solutions

In the absence of up-to-date zero carbon planning policies, the question is: what can local planning authorities do to raise the energy and carbon performance of developments towards net zero? Two case studies show what is possible:

Case Study 3: East Hampshire - Quebec Park and Prince Phillip Park, Whitehill and Borden

Currently, there is a disconnect between design and actual build quality. This case study provides a model to address this problem. The project comprises of 3,350 homes planned over 15 years. The local authority always had a vision for a sustainable community, with this development previously designated as an eco-town. Throughout, the development partners were taken along with the vision.

With the loss of the Code for Sustainable Homes and Zero Carbon standard in 2015, the local authority's approach focused on the performance gap. The challenge was to raise building energy performance in the absence of sustainability codes. The local authority looked for a way to ensure confidence that homes would perform as proposed at the design stage.

What did the Local Planning Authority do as a solution to the challenge?

Working with the [National Energy Foundation](#) on the Quebec Park development, the developer has been encouraged to follow the organisation's [Assured Performance Process](#). For Prince Phillip Park, the local planning authority has employed a [Section 106 agreement](#) to ensure that the developer will monitor 10% of homes post-occupancy to understand how they are performing.



Assured Performance Process: Image courtesy of National Energy Foundation

What was the response of the developer?

The Assured Performance Process approach was agreed for Quebec Park through the Section 106 agreement. Early indication is that the performance gap has been reduced.

The developer of Prince Phillip Park agreed to a Green Measures Strategy within the Section 106 agreement. Uptake by residents for energy monitoring has been good. This has further enabled engagement with them on energy efficiency, although at this time no data is available to confirm that the trial has been successful.

What was critical to making it work, or work in part, or not?

The Section 106 planning agreement was the hook, along with buy-in from the developers. It has been crucial for the local planning authority to work with the developers and ensure that the approach to energy performance was not a tick-box exercise. For Quebec Park, the local planning authority is looking to work with developers over the life of the development. One of the builders comes from the registered provider housing sector, is new to the private house building market and wants to build to higher standards for their brand reputation. National Energy Foundation provided its Assured Performance Process tool, and some carbon offsetting funding was allocated through the Section 106 agreement, which could be used on wider environmental improvements, including offsite retrofit, streetlighting and solar photovoltaics.

For Prince Phillip Park, the developer is required to demonstrate for each plot how they are closing the performance gap, and where they find issues the developer is required to address them. No raw data will be made publicly available, to avoid perceived reputational issues for the developer. However, the local planning authority has developed an open and transparent relationship with the developer and is confident that this process can influence the wider development.

Wider learning

These solutions require local planning authorities to expend time, effort and money which are commodities that are lacking. Additional resources would support the journey beyond current regulation and policy.

The schemes benefitted from a clerk-of-works role to scrutinise designs to see what gaps existed and to check on what was being done by the builders. This feedback loop on performance has been essential. A simple example of this is the application of Building Regulations to insulation. As the local planning authority officer involved in the project explained: "The question asked by Building Regulations is: "Is the insulation in?" and the answer may be "yes". But with the clerk-of-works inspection, the question is: "How well has the insulation been put in?" The answer may be different."

Ongoing post-occupancy monitoring has been challenging. Simple things like replacing flat batteries in energy monitoring equipment is under the control of residents. Handing out free batteries as well as offering free Wi-Fi and shopping vouchers, funded by the Section 106 developer contributions, has

helped to sustain high levels of participation.

Another question is [how data is collected for the regulated and unregulated energy](#) split to match Building Regulations modelling; total operational energy is made up of regulated components, including heating, cooling, hot water, fans, pumps and lighting, and unregulated ones, such as IT equipment. There is also a need for a good selection of different occupancy behaviours to understand how the buildings perform. BRE considers that having more realistic estimates of unregulated energy use is key. For domestic projects, the use of [BREDEM calculation methodology](#) would help to provide a more realistic estimate of unregulated energy use. The [Home Quality Mark](#) uses BREDEM to refine Standard Assessment Procedure outputs to provide a better estimate of actual energy use.

One of the barriers to applying the approach adopted in this case study is the potential that evidence of poor quality will reflect negatively on the developer, affecting brand liability and financial value. Arguably, this should be the case, but it is important to get builders to participate in a positive, open way.

Case Study 4: West Oxfordshire - Salt Cross Garden Village Area Action Plan

The local authority commissioned an independent assessment for a proposed garden community development to assess the uplift cost of building to net zero. To enable this, the local planning authority considered assessing the uplift cost of retrofit to zero carbon at a later stage, that is, the cost burden to the local area if the development was not built to zero carbon as new. The local authority sought expert advice from green engineering consultancy [Elementa](#) to review the financial viability of net zero in line with the [London Energy Transformation Initiative](#) (LETI) definition so that it is an all-encompassing standard.

The resulting Elementa report analysis shows that “for a semi-detached house (albeit the same principles apply to all domestic buildings) that the costs of achieving a specific standard during new build are around a fifth of those required to achieve this standard during retrofit.”

The local authority is now preparing for the Examination in Public hearing and is being careful to consider, alongside a capital uplift of net zero, the following factors:

- New build cost now, versus the cost to retrofit all new homes to net zero prior to 2050
- Reduced running costs to occupants of the new homes
- Reduced risk of fuel poverty.

4. Different Ways of Achieving Higher Standards

Building construction monitoring

Quality Assurance and post-construction monitoring, as suggested by Case Study 3, are crucial to successful construction. BRE considers post-construction monitoring processes as an important part of the development process, which are important to get right to minimise any performance-gap issues. BRE has recently co-launched the [NABERS UK Office scheme](#), with partners at [NABERS](#) and the [Better Buildings Partnership](#), which allows users to measure the actual energy use of offices.

Overcoming issues with SAP

In response to the emissions factors update in SAP 10, some local planning authorities, such as the Greater London Authority, are banning direct electrical heating and ensuring that developers do not revert to gas heating prior to the implementation of the Future Homes Standard. This should be underpinned by a drive for higher fabric efficiency standards.

New business and investment models to deliver low or zero carbon technologies

To overcome resistance from the developer, landlord or tenant, to investing in low or zero carbon technologies, a third party could invest or invest-operate-maintain as potential, alternative financing or delivery models. Commercial entities may be attracted to invest and/or operate where the commercial returns are demonstrable, and the scheme fits their business approach. Investment can also be attracted using public sector capital reserve or Prudential Borrowing, while other sources of ethical or community investment are available at low interest rates.

Case Study: West Suffolk Solar for Business

The [West Suffolk Solar for Business](#) scheme was set up by West Suffolk Council in 2015 to help local businesses use an unrealised roof asset, while generating revenue for the local authority to support public services. The local authority organises, manages, and funds the installation, and sells the electricity that is generated to the building user, typically at a 20-30% discount compared to the tariff that they normally pay. This scheme pays back the capital with a rate of return for the local authority and reduces building running costs for the bill payer. West Suffolk Council has applied this approach both to existing and new buildings, with around 50 installations now operating. Suffolk Business Park, Bury St Edmunds is an example where the approach has been applied to a new development.

Case Study: Warrington Working with Plastic Omnium

Solar panels on the roof at French automotive supplies company Plastic Omnium have been installed by Warrington Borough Council following an [agreement with the firm](#). The development forms part of the local authority's investment in renewable energy schemes, which generate a financial return for the authority and follows the enormous success of the installation of solar photovoltaic panels on social housing in Warrington. Warrington Borough Council will own, operate, and maintain the panels, effectively renting the roof space of the building. The panels will provide Plastic Omnium with

discounted electricity, with all profits made by the local authority through the deal ploughed back into delivering vital services.

New business models are appearing, with house builders partnering with others to co-invest in development. In this way, the developer does not have to raise the capital for low to zero carbon heat networks, smart grids, or individual heat pumps, and so this does not hit the house builder's profit margins.

Case Study: Consortium Development

A consortium led by energy and services company [ENGIE](#) will create the design of a Smart Local Energy System that will demonstrate how such a system can reduce carbon and energy costs for residents, whilst providing a catalyst for town regeneration and employment creation.

The [Rugeley Smart Local Energy System project](#) is intended to bring benefits to both the town and the future residents of the proposed mixed-use development at the former Rugeley Power Station site, where ENGIE plans to deliver more than 2,000 new low carbon homes, including later-living communities, as well as a substantial number of commercial buildings.

Residents can either purchase the equipment outright or become members of the long-term Energy Services Company (ESCo) for development. This has already been successful with solar photovoltaic installations. This approach changes the relationship with energy from buying units of energy to buying comfort, warm hours, or cooling hours.

Case Study: Burnside Community Energy

Funded through the Next Generation Innovation Fund in partnership with Igloo regeneration, [Burnside Community Energy](#) aims to develop a business case to supply community-owned renewable energy for a new housing development in Burnside, Cumbria for the benefit of the whole village. Up to 180 new homes are due to be built in the centre of the village. This project aims to supply electricity and heat to the new homes using a combination of local generation and supply/demand balancing. The homes will be all electric (despite a gas supply in the village) using ground/water source heat pumps with inter-seasonal storage feeding a heat network, a solar PV network, electricity storage and EV charging points.

Case Study: Sero Projects

[Sero Projects](#) support developers and home builders to deliver smart energy solutions to their residents. They bring knowledge and finance to remove the risks and challenges around carbon reduction and "enable developers to make the most of renewable energy through seamlessly integrated energy storage in homes, using energy when it's low cost and low carbon."

Viability cost assessment

The [costs and benefits of tighter standards for new buildings](#) were the subject of research commissioned by the Climate Change Committee in 2019. The study found that the “carbon penalty for delayed action is significant”. For example, a semi-detached home built in 2020 with gas heating¹ and retrofitted with an air source heat pump in 2030, can be expected to emit over three times more carbon (9-10 tonnes) over 60 years than if the heat pump was installed when the house was built. The study goes on to say:

“If 300,000 homes are built annually by the mid-2020s, each year of delay in adopting lower-carbon heat technologies could result in several million tonnes of avoidable carbon emissions, even if the technology were to be retrofitted after only 10 years.

Tighter fabric standards deliver a range of benefits. While low-carbon heat delivers very substantial benefits, even at current efficiency levels, there are several material benefits from tightening fabric standards alongside the installation of low-carbon heat:

- Further savings in running costs can be achieved (around £30-£40 relative to installing a heat pump alone), while also improving the quality of the internal environment
- Reduced energy consumption reduces the quantity of low-carbon energy required to meet UK demand.
- Ultra-high energy efficiency standards, installed alongside an air source heat pump, represent a 1-4% uplift on build costs relative to a home built to current regulations”.

The key findings of the Climate Change Committee research were as follows:

- Additional costs of the more energy-efficient standards are between 3% to 5% of total build costs.
- The additional cost of tighter space-heating standards are predominantly a result of fabric improvements and introduction of Mechanical Ventilation Heat Recovery.
- A significant (up to c.£2,000) saving in the capital cost of the heating distribution system helps to offset the additional costs associated with the most energy-efficient fabric specifications.
- The additional costs of installing an air source heat pump in place of a gas boiler are c.£2,500. This includes the heat pump, power supply, hot water store and larger low temperature radiators, the additional cost includes a saving of c.£350 per home for avoided gas connection costs.

¹ The Part L 2013 notional specification was used as the baseline from which cost variances were assessed.

This research pre-dates the proposals to change Building Regulations through the implementation of the Future Homes Standard.

Gearing up for compatibility, build for deployment

Although not directly addressing decarbonisation at the time of development, if a developer is not prepared to install the low to zero carbon technology for heating, is there a way to negotiate small additional design and build changes to accommodate future technologies?

The Climate Change Committee research found that targeted preparatory measures in new buildings can significantly reduce retrofit costs.

“The installation of radiators and hot water stores (where used) that are compatible with low temperature heating can reduce the costs of retrofitting an air source heat pump by £1,500-£5,500, depending on house type, at a capital cost of £150-£500 per home. Low temperature radiators will also provide a small improvement in the efficiency of a gas boiler prior to the retrofit of the air source heat pump (assumed to be around 3%).”

Using the existing planning tools

The development planning procedures provide an opportunity to establish checkpoints and reminders for developers, that the local authority is wishing to move developments to net zero. The validation process could include questions about net zero, which although not a legal requirement, provides a means of evidencing the gap between the developers’ ambition and that of the local authority.

One idea raised by West Oxfordshire District Council is that planning committees should hear evidence of the wider retrofit cost when planning applications are being considered, so that the committee members are fully cognisant of the implications of not building to net zero. This approach would give committees explicit evidence to be able to consider the cost burden and associated disruption of retrofitting that would be borne by the local community, not the developer.

The ‘planning advisory’ issued alongside the planning permission can act as a means of marking the direction that the local planning authority wishes to go. Although it carries no weight in law, it gives the developer visibility on the local authority’s long-term thinking at the time. Although yet to be challenged by a developer, one local authority employs the following standard text:

“ABC Council has declared a Climate Emergency in 2019 and have an aspiration to be Carbon Neutral by 2030. This will include encouraging activities, developments, and organisations in the district to adopt a similar policy. This council is keen to encourage consideration of sustainability issues at an early stage, so that the most environmentally friendly buildings are constructed and the inclusion of sustainable techniques, materials, technology etc. can be incorporated into the scheme without compromising the overall viability, considering the requirements to mitigate and adapt to future climate change.

Prior to the commencement of development, a scheme for the provision and implementation of water, energy, and resource efficiency measures, during the construction and operational phases of the development shall be submitted to and approved, in writing, by the Local Planning Authority. The scheme shall include a clear timetable for the implementation of the measures in relation to the construction and occupancy of the development. The scheme shall be constructed, and the measures provided and made available for use in accordance with such timetable as may be agreed.

The Sustainability & Energy Strategy must be provided detailing how the development will minimise the environmental impact during construction and occupation (as per policy CS3, and NPPF) including details on environmentally friendly materials, construction techniques minimisation of carbon emissions and running costs and reduced use of potable water (suggested maximum of 105ltr per person per day).

The Sustainability and Energy Strategy requires the applicant to indicate the retrofit measures and to include an estimate of the retrofit costs for the properties on the development to achieve net Zero Carbon emissions by 2050. It is also to include the percentage uplift to building cost if those measures are included now at the initial building stage.”

The Planning and Climate Change Law and Policy [briefing](#) developed by the Royal Town Planning Institute, the Town and Country Planning Association and Client Earth provides local authority officers with a basis in law to justify their decisions regarding climate change.

5. Tools, Case Studies and Guidance

The following list of weblinks provides further detail:

- [Parc Hadau net zero carbon housing development](#): One of the world’s first net zero carbon neighbourhoods will be constructed in Wales after Neath Port Talbot Council approved the development of 35 homes able to generate more clean energy than they use.
- [West Oxfordshire Area Action Plan](#): The Area Action Plan has been put in place to guide the future delivery of the 'Salt Cross' development - a proposed new garden village to the north of the A40 near Eynsham.
- [Project LEO Energy Plan](#): An Energy Plan that forms part of the evidence base to support the Oxfordshire Cotswolds Garden Village Area Action Plan.
- [Net-Zero Carbon Viability Assessment](#): A report to clarify and assess the implications associated with meeting zero carbon for new buildings at the Oxfordshire Cotswolds Garden Village.
- [Oxford Brookes Building Performance Feedback and Post Occupancy Evaluation](#): This evaluation uses monitoring and feedback to detect issues in operation, construction and fine tune the building to meet its design targets and close the performance gap between as designed, as built and in use energy performance.

- [Milton Keynes Carbon Offset Fund](#): Administered by National Energy Foundation, the Milton Keynes Carbon Offset Fund is a fund of money resulting from taxes imposed by Milton Keynes Council on developers who construct new buildings in the borough that are not carbon neutral.
- [Cornwall Supplementary Planning Document](#): The *Cornwall Renewable Energy Planning Advice* acts as a material consideration in the determination of renewable energy planning applications in the area. Published March 2016.
- [UK Green Building Council – New Homes Policy Playbook](#): Driving sustainability in new homes - a resource for local authorities VERSION 2.0: January 2021. The Playbook is designed to help enable cities and local authorities drive up the sustainability of new homes. It starts from a position that national policy is not currently delivering what is required from all new homes across the board, from either an environmental or social perspective.
- [Sustainability CIBSE Guide L: 2020](#): Provides building services engineers with guidance on how to respond to the changing sustainability agenda. It describes how they can influence the work done and decisions made by clients and other professionals, and the actions that building services engineers should take to enable their work to deliver sustainable outcomes.
- [LETI Climate Emergency Design Guide](#): LETI believes that by 2025, 100 percent of new buildings must be designed to deliver net zero carbon. The Greater London Authority and its associated plan - The Climate Emergency Design Guide, covers five key areas: operational energy, embodied carbon, the future of heat, demand response and data disclosure.

Legal Disclaimer

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Assumptions used in the calculations set out in this document are for indicative purposes and based on a range of sources including information supplied by partners, industry research and published government data. We are not liable for any errors in calculations or omissions resulting from data provided by the customer or third parties.

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