

Driving sustainability in new homes: a resource for local authorities

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Acknowledgements

This resource is the output of a UKGBC project in association with Core Cities UK. It has been produced through a combination of workshops, meetings, written consultation and individual feedback.

The intention is that key stakeholders feel 'co-ownership' of this resource, and we are grateful to the organisations below for their endorsement. We invite others to do likewise.



A large number of organisations have taken time to feed into the process. A full list can be found on the following slide. However, we are particularly grateful for the extensive time provided by Charlene Clear, BRE and Duncan Price, BuroHappold.

For any queries in relation to this resource, contact John Alker, Director of Policy & Places, UKGBC: john.alker@ukgbc.org



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National Energy Foundation

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PRP

Rockwool

Saint Gobain

St Albans & District Council

Sustainable Homes

UK100

Useful Projects

WSP

Contents

[Click on the live link to be taken straight to that section](#)

[Introduction](#)

Purpose of this resource, background to the work and how it is intended to be used

[Part 1: Policy playbook](#)

What should local authorities do to drive sustainability in new homes and which councils are already doing so?

[Part 2: Viability](#)

How can we use viability calculations to support progressive policy making?

[Part 3: Development case studies](#)

Who is demonstrating leadership and how did they do it?

Introduction (1)

Purpose

The component parts of the resource pack that follows are designed to help enable cities and local authorities drive up the sustainability of new homes. We start 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.

Aiming for consistency

The intention of this resource is to encourage a consistent approach by local government. A consistent approach:

1. Enables local authorities to benefit from shared learning, common resources and mutual confidence
2. Provides stability for industry around the requirements expected from it across different parts of the country, which reduces potential burdens and provides a stable climate for investment in delivering higher standards
3. Can be aligned with national policy in the future, given the commitments made in the Clean Growth Strategy and 25 Year Environment Plan which demands more from new homes in terms of both carbon and wider environmental standards

Some local authorities want to or already are demonstrating leadership through ambitious policy. We recognise this and propose what we believe is a pragmatic way to enable this, whilst avoiding a patchwork of different approaches.

Introduction (2)

How we intend this resource to be used

This is intended as a hands-on resource, designed to be used and adapted to support the 'day job' of officers with responsibility for sustainability, planning, regeneration, housing etc within local authorities. It may be used in the following ways (and more):

- To inform planning policy in relation to sustainability of new homes
- To inform local authority sustainability requirements as a procurer of new homes
- To help positively engage with developers who want to support a local authority's aspirations
- To offer guidance on an approach to providing evidence when challenged on viability

Definition of 'sustainability'

~~In this resource we focus on energy & carbon, mitigating overheating~~ risk, and the cross-cutting issue of assuring performance. It is our ambition over time for these starting points to be the basis of a much more comprehensive approach to sustainability that is required. We believe in a holistic approach, in which new homes support regeneration of the natural environment and provide a high quality of life for residents.

Using and contributing to this resource

This is a journey. The intention is for this resource to be a 'live' document. Not only can we add a broader range of sustainability topics, but provide additional case studies, more shared tools and resources of different types. We intend this to feel 'co-owned' by users and are actively seeking ongoing feedback and engagement:

Requested actions for local authorities

- Consider how and when the recommendations can be incorporated into policy and associated guidance & give us your feedback
- Add to this resource pack by providing links to policies, documents, case studies and evidence
- Open up or maintain dialogue with UKGBC on the status of your current policy, and plans going forwards

Requested actions for developers

- Consider the implications of the policy recommendations for your projects and business model
- Positively engage with UKGBC through membership, to develop further iterations of policy proposals
- Provide additional case studies

Please email john.alker@ukgbc.org

Part 1: Policy playbook

- Overview
- National policy & legal context
- Playbook principles

Overview

Purpose

This section provides the core content of the resource. It is intended to provide a common language for use amongst local authorities in respect of setting policy or related guidance on sustainability requirements in new homes.

It takes often highly technical content and attempts to translate it into a usable “playbook” that is neither too time-consuming nor too complex to engage with.

Contents

(click the links to go straight to the section highlighted)

It is structured as follows:

[National policy and legal context](#)

The latest status of key elements of national policy, and how they relate to what local authorities can and cannot do

[Playbook principles](#)

A proposed response to the reality of different local circumstances within which authorities are operating

[Playbook by topic](#)

Recommended requirements, together with guidance on metrics where appropriate on: carbon and energy demand reduction, mitigating overheating risk, and assuring performance

National policy & legal context (1)

Introduction

A changing national policy context for housing in recent years has led to confusion and uncertainty about what can and cannot be done at the local level to raise the sustainability of new build homes – particularly for energy and carbon. UKGBC explored this in a [Green Paper](#) published in January 2017. The recent policy history and current situation is summarised over the next three slides.

Recent history

In early 2015 the Housing Standards Review reported and Government announced the withdrawal of the Code for Sustainable Homes, except for legacy projects. As a result, a number of changes to existing Building Regulations were introduced, along with new technical optional standards on Access, Water and Space. At the time, the policy for all new homes to be ‘zero carbon’ from 2016 was still in place (despite unresolved issues as to exactly what that entailed).

In a [Written Ministerial Statement](#) (WMS) in March 2015, Government stated that *‘local planning authorities...should not set...any additional local technical standards or requirements relating to the construction, internal layout or performance of new dwellings.’* The exception was energy performance, where the WMS said that LAs would continue to be able to require energy performance standards higher than Building Regulations up to the equivalent of Code for Sustainable Homes Level 4 *‘until commencement of amendments to the Planning and Energy Act 2008’*.

The amendments in question would have removed the ability of LAs to require energy performance standards for new homes that are higher than Building Regulations. It appeared as though they would be enacted at the same time that Government introduced higher energy performance requirements nationally in 2016, through Building Regulations, which according to the WMS were to be *“set at a level equivalent to the (outgoing) Code for Sustainable Homes Level 4.”* However, after the General Election in 2015, Government scrapped the Zero Carbon policy and the planned Building Regulations uplift. However, the powers (to amend the 2008 Act) have not been enacted, and have been superseded by subsequent political announcements.

National policy & legal context (2)

Additional clarity was provided during the passage of the Neighbourhood Planning Bill through the House of Lords on 6th February 2017. Baroness Parminter asked in relation to carbon reductions: *“Can the Minister confirm that the Government will not prevent local councils requiring higher building standards? There is some lack of clarity about whether local authorities can carry on insisting in their local plans on higher standards. Will the Government confirm that they will not prevent local authorities including a requirement for higher building standards?”*

Lord Beecham replied: *“The noble Baroness asked specifically whether local authorities are able to set higher standards than the national ones, and I can confirm that they are able to do just that.”*

Revision to the NPPF and Clean Growth Strategy

On 24 July 2018 Government issued a revised National Planning Policy Framework (NPPF) following a consultation period. The revised NPPF states (Paragraph 150b): *“New development should be planned for in ways that...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.”*

This is consistent with Section 182 of the Planning Act 2008, which puts a legal duty on local authorities to include policies on climate change mitigation and adaptation in Development Plan documents.

Crucially, in its [summary response](#) to the consultation (see answer to Q33), the Government has clarified its position on local authorities setting higher energy requirements than those currently contained within Part L of the Building Regulations:

“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”.

National policy & legal context (3)

UKGBC interpretation

Following a long period of uncertainty, Government has now confirmed that local authorities *can* set higher standards than Part L of the Building Regulations through planning policy.

We believe that the wording of the clarification also allows for local authorities to go further than the equivalent to Code 4 on energy performance should they wish, and where viable.

We make our recommendations on 'baseline requirements' for LAs to introduce in the following sections and make the case for local authorities (outside London) taking a consistent, collective approach.

Local authorities remain more constrained on wider sustainability issues in respect of setting technical performance standards. This is picked up further in discussion around the specific issues in the Playbook.

Playbook principles

Balancing ambition, consistency and local context

- 1) There should be a set of minimum or 'baseline' sustainability requirements for all new homes that all cities and local authorities (LAs) are able to set, regardless of local context. This will provide developers with consistency across local boundaries.
- 2) Our recommendations on baseline requirements for LAs to set now are modest and pragmatic. Over time, the baseline requirements should gradually be strengthened to deliver greater environmental and social outcomes. Their future trajectory should be set out in advance, with clear definitions and interim steps.
- 3) Despite being relatively modest in ambition, the recommended baseline requirements still go beyond what is required through national policy, but in principle national policy should 'catch up' and itself provide that baseline.
- 4) We have considered a set of criteria in making our recommendations. The baseline requirements (now and in the future) need to be technically possible, immediately deployable, economically viable, legally sound. For requirements to strengthen over time as we have suggested, it is highly likely that local authorities will need additional powers.
- 5) Some cities and LAs will want to go further, faster (and several are doing so already). This leadership should be supported. However, to use an analogy, we need to get to the same 'destination' using the same 'road', even if some wish to travel more quickly. We have provided commentary and very high level recommendations on future policy.
- 6) The experiences of those authorities (and developers) who do progress more quickly should be able to inform future policy, through lessons learned.
- 7) Standards for local authorities' own procurement or own land disposal should at least match the baseline requirements set for all homes.

Playbook by topic

For each of the playbook topics currently covered:

1. [Carbon & energy demand reduction](#)
2. [Mitigating overheating risk](#)
3. [Assuring performance](#)

A broadly consistent structure is followed:

- I. **Introduction to the topic**
 - General context and policy drivers
- II. **Policy recommendations**
 - Recommended policy intervention(s) for ‘baseline requirements’, and any associated metrics
 - Explanation & rationale
 - Recommended policy and/or commentary on future direction of travel (if applicable)
 - Indicative trajectory map (if applicable)
- III. **Policy examples**
 - Examples already set by local authorities

POLICY PLAYBOOK: CARBON & ENERGY DEMAND REDUCTIONS

Section contents

I. [Introduction to the topic](#)

- General context and policy drivers

II. [Policy recommendations](#)

- Recommended policy intervention(s) for 'baseline requirements', and any associated metrics
- Explanation & rationale
- Recommended policy and/or commentary on future direction of travel
- Indicative trajectory map

III. [Policy examples](#)

- Examples already set by local authorities

Introduction: carbon & energy demand reductions

The case for carbon reduction measures in the built environment has been proven

As signatories to the United Nations Framework Convention on Climate Change (UNFCCC), Paris Agreement (2016) and through the Climate Change Act 2008, the UK must reduce greenhouse gas emissions by 57% compared to 1990 levels by 2032, and at least 80% by 2050, in order to play its part in helping to reduce the risks and impacts of climate change.

To play its part, and given its potential for cost-effective carbon reductions, all buildings need to be net zero carbon by 2050.

However, the Committee on Climate Change has reported that by 2030, current plans would at best deliver around half of the required reduction in emissions, 100-170 MtCO₂e per year short of what is required by the carbon budgets.

A 36% reduction in UK emissions is required from 2016 to 2030, with approximately a 20% cut in emissions (89 MtCO₂e) required from the buildings sector as a whole. The Committee has made clear that this will require “*stronger new build standards for energy efficiency and low-carbon heat*”.

There is a strong precedent for local authorities taking a lead on emissions reductions in new homes. Section 19 of the Planning and Compulsory Purchase Act (2004), Section 182 of the Planning Act (2008), the Planning and Energy Act (2008), and section 14 of the revised NPPF (2018) all empower Local Planning Authorities to enforce policies which reduce carbon emissions from new homes.

Most recently, in its [response to the NPPF consultation](#), the Government highlights that ‘*local authorities are not restricted in their ability to require energy efficiency standards above Building Regulations*’

The government’s [Clean Growth Strategy \(2017\)](#) specifically highlights the role of local leadership:

*“Moving to a productive low carbon economy cannot be achieved by central government alone; it is a shared responsibility across the country. Local areas are best placed to drive emission reductions through their unique position of managing policy on land, **buildings**, water, waste and transport. They can embed low carbon measures in strategic plans across areas such as health and social care, transport, and **housing**.”* (Clean Growth Strategy, p118. Bold font = our emphasis).

Policy recommendations: carbon & energy demand reductions

Baseline requirements

It is recommended that local planning authorities set a requirement for new homes as follows:

A 19% reduction on the Dwelling Emission Rate (DER) against the Target Emission Rate (TER) based on the 2013 Edition of the 2010 Building Regulations (Part L) whilst meeting the TER solely from energy efficiency measures as defined within the SAP calculation model.

For absolute clarity, the reference to 'solely energy efficiency measures' refers to DER against the TER (i.e. the current requirements of Part L 2013) not to the 19% improvement factor.

In addition, it is recommended that:

Requirements for new homes delivered through local authorities' own procurement processes, and homes built on land disposed of by local authorities should at least match this requirement and where possible act as a trailblazer for higher standards.

Policy recommendations

Explanation & rationale for baseline requirement recommendations

Legally sound

This recommendation is equivalent to the energy performance requirements in Code for Sustainable Homes Level 4. For the reasons outlined in detail in the [section on legal and policy context](#) this recommendation falls well within the legal power of local authorities to implement. Furthermore, a number of local authorities are already incorporating this recommended baseline requirement into policy. This includes Brighton and Hove City Council and Ipswich Borough Council, both of whom have had their policies adopted, which provides a clear precedent.

Built on progressive consensus

This recommendation has been arrived at through extensive consultation with UKGBC's network of developers, architects, engineers, product suppliers and local authorities, who represent a progressive consensus of support. To be clear, there will be opposition to this recommendation from many in the wider housebuilding industry many of whom oppose any attempt to move sustainability standards forwards. Local authorities will need to act collectively and consistently to pursue this recommendation and have confidence that the industry will respond, even if some will only do so reluctantly following a period of challenge.

Pragmatic

This recommendation uses a metric and methodology (i.e. DER, TER, Part L etc) which has limitations, but is understood by policy-makers and the industry alike and is likely to be used in future policy development. The level of stretch required is a subjective judgement based on something that we believe is achievable everywhere, but still moves the industry forward compared to the current national minimum standards. We recognise it does not go as far as (for example) GLA policy, but it is designed to take into account likely land values right across the country.

Policy recommendations

Explanation & rationale for baseline requirement recommendations

Outcome oriented

This recommendation is geared towards overarching carbon reductions in order to focus on outcomes and give the market freedom to design for site specific opportunities and challenges. However, it has an energy efficiency backstop in order to ensure an energy demand reduction first approach in line with the energy hierarchy. We believe this approach is preferable the following:

- 1) Simply asking for design to follow the energy hierarchy, without specific targets designed to reduce carbon and no energy efficiency backstop. This leads to very different interpretations and does not provide clear enough requirements
- 2) “Merton Rule” policies which stipulate only a percentage of energy from renewable sources. We believe our recommended approach better mitigates against perverse consequences and ensures energy is reduced before the use of renewables

Strong precedent (therefore technically feasible & immediately deployable)

Much of the industry has had considerable experience in delivering the Code for Sustainable Homes Level 4 (and equivalent in energy performance), which does not require a radically different approach to design. Our research shows that as of early 2018 there were approximately 107,000 homes in England built to this standard. The [case studies section](#) of this resource pack provides a snapshot of what is being delivered by leading developers, many of whom regularly exceed this recommended baseline requirement as a matter of course. To be clear, there would still be a period of adjustment for others, but one we believe is long overdue.

Policy recommendations

Explanation & rationale for baseline requirement recommendations (continued)

Economically viable

A 19% improvement beyond Part L 2013 can be achieved entirely through energy efficiency measures (enhanced insulation, glazing, airtightness and high efficiency heating and hot water heat recovery). Our discussions suggest that developers feel this approach might cost between £2-3k for a mid or end terraced home up to £5-6k for a detached house. However, for those building to the Part L 2013 notional specification it is possible to achieve a 19% improvement through the use of photovoltaics (PV) or other renewables. A terraced would need around 0.8 kWp of PV with a detached house needing perhaps 1.2 kWp (depending on floor area). The capital costs of adopting a renewables based strategy are likely to be c.£1,500-£2,000 per home.

We do not believe this will impede housing delivery. A modest increase to build costs can be factored into the cost of land acquisition and/or minimised if not entirely eliminated over time through supply chain innovation and efficiencies. Developers already exceeding the baseline requirements recommended simply see this as the cost of doing business. The concept of viability is discussed at greater length in [Part 2](#) of this resource.

There are various studies that can be utilised in considering costs, although most are a few years old given they relate to previous policy commitments by central government.:

[Housing Standards Review Cost Impacts](#) (DCLG, 2014)

[Costs of building to the Code for Sustainable Homes](#) (Element Energy/David Langdon, 2013)

[Lessons from AIMC4: Delivery costs](#) (AIMC4, 2014)

LAs can also make use of existing resources produced by other LAs on viability, to help with both proving precedent and providing a guide on structure/process, e.g.:

[Matter Statement \(Climate Change\)](#) (Cambridge City Council, 2016)

[Whole Plan Viability Study](#) (Milton Keynes Council, 2017)

[Whole Plan Viability Assessment](#) (Old Oak & Park Royal Development Corporation, 2017)

[Whole Plan Viability Study](#) (Ipswich Borough Council, 2017)

Policy recommendations

Future direction of travel

It is recommended that local authorities and/or combined authorities and Mayors commit to a future target of:

All new homes (and buildings) to be net zero carbon emissions in operation by 2030 at the latest.

Net Zero Carbon: A highly energy-efficient building with all remaining operational energy use from renewable energy, preferably on-site but also off-site production, to achieve net zero carbon emissions annually in operation. Based on the following [WorldGBC principles](#):

1. Measure and disclose carbon: Carbon is the ultimate metric to track, and buildings must achieve an annual operational net zero carbon emissions balance based on metered data
2. Reduce energy demand: Prioritise energy efficiency to ensure that buildings are performing as efficiently as possible, and not wasting energy
3. Generate balance from renewables: Supply remaining demand from renewable energy sources, preferably on-site followed by off-site, then offsets
4. Improve verification and rigour: Over time, progress to include embodied carbon and other impact areas such as zero water and zero waste

Policy recommendations

Explanation & rationale for future direction of travel

Science based

This target originates from the work of the World Green Building Council and partners, in particular the [Advancing Net Zero](#) programme. It is based on climate change science, and modelling that demonstrates what is required – globally – to meet the commitments set out in the Paris Agreement. It is important to be clear that this target represents a major leap forward - zero carbon emissions in operation includes all energy used for heating/cooling, lighting, hot water use and small power/appliances. This will require a significant and concerted effort by both industry and policy-makers.

Momentum is building

Despite the major challenge this represents, local authorities who adopt this target will be aligning themselves to a global movement of cities, businesses and third sector organisations who are driving a net zero approach. This is something we believe should be taken up by national government, but in the absence of this, local government will need to take a lead. Even if national government does renew its interest, local leadership will still have a key role to play.

Policy & legal context

It is likely that to actually implement a net zero carbon policy (as opposed to simply signal a commitment to one) further powers would be needed for the majority of local authorities, as per the discussion in the [earlier section](#) on wider policy & legal context.

This will require a constructive dialogue between central and local government, taking all relevant opportunities to clarify powers and obligations, including:

- The revised NPPF
- Review of Part L
- Devolution deals & negotiations between combined authorities and central government.

UKGBC's [Green Paper](#) on local authority leadership discussed this issue in early 2017, much of which still holds.

Policy recommendations

Explanation & rationale for future direction of travel

Defining the target and the trajectory

We recognise that the target as it stands, and the principles of a net zero carbon building which underpin it, are high level. But we believe this is sufficient to enable local authorities to issue a commitment, which acts as a signal of intent to the market.

There is much work to be done to define how a net zero carbon target should be implemented in policy, the milestones needed to get there and the respective roles and responsibilities of different stakeholders. Starting in autumn 2018, UKGBC will initiate two pieces of research to support this, covering:

- 1) Net zero carbon and planning policy
- 2) Industry-led definition for Net Zero Carbon Buildings

The first project will aim to start translating the high level net zero carbon principles into planning policy. The intention is to develop a short paper setting out the key issues for planning authorities looking to adopt the policy and an indicative trajectory for implementation up to 2030.

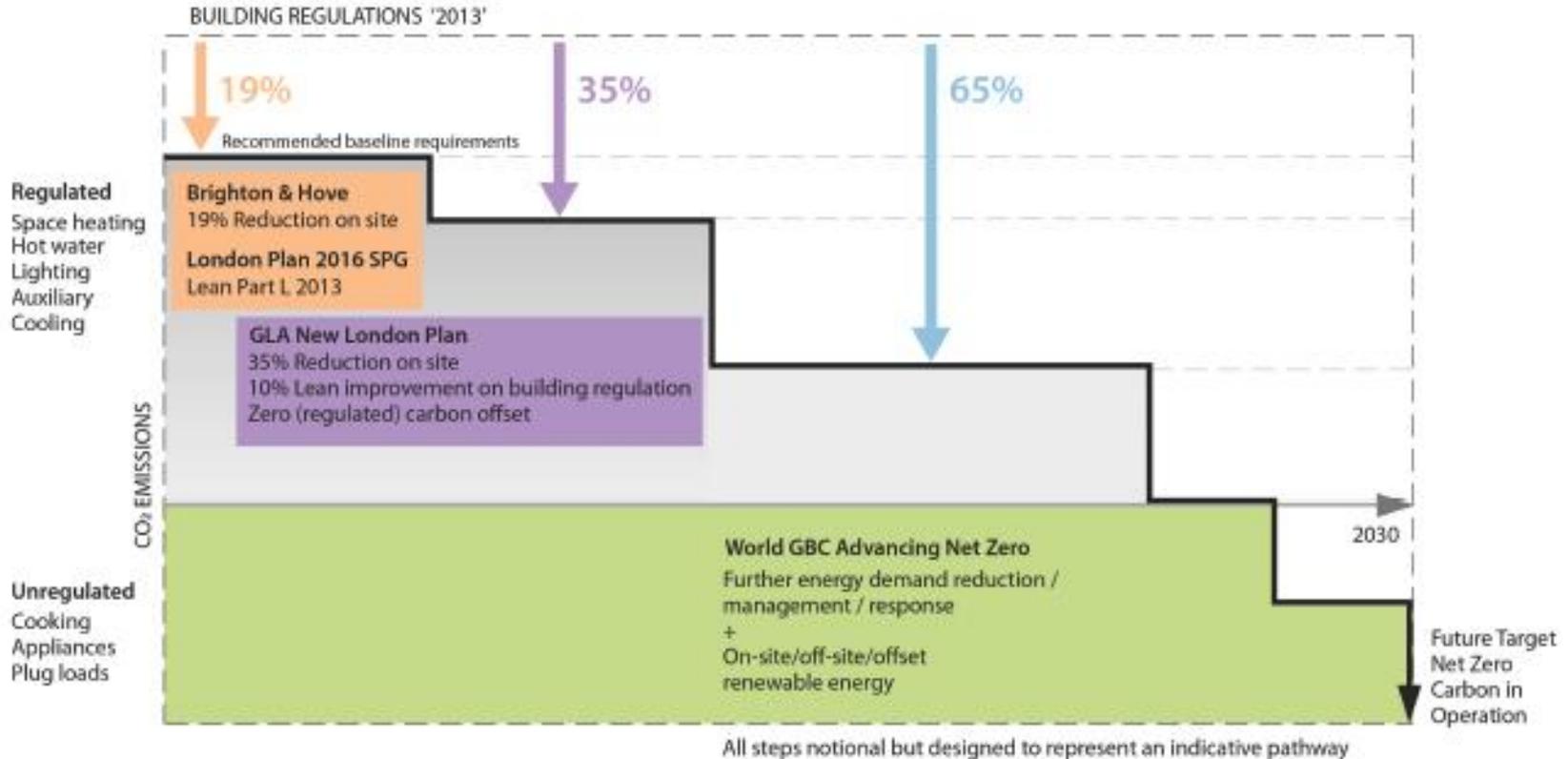
The second project will bring together a broad range of industry stakeholders to agree a framework of principles for net zero carbon buildings in the UK market. These principles will build on existing work and initiatives where available and will address areas such as energy use verification, fabric standards, ventilation, and a renewable energy hierarchy.

Creating this framework will mean addressing some of the following questions, which local authorities should also begin to consider:

- How can smart metering and the Internet of Things be used to demonstrate performance?
- What is the role of local heat networks and how will they become fully zero carbon?
- What is the role of local smart grids and community energy?
- How should demand peaks be managed?
- Do key metrics on carbon need to evolve?
- How can network connections be designed to accommodate onsite renewables?
- How should internal temperatures and air quality be monitored?
- How would renewable energy offsets be managed?

Policy recommendations

Future direction of travel – an indicative trajectory map



Policy examples

Local authorities already applying the recommended baseline requirements

Local authority	Policy summary	Link	Status
Ipswich Borough Council	DM1 New build residential development should achieve reductions in CO ₂ emissions of 19% below the Target Emission Rate of the 2013 Edition of the 2010 Building Regulations (Part L)	Local plan core strategy and policies development plan document review	Adopted February 2017
Brighton and Hove City Council	CP8 Sustainable Buildings - All development will be required to achieve the minimum standards as set out below unless superseded by national policy or legislation...Residential (New Build) Energy Performance 19% carbon reduction improvement against Part L 2013	Brighton and Hove City Plan Part One; Brighton and Hove's City Councils Development Plan	Adopted March 2016
Havant Borough Council	E8 Low Carbon Design – proposals for residential development will be granted where they achieve reductions in CO ₂ emissions of 19% of the Dwelling Emission Rate (DER) compared to the Target Emission Rate of Part L of the Building Regulations	Draft Havant Borough Local Plan 2036	Emerging
Cambridge City Council	In order to ensure that the growth of Cambridge supports the achievement of national carbon reduction targets...all new development will be required to meet the following minimum standards of sustainable construction...unless it can be demonstrated that such provision is not technically or economically viable: On-site reduction of regulated carbon emissions of 44% relative to Part L 2006. (This is equivalent to 19% reduction on 2013 Edition).	https://www.cambridge.gov.uk/public/ldf/coredocs/RD-MC/rd-mc-140.pdf	Emerging

Policy examples

Local authorities going beyond the recommended baseline requirements

Local authority	Policy summary	Link	Status
Guildford Borough Council	D2 Sustainable design, construction and energy (9) - buildings must achieve a reasonable reduction in carbon emissions of at least 20%*. This should be achieved through the provision of appropriate renewable and low carbon energy technologies in the locality of the development. Where it can clearly be shown that this is not possible, offsite offsetting measures in line with the energy hierarchy should be delivered. *20% reduction against the TER set out in 2013 building regulations after energy efficiency has been addressed, in line with the energy hierarchy.	Guildford borough Submission Local Plan: strategy and sites	Emerging
Greater London Authority	S12 Minimising Greenhouse Gas Emissions – Major development should be net zero-carbon...In meeting the zero-carbon target a minimum on-site reduction of at least 35 per cent beyond Building Regulations is expected. Residential development should aim to achieve 10 per cent, and non-residential development should aim to achieve 15 per cent through energy efficiency measures.	New London Plan	Emerging
Milton Keynes Council	SC1 Sustainable Design and Construction - 4.a Achieve a 19% carbon reduction improvement upon the requirements within Building Regulations Approved Document Part L 2013. 4.b. Provide on-site renewable energy generation, or connection to a renewable or low carbon community energy scheme, that contributes to a further 20% reduction in the residual carbon emissions subsequent to a) above. 4.c. Make financial contributions to the Council's carbon offset fund to enable the residual carbon emissions subsequent to the a) and b) above to be offset by other local initiatives.	Proposed Submission Plan	Emerging
GMCA	Greater Manchester Mayor Andy Burnham committed on 21 st March 2018 to the introduction of a zero carbon standard for all new homes and buildings in the updated GM Spatial Framework. The Mayor invited advice on the date at which the standard should come into force.		In development

POLICY PLAYBOOK: MITIGATING OVERHEATING RISK

Section contents

I. [Introduction to the topic](#)

- General context and policy drivers

II. [Policy recommendations](#)

- Recommended policy intervention(s) for ‘baseline requirements’
- Explanation & rationale

III. [Policy examples](#)

- Examples already set by local authorities

Introduction: mitigating overheating risk



There is strong evidence that excessive or prolonged high temperatures in homes can have severe consequences for occupants

Indoor temperature is not just a subject of comfort. There are approximately 2,000 heat-related deaths each year in the UK whilst the 2003 summer heatwave saw more than 35,000 fatalities Europe wide. Summer temperatures in urban areas are predicted to rise between 2 and 4 degrees by 2050, increasing the existing risk posed to the elderly, the young and the sick (those who typically spend most of their time indoors during the day) of suffering from severe heat stress.

There are clear policy drivers to mitigate overheating risk. This includes the [revised NPPF](#) (July 2018), which states:

“Plans should take a proactive approach to mitigating and adapting to climate change, taking into account the long-term implications for flood risk, coastal change, water supply, biodiversity and landscapes, and the risk of overheating from rising temperatures.”

It is also fair to say that increasing levels of building airtightness and fabric efficiency require greater focus on the risk of overheating and strategies to mitigate this. However, we fundamentally believe that it need not be a choice between the two – it is perfectly reasonable to expect efficient, low carbon homes which also minimise

risks posed by overheating. The Zero Carbon Hub published a comprehensive [report](#) on overheating in new homes in 2016.

There are also market trends and drivers which warrant a progressive approach to mitigating overheating risk. Many expect the explosion of consumer interest in health and wellbeing to translate into demand for homes that actively enable positive health outcomes and for this to begin to be a stronger factor in housing choice. See 2016 UKGBC’s [work](#) on this topic.

Policy recommendations

Baseline requirements

It is recommended that local planning authorities develop an overheating risk framework with three core components:

1. Include mitigation of overheating within the local plan, making clear that new development should follow the cooling hierarchy (see existing [policy examples](#)). Provide further guidance on best practice design, either using publications aimed at a national audience ([see examples](#)), or ideally providing locally tailored guidance to take account of climatic and geographical differences.
2. An early screening assessment/score card, used by developers and/or the Local Planning Authority to provide a simple, time-efficient assessment of risk of overheating. This could be locally developed, or could use nationally recognised screening tools such as BRE's temperature reporting tool, currently used as part of the [Home Quality Mark](#) or the [Passivhaus Planning Package \(PHPP\)](#) – which includes summer comfort calculations. A pro-forma could form an appendix to an SPD.
3. When early screening flags a potential issue, we recommend LAs require a detailed appraisal. This would use full dynamic analysis tools to manage and rectify designs that are at significant risk and would need to adopt the methodologies, metrics and KPIs outlined within [CIBSE TM59: 2017 Design methodology for the assessment of overheating](#).

Future direction of travel

As demonstrated in the introduction, mitigating the risk of overheating is now a key policy concern and can be expected to factor increasingly into consumer choice, as part of a wider focus on health and wellbeing.

Future policy might reasonably be expected to have an increased focus on post-occupancy performance of dwellings, enabling real data, or even 'live' data to very tangibly demonstrate the ability of a developer to provide a comfortable indoor environment, including but not limited to temperature. See following section for discussion of assuring performance.

Policy recommendations

Explanation & rationale for baseline requirement recommendations

Built on progressive consensus

This recommendation has been arrived at through extensive consultation with UKGBC's network of developers, architects, engineers, product suppliers and local authorities, who represent a progressive consensus of support. There is widespread recognition within the industry that risk of overheating is a major issue, and we do not anticipate any particular challenge to LAs taking a leadership position on this topic.

Economically viable

The recommendations are designed to front load the discussion so that developers (public and private) can review and design out risk prior to planning submission. Early consideration keeps project team and build design costs down.

Pragmatic & outcome oriented

The recommendations are set out sequentially, but in reality are a closely related package that together form a risk framework for overheating. The 'core' components described as 'baseline requirements' require some upfront investment of time and resource from local authorities, but are relatively light touch to administer and do not pose undue burdens on developers. Early consideration of overheating can bring significant benefits not only to residents, but to public finances through avoiding the costs of ill-health, and ultimately costly retrofits.

Legally sound

We do not consider there to be any legal limitations to these recommendations. If any concerns remain about the WMS 2015, not only does the revised NPPF 2018 make clear the onus on local authorities to address overheating, but providing guidance on designing out risk and requiring a demonstration that appropriate processes have been followed is clearly not a technical standard or performance requirement.

Some local authorities already require evidence of dynamic modelling in cases where there appears to be significant risk of overheating.

Policy examples

Local authority	Policy summary	Link	Status
Brighton and Hove Council	CP8 Sustainable Buildings, policy 2.G.: All development proposals including conversions, extensions and changes of use will be expected to demonstrate how the development... protects occupant health and the wider environment by making the best use of site orientation, building form, layout, landscaping and materials to maximise natural light and heat, whilst avoiding internal overheating by providing passive cooling and ventilation	https://tinyurl.com/y9e8t87c	Adopted March 2016
GLA	London Plan, policy 5.9: Major development proposals should reduce potential overheating and reliance on air conditioning systems and demonstrate this in accordance with the cooling hierarchy	https://tinyurl.com/yd7tgp2r	Adopted (New London Plan emerging)
Milton Keynes Council	Plan MK, policy SC1: Sustainable Construction. Development proposals for 11 or more dwellings are required to calculate Indoor Air Quality and Overheating Risk performance.	https://tinyurl.com/yb97eg19	Planning Inspectorate review
Cambridge City Council	Overheating requirements are included in the Greater Cambridge Housing Development Agency Housing Design Guide. Guidance on the cooling hierarchy will be incorporated into the update to the Council's Sustainable Design and Construction SPD. Developments at perceived risk of overheating can be required to carry out detailed modelling.	https://tinyurl.com/yb6wd7f3	HDA guide published. SPD update forthcoming
London Borough of Islington	A good example of design guidance and an explanation of the cooling hierarchy can be found in "Low Energy Cooling – Good Practice Guide 5".	https://tinyurl.com/yrcfdatd	Published

POLICY PLAYBOOK: ASSURING PERFORMANCE

Section contents

I. [Introduction to the topic](#)

- General context and policy drivers

II. [Policy recommendations](#)

- Recommended policy intervention(s) for 'baseline requirements'
- Recommended policy and/or commentary on future direction of travel
- Explanation & rationale

III. [Policy examples](#)

- Examples already set by local authorities

IV. [Independent Assessment Frameworks](#)

- How tools and systems can help to achieve desired outcomes

Introduction: assuring performance

New homes should perform as intended to

In reality, we know this is not the case at present. Energy used by buildings in operation can regularly be three times higher than predicted at design stage. Although the issue is often highlighted by disparities in energy and carbon performance, this is a cross-cutting problem which equally applies to other sustainability issues – not least those relating to occupant health and wellbeing such as overheating and indoor air quality.

This is an issue which the construction sector has recognised for a long time (and is a topic on which the [Zero Carbon Hub](#) did much to engage the industry), but there remains a long way to go to close the ‘performance gap’. Local authorities can play a crucial role in incentivising industry to overcome this problem and drive an assured performance process, which is essential if policy – including the recommendations we have set out in previous sections – is to have the impact intended.

We are at a time when there is an increased focus on quality for new build homes, most recently the Independent Review of Building Regulations and Fire Safety by Dame Judith Hackitt, but also from consumers (enabled by social media). Standards must be set in a way that supports the culture change required in taking greater responsibility for the performance of homes that are built.

The proposals that follow do not attempt to provide a comprehensive response to this challenge, but are designed to be complementary to the recommendations made in previous sections, and would also complement further iterations of this resource, if expanded to address other issues.

Policy recommendations

Baseline requirements

It is recommended that local authorities require developers to demonstrate that they have acted to close the performance gap. This may be done through:

- a) Demonstration of a developer's own internal processes and quality controls
- b) Demonstration of working within a third party process or system to ensure that standards are met on site. This might include the [BEPIT Better Building Tool Kit](#) or [NEF's Assured Performance Toolkit](#)
- c) Demonstration of certification against independent assessment frameworks would also provide clear evidence of taking performance seriously, e.g. the [Home Quality Mark \(HQM\)](#) and/or [Passivhaus](#) and/or [Energiesprong](#)

Future direction of travel

It is recommended that local authorities signal a commitment to introducing a system of in-use testing and reporting. This would require further consultation and a period of transition, but in essence a proportion of homes in a new development would be tested to gather in-use data and provide a performance report on key factors including but not limited to energy performance, indoor air quality and thermal comfort for a set period of time after occupation.



Policy recommendations

Explanation & rationale for baseline requirement recommendations

Built on progressive consensus

This recommendation has been arrived at through extensive consultation with UKGBC's network of developers, architects, engineers, product suppliers and local authorities, who represent a progressive consensus of support. There is widespread recognition within the industry that assuring performance is a major issue, and progressive developers will support this position – many of whom are pro-actively addressing it through their own POE commitments.

Multiple benefits

Encouraging greater transparency on in-use performance is vital in engaging consumers, while providing clarity to local authorities and investors, and in general creating demand for more sustainable homes.

We believe that reputation will be a key driver for developers in addressing any shortcomings, perhaps ultimately acting as a more effective driver than regulation. Analysis of the data can help all stakeholders make progress on this issue.

Pragmatic & economically viable

The 'menu of options' included in the recommended baseline requirement is a light-touch approach, that carries little or no burden for developers who take the performance gap seriously. The recommended future direction of travel would constitute a significant leap forward for many local authorities and developers, and would need to be done after further detailed consideration of the most cost-efficient means of implementation. Nevertheless, many leading developers are already on this journey with no adverse impact on delivery.

Legally sound

We do not consider there to be any legal limitations to the recommendations on baseline requirements, for a similar reason to that set out in the section on [overheating](#). It is designed to encourage the following of appropriate processes and cannot be considered a technical standard or performance requirement given that evidence of a developer's own internal processes is included as an option. It could be argued that local authorities, through Building Control, are on the front line in assuring performance anyway, and these recommendations are consistent with that role.

The recommendation on in-use testing would require further investigation from a legal perspective (i.e. in relation to WMS 2015, and in relation to data protection issues). We applaud the leadership demonstrated by [Milton Keynes](#) in including a far-reaching policy on this topic within Plan:MK and await the outcome of the inspection process with interest.

Policy examples

Local authority	Policy summary	Link	Status
Milton Keynes Council	Plan MK, policy SC1: Sustainable Construction. “Implement a recognised quality regime that ensures the ‘as built’ performance (energy use, carbon emissions, indoor air quality, and overheating risk) matches the calculated design performance of dwellings...Put in place a recognised monitoring regime to allow the assessment of energy use, indoor air quality, and overheating risk for 10% of the proposed dwellings for the first five years of their occupancy, and ensure that the information recovered is provided to the applicable occupiers and the planning authority.”	https://tinyurl.com/yb97eg19	Planning Inspectorate review
Cambridge City Council	The Housing Design Guide contains guidance on Minimising the performance gap and post construction monitoring and Evaluation, which applies to schemes brought forward by Cambridge City Council	https://tinyurl.com/yb6wd7f3	Published
Newcastle City Council	Newcastle are developing Planning Guidance to support their Climate Change Policy. This includes making provisions to minimise the performance gap and to involve a third party check on post completion performance.		Consultation imminent
East Hants District Council	Planning Guidance was developed for the Whitehill and Bourdon green town development. This included requirements to adopt the Assure Performance process, to mitigate the performance gap.	www.assuredperformanceprocess.org.uk	Established for the specific development

Independent assessment frameworks

Introduction

Paragraph 129 of the revised NPPF (2018) encourages local authorities to use assessment frameworks as tools for improving design quality. This section briefly outlines some of the most commonly used or those which have generated most interest amongst local authorities. It is important to note that these are not necessarily mutually exclusive.

We would welcome additional material and suggestions for tools to include in this section. UKGBC is independent of any one tool, framework or system. The information on the following pages is based on information provided by the tool provider:

1. [Home Quality Mark](#)
2. [Passivhaus](#)
3. [Energiesprong](#)

Home Quality Mark

Overview

The Home Quality Mark (HQM) is part of the BREEAM family of schemes that aim to deliver quality and sustainability in an holistic manner. HQM is consumer-oriented, intended to allow developers to differentiate their homes whilst providing policy makers and specifiers confidence that standards have been met.

- A star rating (out of 5), with three performance indicators (scaled 1-5); My Cost, My Wellbeing, My Footprint, designed to offer consumer-friendly ways of messaging performance
- A flexible framework designed to drive better outcomes for consumers and for use as a tool by the financial sector, clients, investors, planners, product manufactures and more
- A holistic approach to address unintended consequences (such as poor temperature control) whilst ensuring that other issues (energy/carbon, water, air quality, materials, ecology and site management etc) have been addressed
- Minimum entry requirements for star ratings and back stop performance levels for the indicators to provide assurance to specifiers and consumers.



Ratings and indicators

The scheme addresses a broad spectrum of sustainability issues which can be targeted to drive performance and contribute to the overall star rating. To meet certain levels on the indicators (which are generated in parallel to the star rating), specific aspects have to be address to a prescribed level of performance. If they are not met, the indicator score will be capped despite the overall star rating achieved. These backstops are outlined within Appendix A of the HQM technical manual.

Home Quality Mark

Assuring performance

In addition to the confidence provided by its third party certification process, a number of other elements of HQM are designed to help minimise performance gap related issues.

- 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 assumptions

Relationship with Playbook recommendations

BRE advise that achieving Level 4 of the My Footprint indicator will enable developers to meet the recommended baseline requirements in the energy & carbon section of the Playbook.

HQM Energy Engine

HQM Energy Engine - The HQM energy engine 'triple metric' approach looks at primary energy, CO2 emissions and heating & cooling demand holistically. An overview of the methodology can be found here and the BRE intends to publish more on this in due course. However, in the meantime please contact hqm@bre.co.uk for more information.

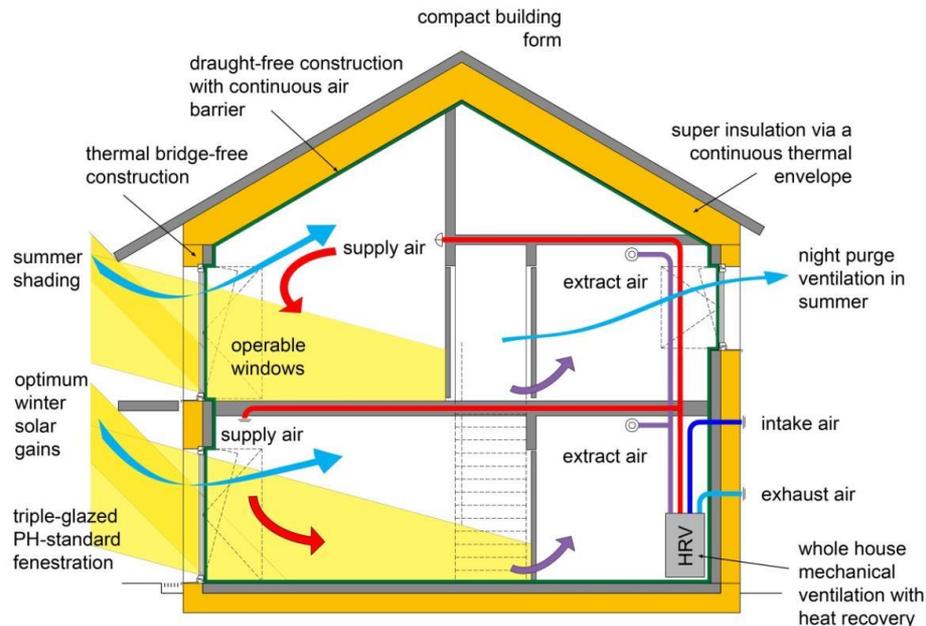
Passivhaus

Overview

Passivhaus is an energy performance standard, with its origins in Germany in the early 1990s. The core focus of the Passivhaus standard is to dramatically reduce the requirement for space heating and cooling, whilst also creating excellent indoor air quality and comfort levels.

Features

- Super-insulated fabric and windows
- Very low air-leakage
- Mechanical ventilation (with heat recovery)
- Use of solar and internal heat gains for heating
- Manages summer comfort
- Accurate modelling through the Passivhaus Planning Package (PHPP)
- Quality assured process & components



Passivhaus

Assuring performance

Passivhaus certification is a quality control process that aims to ensure that buildings will perform as designed.

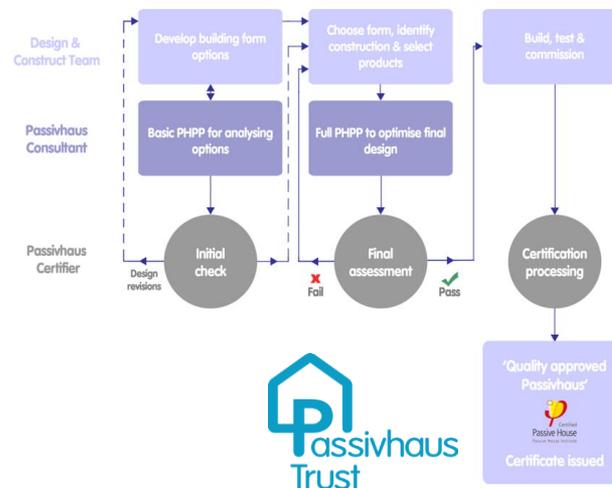
The standard aims for certainty of performance by providing certification for:

- Products/components
- Designers/consultants
- Tradespeople/installers
- Buildings

The process is to:

- Check design
- Check construction
- Check commissioning

Certification Process:



Relationship with Playbook recommendations

The Passivhaus Trust advise that achieving Passivhaus certification will enable developers to meet or exceed the recommended baseline requirements of this Playbook. For more information on the Passivhaus standard and certification process, click [here](#).

Energiesprong

Overview

Energiesprong is intent on changing the way new build housing is procured. The aim is to create a net-zero energy home with a lifetime cost that is no more than a building regulations compliant home of today. 8,000 Energiesprong homes are in planning for delivery in 2018 in the Netherlands of which 4,000 are new build.

Principles

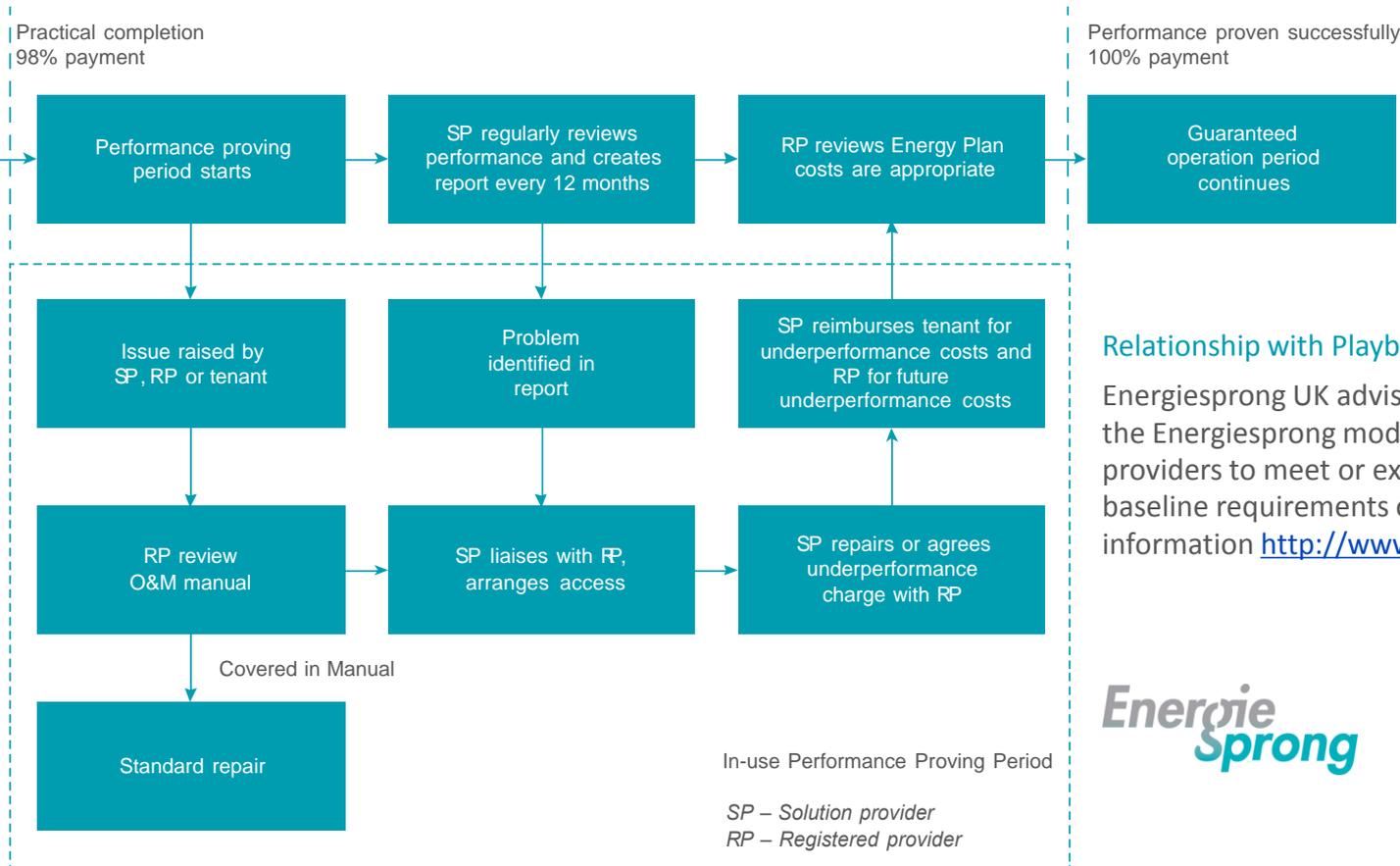
1. A performance outcome specification, rather than a 'design compliance' approach
2. Backed by a performance guarantee of 30 years
3. Technology agnostic (compatible with, for example, Passivhaus components and thinking)

The initial energiesprong model is aimed at social landlords, with the higher upfront costs funded by an additional charge made possible due to the guaranteed lower tenant energy bills. By aggregating demand to create scale, costs are driven down which leads to the same level of financial viability as the much lower performing building regulation-compliant option.

Assuring performance

- Energy performance model – a solution provider's decision, not contractual, but must demonstrate competence
- As-Built performance - solution provider to demonstrate that dwelling meets agreed specification for: hot water availability, internal noise, air movement
- In-Use performance - solution provider to demonstrate that dwelling meets agreed specification* in-use for: net energy, energy cost, CO2, space heating, overheating. * Normalized for external / internal temperatures, hot water, small power consumption, actual tariffs
- Performance gaps - addressed through pre-agreed contractual resolution plan including: opportunity to resolve issues, where not possible / as agreed, pay the NPV of the financial detriment for 30 years or a fixed pre-agreed penalty
- In use monitoring – including: space heating energy, hot water energy & use, internal & external temps, small power consumption, renewables performance etc

Energiesprong



Relationship with Playbook recommendations

Energiesprong UK advise that procurement through the Energiesprong model would enable housing providers to meet or exceed the recommended baseline requirements of this Playbook. For more information <http://www.energiesprong.uk>



Miscellaneous additional resources

Designers Handbook

(The Buildings Hub, 2016)

<http://thebuildingshub.co.uk/wp-content/uploads/2017/03/TBH-DesignGuide-Screen.pdf>

Zero Carbon Hub (various)

<http://www.zerocarbonhub.org/full-lib>

Environmental Design Pocket Book

(Sofie Pelsmaker, Second Edition 2015)

<http://www.environmentaldesignpocketbook.com/>



PART 2: VIABILITY

**N/B THIS SECTION IS CURRENTLY BEING UPDATED IN LIGHT OF THE
PUBLICATION OF NPPF 2018**

Section contents

I. [Purpose](#)

- What this section sets out to do

II. [An introduction to viability](#)

- NPPF guidance: constraints & opportunities
- How is viability calculated?
- Building the evidence base

III. [Future direction of travel](#)

- From capital costs to whole life costs
- Wider social and environmental value

Purpose

What this section sets out to do

Viability is a key concept at the heart of the planning and development system. This section provides an introductory guide to viability for any stakeholder, but particularly local authority sustainability officers who wish to drive higher sustainability standards through planning.

The draft NPPF sets guidance that local authorities have to follow to demonstrate, through viability assessments, that higher sustainability standards will not affect housing delivery. Assessments need to be underpinned by a proportionate evidence base that reflects local circumstances. This can seem daunting for local authorities with tight budgets and pressure on land values.

This section therefore outlines some of the key tenets of this guidance from central government. In doing so, we outline some of the main parameters within which local authorities must work and simultaneously identify opportunities to work within the confines of the current system to deliver more progressive outcomes. We then look at ways in which evidence can be generated.

Later in the section we look to the future, putting forward commentary on ways in which we see the concept evolving to capture wider social and environmental value within viability assessments, and we suggest further opportunities for local government to take the next steps on that journey.

Although this section is relevant to any sustainability topic, we were particularly mindful of our recommended baseline requirements on energy and carbon when compiling it.

An introduction to viability

NPPF guidance: constraints & opportunities

Introduction

Viability assessment is a process of assessing whether a site is financially viable, by looking at whether the value generated by a development is more than the cost of developing it. The [Draft Planning Practice Guidance](#) sets out the Government's recommended approach to viability assessment for planning. Whilst the focus is often on the deliverability of affordable housing, the assessments are also used to test a full range of policy requirements including the cost of meeting

particular energy and carbon standards. The National Planning Policy Framework says that plans should be prepared positively in a way that is aspirational but deliverable. This means that policies should be realistic and the total cumulative cost of all relevant policies should not be of a scale that will make development unviable. Key points from the guidance are as follows.



An introduction to viability

NPPF guidance: constraints & opportunities

When should viability testing be done?

The Draft Planning Practice Guidance states:

'Policy requirements, particularly for affordable housing, should be set at a level that allows for sites allocated in the plan to be delivered without the use of further viability assessment at the decision making stage. Where proposals for development accord with all the relevant policies in an up-to-date development plan no viability assessment should be required to accompany the application. Plans should however set out circumstances in which viability assessment at the decision making stage may be required.'

The implication of this is that viability should primarily be tested at the plan-making stage and that the evidence base needs to be strong enough to demonstrate the viability of a variety of different schemes covering a range of scales and locations in order to pass through Examination in Public. The guidance that no scheme-specific viability assessment is required for compliant developments helps to reduce the burden on developers whilst the NPPF leaves open the prospect of viability assessment for non-compliant schemes which should give local authorities confidence that there is a mechanism to deal with exceptions.

Opportunity: If the same policy targets are adopted by a wide range of local authorities collectively, then this strengthens the technical evidence base, at least, and potentially the costing evidence base so long as similar market conditions exist.

An introduction to viability

NPPF guidance: constraints & opportunities

Evidence base

The Draft Planning Practice Guidance states:

'Any viability assessment should be supported by evidence informed by engagement with developers, landowners, infrastructure and affordable housing providers. Any viability assessment should follow the Government's recommended approach to assessing key factors as set out in National Planning Guidance and be proportionate, simple, transparent and publicly available'

The implication of this is that the assessment process is rather generic, based on simple benchmark information, rather than scheme-specific commercially sensitive information. Whilst this can help to normalise the process and form a common basis for both local authorities and developers to understand the drivers of viability, there is the potential for public mistrust in the ability of the assessment process to deliver a fair deal so this purpose and limitations of this approach need to be carefully explained and understood by local authorities and developers.

Opportunity: It is becoming increasingly common for local authorities to require open book viability – full publication of the viability assessments undertaken by developers including details of profit margins, to demonstrate what can be accommodated and in theory promote a more transparent negotiation with better understanding on both sides. We believe greater transparency to be a good thing, but for this to be beneficial it requires local authorities to have the capacity and expertise for meaningful engagement with developers.

An introduction to viability

NPPF guidance: constraints & opportunities

Evidence base

The Draft Planning Practice Guidance states:

'Plans should be informed by evidence of infrastructure and affordable housing need and an assessment of viability that takes into account all relevant policies, local, and national standards including for developer contributions. Viability assessment should not compromise the quality of development but should ensure that policies are realistic and the total cumulative cost of all relevant policies is not of a scale that will make development unviable.'

This means that first of all there should be evidence of infrastructure need, such as district heating. Often this will be heat mapping work or assessments of renewable energy opportunity within an area in order to meet climate change targets.

Furthermore, the viability testing is to be carried out against the whole basket of policies, not just those relating to energy, although clearly those policies that place least burden on development are likely to be most supported through Examination in Public. The test is not whether all the policies together add net cost, but rather whether the cumulative cost of all relevant policies renders development unviable.

An introduction to viability

NPPF guidance: constraints & opportunities

Benchmark land values

The Draft Planning Practice Guidance states:

'To define land value for any viability assessment, a benchmark land value should be calculated on the basis of the existing use value (EUV) of the land, plus a premium for the landowner. The premium for the landowner should reflect the minimum price at which it is considered a rational landowner would be willing to sell their land. This approach is often called 'Existing Use Value Plus' (EUV+). Proposed development that accords with all the relevant policies in an up to-date plan should be assumed to be viable, without need for adjustment to benchmark land values established in the plan making viability assessment. Where a viability assessment does accompany a planning application the price paid for land is not relevant justification for failing to accord with relevant policies in the plan.'

Opportunity: The key point here is that developers cannot avoid complying with the relevant policies on the basis that they paid for the land without factoring in the potential increase in costs to meet future requirements.

Opportunity: Aldersgate Group [research](#) suggest that in time, developers will find a way to pass these costs onto others, e.g. through adjustments to the land value for new site acquisitions.

An introduction to viability

NPPF guidance: constraints & opportunities

Suitable returns for developers

The Draft Planning Practice Guidance states:

'For the purpose of plan making an assumption of 20% of Gross Development Value (GDV) may be considered a suitable return to developers in order to establish viability of the plan policies. A lower figure of 6% of GDV may be more appropriate in consideration of delivery of affordable housing in circumstances where this guarantees an end sale at a known value and reduces the risk. Alternative figures may be appropriate for different development types e.g. build to rent. Plan makers may choose to apply alternative figures where there is evidence to support this according to the type, scale and risk profile of planned development.'

This part of the NPPF deals with the balance of risk and reward. It acknowledges that developers take significant risk and therefore this needs to be balanced with an appropriate reward (20% of GDV as a starting point). However it also acknowledges that the type, scale and risk profile varies for each development and therefore there is a mechanism for reflecting this in viability assessments.

Opportunity: Of particular interest, it highlights the opportunity for local authorities to take steps to de-risk investment by developers (e.g. by guaranteeing the end sale of affordable housing, or enabling ease/speed of route through planning) and that in return a lower return is deemed acceptable by developers.

An introduction to viability

NPPF guidance: constraints & opportunities

Other environmental assessments that may be required

The Draft Planning Practice Guidance states:

‘Strategic and local plans may require a variety of other environmental assessments. This may also include assessments of energy and climate change (to help inform a proactive approach in plans to mitigating and adapting to climate change and help increase the use and supply of renewable and low carbon energy and heat). Wherever possible, assessments can share the same evidence base and be conducted over similar timescales, but plan-making authorities need to take care to ensure that the purposes and statutory requirements of different assessment processes are respected.

‘Assessments should be proportionate, and should not repeat policy assessment that has already been undertaken. Wherever possible plan-making authorities should consider how the preparation of any assessment will contribute to the plan’s evidence base. The process should be started early in the plan-making process and key stakeholders should be consulted in identifying the issues that the assessment must cover.’

Opportunity: Again, this highlights the opportunity to use existing studies as part of the evidence base for plan-making. However it also emphasises the need for these studies to ‘fit’ with the particular requirements of the policy testing and therefore timing and scoping of the work is important.

An introduction to viability

How is viability calculated?

Illustrative calculation methodology

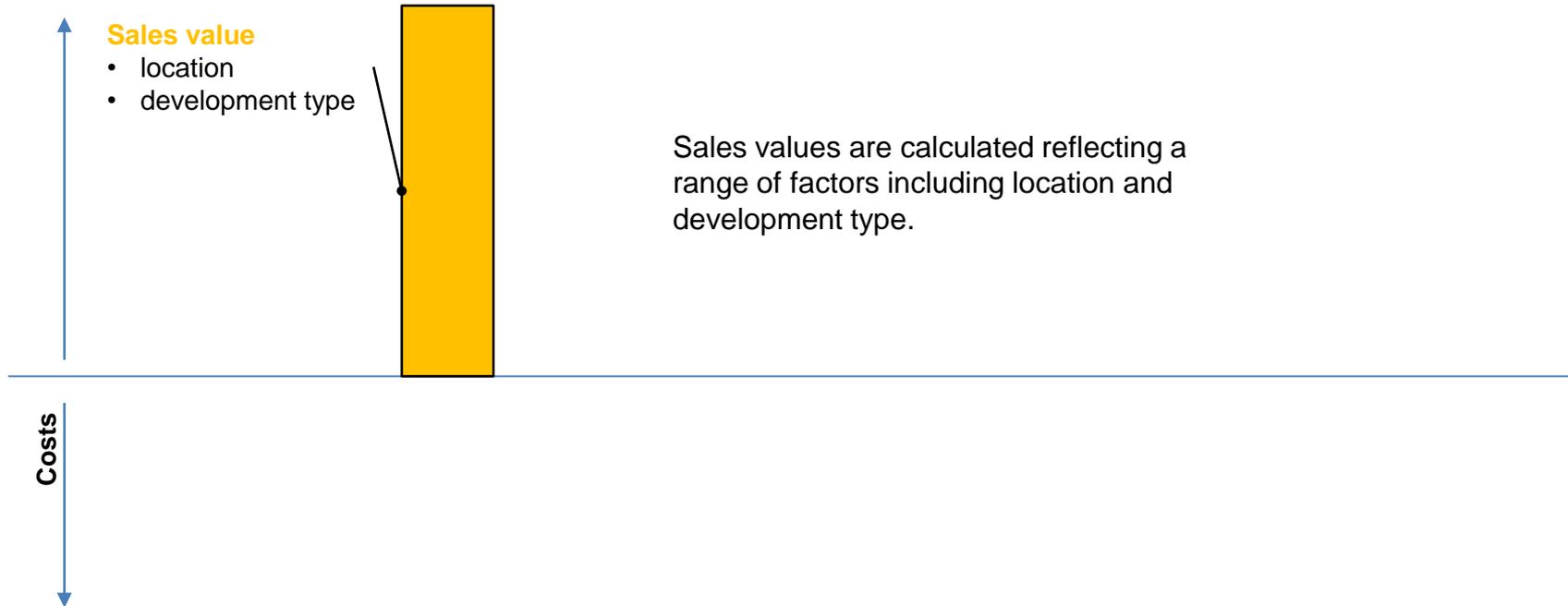
The following slides illustrate the standard approach that is adopted for calculating viability. Sales values are calculated reflecting a range of factors including location and development type. Developer costs include build costs, professional fees, cost of finance and costs to meet particular policy requirements such as affordable housing, site-specific infrastructure, environmental standards, CIL plus any abnormal costs or project contingencies for risk.

The residual scheme value is then calculated as total revenue minus costs. If the residual scheme value is greater than the benchmark land value then the scheme is deemed viable.



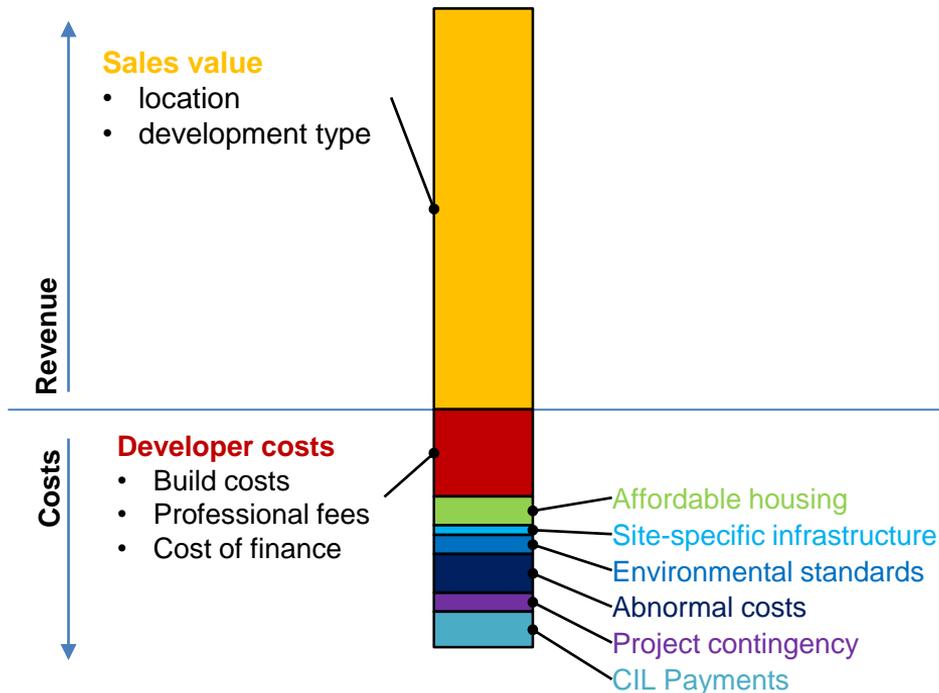
An introduction to viability

How is viability calculated?



An introduction to viability

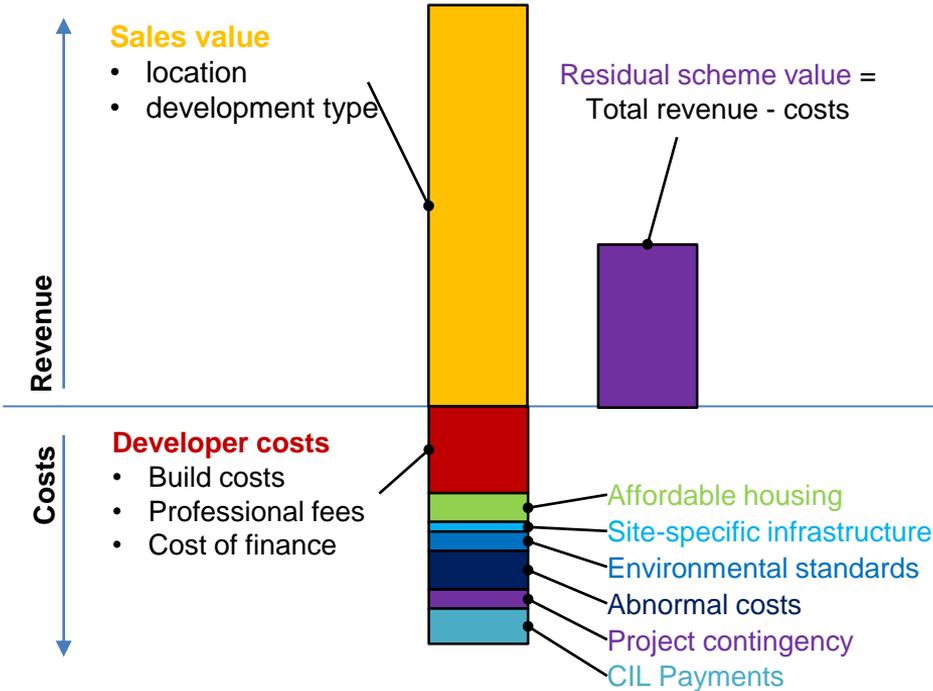
How is viability calculated?



Developer costs include build costs, professional fees, cost of finance and costs to meet particular policy requirements such as affordable housing, site-specific infrastructure, environmental standards, CIL plus any abnormal costs or project contingencies for risk.

An introduction to viability

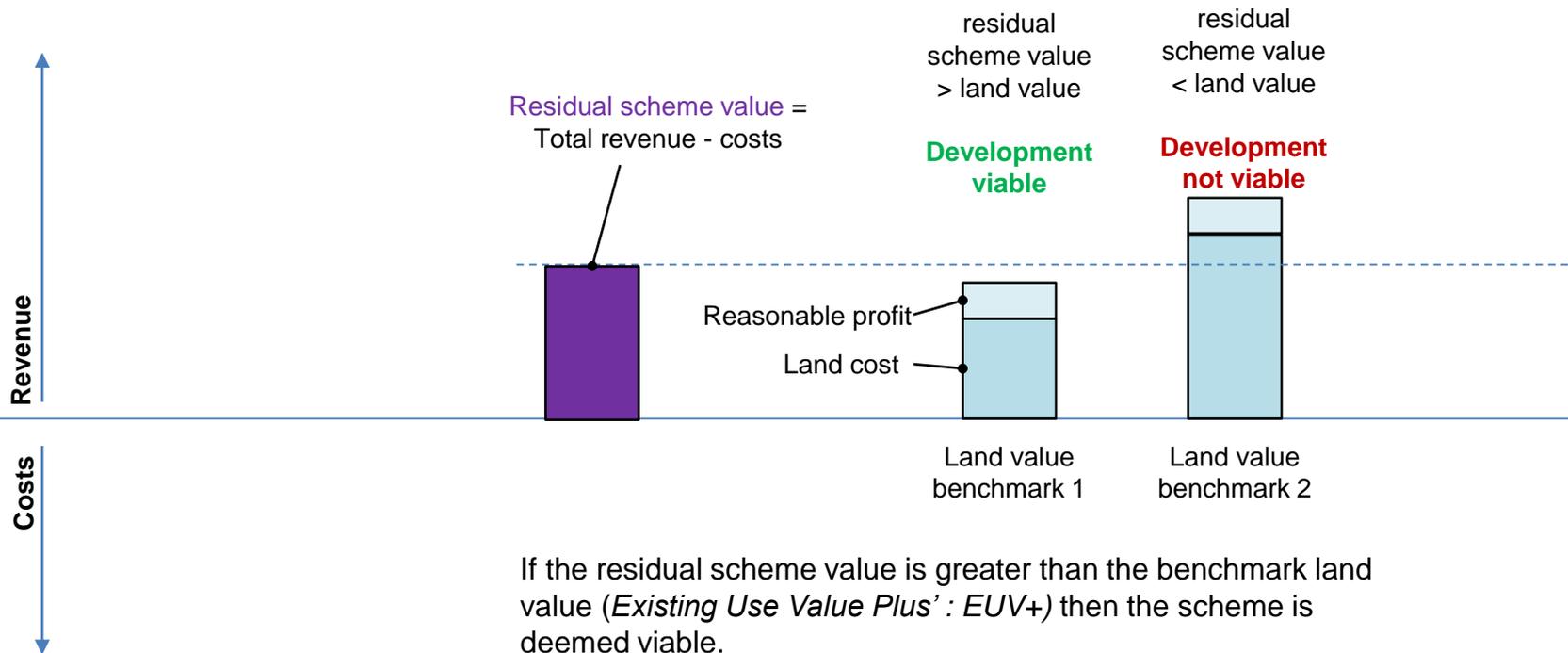
How is viability calculated?



The residual scheme value is then calculated as total revenue minus costs.

An introduction to viability

How is viability calculated?



Building the evidence base

Example analysis

There are three key elements to building the evidence base that feeds in to viability assessments:

1. Review technical evidence base

LAs should begin by assembling the technical evidence which could include relevant studies from other authorities, local precedent, existing studies of infrastructure need or new studies commissioned to address specific gaps in information.

2. Produce costing evidence base

The next step is to gather evidence of the cost impact of particular standards. At its simplest, this could be analysis of local precedent for a range of different development types and market conditions. Where standards are being considered that require deeper insights or costing analysis, specialist modelling should be carried out to strengthen the evidence base.

3. Viability testing

The third step is to feed this information into an overall viability assessment that considers the full suite of policy requirements. For the purposes of testing planning policy, this should primarily be done at the plan-making stage, however in some circumstances (particularly for non-compliant developments) this should be done at the decision-making stage.

Beyond the immediate planning process, strategic planning and developer procurement should consider ways to factor in the wider social and environmental value of a development.

The [Playbook](#) section of this resource links to some of the existing examples of local plans and viability analyses that relate to the recommendations set out. These form a useful reference for those needing to commission their own assessment, and we would like to grow this 'live' resource as more become available.

Building the evidence base

Example analysis

The following slides show in more detail the type of [analysis](#) that the GLA has commissioned to inform local planning policy. We recognise that the GLA is an outlier in terms of policy ambition. The aim is not to endorse GLA policy targets, but to present more clearly different tiers of viability evidence by way of example. The more costly nature of the analysis is probably more appropriate for combined authorities rather than individual authorities, but it provides a comprehensive evidence base on which to take policy action.

Development zones

The GLA commissioned an evidence base in support of energy efficiency policies within the New London Plan which tested the technical and cost implications for different viability development zones.

Viability Development Zone by London Borough

● A ● B ● C ● D ● E



Building the evidence base

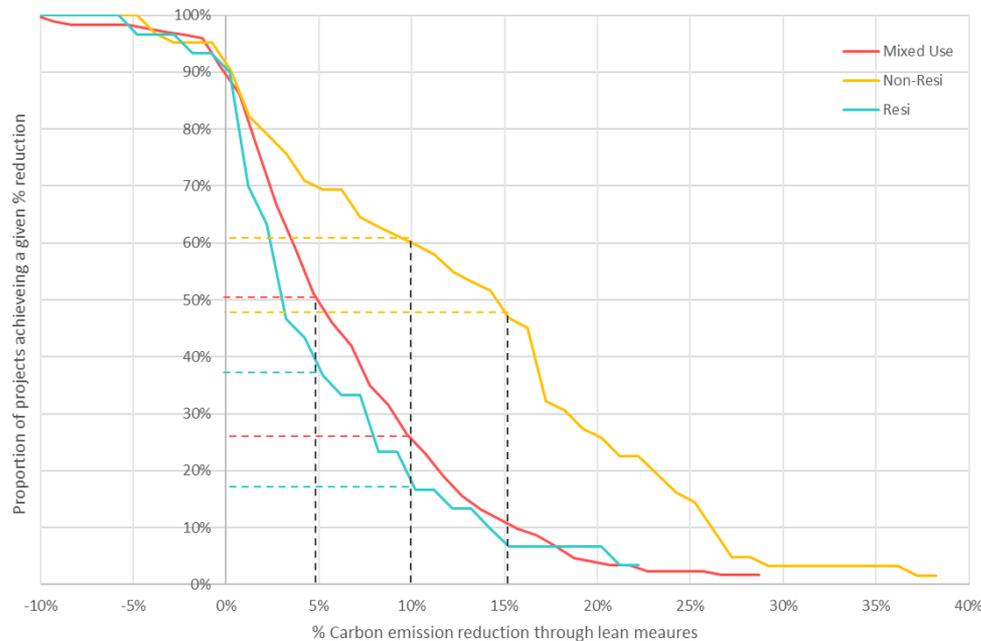
Example analysis

Precedent analysis

A mixture of methods was used that began with a 'top down' assessment of applications received over a three year period to generate an understanding of what carbon reduction and 'lean' targets the market was already delivering (right).

Elemental Modelling

This was supplemented by 'bottom-up' big-data analysis to model the relationship between particular building elements and overall carbon reductions.

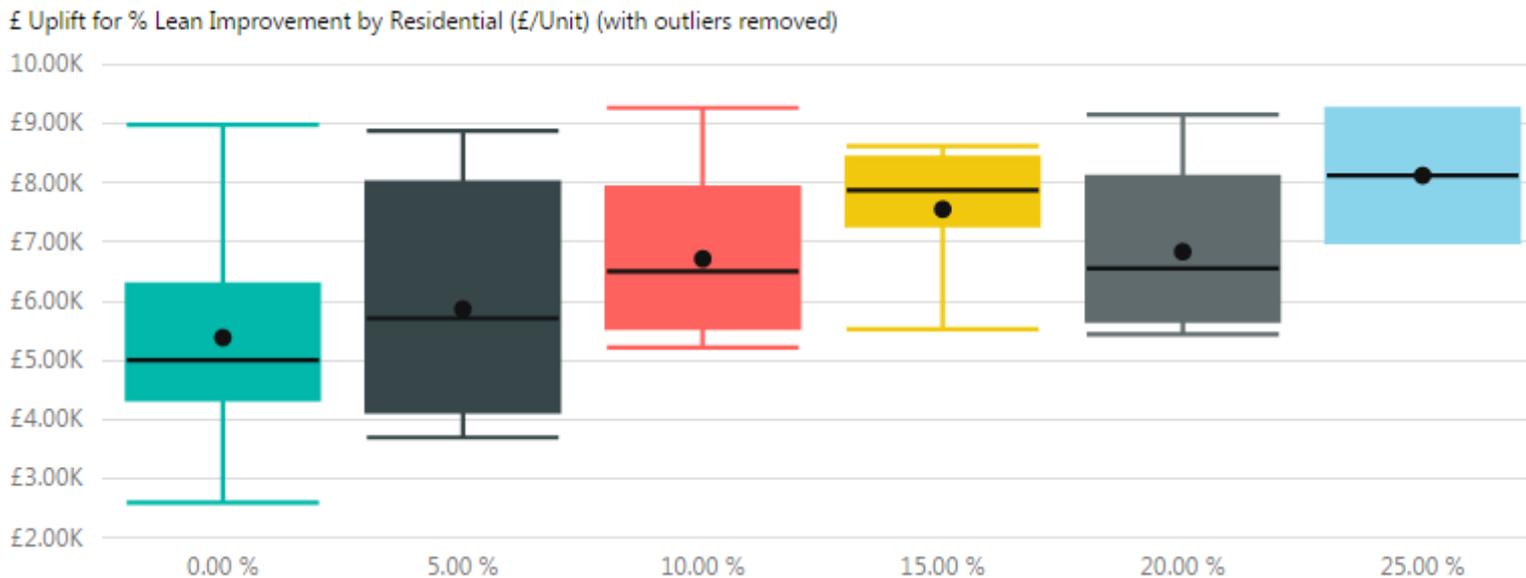


Building the evidence base

Example analysis

Cost ranges

Technical and costing analysis of particular elements was then brought together to generate a series of cost uplift ranges for different energy efficiency levels.



Future direction of travel

From capital cost to whole life cost

Capital costs

Current standard approaches to viability testing tend to focus on the ability of a development to absorb all capital costs within an existing model of sales and land values. This is a conservative approach that assumes a developer realises no additional long term value from investment in sustainable buildings and infrastructure.

Whole life cost

Since many energy and carbon reduction strategies deliver whole-life value for the landlord and/or occupant (e.g. through lower energy bills, reduced operating costs or new revenue streams) then an alternative approach is to capture this value by calculating the Net Present Value over a longer period of time (e.g. 10-20 years), potentially reflecting an energy services agreement between the developer and an ESCo or other management company. This calculation has been used to inform the evidence base for some local authority policies (e.g. Ipswich) and is encouraged through supplementary planning guidance in London. Where possible, this approach should be built into the viability assessment for local plans.

Future direction of travel

Wider social and environmental value

In the future we can see the potential for viability assessments to capture the wider social and environmental impact of a development through a quantification – and potentially monetisation – of the benefit or burden that a development brings to an area. Strategic planning and developer procurement should consider ways to factor this in to decision-making as soon as possible.

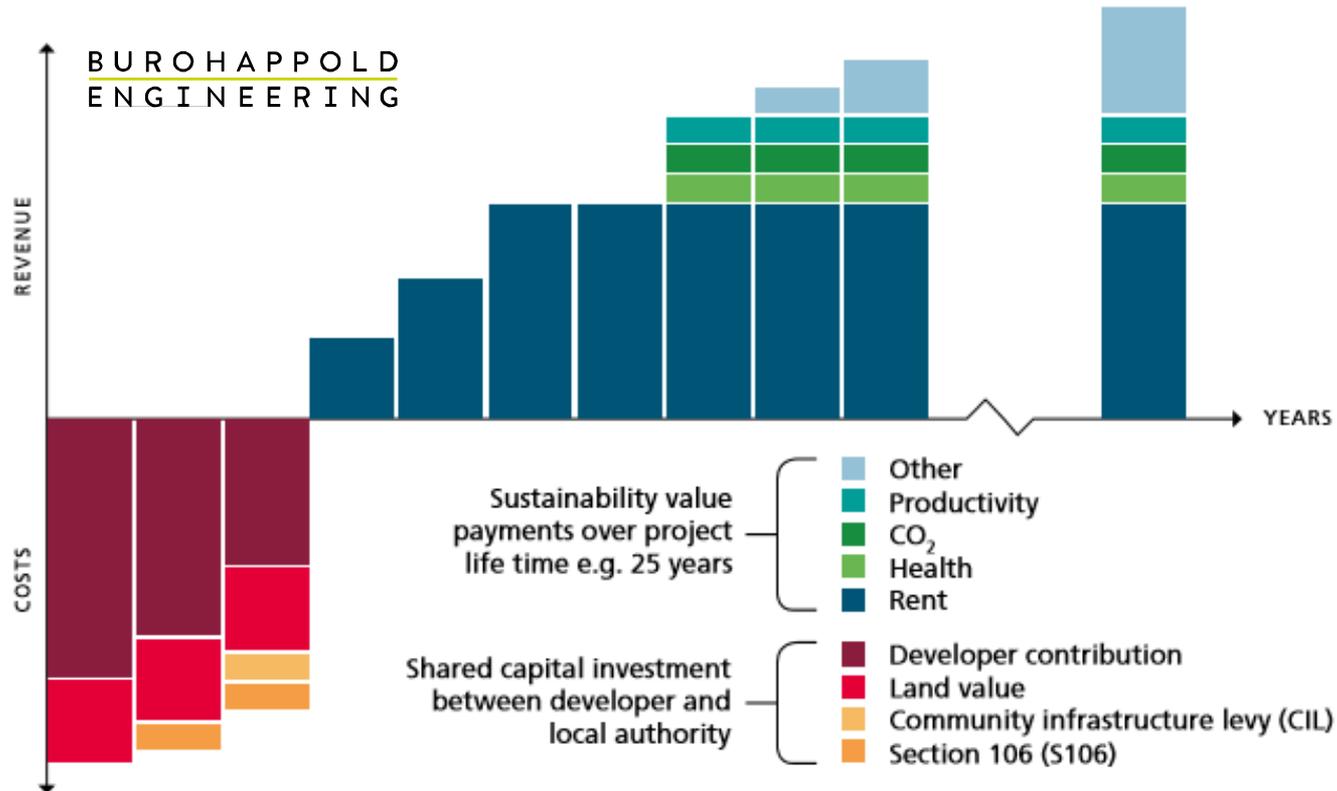
Conceptually, this would be an extension of the existing CIL and section 106 mechanisms to reflect a series of ‘externalities’ such as health benefits of new walking and cycling infrastructure, productivity gains from reduced congestion or improved city resilience from investment in energy efficiency. See next slide for a visualization.

The emergence of Metro Mayors with responsibility for a range of planning powers, social and healthcare budgets provides the prospect of this ‘joined up accounting’ to support strategic planning. Similar methodologies could be used by local authorities procuring development partners for regeneration schemes alongside more established approaches to assessing social value.

See UKGBC’s [Introductory Guide to Social Value in New Development](#) for further discussion and guidance on the concept of social value, including a range of case studies and recommendations for integrating social value into the planning process.

Future direction of travel

Wider social and environmental value



PART 3: CASE STUDIES

Case studies

Introduction

Case studies bring to life the ambitions and recommendations contained in this resource. The small number of examples that follow have been chosen because they offer variety:

- Long established communities
- Schemes that still have phases in development
- Projects based on new business models using innovative production methods
- Geographical diversity
- Diversity of tenures
- Different procurement/partnership models
- Different drivers (policy, social purpose, industry leadership)

We are actively seeking further additions. Email john.alker@ukgbc.org

Contents

Follow the live links to be taken straight to the case study. The name in brackets refers to the organisation which provided the information to UKGBC. In some cases the schemes were joint ventures.

1. [The Meadows, Nottingham \(Blueprint\)](#)
2. [One Brighton \(BioRegional\)](#)
3. [Graylingwell Park, Chichester \(Clarion Housing Group\)](#)
4. [Hungate, York \(Lendlease\)](#)
5. [Gallions Reach and Dominion Doncaster \(ilke Homes\)](#)

The Meadows, Nottingham (Blueprint)

Introduction to developer/client

Blueprint is an East Midlands based developer that specialises in the development of sustainable homes and sustainable workspaces. It is a private limited partnership wholly owned by Aviva Investor's igloo Regeneration Fund and Nottingham City Council and marries the strengths of both the public and the private sector.

Blueprint is passionate about great design and genuine sustainability and not just about new buildings. Blueprint builds new homes, new workspaces, new opportunities and new places, all whilst delivering fair returns to its investors.

Through a collaborative approach, Blueprint has built relationships with

both universities and industry experts to push boundaries in building fabric, community energy and urban design.

Blueprint is the developer behind No.1 Nottingham Science Park, Phoenix Square in Leicester, Green Street in Nottingham and Trent Basin, the £100m regeneration of Nottingham's Waterside.



Introduction to the development

Blueprint's vision to develop in the Meadows has been a catalyst for sustainable regeneration in one of most deprived residential areas in the UK. Having developed 132 new homes and with more planned, the regeneration of the Meadows has been a huge success, with Blueprint attracting people from both within and outside of the existing community.

Hobart & Pitcairn, the third phase of the wider Meadows development, was secured through a competitive bid process instigated by Nottingham City Council, jointly with Asra Housing Association and William Davis. The Council has held a long term commitment to regenerate the Meadows and to replace empty and dangerous accommodation. The development at Hobart & Pitcairn comprised 73, low energy 2-5 bedroom homes.

Hobart & Pitcairn represented a significant challenge from a community point of view. Although Blueprint had become an established name in the area, the Hobart & Pitcairn development meant demolishing existing housing to make way for new ones. Because of this, Blueprint undertook extensive community consultation throughout the planning and design process including regular visits to the Meadows Partnership, Meadows Tenants and Residents Association and consultation sessions in the local community centre over a six month period.



Sustainability standards

From the start, design quality and sustainability were the defining attributes of Hobart & Pitcairn. Local architects, Marsh Grochowski, worked tirelessly to achieve Blueprint's vision. During design development of all the phases, the team pushed the boundaries to ensure the project enhanced the local area and followed the established street pattern and design aesthetic established at other developments.

Very early in the project, Blueprint chose to self-impose higher building standards on the project, aiming to achieve the AECB Silver Standard. This environmental building standard is aimed at achieving high-performance buildings in order to reduce overall CO2 emissions by 70% compared to the UK average. The project also met Code for Sustainable Homes level 4. This allowed Blueprint to tap in to the emerging market of energy conscious buyers in Nottingham.

The development at Hobart & Pitcairn represents one of the largest AECB Silver Standard housing development in the UK, showing the mainstream market that improved sustainability can be achieved commercially.

The project focuses on air tightness, reduction of energy usage and energy cost savings for the user. The homes at Green Street Phase II and Hobart & Pitcairn include super-high levels of insulation, whole-house heat recovery, industry leading levels of air tightness and maximum use of natural light. A combination of simple energy efficient measures guarantees that buyers would be using significantly less natural resources resulting in savings on energy bills, as much as £100 a year.

The scheme has won two awards 2015 – Sustainable Development of the Year East Midlands Business Link, 2016 – Residential Development of the Year Insider Midlands.

How/why standards were set

Blueprint subscribes to Footprint™, a leading sustainability policy developed by the igloo Regeneration Fund – the world’s first responsible real estate fund. Within the Policy there are four key themes – Regeneration, Urban Design, Environmental Sustainability and Health, Happiness & Wellbeing and all of Blueprint’s projects are independently scored by external guardians of the policy, Urbed, against these themes.



Over four rounds of scoring during the project life, Blueprint aims to improve the development through not only the fabric of the building, but the way the buildings are occupied, the landscaping and proximity to services and local amenities, to name a few. In order to reach a minimum of Best Practice, the project is reviewed by both internal and external industry experts to find a solution which is both commercial viable, but also pushes the boundaries of deliverability.

Blueprint will only progress projects that meet specific performance criteria, both in terms of profitability and also Footprint scoring. Having belief that houses could be delivered in a commercial setting using the AECB Silver Standard, Blueprint delivered the scheme with significant sales success – all homes were sold off-plan.

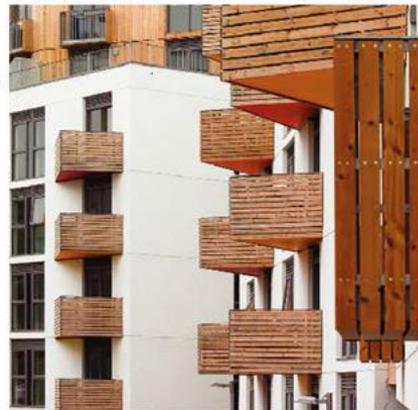
There was a particular focus on health and well-being with daylighting and overheating analysis as part of the design process. In addition, a post-occupancy survey of homeowners have been undertaken. With highly encouraging responses on energy performance and on well-being particularly in relation to natural light and air quality.

One Brighton, Brighton (BioRegional)

Introduction to developer/client

One Brighton was developed by joint venture company Crest Nicholson Bioregional Quintain. Crest Nicholson is one of the UK's largest housebuilders. Bioregional is an international sustainability charity and social enterprise while Quintain is the developer behind London's giant Wembley Park project surrounding the world-famous stadium.

One Brighton's designers were Fielden Clegg Bradley Studios, the architects of Cambridge's Accordia, the first housing project to win RIBA's Stirling Prize. The team came together with the aim of creating a One Planet Community – a mixed use development planned and managed post-completion using Bioregional's One Planet Living sustainability framework.



Introduction to the development

One Brighton consists of 172 homes in two eight and 12-storey apartment blocks plus nearly 2,000m² of community and work space in the heart of Brighton, close to its main railway station. The project is part of a wider eight-hectare regeneration plan, the New England Quarter, including new homes, a supermarket, community facilities, offices and other work space, a language school and two hotels.

In 1999, Bioregional were approached by a community group opposing redevelopment of ex-industrial land next to the station as a supermarket with large car park. With Bill Dunster, architect of the pioneering BedZED ecovillage in Sutton, south London, Bioregional proposed a more sustainable solution – a smaller supermarket underground with housing, offices and other commercial development above. This helped kickstart a new process led by planning authority Brighton & Hove City Council, urban planning specialists Urbed and the landowner’s agent leading to the New England Quarter plan.

The Ethical Property Company PLC, which rents low cost space to social change organisations, won the contract to operate the quarter’s community space. It suggested Bioregional put together a proposal to develop the residential and commercial elements of the block where a community centre would be based. Bioregional won a small grant for a feasibility study; this was then used to secure Quintain and Crest Nicholson’s investment to purchase and develop the site as a One Planet Community. This project team had a strong commitment to delivering a commercially successful development while setting high sustainability standards. Construction began in 2007 with completion in 2010.

Sustainability standards

One Brighton's guiding sustainability standard is its One Planet Community status. Design, construction and use are framed by a sustainability action plan based on ten One Planet principles covering areas such as waste, water, carbon emissions, the health and happiness of building users and support for the local economy. The One Planet Living framework emerged from Bioregional's experience as a partner in developing the BedZED eco-village.

One Brighton has high insulation levels, a clean-burning wood-pellet fuelled boiler and its own energy services company purchasing renewables-generated power backed by REGO certificates, supplemented by rooftop PV. In 2014 annual carbon emissions from heating, hot water and electricity consumption were estimated at one third of the average for a UK home, despite being heated by gas at the time with its biomass boiler out of service. This has since been replaced with a new biomass boiler, leading to further carbon savings.

The development's embodied carbon was lowered by innovations such as low carbon concrete in its frame and floors and external walls built with clay blocks fired at low temperatures.

One Brighton has only 14 parking spaces, nine for disabled users and five for car club vehicles, and benefits from excellent public transport access. It has rooftop allotments, vegetable and fruit growing plots on its generous roof terraces. These were a first for a new development.

17% of One Brighton's units are for social rent and 14% for shared home ownership. In addition, it has 19 highly compact 'Eco-studio' apartments aimed at the 'intermediate market' – people who do not qualify for social housing but are unable to afford to rent or buy on the open market.

Using the BREEAM sustainability assessment scheme for buildings, One Brighton achieved a score of 79.9 points on completion, at that time the highest score achieved by an apartment development at post-construction evaluation.

How/why standards were set

One Brighton's standards were developer led, with support from the planning authority. The project team was headed by mainstream commercial developers who were persuaded that new apartment homes with exemplary sustainability standards were viable in Brighton's housing market. At the same time, the team were determined to contain any additional costs associated with achieving these standards. The near-absence of car parking spaces, reflecting the site's central location, helped lower costs and allow more units to be built on the site.

The scheme was devised before the 2007 financial crisis. One Brighton's homes were being marketed during the subsequent fall in house prices and the difficult market conditions meant that there was no opportunity to charge purchasers any green premium for the development's low energy bills and other eco-features. Even so, the development achieved a 10% return on capital employed (ROCE).

More information at

<https://www.bioregional.com/one-brighton>



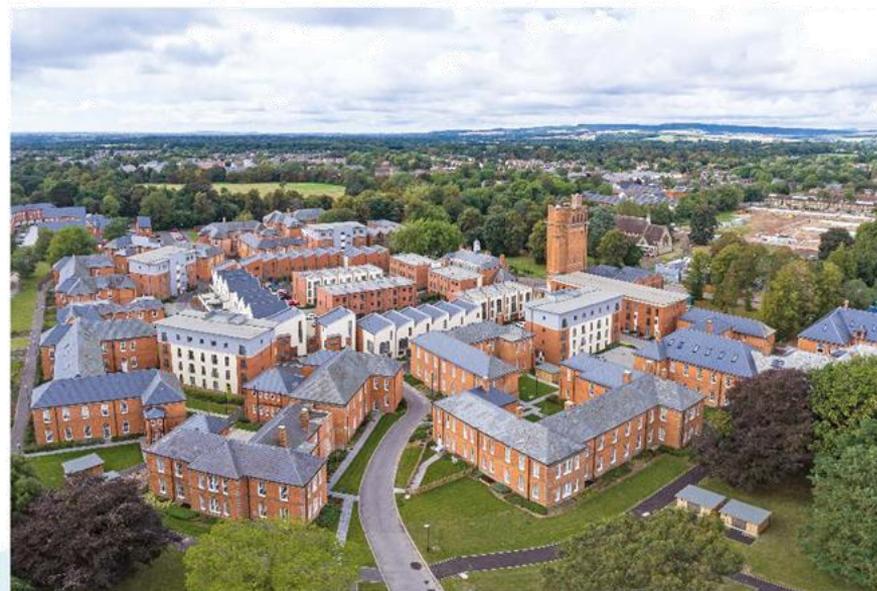
Graylingwell Park, Chichester (Clarion Housing Group)

Introduction to developer/client

Clarion Housing Group is an equal partner with Linden Homes under a Limited Liability Partnership Agreement (LLP). Clarion Housing Group includes the country's largest housing association with 125,000 properties nationwide and over 360,000 residents. As a developer, Clarion's target is to build 50,000 new homes in ten years across the full range of tenures.

In addition to new homes, Clarion works to transform existing communities through sustained regeneration, helping people to access employment and training opportunities and giving young people a better start in life.

Linden Homes is the housebuilding division of Galliford Try. The company strives to create sustainable new developments.



Introduction to the development

Graylingwell Park is a multi-award winning development located in Chichester, West Sussex. With a Gross Development value of around £300m, the development has transformed a derelict former hospital site to provide 792 mixed tenure new build and refurbished homes to meet the needs of a range of family sizes and income levels, along with extensive community facilities and commercial units.

Clarion and Linden jointly negotiated the Development Agreement with English Partnerships and the acquisition of the site. There are five phases to the scheme, four of which are complete. To speed delivery, a hybrid approval for outline and a detailed planning approval for Phase 1 were granted in March 2009. There were only fourteen objections to the Graylingwell planning application and the planning department described the application as an exemplar approach to public consultation.

Clarion has an excellent relationship with the local authority having been a development partner with the authority for more than 40 years. The relationship is sustained by regular meetings on both a formal and informal basis which has led to continued co-operation and support of their activities. Clarion has relationships operating at different tiers with the planning department, housing department and economic development teams. Extensive efforts have been made to build relationships with local councillors, Resident Association members and local residents interested in our vision for Graylingwell. This is demonstrated by the success of the Community Development Trust and the willingness of local residents to get involved.

Sustainability standards

All new homes were built to Code for Sustainable Homes Level 4 standards (and Code Level 6 energy performance), with the flat conversions in the retained Victorian hospital buildings being certified to Ecohomes Excellent. The main focus of the development was on carbon reduction, with it having the label of the UK's largest carbon neutral development. Some 60% of the carbon reduction comes from on-site actions, with the remainder from off-site renewables investment.

The carbon reduction was driven by the inclusion of a central energy centre in the old hospital water tower providing heating and hot water to the homes. Originally designed to contain a combined heat and power unit, the final solution includes biomass boilers, helping to decrease carbon emissions by up to 37%. 16kW of photovoltaic panels were installed on the energy centre roof, providing around half of the energy centre electricity demands.

The heat network is operated by an ESCO – Graylingwell Energy Services. The homes were built with thermally efficiency building fabric, with improved insulation, air tightness of less than 3 m³/(hr.m²) and enhanced junction details reducing the heat lost through thermal bridges. The homes also have mechanical ventilation with heat recovery and photovoltaic panels to further reduce the carbon emissions. Feedback from the first

phase of the development was that the PV was saving residents between £1,100 and £1,350 per customer per year.

A strong emphasis on placemaking includes:

- Sports facilities, including the current sales office which will convert to a sports pavilion and café once sales conclude
- Preservation of green space within the original landscape design of the hospital
- Provision of allotment space, lined with fruit trees for residents to pick
- Fruit trees and crops within the gardens of individual homes to promote healthy eating
- A number of play areas across the site to encourage activity and healthy living

How/why standards were set

Sustainability is at the centre of the Graylingwell development and this includes the placemaking approach. Alongside the commercial appeal that this would bring to the scheme, the approach recognised the need to facilitate the development of a large new community and help that community put roots down in its location. The original plan was to establish many of the placemaking elements of the development at an early stage. However, the financial challenges caused by the recession of 2008 led to some of these having to be delayed until later in the development. Many are now in place and are providing residents with a pleasant environment in which to live which promotes healthy living.

A successful new community is growing with the assistance of the Community Development Trust established by the LLP. The income from the community assets will be transferred to the Community Development Trust to help ensure its future financial viability. The income from the commercial units will be retained by the LLP.



Hungate, York (Lendlease)

Introduction to developer/client

Lendlease is a leading international property and infrastructure group with operations in Australia, Asia, Europe and the Americas. Their vision is to create the best places; places that inspire and enrich the lives of people around the world.

Lendlease was ranked as the UK's most sustainable housebuilder under the NextGeneration benchmark for the second year in a row in 2017, as well as winning Sustainable Housebuilder of the Year at the Housebuilder Awards.

Introduction to the development

Hungate is a development of approximately 1,100 homes within the old city walls of York, situated next to the River Foss. A residential development, it has a mixture of 1, 2 and 3-bedroom apartments spread over 6 phases. The development is being delivered in phases and is due to complete in 2022.

The project brief states: “Hungate will create a natural sustainable environment which aims to increase ecological value by introducing and enhancing green infrastructure within the local heritage of the City of York”. Within the centre of the scheme will sit a newly created St John’s Square providing open community green space and a connection through the development from the River Foss through to the centre of York.

Hungate was purchased privately back in 2006 for a multi-phase residential-led mixed use scheme.

How/why standards were set

Most standards went beyond the requirements of the LA, so were led by Lendlease because they have established internal Sustainability Standards for Residential to ensure that all projects achieve a level of performance which Lendlease are happy with, irrespective of geographical location. Whilst there will always be differences with projects and some which take sustainability innovations to the next level, Lendlease do not believe any should fall below a baseline position which in most cases goes beyond the regulatory expectations.

The development of Lendlease's internal Sustainability Standards for Residential and long-term compliance with CfSH Level 4 has resulted in a more consistent product from a sustainability perspective which in turn allow for greater levels of design and construction efficiency and therefore reduced cost.

Lendlease has a desire to exceed minimum regulatory standards in order to separate them from the competition and to create the right legacy for this part of York – such as job creation, homes delivered with a lower environmental footprint and an increase in ecological value.



Gallions Reach and Dominion Doncaster (ilke Homes)



Introduction to developer/client

ilke Homes aims to address the UK's shortage of affordable housing by delivering consistently high-quality, energy-efficient, modular homes at scale to the people that need them most. Through specialist offsite manufacturing methods, ilke Homes will deliver up to 2,000 homes per year within the next two years from its Yorkshire factory. Working with housing associations and local authorities, onsite preparation works and build manufacturing are undertaken simultaneously, so ilke Homes can be ready in half the time of traditional build homes.

ilke Homes was originally established as a joint venture between Keepmoat Homes and Elliott but incorporated as an independent entity in October 2017, its roots in the JV allows it to leverage its respective partner's experience in the design, manufacture and installation of quality residential and offsite buildings to deliver desirable, high-quality homes.



Introduction to the development

Following the installation of two zero carbon show homes at Gallions Reach, London, ilke Homes has manufactured and installed its first two homes for open market sale with Keepmoat Homes at its Dominion site at Carr Lodge, Doncaster. This development boasts 172 traditionally built homes and was Doncaster's first low carbon community, with all homes designed to the Government's Code for Sustainable Homes level 3.

Available for open market sale alongside Keepmoat's traditionally built homes, the ilke Homes team worked closely with Keepmoat Homes throughout the planning and design stage to ensure its individual specifications were met and the modular homes blended seamlessly with the existing street scene and surpassing the sustainability merits required for the site.

The houses were built off-site in Knaresborough by ilke Homes before being transported fully finished to the Dominion site in January 2018. The homes were installed across several hours on one day, causing minimum disruption to the existing residents on site.

ilke Homes worked closely with the NHBC to gain an NHBC Buildmark warranty for the homes and the LABC on building control approval. As part of its BOPAS approval, Building Life Plans (BLP) has also confirmed the durability and maintenance requirements of ilke Homes are similar to that of traditionally built homes.



Sustainability standards

ilke Homes look and feel like traditionally built homes, while also delivering enhanced performance and in many cases enhanced financial viability. All ilke Homes have a high-performance building fabric which exceeds building regulations by 20% as standard due to the air tight, super-insulated and thermal bridge free design:

Typical semi-detached house Dwelling Fabric Energy Efficiency (DFEE) = 46.3kWh/m² (Vs SAP Target TFE = 57.3 kWh/m²);

Air tightness: Test results 2.5 to 3.5 m³/hr/m² at 50Pa, 5 m³/hr/m² input in SAP (Part L1a 2016 minimum = 10 m³/hr/m² at 50Pa).

U-values:

Walls 0.15-0.17 W/m²K (Vs Part L1a 0.30 W/m²K).

Floors 0.12 W/m²K (Vs Part L1a 0.25 W/m²K).

Roof 0.13 W/m²K (Vs Part L1a 0.20 W/m²K).

Doors 1.1 W/m²K (Vs Part L1a 2.0 W/m²K).

Windows 1.4 W/m²K (Vs Part L1a 2.0 W/m²K).

Thermal bridging: average Psi-value 0.055 W/m²K (Vs Part L1a 0.15W/m²K).

Typical semi-detached house Dwelling Carbon Dioxide Emission Rate (DER) =17.26 kgCO₂/m² (Vs SAP Target TER = 19.34 kgCO₂/m²); With 3.6kWp solar PV DER < 0 kgCO₂/m² (SAP 100).

All ilke Homes have a 2.5m floor to ceiling height with large windows as standard which provide excellent daylight. Acoustic testing has also shown ilke Homes to be a third quieter than traditionally built homes.

All ilke Homes are expected to have lower running costs than traditionally built new homes and due to the high-performance envelope with factory built quality control. The specification used at Dominion can also be tailored to feature an integral tiled roof with solar PV fitted “in roof” to further boost the homes’ sustainability credentials.

How/why standards were set

ilke Homes has set a base specification above building regulations and industry standards in a number of areas in a cost-effective manner. This differentiates and future-proofs the product from future changes in building regulations.

Beyond housetype, internal layout, internal and external specifications and finishes. ilke Homes can be further upgraded will the following options:

- Solar PV – factory installed roof integrated solar PV to meet zero carbon standard
- Solar PV and storage – as above with the inclusion of a battery storage system
- The inclusion of sprinkler systems
- Efficient electrical heating, hot water and cooking solutions (so no mains gas)
- Smart Home pack – including smart thermostat and alarm

ilke Homes are working with partners to fund the capital cost of these enhancements.

As a result of the factory build quality control, achieving high fabric performance and repeatable performance is significantly easier than with traditional construction. Reductions in defect rectification and maintenance costs are also anticipated.



Driving sustainability in new homes: a resource for local authorities

VERSION 1.0: March 2018

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