Climate Change, Planning and Design
APSE Big Energy Summit

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In an Uncertain World

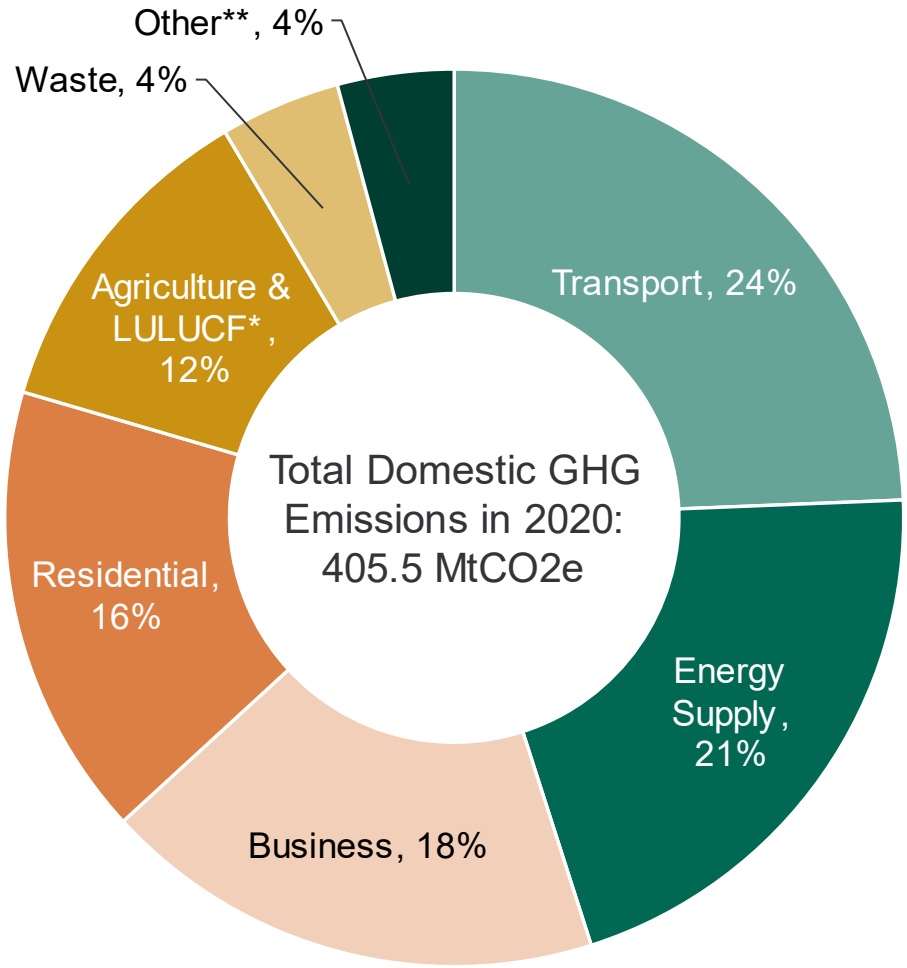
Changes to the Planning System

Levelling Up and Regeneration Bill

The Bill seeks to use the planning system to deliver five key outcomes:

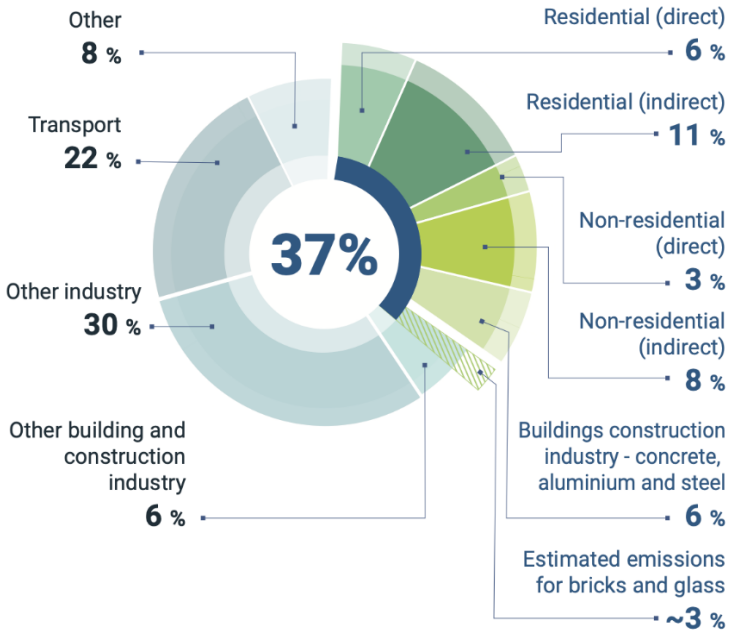
1. Deliver high quality design and beautiful places, and protect our heritage;
2. Enable the right infrastructure to come forward where it is needed;
3. Enhance local democracy and engagement;
4. Foster better environmental outcomes;
5. Allow neighbourhoods to shape their surroundings, as this is where the impact of planning is most immediately felt.

Making a Difference

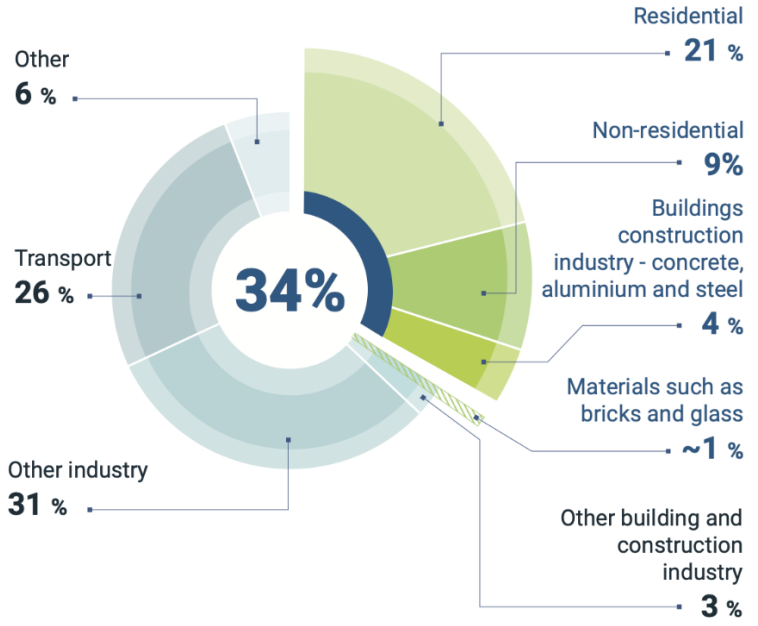


Construction and Operational Emissions

Global share of buildings and construction operational and process CO2 emissions, 2021



Global share of buildings and construction final energy demand, 2021



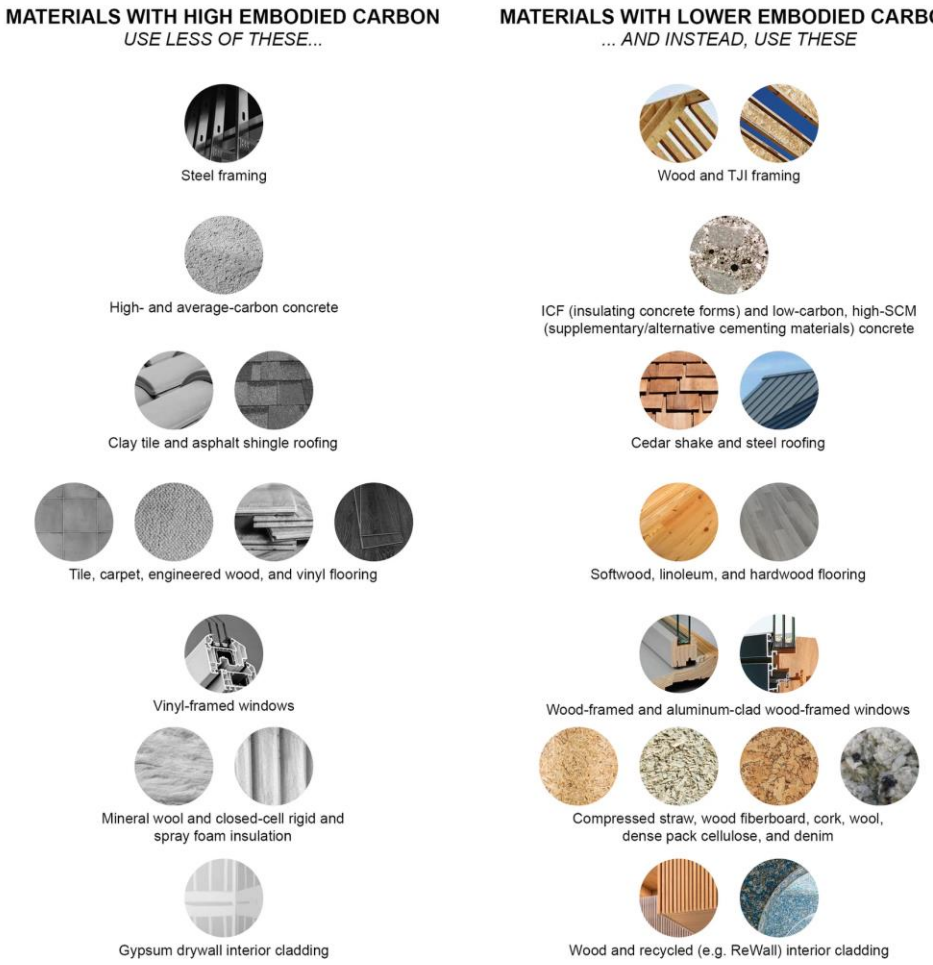
Embodied Carbon

Embodied carbon in buildings need immediate action to avoid undermining the carbon reductions achieved from energy efficiency.

- Materials used in the construction of buildings (i.e. concrete, steel, aluminium, glass and bricks) are estimated to represent around 9% of overall energy-related CO2 emissions.
- Globally, approximately 100 billion tonnes of waste is caused by construction, renovation and demolition, with about 35% sent to landfills.
- Raw material use is predicted to double by 2060 – with steel, concrete and cement already major contributors to greenhouse gas emissions.
- In fast-growing developing economies, construction materials are set to dominate resource consumption, with associated GHG emissions expected to double by 2060.
- A whole-life cycle approach to construction is essential to maximise sustainability.

https://globalabc.org/our-work/tracking-progress-global-status-report

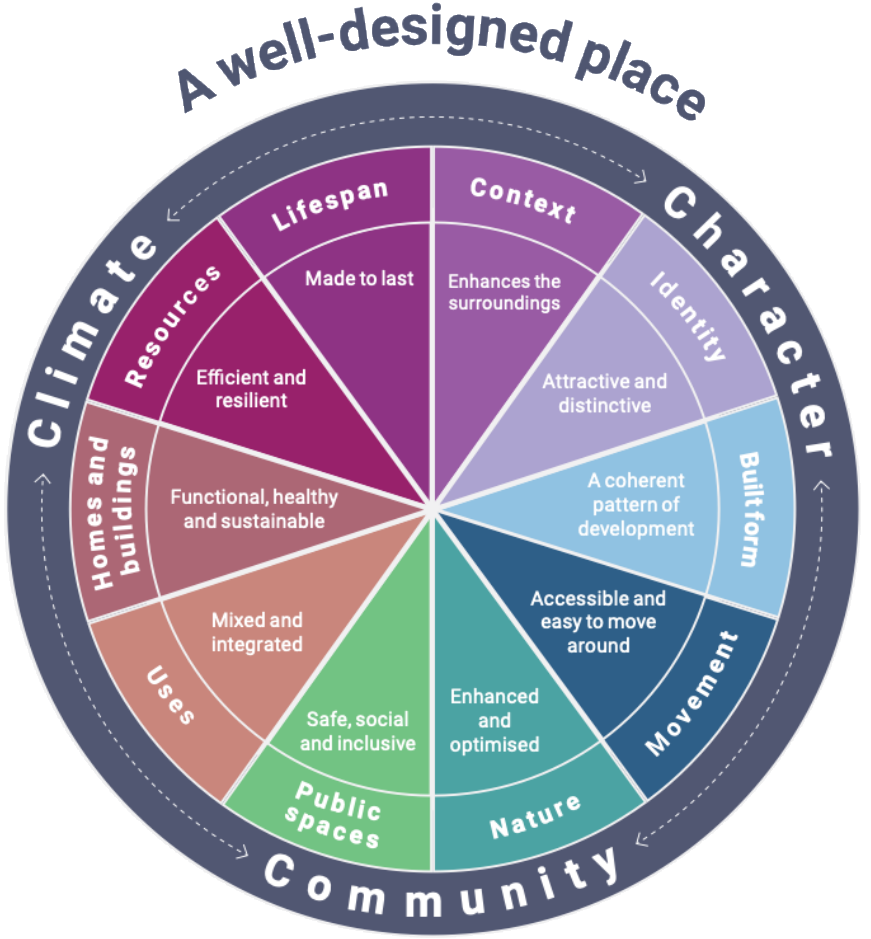
Embodied Carbon



A New City Aesthetic?

A New City Aesthetic?

National Design Guide



National Design Guide

Low energy housing with passive solar design, including shading to prevent overheating in summer, and highly insulated thermal mass construction. ***Great Bow Yard, Langport, Somerset***

135 Well-designed places and buildings conserve natural **resources** including land, water, energy and materials. Their design responds to the impacts of climate change by being energy efficient and minimising carbon emissions to meet net zero by 2050. It identifies measures to achieve:

- mitigation, primarily by reducing greenhouse gas emissions and minimising embodied energy; and
- adaptation to anticipated events, such as rising temperatures and the increasing risk of flooding.

136 A compact and walkable neighbourhood with a mix of uses and facilities reduces demand for energy and supports health and well-being. It uses land efficiently so helps adaptation by increasing the ability for CO_2 absorption, sustaining natural ecosystems, minimising flood risk and the potential impact of flooding, and reducing overheating and air pollution.

137 Well-designed places:

- have a layout, form and mix of uses that reduces their resource requirement, including for land, energy and water;
- are fit for purpose and adaptable over time, reducing the need for redevelopment and unnecessary waste;
- use materials and adopt technologies to minimise their environmental impact.

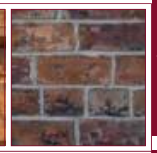
6.13 MATERIALS

Materials should express their structural or functional role or historic use. Unfinished concrete or concrete cladding panels are not acceptable.

Section 6.7

A. BRICK
A variety of brick types can be used but should reflect local context and type. Bricks should be predominantly red in colour and only in exceptional circumstances should other colours be specified. All bricks need to be agreed. The detailing of brickwork is very important. Brick should not be used as a cladding material in panels. Reuse may be appropriate.

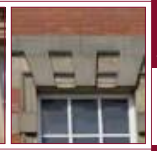
Z1 Z5 Z2 LT Z3 EZ Z4

Section 6.7

B. STONE
Stone, other than in the rural context, is primarily dressed and reserved for important buildings. Where used it is laid in courses throughout the elevation. Stone is also used for details, creating openings and bays. Polished stone may be used for stallrisers on shopfronts. Artificial stone should only be used for details in Z1, Z2 and LT, subject to heritage considerations.

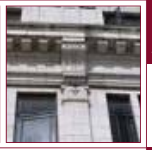
Z1 Z5 Z2 LT

Section 6.7

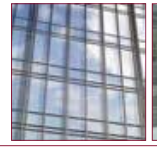
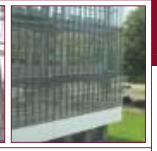
C. CERAMICS
Terracotta, faience and modern ceramics are suitable for detailing and as cladding materials.

Z1 Z5 Z2 LT EZ

D. GLASS
Other than as a window material, glass walls may be used in certain circumstances, subject to environmental performance considerations.

Z1 Z2 EZ

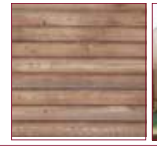



E. RENDER
Subject to local context, render may be an appropriate wall finish. It should be detailed in such a way to resist discolouration by weathering and should not be used directly abutting the public realm as this can encourage graffiti. In all zones, render should be white, cream or natural self coloured. Other colours may be appropriate in some contexts which should be identified through the design appraisal.

Z5 Z2 LT Z3 EZ Z4


F. TIMBER CLADDING
Timber cladding is a renewable building material, appropriate to a number of contexts. Timber cladding should not directly abut the public realm and should not be painted or coated with coloured treatments. Timber may be treated against weathering.

Z5 Z2 Z3 EZ Z4




G. METAL
Metal may be an appropriate wall finish in some contexts. Metal cladding might take the form of smooth panels, a beaten finish or profiled.

Z2 EZ


Design of New Development
Supplementary Planning Document 2011

6.11 GREEN INFRASTRUCTURE

A. PLAYGROUND
Designed specifically for children's recreation, playgrounds should be enclosed, have limited points of access and benefit from natural surveillance from nearby roads and streets. Playgrounds should be designed not to cause noise nuisance to local residents and can be stand alone provision or integrated with other open space.

Z1 Z5 Z2 LT Z3 Z4


Section 6.12

B. PLAZA
Defined by building frontages a plaza is designed for recreational, commercial or civic purposes. Trees should form part of any design. Plazas should be placed to benefit from high footfall, commercial or leisure attractions and be constructed of high quality materials. PUBLIC ART is encouraged in all plazas.

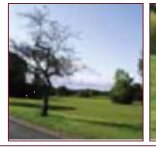
Z1 Z2 LT Z3 EZ


C. GREEN SQUARE OR PUBLIC GARDEN
Squares are defined by building frontages and streets appropriate to the locality and may be used for informal recreation. Predominantly green in character, with tree cover offering habitats and shade, squares should contain seating and in areas away from the street, adequate lighting. Paths should be provided along key desire lines to facilitate ease of movement. Informal sport may be appropriate.

Z1 Z2 LT Z3 EZ Z4


D. GREENSPACE
A larger open space partially defined by frontages and streets but may also have an interface with the countryside and green corridors. Greenspace should benefit from natural surveillance, with paths and routes accessible to all. A greenspace should incorporate a variety of open space types to promote multifunctionality and greater use during the day and evening. Informal sport may be appropriate.

Z2 LT Z3 EZ Z4




E. PARK
A semi natural large open space, that may have defined boundaries close to streets and residences, but which may interface with the wider green infrastructure network. Natural surveillance should be maintained where possible with buildings fronting the park, separated by a road or street. Informal sport may be appropriate.

Z5 Z2 Z3 Z4


Section 6.10

F. NATURE RESERVE
An area set aside for nature conservation. Appropriate access should be accommodated in all zones to provide an outdoor classroom for all ages.

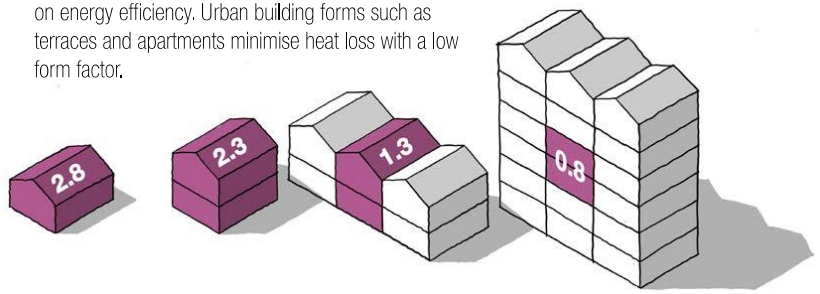
Z5 Z2 LT Z3 EZ Z4


G. GREEN CORRIDOR
Fulfilling the needs of transport and access as well as providing wildlife and habitat opportunities, corridors are appropriate in all zones as part of the green infrastructure network. Open space needs must be considered alongside recreation, transport and sustainable drainage needs. In terms of natural surveillance, corridors should be treated the same way as streets in terms of building orientation. Informal sport may be appropriate.

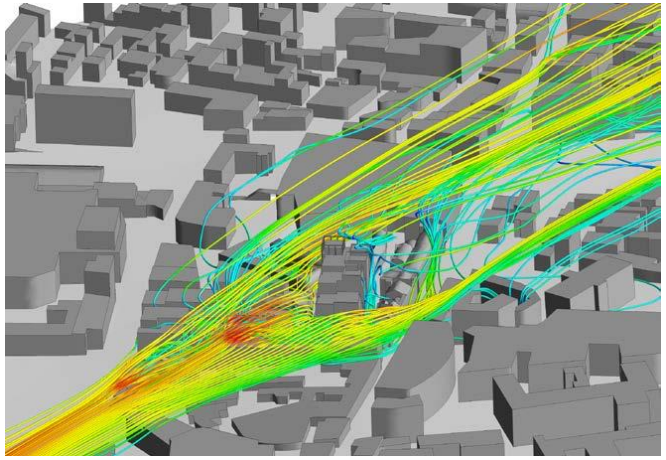
Z1 Z5 Z2 LT Z3 EZ Z4


National Model Design Code

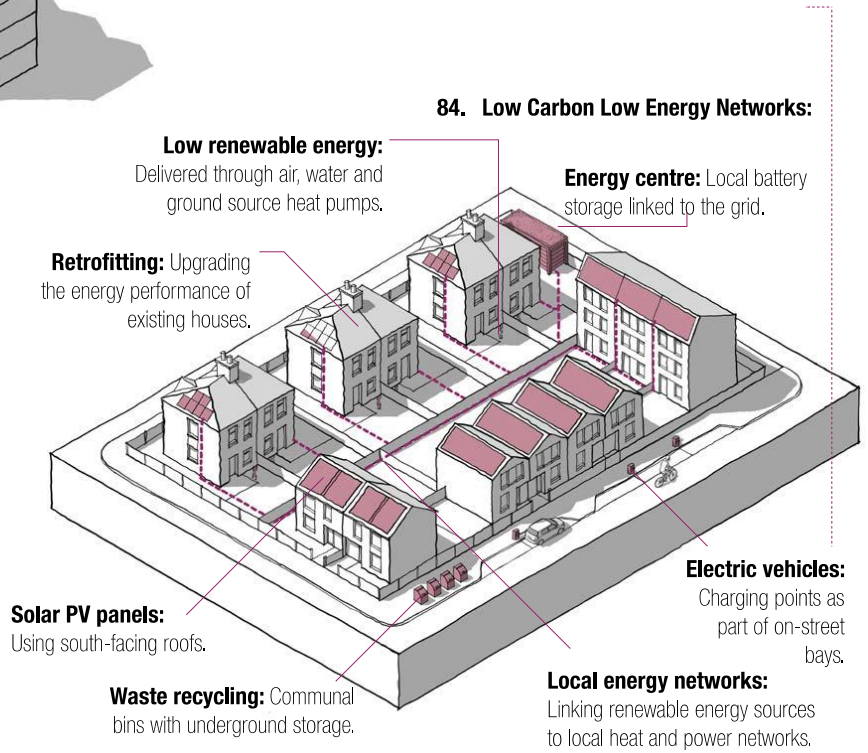
82. Form Factor: Is the proportion of floor area to external wall area and can have a significant impact on energy efficiency. Urban building forms such as terraces and apartments minimise heat loss with a low form factor.



83. Micro-climate: Schemes needs to consider micro-climate, particularly wind impact on exposed sites or where taller buildings are proposed. This affects the usability of the public realm and the energy demands of buildings.



84. Low Carbon Low Energy Networks:



National Model Design Code

202. The design of windows needs to consider orientation to balance heat loss and beneficial solar gain, daylight and sunlight. Southern-facing glazing can be beneficial in contributing to overall energy demand in winter. It can lead to overheating in summer and excessive heat loss on cold cloudy days in winter. Glazing needs to be sized appropriately for context and passive measures such as external shading devices or provision for future installation of shading devices needs to be considered to reduce reliance on mechanical ventilation.

R.1.iii Neighbourhood Energy Issues

203. Some energy issues are most appropriately dealt with at the level of the neighbourhood rather than at building level. Design codes can address neighbourhood level issues that contribute to meeting energy efficiency targets, support supply and demand at the local level and reduce transmission losses. See Figure 84.

R.2 Sustainable Construction

204. Sustainable construction is the practice of creating buildings using processes that are environmentally responsible and resource efficient. Design codes can include guidance on sustainable construction including embodied energy, approach to construction and use of water.

R.2.i Embodied Energy:

205. Embodied energy is the energy consumed by all the processes associated with the production of a building.

206. Reducing embodied energy can be achieved by remodel and reuse of buildings where possible rather than rebuild, using low energy materials, designing to use materials efficiently, reducing the energy used in construction, the re-use of materials and design for disassembly and adaptability so that the carbon locked in the building can be retained or reused in future. This can be achieved by:

- Reuse and refurbishment in preference to new construction.
- Embedding circular economy principles to reduce embodied carbon / energy and reduce waste
- Energy used in construction.
- Reuse of materials.
- Design for disassembly.
- Foundations that accommodate trees.

R.2.ii Sustainable Construction

207. All demolition and construction processes and materials production and application have environmental impacts. In addition to embodied energy, issues relate to the impacts of extraction, pollution, ozone, water extraction, and waste disposal. Design codes can include standards and guidance that address these issues.

R.2.iii Modern Methods of Construction:

208. ‘Modern methods of construction’ is a term that embraces a range of off-site manufacturing and on-site techniques that provide alternatives to traditional housebuilding. Such techniques can contribute to the efficient use of resources. Design codes could encourage innovative methods of off-site construction and modular production to improve building performance, productivity, waste reduction

Didn’t Go So Well

West Oxfordshire District Council Area Action Plan

“Policy 2 – Net Zero Carbon Development. Proposals for development at Salt Cross will be required to demonstrate net zero operational carbon on-site through ultra-low energy fabric specification, low carbon technologies and on-site renewable energy generation. An energy strategy will be required with outline and detailed planning submissions, reconfirmed pre-commencement, validated pre-occupation and monitored post-completion demonstrating alignment with this policy.”

Didn’t Go So Well

The Inspector Said…

“…we anticipate that our conclusions in relation to Policy 2 (Net Zero Carbon Development) will come as a disappointment. As such, we will say at this stage that we are not satisfied that Policy 2 is either consistent with national policy or justified. As such, we are unable to conclude that the policy is sound. Our fuller reasoning on this matter will be set out in our report.”

Recently Defended

- Reading Borough Council Policy H5 (2019)

“c. All major new-build residential development should be designed to achieve zero carbon homes.”

“Therefore, the requirement will be that major new housing is built to zero carbon homes standard. A revised Sustainable Design and Construction SPD to be produced in 2019 will contain more detail on achieving this requirement, but in general, where homes are not designed to be carbon neutral, this will mean as a minimum a 35% improvement in the dwelling emission rate over the 2013 Building Regulations83 plus a contribution of £1,800 per tonne towards carbon offsetting within Reading (calculated as £60 per tonne over a 30 year period)."

Offsetting

Offsetting project types

Main priority: Reduce energy demand in existing buildings, including through energy efficiency measures and improving monitoring and operation

Other priorities:

Generate renewable electricity, e.g. solar PV

Generate renewable or very low carbon and low emission heat e.g. solar thermal, heat pumps or fuel cells, replacing higher carbon systems that contribute to poor air quality such as gas-engine CHP

Support low carbon heat networks

Undertake whole building retrofit, e.g. improve energy and water efficiency, install renewables and smart metering

https://www.london.gov.uk/sites/default/files/gla_carbon_offsetting_guidance_2022.pdf

Local Plans

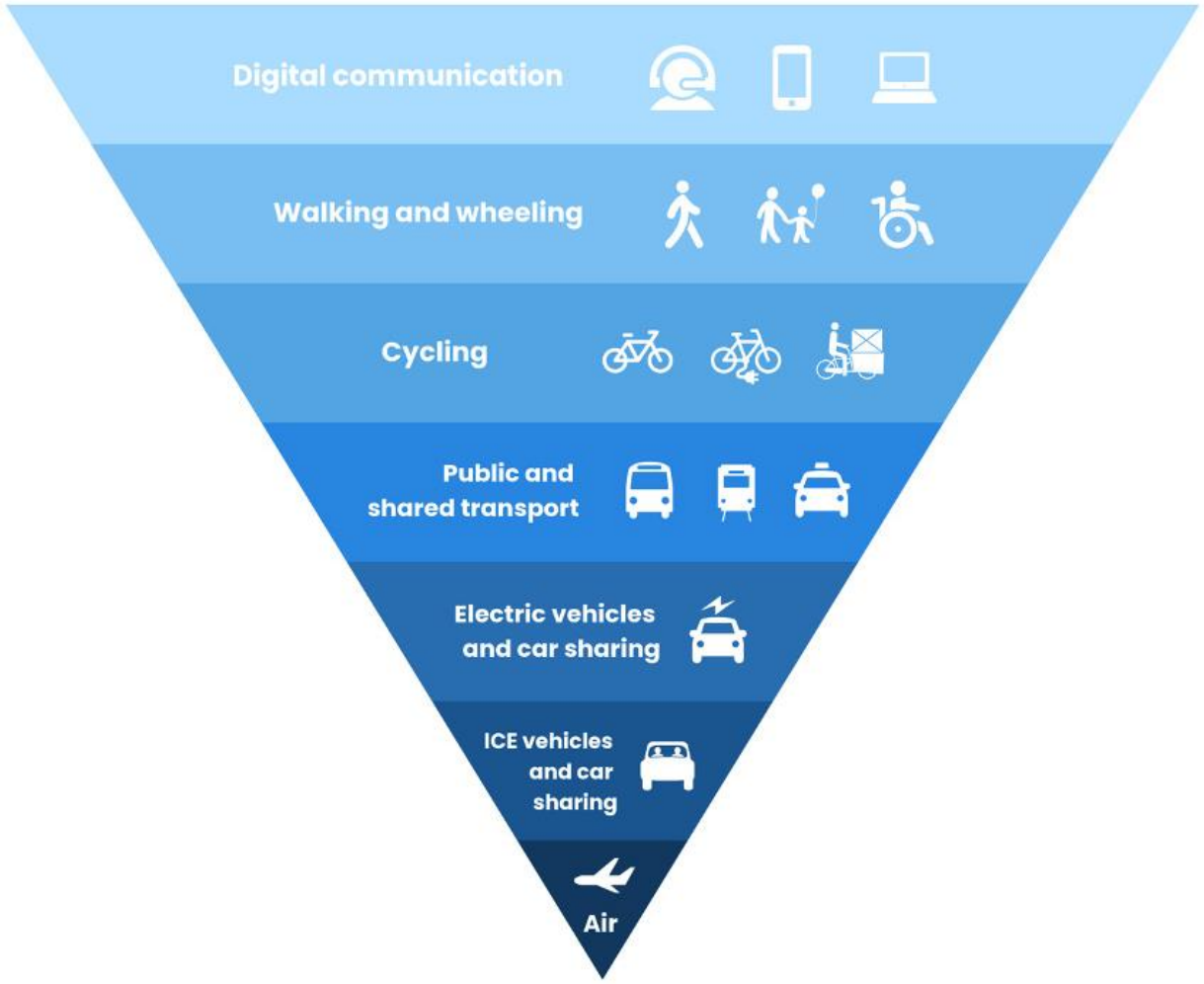
Strategic Objective 1	Support sustainable approaches to the location, design, construction, operation and impact of new development and infrastructure, to help secure the extremely rapid reduction in local emissions needed to stay compatible with the latest international climate agreement and nationally legally binding targets and reach a net zero carbon locally no later than 2041.	
Strategic Objective 2	Realise the potential of our industrial legacy, including its' previously developed land, and our waterside and heritage assets to deliver comprehensive urban regeneration of Birkenhead and other urban areas.	
Strategic Objective 3	Secure sustainable travel, improve accessibility, connectivity, and ease of movement and direct new development to locations which will provide easiest access to existing centres, high-frequency public transport corridors, and pedestrian and cycle routes. Thus reducing both the need to travel and the reliance on private cars and helping to ensure local travel is largely fossil fuel free by 2030.	
Strategic Objective 4	Make responsible use of land and natural resources to mitigate and adapt to climate change and enhance natural carbon stores and promote the transition to a low carbon Borough and circular economy, reusing and recycling waste and minerals.	

Strategic Objective 5	Protect and enhance the connectivity, quality and accessibility of urban and rural green space, and multifunctional green and blue infrastructure. Protect nature by ensuring development delivers measurable net gains for biodiversity and the blue and green infrastructure network continues to grow.	
Strategic Objective 6	Manage flood risk through an approach which: directs incompatible development away from high risk coastal, river or surface flooding areas; makes space for water; and prioritises nature based solutions to slowing the flow of water such as sustainable drainage systems.	

A special and healthy place to live

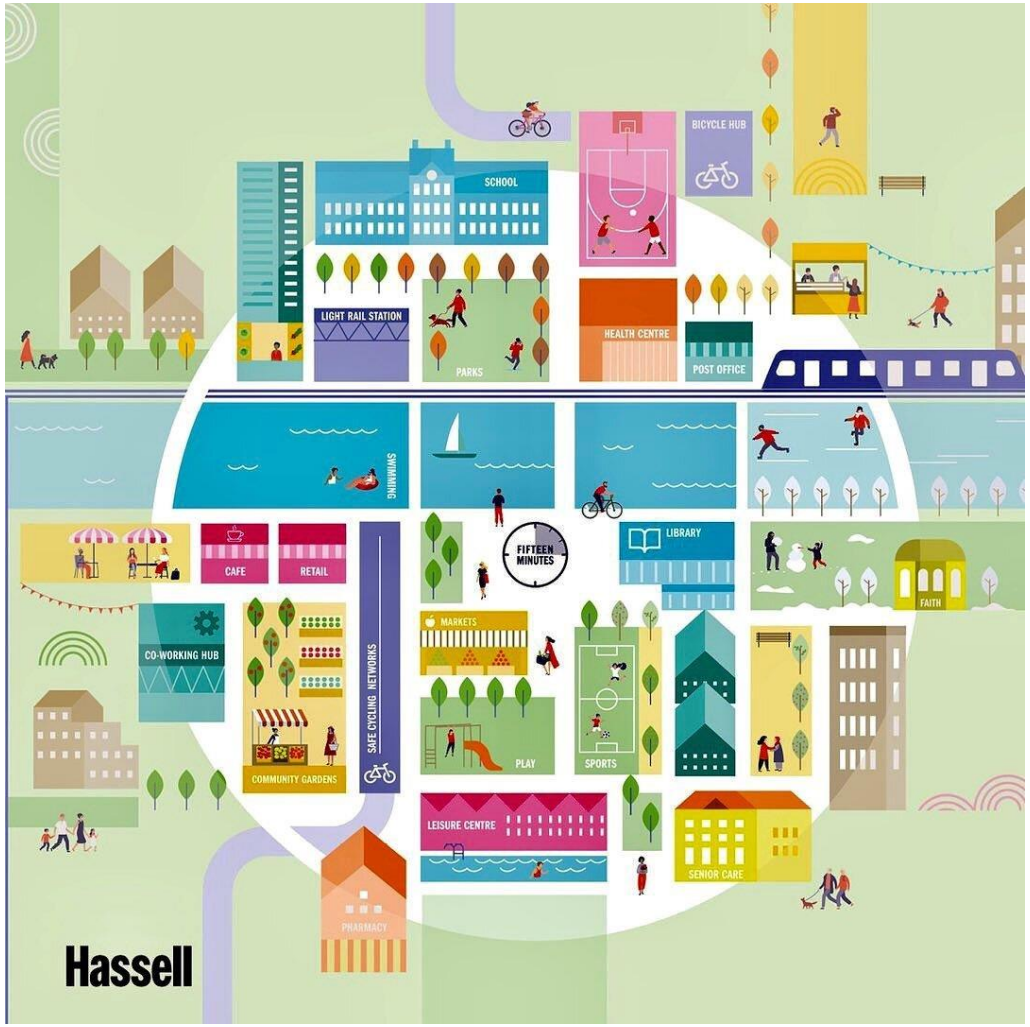
Strategic Objective 7	Enable the provision of sufficient housing to meet identified local housing needs and a choice of housing, including social and affordable housing, for people at all stages of life and incomes.	
Strategic Objective 8	Ensure that high quality new development integrates with and respects our peninsula's distinctive character, natural environment, valued landscapes and locally distinctive heritage to create high quality of design for vibrant, healthy places and local communities - whilst protecting and enhancing the historic character of places and buildings in the Wirral.	

https://www.wirral.gov.uk/media/567/download?inline



The Transport Hierarchy – Energy Saving Trust

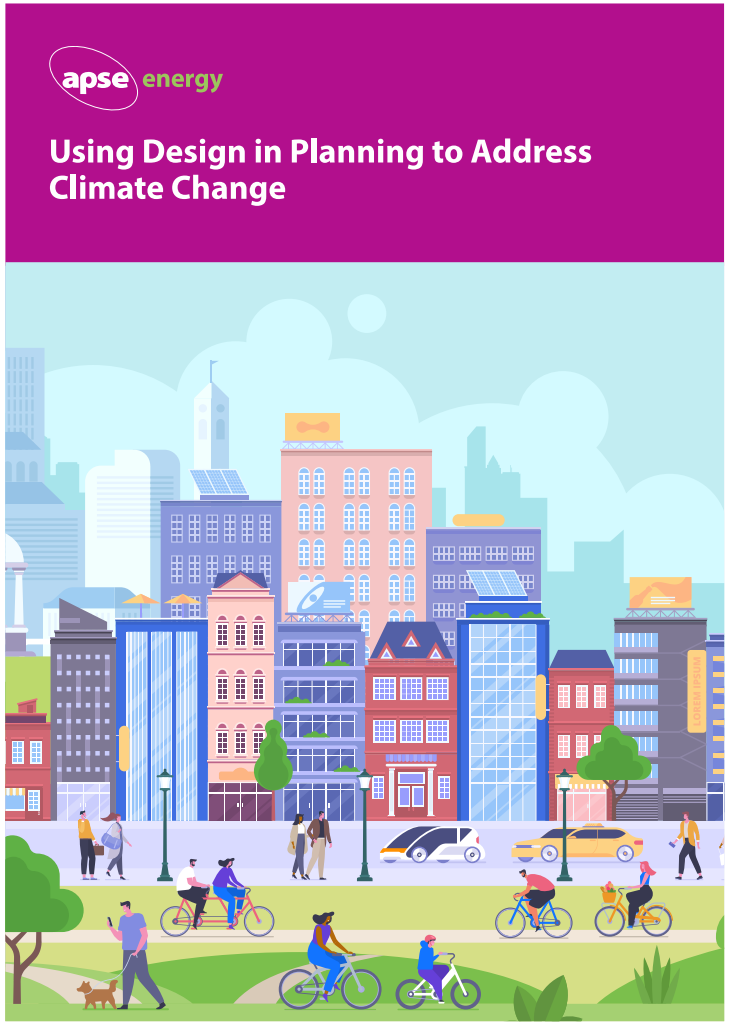
15 Minute City



Key Takeaways

- Design can influence structural and site level energy efficiency and the choice of materials to reduce CO_2 emissions as a result of development
- Offsetting can be achieved locally through projects and carbon capture – think about developing internal carbon and BNG markets
- Local design codes are an opportunity to ‘bake in’ energy efficiency, offsetting, and other priorities
- Don’t forget transport and compact growth models

Sources of Guidance



Thank You!

Questions and Comments