

Repurposing to Zero

**A framework for the repurposing of buildings
across the West Midlands**



West Midlands
Combined Authority

WEST MIDLANDS
Greener Together



The most sustainable building is one that is already built.

The WMCA has declared a climate emergency and a target for the region to reach net zero carbon emissions by 2041. One of the key strands was to prepare a Circular Economy Routemap to indicate how the region could take action in the manufacturing food and construction sectors as part of its programme to reach net zero carbon emissions.

The initial construction of buildings represents a major part of its whole life carbon emissions, from the selection of materials to how it was constructed. When decisions are made to demolish and rebuild at the perceived end of a buildings life, it results in significant amounts of new carbon emissions being produced, and a lost opportunity to retain this embodied carbon.

With 87% of the buildings we need in 2050 already existing, we need to prioritise how we treat this embodied carbon. Renovation, refurbishment and retrofit of buildings help to retain this embodied carbon. What is often more

challenging is how to consider a new use for a building, given its design often reflects its former occupiers needs. How do you change a workplace in to someone's home, a new community facility or meet the space requirements of the creative, arts and culture sectors?

This Framework is the first step in embedding building repurposing in the West Midlands, and will be used by the WMCA to raise awareness, inform and influence strategic partners on opportunities and approaches in this exciting new area.

With over 215,000 homes to be developed by 2031 on brownfield sites in the West Midlands, there are already lots of opportunities to trial these approaches and see which buildings can and should be repurposed as part of delivering inclusive and sustainable growth.



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WHY BUILDING REPURPOSING?

Introduction

The repurposing of existing buildings – bringing them back into new uses - has been gaining increased recognition over recent years. In the West Midlands, this opportunity for building repurposing has been highlighted as an opportunity in the West Midlands Circular Economy Routemap as part of the urgency and commitment for the region to be net zero by 2041.³

Although not a new approach, building repurposing can provide a number of increasingly desirable benefits. Notably, efforts to transition towards becoming net zero have brought increased interest in repurposing as a result of the lower whole life embodied carbon that can often be realised through repurposing when compared to demolition and rebuild.¹

What is more, the region has ambitions to revitalise brownfield land while also preserving the character and heritage of the region. Not every building will be suitable for repurposing, however those that can could make important contributions to development in the West Midlands.

The repurposing of buildings is also an effective means to preserve the cultural heritage and character of a given location.² Repurposing buildings would create another chapter in the life of a structure.

If the region is to meet its net zero commitments, it may need to consider prioritising retaining buildings and their embodied carbon. This may require difference approaches to appreciating value and funding.

With this in mind, building repurposing is being viewed as an increasingly interesting approach that can generate benefits from both a climate change and socio-economic perspective.¹ Crucially, for the West Midlands Combined Authority (WMCA), supporting the Inclusive Growth Framework – ensuring that all residents are able to realise social benefits – is a key overarching approach underpinning this work.

The ultimate aim of this Framework is to bring building repurposing into decisions on the future of buildings, whether it is to be retained or demolished.

How to use this framework

To support the repurposing of buildings across the West Midlands, this framework has been developed to help key partners and stakeholders (including developers, architects and surveyors) to gain a shared understanding of building repurposing, provide guidance on a process to determine whether a building might be suitable for repurposing, and explore approaches and best practices.

The framework is intended to be used by those around the West Midlands that are seeking to understand whether building repurposing could be a valid approach to pursue.



WHAT IS BUILDING REPURPOSING?

Definitions and terminology

Despite the growing recognition of the potential of building reuse and repurposing to support environmental and social ambition, related words are often used interchangeably.

Most people will have heard of renovation, refurbishment and retrofit works to a building, and repurposing is another level of potential changes. Each focuses on the overarching objective of extending the useful life of a building.

Our definition of repurposing has been developed through research

and engagement with stakeholders in the region to come to a common understanding.

Building repurposing is focussed on the change of use and function of a building, as well as all the related works to ensure it meets requirements and standards. This can be more challenging than just renovating a building.

The importance of people and communities was added to our building repurposing definition, reflecting that the function of an existing building has a role in the area it serves. Communities remember the history of buildings, and what they brought to the area such as

economic prosperity. It can also reflect the impact that long term vacant buildings can have in areas, affecting the pride people have in their place.

By including the building and community in the definition of repurposing we can ensure a holistic approach is taken to opportunities and benefits in the West Midlands.

Building Repurposing

“Building repurposing is the process of reusing an existing (often vacant) building for a purpose other than that for which it was originally built or designed. Also called adaptive reuse, building repurposing can create new futures for existing buildings and extend their useful life in an energy efficient way, which can also serve a need for the local community and support inclusive development.”

Works to Buildings	← Extend useful life →			
	Improve state of repair <i>e.g. structural repairs</i>	Improve operational efficiency <i>e.g. efficient lighting, heating, cooling</i>	Enhancement through addition <i>e.g. renewable heating system</i>	Change of use / function <i>e.g. office to residential</i>
Structural Renovation	✓			
Refurbishment	✓	✓		
Retrofit	✓	✓	✓	
Repurposing	✓	✓	✓	✓

WHAT ARE THE BENEFITS OF REPURPOSING BUILDINGS?

Impacts of repurposing

With the increased interest in building repurposing, an increased knowledge of the range of potential benefits that the practice can generate has followed.

Recognition of the climate crisis and other environmental challenges has resulted in an increased recognition of the need, and growing market demand for, sustainable practices in construction. The repurposing of buildings is commonly demonstrated as a key practice to achieve a low carbon future.

Nevertheless, building repurposing can also have financial benefits when

compared to demolition and rebuild, albeit these are less commonly understood.

What is more, building repurposing can also work to provide additional social and cultural benefits. Notably, the heritage value that is embodied within a building can be preserved and celebrated.

The West Midlands growth plans, including its brownfield approach and revitalisation of the high street will undoubtedly impact on existing buildings in the West Midlands. The opportunities for repurposing include a range of buildings, from large department stores, vacant industrial

buildings to small units in Town Centres. The repurposing of buildings as part of these schemes can bring placemaking benefits, character and local distinctiveness, and allow existing and new communities to form a connection as part of change in their area.

Whilst the benefits of repurposing a building will vary based on each building, due to the range of different locations and approaches that can be pursued, ensuring this option is considered and benefits understood can lead to more positive decisions for buildings.

Financial

Cost effective – Lower cost than demolition and rebuild.⁴

Faster to complete – Quicker to bring back to market.⁴

When comparing projects of comparable size, benefits could be greater depending on the size of intervention but could yield at least 10% to 15% for cost and speed respectively.⁴

Environmental

Low carbon – Cut embodied carbon by up to 70%.⁵

When compared to demolition and new build.

Waste and resources – Divert materials from waste and saves natural resources.⁶

Social

Heritage value – Preserve, refresh and build upon cultural heritage of build.²

Faster to complete – Can engender positive changes within communities and meet local needs.⁷

WHAT TYPES OF BUILDING REPURPOSING ARE THERE?

There is not one single approach to the repurposing of a building. Each building presents its own unique opportunities, based on where it is located, its current condition, and what the new use could be.

Repurposing is ultimately a creative process with many options that can be considered.

Some common trends in repurposing have been identified (Table 1), and while these approaches are presented separately, they are not mutually exclusive and can be combined in endless and creative ways.






	Façade retention	Repurposing one or more of the existing walls as a façade. The remaining elements of the structure are removed.
	Insertion	The (majority of) the exterior structure is repurposed, while the (majority of) the internal layout and fixtures are changed.
	Preservation	Preserve and restore elements of the original building, both structure/exterior and internal as much as possible.
	Expansive reuse	Repurpose the original structure, but additional structures and components are added into and/or around the original building.
	Meanwhile use	Change the use and function of the building over the short-term

Table 1: Trends in building repurposing



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The Mailbox, Birmingham

A FRAMEWORK FOR BUILDING REPURPOSING

A check-list towards building repurposing

In seeking to prioritise repurposing in decisions for a building's future, a couple of questions are becoming more common:

- How to approach the repurposing of a building?
- How to determine the viability of a building for repurposing?

This section of this Framework provides guidance on these two questions by creating a light process and 'check-list' of steps to consider when initially exploring building repurposing. While the full process to practically repurpose a building spans multiple phases over many months, this Framework is positioned as a valuable first step to understand the viability of building repurposing and which options may be available.

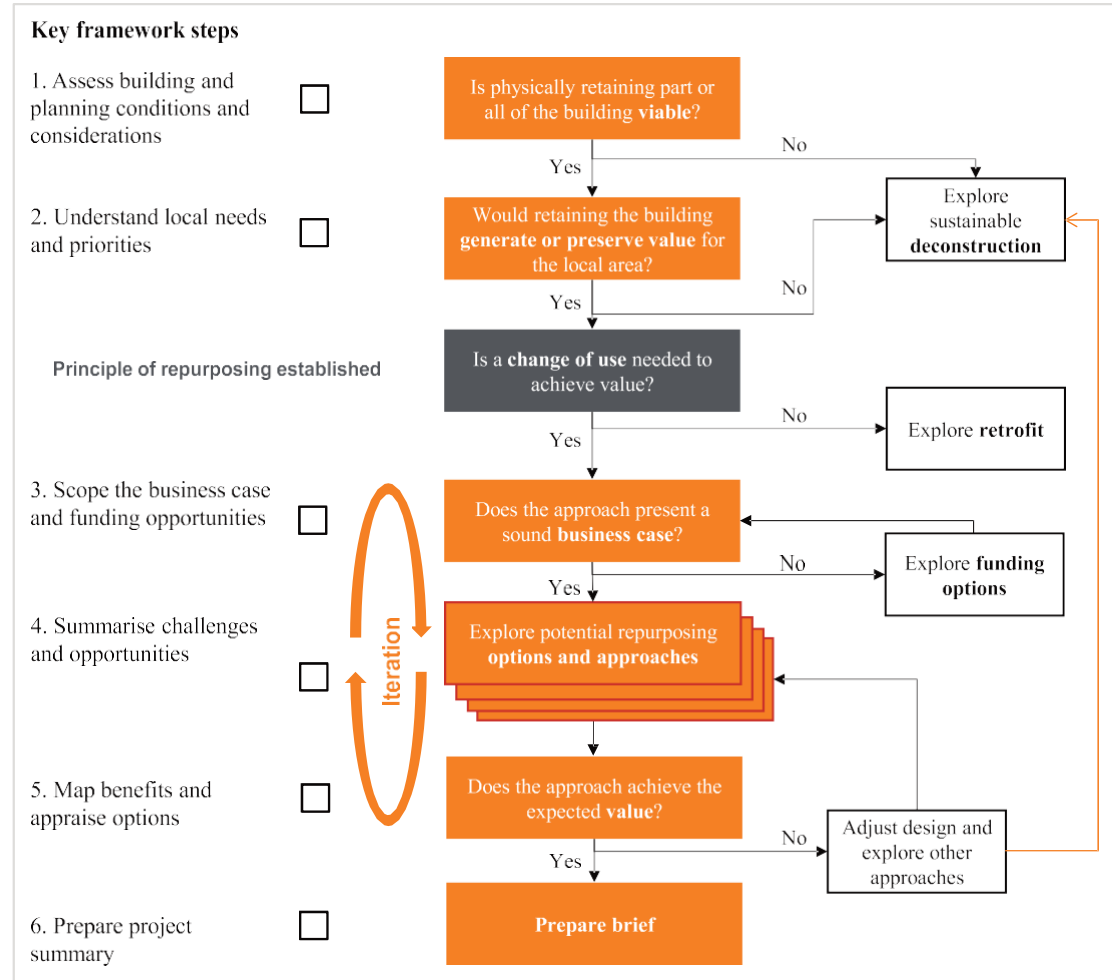


A FRAMEWORK FOR BUILDING REPURPOSING

A process towards building repurposing

The key steps follow a process to guide the initial examination of a building for repurposing. Each of them presents a key question, the answer to which can guide the decision of whether to repurpose. This process outlines both technical considerations, financial considerations, as well as framing the various types of 'value' that the building may provide (taking a broader definition of value than purely economic, including cultural/heritage value, environmental value, amongst others). In some cases, repurposing may not be the best solution, and this process can help to document the decisions towards an ultimate answer. The responsibilities of key stakeholders across each of the steps is outlined further in the Appendix.

This process would fit within the **RIBA Plan of Work Stages - Stage 0 Strategic Definition** to set the direction for the project. The process is iterative and returns to key questions as the scope becomes progressively clearer. The information gathered can be used to further prepare the project brief for repurposing at the end of this RIBA Stage.



1. ASSESS BUILDING AND PLANNING CONDITIONS AND CONSIDERATIONS

Is physically retaining all or part of the building viable?

Although reuse is not appropriate for every building, it is important to differentiate between 'available' and 'suitable'. A number of factors can influence the viability of a building to be repurposed including growth plans, the structural soundness of the structure, and its protected status.

Understand the future of the area

Planning considerations are set out in the National Planning Policy Framework and Local Plans. The spatial strategy for the area can influence whether a building can be repurposed to an alternative use. For example, buildings in industrial areas are less likely to be suitable for residential uses and deliver fewer benefits.

What's more, it's also important to viability of the building not just under today's context, but also within a future of increased severe weather events such as heatwaves and flooding. Resilience needs to be factored into the considerations of the building at an early stage.

Assess the technical considerations of the building

Each building is subject to a number of building regulations that ensure a minimum level of quality, such as safety, energy efficiency and adaptation to climate change. The ability to cost-effectively meet the required building regulations when compared to demolition and rebuild is an important consideration to influence the viability of repurposing.

Important technical specifications of the building to determine the viability include, but are not limited to:

- Condition of existing structural frame.
- Availability of archive information.
- Industry standards, such as floor to ceiling heights.
- Party wall issues.
- Depth of building.
- Internal space layout / historic listing.
- Building structure (type of frame).
- Load capacity
- Structural redundancy / foundations
- Fire escapes
- Legislative and regulatory, including permitted development rights, environmental protection etc.

Determine protected features

The designation of a building or respective area can influence its ability to be modified as well as demolished. Buildings that are listed heritage assets or in protected areas are at a lower risk of being demolished given existing policies, however can present added complexities.

Relevant sources of information

- National Planning Policy Framework
- Local Plans by Local Authorities
- Building archive information
- Listed building register



Springfield Campus, University of Wolverhampton

2. UNDERSTAND LOCAL NEEDS AND PRIORITIES

Would retaining the building generate or preserve value for the local area?

It is important to engage with a range of relevant stakeholders (including local communities, the supply chain, and local government) to ensure the project is framed in a way to achieve the greatest possible value, is relevant, and has the greatest chance of success.

Understand opportunities for the location

A building must be viewed in relation to the location in which it sits, and repurposing can present an opportunity to contribute to wider priorities of the area. Notably, there are opportunities to revitalise high streets and regenerate brownfield land. Exploring Local Authority plans can help to determine the wider ambitions, priorities and trends for the area.

Local community assessment

Assessing the needs of the local community can be carried out through interviews, surveys and information from Local Authorities. This is an important step to determine the needs of the local area

that the project could meet. Consider the Inclusive Growth Framework - an overarching strategy for the WMCA to ensure that plans, actions and policies are carried out in a way that achieves equitable social benefits. The Growth Decision-making Tool has been developed to support the integration and application of such principles, and this equally applies to building repurposing projects.

Public and private sector priorities

Building repurposing can generate a range of value for a number of beneficiaries (Table 2). It is important to understand at the start of the process which types of value are key considerations.

Engaging with developers and Local Authorities, and exploring local strategies and policies can help to map out various such priorities for the project.

Prioritise intended outcomes

It is important to clarify the relative priorities of the various needs and benefits - the intended outcomes of the project. Ranking and weighting criteria can support the identification of the best approach for repurposing. It is also valuable to determine whether there are any minimum thresholds any approach much meet, for example the requirement for repurposing to have lower lifecycle carbon than a demolition and rebuild option. This should be done in collaboration with the relevant stakeholders that are likely to be affected.

Potential Beneficiaries		
Private Sector	Public Sector	Society
Developers Investors Contractors	NHS Local Authorities	Local Communities & Residents Jobseekers
Owners and occupiers of buildings		
Benefit Type	Benefits	
Social	Heritage value/community identity	Encourage urban density
	Mitigate fuel poverty (housing)	Less disruption and business as usual for neighbours
	Community involvement and support	Increase in health and wellbeing
Economic	Cost savings during construction	Reduction in waste
	Reduced programme	Vitalised high street
	Supply chain innovation	More economically resilient and adaptable places
Environmental	Embodied carbon savings	
	Reduction in energy consumption (during construction and post completion)	
	Decrease in construction traffic	

Table 2: List of potential benefits of building repurposing

3. SCOPE THE BUSINESS CASE AND FUNDING OPPORTUNITIES

Does the approach to building repurposing present a sound business case?

As for any construction project, the overarching business case is a fundamental factor that will determine the viability and direction of a particular approach. It is important to explore these financial considerations during earlier stages to understand the broad business case which can ultimately shape which approaches are considered. But it is also important to continually revisit this consideration as the scope and clarity of the project becomes clearer. The Framework provides initial guidance to explore the conditions and scope of a feasible case, and projects will need to undertake their own detailed commercial appraisal and business case.

Examine local economic conditions

The local economic conditions of an area can shape the viability of certain repurposing opportunities. For example, dimensions such as rental prices, economic trends and market demand across the area can influence the underlying business case for building repurposing options. Exploring these characteristics and trends can help to

determine where the demand could be for a new use of the repurposed building.

Certain sectors of the economy (including the creative, arts and culture sectors) appear to favour repurposed buildings, including the BBC moving from one repurposed building to another – the Mailbox to the former Typhoo Tea

Scope the business case

Outlining and providing clarity on the overarching business case can help to determine which approaches to repurposing will be more suitable. For example, clarifying the project budget, potential occupiers and rate of return are important to shape future decisions.

Returning to these discussions to understand the costs and revenue potential is important throughout the continued development of the project to ensure the business case remains.

Identify risks

There are inherent risks associated with any building project. With repurposing projects it is important to identify risks early on as this will influence decision making and the feasibility of the project.

Greater understanding of the building, its capacity and any opportunities will help owners to maximise investment both economically and sustainably.

Identify funding opportunities

With Governments focus on supporting growth, available public sector funding opportunities should be explored to repurpose buildings.

Whilst not always explicit in funding criteria, cases have been made for investment in repurposing building projects through existing WMCA funding sources, including the Brownfield Land Fund. It is a similar position at the national level, where Towns Fund, Levelling Up and National Lottery Heritage funding have been used to support the repurposing of buildings. What's more, commitments to ESG (Environmental, Social and Governance) objectives by a growing number of funders may enable repurposing as a means to access funds to achieve such objectives of the funds.

Relevant sources of information

- Repurposing and Reconfiguring Buildings. CIRIA research project
- The Green Book and guidance
- RIBA Plan of Work 2020

4. SUMMARISE CHALLENGES AND OPPORTUNITIES

Explore options for building repurposing

There is no one template for the repurposing of a building. Ultimately, it is a process to find innovative approaches to make the best use of what is already there, to breathe new life into the building and the surrounding area.

Each building will have its own set of challenges and quirks. Encouragingly though, building repurposing is not a new phenomenon, and there are a huge number of success stories and examples where projects have found creative solutions to a vast range of challenges.

Exploring these examples in relation to the project in question can help to demonstrate the art of the possible and showcase a range of possible approaches and solutions.

Identify challenges and opportunities

Based on the exploration from earlier stages, summarise the prevailing challenges and any key opportunities that have been identified. These could relate to a particular building feature, technical consideration or

reflect wider market conditions such as skills and knowledge gaps. Use this stage also to define the potential new uses for the building. This identification can be done collaboratively with the various stakeholders that are involved in the process.

Explore success stories

Based on the challenges and opportunities, explore examples of building repurposing where lessons can be learnt, particularly in the local market.

Section 3 of this Framework provides a range of examples, spanning the West Midlands and beyond, and across a variety of building types and future uses. There is a range of success stories of repurposed buildings which have navigated the change of uses with initially unaligned specifications such as floor-ceiling heights.

The region's academic institutions are a wealth of knowledge which could provide invaluable insights into the repurposing of buildings, including the National Brownfield Institute at University of Wolverhampton, University of Birmingham, and University of Warwick.

Define repurposing approaches

List the range of potential approaches to building repurposing for the given project, for example, what will the new use be, and what designs, modifications and construction work will be required.

This can also be done in a collaborative and creative setting, and can be revisited as the project progresses.

The Old Library, Stafford
Library to residential



©Alan Murray-Rust

Coal Drops Yard, London
Industrial to retail



©diamondgazer



©Evelien-12345

BlueCity, Rotterdam - Leisure facility to business hub

5. MAP BENEFITS AND APPRAISE OPTIONS

Can the approach to building repurposing contribute to the value?

As there is no single solution to how a building might be repurposed, it is important to appraise each of the options against one another to determine which of the approaches could best deliver the desired value and outcomes. Assessing options in a consistent way can help to ensure the most viable approach is pursued, and can provide sound justification and greater clarity on the decisions.

Assess potential impact

Evaluate the estimated impact of each approach across determined variables based on the key priority areas outlined in earlier stages. Determine whether there are any fundamental conditions to be met or minimum thresholds. This could require repurposing the building to present lower Lifecycle Carbon than demolition and rebuild. There are common methodologies to support the evaluation of a range of impacts. Table 3 provides suggestions of methodologies for three of the core priorities across the three benefit types (Table 3). Each of the potential benefits should be evaluated with respect to a baseline, and alternative options, including demolition and rebuild.

Appraise options

With each repurposing approach assessed in relation to the key variables, the prevailing approach(es) that best meet the needs of the project can be determined, and any compromises discussed.

This can be an iterative process. Scoring low(er than expected) on a given indicator can indicate the need to update the design of the approach. Its useful to think beyond the life of the project – would the preferred option create problems in repurposing the building again in the future?

Benefit type	Benefit	Methodology	Example Data
Environment	Embodied carbon savings	IStructE/RICS methodology guidance on measurement GLA Whole lifecycle carbon assessment guidance BEIS Carbon valuation guidance	BEIS carbon values
Economic	Cost savings during construction	RICS Whole lifecycle costs assessments	BCIS costs
Social	Increase in community support	Surveys	Qualitative responses from surveys

Table 3: Table of methods and data to evaluate key priorities

Royal Hospital, Wolverhampton



6. PREPARE PROJECT SUMMARY

The final step in this Framework acts as the springboard to the next project stage to repurpose a building. Consolidating the key information in a clear and concise brief is important to support future phases of work. Clarity on the timeframe and roles of these future work phases can help to put the plan into practice

Summarise project scope, desired outcomes and proposed approach

Based on the discussions and decisions of the previous steps, clearly define the project in relation to its scope, the desired outcomes and any prevailing challenges.

Summarise the identified approach(es) to repurposing that will be pursued further, and the approach(es) that can meet the desired outcomes of the project as well as the overarching business case.

We expect the following elements to be addressed within the summary of the project scope:

- Current state
- Local needs and priorities
- Business case and funding opportunities
- Challenges and opportunities
- Options summary

Prepare project programme

Set out the programme to continue the development of the project, including the intended timeframe, and individual workstreams such as briefing, surveys, design, construction and handover. Scope which stakeholders are required for each stage of the project, and begin to identify suitable contractors.

Monitoring, evaluation and learning

At this conceptual stage of the project, it is important to understand how a successful project will be determined, particularly where the brief includes a range of desired outcomes, such as benefits to local community, low carbon, and others. Determine which indicators will demonstrate whether the project successfully delivered the intended benefits, and establish a process for how and when these will be monitored.

Relevant sources of information

- RIBA Plan of Work 2020



Daimler Powerhouse, Coventry

NEXT STEPS

Advancing building repurposing across the West Midlands

Repurposing buildings can play a key role in the West Midlands becoming a net zero carbon and circular region, and build on the rich cultural heritage to grow new economic opportunities for the future. These are the first steps for the West Midlands Combined Authority to support building repurposing throughout the region and will step up work in the future to provide more advice and support.

Is your project looking for funding?

If you have a project plan for repurposing a building and think your project could apply for funding support, contact invest@wmca.org.uk.



References

- 1 Arup (2022) 'CIRIA Research project 1137: Repurposing & Reconfiguring Buildings.' Arup & CIRIA.
- 2 ICLEI (2020) 'Adaptive Reuse of Cultural Heritage: An Examination of Circular Governance Models from 16 International Case Studies.' CLIC Project. Online.
- 3 West Midlands Combined Authority, Usefulprojects & SOENECS (2021) 'West Midlands' Circular Economy Routemap: Kickstarting the region's journey to a green industrial revolution.' West Midlands Combined Authority. Online.
- 4 Addy, N. (2014) 'Making Sustainable Refurbishment of Existing Buildings Financially Viable', in Burton S. (ed) Sustainable Retrofitting of Commercial Buildings, Routledge, Oxon, UK.
- 5 Derwent London (2012) 'Sustainability Report' p14.
- 6 UK Green Building Council (2015) 'Tackling embodied carbon in buildings'.
- 7 Ball, R.M. (2002) 'Reuse potential and vacant industrial premises: revisiting the regeneration issue in Stoke-on-Trent'. Journal of Property and Research 19 (2) pp93-110.



