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Habitat for Humanity® Great Britain

Replacing Empty Spaces with Productive, Green Places

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Contents

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Foreword

The UK continues to face significant housing challenges. Many people remain without a permanent home each night, while families often spend months, or even years, in temporary accommodation, sometimes in poor-quality or overcrowded conditions.

In response to this national issue, the call to action is often to build more homes – yet at the same time, many properties remain vacant across the UK, properties that could potentially provide safe, dignified shelter.

Partial solutions will not suffice. We need new market housebuilding, improvements to empty homes and development of new social and affordable housing, but conversion is also an important tool. Reimagining existing buildings as energy-efficient, affordable homes offers multiple benefits: easing housing supply pressures, reducing carbon emissions, revitalising neighbourhoods and supporting pride in place.

In 2019, M&G and Habitat for Humanity Great Britain began a new partnership. Building on learnings from projects Habitat for Humanity GB had completed in London and Kent, we launched the Empty Spaces to Homes programme. Together, and with a coalition of other funding, academic, policy and technical partners, we aimed to demonstrate how underutilised buildings across the UK could be transformed into homes for those who need them most.

This research provides an evidence base to strengthen the case for conversion. It shows how converting these spaces can help address homelessness, boost local economies, create jobs, and support environmental goals. It highlights successful examples from Liverpool, Glasgow, Fife and Tunbridge Wells, and offers practical recommendations for councils, developers and government.

The social and economic need is clear both in this research and elsewhere. With over 131,000 households in temporary accommodation, the demand for affordable housing remains urgent. Unused buildings can offer a relatively fast and cost-effective way to create homes, particularly in areas with high housing need. Domestic and international case studies here show how revitalising empty buildings can reinvigorate high streets and town centres, reduce costs for councils and stimulate local economies through construction and new residents.

The research team have also provided extensive evidence of the ways empty building conversions can contribute to tackling the climate challenge. Reusing buildings saves “embodied” carbon and avoids demolition waste, which makes up a large share of landfill. Conversions reduce pressure to build on greenfield sites, helping to protect nature and biodiversity. They also make use of existing infrastructure, reducing car travel and emissions.

The report makes recommendations for the coalition of policymakers and organisations responsible for addressing housing challenges. It also sets out priorities for the next phase of Empty Spaces to Homes.

We know that empty buildings owned by local authorities could provide thousands of homes. By making more strategic choices about the buildings they own, the evidence here suggests that local and national government could play a more active role in place-making. The public sector cannot do this alone, and Empty Spaces to Homes will seek to support them to deliver for residents.

As the report notes, current guidance, taxes and incentives do not always make it straightforward for developers or building owners to bring buildings back into use as housing. With the Chancellor committed to growth, there is an opportunity to explore how the tax system could better support conversion alongside other priorities. Through Empty Spaces to Homes and with partners, we aim to build on this research to show that incentivising conversion can deliver benefits for society, building owners and the Exchequer.

Creating well-paid jobs and careers for local people is key to realising all the benefits of conversions. The research team have shown that some places already focus on building a skills pipeline. While a portion of funds from the Apprenticeship Levy remains unspent on apprenticeship training, there is scope for more areas to help residents access work on a long pipeline of local conversion projects. This is another area where Empty Spaces to Homes can help.

Lastly, the research team have shown that there is much to learn from other places. Paris and Brussels provide examples of what is possible. As a programme working across Europe, Empty Spaces to Homes is well placed to bring learnings and examples of best practice from across the continent to support decision-making at home.

The research here shows that there is still much to do. Empty Spaces to Homes offers an opportunity to make a real impact on the housing challenge, but to seize this moment, we need others to join with us. Whether you are a policymaker, investor, developer or community leader: the opportunity is clear and significant. Together, we can do more than convert buildings. We can create lasting homes, reduce emissions and renew communities.

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Executive Summary

Unused commercial property provides a major opportunity to tackle housing and homelessness, support the UK's net zero goals, and improve urban density and the urban landscape.

The scale of housing need is stark: as of March 2025, over 131,000 households in England were living in temporary accommodation, including more than 169,000 children. These figures reflect a deeper crisis, millions of families facing unaffordable housing or living in unsuitable homes.

In August 2025 new research published by Habitat for Humanity demonstrated the potential to re-claim empty and vacant buildings belonging to local authorities and the private sector, creating over 500,000 opportunities to develop housing.[1] This initial research highlighted the scale of opportunity in repurposing empty spaces but didn't explore the environmental impacts and how incorporation of these could support productive growth.

To address this, Habitat for Humanity and M&G plc commissioned the LSE to investigate the environmental effects of retrofit housing and the transformational potential of this work in places with lots of empty buildings. The resulting report reveals a significant opportunity to harness embodied carbon in existing buildings, particularly commercial properties, to create up to half a million new homes whilst also increasing the skills base in the labour market and providing support for wider economic activity.

Extensive funding and technical guidance on retrofitting existing homes and offices to achieve net zero already exists at both national and local levels, supported by Government programmes and independent advisory bodies. However, this support does not extend to the conversion of unused commercial spaces into housing, despite the significant environmental and social benefits such conversions could deliver.

The report sets out the evidence base for the opportunities such commercial conversion work offers and provides detailed recommendations for stakeholders both within and beyond the housing sector.

Our recommendations on commercial conversions fall under 4 clear themes:

1. **Using conversion to achieve a Net Zero carbon approach and support the UK's Net Zero and housing goals**

- The Net Zero Carbon and Sustainability Guidance Note should be reviewed to include specific references, and at least one case study of commercial property conversion into affordable housing.

- The Green Building Council's UK Net Zero Building standards currently being developed include guidance on commercial property conversion into affordable housing

[1] https://www.habitatforhumanity.org.uk/wp-content/uploads/2025/08/Repurposing-Empty-Spaces-2025-Full-Report.pdf

- The UK Green Building Council should follow up the Building the Case for Net Zero: Retrofitting Office Buildings document with specific guidance on the use of suitable larger office spaces for good quality affordable housing.

- MHCLG and DESNZ should formally recognise the potential of repurposing unused commercial properties to deliver quality homes and support net zero goals. Following this recognition, an urgent review of available commercial stock should be undertaken to integrate such conversions into mainstream policy, incentives, and standards. A concise, accessible "decision support toolkit" should also be developed to assist funders and developers in advancing these schemes.

2. Economic and social cost benefit aspects of conversions

- Negative health outcomes (prevalent in conversions done under the PDF framework) should be addressed in planning and design standards by improved and enforced space standards, windows, amenities, ventilation and thermal comfort.

- Removing VAT on renewal and conversion projects should be considered and implemented. This has the potential to provide a much-needed boost to national economic growth.

- To support the objectives of the Warm Homes Plan additional guidance should be developed and issued to local government to clarify how the funding within the plan can be applied to the conversion of empty spaces to homes, in all rented tenures.

- Not all commercial properties are good candidates for conversion due to their design, location, or conversion cost. Evidence on economic and social cost benefit implications of conversions should be systematically explored, and national and local guidance issued to consolidate how these considerations can guide options appraisals of schemes.

- Updated EPC metrics currently being prepared should include consideration of the specific and emerging examples of commercial conversions, where additional or derogated situations may need to be included

3. Supporting upskilling and job creation to meet the technical requirements of commercial conversion opportunities

- The Office for Clean Energy Jobs should work with the housebuilding and construction sectors to provide clear additional guidance and targets around jobs which specifically concern office to homes conversion skills

- Initiatives to improve and expand skills training taken by local authorities[2] should be supported and expanded. This includes developing appropriate national skills standards and assessment tools.

[2] For example in Greater London https://www.london.gov.uk/programmes-strategies/jobs-and-skills/mayors-skills-academies-programme/skills-academies-hubs-success-stories

- Available online advice on energy efficiency and clean heat (and signposting to trusted local installers) should be extended to cover commercial conversion projects

4. Harnessing the opportunity of commercial conversion: national governance, local delivery, and global learning

- **National:** A convened Government task and finish group, including the Ministry of Housing, Communities, Local Government, industry, and building standards stakeholders, answering to the Housing Minister, needs to be established. This group will deliver a clear set of tasks necessary to make the most effective legislative and operational changes to enable local authorities to support conversions in partnership with their own stakeholders and residents.

- **Local:** Local authorities should be required to maintain and publish detailed records of unused commercial units, and use the proposed guide to assess their suitability for conversion into quality homes. These assessments should also be made public and reviewed annually to identify opportunities for engagement with commercial and third sector developers.

- **Best practice learning:** that further consideration should be given by Government to the Paris all-city approach to making renewal the default option, as well as of the long and extensive Brussels experience of conversion of unused offices to homes, with a view to compiling the main practical learning points and lesson which can be seen on those two cities

Introduction

This report presents evidence about how best to assess the environmental or climate impacts of completing a conversion of non-residential 'empty spaces' into good quality homes for people in need; how that compares to creating the equivalent housing as new build; and what the potential impact of undertaking such conversions would be at scale. These conversions can be taken across all of the commercial sector, including not only property owned by public bodies and not for profit organisations, but also the wider commercial market. This report focuses principally on the opportunities for conversion into homes that will be socially or affordably rented, owned or managed by a not-for-profit landlord or organisation following their conversion, and would offer community and wellbeing benefits for the residents. As the report goes on to show, converting empty buildings into social and genuinely affordable homes can support sustainable urban development, boosting social, economic and environmental outcomes while strengthening community resilience and pride.

There is a very large amount of local authority owned unused commercial property in many towns in the UK. The Habitat for Humanity report on its 2024-5 survey of UK local authorities estimated that there were now over 8,242 such empty units. These include vacant offices, retail units, leisure spaces, and a range of other property types. If these empty units were adapted and reused, the report estimates that they could provide over 25,000 new homes, contributing to the government's recently announced target of providing 1.5 million new homes to address the overall problems of homelessness and housing need. Similarly Historic England estimate that up to 670,000 homes could be created from vacant historic properties.

This report is also informed by the 2023 All Party Parliamentary Group Joint Inquiry into Rethinking Commercial to Residential Conversions which reviewed an extensive range of evidence and concluded that as well as conversions of local authority owned commercial units, there was additional potential for conversions from the empty commercial properties owned by the private sector. Overall, it concluded, 14% of all retail unit space and 7% of all office space is vacant. The APPG report included an Annex presenting the Habitat for Humanity's 'Empty Spaces into Homes' approach, which includes a practical open-source toolkit developed for local authorities, community groups, civil society organisations, and socially minded private sector property owners to use as a guide to convert vacant, commercial spaces into good quality social housing.

In this report we first look at the current UK government approaches to meeting climate change targets in terms of its strategy and the incentives it has set to meet "net zero carbon". We explore how reusing our existing buildings and built environment infrastructure can form an additional and important element of this wider and overarching objective Conversion of unused commercials spaces can be more beneficial for the environment and climate than building new homes on greenbelt land; and that avoiding demolition of existing buildings could save significant amounts of embodied carbon, reduce waste, and create lower demands on new materials. Converting and reusing existing buildings also makes best use of existing social infrastructure and networks as well as retaining a sense of community memory, history and identity, especially in areas which have undergone significant socioeconomic and urban change. In addition, these conversion to affordable homes can bring additional benefits in terms of also addressing the governments targets to provide more housing.

We then turn to how the government incentivised the move to net zero through standards, regulations, and financial incentives. Initiatives such as the Warm Homes Plan are designed to drive the pace of delivering net zero and incentivising individual, local government, and commercial action. In fact, however, these incentives have not been designed or adapted to specifically address and drive conversion of empty commercial properties in a way that could contribute to net zero and to housing targets. This is a missed opportunity to extend existing powers, funding and incentives to address conversion, and we explore the changes which could be made to address this missed opportunity. We consolidate this section in the first set of recommendations.

In addition to government funding, the wider issue of financial viability and social costs and benefits of schemes is also important to consider. Not all conversion schemes are economically or socially cost effective, and wider financial issues such as differential VAT rates for conversions compared to new build affect the financial modelling. There are also a wide range of social impacts, including health impacts, which need to be considered in the process of scheme appraisal. We have reviewed some of the ways in which environmental, social and economic aspects of these conversions from commercial to housing units have been evaluated in a range of specific studies and examples – including the questions about quality of housing, affordability, access to services and the wider urban environment. We consolidate this section in the second set of recommendations.

We then consider the issue of skills and the availability of contractors to undertake the necessary conversion work. Knowing what needs to be done and having the legal and financial incentives to do it is a starting point, but the question of having a skilled workforce to deliver quality conversions is also essential. We consolidate this section in the third set of recommendations.

We then consider evidence around the cost benefits of conversions, and which actions and approaches can most effectively deliver those benefits at least cost.

Finally, we consider the main policy and operational drivers which could deliver programmes of this kind at national and local government levels and could build on the considerable amount of knowledge and good practice which already exists. This is to say that a programme of conversions of the type set out here will not actually happen unless there are political and delivery objectives and targets which are clearly articulated, monitored, and reported on which drive a national and local programme of specific outcomes. To bring this about we propose in the final set of recommendation including that a ministerially led cross sector task and finish working group should be created to ensure that all local authorities and developers are clear what is possible and what is expected, and to monitor progress. This would include considering the adoption of good European practice in city wide mandates to consider re-use as a default presumption rather than demolition and rebuilding.

To prepare the report we have conducted:

1. an evidence and literature review of the evidence around good practice in delivering and evaluating the impact of these conversions
2. a policy scan, to understand how existing conversions sit within government policy, and to evaluate opportunities for future policy to support an empty spaces to homes programme.
3. a review of a small range of specific and cited case studies of previous conversions, to understand how they are applied in practice, what barriers they faced, and the impact of the conversion on the building and the residents.

Using conversion to achieve a Net Zero Approach and support the UK's Net Zero and housing goals

Overview of Net Zero carbon goals

There is considerable current and past government guidance and incentives provided to deliver net zero strategies for retrofitting existing homes, and reducing emissions in new homes and offices. These incentives are mainly directed at householders and landlords, as well as separate guidance for housebuilders, and in relation to existing office net zero improvements. There is less guidance on the explicit comparison of doing conversions of empty commercial properties to homes. Extending the scope of these strategies and incentives specifically for conversions (where there are no current householders or business tenants} is a clear policy option to promote as is set out next.

This existing guidance is driven by the identified national priority to achieve 'net zero' carbon by 2050. In order to achieve this the UK has a "carbon budget" which sets a legally binding cap on the maximum level of emissions that the UK can emit, over the following five year period. In effect, a carbon budget is the amount of carbon that the UK has available to 'spend' in the current five year period set time frame[3], and these carbon budgets are set to reduce over subsequent periods. Government has published a number of carbon budget strategies, and following legal challenges a revised plan setting out policies and commitments to meet carbon budgets and the UK's net zero target has to be published by October 2025. In anticipation, the 2025 spending review announced further funding for measures to decarbonise the economy and meet net zero, and the government has said that it would set out an updated whole economy plan to meet Carbon Budgets for the later five year periods in a refreshed Carbon Budget Delivery and Growth Plan later in 2025.

The APPG report cited above also had a focus on homelessness and recommended a "step-change in the delivery of new affordable housing" which estimates suggested would be 145,000 units a year of which 90,000 are social rent. Its report "sought to find solutions to see whether commercial to residential conversions could provide a partial solution to the gap in demand and supply of new affordable housing". A recent government announcement set out plans to fund the delivery of 18,000 social and affordable homes, which provides a context for the contribution which commercial to housing conversions could make. This is part of a longer term commitment to build an additional 1.5 million new homes. The wider environmental aspects of balancing new build (particularly on greenfield sites) with conversion of existing unused commercial buildings are explored next. The challenge and opportunity here is to identify the best ways to maximise the development of high quality affordable and environmentally low carbon homes with the overall needs of both the environmental and housing pressures. The current housing and homelessness crisis requires a multifaceted response, within which converting empty commercial properties into affordable homes can play a role.

The focus of this report is to highlight how significantly increasing the number of units converted into homes could make a much more significant contribution to addressing both the environmental and housing problems, not least due to the huge number of empty commercial building that currently lie empty and most often unidentified in local authority areas.

[3] https://commonslibrary.parliament.uk/what-are-carbon-budgets/

Finally, the previous government had also commissioned an independent review of Net Zero and in that government's response to the recommendations it included a few which have specific relevance to office conversions to homes:

- On Recommendation 59 that Government should drive forward delivery of the recommendations of the *Green Jobs Delivery Group*, it set out that it would produce and monitor the Net Zero and Nature Workforce Action Plan in 2024. This will outline the headline actions and solutions the group is progressing to deliver the skills needed within the UK workforce to deliver net zero. An important addition to the guidance here would be for it to include clear additional guidance and targets around jobs which specifically concern office to homes conversion skills
- On Recommendation 72 recommending the government develop a public procurement plan for low-carbon construction and the use of low-carbon materials, by the end of 2023, it noted that *The Construction Playbook* sets out a consistent approach to the procurement of built assets, consistent with achieving the objective of net zero carbon by 2050. The Playbook requires government departments and arm's length bodies to undertake whole life carbon assessments of projects, and to ensure that decarbonisation is one outcome that project procurement is intended to achieve. In addition, to support procurers to achieve decarbonisation and wider mitigation of the environmental impacts of construction, the government has also published a 'Net Zero Carbon and Sustainability Guidance Note' to supplement the Playbook, which includes both an annex detailing standards and guidelines for assessing projects in net zero terms (which is attached as Annex X), and also case studies including one on *Foleshill Health Centre - Delivering a Net Zero NHS Estate* which has relevance to office conversions. It would be particularly useful if the Net Zero Carbon and Sustainability Guidance Note could be reviewed to include specific references to conversions of commercial properties to affordable homes, and a specific example of a major conversion of this type be included in the document.
- On Recommendation 111 that the Government should support establishing retrofit hubs by 2025 (though mainly to link householders to suppliers, but with wider value for conversions) the response noted that there are several organisations already working in retrofit sector including the 5 government funded Local Net Zero Hubs and TrustMark, the government endorsed quality mark for retrofit. It also noted that the Construction Leadership Council are setting up a National Retrofit Hub focused on industry activity. Again we would suggest that the Local Net Zero Hub delivery group and the Construction Leadership Council could each be invited to provide specific guidance and support to the development of additional conversions of commercial properties to high quality affordable homes as a specific aspect of their remit

Although the government has now changed, these responses highlight some of the continuing initiatives and guidance by which to assess and take forward conversion activities.

We have seen in this section that a range of guidance, support, and financial resources are already in place or being made available. The challenge here is to ensure that in the allocation of these financial resources and support services local authorities have clear and unambiguous instructions on how to deliver conversions to affordable homes.

The specific environmental benefits of conversions for Net Zero goals

The 2023 joint All Party Parliamentary Group Housing market and delivery and Ending Homelessness report on Rethinking Commercial to Residential Conversions brought together evidence on the opportunities that commercial-to-residential conversion offers towards meeting net carbon as well as boosting housing supply in the UK. It cites a report from C40 Cities and Arup which found that reducing the global demand for new buildings by 20%, for example through converting existing buildings, would reduce global carbon emissions from buildings and infrastructure construction by 12%. It outlined that requiring office conversion projects to measure, monitor and report whole life costs, carbon and local impacts will help to build evidence around this approach, raise developer confidence and dispel misconceptions about office conversions. This represented a major focus of parliamentary attention on this issue, although this was made in the lifetime of the previous government and its recommendations were made in that context.

The environmental impact of any conversions or new building can be understood and calculated using a "whole life carbon" approach. Whole life carbon refers to "*the combined total of embodied and operational emissions over the whole life cycle of a building*", while the whole life cycle means "*the entire life of a building from material sourcing, manufacture, construction, use over a given period, demolition and disposal, including transport emissions and waste disposal*".

The UK Green Building Council (UKGBC) provides definitions of two types of carbon which need to be considered, "operational" and "embodied":

> ***Operational carbon*** *refers to 'the emissions associated with energy used to operate the building or in the operation of infrastructure', including heating, hot water, cooling, ventilation, lighting systems, equipment and lifts. This is often what people will focus on when thinking about how to make a building more sustainable. However, operational carbon only makes up a certain percentage of a building's total emissions.*
>
> ***Embodied carbon*** *refers to the remaining 'emissions associated with materials and construction processes throughout the whole lifecycle of a building or infrastructure'. This is typically associated with any processes, materials or products used to construct, maintain, repair, refurbish and demolish a building.*

Each element of a building – from the glass in the windows, to the concrete foundations, insulation in the walls, and bricks in the façade – has an embodied carbon cost.

The Green Building Council have maintained that 'the greenest building is the one that already exists', a phrase originally attributed to Carl Elefante, former president of the American Institute of Architects.[4] Similarly a campaign group, Don't Waste Buildings, was set up in 2024, to make the case for the productive use of empty and underperforming buildings in the UK. It proposes that these economic and social assets should be reused and repurposed, rather than discarded[5]. Commenting on the wider government housing target,

[4] https://www.architectsjournal.co.uk/news/opinion/the-greenest-building-is-the-one-that-already-exists

[5] Don't Waste Buildings uses LinkedIn as its key organising platform. Their public page is available here: https://www.linkedin.com/groups/13002786/

and building on a study of how to meet housing goals sustainably, this campaign suggested that

> *estimates have indicated that the current government's housebuilding target of 1.5 million new homes in this parliament would use up the entire 1.5C carbon budget for England on housing alone*[6].

Drewnoik, M. et al (2023) have also modelled embodied carbon cost of UK domestic building construction up to 2050.

Buildings have always changed uses, and this flux has formed part of the rhythm of urban spaces. However, since the Covid-19 pandemic and subsequent cost-of-living crisis, the rate and regularity of flux has increased[7]. Since 2013, permitted developments in England has led to an increase in office-to-residential change of use developments. Permitted developments require developers to notify the local planning authority, but do not require full planning permission. As a result, there have been negative examples of office-to-residential conversions: poor quality conversions; poor location leading to a lack of local amenities; overheating; lack of ventilation and ensuing health challenges from damp and mould, leading to office-to-residential conversions gaining a poor reputation.

New build properties are often advertised as energy efficient, and can be seen as more energy efficient than older properties. However, many of these calculations look only at the operational carbon of the building and do not take into account the embodied carbon of the construction of new builds, or when an older building is demolished. Two-thirds of the UK's produce waste is construction and demolition waste, and 75% of this waste ends up in landfill[8]. Concrete, bricks, metal, wood, glass, and insultation can all end up in landfill, with demolition projects specifically contributing substantial amounts of materials to landfill. A 2021 study estimated that, globally, Construction and Demolition Waste makes up around 30-40% of the world's total solid waste stream[9]. Demolition accounts for 90% of this waste, which the remaining 10% is from wider construction activity. The UK Green Building Council (UKGBC) estimates that 13% of materials delivered to building sites are never used, instead going straight to landfill.

Reducing the demands on landfill also reduces demands on land for new landfill sites, and reduces future impacts on the environment from leaching of chemicals into the ground or water, or from the development of greenhouse gas emissions as materials break down in landfill.

The APPG evidence cited work from *Building and Infrastructure Consumption Emissions* (Arup and University of Leeds, 2019) published by C40 Cities, which set out in the section on quantifiable actions to reduce consumption that:

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[6] Don't Waste Buildings Hymn Sheet calculation based on 2022 paper:
zu Ermgassen, S.O., Drewniok, M.P., Bull, J.W., Walker, C.M.C., Mancini, M., Ryan-Collins, J. and Serrenho, A.C., 2022. *A home for all within planetary boundaries: Pathways for meeting England's housing needs without transgressing national climate and biodiversity goals*. Ecological Economics, 201, p.107562.

[7] Muldoon, Smith, and Moreton, 2022

[8] Don't Waste Buildings Hymn Sheet. Don't Waste Buildings uses LinkedIn as its key organising platform. Their public page is available here: https://www.linkedin.com/groups/13002786/

[9] Juliana Rodriguez-Morales, Oswaldo Burciaga-Diaz, Lauren Y. Gomez-Zamorano, J. Ivan Escalante-Garcia. 'Transforming construction and demolition waste concrete as a precursor in sustainable cementitious materials: An innovative recycling approach'. *Resources, Conservation and Recycling.* Volume 204, 2024.

Buildings are underutilised and often discarded before they have reached the end of their useful life. Building utilisation can be increased by promoting refurbishment over new construction and encouraging the efficient use of existing space and infrastructure through flexible design. Flexible designs consider the potential future uses of a building by allowing the inside to be reconfigured for different functions. For example, apartments could be reconfigured for a growing family or shops could have the facilities to transform into office spaces. Changing work habits such as home working and coworking are also expected to increase building utilisation

The UK Green Building Council have also estimated that by 2035, half of all built environment emissions will come from embodied carbon. Currently embodied carbon makes up around 20% of the UK's built environment emissions. It is harder to assess and regulate, so much of the work on reducing carbon emissions in the built environment over the last 10 years has focussed on operational emissions. This has a positive impact on net carbon as the new buildings emit less carbon, but continuing demolitions of old buildings in order to provide these new homes would continue to be a major source of embodied carbon emissions.

A World Green Building Council (WGBC) 2021 report estimates that the global consumption of concrete and mortar accounts for around 46% of all materials extracted from the earth, and the production of concrete and mortar accounts for over 3% of global energy demand[10]. WGBC also estimate that between 40-50% of resources extracted globally for materials are used in the housing, construction, and infrastructure sectors[11]. In 2024, the carbon emissions of bricks used in the UK building industry was estimated at almost 300,000 tonnes. The UK is the leading importer of bricks in the world, and emissions are a result from both the manufacturing process and shipping[12]. While timber is seen as a more sustainable building material, at present 60% of timber used in the UK annually is imported, according to the Climate Change Committee, with impacts on deforestation and carbon capture from mature trees, as well as shipping emissions[13]. A useful example of good practice here is Social Bite's use of Scottish timber on their sites in Edinburgh, producing a new community hub using the same methods.

Furthermore, whilst the UK has previously achieved carbon reductions in line with its first three carbon budgets, some critics have claimed that this has been done by 'ignoring' the emissions generated in the manufacture of imported materials, and in shipping[14]. In advice to the government ahead of the setting of the fourth Carbon Budget, the Climate Change Committee, an independent statutory advisor to the government, stated that emissions from international aviation and shipping should be included in the limit for 2038-2042[15]. The UK imports many of its building materials, and so the inclusion of shipping emissions in the

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[10] WorldGBC. (2021) *Beyond the Business Case Report*. https://worldgbc.org/wp-content/uploads/2022/08/WorldGBC-Beyond-the-Business-Case.pdf

[11] WorldGBC (2021). An integrated approach to a sustainable built environment: the co-benefits of resources & circularity. https://worldgbc.org/article/an-integrated-approach-to-a-sustainable-built-environment-the-co-benefits-of-resources-circularity/

[12] Rachel Keenan, 'UK importing more bricks than ever and carbon cost is rising, study reveals'. *The Guardian,* 24th May 2025.

[13] Helen Freeman and Lorna Christie (2021). Reducing the whole life carbon impact of buildings. UK Parliament POST Brief.

[14] Dr Ian Campbell, 5th August 2024. *The UK's fair carbon budget will run out in 2026: here's the evidence.* Responsible Science Blog https://www.sgr.org.uk/resources/uk-s-fair-carbon-budget-will-run-out-2026-here-s-evidence

[15] https://www.theccc.org.uk/publication/the-seventh-carbon-budget/#post-49721-_Toc187753724

carbon budget means that the construction industry should also consider how it reduces these emissions.

Standard and measurement of carbon impacts

The Energy Security and Net Zero Committee had in May 2025 published a report on Retrofitting homes for net zero. The government responded on 21 July 2025 and in its overall response it noted that:

- Proposals were being developed and consulted on for updated Energy Performance Certificate (EPC) metrics to more fully reflect a building's energy performance and show clear information on emissions and cost. These revisions would also aim to address problems of fuel poverty and affordability of homes by reducing households running costs and increasing quality.

These standards could, we presume, be written so as to apply equally to conversions of unused commercial properties to homes but as part of this the *updated* EPC metrics could certainly include consideration of the specific and emerging examples of conversions of this type, where additional or derogated situations may need to be included

Above we have made reference to the annex to the government's 'Net Zero Carbon and Sustainability Guidance Note' which provides a short list of the main UK recommended standards and guides to assessing environmental impacts, and in this section we consider some of the other main initiatives in relation to measuring carbon impacts, standards, and good practice.

A specific assessment tool has been developed as the UK Green Building Council's UK Net Zero Carbon Building Standard and a pilot version of the assessment tool was launched in 2024. Following market analysis which showed a clear demand for a single agreed methodology for making 'net zero' claims, the project to deliver the UK Net Zero Carbon Buildings Standard was launched in 2022 to enable industry to robustly prove their built assets are net zero carbon and in line with the UK's climate targets. The purpose of this framework is set out as

> *…to provide the industry with clarity on the definition of net zero carbon buildings. It sets out high-level principles for achieving net zero carbon for construction and for operational energy, with the intention that further detail and stricter requirements would be developed over time.*

The project is supported by a consortium of leading organisations – Building Research Establishment (BRE), Better Buildings Partnership (BBP), the Carbon Trust, the Chartered Institute of Building Services Engineers (CIBSE) the Institute of Structural Engineers (IStructE,) the Low Energy Transformation Initiative (LETI), The Royal Institute of British Architects (RIBA), The Royal Institute of Chartered Surveyors (RICS), and the UK Green Building Council (UKGBC). It is described (by BRE) as

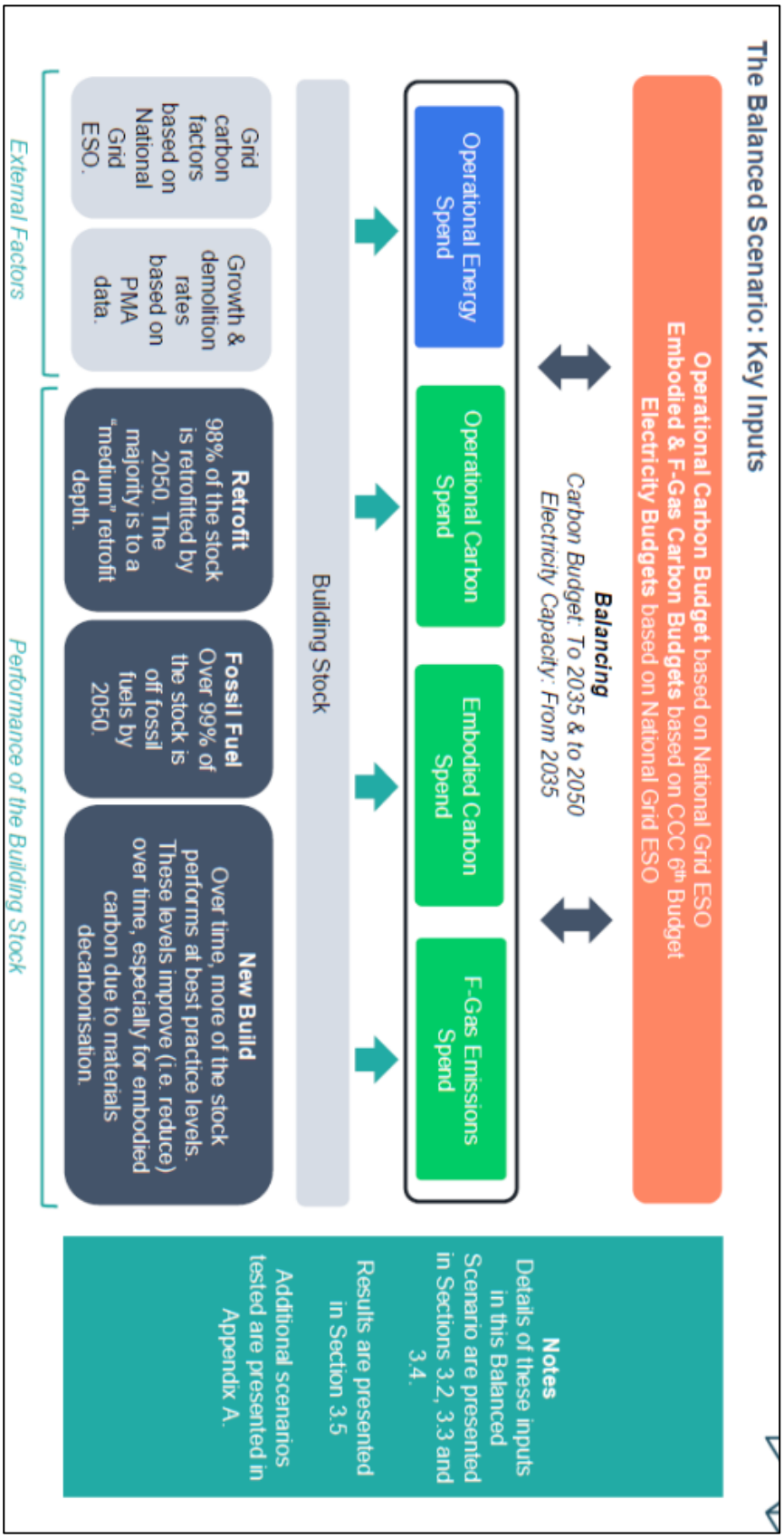
> *a free-to-access technical standard that will enable the construction industry to robustly prove that built assets align with the UK's carbon and energy budgets. Previously there had been no single, agreed methodology for defining what 'net zero carbon' means for buildings in the UK. Consequently, the area has been rife with spurious claims around the topic. The Standard provides a set of consistent rules to create a level playing field around such claims.*

The Standard sets limits for the embodied carbon and operational energy a building can use, and buildings aligned to the standard should be fossil fuel free, with targets set for on-site renewable energy generation. The Standard requires in-use measurement, meaning that buildings can only claim to be 'Net Zero Carbon Aligned' once they have been occupied and in use for at least a year[16]. Testing of pilots started in early 2025, and feedback from the first pilot projects to use the Standard will then feed into the first version of the Standard. Once launched, buildings will be able to be verified as meeting the Standard. Any conversion of empty spaces to homes should be guided by the principles in the Net Zero Carbon Buildings Standard, and once launched, should adopt the Standard into design briefs.

Each principle includes the approach that should be followed, technical requirements and, where relevant, any areas for future development. This therefore provides a practical way to guide the construction industry, and commissioning stakeholders including Local Authorities, to plan and assess projects to meet green savings standards. This would in principle include conversion projects and additional and specific guidance could be developed in relation to the principles to be applied to conversion of unused commercial properties into good quality affordable homes be published as part of the continuing process of developing the Green Building Council's UK Net Zero Building standards, so that commissioners and the industry would be able to robustly prove the net value impact of these conversions and thereby guide proposals being made.

A brief overview of the process of developing these standards is on the next page:

[16] https://www.nzcbuildings.co.uk/_files/ugd/6ea7ba_33db26ba808b4212801457963d2ed225.pdf



Source:
https://www.nzcbuildings.co.uk/_files/ugd/6ea7ba_8eaff0e25fcc494c8b7fb92c3fac4821.pdf

Another key document around evidencing environmental impact is the UK Green Buildings Council 2024 publication "Building the case for net zero: retrofitting office buildings". This focuses on deepening understanding of how to retrofit large (>1,000sqm) commercial office buildings towards net zero, the retrofit measures required, potential impacts, and associated costs. This is not a document about conversion of offices to homes, and it is aimed at offices over 1000sqm which means it deals only with larger office buildings. The report has both detailed case studies and considerable information about how to estimate the environmental impact of retrofit works. It builds a tangible evidence base to support investors, owners, occupiers, designers, and facilities management teams in developing their own business case for retrofit.

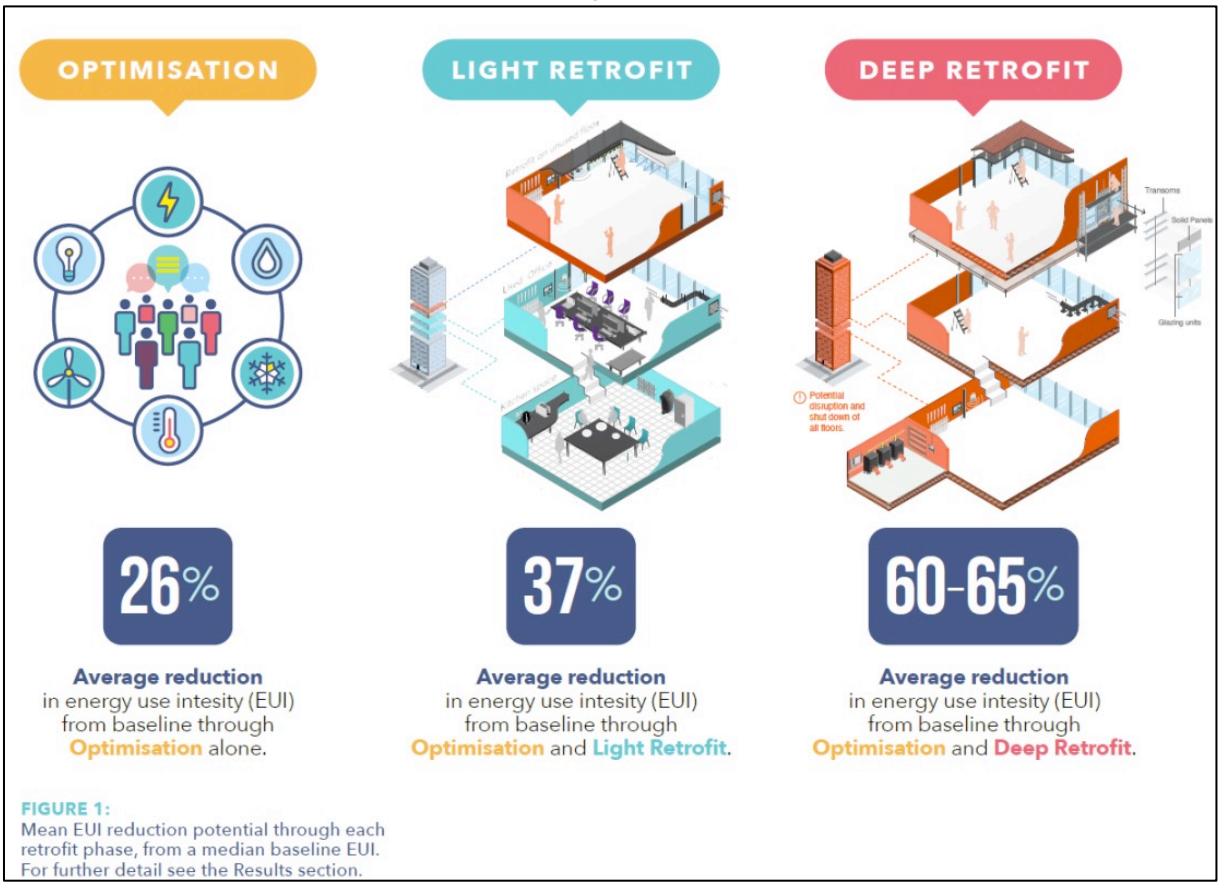
Overall the report provides information and guidance on tackling the environmental issues which offices provide, and flags specific solutions which can be of relevance to planning conversions.

> *Commercial retrofits offer a significant opportunity for realising deep value. At FORE partnership, we estimate there are around 6,500 office buildings above 20,000 sq ft in London alone in urgent need of retrofit to meet existing EPC regulations and hit London's ambitious net zero goals. Fixing them could save over £1 billion annually in electricity costs, and crucially as evidenced by study after study, drive up the investment value of these buildings by 15-20% through what has become a clear green premium*

A key finding was that

> *Overall the project concluded that significant reductions in operational energy use are possible through both optimisation and light retrofit (26% and 15% respectively or 37% combined), which generally include the most cost, and carbon-effective retrofit measures. Optimisation and light retrofit can be landlord or tenant-led, and success depends on effective collaboration between all stakeholders. Deep retrofit is generally required to achieve significant cuts in operational energy use (60-65%), transition building systems away from fossil fuels, and meet best practice 2030-2035 energy performance targets for offices.*

This information was summarised in a useful graphic:



Source https://ukgbc.org/resources/building-the-case-for-net-zero/

A good further step here would be if the UK Green Building Council could follow up the Building the Case for Net Zero: Retrofitting Office Buildings document with specific guidance on the use of suitable larger office spaces for good quality affordable housing.

There are several other ways of calculating whole life cycle carbon emissions for buildings, including a European Standard, EN15978, which is a widely accepted calculation method. In a specific Belgian case study below we include a further tool used to quantify life cycle greenhouse gas emissions and hence the environmental impacts. This is TOTEM [17] which aims to assess the environmental impact of urban buildings throughout their lifecycle and to optimise architectural choices. It seeks to reduce the environmental impacts of a construction and renovation project by comparing relevant design options. In evaluating buildings, TOTEM takes into consideration four core and comprehensive aspects:

1. the **production** phase of the **materials** used,
2. the **on-site implementation** phase (from transportation from the plant to the site to implementation of the material in the building),
3. the **use** phase **of the building**, including maintenance of materials and consumption of energy,

[17] See also https://www.totem-building.be/

4. the **end-of-life** phase **of the building,** including demolition or waste treatment.

A recent article[18] casts doubt on the longer term impact of retrofit as housing compared to new build, which draws attention to the longer expected life of new build homes than the expected life of office conversions. The paper evaluates the carbon viability of office-to-residential retrofits. It aims to determine at what point in time a retrofit becomes more carbon-intensive than a theoretical newbuild scenario (with a similar design in the same location), primarily due to enhanced operational performance of the latter. Comparative Life cycle Assessments (LCAs) showed that despite the high embodied carbon savings of the retrofit, the newbuild scenario has a lesser carbon impact overall when considering a typical lifespan of 60–100 years. This was due to the newbuild outperforming the retrofit with regards to lower operational carbon emissions, annulling the initial embodied carbon advantage after 22 years. Considering that LCA is typically conducted for 60–80 years, and that on average new buildings' lifespans in the UK are 60–100 years, it can be concluded that the retrofit would present a significantly higher carbon footprint over the entire life cycle, when compared to demolition and reconstruction. To address this, the paper also presents recommendations for minimal energy standards for retrofits, which aims to result in significant carbon savings, and we can also consider how to extend the lifespan of conversions, some of which are in substantial buildings with potential longer usage. On the other hand, we can also consider whether sometimes demolition could be more appropriate if it can deliver a significant uplift in the capacity of a plot for housing.

Our overall conclusion in this section is that there is a considerable and rapidly emerging body of guidance on good principles and practice in how to assess and compare different options to move towards net zero in existing homes and offices which are being retrofitted. What also seems clear is that this extensive and useful body of work does not currently extend to providing principles and guidance around the conversion of unused commercial spaces to good quality affordable homes.

Wider environmental impacts

Looking more widely at environmental impact, the conversion of empty spaces into homes has a wider positive ecological and biodiversity impact than new build. Reusing existing buildings and converting them to good quality homes means an increase in housing supply without further loss of nature or green space, as the building already exists. The Don't Waste Buildings campaign supports this, stating that a conversion and retrofit approach has less impact on water, animal, and plant life than new build[19].

Building Prosperity, a 2024 report by the Ellen MacArthur Foundation, focusses on how a nature-positive, circular economy can be 'unlocked' in Europe. The report states that prioritising brownfield site redevelopment, and crucially for this report, the *conversion of vacant commercial buildings*, can help the EU deliver on its target to halt the net loss of urban green spaces by 2030, and simultaneously address the need for housing. Repurposing buildings that are already well-located, close to infrastructure and transport, is inherently more space and resource efficient, but also avoids green field expansion. Reducing reliance on green field building for new homes avoids encroaching into natural animal and biodiversity habitats.

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[18] Mok, B et al (2024) *Carbon viability of retrofitting office buildings to residential use* https://doi.org/10.1016/j.enbuild.2025.115979

[19] Don't Waste Buildings Policy Roundtable Report

A 2005 paper by Bromley, Tallon, and Thomas looked at the inclusion of residential developments in city centre regeneration and how it could contribute to sustainability. Bristol and Swansea city centres were chosen as case studies, where residential development in the city centre had incorporated reuse of derelict sites and buildings for housing. In Bristol, office blocks, industrial units, and even a Catholic cathedral had been transformed into housing. Bromley, Tallon, and Thomas state that: "*Residential development can contribute to sustainability through the recycling of derelict land and buildings. This can reduce demand for peripheral development and assist the development of more compact cities"*[20]. Recycling these sites can also alleviate pressures on rural areas and reduce travel times to jobs, shops, and leisure opportunities, which reduces the demand on cars. Importantly, the reduction of urban sprawl is a key sustainability goal, which conversion of existing spaces can support. They argue that by reducing the pressure on suburbs and rural areas, the environmental and sustainability benefits extend far beyond the city centre where the reuse and recycling of buildings takes place.

Recommendations

In conclusion, our overall recommendations in this section are:

Using conversion to achieve a Net Zero carbon approach and support the UK's Net Zero and housing goals

- The Net Zero Carbon and Sustainability Guidance Note should be reviewed to include specific references, and at least one case study of commercial property conversion into affordable housing.
- The Green Building Council's UK Net Zero Building standards currently being developed should include guidance on commercial property conversion into affordable housing.
- The UK Green Building Council should follow up the Building the Case for Net Zero: Retrofitting Office Buildings document with specific guidance on the use of suitable larger office spaces for good quality affordable housing.
- MHCLG and DESNZ should formally recognise the potential of repurposing unused commercial properties to deliver quality homes and support net zero goals. Following this recognition, an urgent review of available commercial stock should be undertaken to integrate such conversions into mainstream policy, incentives, and standards. A concise, accessible "decision support toolkit" should also be developed to assist funders and developers in advancing these schemes.

[20] Bromley, R. D. F., Tallon, A. R., & Thomas, C. J. (2005). *City Centre Regeneration through Residential Development: Contributing to Sustainability*. Urban Studies. 42 (13).

Case study: Station Mews, Liverpool (2024)

Below we detail a case study where a former police and fire station in Liverpool was redeveloped into affordable housing retaining much of the embodied energy of the original building and creating much needed homes within an already built-up area close to public transport and existing amenities.

Summary

- Project Value: £8 million (as guidance to)
- Partners:
  - Torus
  - HMS
  - Halsall Lloyd Partnership – Architects and Designers
  - AA Projects
  - HL Structural Engineers
- Date of completion: February 2024
- Duration of works: 23 months
- Homes created: 7 shared ownership homes (two 3-bedroom semi-detached homes; two 3-bedroom and three 4-bedroom townhouses) plus 40 unit independent living scheme for the over 55s (also for shared ownership)
- The main benefits are that it showcases how a social landlord with partners can repurpose and redevelop an empty building into much needed affordable homes. The new homes have a better than average EPC certification and are in an area of high demand for affordable homes close to public transport and other existing amenities.

> *"Investing in and regenerating much-loved local landmarks is something Torus is passionate about and its latest completion sees the team celebrate a new future for the former Allerton Fire and Police Station – a building now internationally renowned thanks to The Beatles song, Penny Lane."*

The redevelopment and refurbishment of the iconic Allerton Fire and Police Station into shared ownership homes and an independent living scheme for the over 55s.

The project was led by social landlord Torus Homes and the HL Partnership with £1.7 million grant funding support from Homes England through a bid via JV North.

The group of buildings had been extended and modified over the years and therefore required careful analysis and planning in order to convert sensitively into quality residential accommodation.

If the building had not been developed into new homes it is likely it could have risked demolition, as was the case for another disused police station in Liverpool[21], as set out above reusing existing structures can contribute to lower embodied carbon.

The development partnership was acutely aware of the historic associations of the buildings, their importance to the community as a landmark and the need to develop a high-quality living environment for future residents.

[21] https://www.bbc.co.uk/news/articles/cg75x1me97mo

The design process was therefore shaped by this contextual analysis and research and proceeded through a number of iterations to meet strict cost/value parameters and to ensure a long-term sustainable development.

The redevelopment of the site has involved the use of modern methods of construction and innovative build techniques which made the scheme more sustainable and created cost savings for future residents on their energy bills. HMS also used this redevelopment as an opportunity to invest in local supply chains and create training and employment for local people ensuring that the project has contributed to the local economy.

The new apartments all have EPC certification of B or C, although the EPC rating of the original structures is not recorded this an improvement on the national median EPC rating of D[22].

Discussing the completion of Station Mews, Torus Chief Executive, Steve Coffey, said

> "*Our communities are central to every development we undertake, and Station Mews clearly highlights our commitment to work with the fabric of the local area to create something unique and much needed. I'm thrilled to be celebrating this major milestone with the team who worked so hard to transform a forgotten site into something that will continue to benefit the people of Allerton, reflecting the history of this unique building*.

Source: Torus Homes website: https://www.torus.co.uk/news/post/torus-completes-redevelopment-historic-allerton-fire-and-police-station and https://constructingexcellence.org.uk/hms-2/

[22]https://www.ons.gov.uk/peoplepopulationandcommunity/housing/articles/energyefficiencyofhousinginenglandandwales/2023

Case study: Bowhill Miners Institute, Cardenden, Fife

Below we detail a case study highlighting the conversion of a former miners institute into much needed social housing with a focus on sustainable redevelopment by reusing existing materials and reducing waste.

Summary

- Project Value: £2 million
- Partners:
    - Ore Valley Housing Association in association with Kingdom Housing Association.
    - ECD Architects – Architecture
    - Campion Homes – Main Contractor
    - Bayne Stevenson Associates Ltd – Structural Engineer
    - Carbon Futures – Energy Consultants
    - Scottish Government
- Date of completion: June 2024
- Homes created: 10 energy efficient flats

Status: Complete

Specialisation: Conversion and extension of listed building for social housing

"Bowhill carefully balances the need for modern, high-quality housing with a commitment to preserving the site's architectural and historical significance"

Awards:

- **Winner of the National Gold:** International Green Apple Environment Awards 2024 – Property and Estate Management, Regeneration category
- **Winner:** Scottish Energy Efficiency Awards 2025 – Regional New Build or Renovation Project of the Year
- **Shortlisted:** Scottish Civic Trust 2025 – My Place Awards Community-led Projects
- **Shortlisted:** Unlock Net Zero Awards 2025 – Retrofit Project of the Year, North and Scotland
- **Shortlisted:** The Herald Property Awards for Scotland 2025 – Best Renovation & Conversion
- **Shortlisted:** The Herald Property Awards for Scotland 2025 – Best Regeneration Project – Residential

Ore Valley Housing Association completed of the redevelopment of the former Bowhill Miners Institute building in Cardenden, Fife in summer 2024.

The historic community building opened in April 1934 and had been empty and unused for almost thirty years. It has been carefully restored and renovated to become ten modern and energy efficient flats for much-needed social housing, returning the building to its original place at the heart of the local community.

The building was previously a focal point for miners' welfare activities including dances, weddings, education programmes and even sustaining industrial action. The building was in a state of severe disrepair with structural surveys identifying that internal features were irreparably deteriorated, with collapsing roof elements, decayed masonry, and bowing timber lintels. However, the building was saved from demolition and reconfigured with a modern extension added to the rear to bring it back to life. The properties that have been created are being targeted towards addressing homelessness in support of Fife's Rapid Re-housing Transition programme.

Despite these challenges, the client prioritised retaining two of the traditional polychromatic brick façades to honour the village's mining heritage. These were stabilised and repaired using reclaimed materials, maintaining the visual identity of the Old Miners' Institute.

Behind the retained façades, a self-supporting structure was built to house the new home modern interiors and ensure long-term stability. The new construction includes a three-storey extension to the northwest.

Complete and fully occupied, Bowhill exemplifies sustainable redevelopment by reusing materials from the site and reducing waste. The design maximised financial efficiency to deliver affordable housing while addressing the client's goals of preserving Cardenden's mining heritage.

Nick Clark, chief executive at OVHA, said:

> "*Where once there was a symbol of decline in our former mining town, there is now a prominent sign of regeneration and renewal through this sympathetic preservation of local history. We extend our sincerest thanks to all involved in this challenging project."*

Economic and social cost benefit aspects of conversions

This section looks at how conversions can be delivered in a way which is financially viable, and is beneficial in terms of social cost benefits to the households being housed in the converted homes and also to the local community in which the homes are converted. We look at some of the main financial drivers and issues, as well as approaches to undertaking options appraisals of proposed conversions of available commercial units.

Accessing Warm Homes Plan funding

Above we noted that the Energy Security and Net Zero Committee had in May 2025 published a report on Retrofitting homes for net zero and the government responded on 21 July 2025. In addition to the response around Net Zero considered in the previous section, it also noted that:

- £13.2 billion had been committed to the Warm Homes Plan over the years 2025/26 to 2029/30. This investment would be allocated across schemes that support households to upgrade with heat pumps, energy efficiency measures and low carbon technology like solar and batteries, and ensure families can benefit from homegrown energy and the mission for clean power by 2030.

Updated guidance for local authorities on the Warm Homes Plan was published on 16 June 2025, which makes clear that private landlords are eligible to apply as well as charity-owned properties where the lets are identified as PRS, not social housing lets. Registered Social Landlords can also apply for funding for 'infill' purposes and to support area-based upgrades – for instance, upgrading a block of flats or adjacent, terraced properties as part of area-based delivery – although there are additional conditions including 50% self-funding.

This is useful, although it is not made clear in the guidance exactly how this funding could be successfully claimed for converting unused commercial properties to homes. Our view is that in light of the centrality of this funding to the government's net zero agenda, additional guidance should be developed and issued to local government to clarify how it can be used to support these conversions to homes, in all rented tenures.

Options appraisals of possible conversion projects

A useful historical overview is provided in Wilkinson, S.J. et al (Eds) (2018) *Building Urban Resilience through Change of Use* which reviews the benefits and aspects of sustainable conversion adaptation through the whole lifecycle from inception, planning, and design, to procurement, construction, and management and operational issues. It illustrates and quantifies, through empirical research, the changes that have been achieved or delivered in sustainable conversion adaptation. In that book the article by Geraedts, van der Voordt and Remøy provides a demonstration of the utility of 'Conversion Potential Assessment Tools' in assessing buildings for 'conversion potential'. It presents an overview of the factors and characteristics of buildings that enable or hinder adaptive reuse of offices into housing, as well as guidance on how the market, location, building typology and involved stakeholders can be assessed to ensure that a potential conversion is a success. Developing this work further, the authors present a 'Conversion Meter' tool to assess the potential for conversion of office buildings into housing. These tools have been used successfully in the Netherlands on office to homes conversion. A similar tool or methodology could enable organisations in

the UK to think more carefully about conversion of empty spaces into homes, allowing a standardised and replicable method of exploring the applicability of buildings for conversion.

One more general term often used to describe the whole process of deciding which buildings are suitable for conversion to new homes is "adaptive reuse" which is defined in Tam et al (2018)[23] as:

> *the process of adapting old structures, renovation of a building or site for including elements that allow particular uses to occupy a space that originally was intended for a different purpose*

Many empty buildings have become empty because their original use has become unviable. This may be for a number of reasons – technological change; economic downturns; social obsolescence – that are not related to its structural condition.

Adaptive reuse can be particularly pertinent to the conversion of heritage properties, and supports circular economy principles by preserving embodied energy, reducing the need for raw materials, and preventing demolition waste[24]. Tam et al note that many existing buildings are valued and admired for their architectural beauty and urban functions and presence.

> *Heritage buildings can offer psychological reassurance because of their distinguishing characteristics; it can therefore provide social and cultural benefits. Since these buildings are located within the city near existing markets and amenities, the centrality and convenience of such accommodation may increase pedestrian traffic in the neighbourhood and could support diverse activities within an area. Several have witnessed the reuse of abandoned industry sites turning into social gathering places*

Yung and Chan (2012), note that *adaptive reuse should be viewed holistically, integrating social, economic, environmental, urban and political policies*[25]. According to Yung and Chan, adaptive reuse of buildings can support wider sustainable urban development aims, and that building conversion plans should act as a catalyst for wider urban regeneration in its surrounding environment. When assessing empty spaces to homes conversions, project managers and organisations should be aware of wider sustainability goals that the conversion can contribute to, beyond the environmental impact of the actual build or conversion.

Assessing the wider environmental, social, and economic potential in the round in order to identify viable and positive developments can be approached through the use of systematic assessment frameworks which take account of all these factors. Tam et al developed a wide-ranging analysis of international systems currently used for evaluating adaptive reuse internationally, to support a "Leadership in Energy and Environmental Design (LEED)" framework. This framework draws on the three main types of indicators, environmental, social and economic as below:

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[23] Tam, V. W. Y., & Hao, J. J. L. (2018). *Adaptive reuse in sustainable development*. International Journal of Construction Management, 19(6), 509–521. https://doi.org/10.1080/15623599.2018.1459154

[24] Foster, G. (2020). 'Circular economy strategies for adaptive reuse of cultural heritage buildings to reduce environmental impacts'. *Resources, Conservation and Recycling,* Volume 152, January 2020, 104507

[25] Yung and Chan (2012). Implementation challenges to the adaptive reuse of heritage buildings: Towards the goals of sustainable, low carbon cities'. *Habitat International*, Vol. 36, Issue 3, pp. 352-361.

Environmental, social and economic factors in Adaptive Reuse (Tam et al 2018)	
Category	**Purpose**
Environmental	
Site and community	To understand the impacts that the site has on the buildings and its sustainability levels
Energy efficiency	To reduce the potential of energy supply, improve air quality and reduce the impacts of global warming
Water efficiency	To reduce water consumption of the buildings
Material and resources	To provide opportunities for recycling materials and the use of sustainable materials for the buildings
Health and indoor quality	To improve health and indoor air quality of the buildings
Social	
Use	To understand the specific usability of the buildings
Context	To understand the surrounding context including physical, functional and visual relationships of the buildings
Occupant comfort	To understand the comfortable levels affected from the exterior environment to the interior environment of the buildings
Access to facilities	To examine the available facilities available around the buildings
Transportation	To examine the available transportation methods from the buildings
Economic	
Property value	To evaluate the property value after the development from adaptive reuse
Repair costs	To evaluate the repair costs of the buildings
Material and structural costs	To reflect the sustainability of the materials and structures from the original buildings
Operational and maintenance costs	To evaluate the operational and maintenance costs for the buildings after the development of adoptive reuse

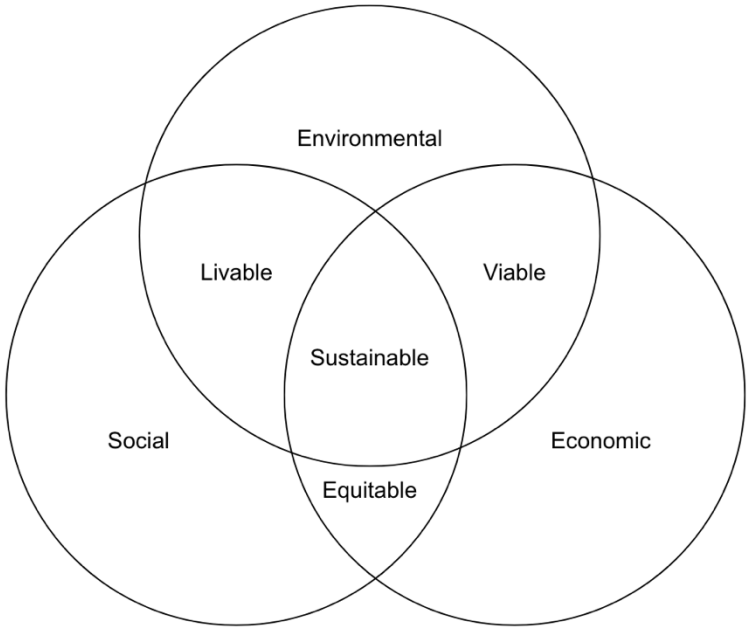
This framework was then used by Tam et al to assess six examples of adaptive reuse, using these factors and judging the outcomes in terms of four indicators:

- below standard,
- reach standard,
- good practice, and
- best practice.

The article also reviewed the weightings and ranking approach to all of these indicators. The conclusions were that this approach provided a comprehensive and reliable means to assess the quality and outcomes of adaptive reuse projects, although this did not include any specific quantitative outcome data in terms of the specific environmental carbon savings beyond the specific indicators measured in the environmental section, and nor did it provide direct comparison to alternatives such as new build.

Another practical example of balancing these factors is in Hoogendijk (2019) ***"Using Workplace to Create Social Housing Space: The Applicability of Office Conversion for Achieving Urban Sustainability in the Netherlands"*** This paper sets out what the author suggests is a widely accepted framework for the different aspects of undertaking successful conversions:

Fig. 2.1: Widely-Accepted Dimensions of Sustainable urban Development



Source: Hoogendijk (2019)

This is a relevant study in the UK context as the urban environments in the Netherlands and across parts of UK are similar in many ways. Overall, the results of this research suggest that the practical application of urban sustainability through building conversion shows great potential for consolidating the three presented urban challenges while contributing to the ongoing goals of Dutch urban development. The paper notes that through interventions like office conversions, urban society reaps the benefits of removing the socioeconomic threats presented by building vacancies, increasing the provision of affordable urban housing, and mitigating environmental stressors, such as urban energy consumption and greenfield construction. The paper describes a framework which has been developed and used in practice for Dutch projects and is summarised in terms of the positive and negative impacts on the different stakeholders as set out below. The framework is designed to be applicable to different types of developments in different types of urban environment (small towns, large dense urban areas) – and the positive or negative impacts could vary in each of those cases. The diagram shows, for example, the positive environmental impact for new residents of access to existing services, and the positive impact on their neighbours of increased values of homes – but a negative impact on the municipality on their concerns for the long term quality of the conversions.

Table 7.1: Summary of Environmental, Economic, and Social Implications of Office to Social Housing Building Conversion

	Environmental	Economic	Social
Residents	(=) Preestablished access to green space	(+) Affordable housing (+) Desirable location, including access to urban services	(=) Preestablished access to services (-) Limited interaction with neighbors outside apartment & community participation
Neighbors	(+) No removal of green space (-) More trash in neighborhood (-) More noise in neighborhood	(=) No perceived impact on home value in neighborhood	(+) More liveliness and sociability in the neighborhood (+) Removal of (threat of) social problems associated with vacant buildings (+) Residential stability in neighborhood (-) Limited interaction with new residents of converted buildings
Developer & Housing Organization	(+) Housing organizations have and apply performance goals for energy efficiency in new residential developments	(+) More affordable housing created (+) Housing organizations have and apply performance goals for expanding dwelling count (=) Resources spent convincing neighbors of conversion project (-) Increased competition in the office real estate market	(+) Positive ratings from residents living in converted buildings (+) Intentional social mixing for social cohesion and control
Municipality	(+) Increased cooperation and expertise across institutional actors to address environmental goals (+) Intensifying land-use in city (=) Upgrading the sustainability of the building stock is not an explicit goal for conversion (-) Concern about the long-term environmental quality of converted buildings	(+) More affordable housing created (+) Improved image of economic competitiveness (+) Removal of economically inefficient property	(+) Increased cooperation and expertise across institutional actors to address housing needs (+) Improved urban livability levels (=) Limited social mixing
Province	(+) Increased cooperation and expertise across institutional actors to address environmental goals (+) Intensified land-use in urban areas (+) No removal of green space (=) Upgrading the sustainability of the building stock is not an explicit goal for conversion	(+) More affordable housing created (+) Creation of more affordable housing	(+) Increased cooperation and expertise across institutional actors to address housing needs (=) Limited social mixing
Overall Urban Sustainability	(+) Increased cooperation and expertise across institutional actors (+) Removal of energy expenditure redundancy at the level of the building (+) Adaptions to the energy efficiency of the urban building stock to address environmental goals (+) Intensified land-use in urban areas (+) No removal of green space	(+) Removal of financial expenditure redundancy at the level of the building (+) Removal of vacant office buildings (+) Creation of more affordable housing (+) Intensified use of existing services	(+) Increased urban residential accessibility for low-income households (+) Removal of (threat of) social problems associated with vacant buildings (=) Access to services remains in place (-) Limited interaction & community participation among residents of converted buildings

Source: Hoogendijk (2019)

Hoogendjik's overall conclusions are that:

> *Dutch institutions still struggle to address the environmental, economic, and social demands of cities in a balanced and adequate manner. In fact, the overarching political sentiment is still to foster short-term economic and social goals before long-term environmental needs.*
>
> *Nonetheless, this investigation of office conversion through the lens of urban sustainability shows that such small-scale urban developments have the potential to concomitantly address the environmental, economic, and social needs of all urban society, starting at the community-level…… While demolition-construction or greenfield construction may be more desirable options for realizing more housing in the short-term, environmental considerations must not be pushed aside.*
>
> *Furthermore, entire neighbourhoods may benefit from the intervention on vacant buildings, which also offer pre-established social and economic infrastructure for new residents of converted apartments…… [M]unicipal collaboration with housing organizations is encouraged in order to meet each party's goals, while working towards the ongoing urban sustainability of the urban arena.*

Similar evidence is reviewed by Mohamed, R. et al (2017) in a study which notes that there was a lack of literature which pulls the three main strand of adaptive reuse together, listing these as Environment, Equity, and Economic Development. This paper - *Adaptive reuse: a review and analysis of its relationship to the 3 Es of sustainability* – provides a overview of the relationships between these strands as below which echoes Hoogendijk (2019) above:

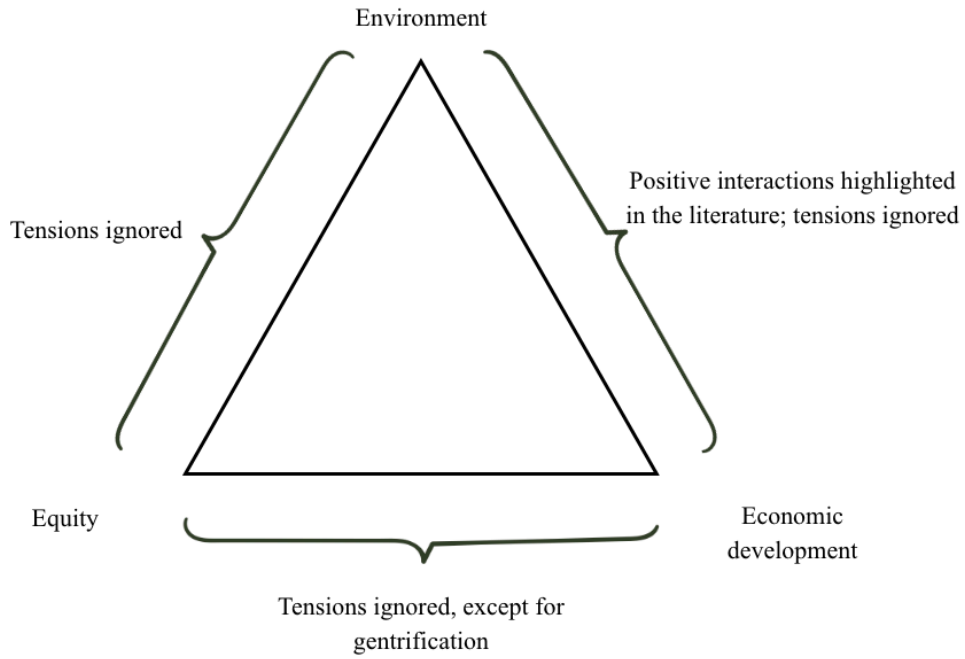


Figure 1.
The sustainability triangel

Source: Adapted from Campbell (1996)

Source: Mohamed et al (2017) NOTE original in Campbell (1996)

This study is of US evidence, although the issues cited and discussed are similar to the UK. The authors offer a slightly different definition of adaptive reuse: "*Adaptive reuse is the repurposing of a structurally sound building for a new use that reconciles the tensions between the environment, economic development, and equity*". This recognises the need to identify and acknowledge the complexity of these relationships and tensions in specific places. In relation to the approaches which they consider important to consider, these include:

- *Reuse can create distinctive communities*: Adaptive reuse that makes communities distinctive has the potential to be more successful and have a more lasting impact. Indeed, distinctive communities are now an important consideration in sustainable land use.
- *Reuse can acknowledge underserved and vulnerable populations*: Adaptive reuse that specifically addresses the needs of underserved and vulnerable communities can help counter the effects of gentrification. The sustainable land-use literature, for example, advocates providing housing options for the elderly; investing in healthy, safe and walkable neighbourhoods; and prioritizing development along existing bus routes.
- *Make allowances for affordable housing*: As discussed earlier, many adaptively reused buildings have been imaginatively reused, sometimes for high-end purposes. However, the authors found no evidence of adaptively reused buildings where the emphasis was on affordable housing in the US literature which is in contrast to UK and EU studies.
- *Workforce development*: In addition to providing green jobs, adaptive reuse could be used in conjunction with workforce development to train workers either in deconstruction and preservation techniques or to work in the new businesses that occupy these buildings.

Value Added Tax (VAT)

There are complex rules about VAT charges for building new homes and different charges which apply to conversions of commercial properties to homes. The overall position, however, is that VAT charges for conversions are higher than for new homes, including those built on brownfield sites. This has a deterrent effect on being able to provide a financially viable conversion proposal and equalising these rates of VAT for conversions and new build would redress the disadvantage for conversion.

In fact, the imposition of differential VAT on renewal and not on new build is an issue not only for the UK and also in other EU countries, and as such has been recognised as a major financial deterrent to renewal. Removing VAT on renewal and conversion projects is often flagged as a necessary consideration as part of wider changes to favour net zero development

Health and wellbeing concerns in homes converted under PDR

The current Permitted Development Rights approach allows certain conversions to be carried out without requiring planning permission. This lack of supervision of the quality and safety of conversions has been the subject of investigations and expressions of concern for some time. The importance of this issue is to highlight that although conversions to homes

are proposed in this report, the need for thorough options appraisals and high standards of conversion, as outlined in this section of the report, is essential.

An example of concerns around PDR is in a recent (August 2025) letter from the LGA supporting the a proposed amendment of the regulations to remove these rights.

In their 2020 article on permitted development in England Jessica Ferm and colleagues found that deregulation of the planning control system had led to the delivery of quantity over quality, and that '*a focus on housing numbers is eclipsing problems of housing quality, the type of housing being made available and whether it is in sustainable locations'*.[26]

Pineo et al (2024) also undertook as study around this issue: Health and wellbeing impacts of housing converted from non-residential buildings: A mixed-methods exploratory study in London, UK . This study noted that since 2013, changes to Permitted Development Rights (PDR) allow conversions of non-residential buildings into housing without planning permission in England. The study explored the potential health and wellbeing impacts of such 'PDR housing' through an online survey and semi-structured interviews in four London boroughs.

The study notes that Permitted Development Rights have existed since the start of the UK's statutory planning system in 1948, exempting certain categories of development from the need for case-by-case planning permission from the relevant local planning authority. In England since 2013, PDR have been progressively expanded to increase the supply of housing in the context of a long-term housing shortage, and former offices are the majority of PDR housing. A further expansion in 2021 meant that up to 80 % of non-residential buildings in England, including offices, shops, light industrial units, gyms, restaurants, day centres and clinics could potentially be converted to housing under PDR. They note that although building regulations apply to permitted development, this does not guarantee that conversions have been adequately constructed, inspected or maintained. They do cover building structure, fire safety, site preparation, toxic materials, sound, ventilation, sanitation, drainage, heating, falling objects, power and fuel efficiency, access, overheating, electrical safety, security, ICT, infrastructure for electrical vehicles and workmanship, but omit other design issues such as lighting and space. They note that in principle, reusing existing buildings to meet housing need is a sustainable construction strategy to avoid new carbon emissions from new development. These environmental considerations are important for health, although they operate over longer time scales and larger spatial scales than the local health impacts of PDR housing.

More specifically they note that the conversion of non-residential properties to housing creates several potential risks for health and wellbeing. Depending on the quality of the conversion, non-residential buildings, such as offices, may not support indoor environmental quality (i.e. thermal comfort, noise, air quality, lighting) when floors are portioned into flats. The location of such buildings may be disconnected from social infrastructure, such as in retail and office parks, reducing residents' ability to access education, employment or social activities. Policies from the local plan, such as those related to residential design, amenity and healthy environments cannot be applied or considered as part of decision-making. It is also the case that health and wellbeing impacts of this policy change were not considered in the government's initial impact assessment published in 2013.

[26] Ferm, J; Clifford, B; Canelas, P; Livingstone, N; (2020) Emerging problematics of deregulating the urban: The case of permitted development in England.

As part of the analysis of these issues the article provides a conceptual framework for the health and wellbeing impacts of PDR housing, drawn from existing literature including a prior review of evidence linking the urban environment to health (Pineo et al., 2018)[27].

This framework indicates the geographical level at which the impact takes place and provides the overall list of the factors which can give rise to negative health outcomes (such as poor air quality, lack of green space, poor fire safety and so on). Some of these have direct exposure outcomes (such as breathing toxins in poor quality air) while others have specific outcomes in terms of how people behave (such as lack of green space leading to physical inactivity or lack of affordability leading to having a poorer diet to eat). The framework also includes health outcomes, such as poor construction and ventilation leading to damp and mould which can eventually lead to serious injury or death, or lack of amenity and play space leading to poor mental health outcomes.

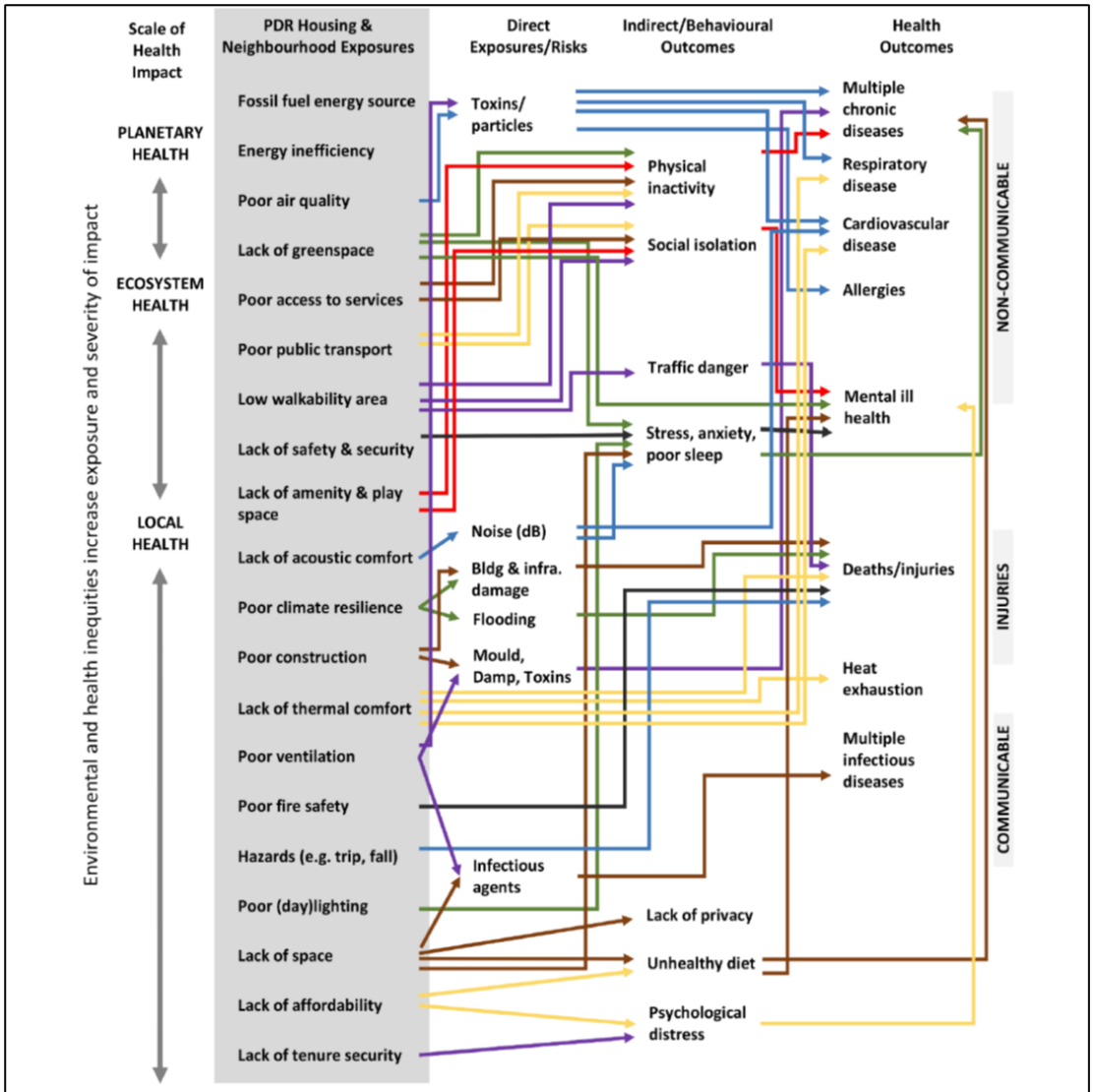


Fig. 1. Conceptual framework depicting potential health and wellbeing impacts of PDR housing, aligned to the THRIVES Framework scales of health impact (Pineo, 2020), adapted from Pineo et al. (2018). Colours are solely used to differentiate lines.

[27] Pineo, H., Zimmermann, N., Cosgrave, E., Aldridge, R.W., Acuto, M., Rutter, H., 2018. Promoting a healthy cities agenda through indicators: development of a global urban environment and health index. Cities Health 2, 27–45. https://doi.org/10.1080/ 23748834.2018.1429180

The conceptual framework is detailed but the identification of the various risks and how they affect behaviour and consequent health outcome is comprehensive and clear.

The authors provide a more narrative summary to accompany the framework, which notes that the results are representative only of a small sample of residents and that a wider national study on this topic could include a more socio-economically diverse set of participants from a broader range of geographical locations across England to gain a better understanding of the nature of PDR housing, its occupants and the health and wellbeing impacts of this type of housing more generally. With that caveat they found that PDR housing occupants experienced problems with shortage of space, overheating, windows, perceived safety, lack of outdoor space and neighbourhood environmental burdens such as noise and pollution. In combination with existing research, we add new evidence that a deregulated approach to building conversion has led to housing quality problems that are likely to affect residents' health and wellbeing, more so for residents. More specifically they listed:

- the need to have sufficient space for socialising, eating together as a household and studying, which is strongly associated with higher mental wellbeing
- residents of PDR housing may be particularly vulnerable to overheating due to lack of cooling options
- numerous issues were raised regarding windows, including their absence or low number, sound insulation properties, operability for ventilation, daylighting, glare and views outside
- perceived safety at home and in the neighbourhood were issues, and a clear driver of feeling unsafe at home was difficulty locking the accommodation entrance. Interview participants also referenced factors related to the concept of defensible spaces, which separate private and public areas to increase perceived safety
- availability of amenities was a problem for a small portion of our people surveyed. This adds to previous evidence which found that 8% of analysed PDR conversions were in commercial areas, such as business or industrial parks, compared with only 1% of schemes that went through full planning scrutiny
- Overall, the population of PDR housing residents may have a higher portion of vulnerable residents than the general population (due to its 'natural' affordability or its use as temporary accommodation by local government) and PDR housing in deprived neighbourhoods is of poorer quality

The study goes on to make a number of recommendations including:

- Space standards: Although space standards are now in place for PDR housing, many units created between 2013 and 2021 have insufficient space, sometimes considerably. Through the local plan process, such housing could be identified, and measures could be taken to improve nearby open space provision. Where properties are unreasonably small, housing enforcement powers should be used.
- Windows: Central government have required since June 2020 that all new housing created under PD allows adequate natural light to all habitable rooms. Nevertheless the study suggests that PD regulations could be strengthened to ensure adequate window arrangements, building on guidance and requirements used by most local authorities such as encouraging dual aspect windows.

- Amenities: Access to amenities and greenspace cannot adequately be considered through current PD regulations. These gaps could be addressed through future amendments to the regulations so that PD housing is afforded the same consideration as ordinary housing.
- Ventilation and thermal comfort: Although issues of ventilation and thermal comfort are covered by the Building Regulations in England, previous research has questioned the enforcement of Building Regulations in PD housing. Given the health risks, the study recommends that local authorities maximise their ability to monitor these conversions through the use of conditions on prior approvals.
- Housing enforcement: Although there have been recent improvements to PD regulations, this does not eliminate the risk of future or existing poor-quality conversions. The Housing Act 2004, Housing Health and Safety Rating System, Decent Homes Standard and Homes (Fitness for Human Habitation) Act give local authorities considerable housing enforcement powers for privately rented as well as social housing. There may also be relevant powers under enforcement of Building Regulations. The study recommends that local authorities take proactive action, supported by central government providing adequate resourcing. Visiting PD housing created from 2013-2021 may be a particular priority.

Views from a consultation workshop

Habitat for Humanity and LSE held a joint workshop with a wide range of stakeholders from groups involved in similar work on the environment, cities, design and delivery of conversions, funders and commissioners of this and similar work. This provided considerable insights to how to develop and assess conversion schemes around the themes of financing, community engagement, geographically specific issues, local and national government, environmental issues, building types and planning, policy changes and recommendations. Annex One includes short notes from this workshop, which provide specific and evidence-based views on appraisal and assessment criteria.

Recommendations

Economic and social cost benefit aspects of conversions

- To support the objectives of the Warm Homes Plan additional guidance should be developed and issued to local government to clarify how the funding within the plan can be applied to the conversion of empty spaces to homes, in all rented tenures.

- Not all commercial properties are good candidates for conversion due to their design, location, or conversion cost. Evidence on economic and social cost benefit implications of conversions should be systematically explored, and guidance issued to consolidate how these considerations can guide options appraisals of schemes.

- Removing VAT on renewal and conversion projects should be considered and implemented as it is a financial deterrent

- Recommendation made in Pineo et al (2024) around negative health outcomes prevalent in conversions done under the PDF framework should be addressed in planning and design standards by improved and enforced space standards, windows, amenities, ventilation and thermal comfort.

- Updated EPC metrics currently being prepared should include consideration of the specific and emerging examples of commercial conversions, where additional or derogated situations may need to be included

Case study: Friends Meeting House, Tunbridge Wells (2018)

Summary

- Project value £750,000
- Project Partners:
  - West Kent Quakers
  - West Kent YMCA
  - Habitat for Humanity
  - Tunbridge Wells Borough Council
  - Kilo Architects
- Date of Completion: April 2018
- Homes created: 3 shared flats housing 9 people providing move-on accommodation for local young people at risk of homelessness and living at the local YMCA hostel.

The conversion and retrofitting of the Quaker Meeting House in Tunbridge Wells repurposed the underused rear hall into three flats with bedrooms for nine young people at risk of homelessness while ensuring the building also serves the quaker community.

The project was led by the charity Habitat for Humanity on behalf of the West Kent Quakers and the West Kent YMCA, including partnership with Tunbridge Wells Borough Council, contributing to the £750,000 total cost.

The front meeting hall was reconfigured to continue serving the Quaker community, while also offering affordable, accessible space for local groups. As the building served the quakers as ‘a bridging place that serves the community’, incorporating the flats ensured the continuity of the quaker’s social mission of contributing to community development.

The retrofit preserved embodied carbon and avoided emissions associated with demolition and new construction. As the original 1894 building proved expensive to heat, reducing energy inefficiency was at the centre of the project.

Retrofitting the building included improved insulation, double-glazed windows, and efficient heating systems. The build using local contractors prioritised selective material reuse, minimised construction waste and supported circular economy principles while reducing transport emissions and supporting local supply chains.

Views of external works:

Source: Kilo Architects

Case study: Bell Street Stables Conversion, Glasgow (2019)

Below we highlight the conversion of Bell Street Stables in Glasgow city centre where 52 properties were created as part of a wider urban regeneration / revitalisation process in the local area promoting compact, walkable and sustainable approaches to city centre living.

Summary

- Project Value: £6.4 million
- Partners:
    - Glasgow Housing Association / Wheatley Group
    - Collective Architecture
    - CCG
- Funders Scottish Government
- Date of Completion: August 2019
- Homes created: 52 flats (73% are one-bedroom properties with 27% as two-bedroom) for affordable rent managed by housing association Wheatley Homes Glasgow

Awards

- Saltire Housing Medal 2021
- Saltire Housing, Best Multiple Dwelling - Winner
- Herald Property Awards 2021, Best Renovation & Conversion - Winner
- AJ Retrofit Awards 2021, Housing - Finalist
- Scottish Design Awards 2021, Affordable Housing - Winner
- Scottish Design Awards 2021, Building Re-use - Commendation
- Scottish Home of the Year 2020, Renovation of the Year - Winner
- Homes for Scotland 2020, Development of the Year (Medium) - Finalist
- GIA Conservation - Special Award 2019
- Historic Environment Scotland's Conservation and Climate Change Award, a special category award of the Royal Incorporation of Architects in Scotland's (RIAS) Awards 2021

> "*The project's success can be measured by its role in catalysing regeneration in the local area*." Frank McCafferty, group director of assets and repairs, Wheatley Group

Bell Street Stables in Glasgow previously occupied by working horses. The building is Category B listed dating from the 19th century and previously used as stabling for the local authority cleansing department and the police until the 1980s.

Following a feasibility study, Glasgow Housing Association built the building and planned to convert the building to 52 affordable rented homes.

The designers Collective Architecture sought to retain the remarkable circulation system and courtyard as the key elements in the history and character of the building. A car free development was agreed early on with planning to preserve the courtyard and the layouts developed to retain the large volume of the horse ramp.

The variance in original function and construction coupled with the poor state of repair and the need to reverse some earlier building works from the 1950s posed many challenges and opportunities in the conversion. The building condition was mixed with the massive masonry structure – engineered for horses – ample for the reduced loads of a domestic property. The roof and rainwater drainage though was in extremely bad condition and the majority of the

parapets needed to be rebuilt; most truss ends had to be removed and repaired and the whole lead parapet gutter system had to be re-built.

The completed building utilises many of the fitments that were remarkably still in the building with original stable stalls repurposed to form screens in the courtyard and timbers re-used to build the external lean-to bike store. The resulting building remains focused on the courtyard and gangway circulation, but the space has transformed from a noisy industrial space to a quiet sheltered residential space with clear links to it industrial past.

> "*Locally sourced materials, recycled bricks and bespoke joinery minimised the carbon impact and supported sustainability goals. A car-free development was another critical decision, fostering a more vibrant, pedestrian friendly environment*."
> Andrew Caldwell, architect, Collective Architecture

Sources:

- Collective Architecture: https://www.collectivearchitecture.co.uk/projects/142-144-bell-street
- Architects Journal / Architects' Action for Affordable Homes (2025) *Good Homes for all, 20 examples of how to do housing*

Supporting green jobs to deliver changes

An important element of delivering green conversions is to have a workforce who are skilled and available to undertake the work, from the architect and surveyor to the front line worker. A recently published National Audit Office report has set out the failures of the Energy Company Obligation, which is a government scheme which obligates energy suppliers to fund the installation in homes of energy efficiency measures such as insulation. In fact much of the work done was non-compliance with the standards set out, and resulted in problems with a wide range of severity, from major issues that pose immediate risks to the health and safety of the household to minor issues such as missing paperwork. The report sets out that their view that the main potential reasons that retrofit businesses are failing to meet quality standards were poor workforce skills, including subcontracting work to others who are not competent or registered with TrustMark; uncertainty over how the different standards apply to different jobs; and shoddy work produced as retrofit businesses 'cut corners' in both the design and installation. This is a clear statement, if one were needed, of the importance of training and the development of new green skills and available workers to undertake good conversion schemes in line with the standards and requirements in all the types of green office conversion set out above set out above.

The Government has recently published the Clean Energy Jobs Plan, to be delivered via the Office for Clean Energy Jobs – a cross-cutting team within the Department for Energy Security and Net Zero – alongside industry, trade unions and training providers.[28]

In terms of examples of this type of workforce training and development we can look to some of the initiatives which have been taken by the Greater London Authority as an example. The overall approach is set out in the Academies programme, which supports organisations to lead the delivery of skills hubs which support Londoners into good work in the green economy, as well as in the wider creative industries, digital, health, social care and hospitality sectors. The specific green economy skills are grouped round the Green Skills Academy, and include training on areas such as domestic refit, solar and wind power, environmental stability, and finding job opportunities for working in the green sector. Many other local authorities provide green skills training, for example in Greater Manchester, West Midlands, Surrey Midlothian, or many others.

Our **recommendation** here is that *the initiatives to improve and expand skills training taken by the Greater London Authority, and a number of other local authorities should be supported and expanded as part of the wider actions to promote conversions of unused commercial units to quality affordable homes, and national skills standards and assessment tools should be made available for use*

Above we noted that the Energy Security and Net Zero Committee had in May 2025 published a report on Retrofitting homes for net zero and the government responded on 21 July 2025. In addition to the response around Net Zero considered in the previous section, it also noted that

- Access to trusted and impartial energy efficiency and clean heat advice was crucial. There are currently several digital services on GOV.UK, but these were now being streamlined to make it even easier for households to access information, including funding options and trusted installers, and to get advice from local advice services.

[28] https://assets.publishing.service.gov.uk/media/68f762b324fc2bb7eed11a45/clean-energy-jobs-plan.pdf

It can be noted that in this recommendation about access to trusted installers to whom households can be impartially referred would require that such an installation workforce would be available across the country. From the NAO evidence above (which also deals with fraud in the green energy sector) is seems prudent and essential to focus resources on the development of both a skilled workforce and a trained inspection regime at local authority level. This is a long term development issues, but as NAO points out is essential to delivering conversions which do actually meet the environmental, housing, and social needs of residents in both mainstream housing conversions and the office to home conversions dealt with in this report. these schemes.

Recommendations

Supporting upskilling and job creation to meet the technical requirements of commercial conversion opportunities

- The Office for Clean Energy Jobs should work with the sector to provide clear additional guidance and targets around jobs which specifically concern office to homes conversion skills

- Initiatives to improve and expand skills training taken by local authorities[29] should be supported and expanded. This includes developing appropriate national skills standards and assessment tools.

- Available online advice on energy efficiency and clean heat (and signposting to trusted and skilled local installers) should be extended to cover commercial conversion projects

[29] For example in Greater London https://www.london.gov.uk/programmes-strategies/jobs-and-skills/mayors-skills-academies-programme/skills-academies-hubs-success-stories

What energy efficiency measures can most effectively improve the environmental impact of conversions?

This section considers the question of how to measure impact in terms of the overall environmental, social, and economic costs and benefits of undertaking these conversions through robust Cost Benefit Analysis (CBA). It flags the areas where most cost benefit is likely to arise.

We have already noted the evidence from ARUP cited in the APPG report above that that a "*20% in reduction of newbuilding and infrastructure construction, in favour of conversions of existing buildings, could reduce global carbon emissions by 12%*[30] ". This is useful as an overall comparison of adaptive reuse compared to new building, but for this section we need a more specific and detailed assessment of the CBA impact of scaling up the re-use of empty non-residential properties for housing.

Building specifically on the approach which has been outlined above in terms of linking into existing programmes, The Green Buildings Council report on "Building the Case for Net Zero: Retrofitting Office Buildings" report cited earlier provide details and specific guidance on types of retrofit changes (for example to building airtightness, window replacement roof insulation or wall insulation) as well as providing a range of building types and differentials around the age of the buildings which might be retrofitted. This produced various tables to indicate the impact in terms of the carbon savings which could be produced. Note that as set out above this is in relation to general office refurbishment, and not specifically to office to homes conversion.

[30] Evidence from their report with University of Leeds *Building and Infrastructure Consumption Emissions*

The table below sets out the comparative cost benefits in terms of types of refit options so sets out the comparative cost effectiveness of different types of works, as below:

Source

FIGURE 4:
Mean reduction in EUI of retrofit measures against the cost per square metre.

Source : https://ukgbc.org/resources/building-the-case-for-net-zero/

This analysis is useful, and links to the discussion and recommendations in the sections above. Alongside this there are government publications which can be used as a methodological basis for estimating the comparative value of different types of conversion or new buildings and incorporating them in options appraisals (a type of cost benefit analysis). The Departments of Energy Security and Net Zero has published guidance on Valuation of energy use and greenhouse gas emissions ,alongside a toolkit to undertake these valuations. More specifically in relation to CBA and options appraisals, HM Treasury (updated in 2023) has provided specific supplementary guidance to its main "Green Book" on options appraisals set out rules for valuing energy usage and greenhouse gas emissions

which is the basis for CBA reviews. In addition, the report of the independent Net Zero Review provided evidence and recommendations around the barriers that are preventing businesses, regions, communities, and households from taking further action to decarbonise, as well as exploring the opportunities that can catalyse further economic growth.

These documents are useful guides about the specific aims of net zero, but in relation to conversion of existing buildings for reuse we need to undertake a comprehensive comparison of the wider overall environmental, social, and financial impacts in terms of the wider cost benefits of such a programme in order to undertake a full cost benefit analysis of their likely overall value and impact.

In fact there has been a full analysis and literature review of these questions published earlier this year[31] (Sharbaf et al (2025)). This provides an up to date, comprehensive and detailed review of the ways in which the various dimensions of impact of conversion of buildings can be judged in cost benefit terms. Like many of the documents in this field it does not specifically deal with the conversion of unused commercial properties into homes, but nevertheless provides the best current evidence about the likely types and extent of impact which could be achieved for different types of project.

The paper undertook a structured search of literature published between 2000 and 2004, in peer reviewed journals and review papers where English was the main language. An initial 385 such articles were found, which was subsequently narrowed to 72 to be included in the review.

Starting with costs, the review notes that these need to include investment costs, ongoing operational costs, and disposal expenses, all discounted across the project's lifespan when considering building costs. This includes costs around maintenance and repair of the building. Cost Benefit Analysis (CBA) modelling also includes wider social costs and market costs. They point out that as part of economic analysis it is essential also to consider the social impact of the project on the wider economy (which can be positive or negative). It includes not only considering the emissions impact but also the impact of different retrofitting approaches on vulnerable households' thermal energy costs and addressing the issue of fuel poverty. One reviewed study noted that building owners may be hesitant to invest in energy efficiency measures where the direct benefits are not immediately apparent and suggests that these benefits should be analysed from both the landlord and the tenant point of view to draw out the wider impacts. The main review also notes that there is a wide range of sources of data in determining costs for a CBA, which is illustrated in the diagram below:

[31] Sara A. Sharbaf, Patricia Schneider-Marin (2025) *Cost-benefit analysis of sustainable upgrades in existing buildings: A critical review*

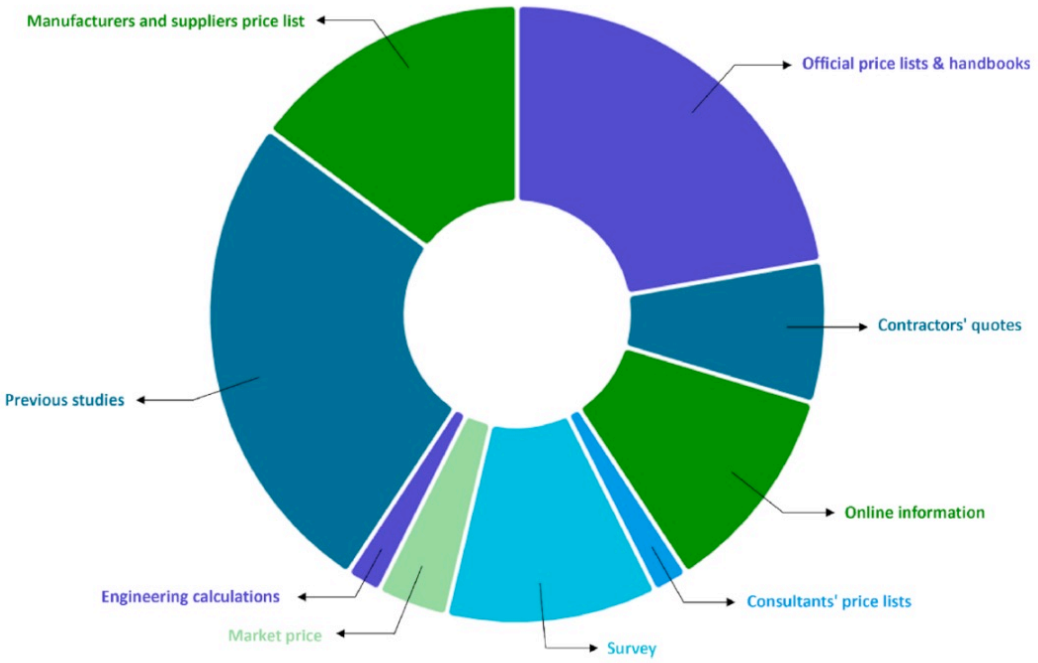


Fig. 7. Cost data sources in the studied literature.

Our overall conclusion from this section on costs is that this is a complex area to understand and include in any local authority assessment of the costs and benefits of conversion of commercial units to homes, but one where it is likely to be essential to both assessing which of their empty units might be suitable to convert.

Turning to benefits next, the study notes that in the literature,

> *The benefits of implementing upgrading measures have been categorized and valued in various ways. In some cases, benefits were grouped based on the beneficiaries of the upgrading activities e.g. owners, tenants, and society or participant, utility, and society. Other studies also classified them as either direct or indirect benefits, economic or non-economic benefits, and tangible or intangible benefits. In this context, the obtained benefits were organized based on the fact that how easily they can be quantified. Wider benefits, co-benefits, non-monetary benefits, externalities, and multiple benefits are terms referring to benefits beyond financial savings whose contribution to the project might be less quantifiable. In recent literature, there has been a noticeable shift from traditional economic studies toward incorporating non-market parameters, such as environmental and social factors*[32]

These wider social benefits can be for example in the evidence that energy upgrading can benefit society in terms of enhancing national energy security, and decreasing health service costs due to the reduction in air pollution due to fossil fuel usage. The monetisation of wider social benefits can be done in a range of ways , including the savings from preventing the use of public services like hospitals, benefits of more people being able to work and contribute to taxes, “willingness to pay” measures based on surveys asking people about how much they value a specific outcome, or “hedonic pricing” approaches which estimate

[32] Ibid, p9

the wider value of an investment considering human behaviour including the pursuit of pleasure and the avoidance of discomfort – similar to willingness to pay.

Energy Saving: The study notes that energy saving is one of the most prevalent and consistently cited benefit across most (86%) of the studies. This can be attributed to different types of benefit as set out in the table below:

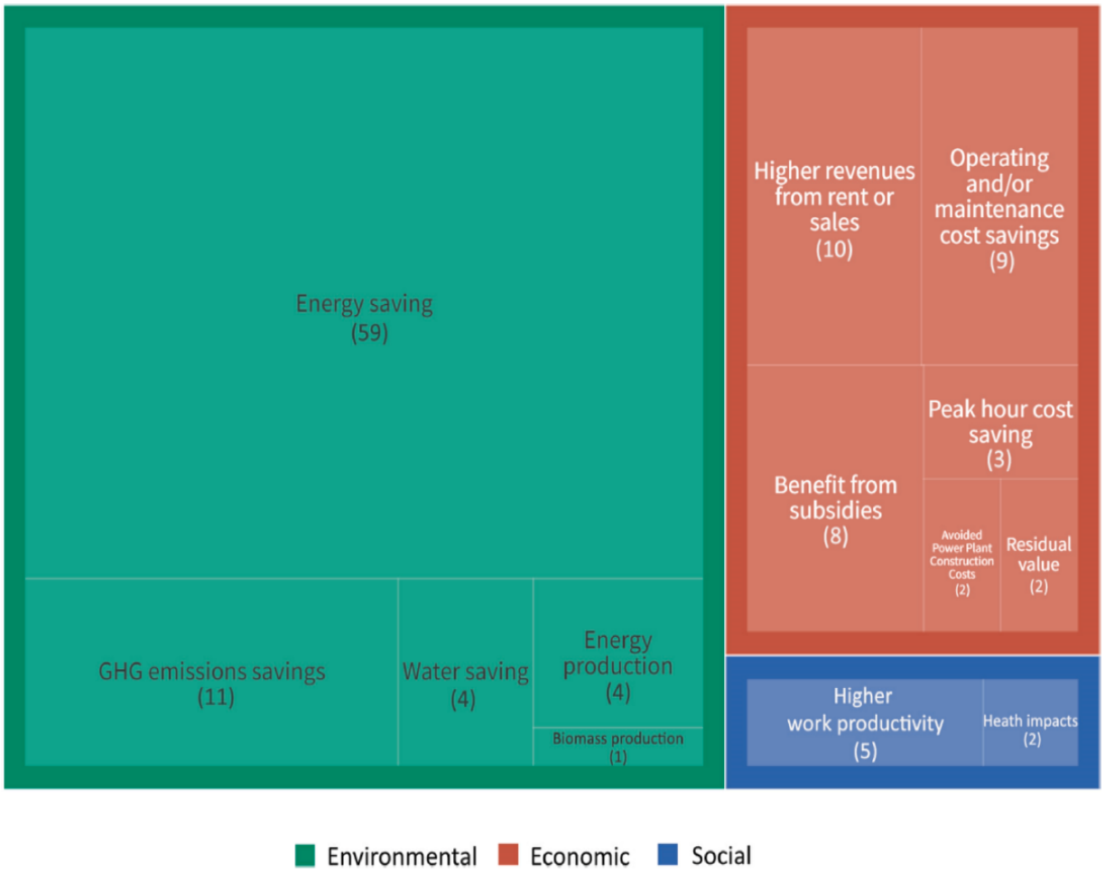


Fig. 8. Frequency of the investigated benefits in the current literature (Scaled by the number of studies, as indicated in parentheses).

One reason for the prevalence of this measure is actually because it is comparatively straightforward to quantify given the range of guidance and standards available for the main areas of benefit above.

Energy production: This benefit mainly relates to on-site renewable energy sources (RES)to generate electricity and heat or cold within the property (homes in this case). The research indicted that about half of the publications focused on photovoltaic panels (PV) to do this. More importantly for this report, 74% of the studies identified financial implications and benefits associated with the provision of renewable energy sources. Other studies highlighted the positive impacts of biomass boilers, geothermal heat pumps, hybrid solar panel and heat pump technologies.

Greenhouse gas (GHG) emissions savings: The most common measure of environmental impact and improvement used in the studies was Global Warming Potential (GWP) expressed in CO_2 equivalents, with conversions linked to reducing or offsetting these carbon dioxide emissions. This can lead to contributing to the reduction of the overall detrimental impact of carbon emissions, but also lead to impacts on the carbon tax rates which may be payable.

Peak demand cost savings, and avoided cost of constructing new power stations: The cost of electricity varies during the day and is more expensive at peak hours, so some projects analysed different models of PV panels and other retrofit measures to find an optimum way to reduce costs and also the need to construct new power stations to meet peak and overall demand. Overall, this combination of measures was shown in modelling and in specific projects to be a highly cost-effective approach.

Benefits from subsidies: The study notes that encouraging investments that yield positive environmental benefits can be approached through two main strategies: market-based incentives and direct regulatory control. Generally, market-based incentives can be applied in two ways:

- direct intervention, involving taxes on products or processes, such as an electricity tax,
- indirect intervention, including subsidies and tax incentives like tax deductions where examples of this such as in Germany where tax incentives and public subsidies demonstrated significant additional savings in carbon emissions and the overall affordability of schemes. There was evidence that shifting subsidies to conversion and conservation projects could be very effective, and also that a useful approach was to link the amount of subsidy offered to the extent of the beneficial environmental impact, indicating the need for both subsidy and high environmental standards being in place.

Maintenance and repair costs: Here there are benefits from the installation of new appliances and environmental design features but also some additional costs from the need to maintain more complex aspects of these installations in the converted building. A range of studies noted an overall positive benefit in terms of these costs, over the expected lifetime of the new building.

Higher work productivity: The study noted the overall increase in work productivity in workers in the converted buildings, due to better overall health and comfort outcomes. These studies were mainly about office work, but the same benefits could be considered likely to be present in conversion to homes

Summary of findings on benefits: The study concluded that following the review of these 72 peer reviewed articles:

> *In summary, upgrading measures can have a profound impact on individuals and society in terms of social benefits. The limited attention paid to these benefits can be explained by the complexity of social sustainability metrics and the difficulty of placing a tangible economic value on people's productivity….*
>
> *...The economic viability of upgrading activities in buildings is demonstrated consistently across various studies. For residential buildings, retrofitting lighting and appliances, as well as improving thermal performance, emerges as a highly cost-effective measure across diverse housing types. The economic feasibility of adopting low-carbon technologies throughout the building life cycle is highlighted by positive net energy benefits and a reduction in GHG emissions, especially during the operation stage*

This section has set out the most recent, comprehensive, and well evidenced information about the impacts which conversions could have on the environmental, social, and financial outcomes for local authorities and residents of the new homes.

Harnessing the opportunity of commercial conversion: national governance, local delivery, and global learning

This section considers what needs to be done to move forward quickly with a programme of conversions of commercial properties to affordable homes. It builds on the evidence and recommendations in the previous sections, but also on international examples of best practice, which are set out first.

International evidence of good practice

In this section we look at one specific case study of a completed conversion of a historic site into homes in Paris, and then a study of the potential for conversion of a large office building in Brussels which includes an assessment of the comparative impacts of conversion compared to demolition and rebuilding.

L'îlot Saint-Germain project, Paris

This project is located in the 7th Local Authority district of Paris, which is very central, and in which is located the Eiffel Tower and the Hotel des Invalides building.

Summary

- **Project Value:** £71.7M including acquisition costs, 68% State subsidy for the housing units ("décote Duflot").
- **Partners:**
  - Elected Mayoral Authority for the 7th Paris District
  - Overall planning of the project by the City of Paris Housing Development Department
  - François Brugel Architects Associates and h2o Architects for the housing units.
  - Antoine Regnault Architecture for the non housing elements.
  - Elise et Martin Hennebicque Architecture for the gardens and green areas and green areas.
- **Date of completion:** 2024
- **Duration of works:** 34 months
- **Homes created: Number, type and intended audience** 254 social housing units (138 one bed, 64 two bed, 22 three beds, 30 four beds) with around 450 residents in all; a 68-crib daycare centre, a gymnasium, a multi-sport room, and a 550-square-meter garden. The development is intended to provide a better social mix by raising the proportion of social housing in the up-market District from 2.2% to 3%, as well as preserving the historic Ministry of Armed forces building (which has protected building status) as a thriving part of the wider community.
- **Status:** Complete
- **Energy efficiency** The City of Paris formally adopted a "Local Urban Climate Planning Framework" on 24 November 2024, and this conversion project was delivered within the anticipated rules of the subsequently adopted framework. While the 7th District has some specific variations due to its unique historical development and building, the main principles apply and have been implemented in the building as is set out in more detail below. The main energy aim set out in the framework is to "*Become an energy efficient city in its building design and use, and be more respectful of nature and biodiversity in the city*".

Awards: Awarded the "Silver Set Square" architectural prize[33] for 2023

Useful websites:
https://divisare.com/projects/497279-francois-brugel-architectes-associes-h2o-architectes-antoine-regnault-architecture-jared-chulski-11h45-ilot-saint-germain (in English - pictures, plans, and explanations of how building was converted in line with its historic and architectural character)
https://mairie07.paris.fr/pages/projet-ilot-saint-germain-16122 (in French – a compendium of documents from the Elected Mayoral Authority for the 7th Paris District, including plans, brochures provided to local residents, accounts of public meetings and other background material)

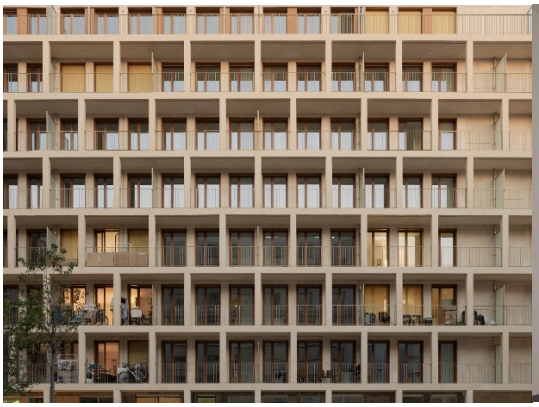
Architectural and social approach

The lead architects have set out a number of guiding principles. The existing stone envelope is a big plus, and the different materials in the elements of the site (housing, green spaces, communal areas) were associated with specific uses of wood, concrete and glass. In addition, plants and trees were sited in the overall landscape which spread over the two different ground levels.

The conservation of existing structures was the project's high point. In buildings number 10-100, the loadbearing stone masonry façades were repaired and the wooden floors reinforced. The restored decorative elements as well as the proportions of the interior layout enhanced the architectural quality of the housing units. The post-beam-concrete structure of building number 200 was conserved and the joist-hollow block floors renovated. Depending on the level of damage, the stones and façades were cleaned, consolidated or restored using plugs or replaced by the same type of new stone. They were insulated using mineral wool thermal insulation applied from the inside.

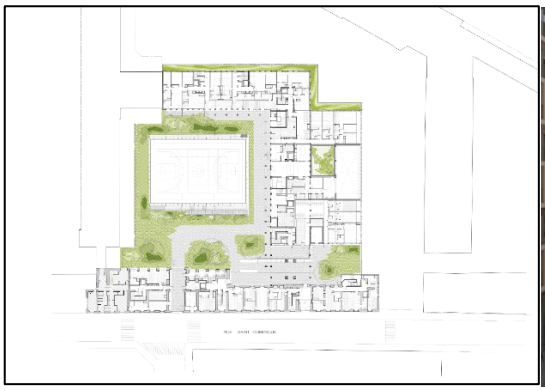
The housing was designed so that, as far as possible, it would fit with the external façade spaces. Good housing was also deemed to need to be efficient and adapted to contemporary lifestyles. Good housing was also considered to include "adaptation spaces". This allows varied usages to made possible by architectural elements designed in a way that goes beyond a single functionality: volumes that simultaneously incorporate furniture, a kitchenette, a library or storage area, or whatever else might be needed.

[33] « L'Équerre d'argent » (The Silver Set Square) is an architectural prize awarded annually in France (since 1983) by a jury of architects, architectural experts, and building construction companies. It is organised by the journal « Le Moniteur » which reviews public building projects.



New balconies and homes

Interiors of some of the flats



Plan of the new green spaces and gardens

Landscaping

The Gymnasium, in its own new building

The project aligns with Paris's broader housing policy, significantly increasing the percentage of social housing in the 7th District from 2.2% to 3%. It is part of a larger initiative that has seen the creation of 52,000 social housing units in Paris between 2014 and 2022, with a total investment of 1.6 billion euros. This urban renewal project not only provides affordable housing in a prime location but also contributes to the city's sustainability goals. It demonstrates how a historic building can be repurposed to meet contemporary housing needs while preserving the building's architectural heritage.

Environmental Approach

The main heating in this development is now provided by the *Compagnie Parisienne de Chauffage Urbain* (CPCU) network which is the largest in France and 11th largest in the world. It provides for 22% of consumer energy needs linked to heating and domestic hot water in all Parisian buildings. Historic information shows it had an energy mix of 51.3% of renewable or recuperated energy sources (2019) and a distribution of 4.4 TW.h of heat (2017). The last Paris Climate Air Energy Plan 2024-30 placed its heating network as one of the essential tools in its policy for reducing greenhouse gas emissions in the territory with the objective of rapidly greening its energy source mix (75% renewable and recuperated energy (R&RE) by 2030, 100% by 2050), as well as densifying and developing the network itself.

As noted above, external walls were insulated using mineral wool thermal insulation applied from the inside. The rehabilitation process also was planned to re-use as much of the original building elements as possible, including the repair and reuse of existing material. The landscaping increased the number of plants and extent of green spaces, which was combined with providing more permeable surfaces in the surrounding land. A wide diversity of new trees and bushes were planted. In addition, the development included a system of water management and management of rainwater to irrigate the new green external spaces.

This case study is an example of the conversion of a historic unused army office building, done with the full participation of the local community and in the context of a Paris based on the principle that “rehabilitation must become the norm and demolition the exception”.

Brussels

A second example from Brussels that shows the differential impact of conversion and new building is Stieron, D. et al (2023) Office to housing conversion: estimating life cycle environmental and financial performance .

While many cities are currently facing the challenge of converting offices to housing, Brussels can be considered a forerunner, with the first conversion dating back to the early 1990s. Since then, the pace of conversion has steadily increased. In 2018 and 2019, it is estimated that some 20% of annual housing floor area built in Brussels result from converted office buildings. Since the records began (in 1997) more than 1 million m² have been transformed into housing (more than 1,6 million m² in total, including other functions than housing, compared to approximately 700 000 m² in Paris over the same period, but with a much more significant built stock and population). This was driven by a sharp decline for offices and a dead city centre at weekends, linked to a high and unmet demand for housing. Although it does not evaluate the comparative usefulness of different environmental measures, nevertheless it provides a good starting point for considering, in policy terms, how to undertake this kind of evaluation and provide evidence to lobby for adaptation programmes locally.

The 2023 research aimed to provide a benchmark based on a real and representative case study building to estimate life cycle greenhouse gas emissions and financial costs of redeveloping an office building by considering different scenarios:

- renovation as an office building;
- conversion as a residential building;
- demolition and construction of an office building and
- demolition and construction of a residential building.

The impact of the conversion and new build was measured using the TOTEM tool described above in the section on measurement and standards.

The case study used was an office building of approximately 11,000 m² located on rue d'Arlon, 104 in Brussels, in the European district, built in the 1960s. It is representative of the most common construction assemblies used in new buildings and in renovations in the European District of Brussels. It presents several specificities, both typological and constructive (load-bearing facade) and, having been empty for nearly 20 years, it is currently bare, without any finishes, nor any technical equipment. Distributed over nine floors above ground and two floors of underground parking (2,800 m2). The basements as well as the ground and second floors occupy almost the entire plot (except for a strip set back from the sidewalk) and have a floor area of approximately 1,400 m2 each. The second through sixth floors are identical and have an "L" shaped floor plan. The facade elements are made of prefabricated reinforced concrete and are self-supporting, cast in one piece and are therefore integral with the structure. They play a load-bearing structural role. This results in a very low flexibility of the structure and a real difficulty in case of dismantling or demolition of the building. The frame of these elements is 1.80 m wide. The street facade of the last three floors is set back about 1.80 m from the lower floor (i.e. the width of a facade module), resulting in smaller floor areas (1,000 m², 850 m², 700 m²) on the last three floors and the existence of flat roofs. Pictures of the building are below

Figure 1. Photographs of the case study, rue d'Arlon 104 in Brussels

Results on the environmental analysis show that the demolition-construction scenarios undoubtedly create the most harmful impacts, but the difference between offices and housing is less significant and depends greatly on the assumptions made. On the other hand, from a tax point of view, the demolition-construction scenario is favoured by the real estate industry because it allows for the recovery of VAT in the operation and thus maximizes the value of the real estate asset as well as the financial return. There is also a significant difference between the profitability of a housing and an office project. The latter is favoured by market values. The article does not consider the social and equalities implications. The article concludes that there is a tendency to favour offices in the European district, but nevertheless solutions exist to encourage the development of housing projects and there is good evidence to counter, and indeed reverse, that tendency in the current post COVID situation.

What can be done to make the conversion programme happen?

This final section builds on all the information and recommendations already made in the report to address the practical question of what can be done to ensure a vibrant programme of conversions happening across the country.

Local authorities have a key role to play here as they have a duty and the aim to develop their local area and meet local needs, A starting point here is to require them to compile, maintain and publish detailed records of unused commercial units, so that potential developers of affordable housing can easily identify local opportunities. These lists should also include some preliminary assessments of the suitability of these units to be converted to good quality homes. These assessments could be based on national guidance around design and feasibility issues for options appraisals as well as their own local guidance about the social and environmental impact of the local area including any impending re-development or economic activity planning. Time and resources will be required for this work and consideration could be given to providing a national funding grant as part of the overall national net zero funding arrangements.

This leads to the national government actions. We have made a series of recommendations around the extension of commissioned guidance on standards and good practice, the use of the Warm Homes Plan funding, stimulating training, and addressing issues around PDF and health regulations. To coordinate this we recommend the creation of a specific dedicated and politically chaired group with a fixed timetable to deliver a clear set of tasks which will create the most effective legislative and operational changes to enable local authorities to move forward in conversions in their own local areas in partnership with their own stakeholders and residents.

Recommendations

Harnessing the opportunity of commercial conversion: national governance, local delivery, and global learning

- **National:** that a convened Government start and finish group, including the Ministry of Housing, Communities, Local Government, industry, and building standards stakeholders, answering to the Housing Minister, needs to be established.

- **Local:** Local authorities should be required to maintain and publish detailed records of unused commercial units and use the proposed guide to assess their suitability for conversion into quality homes. These assessments should also be made public and reviewed annually to identify opportunities for engagement with commercial and third sector developers.

- **Best practice learning:** that further consideration should be given by Government to the Paris all-city approach to making renewal the default option, as well as of the long and extensive Brussels experience of conversion of unused offices to homes, with a view to compiling the main practical learning points and lesson which can be seen on those two cities

Annex One: Workshop findings

A workshop was held at LSE in September 2025 to discuss the emerging findings from the research and to share knowledge on the proposed recommendations.

Attendees included representatives from:

- Habitat for Humanity Great Britain
- LSE
- Empty Homes Network
- Davitt Jones Bould
- M&G
- Historic England
- Social Finance
- Centre for London
- Centre for Cities
- Campbell Tickell
- ECD Architects
- Stride Treglow Architects

Key ideas from the workshop are included below:

Financing:

Viability is a significant and growing challenge for housing development in Great Britain of every sort, with developers finding it increasingly difficult to stack up land, planning, and construction costs alongside other commitments to providing infrastructure, affordability and meeting environmental obligations. Non-residential to residential conversions can in some cases save money, where planning processes are simpler, and existing structures and materials reduce construction and demolition costs. However, there are additional risks and uncertainties when working with existing structures which make investment and financing more difficult in some cases. Equalization of VAT between new builds, refurbishment and conversion is an important step to boost viability of conversion, but further incentives or policy changes that reduce risk would be welcome.

Crucial to the equation when assessing the merit of a conversion project are benefits that accrue to wider society (such as economic impact on town centres, savings on temporary accommodation costs, etc.). While important, these positive externalities will not be fully accounted for by a developer or building owner. Empty Spaces to Homes should make the case to local authorities and consider how to encourage private owners to consider these externalities. Government should consider how to better use financial incentives to reflect externalities in business cases or viability assessments

Finance is often not well targeted at empty building conversion projects. Strategic engagement with local government pension funds has been used in some places to unlock resources for greening projects. Affordable homes funding aimed at housing associations that is currently underutilized could also be redirected.

With scale often a barrier to financing, the National Housing Bank could be considered as the base for a taskforce approach that joins sites together.

Community engagement:

Community engagement is crucial, and particularly important when seeking to make the case for conversion of empty buildings into social and affordable housing. Empty buildings have a detrimental impact on the success and feel of their neighbourhoods, reducing footfall while also being interpreted as a sign of decline, damaging community pride. Buildings are important for community memory, history and identity, so retaining them is particularly important in places that have experienced significant socioeconomic change.

While empty buildings are unpopular, and residents want to see them brought back into use, engagement is crucial because some potential uses (e.g. as temporary accommodation or as housing for asylum seekers) can also be divisive.

One barrier to community engagement or leadership is the lack of transparency of ownership – it is difficult for community groups to take a lead on reusing an empty building if they don't know who owns it. Many empty buildings are on very long leases or are "orphan" buildings. Increasing transparency with a publicly accessible register of empty buildings and their ownership status would support conversions generally, but particularly the engagement of community groups as active leaders of place. Local authorities used to have a statutory responsibility to maintain an asset management plan, which highlighted authority-owned empty buildings. This responsibility was removed, increasing opacity, and consideration should be given to its reintroduction.

Geographical and place making:

While housing is a crucial challenge facing the UK, solutions can conflict with the government's growth agenda in some geographies. Local leaders must balance housing need with employment space. There may be opportunities for regional mayors to take an active lead in helping their areas identify where it is most important to retain economic space, and where it may be more appropriate to convert empty buildings into housing that remains accessible.

Places where housing density is currently lower may benefit the most from a strategy focused on empty building conversion. Given that these places are also likely to be less economically active, they may also have a higher proportion of buildings that are empty and that don't have highly productive alternative uses. However, it is often central locations that are easiest to convert and best connected to infrastructure.

Homes England can be a significant support for places looking to assemble land for development, but are less well equipped to address smaller sites, leaving opportunities overlooked. Homes England could take a leading role for a programme similar to the Housing Market Renewal Pathfinders.

Local authorities/Government:

While many of the challenges that make it difficult to convert empty buildings into social and affordable housing could be overcome by a well-resourced, confident local authority sector, the lack of capacity in the sector to act as place leaders or do the practical work of identifying solutions for buildings is a barrier. There are examples of excellent practice, showing that it is possible, but these seem to be the exception.

Relatively simple steps that local authorities could take include inserting a presumption against demolition into local plans. This is being done in some places. Local planning knowledge can be a blocker on communities delivering projects, and should be central to a local taskforce approach to addressing empty buildings. Data sharing within local authorities could also be improved, with assets managed by finance departments rather than property or housing teams.

At the regional level, Combined Authority Mayors could play a more active role in place making, focusing efforts across their region on, for example, high street housing. New strategic and combined authorities may be well equipped and positioned to consider an Empty Spaces to Homes approach. This could echo the coordinating role that was previously played by Local Economic Partnerships.

Environmental issues:

A holistic approach to considering environmental impact is important – material choices and design will have a big impact on the ultimate value of a project from an environmental perspective. Project designers should consider how to use environmentally sustainable materials in a conversion. Assessing environmental impact should be done in the round including, for example, the impact on transport costs for residents. A development close to excellent public transport links but delivered to lower environmental standards may ultimately have a lower carbon impact than one delivered to high standards but that necessitates car travel.

It is important to acknowledge that sometimes demolition will be the most appropriate solution from an environmental point of view, such as when a two-storey block is demolished and replaced with a much taller building. Guidance from government, its partners or Empty Spaces to Homes to support organisations to identify when this would be the case would be valuable.

Specific building types/planning:

Every building is unique, with its own challenges, making a tailored approach useful. However, to achieve scale there would be value in identifying a particular typology of buildings that are particularly appropriate for conversion. Institutions like the Ministry of Justice, who may have many standardised buildings, could be a good partner.

There is evidence that retail units are relatively easy to convert, but the biggest barriers are often access, combined with the willingness of the users of the ground floor retail space to accommodate housing above them. Owners of retail units often make upper floors uninhabitable (e.g. blocking off stairways) so they can leave them empty and avoid council tax or business rates – this should be disincentivized.

Historic England estimates that 600,000 homes could be created out of historic buildings, although these buildings would vary in their conversion potential.

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