Zero Carbon Westminster

A white paper on decarbonising the City's built environment

November 2020

WPA
Westminster Property Association

Vision statement

A net zero carbon Westminster by 2040: a climate first approach to transform our City

Westminster City Counctil (WCC) has set a bold ambition, aiming to transform the City of Westminster and put the climate first. This 2040 target has been further articulated and contextualised in this white paper to set an overarching vision for a built environment of the future with net zero carbon emissions.

1. By 2040 Westminster's **heritage assets** will be adapted and retrofitted to be resilient to climate change and updated to optimise their energy efficiency, using sensitive solutions which preserve their historic significance

2. All **new developments** will be 'net zero carbon' by 2030: fully electrified (or using other low carbon heating options) and powered by renewable energy. Whole life carbon will be significantly reduced by adopting circular economy principles and innovative construction materials and processes.

3. All **remaining building stock** will be made energy efficient through appropriate retrofit and de-carbonised energy and heating systems.

4. The City's **high quality public realm** will be created with low carbon materials, and designed to be flexible and adaptable to meet the needs of residents, workers and visitors.

5. Any unavoidable carbon emissions are **offset** through credible programmes which maximise benefits for the local community.

6. **Monitoring and performance** disclosure against Westminster's net zero carbon targets will set new standards for transparency and reporting in the built environment.

These outcomes are intrinsically linked to the decarbonisation of transport, freight delivery and waste collections, which serve and support Westminster's built environment.

The success of a net zero carbon City will not just be measured in carbon reductions but will simultaneously benefit the community and economy by strengthening climate resilience, innovation, job creation, supporting a green recovery and creating a healthier environment for all.

Acknowledgements

Westminster Property Association (WPA) is the not-for-profit membership body and advocacy group which represents the leading owners, investors, professional advisors, and developers of real estate operating in the City of Westminster. We undertake three key activities for our 260 member organisations: representing the interests of Central London's built environment sector to policymakers at local, London and national government; organising engagement and thought leadership activities; and publishing industry-leading research.

This research paper has been produced with support from consultants **JLL and WSP**, data provided by **Vu.City**; engagement with policymakers at **Westminster City Council**; and input from a steering group of sustainability and planning experts from the WPA membership:

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Image: One Church Square, Dolphin Living

Foreword

I am extremely pleased to be supporting this white paper and very much welcome the commitment from the Westminster Property Association to work with us to tackle the pressing issue of climate change and deliver a net zero carbon city by 2040. This is an ambitious and challenging target. Since becoming Leader of Westminster City Council earlier this year, I have been working to ensure that tackling climate change is a priority within every area of council business and that we are working hard to reduce emissions across all council activity.

We are also forming a much clearer picture of carbon emissions from the city. With the built environment being the most significant contributor of emissions, there is no doubt that we must take ambitious steps to reduce emissions from homes, businesses and institutions across all of Westminster as an absolute priority. To achieve this, we will work across key service areas such as planning and building control to influence the national agenda and place climate concerns at the heart of our emerging local policy and decision-making.

I know that many landowners, businesses and residents are already taking great strides to reduce carbon emissions from their buildings and as a council we are working to achieve this across our own building portfolio. But we will only achieve the scale of impact required to deliver a net zero carbon Westminster by 2040, by working together. This is why this white paper from the Westminster Property Association is so important now. It represents collaboration between the property industry on climate action and strong partnership working between the WPA and Westminster City Council to create a vision for Westminster's built environment consistent with a low carbon future.

There are many significant challenges ahead and whilst we are working in challenging times, we cannot afford to delay action on climate change to deliver a greener, cleaner and healthier city for our residents, communities and businesses. I also know that urgent action will be essential to creating a City for All, as the effects of climate change disproportionately impact on poorer communities. By building more sustainable homes and workplaces we will be making important strides in ensuring that Westminster is a city where everyone can thrive. This white paper is an important first step and I very much look forward to working with the WPA to implement the recommendations. Now the real work starts…

Cllr Rachael Robathan
Westminster City Council
Leader

Foreword

Climate change is the greatest challenge we face. Urgent action is required from governments, businesses and individuals across the world if we are to protect our environment - and future generations - from catastrophic global warming.

Westminster City Council has shown leadership in declaring a climate emergency and committing to becoming carbon neutral by 2030, with the whole City achieving the same target by 2040. We strongly welcome this bold ambition and the WPA looks forward to working with the council to deliver the de-carbonisation of Westminster's built environment.

Westminster is home to 55,000 businesses, 250,000 residents, iconic retail, cultural venues and national institutions. It is the beating heart of the UK's economy, yet the City's rich urban fabric is a major source of carbon emissions, generating nearly 2m tonnes of CO2e each year.

WPA members are already implementing innovative sustainability strategies and setting stretching new targets, building on a strong track record of environmental leadership in Westminster, but there is much more, collectively, that we can do.

Urgent action and collaboration is needed. 81% of the public are concerned about climate change[1], and the business case for green investment is clear. Businesses and policymakers must work together, in partnership with local residents and commercial occupiers, to accelerate delivery and secure a net zero carbon future.

Fit for purpose, flexible work and retail spaces are required to retain and attract businesses and visitors to Westminster, and maintain the area's economic competitiveness as well as homes for residents. But these buildings should also be green, achieved through sensitive retrofit or redevelopment, where appropriate, to deliver the highest possible environmental standards.

Achieving these goals in a post-Covid economy will be challenging, but we simply cannot afford to delay.

The WPA has prepared this white paper to stimulate debate and share our ideas and suggestions of how Westminster can be a global leader in green recovery and transformation. This will require Westminster's property industry, City Council, residents and occupiers to work together. Meaningful change will not be quick or easy, but the City's long-term success and the prosperity of future generations depends on it.

Co-Chairs of the WPA Climate Change Working Group

Michael Meadows
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Head of Planning

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How to read this white paper

The white paper starts with a vision (pg. 3) of how the City Council's climate emergency declaration would translate into specific outcomes by 2040. We then reflect upon the unique local context of the City of Westminster (pg. 22-24) and the greatest barriers to de-carbonising its built environment (pg. 25-26).

Advised by JLL, we have proposed a pathway of action to achieve net zero carbon buildings by 2040 (pg. 30). This is followed by a call-to-action for WPA members: recommendations which we ask all our member organisations, big and small, to take on board (pg. 32-39) supported by case studies to inspire innovation (pg. 56-73).

Finally, we explore a set of recommendations for policymakers at Westminster City Council which would enable the property industry to make a greater impact (pg. 40-49), ranging from introducing 'climate first' planning policies, to supporting clean energy infrastructure. These ideas have been linked with examples of climate leadership from across the globe (pg.74-78).

A wide range of sustainability, planning and real estate experts involved with Central London's built environment have contributed to the ideas included in this paper, but it has been written to be accessible to all. There is a glossary of technical terms on pg. 79-80.

Image:
Kingdom Street at Paddington Central, British Land

Introduction & Executive Summary

Objectives

In late 2019 Westminster City Council (WCC) declared a climate emergency. The local authority pledged that the City Council's activities would be carbon neutral by 2030, with the wider City following suit by 2040 - ten years ahead of UK Government targets. Representing Westminster's real estate industry, WPA endorses WCC's declaration and welcomes the priority that the City Council is placing upon climate action.

This white paper has been written to support and contribute to the City Council's ambitious programme of work focused on achieving a net zero carbon Westminster by 2040. It identifies the **key challenges** and **recommendations** for translating the emergency declaration into specific climate action for **Westminster's built environment.**

These recommendations are supported by **case studies**, and have two primary audiences: Westminster's property industry, represented by WPA members, and policymakers at Westminster City Council. We would also welcome engagement and discussion of our ideas with a wider network of stakeholders, including local residents, businesses and statutory bodies, such as Historic England.

Scope

This white paper has been written in the **context of supporting the post-Covid-19 recovery of Westminster's economy**: balancing the need for sustainable growth with building long-term environmental resilience. It considers the City of Westminster's **unique context and challenges** as a vibrant and strategically important commercial district with world-class heritage assets.

The paper is intentionally focused on reducing the carbon impact of Westminster's built environment. Commercial, residential and institutional buildings account for over 60%* of Westminster's carbon footprint. These buildings are responsible for producing around 1.9m** tonnes of CO_2e each year.

There are other important and interconnected sustainability issues, which fall outside this paper's scope, including improving air quality; sustainable transport and consolidated freight, delivery and waste networks; achieving resource efficiency; and enhanced biodiversity. The WPA will work with WCC to address these topics through the planning process and in future research projects, white papers and thought leadership.

* Data supplied by Vu.City, analysed by JLL.
** Data supplied by BEIS / Anthesis analysed by JLL

Key challenges

There is a lack of consensus and common understanding of the concepts of ‘carbon neutral’ and ‘net zero carbon’

The WPA and its diverse membership stands ready to work in partnership with the City Council on climate action and deliver the vision for a zero carbon City by 2040.

WPA’s membership ranges from the historic landed estates and FTSE 100 development companies, through to small design practices and affordable housing charities. Identifying a 2040 decarbonisation pathway that is accessible and practical for all of our members poses some challenges. These include issues around **planning and technical constraints, requirement of additional resources and upfront investment, as well as greater knowledge and skills in the supply chain**. These challenges are further amplified by **performance gaps in buildings** (i.e. the disconnect between building design and use), including the ability of landlords to influence tenants’ behaviours and monitor the performance of whole buildings.

Westminster is home to an exceptional range and quality of **heritage buildings** which contribute to the City’s economy, character and environment. Maintenance and upgrading of existing buildings can help in the fight against climate change. The need to find effective and sensitive retrofit solutions for these buildings is a pressing issue for the City Council and the WPA. Adapting heritage buildings can incur high upfront costs, and significant regulatory challenges through their protection by local and national heritage policies.

There is a lack of consensus and common understanding of the **concepts of ‘carbon neutral’** and **‘net zero carbon’**. The use of multiple definitions complicates the implementation of sustainability strategies.

Recommendations

This paper outlines a set of ideas and recommendations to help WPA members and the City Council meet the 2040 net zero carbon ambition for the built environment, while accounting for these challenges. There are recommendations that are specific to WPA members, to WCC, and those that are jointly shared between the two.

We hope that these findings are also useful to the City Council's other climate emergency workstreams, stimulating debate and discussion, and encourage collaborative working – such as sharing best practice and lessons learned.

Summary of the white paper's key challenges and recommendations

Challenges to achieving a net zero carbon built environment	Recommendation for WPA members	Recommendation for WCC policymakers
Planning & technical constraints	• Applicants and planning officers to work flexibly and creatively to maximise sustainability outcomes from planning decisions	
	• Subscribe to a progressive and impactful carbon reduction framework (e.g. BBP members' climate change commitment) which covers both embodied and operational emissions • Design flexible, adaptable buildings with the lowest possible whole life carbon emissions	• Give greater weight to carbon reduction outcomes in the planning system • Provide guidance and support to the owners of historic buildings, especially older homes: taking a 'whole house approach' to energy efficiency and reducing carbon consumption • Enable and invest in clean energy infrastructure for local neighbourhoods
Resources & upfront investment	• Take a 'climate first' approach to building design, construction and asset management • Switch to 'all electric 'energy and heating systems where possible, with 100% renewable sources • Provide upfront investment for maintaining, adapting and retrofitting older buildings • Support the business case for sustainability. Consider designs with fewer building materials and apply 'circular economy' principles to construction and fit-out	• Introduce new 'climate first' planning policies and regulations in consultation with sustainability experts and the property sector: levelling the playing field for applicants, whilst ensuring that schemes remain commercially viable • Reform the use of offset funds to be more transparent and deliver tangible community benefits • Lobby national Government to help encourage green investment e.g. removal of VAT for retrofit projects
Knowledge & skills	• Agree a common definition and vision for net zero carbon buildings that accounts for embodied and operation carbon across a building's lifecycle • Establish the carbon footprint of buildings and material sources of emissions across Westminster • Produce property-specific pathways to net zero by 2040, supported by monitoring and public reporting of performance • Build on the positive outcomes and valuable experiences of the 'Wild West End' urban greening initiative	
	• Work collaboratively, flexibly and creatively • Share best practice and lessons learned with the wider industry	• Promote best practice and innovation by appointing a dedicated sustainability champion within the planning department
Performance gap	• Capture and report data: introduce robust energy metering strategies for buildings, • Subscribe to BBP's Design for Performance trials • Focus on positive tenant engagement and consider green clauses within leases	• Co-ordinate a transparent system of public reporting for building performance data to encourage market-driven improvements in energy efficiency

Context

1

The strategic importance of Westminster

The City of Westminster is the economic and cultural heart of the capital; it is a vibrant and strategically important commercial district. Westminster is a driver of the wider London and UK economy. Importantly, Westminster is also home to 250,000 residents.

The City of Westminster generates **£54 bn GVA**, 14% of the London total

120k employees per sq km in the West End

Home to **55,000** businesses, including **29 HQs** of global businesses

Westminster produces **£2bn in business rate** income for the UK Treasury

Daytime population of **1.1m people,** including workers and visitors

The area's **business rate income** is more than that of Birmingham, Bristol, Leeds, Liverpool, Manchester, Newcastle and Sheffield City Councils combined

Sources
Draft Westminster City Plan 2019 - 2040[5]
Westminster Business Unit[6]
MHCLG 2019
London Councils 2019[7]

Westminster's world-famous heritage assets and green spaces are keys to its success, alongside an engaged property industry which invests in world-class buildings and public spaces.

11,000 listed buildings and structures

Westminster has **5.5m sqm** of **office floorspace**: the second highest volume for a London borough

56 conservation areas, covering **78%** of Westminster's footprint

Along with **1.7m sqm of retail** floorspace: the highest volume of any London borough

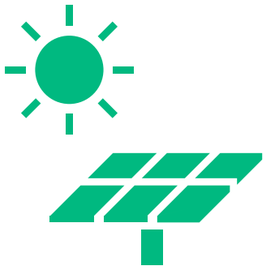
Over **46%** of Westminster's **housing stock** was **built before 1900**

£5.14bn was invested in **West End real estate market** last year

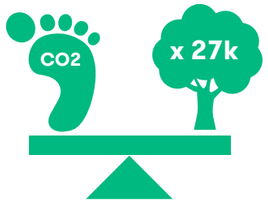
Sources
Draft Westminster City Plan 2019 - 2040
Knight Frank[8]
Arup, Good Growth for Central London: analysis of the CAZ+ from 2020 to 2041[9]
Savills, West End Investment Watch, January 2020[10]

Businesses, civic leaders and citizens have limited time in which to mitigate and reverse the catastrophic effects of climate change. WPA encourages its 260 members and the wider built environment sector to unite in action to de-carbonise Westminster's built environment.

The scale of the challenge for achieving a net zero carbon neutral Westminster by 2040 is immense.



The total annual energy consumption of buildings in Westminster is estimated to be **5,600 GWhe**, the amount of energy generated by **28,000 acres of solar farms**



Westminster's annual carbon footprint from buildings is estimated to be around **1.9m tonnes of CO2e** . To offset this would require planting **270,000 trees each year**

In addition to **commercial and residential buildings**, the **institutional building** footprint is large in Westminster, contributing significantly to the total built environment emissions

Commercial, residential and institutional buildings account for over **60% of emissions** in Westminster

Data supplied by Vu.City and BEIS, analysed by JLL, September 2020

Challenges to achieving a net zero carbon Westminster

Planning & technical constraints

- Working with Westminster's sensitive historic assets. Westminster is home to an exceptional range and quality of heritage buildings which contribute to the City's economic character and environment. Fabric maintenance and the upgrading of existing buildings can help in the fight against climate change, the need to find cost-effective retrofit solutions for these buildings is a pressing issue. Retrofitting and adapting heritage buildings has a number of significant regulatory challenges – including additional planning policy protections through national guidance and primary legislation (namely, the NPPF and the Planning Act 1990) along with local conservation areas and heritage listings.

- Competing pressures and demands on this densely built and populated area in the heart of Central London. This is evidenced through a complex framework[11] of local, regional and national planning policies and guidelines, with challenging and sometimes conflicting policy priorities. Competing pressures also relate to the significant number and difference between the daytime population coming into London's West End every day versus the nighttime population, putting additional pressure and demands on the City's buildings and public realm.

- London's West End supports high numbers of retail businesses and hotels. Such uses have greater energy demands[12] and other technical constraints, compared to self-contained offices and housing.

Resources & upfront investment

- Retrofitting heritage and older buildings, and the redevelopment of existing stock into low or zero carbon developments, requires significant upfront investment, innovation and new technologies. This can be challenging at a time of economic downturn[13]. Central London's economy requires post-Covid-19 recovery to support jobs, maintain the dynamic economy of London's West End, and generate funding for affordable housing and social infrastructure.

- The City's homes, offices and shops are owned by a wide range of different private and public sector landlords. Each will have different resourcing capacities and investment strategies.

Knowledge & skills

- There is a need for greater knowledge and skills across the built environment sector and its supply chain. Net zero carbon is an emerging concept for the whole industry.

- Lack of a common understanding of net zero carbon, with multiple definitions (including for 'zero carbon' and 'carbon neutral) used by different businesses and stakeholders. These definitions range in ambition and scope. Many do not account for the indirect or 'embodied' carbon emissions associated with the manufacture of construction materials, which can be responsible for as much as 50%[14] of a building's emissions across a building's lifetime. There are also multiple, and potentially competing, assessments for measuring energy consumption and carbon emissions; and concerns about the over-reliance on potentially unaccountable offsetting schemes to achieve net zero carbon outcomes.

Performance gap

- This lack of common understanding of net zero carbon is compounded by the challenge of performance monitoring. It is difficult to monitor the actual performance of the whole building including the emissions resulting from individual occupiers - especially for older buildings which are not sub-metered.

- Many landlords are restricted in their ability to influence how leased properties are used by their tenants, especially for multi-occupancy buildings or where the occupants procure their own energy.

- The disconnect between how buildings are designed and used. When occupied, a building that has been designed to a high sustainability standard can have significantly higher levels of energy use and emissions. The UK's current building regulations do not account for addressing this 'energy performance gap'.

This white paper seeks to address many of the above challenges with ideas and recommendations to help policymakers, WPA members and wider stakeholders work together to translate the City Council's emergency declaration into climate action.

Whole life carbon of buildings = **Operational carbon:** Heating, cooling, lighting and equipment + **Embodied Carbon:** Manufacture, transport and installation of construction materials and end of life emissions

Recommendations

2

The pathway to net zero carbon buildings

2020-2021

- Agree the vision for a 2040 Westminster (see pg 3)
- Agree a common definition for net zero carbon (see Appendix A)
- Establish carbon footprint and material sources of emissions, identify key areas of control, and subsequently define key focus areas
- Define carbon targets by asset type and building typology, or carbon budgets at organisational level
- Establish reporting system for performance disclosure

2021-2025

- All properties to have an asset-level pathway which aligns with this framework (comply or explain principles) (2021-22)
- All properties to report whole building carbon emissions (including tenant and landlord area emissions) (2021-22)
- All new buldings and major refurbishments to be designed to net zero standard
- Establish programmes to support skills and knowledge development and sharing
- WCC to establish 'climate first' planning policies
- WCC to review and reform its local carbon offsetting programme
- WCC to enable and invest in clean energy infrastructure in neighbourhoods
- Implement asset-level net zero carbon pathways
- Annual progress against targets to be published by WPA members
- New office and small residential developments transition to 'all electric'

2025-2030

- All properties to have a climate risk mitigation plan
- Roll out of improved metering strategies
- All new developments transition to 'all electric', or low carbon heating

2030-2040

- All properties transition to 'all electric' or low carbon heating
- 2040: All properties in Westminster are net zero carbon

It is essential that WPA and WCC responsibilities are clearly defined prior to the establishment of this pathway.

The following two chapters set out suggested recommendations and responsibilities for WPA members (section 5) and WCC policymakers (section 6), which are linked to case studies provided in Appendix B and C.

Recommendations for WPA members

The business case for green investment is clear. A 'climate first' approach to building design, construction and asset management has material commercial benefits

Achieving a net zero carbon Westminster by 2040 (as envisioned on pg. 3) will only be possible if the property industry plays its part. The transition requires long-term investment planning, creative thinking and partnership working by WPA members: the owners, investors, professional advisors and developers of the City's built environment.

It will not be easy, especially as Central London recovers from the economic impacts of the Covid-19 pandemic and Government-sanctioned lockdown. The financial impact on the property industry includes but is not limited to, material uncertainty over construction costs, affected supply chains, demand for new office space, inward investment and bank lending to the sector.

Nevertheless, the business case for green investment is clear. A 'climate first' approach to building design, construction and asset management has material commercial benefits, including:

- Creating better-quality assets, for example innovative buildings generating low energy bills, which translate into higher returns on investment[15] (ROI) for owners and investors. According to UKGBC[16], companies which actively manage their carbon emissions and plan for climate change enjoy 18% higher ROI than companies that do not.

- Attracting favourable finance from lenders which reward sustainable investment strategies in line with corporate ESG commitments. For example, both Great Portland Estates[17] and Derwent London[18] have recently acquired £450 million ESG-linked revolving credit facility packages (see case study in Appendix B).

- Driving occupier interest, as tenants increasingly prioritise a building's sustainability credentials and well-being features when making leasing decisions – such as natural light and urban greening.

- Future-proofing buildings from incoming regulation. Preceding Westminster City Council's climate emergency declaration, the UK Government was the first major economy to pass a net zero emissions law, mandating greenhouse gas emissions reach net zero by 2050. As these political ambitions and legislation translate into regulation, the built environment sector will face increasingly strict rules on how real estate assets operate. The Mayor of London has committed London to be a net zero carbon city by 2050.[19] Investing in sustainable buildings now is prudent.

As a membership body representing 260 diverse organisations, WPA members cover a broad spectrum of the property industry. Within our property owner members, the historic 'Great Estates' and larger developers have long-term investment strategies and are using their resources to invest in industry-leading innovations to create low-carbon buildings (see 119 Ebury Street and 1 Triton Square case studies in Appendix B). WPA also represents small and medium sized developers, and affordable housing charities, which do not have access to the same level of resourcing. It will not be possible for every organisation represented by the Association to invest heavily in zero carbon outcomes, without the relaxation of other regulations and planning obligations, as set out in the recommendations for WCC policymakers (section 6).

We encourage each WPA member to play their part in creating a cleaner, greener, more sustainable Westminster – which in turn will make London's West End a more attractive place to live, work, visit and invest.

The Mayor of London has committed London to be a net zero carbon city by 2050.

The recommendations for WPA members are set out below.

i. Capture and report data

- As BBP (Better Buildings Partnership) explains in the introduction to its Better Metering Toolkit[20], one of the key barriers to improving the energy efficiency of commercial buildings is the lack of performance data. Energy metering strategies enable both property owners and occupiers to measure how much energy is being consumed on a regular basis, informing them of how to make targeted improvements. BBP's toolkit sets out the metering options available for commercial buildings and provides guidance to help owners understand the system design, suppliers and utility companies used to inform decision-making to reduce energy and carbon, as well as cost.

- WPA members should consider ways to address the 'energy performance gap', including subscribing to BBP's Design for Performance[21] trials (see Derwent London's net zero case studies in Appendix B).

ii.Subscribe to a progressive and impactful carbon reduction framework

- WPA members should subscribe to a sustainability framework that supports their alignment with the proposed Westminster net zero carbon pathway to 2040.

The framework should align with best practice carbon targets such as the UKGBC definition of net zero carbon or the BBP Climate Change Commitment, covering both building operations and construction yet allowing flexibility in the detailed approach. It should include:

In operation

- Actively monitor and measure your building's annual energy use and emissions. This information should be disclosed alongside the floor area to give a better understanding of how the building is performing
- Reduce energy use through efficient systems
- Supply the remainder of energy from renewable sources, prioritising on-site over off-site renewables
- Pay to offset any remaining emissions

In construction

- Measure and disclose emissions associated with construction activities, along with embodied carbon emissions of the materials used
- Design buildings which can run more efficiently, and which will use less energy throughout their lifetime
- Design in building-integrated renewables wherever possible
- Pay to offset the emissions from construction activities and the embodied emissions of the materials used

An excellent example of a progressive commitment for property owners is the BBP (Better Buildings Partnership) Climate Change Commitment[23] which commits signatories to publish their net zero carbon pathway and disclose the in-use energy performance of their real estate assets. Signatories are also required to account for the embodied carbon of development, refurbishment and fit-out works.

iii. Invest and innovate for a net zero carbon future

- Property owners and developers will need to address carbon reduction throughout the building lifecycle. At a basic level, achieving net zero will require switching to renewable power sources and moving away from the use of fossil fuels in buildings, like natural gas for heating. The challenge will be adapting and retrofitting older buildings, as this may require updating traditional energy systems, as well as changing internal layouts and façades. While favouring refurbishment over new construction will minimise embodied carbon impacts, this should be carefully balanced against potential energy savings over a building's lifetime. There is also a need to explore designs for flexible, adaptable buildings which use fewer materials and use materials with lower embodied carbon. Simple choices such as using cross laminated timber, recycled steel rather than virgin steel and incorporating recycled concrete where possible can have a huge impact on the embodied carbon of the building.

- Where possible, property owners should invest in creating 'all electric' buildings[24] (see case studies in Appendix B) which benefit from renewable electricity and decarbonisation of the National Grid[25]. This transition will be achievable for many new office and small residential developments in Westminster in the short-term (2021-25) but requires design stage planning to ensure transformer capacity is sufficient to cover the site's electricity demand. However, this will be far more challenging for existing building stock which has heritage and technical constraints, for example hotels in conservation areas with high hot water demands.

To support the transition of buildings in Westminster to be 'all electric', action is needed from Government and the National Grid to upgrade the capacity of the UK's electricity network and fully de-carbonise its energy sources.

iv. Focus on tenant engagement

- With energy use associated with the operation of existing buildings accounting for 30% of the UK's total emissions[26], occupiers play an important role in buildings achieving net zero beyond investments in 'hard' measures (e.g. LED lighting upgrades). This is particularly the case where building owners do not have operational control and/or responsibility of energy supply within occupiers' jurisdiction.

- Property owners should focus on positive occupier engagement, supported by data collection and analysis, to deliver meaningful outcomes for energy efficiency and low carbon building management, including deliveries and waste (see The Crown Estate's customer engagement case study in Appendix B).

- Owners should also consider 'green' clauses within leases to encourage behaviour change and encourage or mandate the sharing of energy data. BBP has created a 'green lease toolkit[27]' to enable owners and occupiers of commercial buildings to work together to reduce the environmental impacts of their buildings. It includes both a template for Memorandum of Understanding and green lease clauses. Furthermore, in 2020, the BBP has initiated an owner-occupier forum on sustainability issues[28], enabling them to tackle institutional, technical and legal barriers by creating strategic alliances, and sharing knowledge to scale up action across portfolios.

- There is a case for exploring a West End-wide lease clause to create a level playing field between landlords across the West End. This work is being undertaken by WEP (West End Partnership): a private and public sector partnership including WCC, the neighbouring London Borough of Camden, GLA as well as business and resident groups.

Image: One Heddon Place, The Crown Estate (photo credit: Philip Vile)

Recommendations: WCC policymakers

Westminster City Council is establishing a pathway to achieving carbon neutrality for its services and buildings by 2030. Inspiration can be found from other leading global and UK cities, which are learning valuable lessons from innovative policies and experimental sustainability initiatives. These range from New York City's Retrofit Accelerator and the Copenhagen 2025 Climate Plan, to projects closer to home, including Oxford City Council's Climate Assembly and the Stratford Olympic Park's ambitious district energy scheme (see 'learning from other cities' case studies in Appendix C).

As a local education authority, the City Council can also help increase the skills and knowledge needed for a net zero carbon future.

WCC should consider a 'place-based approach' for sustainability initiatives within its own real estate portfolio, including working with existing heritage constraints and sharing the learnings with property owners, occupiers and residents.

There are a large number of public sector and institutional buildings in the City, including the Palace of Westminster and the large Whitehall estate. The City Council should engage with the Office of Government Property (OGP) to identify opportunities to decarbonise these strategically important buildings in line with WCC's 2040 ambition.

As a local education authority, the City Council can also help increase the skills and knowledge needed for a net zero carbon future. It can provide further education courses and support apprenticeships to develop the skills required to retrofit Westminster's buildings, and specialists to work in construction, engineering, and low-carbon energy infrastructure.

However, for this white paper, we are focusing on the City Council's role in working with the property industry as a policymaker, planning authority and civic leader. There are three key areas where we believe that WCC can support and enable WPA members to accelerate the transition to a net zero carbon City, which are set out below.

The Government's Planning for the Future white paper (August 2020) proposes wide-ranging reform of the national planning system, with an emphasis on greater simplification and standardisation, and potentially significant increases in housing delivery targets. It seeks to further embed climate change mitigation and adaptation into plan-making and decision making, including specific reference to new homes to be 'zero-carbon ready' from 2025 and encouraging greater flexibility for adaptation of historic buildings to incorporate energy efficiency measures.

i. Instigating 'climate-first' planning policies

- Council officers should work flexibly and creatively with applicants to deliver on WCC's climate priorities and maximise the sustainability outcomes of development sites with their own unique challenges and opportunities, exploring innovative and site-specific solutions, such as on-site renewables and urban greening or 're-wilding' of roofs and the public realm.

- Supported by the Government's national planning reforms, WCC should give greater weight to carbon reduction outcomes in the planning system, considering it a public benefit alongside other factors such as design quality. To achieve this, carbon should become a more visible part of the planning process, and needs to be profiled better.

- Introduce new 'climate first' planning policies and regulations in consultation with sustainability experts and the property sector: levelling the playing field for applicants, whilst ensuring that schemes remain commercially viable. Policy proposals should focus on reducing 'whole life'[29] carbon and be carefully considered within the existing planning context to encourage sustainable growth and the development of world-class 'green' buildings. At a time of challenging economic circumstances, ambitious targets on new developments should be applied flexibly, especially in the early years of any plan or new guidance.

- Conservation, design and planning officers should work collaboratively to enable the sensitive retrofitting of historic and protected buildings: achieving an objective balance between heritage protection and climate resilience, and securing historic buildings' use for the future. In line with the National Planning Policy Framework[30], reducing carbon emissions from heritage properties should be considered a public benefit and positively weighted against a property's designation.

Adapting and retrofitting Westminster's heritage assets to be resilient to climate change

1. **Provide guidance and support to the owners of historic buildings, especially older homes, for maintaining the building fabric, reducing the risk of over-heating, and taking a 'whole house approach[31]' to energy efficiency and reducing carbon consumption.**

2. **Set out more detailed guidance on the type of interventions that would, generally, be appropriate - taking into account the building's significance, the scope of the proposed works and whether they are reversible. This could be built upon the template of the Oxford HEET guide.[32]**

3. **Expand design and conservation officers' role to consider, perhaps with specialist input from an energy officer, the energy efficiency and carbon emissions of historic buildings proposals.**

4. **Give significant weight to carbon reductions as a public benefit in heritage decision making.**

- To promote best practice and innovation, WCC could consider appointing a dedicated sustainability champion within the planning department to embed a 'climate-first' approach.

- WCC should help coordinate a transparent system of public reporting of building performance data to encourage market-driven improvements in energy efficiency. This can include wider uptake of Display Energy Certificates, and the emerging trials of Design for Performance ratings[33] for office buildings (see The Crown Estate's occupier engagement case study in Appendix B). The initial draft of the GLA's 'Be Seen' energy monitoring guidance[34] can be used as a point of reference for this.

Image:
Brown Heart Gardens,
Grosvenor Britain & Ireland

- The City Council could support the property industry, especially SME developers, by lobbying national Government to help make green investment more commercially viable. This could include the removal of VAT to retrofit projects[35], fiscal incentives to encourage enhanced energy efficiency, and research and development into sustainable technologies and construction materials such as regulated timber construction[36].

ii. Use of carbon offsetting funds to support innovation and retrofitting

Where fully net zero carbon buildings cannot be achieved through design, carbon offsetting may be required. WCC's offsetting scheme should be reviewed to ensure it is a transparent system, with charges set at a realistic price, and designed to deliver meaningful local benefits.

Money raised could be spent via an accredited 'climate innovation fund' for Westminster, to support:

- The retrofitting of existing buildings across Westminster, including affordable housing stock.
- Community clean energy infrastructure projects and district heating networks.
- Grants for SME developers and homeowners that would not otherwise have the resources to invest in green infrastructure e.g. installing energy performance monitoring systems; solar photovoltaic panels (to provide low-carbon electricity) and solar thermal systems (to provide hot water); and electric vehicle charging points.

The transparency of this climate innovation fund could be assured through an independent board involving local stakeholders and guided by sustainability experts. The board would be consulted before allocating grants to impactful and local carbon-reduction projects.

- A robust approach to net zero is crucial. At building level, this will mean demonstrating confidence that a carbon hierarchy is applied, whereby energy reduction is prioritised first, followed by procurement of renewable energy and offsetting should be considered only to eliminate the hard to abate residual emissions.

- When considering Westminster's approach to offsetting, our recommendation is to align with the emerging best practice guidance on net zero aligned offsetting being developed by organisations such as UKGBC* and Oxford University*. These principles are designed to ensure the approach to offsetting is credible and prioritises local impact, in addition to supporting the transition to net zero.

* UKGBC, Renewable Energy Procurement & Carbon Offsetting, 2020: https://www.ukgbc.org/wp-content/uploads/2020/10/201027-Renewables-Offsets-Consultation-Paper-3.pdf

** University of Oxford, The Oxford Principles for Net Zero Aligned Carbon Offsetting, 2020: https://www.smithschool.ox.ac.uk/publications/reports/Oxford-Offsetting-Principles-2020.pdf

iii. Enable and invest in clean energy and green infrastructure in Westminster

- As a local authority, the City Council should consider investing in community clean energy infrastructure as a priority within its overall decarbonisation strategy. This could include PVs, district heating networks and electric vehicle charging infrastructure.

- Lobby the Government and National Grid to upgrade the capacity of UK's electricity network, so it can support the transition of buildings in Westminster to be 'all electric'. The full decarbonisation of the network's energy sources is also required if the heating, cooling and wider operation of these buildings is to be genuinely zero carbon.

- WCC should capture the opportunities and lessons learnt from the Covid-19 lockdown, which saw dramatic reductions in traffic pollution across Westminster and a renewed public appreciation for the value of green and open space. Working with landowners and developers, the City Council can encourage urban greening of the built environment.

- Building on the positive outcomes and valuable experience of the Wild West End[37] project (case study in Appendix B) a greater use of nature-based solutions would capture carbon in the atmosphere and off-set emissions from Westminster's building stock. Examples include maintaining and increasing tree cover; improving wildlife and biodiversity; and smaller scale urban green solutions to reduce carbon emissions, such as green roofs which simultaneously deliver energy savings in buildings.

As governance is crucial to the delivery of this net zero carbon ambition, the WPA would also welcome the opportunity for a continued dialogue between WCC policymakers and the property industry. This could include a permanent working group set up between the council and WPA members, to measure progress and explore potential solutions to the on-going challenges of achieving a net zero carbon Westminster.

Image: Cardinal Place, Landsec

Next steps

The WPA and its members, working together with the City Council, have an important role to play in enabling and delivering a successful transition to a net carbon zero Westminster by 2040.

The WPA will work together with WCC to address the topics addressed in this white paper. Critical next steps include:

a. Agreeing a common definition for net zero carbon buildings, based on a whole life carbon approach.

b. Establishing Westminster's carbon footprint and material sources of emissions; identify key areas of control; and define key focus areas.

c. Setting a framework of best practice carbon targets for each asset type and building typology, including guidance on the flexibility of these targets e.g. a possible 'comply or explain' approach.

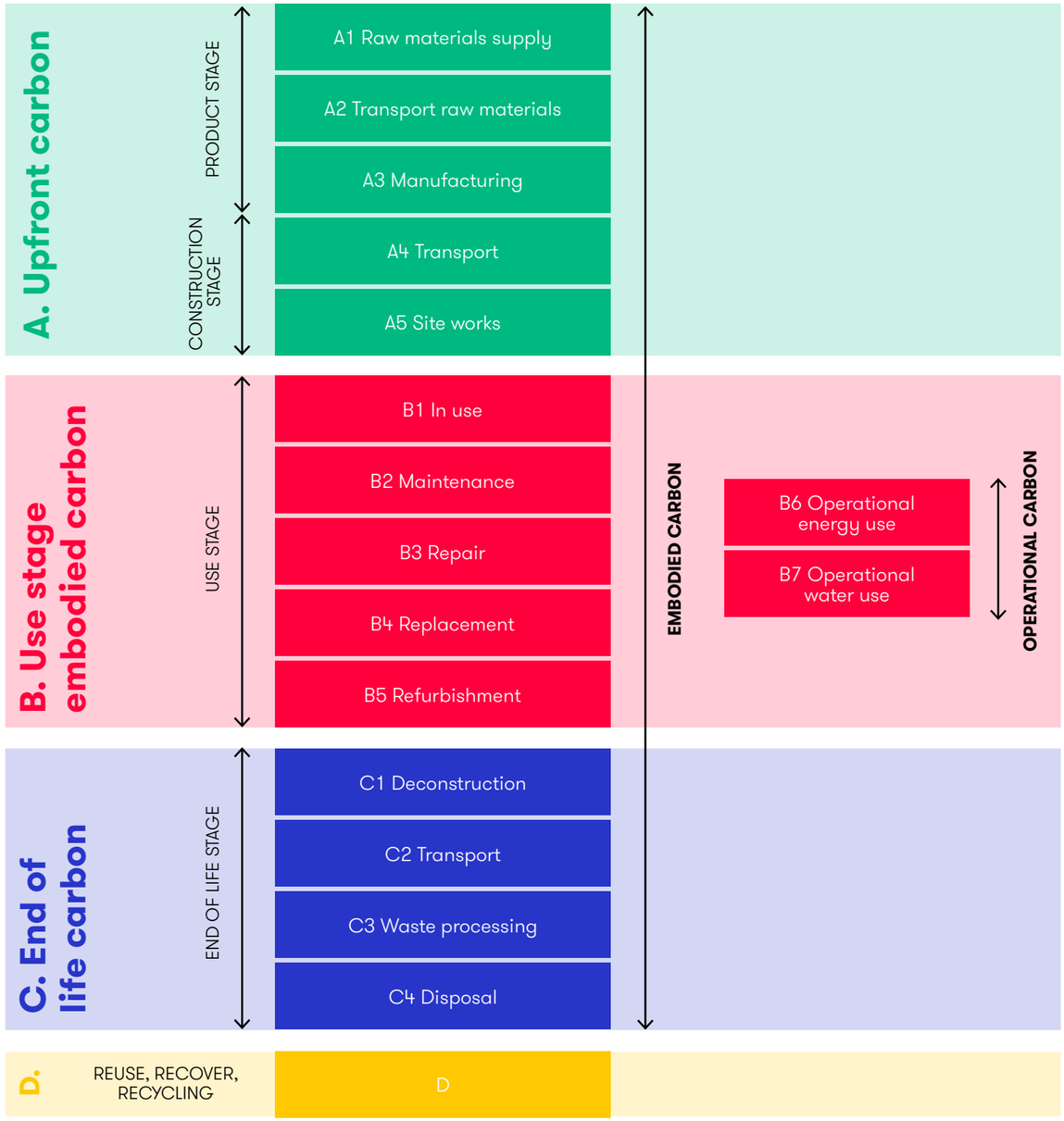
d. Creating a reporting system for building performance disclosure.

Appendix A. Defining net zero carbon for Westminster

As set out in the first step of the pathway (section 4), it is vital that a standard definition of net zero carbon is agreed for buildings to help both Westminster City Council and property owners set meaningful targets and action plans. The definition should be ambitious but achievable.

Globally there are a range of different definitions used to describe net zero carbon buildings. This varies from properties which are 'net site zero energy' or 'net off-site zero energy' buildings, depending on whether energy use is balanced by onsite or offsite renewables; 'net zero energy emissions' buildings which require balancing of fuel emissions by onsite or offsite renewables; 'net zero emissions buildings' which account for both operational emissions (energy use in the building) and embodied carbon (associated with building materials, construction and the whole life cycle).

We recommend using a net zero definition that covers all types carbon emissions (operational and embodied), better known as 'whole life carbon'. This aligns with other initiatives such as the Advancing Net Zero agenda of the UK Green Building Council (UKGBC), the Climate Emergency Design Guide of the London Energy Transformation Initiative (LETI) as well as the RICS professional statement Whole Life Carbon Assessment for the Built Environment. The graphic[38] below gives an overview of the different sources of operational and embodied carbon that make up the whole life carbon footprint of an asset.



Whole life carbon - includes A, B, C and D

The UKGBC published Net Zero Carbon Buildings: a framework definition[39] in 2019, which sets out two key approaches to achieving net zero carbon for the property and construction industry:

- The energy used by buildings in operation should be reduced and where possible, any demand met through renewable energy. Any remaining emissions from operational energy should be offset to achieve net zero carbon.

- The 'embodied' emissions associated building materials and construction works should be measured, reduced and offset.

UKGBC states that this definition requires a fundamental reimagining of the way buildings are designed, constructed and used. 'Net zero carbon' is not a label, but a process, which demonstrates the building's carbon performance is being maintained. It also calls for the principles of the carbon hierarchy to be implemented correctly, focussing on driving energy intensity of buildings as a priority.

There are emerging energy intensity[40] and embodied carbon[41] targets for net zero buildings such as 70kWhe/m2 NLA per year for office buildings. While these are challenging targets and likely unachievable in the near-term, the intent is to encourage working towards a reduction of the impact of buildings across their lifecycles, before any offsetting measures are considered.

As part of the initial steps of the Net Zero Carbon pathway suggested in this whitepaper, WPA would look to work with WCC in setting out a framework of carbon reduction targets, aligned with the latest industry initiatives such as the UKGBC definition of net zero carbon or the BBP Climate Change Commitment, that will clearly define best practice per asset type.

This framework should include guidance on the interpretation of these targets and dates for implementation, depending on the property life cycle stage, level of operational control and any possible historical constraints. The framework should provide:
- Clarity on the ambitious targets that the industry needs to adopt in the coming decade(s)
- Guidance on the flexibility of these targets e.g. a possible 'comply or explain' approach
- Insights into the consequences of not delivering on these targets e.g. potential planning restrictions

Inspiring Innovation

3

Appendix B.
WPA member case studies

This section signposts readers to best-in-class case studies - both within and outside of the City of Westminster - of where WPA members have achieved exemplary impacts in energy efficiency improvements and carbon reduction, including retrofitting existing buildings and developing new builds.

i. Investment: Great Portland Estates' ESG linked revolving credit facility

As a major contributor to the UK's carbon emissions, financial institutions and the property sector are recognising the need to work together to tackle climate change and to invest in clean and resilient growth. One recent example of this is Great Portland Estates' signing of a £450 million ESG (Environmental, Social and Governance) linked revolving credit facility (RCF).

This innovative facility provides favourable financial package to Great Portland Estates (GPE) on the condition of three ESG-linked KPIs:

1. Decarbonising GPE's existing buildings: reducing the portfolio energy intensity by 40% by 2030

2. Reducing the embodied carbon of its new build developments and major refurbishments

3. Providing better quality urban greening measures, increasing the biodiversity net gain across the portfolio

The £450 million package is provided by five banks: Santander, NatWest, Wells Fargo, Lloyds Bank plc and Bank of China.

ii. Refurbishment: The ‘circular economy’ approach at British Land’s 1 Triton Square

1 Triton Square has achieved an estimated 43% reduction in operational carbon versus a typical commercial building

British Land has adopted a circular economy approach for the transformation of 1 Triton Square, an office development in London’s West End. The redevelopment projects a saving of 56% embodied carbon versus that of a typical new build, and challenges approaches to refurbishment by reusing and retaining as many exiting materials as possible[42].

By taking a circular economy approach, British Land was able to reduce the construction and delivery programme, whilst contributing a BREEAM Outstanding sustainability rating at design stage.

Numerous innovations have been realised through the adoption of this approach – British Land pioneered their first carbon fibre column wraps to strengthen existing columns, replaced over 70% of the cement needed with more carbon-efficient blast furnace slag, and retained as much of the existing façades and superstructure as possible.

Perhaps most ambitiously, 3,500sqm of glazed panels were removed from the existing building and transported to a pop-up factory less than 30 miles away from the site to be inspected, deep cleaned, and refurbished before being reinstalled at 1 Triton as a circular façade, costing 66% less than a new equivalent.

As well as saving on project costs and saving an estimated 56% embodied carbon versus a typical new build, 1 Triton Square has achieved an estimated 43% reduction in operational carbon versus a typical commercial building, averting 34,690 tonnes of CO2 emissions over the next 20 years.

Image:
1 Triton Square

iii. Retrofitting historic buildings for energy efficiency: Grosvenor's 119 Ebury Street

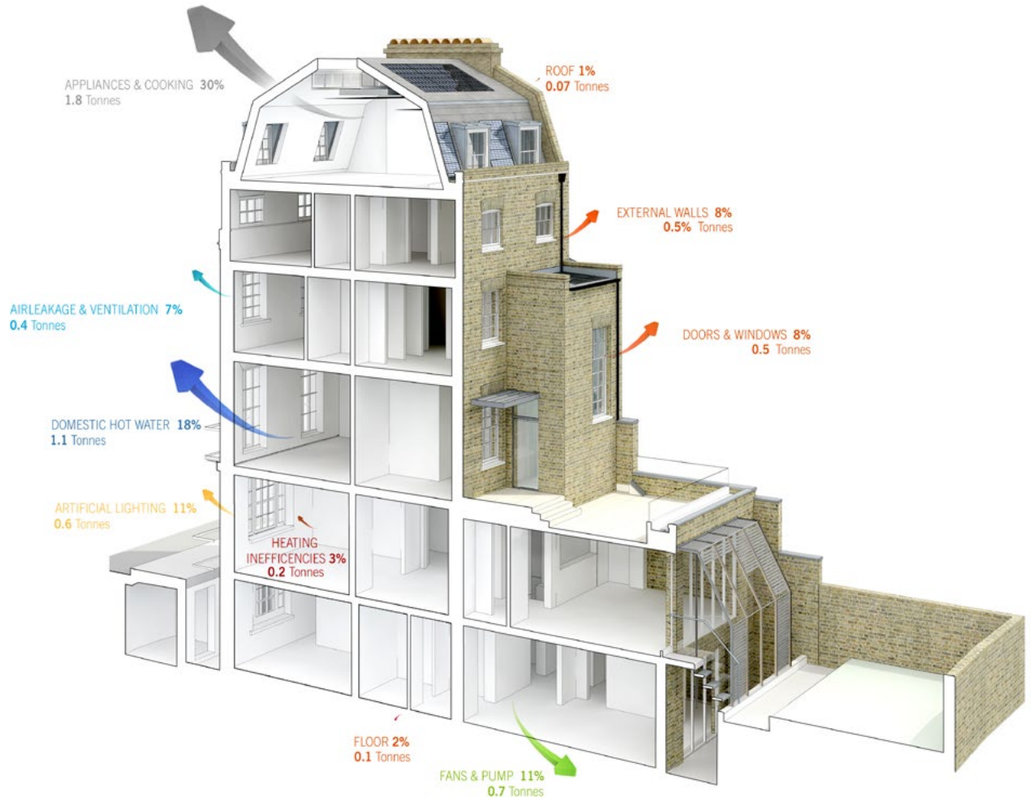
Image:
119 Ebury Street

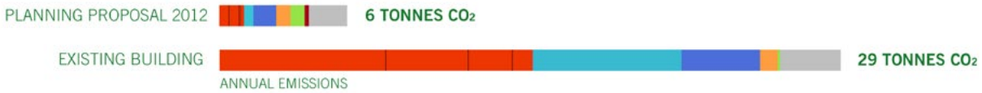
Results of the monitoring revealed that 119 Ebury Street achieved an 80% reduction in operational carbon emissions

Grosvenor Britain & Ireland used the BREEAM assessment method to understand the impact of retrofitting works at 119 Ebury Street, a listed building in the City of Westminster. Grosvenor set out with the goal of achieving the highest level of BREEAM certification – 'Outstanding' – to support their objective of significantly reducing carbon emissions and to help establish their position as a leader in sustainable conservation.

The retrofit works included the installation of triple glazing, insulation, and a solar thermal system. Construction materials and interior design finishes were chosen for their sustainable credentials, utilising high levels of recycled content from local suppliers.

Permission to redevelop the building into three duplex apartments had been permitted by WCC under the condition that Grosvenor undertake a two-year monitoring strategy to measure the building's performance. Monitors were installed to collect data on factors such as the walls' temperature and relative humidity, and this was compared with data from a neighbouring building.





Results of the monitoring revealed that 119 Ebury Street achieved an 80% reduction in operational carbon emissions, meeting BREEAM's 'Outstanding' rating[43] and hitting the UK Government's 2050 carbon emissions target over 30 years early. The retrofit works were found to have no damaging effects on the building's fabric.

Following the success of 119 Ebury Street, Grosvenor continue to implement retrofitting projects to test the most rigorous quality assurance standards for energy efficiency in historic buildings.[44] These additional projects also achieved energy and carbon reductions whilst preserving the historic fabric of the buildings and delivering fit for purpose homes and workspaces that support the wellness of residents and businesses.

iv. Development: Delivering Net Zero Carbon Buildings at Derwent's 80 Charlotte Street and 19-35 Baker Street

Completed in June 2020, 80 Charlotte Street is the largest and first 'net zero carbon' development by Derwent London. The 380,000 sq ft mixed-use scheme in London's West End (but located in the neighbouring borough of Camden) comprises 321,000 sq ft of office floorspace, 45,000 sq ft of housing (a quarter of which is affordable) and 14,000 sq ft of retail space, along with a new public pocket park.

Significantly, 80 Charlotte Street is an 'all electric' building so requires no natural gas for heating or cooling. Instead air source heat pumps, powered by electricity from renewable sources, have been integrated into the development.

The embodied carbon impact, including building materials and installation, has been monitored throughout construction and is estimated to be 28% lower than the RICS Carbon Database average for office buildings. These emissions will be offset using certified schemes.

Reflecting on the success the project, the developer said that early planning was key. Design work which put environmental sustainability at the heart of the development and planned for its all-electric systems, started 10 years prior to its completion.

Lessons from 80 Charlotte Street are now being applied by the developer to a new scheme in Westminster's Marylebone neighbourhood.

Planning permission has been granted by Westminster City Council for a 293,000 sq ft development comprising 206,000 sq ft of offices, 52,000 sq ft of housing and 35,000 sq ft of retail floorspace. Due for completion in 2025, 19-35 Baker Street will replace three existing out-dated and energy inefficient buildings (held by Derwent London in a joint venture with The Portman Estate).

This will be another 'all electric' building using air source heat humps for heating and cooling.

The development is also a pioneer project for BBP's Design for Performance (DfP) trials. Based on Australia's leading building performance rating, the National Australian Built Environment Rating System (NABERS), DfP is designed to address the 'energy performance gap' challenge and provide an approach, based on measurable performance outcomes, to ensure new office developments deliver on their design intent. NABERS rated buildings have saved over A$400 million in energy bills since 2010 and office buildings using NABERS have reported an average improvement in emissions of 11.5%.[45]

As one of the first DfP pioneer projects in the UK, Derwent's Baker Street project has been set ambitious energy performance targets at its design stage, which will be thoroughly tested and revised to ensure achievability (using advanced simulation techniques and an independent design review panel). Those targets will be compared to actual building performance, using base building performance measurements for a 12-month period, where performance issues are highlighted and corrected; and its operational rating will be produced by an independent accredited assessor.

Image:
80 Charlotte Street

Image:
19-35 Baker Street

v. Achieving ‘Passivhaus’ standard: The Portman Estate’s 2 Gloucester Place Mews

The ‘Passivhaus’ standard was developed in Germany in the 1990s as a rigorous and voluntary standard for energy efficiency in buildings, which far exceeds UK building regulations. The Portman Estate has achieved the standard at the Grade II listed 2 Gloucester Place Mews in Marylebone.

Whilst undertaking an extensive repair and sensitive reconfiguration of the heritage property in 2018, the project team integrated a suite of measures to achieve the required insulation and air tightness levels. This included installing an innovative airtight membrane and aerogel super insulation within the external walls, as well as triple glazed windows, eliminated thermal bridges and a mechanical ventilation and heat recovery system

Extensive planning and collaboration were required to manage this pioneering project and achieve an ultra-low energy home. It was necessary to obtain full buy-in from the project sponsors in support of this trial project, and additional time and cost contingencies were applied as a precaution to cater for the design team and contractor’s learning curves.

The long-term benefits for the occupants include low energy costs, improved indoor air quality, thermal comfort and self-maintained moisture and humidity levels throughout the year.

The Portman Estate has monitored the post-occupancy performance of the property to continue learning from this innovative heritage project.

Image (opposite): Outside 2 Gloucester Place Mews, The Portman Estate

Image (below right): Electric car charging point in the garage

Image (below left): Home interior.

Image:
Regent Street

vi. Asset management: customer engagement to achieve energy reduction across The Crown Estate's Central London portfolio

The Crown Estate has been collaborating with JLL as the managing agent, engaging with different occupiers across a range of sectors (including offices, residential and retail/hospitality) to identify opportunities to manage and reduce energy use.

Data Collection and Analysis

Collecting and sharing accurate building consumption data underpins successful occupier engagement and is crucial to identifying energy reduction opportunities. The Crown Estate has found that on newer properties, data collection and analysis of occupier use is comparatively easier through the availability and use of automatic meter readings. In addition, technology such as building analytics software has been used to visualise large sets of data and indicate where savings can be made. Facility managers (FMs) have used this software to demonstrate how rectifying issues to building plant, such as reviewing and adjusting plant running times, can reduce energy consumption without compromising the functionality or comfort within occupiers' area.

Where occupiers procure and manage their own energy supply (such as in older properties, headlease assets and retail uses), data collection and analysis have been more challenging.

Developing and maintaining relationships

Whilst time intensive, the JLL FM team has integrated this responsibility into their role day-to-day, building on existing relationships with occupiers and actively discussing specific opportunities to reduce energy. A recent initiative within the FM team saw a total 5% reduction in electricity and a 21% reduction in gas, equivalent to 520,000kWh against the same quarter in the previous year. These reductions were seen through low/no cost measures such as reviewing plant times alongside occupier engagement, signage to remind lights be switched off, and LED lighting replacements where budgets allowed.

However, challenges exist in finding the right individual to engage with, or maintaining relationships, particularly in sectors with a more transient workforce like hospitality. To help overcome this, a number of 'touch points' has been adopted by both JLL and The Crown Estate, including occupier meetings, a residents' app, newsletters, day to day FM engagement and access to a bite-size sustainability programme. A CRM platform has helped to manage relationships with a range of stakeholders, identify different interests and needs within each business (including sustainability), and increase the resilience of the relationships.

Instigating behavioural change

Beyond regular occupier meetings, all Crown Estate occupiers have access to a free bite-sized sustainability programme to actively encourage behaviour change, which includes practical energy management ideas that can be applied in both the workplace and at home. The programme has been developed to be accessible and convenient to a wide range of occupiers at different times of the day, and where appropriate, encourage sessions to be hosted by occupiers. The programme has been very successful, with over 1,500 members in the sustainability network. Some occupiers have also requested that JLL develop more bespoke strategies for their own demise covering a range of sustainability areas, involving regular feedback on agreed objectives to track progress and maintain momentum.

However, not all occupiers consider energy costs to be material to their business, with staff wellbeing and comfort, and business operations regarded as bigger priorities. In these situations, the FMs have used analytics software to show energy consumption, temperature and indoor air quality levels together and worked

collaboratively with these occupiers to adopt solutions that meet the individual needs of their businesses and maintain the comfort of their staff, whilst realising energy savings.

Renewable energy procurement

The Crown Estate ensures that all energy procured on behalf of its occupiers are from REGO and RGGO certified supplies across its real estate portfolio. Where occupiers are responsible for their own electricity supply, they are offered a complimentary re-tendering service from The Crown Estate's energy procurement team to make an easy and normally cost neutral switch to a certified renewable electricity supply.

A recent initiative within the FM team saw a total 5% reduction in electricity and a 21% reduction in gas, equivalent to 520,000kWh against the same quarter in the previous year.

Image:
Regent Street

vii. Collaboration: Wild West End

Wild West End[46] is a private sector-led initiative, where the West End's largest property owners are working together to encourage birds, bees and bats back into this iconic area of London, and create greater connections with nature for residents, visitors and workers to enjoy.

Wild West End is a unique partnership between The Crown Estate, the Church Commissioners, Great Portland Estates, Grosvenor Britain & Ireland, The Portman Estate, The Howard de Walden Estate and Shaftesbury.

Focusing on just of the private sector partners, **The Howard de Walden Estate** sits within 92 acres of Marylebone. The estate has committed to increasing green cover wherever possible - using native plant species which support improved biodiversity - whilst capturing carbon in the atmosphere. Without any gardens or squares under the estate's direct ownership, the majority of green space installations have been at roof level. The Howard de Walden Estate has:

- Created 17 new green roofs, providing over 900 sqm of hidden green space in Marylebone, and a further three green walls.

- Developed proposals for an additional 13 green roofs, which have been granted planning permission by WCC. This will create more than 1,000 sqm of new green space.

- Through its 'Greening the Mews' initiative, the landowner has encouraged its tenants (both residents and businesses) along Wigmore Place to plant as much carbon-capturing greenery as possible. The estate has installed planter boxes, hanging baskets and trees along the mews.

- Building on the success of the Greening the Mews, the estate has now extended the project to Marylebone Lane. It is working with the area's retailers and other occupiers to provide shopfront planters from Marylebone High Street to Wigmore Street.

Image:
Wigmore Place

The estate has committed to increasing green cover wherever possible - using native plant species which support improved biodiversity - whilst capturing carbon in the atmosphere

Appendix C.
Learning from other cities

Pathways to a zero carbon city

CPH 2025 Climate Plan

With sights set on becoming the world's first net zero carbon city by 2025, the City of Copenhagen has created a clear strategic plan that is both holistic in its approach and specific in its targets.[47]

The CPH 2025 Climate Plan includes detailed targets in four key areas (energy consumption, energy production, mobility and city administration initiatives) which have been set to mitigate the effects of climate change and demonstrate that it is feasible to combine growth, development and an enhanced quality of life with lower CO2 emissions. Targets are set into implementation phases and evaluated at the end of each phase to inform next steps and priorities.

The plan encourages close cooperation between public authorities, businesses, knowledge institutions and individuals, and describes how the goal of net zero carbon can support innovation, job creation and better quality of life for Copenhagen residents.[48]

Bristol Advisory Committee on Climate Change[49]

In 2019 the elected Mayor of Bristol established a cross-sector (academic, public, private and charity) committee to provide independent, technical advice for achieving a net zero carbon and climate resilient city by 2030.

The committee monitors the City Council's progress in reducing emissions, achieving carbon budgets and implementing measures to meet climate adaption needs.

Public sector leadership in driving energy efficiency

NYC Retrofit Accelerator[50]

The City of New York offers a free personalised advisory service to encourage energy efficiency improvements to privately owned housing stock. The programme is estimated[51] to reduce emissions from New Yorkers' homes by 1m metric tonnes a year by 2025, by accelerating retrofits in up to 1,000 properties per year – while saving residents an estimated $350m a year in bills and generating over 400 local construction-related jobs.

Milton Keynes Carbon Offset Fund[52]

The council's offsetting fund, which has been in place since 2008, and has achieved an estimated 6,000 tonnes of carbon savings and resulted in more than £1m in carbon saving projects across the town. Money raised by charges to new developments that do not reach net zero carbon standards are pooled by the council and the funds are managed by the independent National Energy Foundation.

Grants are provided for:

- Boiler cashback schemes to encourage residents to replace old inefficient boilers with new A-rated boilers
- Loft and cavity insulation in local homes
- Funding for local schools for boiler and lighting upgrades

A climate-first approach to planning

Policymaking within #WM2041

West Midlands Combined Authority has published a suite of proposals[53] across policymaking, transport, infrastructure and industry to roadmap to the region to carbon neutrality by 2041.

It is looking to implement a design charter to shape new neighbourhoods (with developer guidelines on low carbon construction and operation); creating a zero carbon homes standard; and will lobby for changes to the NPPF to have a more robust planning basis for encouraging zero and negative carbon developments[54].

Reducing carbon emissions from the historic environment

Camden's energy efficiency planning guidance for heritage buildings

Working with local residents, the London Borough of Camden has produced detailed guidance[55] to help those who want to improve the energy efficiency of homes within conservation areas.

The guidance note includes advice on developing an individual retrofit plan for a home; the cost efficiency considerations and subsidies available for various technologies from solar panels to floor insulation; and detailed support on how to seek planning permission for energy efficiency interventions with conservation zones.

Community engagement in zero carbon policymaking

Oxford's Climate Assembly

In 2019 Oxford City Council implemented the UK's first Citizens' Climate Assembly to increase public engagement and assist with the establishment of carbon reduction targets and climate mitigation strategies.

In response to the Assembly's recommendations, the City Council will move towards a zero carbon built environment by undertaking a comprehensive assessment and retrofitting of public buildings and the council's housing stock. All future housing built by the council will be net zero or Passivhaus standard.[56]

The council has created a £100m funding pot to help fund energy efficiency and climate resilience projects.

The council has further demonstrated its commitment to community and cross-sector engagement with initiatives such as One Planet Oxfordshire,[57] the Low Carbon Hub, the Zero Carbon Oxfordshire Partnership and the planning of a Retrofit Summit to bring together manufacturers, contractors, and designers to progress research and development of sensitive retrofitting within this historic city.[56]

Developing green infrastructure

Olympic Park District Energy Scheme

In preparation for the 2012 London Olympic Games and in line with the Olympic Development Authority's sustainability commitments, two interconnected energy centres were built in Kings Yard and Stratford to provide low carbon energy for Queen Elizabeth Olympic Park and surrounding communities.[60]

The agreement of a 40-year concession for ENGIE to design, finance and build the energy centres and network on behalf of the Olympic Delivery Authority and Stratford City Developments Ltd.[61] enabled investment of over £100m and the development of approximately 16km of community energy networks for heating and cooling systems that reduce energy losses.[62] ENGIE, the energy provider, has estimated that the network will create savings of 11,000 tonnes of CO2 emissions each year, compared to using traditional heating and cooling plants.[63]

Impactful embodied carbon policies

City Policy Framework for dramatically reducing embodied carbon[64]

In 2020 the Carbon Neutral Cities Alliance published a policy framework intended for cities and other government bodies to develop a strategy, action plan and policies they can adopt to dramatically reduce embodied carbon. The report provides insights into how to do this, and what the most carbon reducing, cost-effective, easiest-to-implement, and enforceable policies are. The report contains 52 (best practice) policies from cities in Europe and North America.

The report classifies reduction measures by their level of impact (from low to high):

- REQUIRE low carbon products ensures that materials used are low carbon.
- REUSE products and materials at end of life for additional uses for unused products from sites and for salvaged materials from refurbishments and demolitions.
- REDUCE & REPLACE materials and structures reduces the total net use of materials by design and uses lower carbon structures and materials where appropriate.
- REFURBISH existing assets. This reduces total materials use, and can be a powerful decarbonisation strategy, where it does not compromise energy efficiency.
- REDEFINE the solution to address needs by means other than construction, or by implementing measures that have result to net carbon reductions.

Appendix D. Glossary

Term	Meaning
'All electric' buildings	Buildings which utilise electrical power for both heating and cooling.
Biodiversity	The variety of plant and animal life in the environment or in a particular habitat, a high level of which is usually considered to be important and desirable.
BREAAM	A widely-used method of assessing, rating, and certifying the sustainability of buildings. The acronym stands for Building Research Establishment Environmental Assessment Method.
Building asset type	The category or type of building, for example: office, retail, residential or industrial.
Building performance disclosure	Certificates or labels which interpret a building's energy performance / efficiency.
Building typology	The classification of buildings which have similarities in their type of function or form.
Carbon baseline emissions	The amount of greenhouse gases that have occurred in the past and are being produced prior to the introduction of any strategies to reduce emissions. This figure then offers a starting point to benchmark progress against.
Carbon budgets	A system that shows the cumulative amount of carbon emissions permitted over a period of time to keep within a certain temperature threshold, or within the interim milestone set as part of the overarching de-carbonisation goal.
Carbon impact	The amount of greenhouse gas emissions released into the atmosphere as a result of the activities of a particular individual, organisation or community.
Carbon offsetting	The process of compensating for greenhouse gas emissions (arising from a building, industry or human activity) by participating in schemes designed to make equivalent reductions of carbon dioxide in the atmosphere e.g. planting trees.
Carbon innovation fund	Funding programme focussed on innovative low-carbon technologies and products to help de-carbonise buildings or energy intensive processes.
Circular economy principles	Keeping resources in use for as long as possible, extracting the maximum value from them whilst in use, then recovering and regenerating products and materials at the end their productive life. In simple terms, it can be explained as 'make, use, remake' as opposed to 'make, use, dispose'.
Climate emergency	A situation in which urgent action is required to reduce or halt climate change and avoid potentially irreversible environmental damage resulting from it.
Climate first approach to planning	When considering a planning application, the local planning authority gives weight to measures which reduce the building's whole life carbon emissions.
'Comply or explain' approach	A regulatory approach, whereby companies must either comply with the requirements or explain publicly why they are not able to comply.
Consolidated transport networks	Programmes which eliminate wasted space and inefficiencies in transporting freight, personal deliveries or waste collections.
Cross Laminated Timber	A structural, prefabricated panel used to form environmentally sustainable, walls, roofs and floors across a wide range of structures.
Decarbonisation	Reducing greenhouse gas emissions produced as a result of industrial or human activity.
District heating networks	A system for distributing heat generated in a centralised location through a system of insulated pipes.

Appendix D. Glossary (continued)

Term	Meaning
Embodied carbon	The total greenhouse gas emissions generated to produce a built asset or building. This includes emissions caused by extraction, manufacture/processing, transportation and assembly of every product and element of that building
Material sources of emissions	The largest sources of emissions as a result of an activity.
Nature-based solutions	Sustainable management and use of nature for tackling socio-environmental challenges e.g. climate change.
Operational carbon	The carbon dioxide emissions produced during the operational or in-use phase of a building.
Passivhaus	A voluntary standard for energy efficiency in a building, which results in ultra-low energy buildings.
Pathway (Net zero)	A roadmap to achieving net zero emissions by the target date, including key outcomes and reductions to be made at interim milestones.
Photovoltaic (PV)	Photovoltaic (PV) devices are a form of renewable energy generation, they generate electricity directly from sunlight.
Place-based approach	The approach aims to respond and address issues that exist at the local level, such as heritage buildings.
REGO	Electricity suppliers use REGOs to show customers the renewable content of electricity that has been supplied each year. Acronym stands for Renewable Energy Guarantees of Origin.
Retrofit	Changing a building's systems or structure after its initial construction and occupation. Retrofitting is often done to improve the performance of a building, so reducing its energy usage.
Urban greening	Public landscaping and forestry projects in urban locations, for instance roofs and walls covered in plants, street trees and small pocket parks in between buildings.
Whole life carbon	Considering operational ('in-use') as well as embodied carbon emissions together over a development's expected life cycle.
Decarbonising the heat supply	Eliminating carbon from heating supply by using either green gas, biofuels or electric heating options.
Net zero construction	The amount of carbon emissions associated with a building's product and construction stages up to practical completion is zero or negative, through the use of offsets or the net export of on-site renewable energy.
Sharing knowledge an 'open source basis'	An accessible knowledge platform that acts as a repository of information for everyone to use.

Image: Coniston Court Gardens, The Church Commissioners

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