Euston Tower

Summary of Sustainability Proposals

British Land | Regent's Place

Indicative view of the proposed Enterprise Space at Euston Tower

1. Introduction

1.1 British Land's Approach to Sustainability

British Land is committed to sustainability leadership across the development and operation of its buildings. The British Land Sustainability Brief sets out its ambitions across a range of topics that impact environmental sustainability, which go beyond standard practice and policy requirements.

"Greener Spaces" is the part of the brief that focuses on environmental sustainability. British Land has set ambitious decarbonisation targets for 2030, which will be achieved by:

- Prioritising retention over new-build where feasible
- Advancing the circular economy in design, deconstruction, and construction
- Being innovative in the use of sustainable materials
- Prioritising energy efficiency and renewable energy sources

1.2 Our Approach at Euston Tower

The future Euston Tower will be a greener, all-electric building, with cutting edge sustainability goals, and full transparency of our assessments and approaches. The proposal is an exemplar of low-carbon and circular design, seeking to challenge business as usual, and designed to be fit for today and long into the future.

Euston Tower plugs into the grid with **an all-electric, low-energy design, drawing on Regents' Place Renewable Energy Guarantee of Origin** (**REGO**) **certified all renewable energy supply.** Through a combination of modern passive design and on-site renewables, the proposal will be one of the best performing tall, commercial buildings in London (see Benchmarking in Appendix A).

The proposal **retains nearly a third of the existing structure,** following a forensic assessment of the existing building, where previously demolition would have been the starting point. Together with a lean design and material selection approach, **the proposal sets a benchmark for the design of tall buildings, and will be one of the lowest embodied carbon tall buildings in London** (see Benchmarking in Appendix A).

As a circular economy pioneer, Euston Tower is pushing the boundaries of material reuse and recycling. This includes **developing novel approaches for the recovery and closed-loop recycling of key materials like glass, aluminium, and steel.** Approaches like this have the potential to avoid carbon emissions, reduce both waste and reliance on raw materials, and have potential application globally. The project team is working closely with the supply chain to implement these. A similar shift is required for concrete, although more nascent, the team is **pioneering a new approach to the extraction, testing and reuse of concrete – the first time this has been trialled in the UK.**

The impacts of our approaches extend beyond Euston Tower. It is our hope that, by sharing the innovative techniques being tested on Euston Tower, the learnings can be used to catalyse systemic change that is urgently needed across the industry.

Indicative view of the proposed Euston Tower from Tottenham Court Road

2. Sustainability Metrics

The following paragraphs outline the key performance metrics for Euston Tower, including clarification of what they represent and why this is valuable.

A summary table is presented at the end of this section.

2.1 BREEAM

BREEAM (Building Research Establishment Environmental Assessment Method) is a tool that measures and assesses the environmental sustainability of a development. Qualifying developments achieve an assessment rating from “Pass” (lowest rating) to ”Outstanding” (highest rating).

Current BREEAM policy requirements

Camden expects non-residential development of more than $500m^2$ to achieve at least BREEAM “Excellent” performance. Additionally, Camden has set minimum performance thresholds for the Energy, Water, and Materials credits.

How does the proposed Euston Tower meet / exceed this policy?

Euston Tower is targeting BREEAM ”Outstanding” for office and research and development, and exceeds the Council’s required performance thresholds for the Energy, Water, and Materials credits. A pre-assessment submitted as part of the planning application evidences this. This exceeds Camden’s policy requirements.

Discovering Environmental Sustainability Event, July 2023

Indicative image of the proposed entrance on Hampstead Road

2.2 Energy

Energy performance is essential for mitigating climate change and achieving the borough's net zero carbon target by 2030. Beyond cutting carbon emissions, high energy performance improves building resilience, helps future-proof to changing regulations, enhances indoor comfort and well-being, and supports long-term operational sustainability.

Current energy policy requirements

Regulated energy performance in England is measured using emissions limits and associated compliance methodologies as detailed in Approved Document L of the Building Regulations (Part L). It compares the performance of a model of the Actual Building what that of a Notional Building – a geometrically similar building with a set of Government-prescribed performance parameters. To comply with Part L the Actual Building must equal or improve on the performance of the Notional Building. The GLA takes this further and requires a minimum 35% improvement.

Part L was updated in 2021, introducing several changes including stricter energy performance standards compared to Part L 2013 (the preceding version). According to DLUHC (2021 changes to the energy efficiency requirements of the Building Regulations for non-domestic buildings, final stage impact assessment, December 2021), the Part L 2021 updates result in a 27% improvement (in carbon terms) compared to Part L 2013 performance, for non-residential buildings.

The London Plan (Policy SI2) expects major developments to improve on Part L performance by at least 35%. This policy requirement was maintained following the Part L 2021 updates, notwithstanding the step change in the Part L baseline. The GLA acknowledged at the time (Energy Assessment Guidance updates – Part L 2021 of building regulations, June 2022) that "non-residential developments may find it more challenging to achieve significant on-site carbon reductions beyond Part L 2021 to meet both the energy efficiency target and the minimum 35% improvement".

These targets are carried forward into the Council's Local Plan Policy CC1 and associated CPG.

How does the proposed Euston Tower respond to policy?

Euston Tower's energy performance of 16% beyond Part L 2021 is below the 35% improvement target. However, the proposal has followed the energy hierarchy to optimise energy performance, and is commensurate with the best-performing towers in London. When measured against Part L 2013, Euston Tower achieves a 45% improvement.

Why is it challenging for Euston Tower to meet the GLA's 35% reduction target?

There are several principal challenges for tall buildings like Euston Tower to meet the GLA's 35% reduction below Part L 2021:

Tall buildings have larger facade form factors (the ratio of facade area to floor area) than lower rise buildings of similar volume/floor area. This means they have an increased area through which heat is being lost/gained, requiring more energy for heating and cooling. This is a geometric constraint of tall buildings.

The impact of this facade form factor is exacerbated by the thermal performance of curtain wall facades (typical in high-rise construction because they are lightweight, high-quality, and can be installed from on the floorplate improving health and safety). The Notional Building in the Part L calculation (against which the GLA reduction percentage is measured) uses a significantly better performing facade construction regardless of buildability.

The extent of glazing is a key driver in determining the solar heat gain and thermal losses through the facade. Contemporary high-quality commercial buildings have a window-wall ratio of approximately 50% (which has reduced significantly in recent years from approximately 80–100% for towers in the mid 2010s) which must mediate between heat gains and losses, daylight, and views. The Notional Building in the Part L calculation has only 40% glazing.

In the Part L 2021 update, the heating and cooling equipment efficiencies are very good, making it difficult to show significant efficiency improvements with current technologies.

Tall buildings have limited roof space relative to floor area, another geometric constraint of tall buildings. This means it is challenging to include significant rooftop PV for renewable energy generation. This is exacerbated by the competition for roof space with the all-electric heat pumps which need to be outside at roof level.

Tall buildings also have limited foundation/basement area relative to floor area. This means higher-efficiency technologies like ground source heat pumps would only deliver relatively small energy improvements. Euston Tower does not include ground source heat pumps due to constraints of the retained basement and foundations.

The Part L calculation represents the energy performance at concept design level. The project team will continue to optimise the energy performance as the design is developed and equipment is selected. Euston Tower will also be going through the rigorous NABERS process, ensuring that the building energy performance is optimised through the design development, third-party reviewed, and verified against real-world performance.

2.3 Whole Life-cycle Embodied Carbon

Embodied carbon refers to the carbon emissions generated throughout the life-cycle of a building, including construction, use, and end of life. This encompasses emissions from the extraction, production, transportation, assembly, maintenance, and disposal of building materials (known as upfront embodied carbon), as well as those from in-use activities such as maintenance, refurbishments, and replacements over time (known as in-use and end-of-life embodied carbon). Together these are known as whole life-cycle embodied carbon, and addressing these embodied carbon emissions is critical in tackling climate change, especially as the electricity grid decarbonises, making these emissions a larger proportion of a development's total carbon footprint.

Current whole life-cycle embodied carbon policy requirements

In the Local Plan, the Council encourages non-residential development of more than 500m^2 to assess the embodied carbon emissions associated with the development. It acknowledges the importance of embodied carbon but does not set explicit targets or require a Whole Life Carbon Assessment (WLCA).

The London Plan (Policy SI2) expects major developments to calculate and reduce whole life-cycle carbon emissions, and evidence this in a Whole Life-cycle Carbon Assessment. Embodied carbon benchmarks for certain typologies are given in its associated LPG, but there are no set performance thresholds.

The London Plan (Policy SI2) embodied carbon benchmarks are compared with Euston Tower's embodied carbon performance in the following table.

Module	Aspirational benchmark	Standard benchmark	Euston Tower performance
Upfront Embodied Carbon [**A1–A5**]	600 kgCO$_2$/m^2 GIA	950 kgCO$_2$/m^2 GIA	725 kgCO$_2$/m^2 GIA
Whole Life-cycle Embodied Carbon [**A–C excl. B6&B7**]	970 kgCO$_2$/m^2 GIA	1,400 kgCO$_2$/m^2 GIA	1,225 kgCO$_2$/m^2 GIA

How does the proposed Euston Tower meet / exceed policy?

The embodied carbon performance is expected to reduce during the detailed design and procurement stages as the design is developed, materials are specified, contingencies reduced and construction strategies are confirmed.

Euston Tower's embodied carbon performance is significantly below the London Plan's standard benchmarks for offices. The figures reported in the table above also include carbon emissions for deconstruction, which are not accounted for the upfront carbon benchmarks. This has been achieved through strategic retention of the existing structure (31% by volume), lean and efficient design for the new-build elements of the proposal, and low carbon material specification commensurate with the stage of design. This exceeds policy requirements.

A WLCA submitted with the planning application for Euston Tower in accordance with British Standard BS EN 15978:2011 and following guidance from the RICS PS (September 2023) and the GLA Whole Life-cycle Carbon Assessment Guidance evidences this.

2.4 Water Demand

Water efficiency is crucial for climate resilience, and reducing pressure on London's constrained water supply. The Council expects non-residential development to achieve BREEAM "Excellent" water efficiency credits. This means at least a 12.5% reduction in potable water demand compared to the BREEAM water baseline.

How does the proposed Euston Tower meet / exceed policy?

Euston Tower is targeting BREEAM "Outstanding" for offices and research and development (the highest performance level), and at least a 50% reduction in potable water demand compared to the BREEAM water baseline, through water-efficient fittings and fixtures, and greywater and rainwater recycling. This exceeds the Council's policy requirements.

Indicative view of Regent's Place Plaza, a key part of improving greening and biodiversity

2.5 Urban Greening Factor

Urban greening involves integrating green infrastructure like trees, green roofs, and other planting into developments to enhance biodiversity, improve air quality, improve sustainable drainage, reduce heat, and promote wellbeing. Urban Greening Factor (UGF) is a metric that encapsulates both the quantity and quality of green infrastructure in developments.

Current urban greening factor policy requirements

There is no policy requirement for UGF in the Local Plan. Major (non-residential) developments are expected to achieve UGF of 0.3 in the London Plan (Policy G5).

How does the proposed Euston Tower meet / exceed policy?

Euston Tower is achieving UGF 0.332 through landscaping, trees, green roofs, terraces and a semi-natural wetland. A UGF calculation submitted as part of the planning application evidences this. This exceeds the London Plan requirement of UGF 0.3.

2.6 Biodiversity Net Gain

Nature provides a variety of environmental, social, cultural, education, health and recreation benefits, including ecosystem resilience, improving air quality, and supporting wildlife for a healthier urban environment. Biodiversity Net Gain (BNG) is a metric that quantifies developments' improvements to the natural environment compared to habitats on-site prior to development.

Current biodiversity net gain policy requirements

There is no policy requirement for BNG in the Local Plan. Developments are expected to manage impacts on biodiversity and aim to secure BNG in the London Plan (Policy G6). The BNG mandate (effective from 12 February 2024) set out in the Environment Act 2021 requires developments to deliver 10% BNG.

How does the proposed Euston Tower meet / exceed policy?

Euston Tower is achieving BNG of 0.86 HU (35.39% net gain). A BNG assessment submitted as part of the planning application evidences this. This exceeds policy requirements and the BNG mandate.

2.7 Waste (Diversion from Landfill)

Diversion from landfill refers to the process of reducing the amount of waste sent to landfill by prioritising reuse, recycling, and recovery of materials. This is important because doing so avoids carbon emissions, reduces demand for virgin materials, saves space, and minimises pollution associated with landfill sites.

Current waste (diversion from landfill) policy requirements

The London Plan (Policy SI7) mandates that developments should meet or exceed explicit diversion from landfill targets for waste streams from construction, demolition, and excavation.

The London Plan (Policy SI7) diversion from landfill targets are compared with those set by British Land for Euston Tower in the following table.

Waste stream	London plan target	Euston Tower target
Construction	95% to reuse/ recycling/recovery	96%
Demolition	95% to reuse/ recycling/recovery	98%
Excavation	95% to beneficial use	95%

How does the proposed Euston Tower meet / exceed policy?

Euston Tower is targeting at least 95% diversion from landfill for all three waste streams, through reuse or closed-loop recycling wherever it is technically, practically, and economically feasible. This exceeds the policy requirements.

Acknowledging that these diversion from landfill routes do not distinguish between the value/quality of the end products, Euston Tower is pioneering industry-leading work to drive change within the supply chains, to ensure that materials are used at their highest possible value, wherever it is technically, practically, and economically feasible. More detail is provided in Section 4.

Careful deconstruction and material segregation is key to improving diversion from landfill

2.8 Recycled Content

Recycled content describes the proportion of new-build elements that comprise recycled material. This is designed to promote resource efficiency and minimise waste, aligning with the broader goals of the circular economy.

Current recycled content policy requirements

The London Plan (Policy SI7) and its associated LPG encourages development proposals to aim for at least 20% recycled content (by value). This metric requires both an estimate of the quantities of materials and the capital cost of those materials for the development.

How does the proposed Euston Tower meet / exceed policy?

Euston Tower is targeting at least 24% recycled content. Noting that this level of detail is contingent on material specification and procurement and is challenging to provide with certainty before the development is fully detailed ahead of construction. This exceeds the London Plan's 20% target.

2.9 Summary Dashboard

The following figure summarises the quantifiable sustainability targets outlined in this section, as they relate to policy.

Category	KPI	Policy	Euston Tower	
Certification	BREEAM Rating	BREEAM "Excellent"	BREEAM "Outstanding"	Exceed policy
Energy	Part L performance	35% below Part L 2021	16% below Part L 2021	Target improvement
Carbon	Upfront carbon [A1–A5]	950 kgCO$_2$e/m^2	725 kgCO$_2$e/m^2	Compliant
	Whole life carbon [A–C excl. B6&7]	1,400 kgCO$_2$e/m^2	1,225 kgCO$_2$e/m^2	
Water	Portable water demand	12.5% reduction	50% reduction	Exceed policy
Greening	UGF / BNG	0.3 / 10%	0.332 / 35.39%	Exceed policy
Waste and Recycled Content	Construction diversion from landfill	95%	96%	Exceed policy
	Demolition diversion from landfill	95%	98%	Exceed policy
	Excavation diversion from landfill	95% to beneficial use	95% to beneficial use	Compliant
	Recycled content	20% by value	24% by value	Exceed policy

3. Sustainability Features

The following summarises other sustainability features of Euston Tower that are not covered in the metrics in Section 2.

3.1 'First Principles' Passive Design

- Fabric first passive design to reduce energy demand and operational carbon emissions
- 50% glazing ratio optimised to reduce solar gain, admit daylight, and increase insulation performance
- Passive solar shading to manage solar gain before heat enters the building

3.2 Low Energy and Future-proofed

- All-electric development powered by REGO certified renewable energy supply
- Heating and cooling generated using simultaneous heat pumps with waste heat recovery
- 100m^2 of solar photovoltaic panels for on-site renewable electricity generation
- Future-proofed systems designed to accommodate future climate change
- Underfloor air supply with 100% fresh air for improved indoor air quality and low energy cooling

3.3 Leading on Whole Life Carbon

- Reducing carbon emissions as far as possible in construction and operation with offsetting as a last resort
- Offsetting embodied carbon through certified carbon offset credits
- Payment into British Land's Transition Vehicle to fund decarbonisation projects across the British Land standing portfolio
- Offsetting regulated operational carbon via the Camden Climate Fund

3.4 Pioneering the Circular Economy

- Detailed feasibility study into the condition and potential for reuse of the existing building, and options and opportunities for deconstruction and retention
- 31% retention of the existing structure by volume to avoid new carbon emissions and waste
- Clear floorplates with regular grids to facilitate flexibility in use
- Soft core principle enables adaptability by accommodating structural changes at the core without impacting stability

3.5 Improving Air Quality

- All-electric heating and cooling strategy has no adverse impact on local air quality
- Car-free development (except for two blue-badge spaces)
- 990 cycle spaces and best-in-class end of trip facilities to encourage active travel
- Air quality neutral development in terms of building and transport emissions.

Indicative image of proposed facade, which is optimised to reduce energy demand and carbon emissions

4. Circular Economy, Reuse and Recycling

4.1 General

The London Plan (Policy SI7) sets a target to meet or exceed 95% construction and demolition waste diversion from landfill. It is acknowledged that this target for waste reduction (diversion from landfill) does not indicate whether materials are being used at their highest possible value in accordance with the waste hierarchy.

This is because reporting for recycling does not distinguish between the value/quality of the end products. Often materials are transformed into secondary materials of a lower value/quality than the original material. This process is irreversible and is sometimes referred to as downcycling.

In simple terms the followings definitions apply:

Reuse

Reuse of materials with little or no loss of value and minor interventions to the material. This may entail checking, cleaning, repairing, and refurbishing whole items or parts, and may result in use on or off-site.

Recycling

Conversion of a material into something of equal or similar value and/or quality to the original material. It gives a material another life within the same supply chain.

Downcycling

In practical terms, this entails the transformation of products and materials into materials of lower quality and/or value. This is the least preferable option in the waste hierarchy, but is still better than disposal to landfill for non-hazardous materials.

Pioneering novel techniques for reusing concrete with the University of Surrey

4.2 Material Recovery Strategy

A pre-demolition audit, submitted with the planning application, was conducted for Euston Tower in accordance with GLA Circular Economy Statement Guidance. It details the quantities and qualities of the materials in the existing building.

Analysis of the pre-demolition audit shows that four materials – concrete, steel, glass, and aluminium – make up 98% of all existing building materials (by mass). Accordingly, the focus has been to ensure that these four materials are used at their highest possible value, wherever it is technically, practically, and economically feasible.

This aim has resulted in a progressive Material Recovery Strategy. **With glass and aluminium, the Euston Tower project team is working with existing supply chains to drive change. For concrete, our experimental work is on the cutting edge of global circular economy practices, and is a potential first step on the road to changing the way this material is reused in the future.**

To catalyse the transition to a low carbon and circular economy, the industry needs more ambitious prototyping, while acknowledging that there is no guarantee yet that these prototype approaches can be implemented at scale. While that is certainly the ambition, the intention is to open-source learnings regardless of outcomes, so that they can be used to accelerate change and inform other projects industry-wide.

Regardless of the outcomes of this industry-leading work, Euston Tower will exceed the council's policy requirements for construction and demolition waste diversion from landfill (refer to Section 2).

The following sections outline the approaches taken for each of the "big four" materials.

4.3 Reuse and Recycling Ecosystem

Whether materials are recycled and reincorporated in the same building or, as is more often the case, in the broader built environment, the carbon and resource benefits are often substantial.

On-site reuse minimises transportation emissions and can provide immediate material supply. However, it is often constrained by the technical requirements and the inability to store and refurbish materials on-site. To enable this, materials are often transported to an intermediate location for refurbishment. At this point, whether the material is reused on the original site, or another local site, the environmental benefits are equivalent.

It is generally not possible to recycle materials on-site, as they must undergo an industrial transformation process at an intermediate location. At this point the destination of the (post) recycled material is unimportant, as the environmental benefits – the reduced emissions and avoided use of raw materials – are again equivalent.

A well-functioning recycling ecosystem ensures that emissions are mitigated across the supply chain, regardless of where materials are ultimately used. The key is to keep materials in circulation, reducing demand for virgin production, cutting down carbon emissions, and encouraging best practice across the industry.

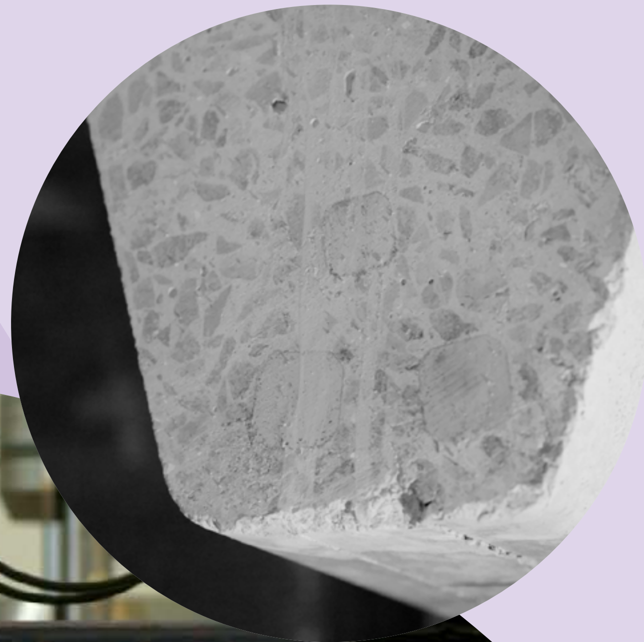
Concrete from Euston Tower undergoing testing for reuse at the University of Surrey

4.4 Concrete

Current practice

A genuine recycling route for concrete waste does not exist. The vast majority of disused concrete is crushed to secondary aggregates and used for low grade, non-structural applications (e.g. road sub-base or backfilling). A small amount of disused concrete is crushed and used as aggregate in new concrete mixes (known as Recycled Concrete Aggregate). Ultimately both of these methods displace some of the need for virgin aggregate, but do not reduce the need for new concrete.

Crushing concrete to secondary aggregates is called "recycling" because the waste is diverted from landfill. Strictly this can be considered "downcycling" as the resulting material is of a lower value/quality than the original.



What this means

To simultaneously decarbonise concrete and reduce its reliance on raw materials the structural reuse of existing concrete elements is required.

Pioneering a new approach at Euston Tower

Euston Tower will retain 31% of the existing structure by volume.

But recognising the problem with concrete waste, the project team is pioneering an innovative, new approach to reusing recovered concrete in collaboration with the University of Surrey. Practically, this means cutting out sections of the concrete slabs from Euston Tower and reusing them as "precast" concrete slabs elsewhere, either in Euston Tower or in another structure.

Examples of this practice are rare globally, and to our knowledge this is the first time this has been trialled in the UK.

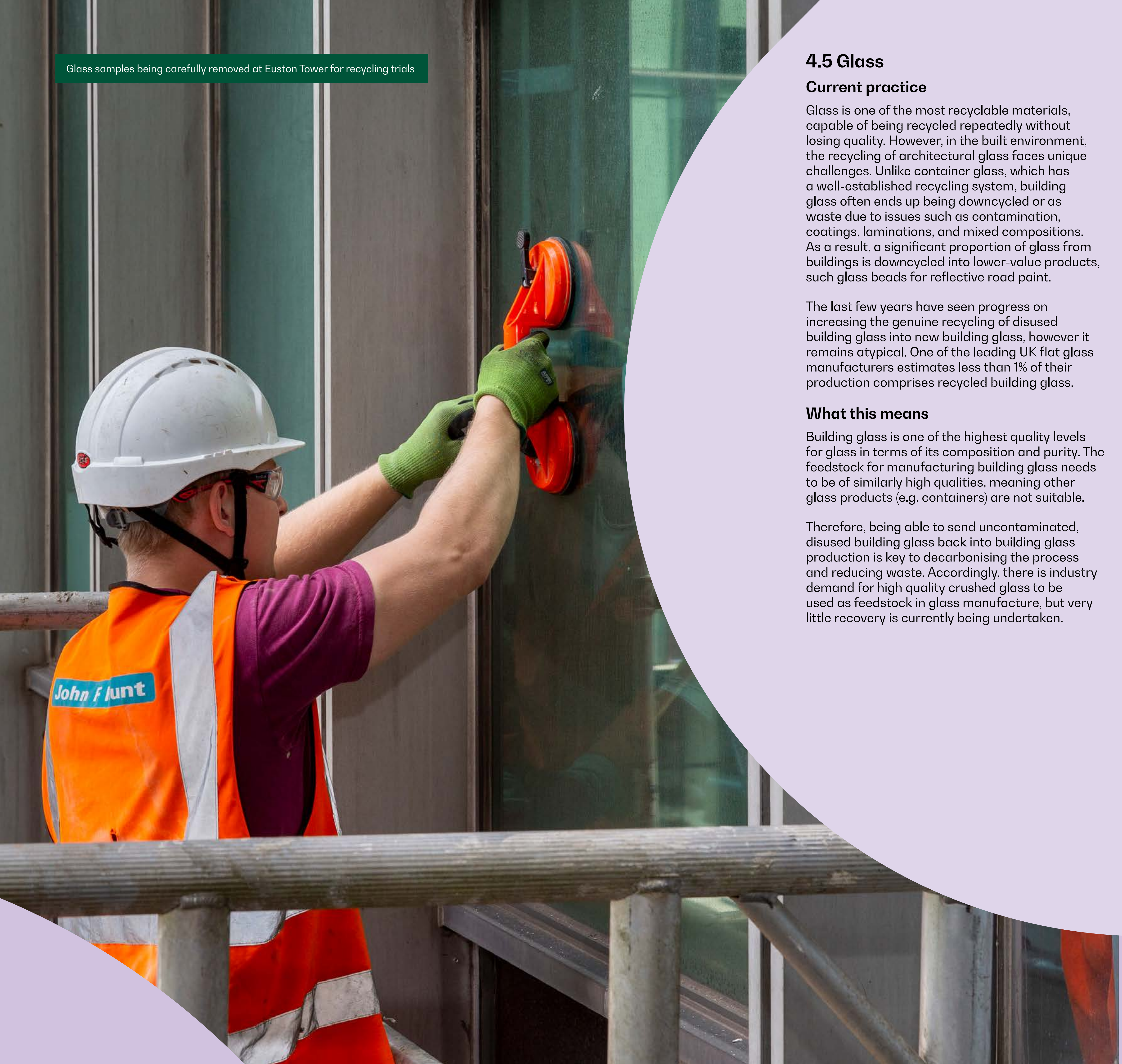
Testing so far has yielded positive initial results. A full-size slab of concrete has been extracted from Euston Tower, and working with the University of Surrey, it has been demonstrated that it has the necessary condition and performance to be reused in another structural application (e.g. the floor of an office building).

Why this is important

Being able to extract and reuse disused concrete in other structural applications, could result in a major shift in the way buildings are designed and constructed. Because concrete is always made new, doing so successfully, at scale, would reduce waste, and result in significant carbon and resource savings, applicable globally.

Acknowledging that such techniques are nascent, there remain questions to answer before its implementation can be realised at scale. The project team is committed to exploring these, and have already begun working on the next stage of implementation with the wider supply chain.

Click here to find out more about our innovative research into reusing harvested concrete.



Glass samples being carefully removed at Euston Tower for recycling trials

4.5 Glass

Current practice

Glass is one of the most recyclable materials, capable of being recycled repeatedly without losing quality. However, in the built environment, the recycling of architectural glass faces unique challenges. Unlike container glass, which has a well-established recycling system, building glass often ends up being downcycled or as waste due to issues such as contamination, coatings, laminations, and mixed compositions. As a result, a significant proportion of glass from buildings is downcycled into lower-value products, such glass beads for reflective road paint.

The last few years have seen progress on increasing the genuine recycling of disused building glass into new building glass, however it remains atypical. One of the leading UK flat glass manufacturers estimates less than 1% of their production comprises recycled building glass.

What this means

Building glass is one of the highest quality levels for glass in terms of its composition and purity. The feedstock for manufacturing building glass needs to be of similarly high qualities, meaning other glass products (e.g. containers) are not suitable.

Therefore, being able to send uncontaminated, disused building glass back into building glass production is key to decarbonising the process and reducing waste. Accordingly, there is industry demand for high quality crushed glass to be used as feedstock in glass manufacture, but very little recovery is currently being undertaken.

Pioneering a new approach at Euston Tower

Being largely original glazing from the 1960s construction, the existing facade glass at Euston Tower is unfit for direct reuse as modern, energy efficient building glass.

No established processes and methodologies exist for recovering end of life building glass. This is because the most appropriate reclamation process for building glass is dependent on the quality and quantity of the specific materials, coatings and treatments, and appropriate segregation from other waste streams.

Working with specialist contractors and glass manufacturers, trials were conducted in 2023 to establish a working process, alongside assessing the feasibility of building glass recycling for Euston Tower. This meant carefully removing samples of the different glass types, crushing the glass, and specialist chemical analysis to understand its composition. The results found that three of the four glass types in the building could be suitable for recycling into building glass manufacturing. The fourth glass type was identified to contain cadmium in the chemical analysis and is therefore not suitable.

The testing results have proven that it could be possible to genuinely recycle (building glass to building glass) at least 21% and up to 81% of the building glass at Euston Tower (by mass), depending on refinements to the methodology.

Why this is important

The manufacture of new building glass is a resource and energy intensive process. Increasing the amount of genuine building glass recycling has the triple benefits of reducing carbon emissions and energy in the manufacture of new building glass, reducing raw material demand in this manufacture, and avoiding waste.

At Euston Tower there is a potential to re-manufacture up to 376 tonnes of glass back into building glass, avoiding more than 218 tonnes of CO_2e, and 451 tonnes of virgin material.

4.6 Aluminium

Current practice

Aluminium, like most metals, has high recycling rates due to its economic value. However different metal types and grades are often mixed on demolition sites, and all sent for recycling together.

What this means

Mixing metal types and grades means there is no guarantee what type or grade of aluminium will be produced from the disused material. The alloys used for facade aluminium are generally high-quality alloys. As such, where aluminium is recycled to an alloy of a lower quality (e.g. that used to manufacture beverage cans), this could be classified as downcycling.

Pioneering a new approach at Euston Tower

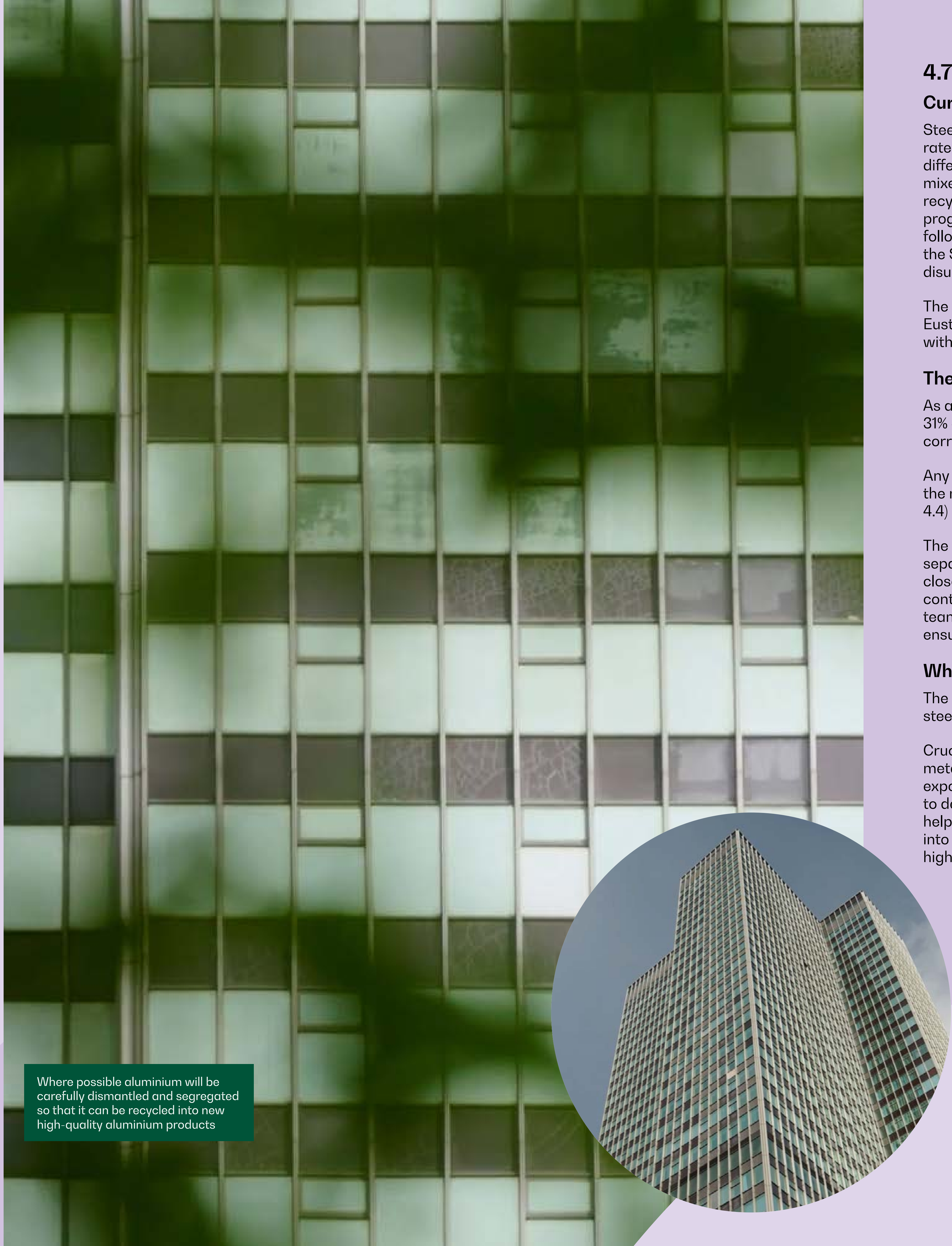
Being the original aluminium from the 1960s construction, the existing facade aluminium at Euston Tower is unfit for direct reuse.

The Euston Tower project team is working with the supply chain to establish a process for ensuring closed loop recycling of the aluminium. This means ensuring that the aluminium scrap from the existing building is being fed back into the production of high-quality products for building use (or similar high-quality aluminium alloys that avoid degradation of the product).

Key to enabling this is ensuring that recovered aluminium is sorted on site, protected from contamination by other materials, and ring-fenced to go to a recycler that works as part of the supply chain for high-quality aluminium (billet) manufacturing, including a verifiable chain of custody.

Why this is important

The primary production of aluminium is highly energy-intensive, requiring large amounts of energy, and contributing to significant carbon emissions. Aluminium can be recycled indefinitely without losing its inherent properties but requires strict controls over aluminium grades during recycling. Increasing the amount of recycled content drastically reduces the amount of energy required (by up to 95%) and the corresponding carbon emissions.



Where possible aluminium will be carefully dismantled and segregated so that it can be recycled into new high-quality aluminium products

4.7 Steel

Current practice

Steel, like aluminium, has high recycling rates due to its economic value. However different metal types and grades are often mixed on demolition sites, and all sent for recycling together. While there has been progress on reusing structural steel sections, following a protocol for reuse published by the Steel Construction Institute (SCI), most disused steel is still sent for recycling.

The majority (96% by mass) of steel at Euston Tower is reinforcing bar embedded within the concrete structure.

The approach at Euston Tower

As a first step, Euston Tower will retain 31% of the existing structure including the corresponding steel (reinforcing bar).

Any concrete that is reused (following the methodology outlined in Section 4.4) will retain the embedded rebar.

The remaining reinforcing steel will be separated from the concrete and sent for closed-loop recycling into high recycled content steel. The Euston Tower project team will work with the supply chain to ensure a verifiable chain of custody.

Why this is important

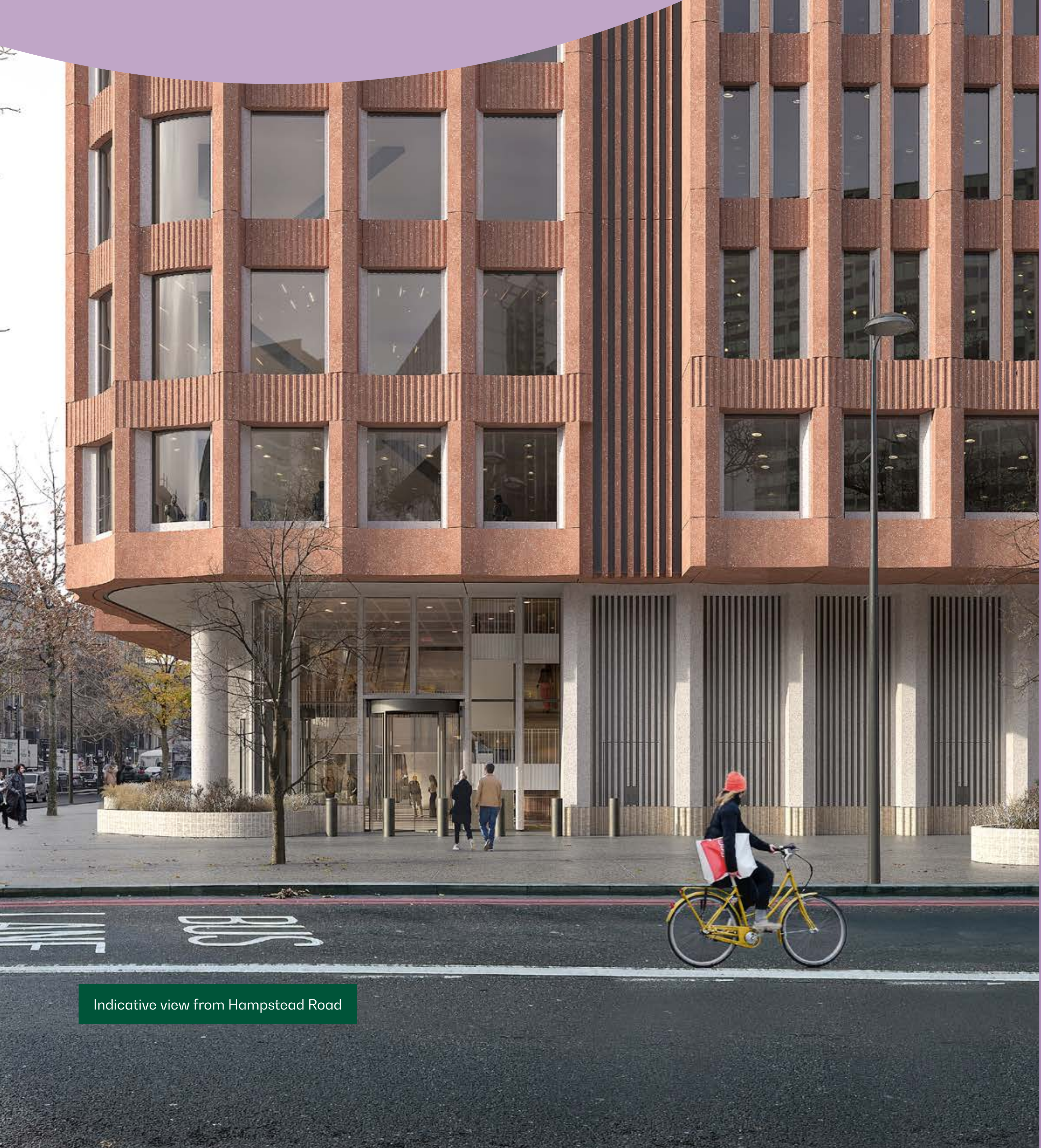
The environmental benefits of recycling steel are similar to those for aluminium.

Crucially, the UK does not use all the scrap metal it produces with approximately 80% exported. Working with the UK supply chains to develop a verifiable chain of custody, can help to ensure that this scrap is recycled into low carbon steel products, at their highest level in the waste hierarchy.

A. Appendices

A: Benchmarking Sustainability Performance

The following section benchmarks Euston Tower's sustainability performance. Where relevant, comparison is made to consented developments, primarily in central London, as these buildings generally share similar expectations and constraints (e.g. occupier demand, lettabiltiy, structural loading, density).



Indicative view from Hampstead Road

A.1 Energy Benchmarking

As outlined in Section 2, the change from Part L 2013 to Part L 2021 represented a 27% improvement in energy performance in carbon terms. The GLA acknowledges that "non-residential developments may find it more challenging to achieve significant on-site carbon reductions beyond Part L 2021 to meet both the energy efficiency target and the minimum 35% improvement".

Accordingly, the graphs in Figure 2 contextualise the energy performance of Euston Tower with the Part L 2021 energy performance of other recent, consented commercial, tall buildings in London. None of the applications in Figure 2 achieve the London Plan 35% target. The two buildings that come closest (60 Gracechurch Street and 55 Old Broad Street) have particular circumstances that result in this level of energy performance, as indicated in Figure 2. It is clear that the Part L 2021 energy performance for Euston Tower is comparable with the best performance of other tall commercial buildings in London.

60 Gracechurch Street's energy performance is primarily due to its limited glazed facades. Its south and east elevations are generally opaque, significantly reducing the heating and cooling demand. This is an atypical scenario, as these elevations are driven by their proximity to neighbouring buildings.

55 Old Broad Street's energy performance is primarily because the tower's performance is combined with that of 65 Old Broad Street (the bathhouse). When the tower (55 Old Broad Street) is considered on its own, it achieves a 2% reduction below Part L 2021.

As a further comparison, the energy performance of Euston Tower under Part L 2013 is compared with that of other (less recent), commercial, tall buildings in central London. Again, it is clear that Euston Tower is amongst the best performing of these buildings.

The energy performance figures in Figure 1 are taken from the documents submitted as part of the respective planning applications.

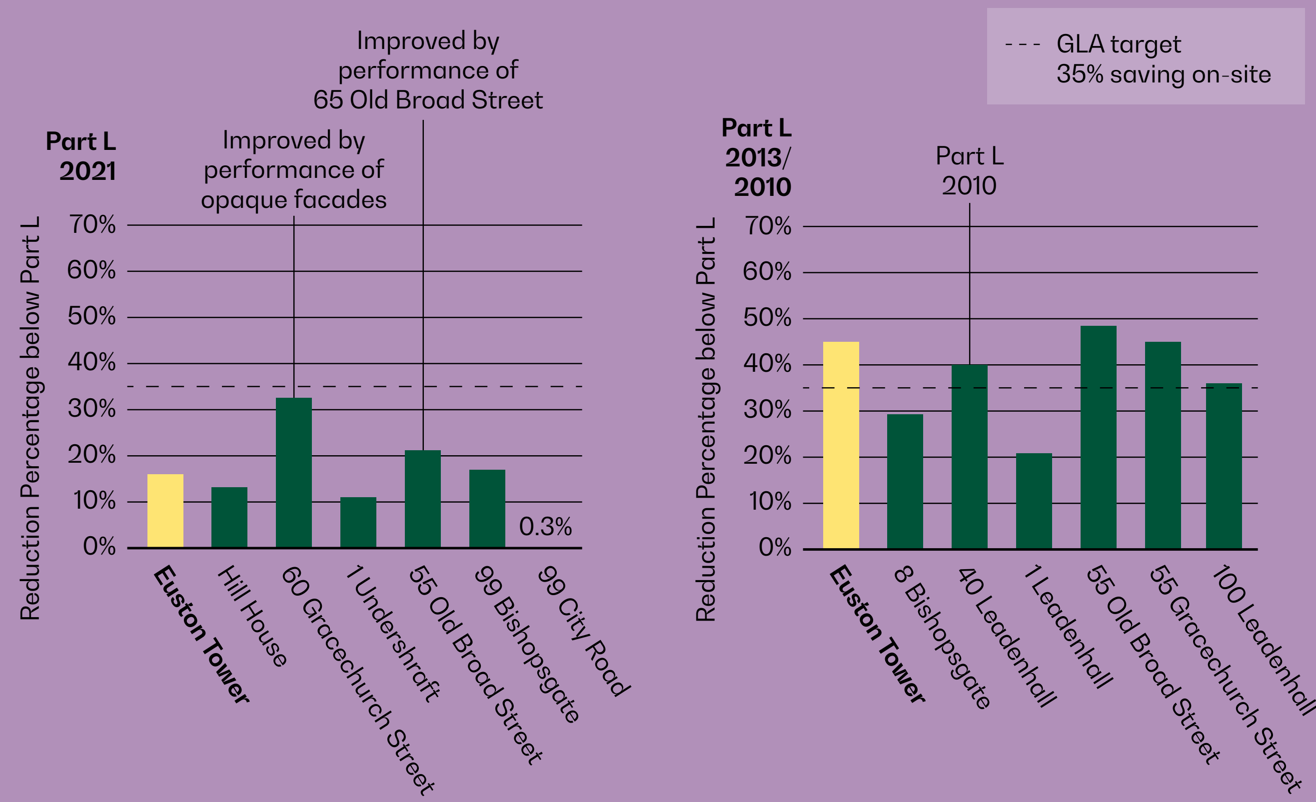


Figure 1 Energy Benchmarking

A.2 Carbon Benchmarking

The requirement to assess embodied carbon emissions was introduced in 2021 with the adoption of the current London Plan.

Unlike Part L for regulated energy, there is no standard method for calculating embodied carbon. The most common calculation methodology currently used for embodied carbon in the UK is the standard developed by RICS. The second edition of the RICS standard (September 2023) aims to reflect advances in professional practice and improve consistency in reporting, but there remain areas of the methodology that are open to interpretation. The London Plan LPG (Whole Life-cycle Carbon Assessments Guidance, March 2022) continues to reference the first edition of the RICS Standard.

Together with methodology changes, our industry-wide understanding of embodied carbon continues to improve. This has two key consequences:

- Benchmarks based on historical carbon assessments may not accurately reflect our current understanding of embodied carbon
- Comparing embodied carbon for different proposals can be difficult because the methodology has changed and has areas that are open to interpretation (e.g. specifications, scopes, contingencies).

The graph in Figure 2 contextualises the upfront embodied carbon performance of Euston Tower with that of other recent, commercial, tall building applications in London. The year of application is indicated as it shows that, while there are nuances in each of these applications, the direction of travel for embodied carbon is not necessarily downwards.

All but one of the applications in Figure 2 are below the London Plan standard office benchmark, and none achieve the London Plan aspirational benchmark. It is clear that the embodied carbon performance for Euston Tower is comparable with the best performing tall commercial buildings in London, and there remain further opportunities to improve this embodied carbon performance as the design is progressed.

Figure 2 Carbon Benchmarking

The embodied carbon figures in Figure 3 are taken from the documents submitted as part of the respective planning applications.

A.3 Material Intensity Benchmarking

The approach to embodied carbon has been to be use as little material as possible. This starts with retaining 31% of the existing building structure, and then focuses on lean design for the key building elements to minimise how much material is used.

To further reduce embodied carbon, low carbon materials and/or those containing high proportions of recycled content will be specified, where it is practical and feasible to do so.

Material intensity is a metric that quantifies the amount of material used in a proposed development, measured as the total mass of materials (kg) per square meter (m^2) of the built area (kg/m^2).

This approach is important because it focuses on reducing the quantity of material required in the first place, and is agnostic to the specification of the materials. Good material intensity performance is a means of safeguarding carbon performance as well as mitigating raw material and resource use.

The GLA published material intensity data from all Circular Economy Statements reviewed in the period 2022–2022 (Appendix 4, LPG Circular Economy Statements, March 2022). It breaks out the upper, median, and lower quartile performance for the material intensity of various budling elements. The GLA notes that the "data can be used for comparison and it is expected that applications will tend towards the median and lower quartile figures in the future".

Figure 3 shows the expected material intensity for Euston Tower compared to the data published by the GLA (individual building elements have been aggregated). It is clear that Euston Tower significantly outperforms the GLA's expected performance.

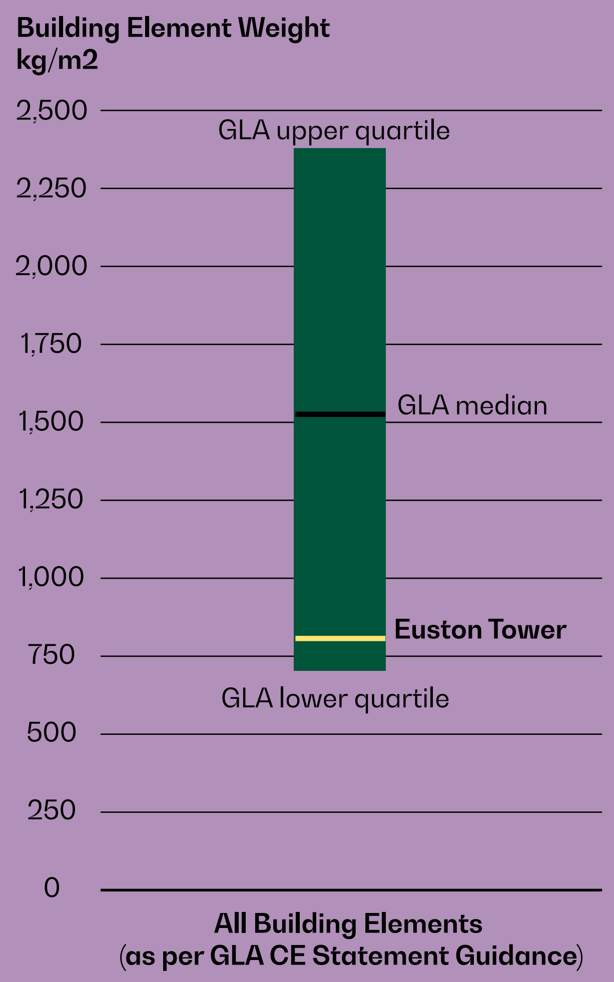


Figure 3 Material intensity Benchmarking

Indicative view of the south west corner of the proposed Euston Tower

You can find out more on our consultation website at **euston-tower.co.uk**

Email us at **info@eustontower.co.uk**