Circularity and Reuse for Fit-Outs and Interiors

Milliken & Company has partnered with Reusefully to provide a current overview of the landscape of circularity and reuse in the fit-out and interiors market. Providing data and insights in Europe and beyond together with the challenges and opportunities for reuse within fit-out.

The report has combined research and case studies together with qualitative interviews with key stakeholders involved in this field, including informative references and links for further reading.

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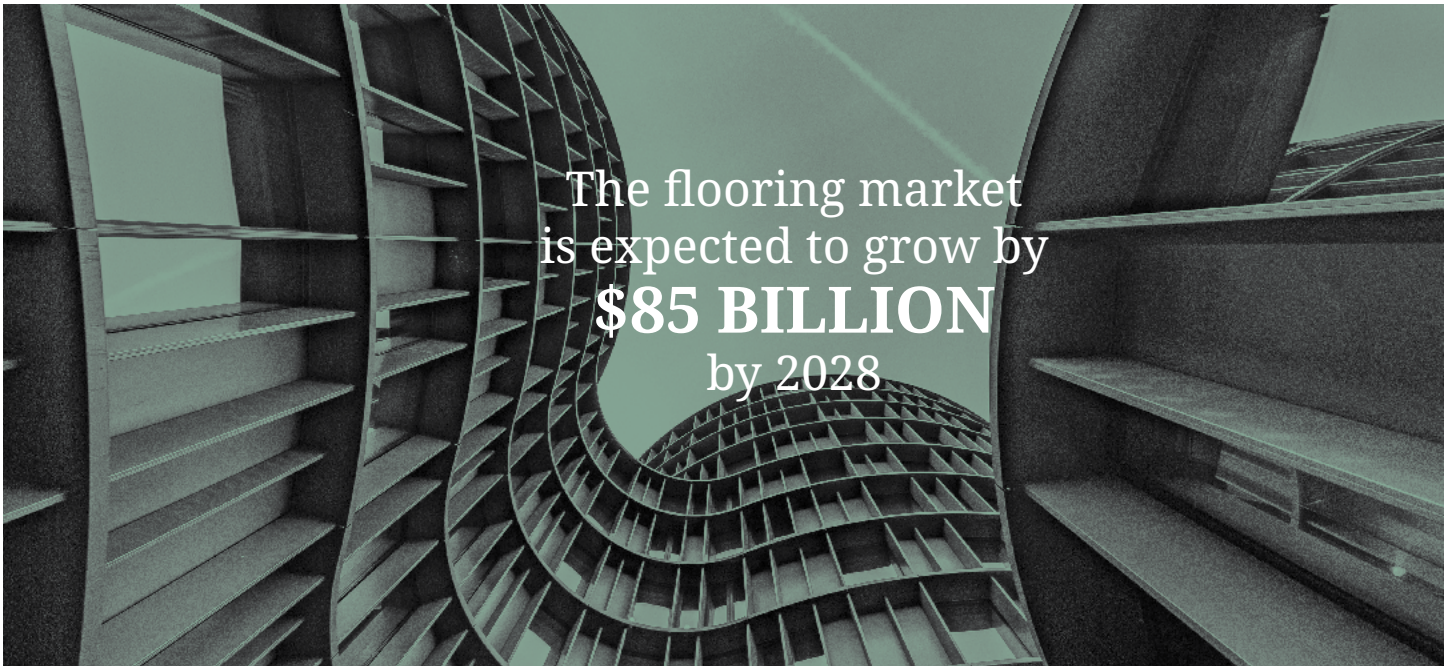
Introduction to Fit-Outs and Interiors – An Important and Fast-Growing Market

The average person is thought to spend 80-90% of time indoors, and therefore the workplaces, leisure and other spaces we use are of fundamental importance to our personal livelihoods, our health and our economy.

The market that supports this in interiors and fit-out is very large and growing. It is projected to experience significant growth in 2025 driven by evolving consumer preferences, urbanisation and technological advancements.

We spend **80-90%** of our time indoors

In terms of budget and size, the 'mid-range' projects are prevalent although the more luxury end of the market is also growing, particularly through investment in premium retail spaces. This is despite the unsettled economic environment globally, higher labour and material costs, shifting working patterns and increased building regulations. Investment in both the refit of existing space and the fit-out of new space remains strong.



These trends are also reflected in fit-out components such as lighting and flooring.

- For lighting, the 2023 global market valuation of U$10.01 billion is predicted to grow to US$14.18 billion by 2029 driven by smart lighting systems and low-energy LED adoption.
- For flooring, the 2024 global market valuation of US$137 billion is projected to rise by US$85 billion by 2028 and is driven by sustainable flooring products, modular designs for adaptable workspaces and durability. The global commercial carpet tiles market is estimated at US $8.7 billion.

Some Key Players

Major companies shaping the market include global construction and project management firms, such as AECOM, Balfour Beatty, and Turner Construction Company. These companies often handle Cat A shell and core base builds for landlords with Cat B customisation options available for tenants in the Asia Pacific and North America/Europe markets.

Global design and build firms with a focus on Cat B builds include Gensler, HOK Group and Perkins & Will. Skanska AB, Mace Group, Structuretone and Jacobs Engineering provide Cat A and Cat B sustainability and innovation specialist services to the fit-out industry, with further dominant players in Europe. These firms are leveraging strategic initiatives, including sustainability-focused designs and modular construction, to capture market share.

Market Segmentation Insights

The commercial sector has the largest market share due to a rising demand for offices, co-working spaces and corporate facilities. This is driven by hybrid working trends, preferences for flexible layouts and technology-integrated spaces. In many parts of the globe, the return to the workplace following the global pandemic is fuelling demand for office space. There is an increased demand for Grade A office space in prime locations, but a limited supply.

In Europe, London commands a premium for high specification briefs at $3,888.5/m^2, fuelled by banking sector investments in both the City and Canary Wharf although, in Europe overall, Zurich commands the highest premium at $4,173.8/m^2 which is largely driven by higher labour costs. In Paris, there is a similar trend for high specification. In the USA, New York City and San Francisco high-spec fit-out costs of $4,625/m^2 and $4,094/m^2 respectively, are driven by increased demand for workplace amenities to encourage staff back to the office.

Emerging Trends for Interiors in 2025

There is a growing recognition of the impact of climate change and a desire to improve our indoor environments to support health and well-being. Current trends in interiors are reflective of the adoption of net-zero carbon targets (NZC), changes in working patterns since the global pandemic (with a particular emphasis on healthier indoor environments) and more efficient workplace technology as Artificial Intelligence (AI) starts to exert an increasing influence on our daily lives. Some of the key emerging trends for the interiors and fit-out industry in 2025 are:

1. **Sustainability:** With a growth in interest in corporate ESG strategies, which are now being adopted by many occupiers, together with life-cycle carbon accountability and circular economy principles. 60% of markets surveyed by JLL in the last 12 months have seen inquiries for more sustainable fit-outs.

2. **Technology integration:** With the AI-driven design tools and smart building systems that are starting to be used across the interiors space.

3. **Human-centric design:** With a focus on the role of environments for experience, health, wellbeing and social interaction, which has grown in strength since the global pandemic.

4. **The need for more modular and flexible spaces:** Catering for hybrid working (again, post-pandemic) and building in resilience to respond to fluctuations in demand.

In sustainability, a key driver is the Science Based Targets Initiative (SBTI), which has just published an initial draft of a Corporate Net-Zero Standard V2 for public consultation (March 2025). The draft standard sets out a science-based, innovative and pragmatic framework to enable more businesses worldwide to join the 3,000 with net-zero targets or which have committed to set them.

The draft is informed by the latest climate science, regulation and recognised standards and frameworks, as well as feedback from businesses about what they need to achieve the collective ambition of a net-zero future. There are specific requirements being developed for the built environment sector, which deal with the need to adopt a whole-building approach and address both in-use and embodied carbon emissions. For buildings, this will include setting targets for both in-use operational and embodied carbon.

Similarly, in the UK, the pilot Net Zero Carbon Buildings Standard sets out limits for operational and embodied carbon and reporting requirements for life cycle embodied carbon - this is to align with the ambition to be net zero by 2050 and retrofit is included. A further example of the growing desire to enhance sustainability performance is provided by the Better Buildings Partnership in the UK. This has 33 signatories with an annual combined turnover of £360 billion who have committed to the BBP Climate Commitment, which acknowledges that transformation is required across the real estate sector to deliver net-zero buildings by 2050.

The Challenges and Opportunities Facing the Sector

Whilst the overall picture for the fit-out and interiors sector is a positive one in terms of global growth, there are a number of particular challenges and opportunities. The challenges include:

- **Economic factors** such as rising material and labour costs and supply chain issues may slow growth in the fit-out sector. A recent report from JLL, indicated globally, fit-out costs have increased across all regions in the last 12 months, with three-quarters of markets reporting increases in raw material prices and half of markets reporting labour shortages – these together are increasing construction costs.
- **Stricter building safety regulations**, for example, the UK's Building Safety Act, 2022 requires updated and typically more demanding compliance measures for providers of buildings and interior space.
- **Sustainability mandates** present a challenge in the adoption of newer materials products and energy-efficient designs requiring certification. However, this also presents an opportunity to capture market share with high consumer demand for more sustainable fit-out solutions.
- **Compatibility issues** with technology that is changing rapidly, one example being the retrofitting of higher performance smart lighting within existing assets and infrastructure.

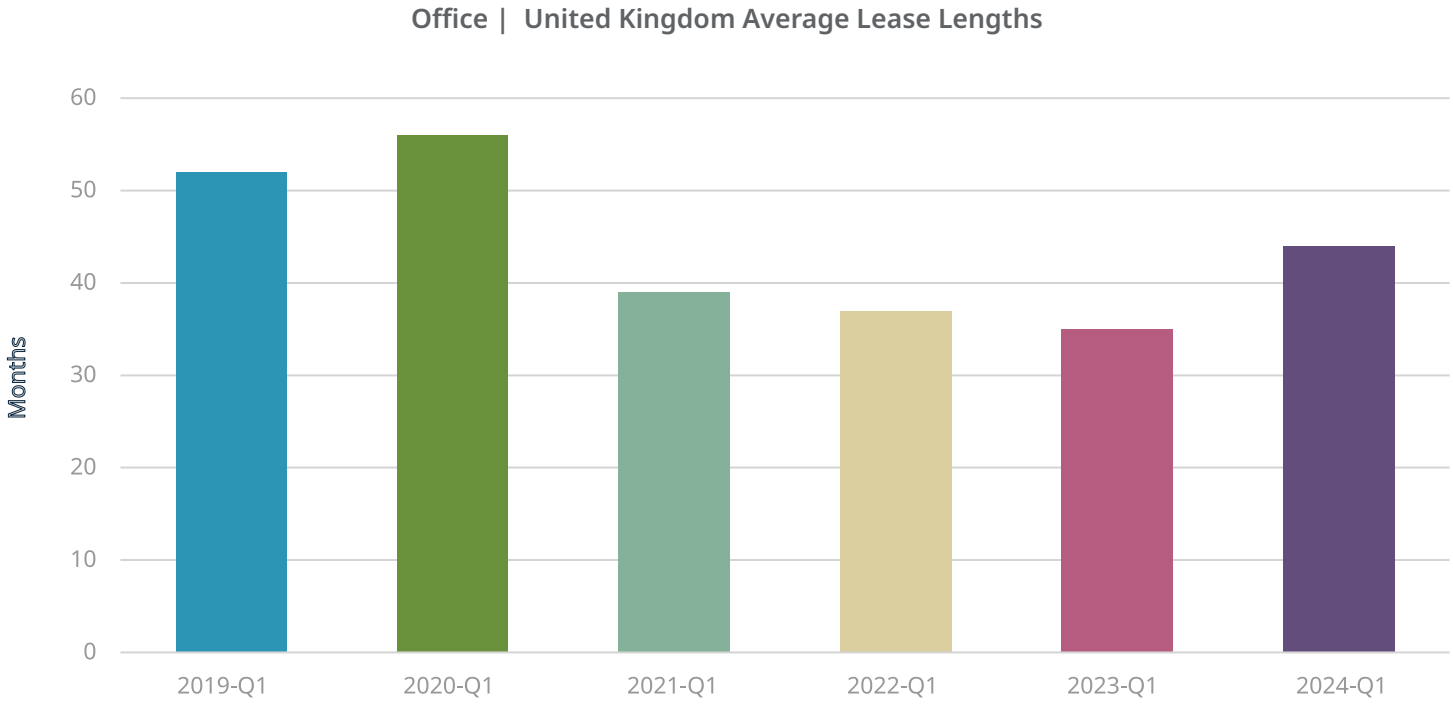
Whilst there are challenges facing the sector, there are also new opportunities, including:

- **Growing demand** for luxury retail fit-out and serviced apartments and apart-hotels in key cities such as London.
- **The adoption and possibilities provided by Artificial Intelligence (AI) and Building Information Model (BIM)** to improve project efficiency, reducing costs and enabling faster turnarounds.
- **Adaptive and human-centric workspaces** where employers invest in office refits to attract workers back to the office, focussing on human-centric designs, modular layouts and technology-integrated spaces.

Focus on Fit-Out in the UK and Europe

The fit-out market in the UK and Europe provides a useful snapshot of the economic realities of the sector. Overall, the market remains strong, with London being one of the most expensive cities for office fit-outs in global terms. In 2024, the cost of high-quality office fit-outs in European cities ranged from ¤1,300 to ¤3,790. Fit-out costs across Europe generally have risen by an average of 9% over the past year, with high-quality fit-outs now averaging ¤2,214 per square metre.

The average UK office lease length has grown slightly (27%) from a low of 2.9 years in Q1 2023 to 3.7 years in Q1 2024 marking an end of the three-year decline post global pandemic.



UK average office lease lengths. Taken from Re-Leased 2024

This decline was driven by reluctance to commit to long term contracts under uncertain economic impacts and changing working patterns. Corporations are now seeking stable leases to maintain consistent workspaces for employees who have adopted a hybrid working model between office and home.

The Environmental Cost of Fit-Outs

Whilst the interiors and fit-out sector occupies a vital role in economic development and competitiveness, as well as for human livelihood, health and wellbeing, the cost in environmental terms is enormous.

In 2023, UNEP reported that the buildings and construction sector is by far the largest emitter of greenhouse gases, accounting for a staggering 37% of global emissions, and with the production and use of materials such as cement, steel, and aluminium creating a sizeable carbon footprint.

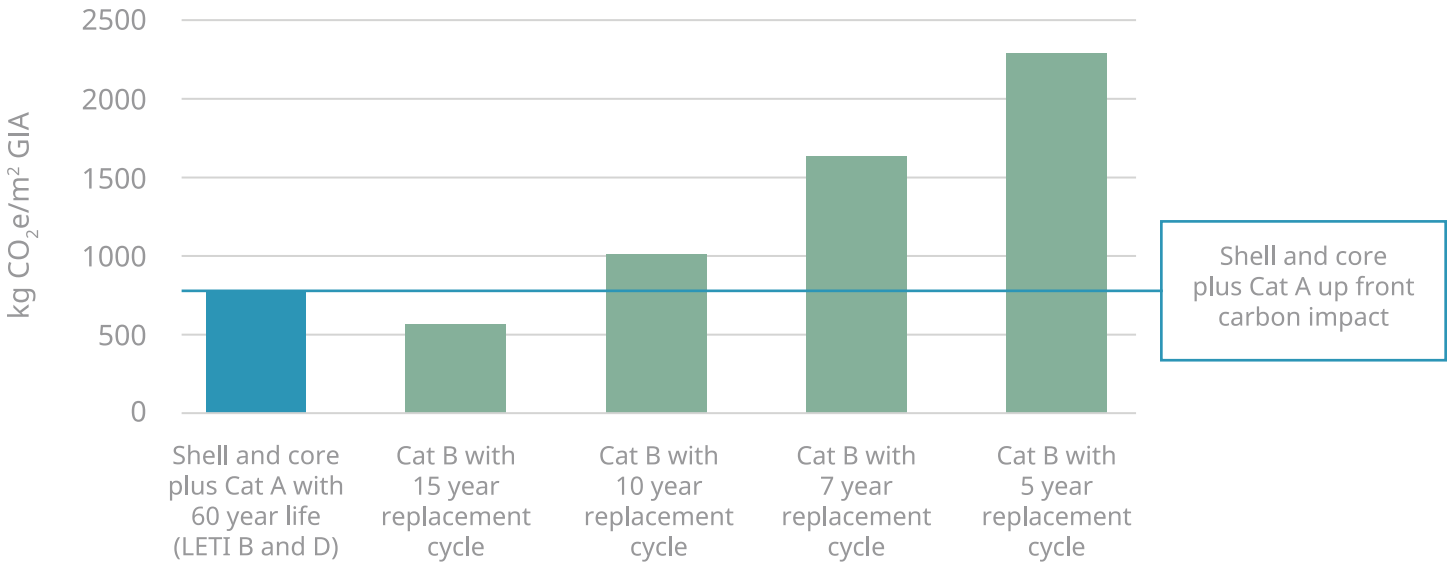
300 TONNES of fit-out waste
goes to landfill every day in the UK

Fit-out alone is thought to be responsible for 300 tonnes of waste going to landfill per day in the UK. BBP also quote that a fit-out project could generate more than 5 tonnes of waste per 100 m^2 of floor space. Much of this waste is arising from the strip-out phase, with many products and materials being fit for reuse or high-value recycling but typically sent to low-grade recycling or energy from waste routes, rather than retaining their inherent value.

Overbury's "Counting the Upfront Carbon in Cat B Office Fit-Out Report" (2024) estimates the average upfront carbon performance level of Cat B office fit-out as 190kg CO_2e/m^2 GIA. Overbury uses LETI (Low Energy Transformation Initiative) Band D carbon targets for offices as a comparison at 775kg CO_2e/m^2 GIA for shell and core plus Cat A fit-out.

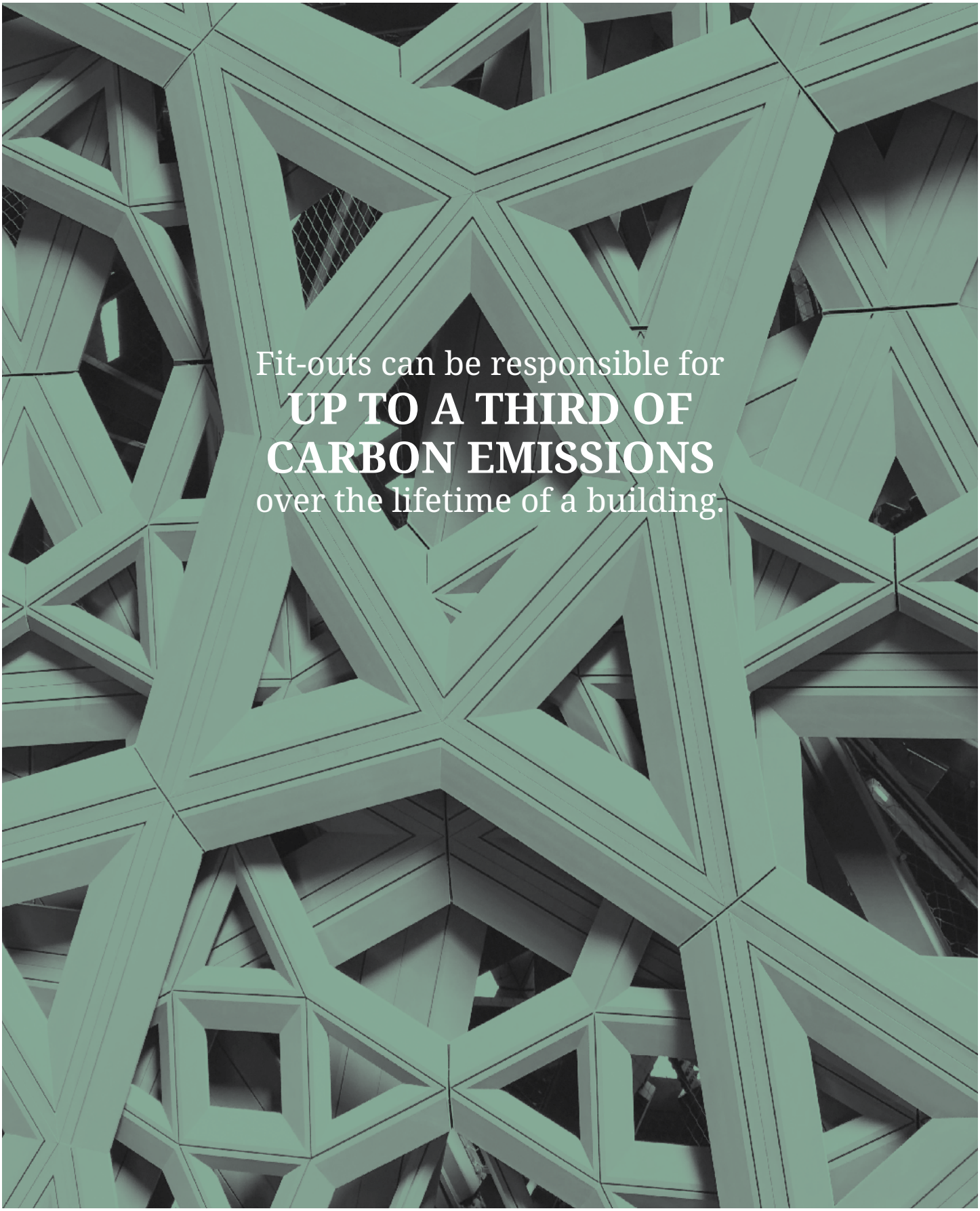
The report uses a typical life of 60 years for a new build fitted to Cat A for the reference study period. With a Cat A life of 20 years and Cat B of 5-10 years, four Cat B fit-outs would produce the same carbon emissions as a new building fitted to a Cat A standard. Therefore, a Cat B fit-out can quickly produce a higher cumulative carbon cost than that of the original building.

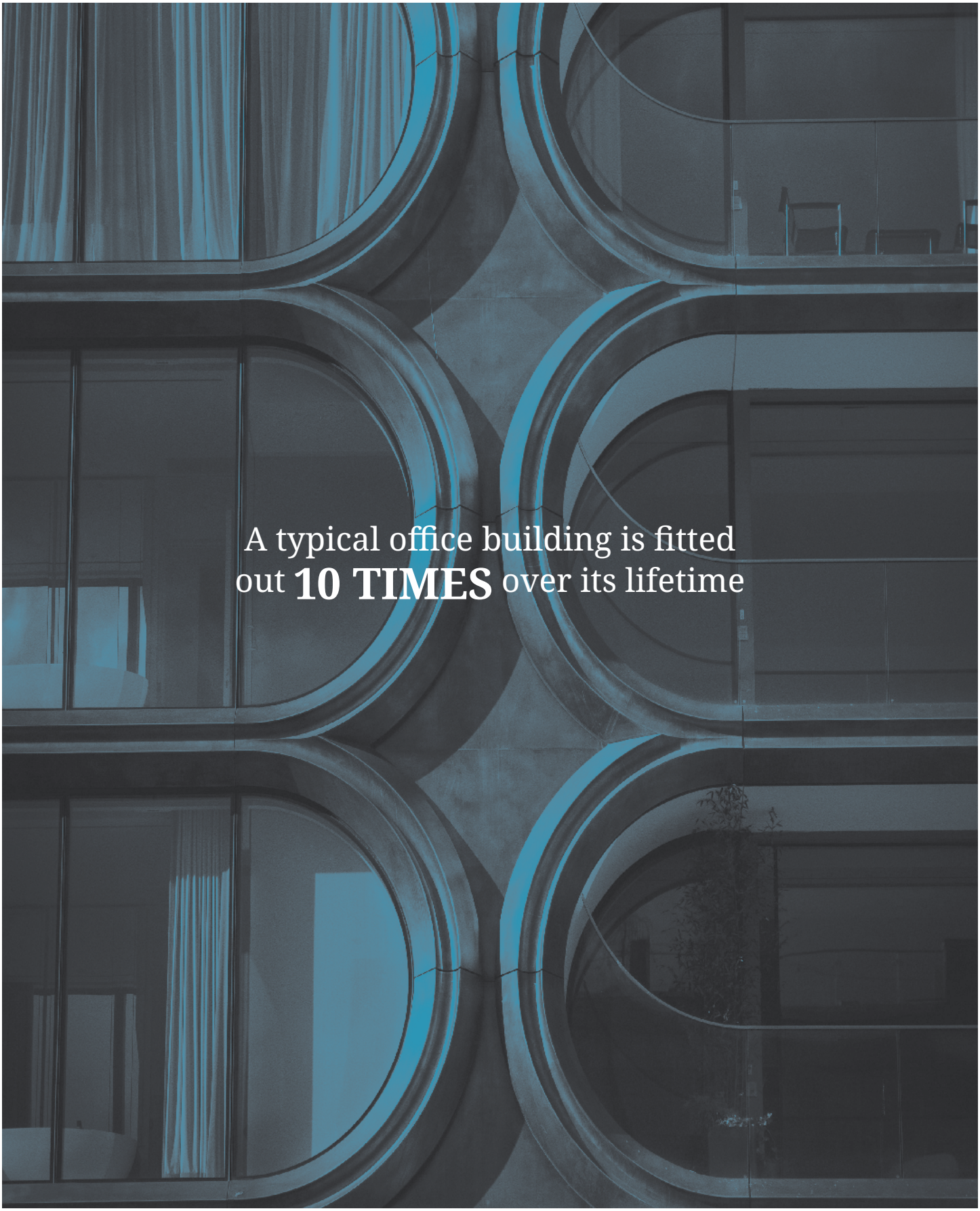
Upfront Carbon Impact (A1-A5) of repeated Cat B fit outs over a 60 year period



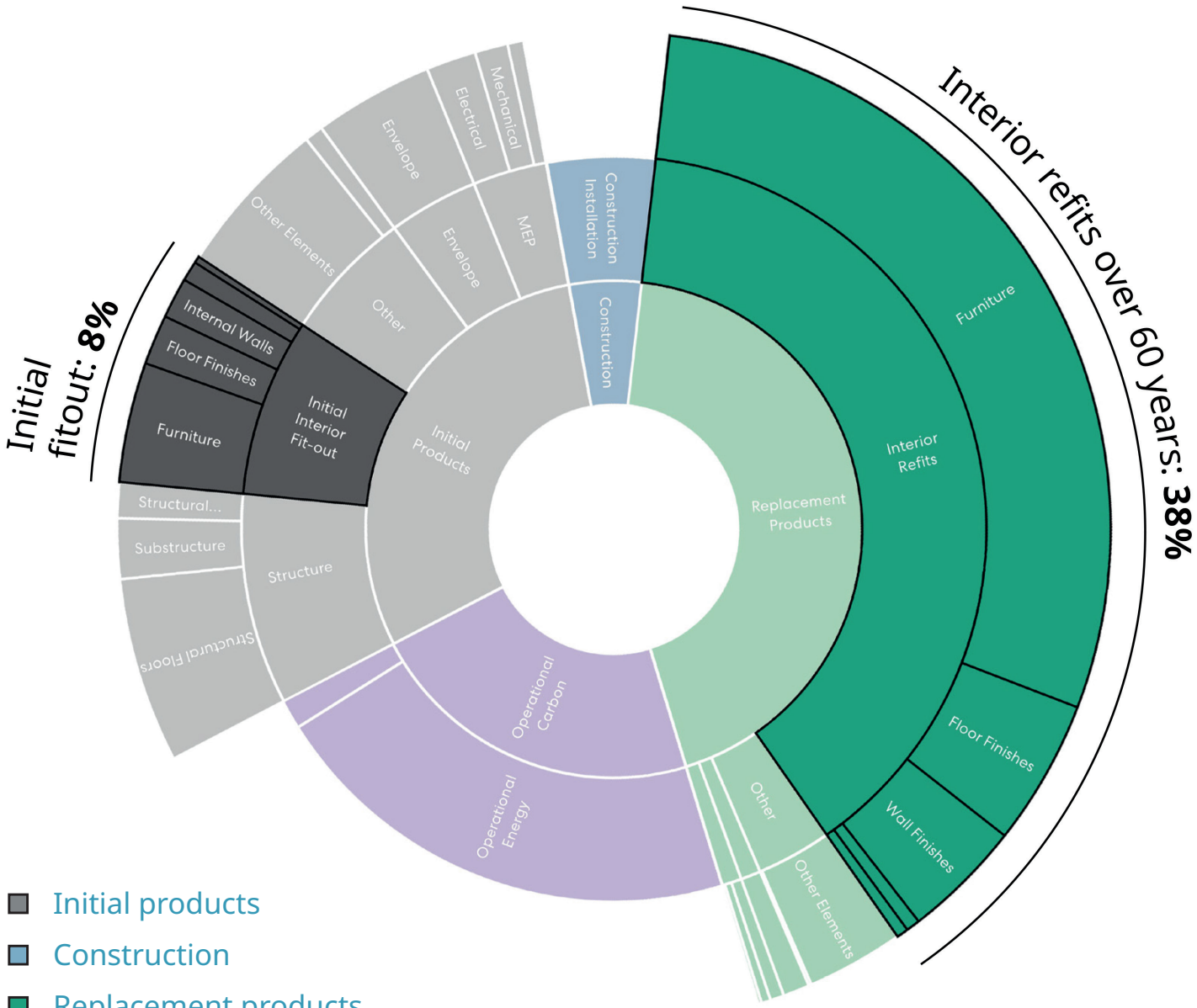
Overbury 2024 Cat B Fit-Outs

A typical new office building is designed to last at least 60 years and will, on average, be refitted 10 times. Individual products such as flooring coverings can have warranties of up to 15 years, however, are generally taken out after 2-3 years.


Fit-outs can be responsible for
UP TO A THIRD OF
CARBON EMISSIONS
over the lifetime of a building.


A typical office building is fitted
out 10 TIMES over its lifetime

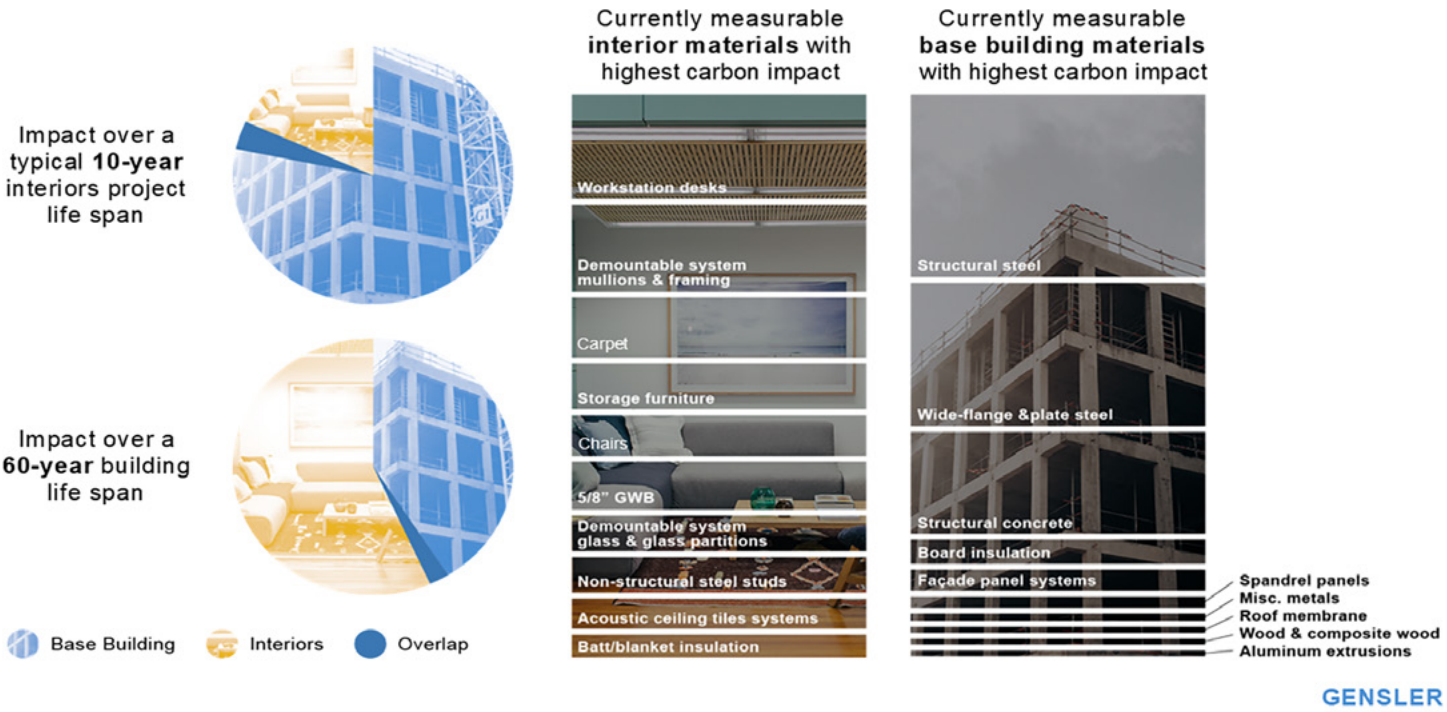
The Impact of Interior Refits



- Initial products
- Construction
- Replacement products
- Operational carbon

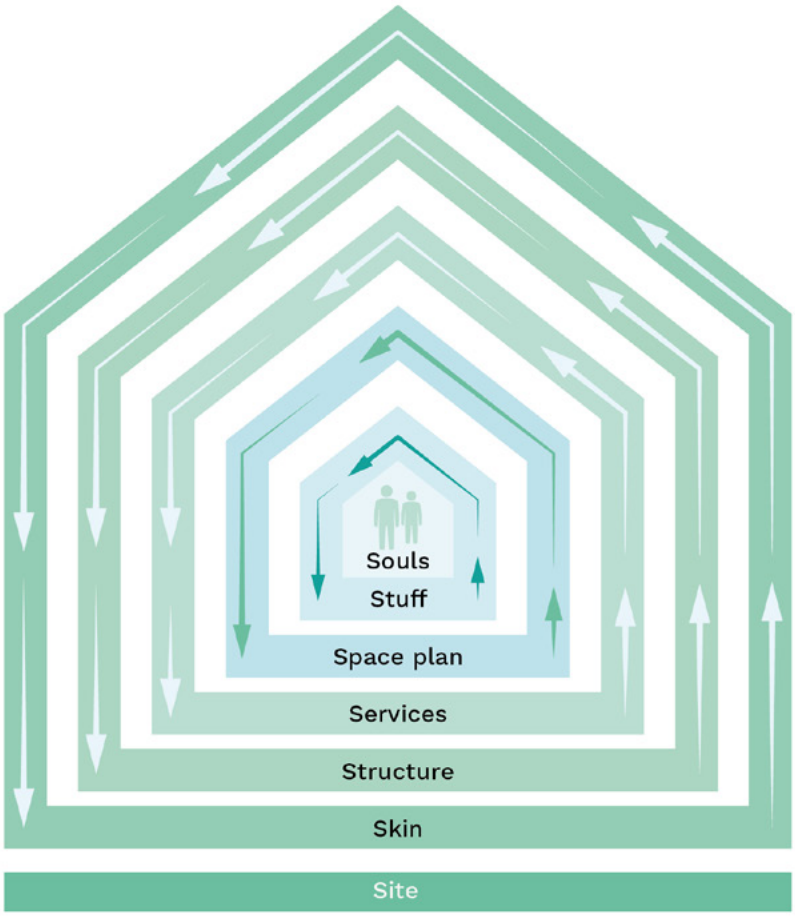
The Impact of Interior Refits
Perkins & Will 2025

RELATIVE CARBON IMPACT: INTERIORS VS. BASE BUILDING - 10-YEAR AND 60-YEAR LIFESPANS



Greater London Authority; World Green Building Council

THE LAYERS OF A BUILDING



Gensler

		Typical lifespan/activity
Site	Location & context	Permanent
Structure	Bones	30-300 years
Skin	Envelope	20+ years
Services	Lifeblood	7-20 years
Space plan	Interior layout	3 years
Stuff	Furniture/equipment	Under 3 years
Souls	People	Daily

CAT A and CAT B Fit-Outs – Amplifying Waste Streams

A **CAT A** fit-out refers to a basic finish of an interior space, usually provided by a landlord. The technical functions such as electricity and mechanics are installed but the space is not generally ready to be used for the function it is intended (e.g. as an office). It may include items such as raised floors, suspended ceilings and lighting. You could describe it as a 'blank canvas' where the landlord or developer provides a space ready for a tenant to customise.

By contrast, a **CAT B** Fit-Out is a space typically ready for occupation, which is tailored to the occupier's needs and desires. Typically, this would include specific flooring types, finishes, IT and data infrastructure and, of course, furniture. This is usually undertaken by the tenant and will align with a tenant's corporate identity.

There are particular aspects and practices associated with both CAT A and CAT B fit-outs that will amplify the production of waste. In some CAT A buildings, tenants will simply want to remove items that the landlord or developer has included, and that removal is often done quickly and at a high environmental cost (i.e. zero reuse and often very little recycling). Landlords might also do a CAT A+ fit-out, whereby parts of a building (say a single floor of a building) are fitted out more akin to a CAT B standard, and then again those items are removed and wasted when the tenant moves in. This can, on some occasions, lead to the complete waste of brand new or unused materials and products.

Some fit-out materials are **SIMPLY WASTED**
when they are new and completely unused

Similarly, spaces that are fitted out to CAT B are prone to high wastage, not only when new tenants move in, but also when working practices, fashion and aesthetics change and there is a perceived need to change office layouts, retail spaces, etc.

The BCO Fit-Out Guide (2025) also describes how most traditional commercial office leases require occupiers to return the space to the building owner in its original form and condition. This requirement is known as **reinstatement** and the works required are defined in a schedule of dilapidations that the occupier is required to rectify. It can include removing all furniture and fixtures, repainting walls to their original colour, ensuring all building service installations operate as they did before the fit-out and repairing any damage done to the premises. This embeds a **triple waste stream** whereby outgoing occupiers remove furniture, fittings and additional services, and reinstate any changes, resulting in items often being downcycled or incinerated. The building owner then upgrades the space to improve marketability, and incoming occupiers change the space and install new furniture, fixtures and fittings.

In the UK, **derating** a building can also cause waste, items will be removed to reduce the rateable value of the property and therefore the tax charged.

Do Green Leases Help?

Green leases are not currently standardised or legally required in the UK but generally include clauses which are intended to help manage and improve the environmental and social performance of a building. The intention is to create benefits for both landlords and occupiers by mitigating sustainability risks and providing improvements to the building. In this way, greenhouse gas
emissions and environmental impacts from tenant-occupied areas can be mitigated in conjunction with those from the building as a whole.

Green leases include, as a minimum, commitments by both the landlord and occupier to operate the building sustainably. For example, by reducing energy consumption, emissions and waste. Secondly, an agreement is in place to share sustainability data between landlord and occupier to facilitate optimal performance. They are often used to maintain green building certifications such as BREEAM and LEED in commercial properties. Marks and Spencer in the UK has pledged to implement green clauses in all
its stores.

Reuse and Carbon

There are a plethora of reports and research papers, such as those by the UKGBC and the Ellen MacArthur Foundation, that clearly state carbon reduction targets, including achieving Net Zero by 2050, cannot be achieved without circularity.

Embodied carbon from the construction and refurbishment of buildings makes up 20% of built environment emissions in the UK. The UKGBC Net Zero whole life carbon roadmap indicates that as operational carbon emissions from buildings decrease, embodied carbon will form over half of the built environment emissions by 2035.

Whilst the reuse of items can incur additional carbon emissions from storage, transport and refurbishing, these are generally outweighed when compared to the whole life carbon emissions from the extraction, manufacturing, transport, use and disposal emissions from a new product. Reuse of the sub and superstructure make up approximately 50% of the upfront embodied carbon of the project, however, carbon savings can also be found in the fit-out sector.

Reused raised access floor panels from the RMF (Raised Modular Flooring) “Eco” range produce a 50% reduction in embodied carbon against a leading manufacturer’s new system. Similarly, Rype, have found over 80% carbon savings for a remanufactured task chair, desk and meeting chair compared to new. The Entopia Building saved approximately 285kg CO_2e/m^2 from the reuse of the existing sub and superstructure. Reusing existing raised access floor across most of the building delivered savings of $32kCO_2e/m^2$ compared to new panels. A case study on the JLL office fit-out found that refurbishing task chairs saved 61% of CO_2e compared to new chairs. Also, donating 500 items from the office clearance saved 45t CO_2e from emissions associated with downstream waste management. At the Royal Bank of Scotland sharing carpets through Collect Eco saved 337.5t CO_2e compared to the recipient organisations buying tiles new.

The Costs of Reuse

The calculation of costs for the reuse of materials varies widely between projects. At 1 Triton Square in London, the project is estimated to have 15-18.5% savings in overall cost compared to a new build. The UKGBC JLL office fit-out case study achieved savings of over £40,000 through the refurbishment of furniture. However, some studies indicate a cost uplift, such as the Entopia Building, which estimated a 5-8% cost uplift compared to new. The majority of studies expect to see a shortened programme time.

While safety and deconstruction may require a longer demolition process, once this is complete, the reused materials are on-site, resulting in time savings. There is also a market premium for net-zero and circular buildings, resulting in faster let times. Social value can also be calculated for the donations of items to charity.

Making the Circular Economy Work for Fit-Outs

The **BCO's Guide to Fit-Out (2025)** outlines typical design principles for a circular economy approach to fit-out which is summarised as follows:

Office Fit Out Sustainable Design Strategies

- Carry out a materials audit
- Create an inventory of materials, plant and equipment
- Retain original fit materials, plant and equipment
- Renovate and reuse furniture
- Minimise changes to base building layout and services
- Design for future reuse by occupier
- Use second-life and reusable items
- Select recyclable, low VOC materials
- Consider leasing as a service
- Specify products with take-back schemes
- Use new materials that are easily reusable, recyclable or content high recycled content

Using Material Audits to Drive Reuse

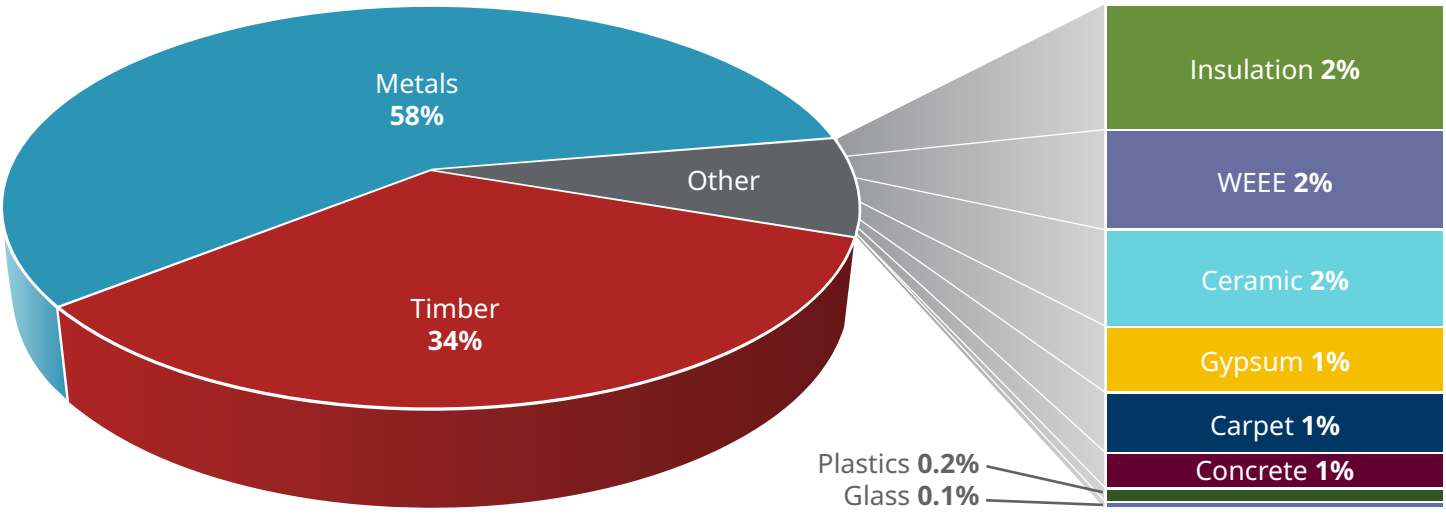
Sometimes referred to as a 'Pre-Refurbishment Audit', 'Pre-Renovation Audit' or 'Pre-Deconstruction/Demolition Audit', a Material Audit provides a client with independent advice about the products and materials that can be reused or recycled prior to a refurbishment (whether large or small scale) or a full or partial demolition. The aims of an audit are:

- To provide an understanding of the types and amounts of products and materials arising during the refurbishment or demolition and associated embodied carbon to enable reuse in the new works or elsewhere.
- To optimise the management of products and materials and provide recommendations to the design team and refurbishment/demolition contractor in line with the waste hierarchy i.e. maximise reuse and recycling and minimise waste to landfill.
- To provide technical advice on the reuse of products and recycling of material on and off-site.
- To facilitate better links and communication within the supply chain and provide details of local charities, organisations and companies who may be able to deal with the reuse and higher value recycling of products and materials arising.
- To advise on targets for the reuse and recycling of products and materials and generally mitigate the negative effects of refurbishment or demolition.

In essence, a material audit is a detailed inventory of the products and components in the building that will need to be managed upon refurbishment or demolition. The client can then use the information to set targets and objectives within the refurbishment or demolition tender documents to ensure best practices in resource efficiency is adopted by the appointed contractor.

Information can be gathered from site visits and building information e.g. Operational and Building Manuals. It is useful for reuse to record the condition of the items and how they may be fixed (this may not always be known until works start). Audits can be undertaken by independent, third-party specialists with expertise in reclamation and experience in preparing these types of reports.

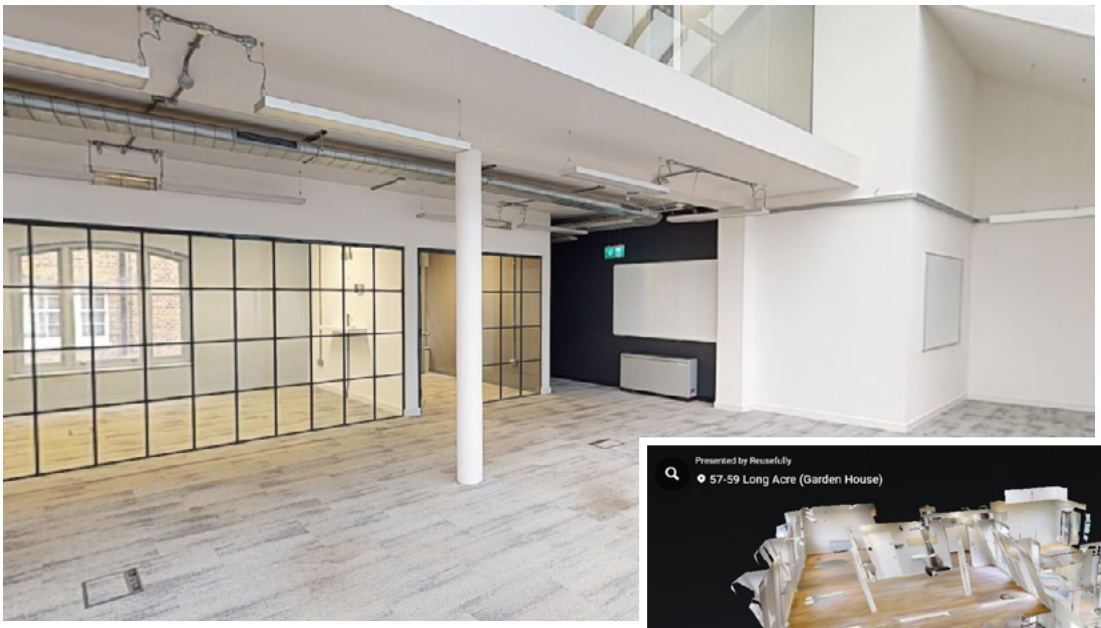
Estimated material arisings, split by material type (% by mass)

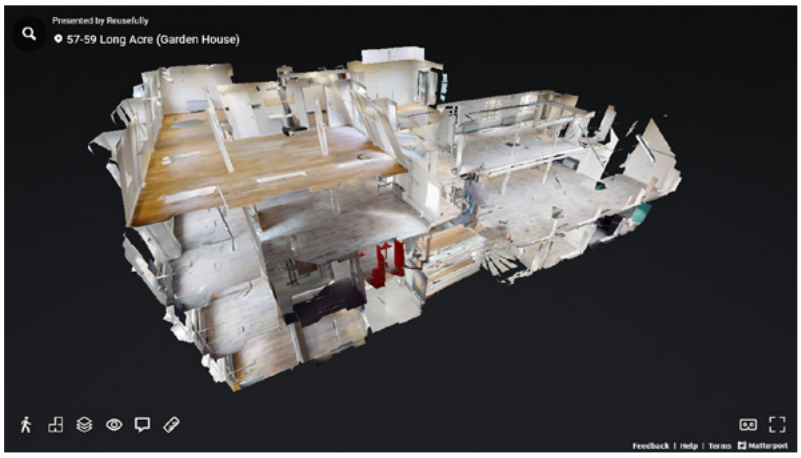


Within the interiors and fit-out market, there are, however, a number of particular challenges when considering implementing audit findings:

- **Time and cost pressures:** Strict project timelines often prioritise speed over reuse, leading to missed opportunities for material recovery. Extended deconstruction periods may also incur additional costs.
- **Supply chain and market barriers:** Reusable items may lack local markets or face logistical issues such as high transportation costs and lack of storage space available. Often, the condition requirements for high-spec fit-outs are prohibitive for reuse. Items may also need to be tested before second use. They may not hold a warranty.
- **Design:** It can also take a long time to find suitable materials and assess their suitability for reuse - and there may need to be a balance between performance, aesthetics, cost and embodied carbon when considering reused materials.
- **Information:** Often detailed attributes of reusable items are unknown such as manufacturer, age and certification. The ownership details and tracking of items can be difficult to establish.
- **Regulatory issues:** Perceived liability concerns deter the reuse of construction materials.

Looking ahead, there are a number of ways in which material audits can and should play an increasingly important role. With the development of new technology and greater integration, AI-driven tools can assist in the visualisation of fit-out options within a platform to match supply with demand. This is important as it reduces the need for storage (and additional cost). Aggregating materials from various projects also provides confidence to designers and contractors of the availability of these materials. There is also the increased use of material passports to record and collate reusable items information, enabling highest value retention.





Scans and 3D digital twins of buildings will aid the recognition and sourcing of materials for reuse

Increased Use of Audits

A number of organisations are now increasingly asking for audits to be conducted as mandatory (e.g. some major property/real estate owners, together with a number of city and governmental authorities) and this should help to create a **wider universe of 'material banks'** whereby reused materials can be sourced.

Pre-Demolition Audits are now a legal requirement in France for every building over **1,000M²**

PREVIOUS BUILDINGS
Donors of building products and materials

CURRENT BUILDINGS
Recipients–reducing carbon, cost and preserving heritage

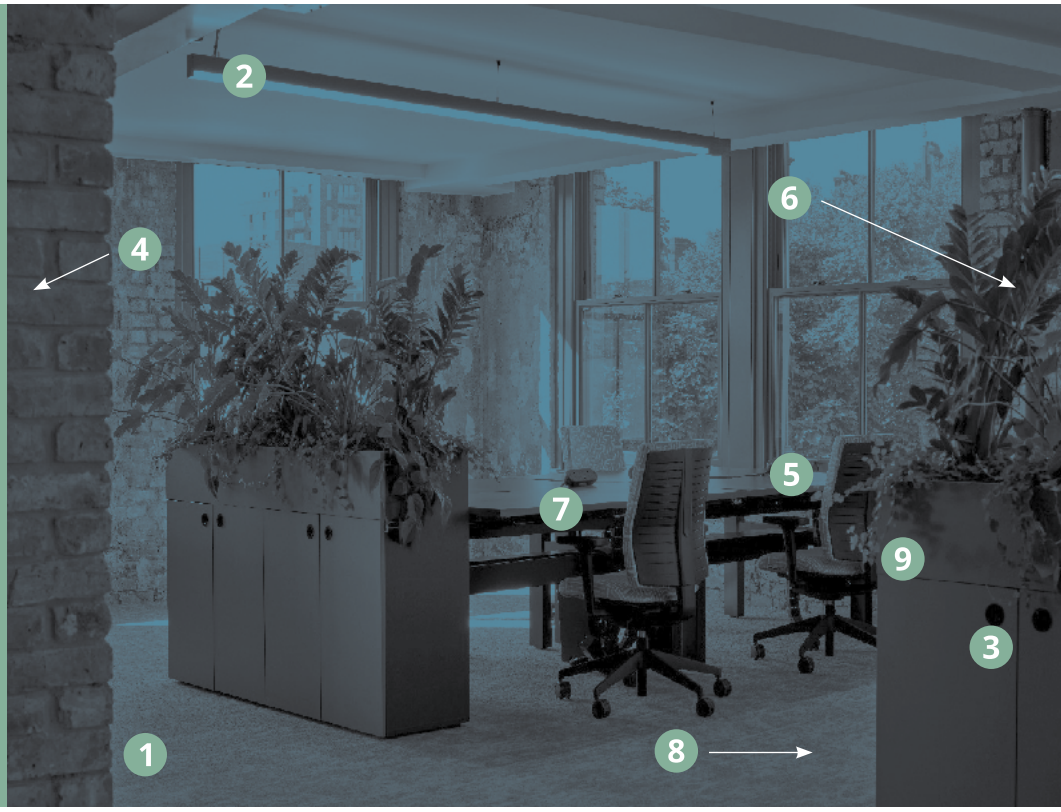
FUTURE BUILDINGS
Designed for adaptability and future reuse = longer lived assets and future bank of resources

Some countries are also now introducing legislation to make material audits mandatory in certain circumstances. In France, for example, since July 2023, project owners have been required to carry out a pre-demolition audit for any buildings of more than 1,000 m^2, under the 'AGEC' law. Practitioners must provide the type, quantity and location of construction materials, the waste potentially generated by these products and the residual waste from use and occupation. They must also estimate the condition of these products and give indications of reuse possibilities on-site or for another site through reuse channels.

Typical Items for Reuse from a Materials Audit

MATERIALS

1. Carpet Tiles
2. Lighting
3. Storage Cabinets
4. Bathroom and Sanitaryware
5. Glass Partitions
6. Doors
7. Meeting Pods
8. Raised Access Flooring
9. Furniture



Extended Producer Responsibility – Examples from France

Extended producer responsibility (EPR) regulations are also encouraging manufacturers to design products for return and reuse (or remanufacture). Whilst these have been mandated for certain products across Europe for many years (such as end-of-life vehicles, tyres, etc.), mandatory requirements for construction products are only recently being developed. France is a good example of relevant legislation developed at a national level.

In **France**, a new law on the circular economy was adopted in February 2020. The law introduces sweeping changes to the EPR regime, with 10 new EPR schemes added to 12 existing ones, including construction products and materials.

Eco-contributions, a type of levy, form part of existing EPR schemes but can be insignificant compared to the overall price of the product. Contribution calculations include the possibility of being reused, etc.

The Role of Certification Schemes

Certification schemes can be used to demonstrate that buildings or spaces meet current best practice, they can also help organisations meet and align with their sustainable strategies and policies.

They can aid and encourage the adoption of circularity principles for interiors and fit-outs. The schemes that relate to interiors and fit-outs include:

Certification Scheme	Scope and Focus	Key Assessment Criteria	Circular Economy Criteria Examples
BREEAM	Comprehensive sustainability standard for buildings (including refurbishments and fit-outs) (Various countries)	Energy, materials, waste, water, health, and site management e.g., reuse, sustainable sourcing, EPDs	Includes undertaking pre-refurbishment/ demolition audits, credits for reusing and recycling materials and for material efficiency which can include reuse.
LEED	Global green building certification for all building phases (design, construction, interiors, ops)	Site, water, energy, materials, indoor environment, innovation; credits for circularity, EPDs, sustainable sourcing	Points for reusing materials from on-site and off site, and targets for reuse.
SKA Rating	Interior fit-out and refurbishment (mainly commercial, UK only)	100+ good practice measures: energy, waste, water, materials, wellbeing; e.g., reuse, EPDs, landfill diversion	Good practice measures for materials which includes encouraging reuse as well as supporting processes such as pre-refurbishment audits and management plans.
DGNB	Holistic sustainability for new/existing buildings and interiors (focus on Europe)	40+ criteria: environment, economy, sociocultural, technical, process, site; circularity, LCA, flexibility	Criteria related to the reuse and recycling of materials and a number of criteria for the deconstruction of buildings.
Living Building Challenge	Most rigorous, holistic standard for regenerative, net positive buildings of all types and scales	7 Petals: Place, Water, Energy, Health + Happiness, Materials, Equity, Beauty; 20 Imperatives; net positive energy/water, material transparency, social equity, beauty	Requires the use or salvaged materials, as well a plan for optimising materials including reuse across a building's lifecycle including a plan for adaptable reuse and deconstruction.

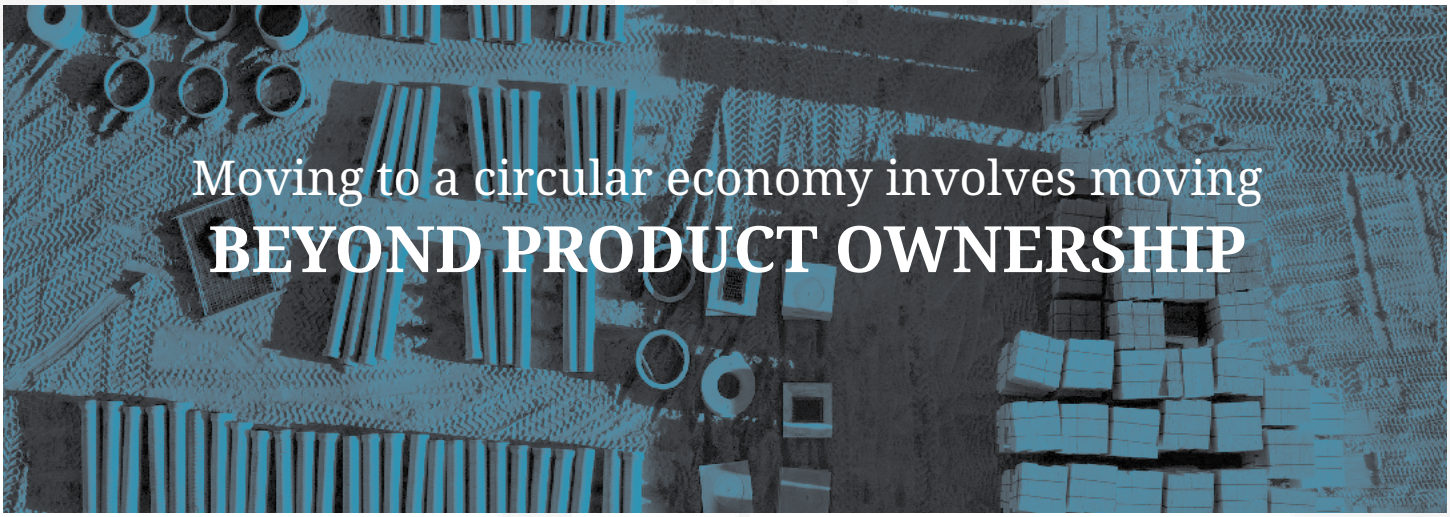
Circularity Developments at European Level

There have been many developments at EU and Member State level for driving forward the circular economy in the built environment, including refurbishment and fit-out. Some of the key policy and standards developments that will impact construction products, at the manufacture, design, installation and end-of-use stages are outlined.

Policy/Standard	Description
Level(s)	EU framework for measuring and improving building sustainability, supporting circularity from design to end-of-life for residential and office buildings. Includes indicators for deconstruction, reuse, recycling, and waste reduction. Used in pilot projects, for example, MAIF's office renovation, which achieved high material recovery and carbon savings.
EU Taxonomy	Classification system for environmentally sustainable economic activities, guiding investment. Circular economy criteria include retaining at least 50% of original buildings and prioritising the reuse of materials in new builds, renovations, and demolitions and use of electronic tools for building information.
EU CDW Management Protocol V2	Voluntary guidance updated in 2024 to improve management of construction and demolition waste (CDW) management and promote reuse/recycling. Includes pre-renovation audit guidelines and links to national initiatives and EU R&D projects, such as reuse toolkits. Referenced in EU Taxonomy circular economy criteria.
CEN TC350 SC1	European standards committee (since 2021) developing principles and guidelines for circular economy in construction, covering design, deconstruction, and end-of-life. Parent committee (CEN TC 350) develops and maintains sustainability assessment methods for construction works.
Revised Construction Products Regulation (CPR)	Updated rules (2024) harmonising technical, safety, and environmental requirements for construction products in the EU. New requirements include Digital Product Passports (DPPs), enhanced CE marking with sustainability criteria, and mandatory environmental reporting (e.g., Global Warming Potential).
Circular Economy Act & ESPR	The upcoming EU Circular Economy Act (expected 2026) and Ecodesign for Sustainable Products Regulation (ESPR, updated 2025) will set stricter standards for product sustainability, including resource efficiency, recycling, and transparency via Digital Product Passports.
Ecodesign for Sustainable Products Regulation (ESPR)	Sets strict sustainability criteria for nearly all physical goods on the EU market, including furniture. Requires products to be durable, repairable, and recyclable, and introduces Digital Product Passports (DPPs) containing detailed environmental, material, and performance data. Manufacturers must redesign products and supply chains for circularity, transparency, and lifecycle carbon reporting.
Other Key Policies	The Energy Performance of Buildings Directive (EPBD, 2024) targets zero-emission buildings by 2050, including life cycle carbon calculations. The Waste Framework Directive (WFD) sets a 70% reuse/recycling target for construction and demolition waste. The Green Claims Directive (proposed) will require substantiated, verifiable environmental claims.

In the United States, there are a range of relevant laws and regulations now coming into place. New York State has a Carpet Collection Program Law, which came into effect in December 2024, establishing recycling rates and increasing the percentages of post-consumer recycled material. California has a state recycling programme known as the Carpet America Recovery Effort (CARE), which provides for extended producer responsibility for carpet and other flooring.

California also has CALGreen, a code mandating minimum construction and demolition waste diversion percentages for new construction and certain alteration projects. For example, projects requiring building permits must divert at least 65% of C&D materials from landfill. New York City has a law requiring large buildings to reduce greenhouse gas emissions. It sets limits on emissions based on building size and type and phased reduction requirements, ultimately aiming for carbon neutrality by 2050. In Seattle, there is a requirement for a salvage assessment for all whole building demolition projects and projects that involve alterations valued at more than $75,000 and/or where the area of work is greater than 750 square feet.



Changing from Supplying a Product to Supplying a Service

Progressing to a more circular economy involves **moving beyond product ownership to more access-based models**, with businesses offering services like rentals, subscriptions, and sharing, rather than selling products outright, thereby maximising resource utilisation and minimising waste.

One key way of doing this is for manufacturers to take back products for re-sale and re-supply. Whilst this is in its infancy in the interiors sector, there are now a number of examples of this.

Copenhagen based NORNORM provides a furniture subscription service which takes back furniture that is no longer needed and refurbishes it for reuse. Items include tables, chairs, sofas and bookshelves. Similarly, Belgium based Enky provides a furniture subscription service as well as a buy-back program which ensures no heavy upfront investment and more flexibility for its customers.

One area that has substantially changed how products are supplied into the interiors world is in raised access flooring. It is now commonplace for raised access flooring to be reused and repurposed, even to the extent that demand often outstrips supply in some high-density office markets (e.g. major cities such as London and Paris etc). Companies such as RMF in the UK have extensive collection, storage and reuse services. They can also potentially deconstruct flooring systems into their constituent parts (panels and pedestals) and reuse or recycle as appropriate.

Other examples of take-back include:

Optima - Glass Partitions

Optima operate a take-back service for all UK-installed Optima products, to repurpose or recycle glass partitioning, keeping valuable materials in circulation and reducing environmental impact. Optima will carefully demount systems, separate materials, and return them to their UK manufacturing facility. Components fit for reuse are repurposed for future projects as pre-owned systems, while others are responsibly recycled. In 2024 alone, Optima calculated that they diverted nearly 15 tonnes of aluminium for recycling and recovered over 600 ironmongery components, including hinges and lock housings, for reuse. If glass panels are bespoke, Optima ensure that all recovered glass is recycled appropriately.

READ MORE

Orak - Carpet Reuse

Orak has developed a reconditioning service which is recognised by several manufacturers in France. ORAK can achieve average rates of reuse at 30-40% and up to 70% for easily dismantled tiles used for less than 8 years. This is well above the building sector average reuse rate for carpet tiles at 0.01%.

Orak offers a “supply, installation, maintenance, dismantling and repurchase” service which goes beyond the traditional “supply and installation” model. At the end of the contract, the tiles are dismantled, and the reusable portion is repurchased as part of the French regulations on Extended Producer Responsibility for Products and Materials in the Building Construction sector. The tiles are tested and recertified in ORAK workshops and are then issued with a technical sheet. The non-reusable portion is sent to the manufacturer’s factories for recycling. The knowledge of the product acquired through its maintenance and reconditioning services limits the manufacturer’s risk and allows the warranty extension.

READ MORE

Cycle Up – Reuse from Construction Sites

Cycle Up recovers materials arising from buildings for reuse through the storage and reconditioning of items and a digital platform. Items are extracted from construction sites audited by Cycle Up or seller partners and are examined for defects and conformity to specifications. They are then cleaned and further inspected for suitability for reuse. Fittings are then wrapped and delivered to a construction site. Cycle Up offers two contractual warranty levels from 12 to 24 months depending on the material type and condition of the item when resold. Excluded items from the warranties include some materials and products linked to structural works, façade and waterproofing elements and some electrical equipment.

READ MORE

The Growth of Reuse Platforms and Marketplaces

The advent of digital marketplaces for construction materials and products for reuse is a positive development. These can be described as 'eBays' for construction materials that are no longer required, either surplus to requirements (e.g. following an initial CAT A fit-out) or the result of refurbishment and demolition works. Typically, these platforms seek to match up those that have surplus materials with those that need them. They are becoming increasingly sophisticated, for example, the best ones will allow you to search your local area for products you are looking for, and also include, as standard, information on condition, age, performance, quantity available etc.

Such platforms can, potentially, be used to buy and sell items, or simply to donate items to local charities and community groups. This can be particularly useful for items from a refurbishment/strip-out such as unwanted carpet tiles and sanitaryware.

Name	Type of Service/Offering
Circotrade	A new web-based platform whereby assets (building materials) can be listed and traded. Subscription is required.
Concular	Listing of products from circular dismantling projects in Germany and provision of related servcies
EME (Excess Materials Exchange)	This is a digital platform to list building products/materials for reuse and recycling. It's a business-to-business platform and a subscription is required.
Enviromate	UK based. Items can be listed for free or sale – mostly surplus building materials/goods. Different packages are available depending on usage etc.
Globechain	A reuse marketplace that donates to charities, schools and small businesses via its member network. It is free to register, request and take items which include building materials. There are charges to list items depending upon the number of items/size of project.
Recolight Reuse Hub	UK based. For the listing of lighting items. Items must be free. Registration is required, but free to use.

Name	Type of Service/Offering
Renee Materials	A platform where reclaimed materials can be listed for purchase. This is aimed at the design/creative community.
REsign	Italian based company matching up supply and demand for reclaimed construction materials.
Restado	German based marketplace matching construction materials coming from demolition or oversupply with the demand in new construction project
Reyooz	UK based. Offer a service to collect and distribute furniture, fixtures and equipment to charities, schools and small businesses. Items are listed on their platform which is free to access. Starting to include building materials. There is a cost to this service.
ROMULUS	UK based. Is a platform based on Upcyclea, for the reuse of building materials operated by Maconda that is supported by the City of London. It is a business-to-business platform.
Werflink	Netherlands/Belgium based marketplacee to swap, sell and share construction equipment, building materials, storage, and freight space with each other.

Storage and Reuse Hubs

Having an appropriate location to store reusable items is a major enabler of on-site reuse. For many projects this can be a real challenge, particularly in tight urban environments, and also in projects where tight timescales demand rapid turnover of offices and other spaces.

However, there is a growing interest in the provision of physical storage hubs which can support greater circularity, particularly for the interiors sector. In fact, interiors and fit-out should address this aspect more and more in the coming years, particularly as, typically, products and materials are more easily transportable and storable when compared to heavier construction materials such as steel and concrete.

FIS Project Reuse

The FIS (Finishes and Interiors Sector) Project Reuse involves the establishment of a physical storage facility in East London. Initially the project is focusing on metal ceiling tiles and luminaires, which the intention of expanding the product range in due course.

The facility aims to isolate and resolve the issues that are blocking a more systemic approach to reuse of product in the fit-out world. One of the project partners is a logistics company from a film and television background – previously film and television sets were used once and now discarded. They are now routinely disassembled and stored for future reuse which not only makes a huge contribution to reducing carbon footprint, but also saves money.

READ MORE

Warranty and Re-Certification

A lack of recertification and warranties for reused products is often quoted as a limiting factor in reuse. A lack of warranty can create uncertainty and risk that contractors and project owners may be unwilling to take on. This is not now always the case as some clients will accept the use of products without a warranty.

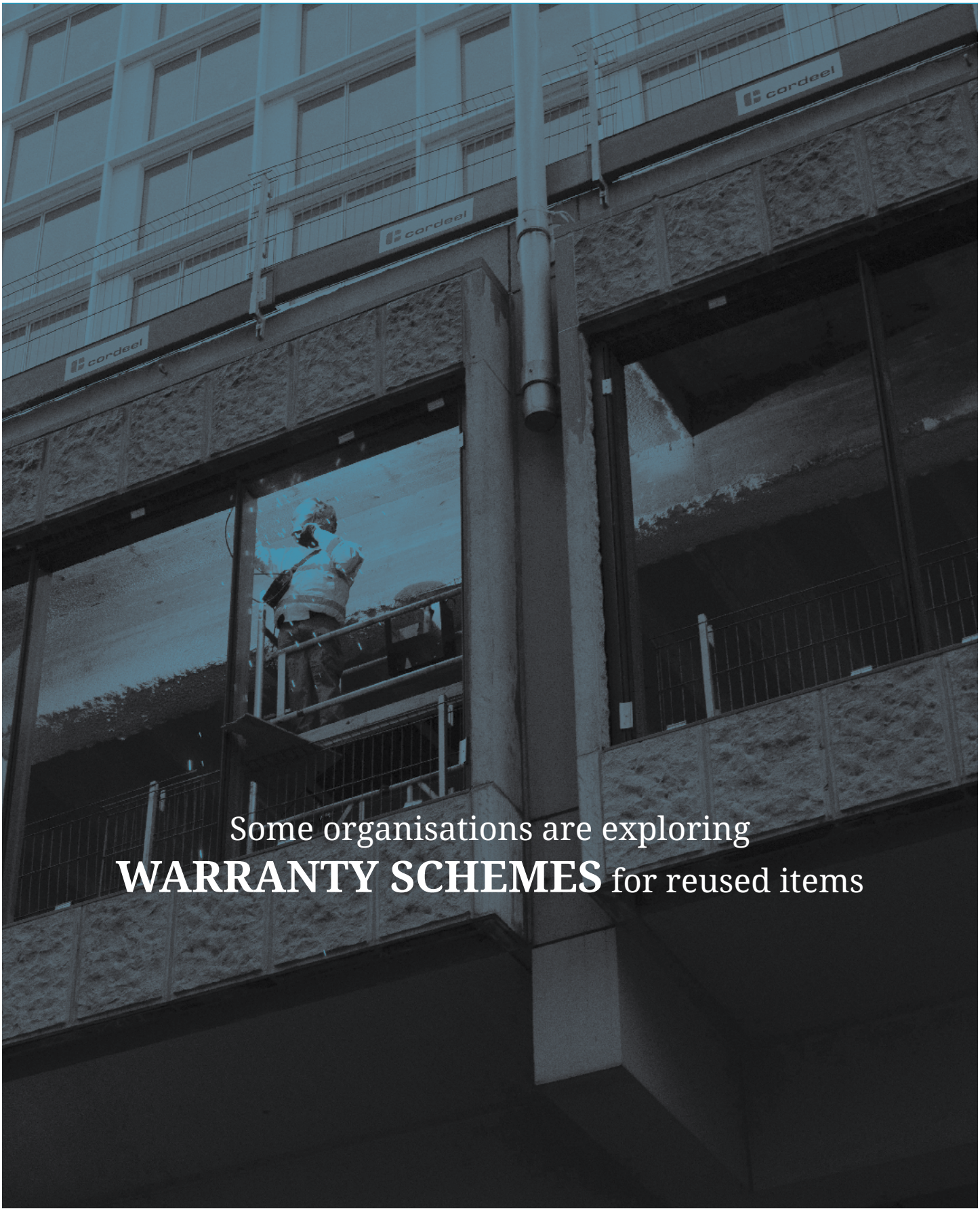
Reused materials are typically no longer the manufacturer's responsibility once extracted from their original home. Comparatively, all new products typically carry an expectation of fitness for purpose, longevity of working life and sometimes a guarantee or warranty.

There are a few examples of organisations trying to make a difference in this area. For example, Lignum Risk Partners are starting to explore the issues related to risk management, warranties and potential insurance schemes for reused product. This is linked to the development of quality assured reuse pathways. Concular in Germany have developed a Reclaimed Construction Material Insurance product, and AXA in France has a guarantee in its contracts covering the use of reused materials.

Philips Lighting (operating under the Signify brand) have developed a "product as a service" business model whereby their product is provided to the customer on a subscription basis, whilst ownership and maintenance remains with the manufacturer.

In the UK, Recolight is a compliance scheme for lighting, taking on responsibility for its members' WEEE compliance, and offering free luminaire collection and recycling. They also provide supporting information, training and reports for members.

Orak provide a carpet tile refurbishment service which is recognised by manufacturers. Tiles refurbished by Orak can be recertified and re-warrantied for further reuse (see case study section).



Some organisations are exploring
WARRANTY SCHEMES for reused items

Designing for Future Reuse

The design of spaces, as well as products and materials, is key to achieving a circular economy through the designing out of waste from the outset. The biggest challenge lies in creating an open mindset to challenge traditional design and exploring new innovative solutions.

Adaptability is key to achieving both current and future demands for spaces whilst maximising waste reduction and carbon emissions. Waste should be designed out through the careful ordering of materials and use of new technologies, as well as the utilisation of off-site prefabrication where applicable.

Designers can specify materials that are reused, reclaimed or refurbished. Products can also be demountable and modular to enable future reuse. The standardisation of materials and elements ensures the reusability of items and to reduce off-cuts.

Material Passporting

The European Union is implementing a new regulation requiring nearly all products sold in the EU to feature a Digital Product Passport (DPP). This initiative, part of the Ecodesign for Sustainable Products Regulation and the revised Construction Product Regulations, aims to enhance transparency across product value chains by providing comprehensive information about each product's origin, materials, environmental impact, and disposal recommendations.

By offering a detailed digital record of a product's lifecycle, the DPP will enhance supply chain management, ensure regulatory compliance, and help companies identify and mitigate risks related to authenticity and environmental impact.

Within the construction sector, there are now a number of initiatives to develop product specific 'material passporting' which should, in future, make a significant contribution to improving reuse and circularity.

A Vision for Greater Reuse

In a perfect world, reuse would be synonymous with fit-out. **Reuse would be the first choice for all product selection** with spaces being designed to ensure products are reused over and over again.

We are still a long way from this, but it is doable, and we are moving in the right direction with more and more examples of good practice and increased drivers.

But what is needed to scale this and make reuse the first choice in all fit-out projects? The responsibilities and actions lie with all of us involved in the manufacture and supply of products, design of spaces, fitting out spaces, and who own, manage and occupy these spaces. Responsibilities also lie with those that hold the levers to drive action - local and national governments, planning authorities and investors, with an environmental imperative to act. So what can we do?

- **Put simply, if the client asks for reuse, it will happen.** This needs to be made clear in project briefs and contracts with a greater understanding of any potential increases in time and resource (and cost) for careful disassembly. The cost of reuse needs to be better understood, this includes the trade-offs for any careful disassembly, testing, storage and logistics.

- **Designers need to be inventive and open-minded, using a reclamation design and inventory-led approach.** Not everything needs to look the same; smaller spaces and zones can be designed with different reused materials such as boardrooms, break out areas etc. Confidence in the use of these materials, particularly where there are strong aesthetic demands needs to be clearly demonstrated. A second-hand item can and should be a well-loved item and not seen as inferior to new.

- **Realise all of the benefits reused materials can provide by connecting the dots.** There is a clear carbon saving win; reusing material lessens the embedded ecological impacts of raw materials; utilising fixings which are not adhesive, decreases VOCs and improves indoor air quality.

- **A rethink on warranties. Are they always needed?** And for how long? How often do companies claim against warranties for interior products? Flexibility is needed as well as models that provide these warranties for reused products ensuring that they meet performance criteria. This may mean the development of protocols for testing and assurance.

- **Should fit-out products be allowed on to the marketplace if they are not reusable and/or recyclable?** Manufacturers can take more responsibility for their products when they reach the end of their first life. However, this is not always easy - manufacturers need to have a better understanding of what happens to their products when they are removed from buildings.

- **Providing information which lives with the product i.e. product passports will aid future reuse, reduce uncertainties and the time it can take to find out this information.** This should be a given with all interior products placed on the market. Moreover, this information needs to be maintained and accessible – for this to happen the value of the information needs to be communicated.

- **Leasing of items to match the lease of the fit-out, should be a viable model.** Leases can be as short as 1 year in some cases – there is plenty of life left in many products; and manufacturers/suppliers can save money and resources by leasing these products again and again and not manufacturing new every time. Moreover, spaces should be designed with the next lease (lifecycle) in mind.

- **Share, share and share!** We need to share the good news stories – this provides confidence that reuse and circularity can work; but we can also sometimes learn from why it did not work, we should equally share these findings.

- **Start with the quick wins!** While it would be nice to do everything on every project this is not feasible. It is important to start with the quick wins, provide confidence to the project team and make this business as usual.

- **Understand the real costs of reuse.** The cost of reuse needs to be better understood especially in comparison with new products over more than one lifecycle and linked to carbon pricing. Building owners and tenants should have a good appreciation of the financial and carbon value of their products.

- **Manufacturers need to be making 'circular' products.** This is not only through the sourcing of renewable, reused and recycled raw materials and designing for end of life but also includes being able to reuse and recycle these products in the future. How different components can be separated from each other is a key consideration.

- **Time.** Taking out products carefully may take longer therefore removal works should be costed for this option. The time considerations need to be balanced with the financial and carbon savings.

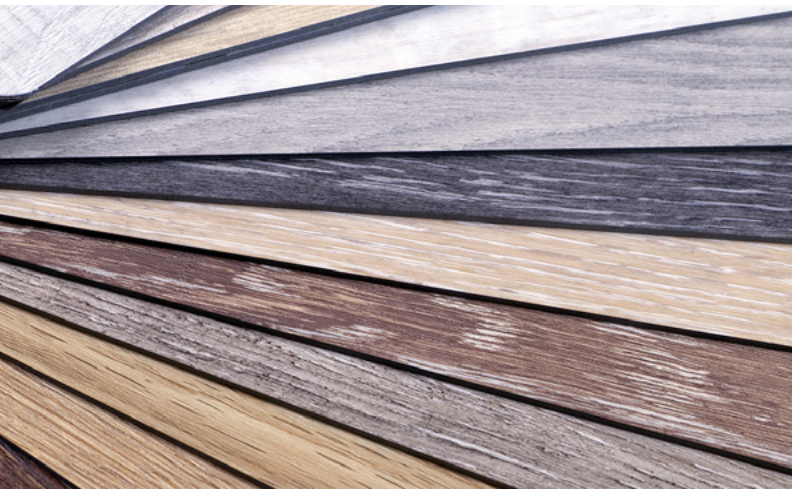
- **Logistics (transport and storage) are a key challenge.** They add cost on to any reused products- where possible it is better to avoid this. Using material marketplaces and understanding what is in the fit-out a long time ahead of any removal process, can help with this and planning ahead.

- **Use of technology.** Utilising technology for the visualisation of space may help with the reduction of waste from removing items from a CAT A where the tenant wants changes. Technology is developing rapidly when it comes to scanning buildings and identifying products.

- **Different products have different reuse opportunities.** This may be reuse in the same project, reuse in other client projects, donating products to local communities/charities, sending back to manufacturers, use of reuse brokers, reselling or donating via material marketplaces. The opportunity will be dependent on the product and the project.


A second-hand item **IS NOT** inferior to new

Case Studies



CISFLO

CISFLO is a project to develop new technologies and products to improve material recovery and drive the flooring sector in Europe towards a circular economy. It includes the development of guidelines for 'Circular Floor Coverings' (CFC) by considering design for circularity, durability and the use of latest digital manufacturing technologies. One of the work streams within CISFLO will consist of the establishment of an integrated product information system for material and product tracing all along the value chain, with a software platform for product information retrieval made available via an app, serving both consumer and professional actors along the value chain.

Grant Thornton

Contractor Parkeray have undertaken a sustainable refurbishment of Grant Thornton's HQ building in London, which involved the reuse of furniture, partitions, flooring and ceiling systems. They carried out an analysis of the embodied carbon savings of the reuse of these items, looking across the various life cycle stages.

Swiss Life, Paris

When Swiss Life were looking to dispose of 1800m^2 of a 7000m^2 Milliken carpet plank installation at one of its central Paris buildings, Orak's team were deployed to manage the project. Originally installed in 2022, the carpet featured Milliken's TractionBack® high-friction coating on the underside of each plank. With the majority of the installation adhesives-free, uplifting the planks was quick, efficient and with minimal damage to either the sub-floor or the carpet itself. With minimal disruption, the planks were uplifted, sorted for full and incomplete tiles and then carefully packaged into Orak's robust transfer crates. Each crate was digitally logged and then transported to their processing facility on the outskirts of Paris, ready for use in another building. **Read More by scanning the QR code.**

The Waterman Building, London

Image: Martina Ferrera

The original structure of the Waterman Building, in London's Farringdon district, was retained, and materials from the strip-out/refurbishment were reused in the new scheme. This included the reuse of raised access flooring (saving 255 tonnes of upfront carbon), the reuse of timber flooring, the repurposing of glazing into worktops and the rehoming of furniture and light fittings with over 700 individual pieces donated to local charities. Vintage fittings and furnishings were specified in keeping with the building's age and character. **Read More by scanning the QR code.**

TULIPS

TULIPS is a project supported by the European Union's Horizon 2020 research and innovation programme, which aims to enhance sustainability at airports over the next four years. There are demonstrator projects at Amsterdam Airport Schiphol as well as partner airports including Oslo, Turin and Larnaca. One of the key themes of the project is to maximise the use of secondary materials with a 'track and trace' module to connect resource passports with assets, the development of circular design guidelines, and an impact assessment of circularity passports. **Read More by scanning the QR code.**

White Arkitekter, London

When relocating its London office from Shoreditch to Farringdon in May 2023, White Arkitekter decided to commit to a circular economy fit-out of its new home on Bastwick Street. The Scandinavian architecture firm aimed to reuse materials as much as possible to reduce waste and to design the new offices with a minimum embodied carbon and operational energy approach. Whilst the process took longer than a non-circular fit-out, achieving an 80% material re-use target set an impressive sustainability precedent. It also saved an estimated 40% on costs, compared with an all-new office overhaul, cutting the project budget. Material sourcing challenges included finding the right size of partition glazing for acoustic separation between meeting rooms, whilst 80% of the furniture in the new office was reused from the old office. **Read More by scanning the QR code.**

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- Contract Flooring Association
- Excess Materials Exchange
- Finishes and Interiors Sector
- Great Portland Estates
- Overbury
- Perkins & Will
- Orak

reusefully

Reusefully is a partnership created to provide expert circular economy and broader sustainability advice and support within the built environment.

Our objective is to support a transition to a low carbon and circular built environment, working holistically with other aspects of sustainability, productivity, resilience, social impact and health and wellbeing. We enable the practical implementation of circular economy thinking throughout the construction supply chain and provide evidence-based support and advice for related policy development. We are keen to collaborate and work with others who genuinely share this objective and value our commitment to delivering effective and impactful project outcomes.

This includes all stages of planning, design, procurement, manufacture, construction, in use and end of life (next life). We address material and resource efficiency, embodied carbon and net zero, design for deconstruction, waste prevention and waste management, end markets, reuse and recycled content. Collectively, Reusefully brings together over 100 years of experience, working across multiple parts of the value chain, from small practical projects to large scale R and D, for a wide variety of clients.

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Milliken™

Together we strive to positively impact the world around us for generations to come.

At Milliken, we look beyond our day-to-day business and consider the positive impact we can have on the world. We have been exploring, discovering and creating ways to enhance people's lives since 1865. Our expertise crosses a wide breadth of disciplines including specialty chemicals, floor covering, performance and protective textiles, advanced medical products and solutions as well as consulting and training services.

We know that achieving our bold vision means having the courage to think big and we empower our associates to aim high—developing their ideas, always guided by long-held values and a clear vision for building a better world.

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