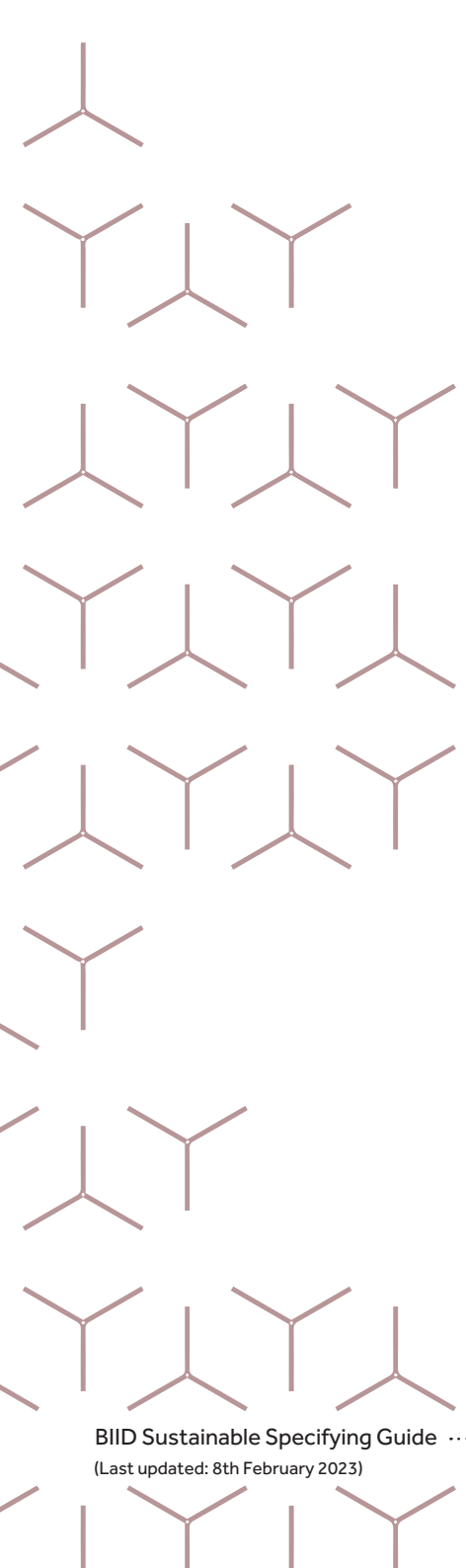




BIID Sustainable Specifying Guide





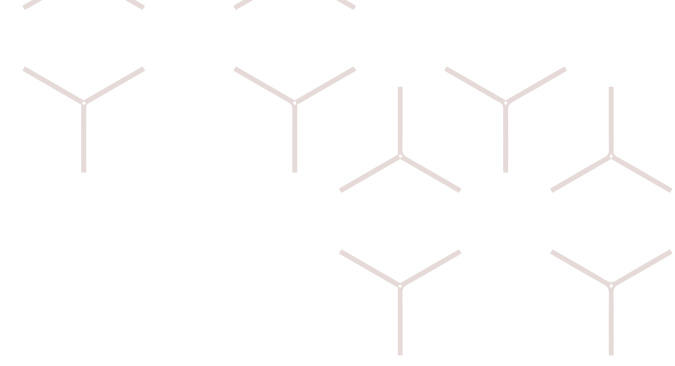
As interior designers, we have a unique opportunity to inform and inspire our clients. Part of our responsibility is to advise clients on the environmental and social impact of their project.

The construction industry accounts for around 40% of the UK's entire carbon footprint. The BIID recognises that one of the key ways our members can make a difference is through careful sourcing.

Sustainability can be interpreted in many ways and ultimately decisions lie with the client - but by providing them with lower impact options and adequate knowledge we can encourage positive decision making which benefits both project outcomes and the wider world.

This guide is intended to provide interior designers with broad knowledge of sustainability issues associated with specifying products, materials and technologies. It is a living document written by members, for members.

The document does not link to specific products or suppliers, instead it provides an overview of supply chain/ lifecycle considerations, followed by a series of useful questions that can be used in conversations with your own suppliers and project implementation teams, to encourage them to offer or facilitate lower impact solutions.



The goal of this document is to encourage the industry as a whole to review our impact and where possible make improvements. This can be achieved by learning and sharing knowledge of:

- **Where products and materials come from and how they are made**
- **What impact they have on their immediate and wider environment**
- **The durability and 'end of life' for products and materials.**

This will be an evolving document with regular updates. The BIID also plans to support this guide with a range of CPDs to enable designers to learn about sustainability and our opportunities to specify with a lower impact.

CONTENTS

Overview of sustainability considerations when designing and supplying:

1. HEALTH AND WELLBEING

- a) Considerations when designing
- b) Questions to ask Manufacturers & Suppliers

2. ENERGY CONSUMPTION DURING USE

- a) Tips
- b) Home Automation
- c) Appliances
- d) Water use
- e) Lighting
- f) Heating, cooling

3. DESIGN FOR LONGEVITY

Building maintenance

4. PRODUCTS

- a) Product Lifecycle
- b) Reduce, reuse, recycle
- c) Considerations when designing
- d) Questions to ask Manufacturers & Suppliers
- e) Questions to ask Contractors

5. MATERIAL SPECIFICATION

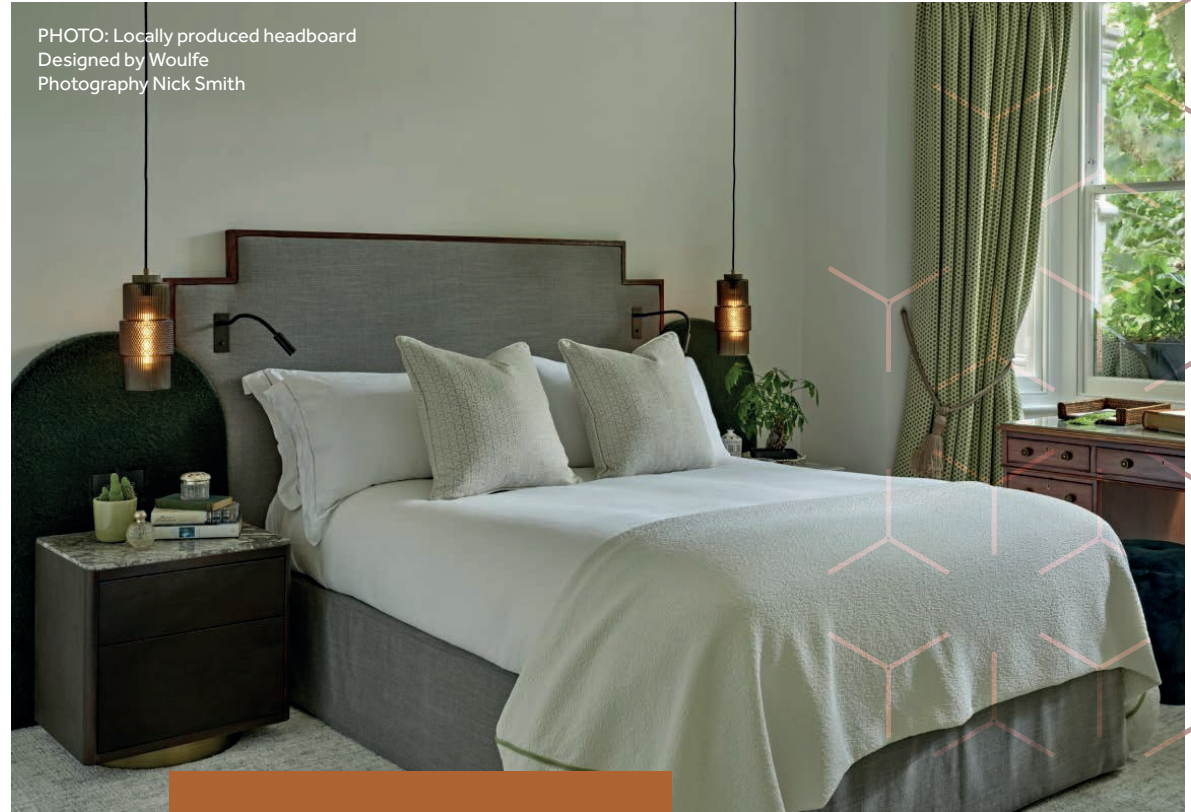
- a) Timber
- b) Paper (including paper wallcovering)
- c) Paint, varnishes, coatings, glues and adhesive
- d) Metals
- e) Glass
- f) Plastics
- g) Cork
- h) Carpets
- i) Fabric
- j) Skins
- k) Ceramics
- l) Stone
- m) Concrete
- n) Plaster

6. FURTHER INFO

Further reading
Acknowledgements

1. HEALTH AND WELLBEING

As well as improved ecological outcomes, sustainable options can also boost health, wellbeing and provide long term cost savings for clients. In the last year of lockdowns, many of us have become aware of our indoor climate and how this can actively affect our mood, productivity and health. By carefully considering the comfort of clients / users and applying biophilic design principles interior designers can make a considerable difference to people and planet. Biophilic design aims to increase a building's occupants connection to nature through spatial design and product specification.



THE AVERAGE PERSON SPENDS ALMOST 90% OF THEIR TIME INDOORS WHERE AIR QUALITY CAN BE 2-5 TIMES WORSE THAN OUTDOOR AIR QUALITY.

Source: WELL Building Standard.

(A) CONSIDERATIONS WHEN DESIGNING

• Noise

- › Is the noise in the space appropriate for use? Is sound proofing necessary to the room or sound attenuation necessary for any machinery?

• Air quality

- › Is there adequate airflow? When adding extraction, check if the air outside the property good quality or if filters should be fitted.
- › Are materials, finishes, and furnishings 'off-gassing' (VOC's in paints, furnishings, fabrics etc).
 - » Consider the health and wellbeing of all involved in the production, delivery and maintenance of a scheme. For example, you should consider initial VOC levels when applying paint, not just off gassing after the paint is dry. The health of the painter is as important as the health of the end user.
- › Are appliances or machinery, creating or releasing harmful toxins such as Particulate matter (PM10 and PM2.5)?
- › More info: <https://www.blf.org.uk/support-for-you/indoor-air-pollution/causes>

• Natural light

- › Access to natural day light improves health and reduces energy expended powering artificial light. Where possible amplify and use natural light sources.
- › Avoid excessive heat gain in the summer through large areas of south facing glazing by careful consideration of the glazing position before install and where necessary solar treatment or window coverings.

• Views of and access to nature

- › Sky, greenery, water are also hugely beneficial and proven to reduce stress, among other benefits.

• Artificial light

- › Is the lighting sufficient for use? Consider task lighting and layers of light for different tasks, times of day and users
- › Does the user have easy control over the lighting? Timers, switches and smart control can be used to achieve this
- › Is it possible to change the light levels during the day in balance with natural circadian rhythms?
- › Are low energy LED light bulbs used, over high energy usage bulbs such as halogen and incandescent?

• Style

- › Natural (or perceived to be) materials through colour or finishes have been known to help improve well being.
- › Consider how materials feel and are interacted with.

• Cleaning / Maintenance

- › Objects and hardware which are touched regularly by multiple people should be easy to clean and maintain.
- › How often is cleaning required and what cleaning products are required? Are these ecologically safe and healthy for inhabitants?

• Society / Community

- › Can you encourage the use of increasingly rare traditional trades and skills to keep them alive?

PHOTO: Residential Lounge
Absolute Project Management
Photo credit: Moon Street Studio



(B) QUESTIONS TO ASK MANUFACTURERS & SUPPLIERS

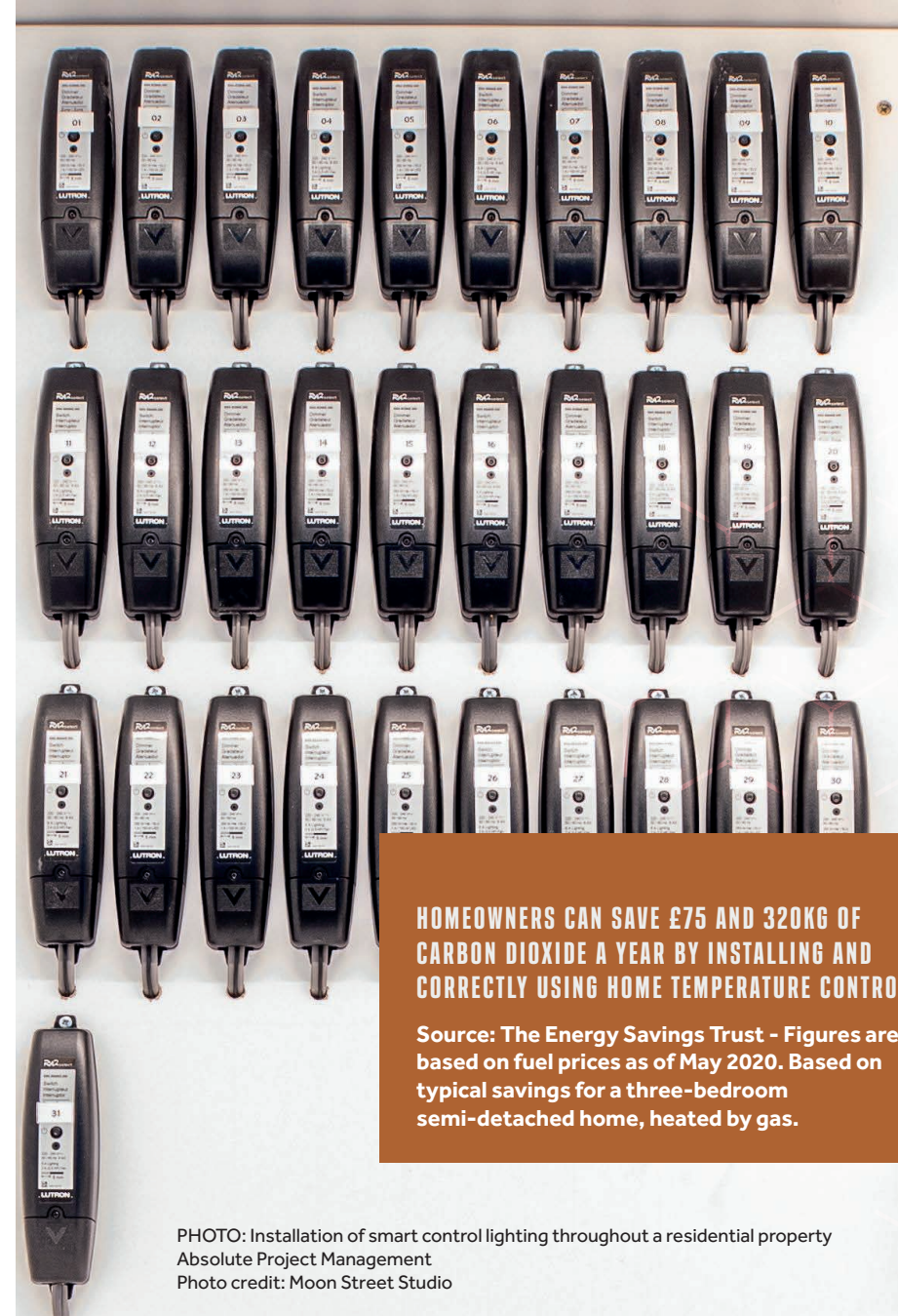
- Does the product or material contain toxic materials and/ or chemicals, known to be detrimental to human (and animal) health? (The [LBC Red List](#) is a good resource indicating the 'worst in class').
- What is the VOC content of their products (at all stages of application/ use and removal) and do they have lower VOC options?
- Are any harmful gasses or particulates released when an appliances/ product is in use? If so which ones, when and how much?
- Are smart controls available?
- How should products be cleaned and maintained? Are the suggested cleaning methods and materials toxic? Are there natural alternatives?
- Is it [Greenguard](#) certified? This is a certification and labelling program for low-emitting interior products and building materials.
- Standards: WELL Building Standard, Fitwel and Building Biology cover guidance on healthy building design and specification.

PHOTO: Residential lounge with TV concealed within unit
Studio Suss
Photo credit: Philip Vile



2. ENERGY CONSUMPTION DURING USE

As homes become more efficient, we're approaching true 'net-zero' dwellings. These are buildings that produce as much energy as they use. With advances in solar technology and automated energy management, homes can either pull from or feed to local energy grids as needed. Whilst newer buildings tend to be more energy efficient, it is not energy efficient to demolish and start from scratch. It is therefore important to value existing buildings and invest/ improve them where possible so they can be used for years to come.



HOMEOWNERS CAN SAVE £75 AND 320KG OF CARBON DIOXIDE A YEAR BY INSTALLING AND CORRECTLY USING HOME TEMPERATURE CONTROLS.

Source: The Energy Savings Trust - Figures are based on fuel prices as of May 2020. Based on typical savings for a three-bedroom semi-detached home, heated by gas.

PHOTO: Installation of smart control lighting throughout a residential property
Absolute Project Management
Photo credit: Moon Street Studio



PHOTO: Photovoltaics and a heat pump added to a renovated existing property
Absolute Project Management
Photo credit: Moon Street Studio



PHOTO: Bespoke home office
Studio Suss
Photo credit: Philip Vile

(A) TIPS

- Undertake an energy survey of the property to identify where improvements can be made.
- Work with a specialist who can advise on green technologies and materials to suit the project (based on many factors such as space, suitability, budget, style, planning restrictions, efficiency and much more).
 - › Are there any planning restrictions? Typical instances could be energy planning constraints for exterior finishes or noise limitations for machinery such as heat pumps or wind turbines.
- Consider whether common use materials be switched for eco versions.
 - › A great example is switching insulation foams for recycled glass wool or natural insulation. You should consider available space, budget and ensure the insulation will reach any required U values for Building regs.
- Work to sustainable building principles or sustainable building accreditations, such as: SKA rating (RICS), BREEAM, LEE, WEL or PASSIVHAUS.
- Utilise government grants and 'green schemes' where possible.

(B) HOME AUTOMATION

- Smart controls allow us to monitor and control energy consumption more efficiently than ever.
 - › Smart heating apps can learn our schedules as well as monitor weather patterns to ensure temperature levels are kept consistent with minimal energy use.
 - › Whole house or combined smart systems can result in further savings. For example, using window shading alongside heating/cooling schedules and smart apps which monitor when people are in the building, ensures minimal energy is consumed and only when necessary.
 - › New appliances or machinery can notify users when maintenance or repairs are needed, allowing for faster more accurate appliance repairs, prolonging the life of the machinery and reducing waste.
- Nearly every room in the home can benefit from modern technology, making homes more efficient reducing their carbon footprint. Examples include:
 - › Automatic blinds which open and close automatically reducing use of artificial light. Additionally the blinds can help with heat loss and/or UV protection minimising overheating inside.
 - › Smart heating can monitor the weather/client habits and adjusts accordingly to maximise comfort and efficiency.
 - › Security: motion sensors for lights and cameras ensure energy is consumed only when necessary.
- CEDIA is a Trade Association for the home technology industry. They provide training, product knowledge including sustainably minded integration.



A 2015 STUDY BY JEAN-NICOLAS, LOUISA ANTONIO, CALOB KAUKO, LEIVISKÄC, EVA PONGRÁCZD FOUND THAT HOME AUTOMATION CAN REDUCE ENERGY CONSUMPTION AND CARBON EMISSIONS BY 13%.

PHOTO: Combined sensor taps with air dryers, producing 72% less CO2 than average hand dryers and up to 68% less than paper towels
Kujira Brighton. Materialise Interiors
Photo credit: Jim Stephenson www.clickclickjim.com

THE UN PREDICTS THAT IN 2021 WE WILL CREATE **52.2 MILLION METRIC TONS OF E-WASTE** (ONE OF THE FASTEST GROWING STREAMS OF WASTE) MANY SMART DEVICES CONTAIN PRECIOUS RESOURCES THAT COULD BE RECYCLED IF THE DESIGN ALLOWED.

Source: UN report: ['Time to seize opportunity, tackle challenge of e-waste.'](#)



PHOTO: Existing Kitchen retained and refreshed with new ironmongery, tiles and A efficient appliances
Absolute Project Management
Photo credit: Moon Street Studio

(C) APPLIANCES

Appliances make up 40% of household electricity consumption. There is a huge potential for saving energy and money through use of smart devices to monitor usage, improving efficiency of existing appliances through servicing or replacing with new efficient appliances (though consider how old appliances are recycled/ reused before replacing).

- Aim for efficiency ratings of A or above. An A+ energy rated appliance can add an extra 10% efficiency to the most efficient rated products.
- Encourage specification for long lasting, quality appliances. Ideally look for brands which offer long warranties and/or servicing.
- Specify appliances that are easy to repair and have parts available.
- Design appliances into spaces so they can be easily accessed for maintenance and follow guideline for their installation to ensure they work efficiently.
- [ENERGY STAR](#) – is voluntary labelling program designed to identify and promote energy-efficient products.

(D) WATER USE

- When specifying, look for water saving devices. For example, low flow taps, showers and dual flush toilets are relatively inexpensive and effective.
- Water saving tap attachments are a retrofittable solution.
 - › Aerators on taps/ shower heads are effective at saving water without compromising on water pressure. Aerators fill the water with little air bubbles by behaving like a sieve, sorting the water into separate streams and mixing it with air. This results in the same pressure, but at a reduced water flow. Aerators don't require any major work or plumbing experience, anyone can fit them easily. For instance, older taps flow at a rate of around 15 litres of water per minute, but an aerator can reduce that to as little as 6 litres.
- Shower sensors learn the temperature that's just right for individuals, reducing energy consumption but can also monitor and time water use, hugely reducing water conservation.
- Smart controls extend to luxury products: pools, spas, or hot tubs can be automated and now, leak detection on plumbing can prevent costly damage and water waste. There are devices available that monitor a home's water pressure, and if an improper drip occurs, those mechanisms can shut off the water main to the house until it can be repaired.
- You can also consider embodied water usage when specifying materials- for example fabrics such as uncertified cotton use large amounts of water to produce.

PHOTO: Water saving Toto WC installed in a new bathroom
Absolute Project Management



IN THE UK EVERY PERSON USES APPROXIMATELY 150 LITRES OF WATER A DAY, A FIGURE THAT HAS BEEN GROWING EVERY YEAR BY 1% SINCE 1930. IF YOU TAKE INTO ACCOUNT THE WATER THAT IS NEEDED TO PRODUCE THE FOOD AND PRODUCTS YOU CONSUME IN YOUR DAY-TO-DAY LIFE (KNOWN AS EMBEDDED WATER) YOU ACTUALLY CONSUME 3400 LITRES PER DAY.

Source: Waterwise.

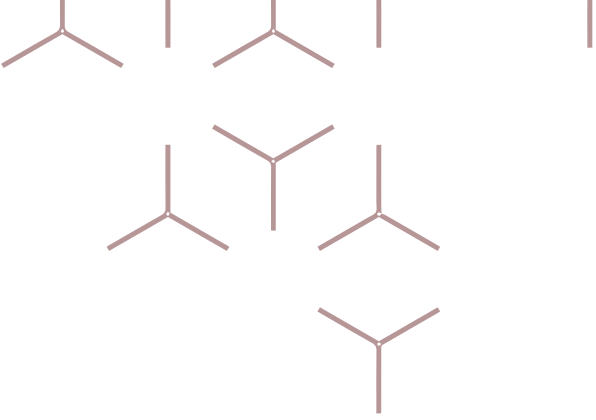


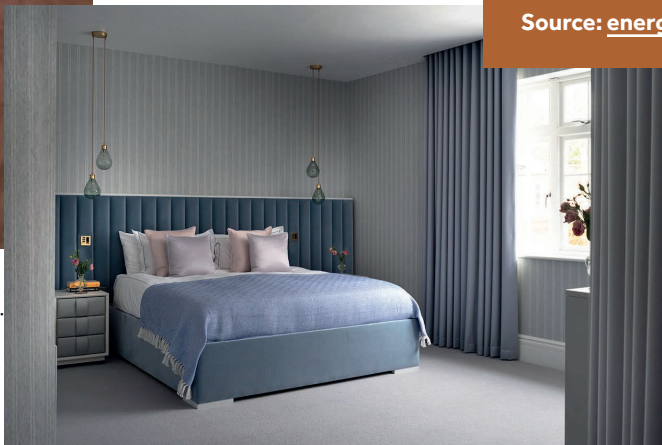
PHOTO: Rooflight with solar treatment to prevent solar gains, with Chandelier underneath
Absolute Project Management
Photo credit: Moon Street Studio



PHOTO: LED version of neon lighting
Kujira Brighton. Materialise Interiors
Photo credit: Jim Stephenson www.clickclickjim.com



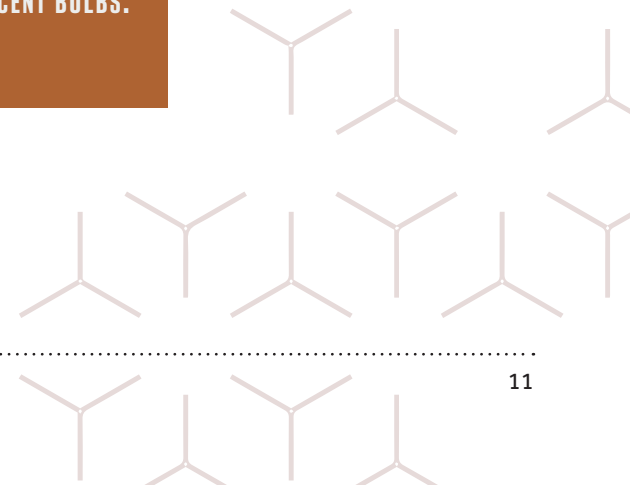
PHOTO: Bedroom Suite
Studio Suss
Photo credit: Philip Vile



(E) LIGHTING

- Maximising daylight in lighting schemes reduces the reliance on artificial light and reduces energy consumption.
- Switching or dimming lights in response to daylight levels, for instance, can save between 20% and 60% of lighting energy (especially when automated).
- Use low energy lighting.
- Use high quality fittings with a long lamp (bulb) life or products that can be returned.
- Consider solar lighting where possible.
- Automate lighting where possible. PIR sensors, presence detection, timers and smart controls can all help monitor and reduce usage.

LED'S USE BETWEEN 25-80% LESS ENERGY AND LAST UP TO 25X LONGER THAN TRADITIONAL INCANDESCENT BULBS.
Source: [energy.gov](https://www.energy.gov).



(F) HEATING AND COOLING

One of the largest consumers of energy within our buildings are heating and cooling systems, including water heating.

If you are carrying out a new build or significant renovation, you may have an opportunity to improve both.

- How well the building retains heat in the winter or remains cool in the summer.
 - › Are the walls, floor, roof effectively insulated, could this be improved and could natural products be used?
 - › Are the doors, windows and rooflights well sealed? Is glazing treated to prevent solar gains?
 - › Is there adequate airflow to prevent damp and ensure good air quality?
- How well the building generates heat and cooling.
 - › Could renewable energy sources be installed on site?
- Or can the client opt for a supplier who supplies renewable energy to the grid?
 - › Can efficiency be improved on the existing heating/cooling equipment? Either through maintenance or upgrades.

AROUND 74% OF THE UK'S HEATING AND HOT WATER DEMAND IN BUILDINGS IS MET BY NATURAL GAS, AND 10% BY PETROLEUM, WITH SMALLER AMOUNTS OF OTHER FUELS SUCH AS COAL AND BIOMASS.

Source: [Climate Change Committee](#).

PHOTO: Smart thermostats allow you to better control heating, lower energy consumption and reduce bills
Absolute Project Management
Photo credit: Moon Street Studio



(3) DESIGN FOR LONGEVITY

BUILDING MAINTENANCE

Through diligent maintenance, we can ensure buildings, machinery and finishes perform optimally and for longer. This saves on running costs, repair costs and waste. Additionally, well maintained properties improve user experience, resulting in happier and healthier occupants/clients.

- Ensure all manuals are handed over upon completion to ensure easy maintenance & repair.
- Consider whole life costs, including maintenance when designing to ensure your design lasts and is not too costly or time consuming to run or maintain.
 - › Awareness of the operational carbon use of a building.
 - › Consider what resources will be available in years to come and whether renewable energy sources may be better (switch from gas to electricity/ generate energy on site?)



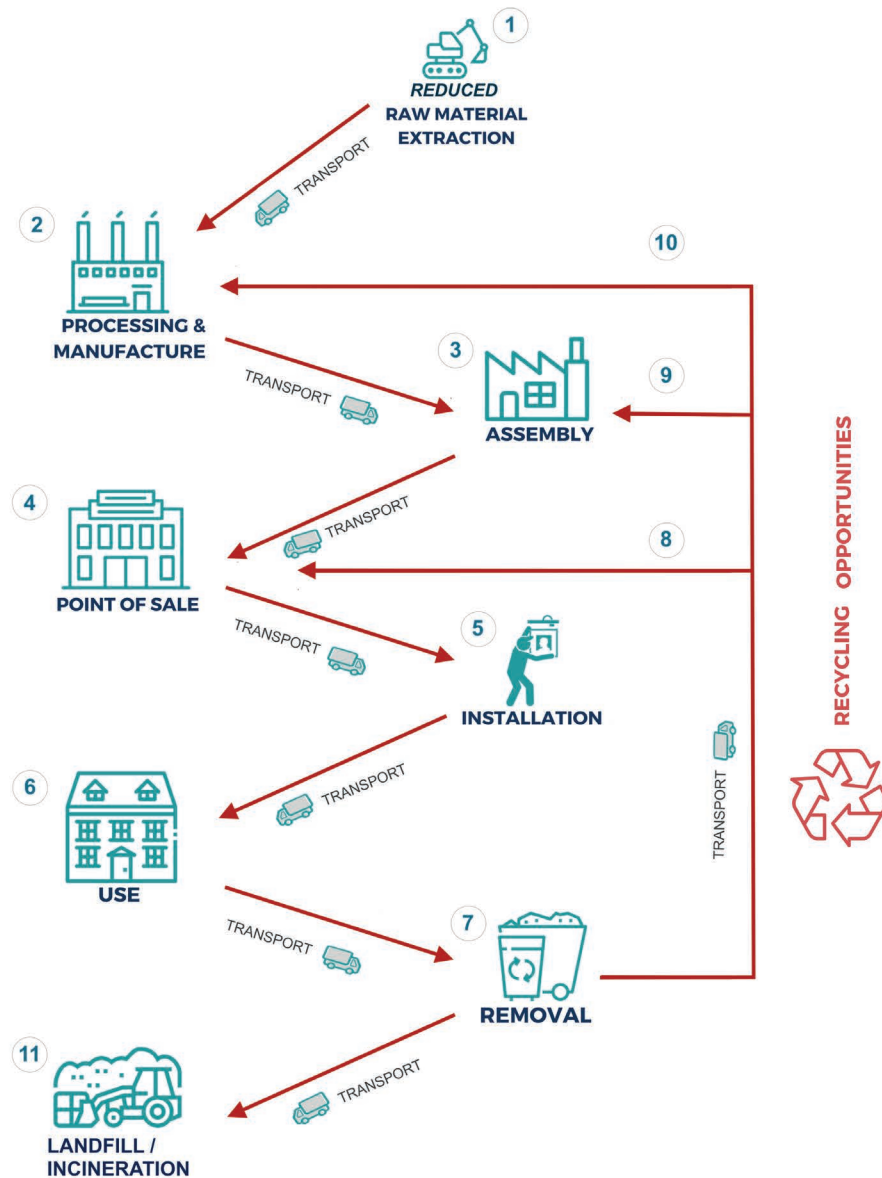
PHOTO: Existing lounge media/storage unit repurposed for children's nursery
Studio Suss
Photo credit: Philip Vile

- Consider benchmarking the scheme to see how it compares against similar projects/ industry standards over its lifecycle and identify where improvements could be made.
- Consider future possible needs of a space and where possible design with this in mind to reduce the need for costly alterations.
 - › Multi use spatial design and component parts which can be reused for schemes.

MAINTENANCE IS THE PROCESS OF ENSURING THAT BUILDINGS AND OTHER ASSETS RETAIN A GOOD APPEARANCE AND OPERATE AT OPTIMUM EFFICIENCY. INADEQUATE MAINTENANCE CAN RESULT IN DECAY, DEGRADATION AND REDUCED PERFORMANCE AND CAN AFFECT HEALTH AND THREATEN THE SAFETY OF USERS, OCCUPANTS AND OTHERS IN THE VICINITY.

Source: Designing Building Wiki.

typical lifecycle
REDUCE > REUSE > RECYCLE



4. PRODUCTS

(A) PRODUCT LIFECYCLE

Every material we specify has a lifespan, from cradle to grave. To accurately assess its full impact- we must consider the energy expended and societal impact at each stage of its existence. The typical route for furniture, fixtures and equipment (FF&E) is **Take > Make > Waste**. However by a) lowering emissions at every step of the cycle and b) lengthening the route from start to finish we can significantly reduce carbon emissions and negative environmental + societal impacts.

YEARLY WE THROW AWAY 1.6 MILLION TONNES OF BULKY WASTE. IF YOU COMBINE THE PERCENTAGES FOR FURNITURE AND BULK TEXTILES (SUCH AS MATTRESSES) IT'S OVER 60%! 51% OF THIS IS EITHER INSTANTLY REUSABLE OR REUSABLE WITH A SLIGHT REPAIR.

Source: WRAP/RSA.

(B) REDUCE/ REUSE/ RECYCLE

1. Raw Material Extraction

Virgin materials require more energy to extract. Where possible reuse existing materials or parts to reduce emissions and negative environmental and societal impacts. Consider:

- › Location: Does extraction cause loss to biodiversity and are there any known issues with child and/or forced labour?
- › Is the material recyclable?
- › Are there recycled alternatives to virgin materials?

2. Processing and Manufacture

- › Avoid materials which have costly manufacturing processes. For example, those which expend lots of energy to create, release toxic waste or have negative impacts on the environment and people.
- › As well as released fumes, consider embodied water usage when specifying materials.
- › If a product is made from multiple smaller products or processes, ensure each part/ level of the supply chain is appraised.

3. Assembly

Consider whether separate parts can be replaced and/or separated. The product is only as durable as its least durable part. Avoid products with built in obsolescence.

4. Point of Sale

Lots of energy is expended in the marketing and sale of a product. For example, energy used in the showroom display, marketing materials and packaging. Is the marketing necessary? Do clients need to visit a physical space or can samples be sent direct? What happens to samples after use? Do brands/suppliers offset their carbon?

5. Installation

How easy is the product to install? If a product is highly likely to break or be damaged during install, it is more likely to end up disposed of and replaced. Work collaboratively with the wider project team to avoid mistakes and waste.

PHOTO: Oars reused as a divider
Materialise Interiors
Photo credit: Teri V Photography



PHOTO: The floor to this newly leased property was completely reusable so was factored into the new design concept Nostos Hove. Materialise Interiors
Photo credit: Jim Stephenson www.clickclickjim.com



13% OF PRODUCTS DELIVERED TO CONSTRUCTION SITES ARE SENT DIRECTLY TO LANDFILL WITHOUT BEING USED.

32% OF LANDFILL WASTE COMES FROM THE CONSTRUCTION AND DEMOLITION OF BUILDINGS.

Source: Designing Buildings Wiki.

PHOTO: Residential Lounge
Absolute Project Management
Photo credit: Moon Street Studio



6. Use

How long will the product be in use compared to the energy required to produce and dispose of it? Encourage clients to value and choose:

- › High-quality items that will have a future resale value without needing to go through more costly repairs or re-manufacture.
- › Design which considers future repairs and ensure parts are available long into the future.
- › Timeless styles, over trends which are likely to go quickly out of fashion, reducing the value of the product or material.
- › Also consider the energy expended whilst the product is in use, either through energy use of the product itself or off gassing (for example the release of VOC's from paints and other finishes).

7. Removal

- › How straightforward is the product to remove? Can it be safely removed, sold and transported to a new owner/ manufacturer or recycling facility?

8. Recycling

- › When specifying products or materials consider whether they can be recycled.
- › The most energy efficient way to recycle is for a product to not require repair or manufacture before re-use. To achieve this, select high quality, desirable and durable products which retain their value.
- › Also consider how you can re-frame people's perception or in some cases aversion to reusing/buying old instead of new. How can you convince clients of the value in existing or old products/ materials?
- › The easiest products to sell on are freestanding rather than bespoke fit.
- › The next most efficient option is for products to be repaired or upcycled. Choose materials which can be reworked, or products which can be easily and cheaply repaired or items which are standard sizes.
- › Finally, the last resort for recycling is to separate a product into its material components which are then each recycled into entirely new products and materials. If compound materials/products are difficult to separate it could be either not possible or too costly to recycle therefore will often spend a lifetime in landfill.
 - › [Urban Mining](#) is a new term for recovering useful materials from waste, especially electronics. 5000 Olympic gold, silver and bronze medals for the Tokyo delayed 2021 games were created from 72,000 tonnes of electronic waste.

9. Landfill and Incineration – The Last Resort

- When a product, material (or packaging for the product/material) can no longer be used or recycled it will be disposed of- either buried in landfill or incinerated. You should consider:
- › how long it will take to break down?
 - › what toxins or gasses it produces when it breaks down or is burned?

- › where it will be disposed of and the impact of the environment/ people nearby?
- › how large and/ or common it is that this item ends up in landfill?

10. Transportation

- At practically every stage of the life cycle, the product needs to be transported.
- › Consider the length, difficulty and impact of this movement.
 - › Additionally, consider any packaging waste at each transportation point.



PHOTO: Recycled pieces of plastic toys turned into childrens furniture
Designed by Woulfe
Photo credit: Nick Smith

(C) CONSIDERATIONS WHEN DESIGNING

- Before the project even starts, take time to pause and evaluate materials, finishes, furniture, and equipment that is present in a space and discuss with client and contractors.
 - › Can anything be retained and reused? Reusing or reinventing a client's furniture and furnishings not only helps reduce negative impact on the environment, it can also reduce sentimental items being sacrificed for the sake of modernisation and enhance a designer's reputation for operating both a thoughtful and sustainable business.
- Cleverly upcycled pieces can add character and are talking points for clients.
 - › Seek out preloved and vintage sources. Apart from the sustainability aspect, a vintage piece in a space is a great way to ground the aesthetic.
 - › Consider collaborating with a professional up-cycler who can offer items from their existing collection to buy, can be commissioned to reinvent a client's current furniture or furnishings or is able to source an original piece for upcycling according to the designer's requirements.
- If vintage or upcycled pieces are not suitable for this project
 - › Can existing items be sold or passed on for reuse by others? There are many furniture recycling companies. Luxury kitchens and office equipment are especially desirable and can be sold, adding cash to the client budget.



PHOTO: Decoupage Vintage Drinks Cabinet
Siren Designs (Dorset)
HOUSE OF UPCYCLING Industry Partner (collective)

PHOTO: Desking was reused in a refresh of this client's new office space
Pavilion Properties
Materialise Interiors
Photo credit: Jim Stephenson
www.clickclickjim.com





AN ESTIMATED 400,000 CHILD LABOURERS IN THE HANDMADE CARPET SECTOR OF INDIA, AS OF 2014.

Source: 'Tainted Carpets - SLAVERY AND CHILD LABOR IN INDIA'S HAND-MADE CARPET SECTOR' report by FXB Center for Health and Human Rights Harvard School of Public Health // Harvard University.

Photo credit: GoodWeave

(D) QUESTIONS TO ASK MANUFACTURERS & SUPPLIERS:

Company / Supply Chain

- Does the supplier have a Sustainability Policy that has substance to it?
 - › These can vary in quality but often the most sustainable suppliers are the most self-critical in their reporting.
- Can you use Fair Trade sourced products?
- Does the company have a [Modern Slavery Act](#) statement/ policy?
- High-risk production sectors such as fabrics and mining may still have issues of child labour, forced labour, and bonded labour.
 - › The [GoodWeave certification scheme](#) addresses child and adult worker exploitation.
 - › You should also consider the location where any materials are extracted and whether they are known to have high incidences of child labour, for example cobalt mining in DRC. (Cobalt is used widely in batteries, paints, dyes and varnishes, amongst other applications.)
- Is the manufacturer/supplier a Living Wage employer?

Product design

- Is it [Cradle To Cradle certified](#)? This is a good certification to use to look at the life of a product, the safe use of chemicals, use of renewable energy & water and social fairness.
- Does this product have an Environmental Product Declaration (EPD)? Having an EPD doesn't mean a product is necessarily environmentally good and healthier. But having an EPD means transparency and makes it easy to compare life-cycle environmental impact of the product when compared to another.
- If a product has recycled content, ask what the percentage of waste material is used. What percentage is post-consumer recycled content and what percentage factory waste recycled content? Try to specify the product with the highest proportion of disclosed recycled material. Higher than 40% is good. Note that disclosed recycled content allows you to check that no toxic materials are included within the recycled content.

Manufacture

- Are production methods waste conscious?
 - › What happens to offcuts?
 - › How efficient/ easy is it to produce the product- are there often breakages/ what happens to imperfect products?
- Do the production operations meet or exceed all relevant local legislation for pollution prevention, waste management and environmental protection?
- What is the embodied carbon of products?



PHOTO: Bathroom design with reclaimed taps, sink and vanity
Absolute Project Management
Photo credit: Moon Street Studio

- Are there any assessment processes in place to know about such as ISO14025 / ISO14001 to monitor environmental management and impact reduction?
- Does the factory use renewable forms of energy?



PHOTO: Kitchen dining table made with recycled scrapwood
Studio Suss
Photo credit: Philip Vile

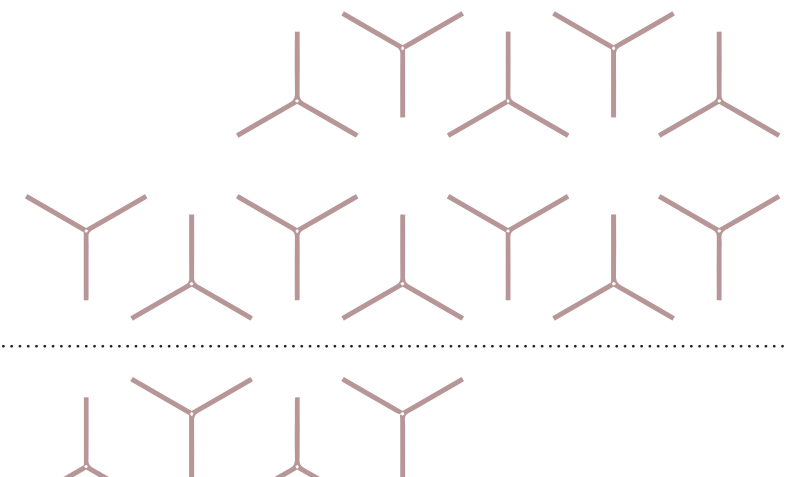


Transport

- Are the products/component parts made in the UK? Look for UK manufacturers (not just UK assembly)
- If outside of the UK, where and how did it travel?
- Is recycled material packaging used or can the packaging be recycled?
- What are the delivery methods? Can air freight be avoided?
- Can deliveries be consolidated or the weight / size of a product reduced for efficient transport?

Recycling/end of life

- Can the product be easily repaired? Are parts readily available/ will they always be available?
- Will an item disassemble easily at the end of its useful life so parts and materials can be recycled or rot? Are there toxins within materials which prevent this happening safely?



THE CONSTRUCTION INDUSTRY IS THE SECOND LARGEST PRODUCER OF PLASTIC WASTE IN THE UK AFTER PACKAGING, GENERATING AN ESTIMATED 50,000 TONNES OF PLASTIC PACKAGING WASTE EACH YEAR.

Source: Changing Streams.



PHOTO: Bedroom work space with worktop made from 100% recycled and recyclable materials
Studio Suss
Photo credit Philip Vile

(E) QUESTIONS TO ASK CONTRACTORS:

Ordering

- Can materials be calculated accurately to minimise wastage?
- How will they recycle product / material packaging?
- Are there more sustainable alternatives for the first fix? For example, sustainable adhesives, insulation, cabling etc.

Waste

- How much of skip waste is recycled / how / where?
- How will they ensure safe disposal or reuse of old appliances?
 - › Local authorities offer varying bulk recycling options.
 - › FF&E – there are several national and local charities that will collect furniture and other items, such as the British Heart Foundation. Furniture will need fire labels to be intact. Alternatively you could consider advertise items for collection on social media.
 - › Consider using schemes such as [Recycle Now](#), [Recycle Your Electricals](#), [Tech Take Back](#), [LITTA](#), [freecycle](#), [Recolight](#) and the [Green Light Alliance](#).

5. MATERIAL SPECIFICATION

Every material has a different origin, application and impact. As specifiers, we are able to encourage suppliers to provide more sustainable alternatives and guide clients to better, healthier choices which consider the whole life story of the material.



PHOTO: Solid oiled parquet - easy to maintain or remove for reuse
Absolute Project Management
Photo credit: Moon Street Studio

IN THE UK, WE IMPORT £7.8BN OF FOREIGN TIMBER EACH YEAR, WHILST NEGLECTING THE POTENTIAL OF OUR OWN FORESTS AND WOODLANDS. ONLY CHINA IMPORTS MORE WOOD THAN THE UK.

Source: Grown In Britain.

YEARLY IN THE UK WE USE AROUND 10 MILLION TONNES OF WOOD AND WOOD PRODUCTS - AND CREATE WOOD WASTE OF NEARLY HALF OF THAT 4.1 MILLION TONNES.

Source: CEI-Bois. Wood – Building the Bio-economy.



PHOTO: FSC Certified staircase, as are the doors to storage underneath
Designed by Woulfe
Photo credit: Nick Smith

(A) TIMBER

The Issues

- As a renewable resource, wood has a much lower embodied energy than many alternatives.
 - However, deforestation is key climate change issue since removing trees both releases carbon dioxide and reduces the amount of carbon dioxide removed by living forests.
 - Sustainably managed forests carefully balance the economic requirements with the habitat of the forest- ensuring an endless cycle of healthy regeneration and resource.
 - Wood from sustainably managed forests will be certified usually either by the [Forest Stewardship Council \(FSC\)](#) or [Programme for the Endorsement of Forest Certification \(PEFC\)](#).
 - Many wood products are covered by the [EU and UK Timber Regulations](#), which make it illegal to place illegally sourced wood on the EU or UK markets respectively. The scope of the EU and UK Regulations are identical in terms of products, however, [this WWF report](#) makes clear that there are some notable omissions.
- › You can verify certificates on their websites - <https://info.fsc.org/certificate.php> and <https://www.pefc.org/>
 - Timber used in furniture production is not always from sustainable sources and may have had environmental and ethical consequences where the wood was harvested.
 - Other issues include transport of timber. The further it has travelled, the larger the embodied energy in the product.
 - Softwood verses Hardwood: Softwood is much quicker to grow making it quicker to replenish. With the right treatment and maintenance, it can last as well as some hardwoods.
 - For manufactured boards, ask what binder has been used. Formaldehyde is widely used in MDF, chipboard and ply and is known to be detrimental to some health conditions. Alternatives are available with natural glue or lower formaldehyde content.
 - What is the life cycle of the product? Can you encourage the client to buy quality that will last? If a short lifespan, can the timber be recycled/ reused? Is it easily separated at the end of its useful life?

PHOTO: Residential Lounge
Absolute Project Management
Photo credit: Moon Street Studio



PHOTO: FSC timber stack
Photo credit: FSC UK



PHOTO: Locally produced headboard FSC Wood
Designed by Woulfe
Photography RoozPhoto

Questions/ Considerations

- Ask for evidence of certification, to ensure the timber is from responsibly managed forests.
- Ask for details of species and country of origin, forest and / or chain of custody certification and supply chain information. Certified product should be labelled and/or include a certification claim on the sales documents.
- Consider using locally Sourced, UK grown wood or recycled & reclaimed timber. Look for [Grown in Britain](#) certification, which confirms it is UK-grown.
- Be flexible about species: some are more readily available with certification than others and can perform just as well. Avoid [endangered or threatened](#) species.
- Carefully consider treatment/ finish of the wood when designing. For example, oil can be easily maintained whereas spray paint is harder to fix and therefore more likely to be thrown away if damaged.
- Building material timber is easier to find sourced from sustainable sources, but that doesn't mean it's a given.

(B) PAPER (INCLUDING PAPER WALLCOVERING)

The Issues

- Timber used for paper production could be from a source that does not have a replanting scheme or even illegally logged timber.
- Recycled materials could be used in some instances, reducing the use of virgin materials.

Questions/Considerations

- Is the paper made from virgin material? If so, is it [FSC](#) certified as coming from a sustainable forest? If yes, ask for details of forest certification and supply chain information.
- If it is not FSC certified, does it have another form of accreditation or certification to evidence that it is sustainable?
- If it doesn't have a certification and the supplier is claiming it to be sustainable, ask for evidence as to what makes it sustainable.
- Is it recycled paper? If so, what percentage is disclosed recycled content, post-consumer recycled content, and factory waste recycled content? Try to purchase the product with the highest proportion of recycled material.
- Has the product received any environmental accreditation such as an [ecolabel](#) certification? If so, it will have to comply with a number of criteria that minimise its environmental impact.

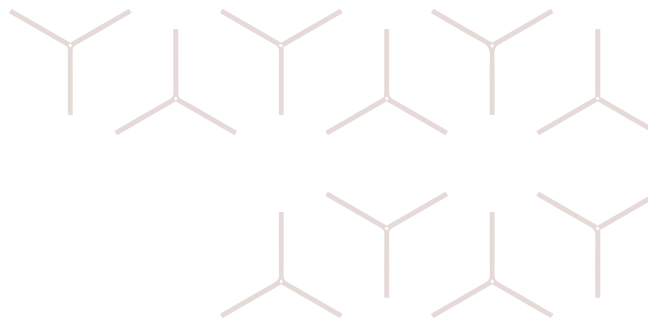


PHOTO: Bedroom with House of Hackney wallpaper
Absolute Project Management
Photo credit: Moon Street Studio

PHOTO: FSC label
Photo credit: FSC UK



DEMAND FOR PAPER ACCOUNTS FOR ABOUT 40% OF THE COMMERCIAL TIMBER CUT WORLDWIDE. WHILE SOME OF THIS TIMBER IS GROWN IN WELL-MANAGED FORESTS AND PLANTATIONS, TOO MUCH OF IT COMES FROM ILLEGAL LOGGING AND THE IRRESPONSIBLE DESTRUCTION OF OLD GROWTH AND HIGH CONSERVATION VALUE FORESTS.

Source: WWF.

(C) PAINT, VARNISHES, COATINGS, GLUES AND ADHESIVES

The Issues

- Many paints, varnishes, glues, and adhesives contain materials harmful to the planet and health.
- Volatile Organic Compound (VOC) content in paint affect indoor air quality and may have negative health effects.
- Petrochemical and plastic content in these substances often end up in landfill or can contribute to ocean microplastics.
- Overestimating or inaccurate calculations can lead to high levels of waste, for example a large amount of paint might be retained for years for 'touch ups' on a project and never used.
- Some ingredients in paint may have been tested on animals within the UK and EU, where required by law. This may extend to final product testing in other jurisdictions.

PHOTO: Bespoke joinery spray painted off site with Low VOC paint
Absolute Project Management
Photo credit: Moon Street Studio

FROM A CONSUMPTION PERSPECTIVE, COATINGS PRODUCTS ACCOUNTED FOR 0.1% OF THE UK'S CARBON FOOTPRINT IN 2016 AND THE CARBON LEVEL IN 2016 WAS 21% OF THAT OF 1990; A NEAR 5-FOLD REDUCTION.

Source: World Wildlife Fund

85% OF PAINTS SOLD IN THE UK HAVE MOVED AWAY FROM SOLVENTS AND ARE NOW WATER-BASED, AND THEREFORE CONTAIN VERY LOW LEVELS OF VOCs

Source: British Coatings Federation

PHOTO: existing flooring retained and new finish samples applied for client consideration
Absolute Project Management

Questions/ Considerations

- What is the amount of VOC in the paint/varnish/glue being specified? The British Coatings Federation runs the VOC Globe Scheme which includes a series of globe logos indicating the amount of VOC in paint, from 'Trace' to 'Very High'. As it is not possible for any paint to be 'VOC free' the 'Trace' logo indicates the lowest possible level.
- How long will VOCs be emitted for after the paint has dried?
- Where is the paint manufactured? How are the ingredients/ the finished product transported to the point of sale?
- Reduce waste:-
 - › Use paint calculators to buy more accurately and avoid waste.
 - › Return/reuse leftover paint. PaintCare is a nationwide UK scheme which aims to increase the use of leftover decorative paint from 2% to 75% by 2030
 - › Recycle empty paint pots after use (if possible)
- To avoid animal tested products, ask if any of the ingredients are required to be tested on animals under current REACH regulations? If yes: historic or current?
- Some more traditional paints have animal-derived content, such as casein (derived from cow's milk), shellac or beeswax. This is not necessarily an issue for some clients/projects, but should be considered/explained particularly if the client has allergies or requires vegan finishes.
- Does the paint have an Environmental Product Declaration (EPD)? Having an EPD doesn't mean a product is necessarily environmentally good and healthier. But having the EPD means transparency and makes it easy to compare life-cycle environmental impact of the product when compared to another.
- Has the product received any environmental accreditation such as an ecolabel certification?
- Does the product contain any heavy metals or heavy metal compounds, in particular antimony, arsenic, cadmium, chromium VI, lead, mercury, or selenium?
- Does the product contain any halogenated solvents?
- Does the production operations comfortably exceed all relevant local legislation for pollution prevention, waste management, and environmental protection?.
- Does the product contain phthalates?

(D) METALS

The Issues

- Aluminium can be reprocessed and reformed endlessly, and the metal loses none of its quality during the recycling process. There is no need to use virgin aluminium.
- If a metal is coated with or contains any other material, it may render it incompatible with the recycling system.
- Heavy metals, in particular lead, cadmium, mercury and hexavalent chromium have particularly severe toxicological effects on human health. If released into the environment, heavy metal pollutants are persistent and have the potential to accumulate in organisms and biomagnify in food chains.
- Whilst chrome plated products are durable and widely used, there are significant health and environmental hazards associated with production and disposal. Chromium VI is considered highly toxic, alongside other substances such as cadmium and cyanide which is also used in the plating process.

Questions / Considerations

- If specifying aluminium, use recycled aluminium.
- What is the percentage of recycled content, post-consumer recycled content and factory waste recycled content? Try to specify the product with the highest proportion of recycled material.
- Is the metal coated with any other material? If the metal contains 'contaminant' material, can you confirm that it is less than 5% by weight?
- Can chrome plating be avoided?
- If solders are used, do they contain any heavy metals?
- Do the production operations comfortably exceed all relevant local legislation for pollution prevention, waste management and environmental protection?

RECYCLING ALUMINIUM SAVES AROUND 95% OF THE ENERGY NEEDED TO MAKE THE METAL FROM RAW MATERIALS. ALONG WITH THE ENERGY SAVINGS, RECYCLING ALUMINIUM SAVES AROUND 95% OF THE GREENHOUSE GAS EMISSIONS COMPARED TO THE 'PRIMARY' PRODUCTION PROCESS.

Source: Alupro.



PHOTO: Recycled and recyclable aluminium external signage
Kujira Brighton. Materialise Interiors
Photo credit: Jim Stephenson www.clickclickjim.com

BOTH METAL AND GLASS CAN BE RECYCLED AGAIN AND AGAIN WITHOUT LOSS OF QUALITY. AROUND 95% LESS ENERGY IS USED TO MAKE PRODUCTS FROM RECYCLED MATERIALS THAN USING RAW MATERIALS.

Source: Recycle Now.



PHOTO: Designed by Woulfe
Photography Nick Smith



PHOTO: Reclaimed stained glass reused as loft hatch to bring natural light from roof light.
Absolute Project Management.
Photo credit- Moon Street Studio



PHOTO: Glass tables and counters using recycled glass collected in Brighton. 95 recycled bottles were used per square metre
Kujira Brighton
Materialise Interiors
Photo credit: Jim Stephenson www.clickclickjim.com

(E) GLASS

The Issues

- Coatings may prevent recycling.
- Only a small percentage of recycled glass is used in the industry.
- Glass is heavier than other clear materials such as plastic and can easily break during transit.

Questions / Considerations

- Give preference to glass with recycled content. Specify that with the highest proportion of recycled material.
- Before removing/recycling, consider whether existing glass fittings can be upgraded. Existing windows could be solar treated or removable films added to improve/update without full replacement. You could consider secondary glazing to provide desirable improvements (such as heat/noise insulation) rather than full replacement of existing casements.
- Specify glass appropriately, avoiding it in places where it could easily be damaged or broken during transit, installation or use.

(F) PLASTICS

The Issues

- 8 million tonnes of plastic end up in the ocean every year, causing huge damage to eco systems and marine life.
- Plastics are estimated to take up to 500 years to decompose and can leak toxins or micro plastics into the surrounding environment.
- Phthalate plasticisers are used in the manufacture of PVC. Certain phthalate esters have been shown to be persistent in the environment and oestrogenic (mimicking the female sex hormone, oestrogen, and therefore potentially disrupting the reproductive system).
- Use of virgin materials, when recycled could be used instead.

Questions / Considerations

- What percentage is recycled content, post consumer recycled content and factory waste recycled content? Try to purchase the product with the highest proportion of recycled material. Aim for at least 40% recycled content. Look for the use reused PET bottles (Polyethylene terephthalate) and ocean plastic recycling and yarns such as Econyl.
- Has the product received any environmental accreditation such as an ecolabel certification?
- Does the product contain phthalates (avoid where possible)?
- Are there alternative materials, such as bioplastics (which biodegrade quicker/safely) that you could use?



THE CONSTRUCTION INDUSTRY IS THE SECOND LARGEST PRODUCER OF PLASTIC WASTE IN THE UK AFTER PACKAGING, GENERATING AN ESTIMATED 50,000 TONNES OF PLASTIC PACKAGING WASTE EACH YEAR.

Source: Changing Streams.

PHOTO: Recycled and recyclable plastic worktop
Studio Suss
Photo credit: Philip Vile

(G) CORK

The Issues

- Like other timber products, cork can be an endlessly renewable and sustainable material (it takes 25 years for a tree to reach harvesting age. Its bark is then removed by hand with a small axe every nine years. The tree can live over 200 years, regenerating its spongy coat up to 20 times). Legislation, such as that in place in Portugal, can guarantee that the cork is sustainable. Cork is harvested from the bark of the cork oak. When the tree has been stripped of bark, it often absorbs 3-5 times more CO₂ whilst regenerating.
- Cork is not as long lasting as other wood based products, therefore PVC is sometimes used/added to the product (see Plastics).
- Urea formaldehyde is a suspected human carcinogen and is sometimes used as a binder in cork flooring.

Questions/Considerations

- Is the cork from a sustainably managed source?
- What is the cork treated with? What chemicals are used? Consider untreated cork if possible/ appropriate for use. Avoid using cork in areas where it could get quickly worn or stained and removed.
- Can the product be recycled after use?



CORK OAK FORESTS ARE NATURAL CO₂ RETAINERS, THE MAJOR CAUSE OF GLOBAL WARMING. IT IS ESTIMATED THAT EVERY YEAR CORK OAK FORESTS RETAIN UP TO 14 MILLION TONNES OF CO₂, A SIZEABLE CONTRIBUTION FOR REDUCING GREENHOUSE GAS EMISSIONS, THE MAIN CAUSE OF CLIMATE CHANGE.

Source: APCOR - the employers' association of the Portuguese cork industry.

A 2014 STUDY FOUND THAT 37% OF WORKERS IN INDIA'S HAND-MADE CARPET SECTOR SUFFER FROM FORCED LABOUR UNDER INTERNATIONAL LAW'

Source: Forbes, 2014



PHOTO: The GoodWeave numbered label on a rug signifies child-labour-free
Photo credit: GoodWeave

(H) CARPETS

The Issues

- Animal welfare: wool, angora, silk,
 - › Wool may come from sheep that have been mulesed. Surgical mulesing is controversial procedure which removes wool bearing skin from a sheep to prevent blowfly strike.
- Child labour and forced labour in some carpet production. Many rugs are hand-made (knotted, tufted, woven) and these rugs are typically not produced by the exporter but by sub-contractors and home workers.
 - › These informal workers are hidden from view, unprotected and exploited.
 - › The use of child, forced and bonded labour is widespread within these hidden supply chains.
 - › The use of child labour (under 14 years old) is illegal in most producer countries.
 - › Child labour prevents children from attending school & getting an education.
 - › Children are often forced to work up to 16 hours per day for little, if any pay. This practice perpetuates extreme poverty, poor health & shortened life.
 - › Forced & bonded adult labour traps adult workers into inflated debt & exploits them.
- Very low recycling rates of carpet.
- Carpets can be easy to damage and difficult to patch repair, therefore are often replaced quickly.

Questions / Considerations

- Is it Responsible Wool? Is mulesing used in the production of the wool used? Wool from South Africa, New Zealand, China and South America is considered lower risk as these sources suffer much lower incidents of blowfly and mulesing is not commonly used.
- Has the wool come from farms with the highest animal welfare practices to protect sheep?
- Is it recycled wool? What percentage is recycled content, post consumer recycled content and factory waste recycled content? Try to purchase the product with the highest proportion of recycled material.
- Where is the carpet made? When buying from countries where child labour is known to exist e.g. India, Nepal, Afghanistan, insist all rugs are independently certified and labelled by an independent scheme such as GoodWeave. Doing so will provide the best assurance that no child or adult was exploited in the production of your product.
 - › GoodWeave Certification provides the best assurance that the rugs being purchased (or recommended) have been produced ethically without the use of child, forced or bonded labour.
 - › GoodWeave operates in India, Nepal and Afghanistan and therefore anyone purchasing GoodWeave labelled rugs made in those countries should be reassured.
 - › GoodWeave is working with the carpet industry in those countries and making a real, positive difference – the more designers insist on GoodWeave certified rugs, the more producers will accept that they need to provide credible, independent proof that no child, force or bonded labour was used in the production of their rugs, by them or any of their subcontractors and/or homeworkers in the supply chain.
- Be aware that some third-party certification schemes can be little more than a tick-box or self-certification with no independent authority and no remediation. You may need to do your own due diligence and research.
- Encourage clients to buy quality, long lasting carpets and rugs.
 - › Consider colour (darker or patterned may hide stains more easily)
 - › Material and usage (coir, sisal and seagrass work well in high traffic areas)
 - › Consider the users (loop carpets are best avoided for clients that have cats/ dogs/ stilettos!). You may also need to consider carpets which have been mothproofed, though this can introduce chemicals/ toxins to the product. Thorough and regular cleaning/ vacuuming can help prevent a moth infestation.
 - › Ensure the carpet can be easily maintained and will last as long as possible- where possible get the manufacturer to provide maintenance details/ cleaning kits.
- Use a recycling scheme to recycle old carpets.
<https://carpetrecyclinguk.com/find-a-recycler/>
- If using carpet tiles, use a glueless system that allows easy removal and recycling of materials.

(I) FABRICS

The Issues

- High water use (water footprint) of some fabrics such as non-organic cotton.
- Pesticide use to produce some fabrics which contributes to greenhouse gas emissions and affects biodiversity.
- Consider the use of bleaches, dyes, inks and pigments used.
- Toxic fire-retardant chemicals are often applied to materials for furnishings.
- Forced labour and forced child labour has been reported in cotton production.
 - › "New evidence from Chinese government documents and media reports shows that hundreds of thousands of ethnic minority laborers in Xinjiang are being forced to pick cotton by hand through a coercive state-mandated labor transfer and "poverty alleviation" scheme, with potentially drastic consequences for global supply chains. Xinjiang produces 85 percent of China's and 20 percent of the world's cotton."
Source: [Center For Global Policy](#) report, December 2020
- Animal welfare in some wool production (see Carpets).

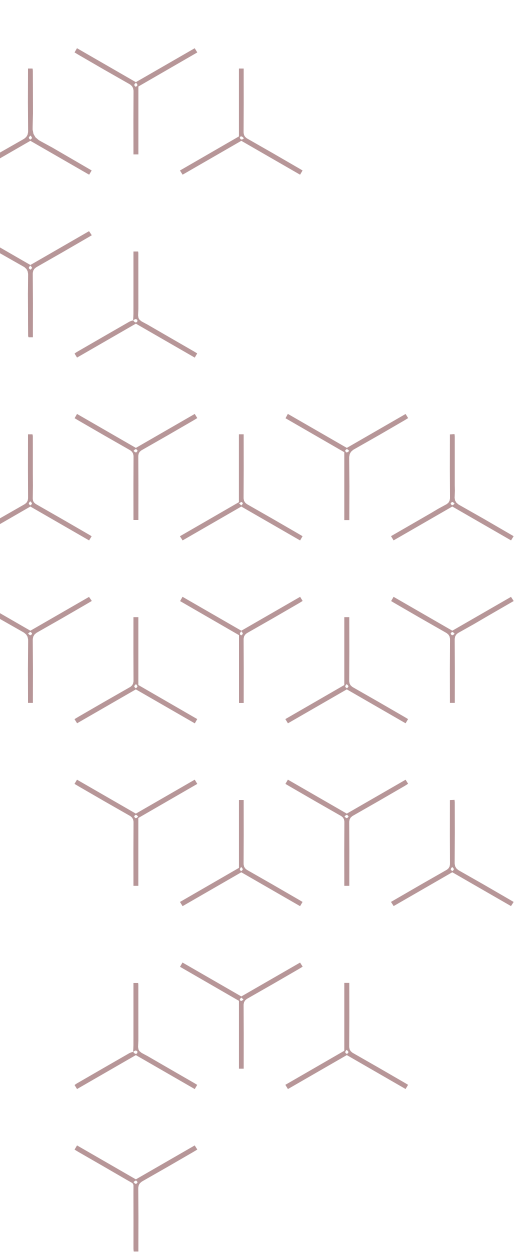
GROWING ORGANIC COTTON PRODUCES UP TO 94% LESS GREENHOUSE EMISSIONS THAN CONVENTIONAL COTTON.

Source: Soil Association.

PHOTO: Residential Lounge
Absolute Project Management
Photo credit: Moon Street Studio

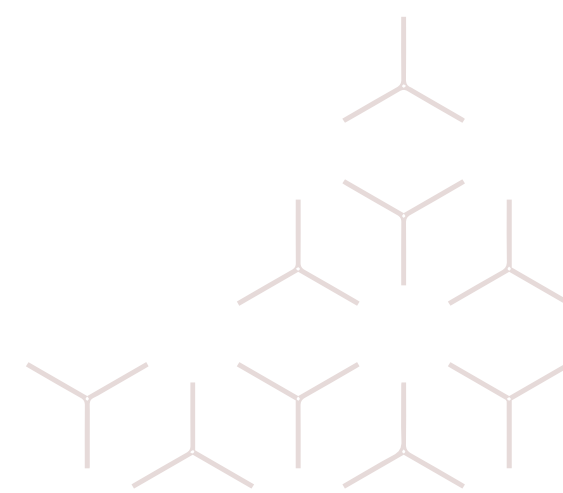


PHOTO: Designed by Woulfe
Photography Nick Smith



Questions / Considerations

- Using cotton that is Global Organic Textile Standard (GOTS) or Soil Association certified means as well as being pesticide and GM (genetically modified) free, social criteria and criteria on chemicals and dyes are followed.
- Also look for Better Cotton Initiative for improved environmental practices of cotton production and improve livelihoods and working conditions.
 - › Uncertified cotton uses large amounts of water to produce.
 - › [The Soil Association](#) found that organic cotton uses around 91% less water among other social and environmental benefits.
 - › Ask about the fabric source. The following countries have incidences of forced and child labour in the production of fabrics according to the U.S. Department of State: Argentina, Azerbaijan, Benin, Brazil, Burkina Faso, Cameroon, China, Egypt, India (cottonseed), Kazakhstan, Kyrgyz Republic, Mali, Pakistan, Tajikistan, Togo, Turkey, Turkmenistan, Uzbekistan, Zambia.
- To ensure safe chemical use ask if the fabric is [GreenScreen](#) or [Oeko-Tex](#) certified.
- Questions to ask regarding fire rating: Can this be supplied with an alternative that doesn't need fire retardant? If fire retardant is required, what chemicals are used and are they safe?
- Has any recycled fibre been used? If so, what percentage is recycled content, post-consumer recycled content and factory waste recycled content? Try to purchase the product with the highest proportion of recycled material. NOTE: Avoid using recycled fibres in washable fabrics as they are known to be source of microfibre pollution in rivers and oceans.
- Look for Coex natural fire retardant (ensure its suitability for its application) instead of toxic fire retardants added to fabrics.



(J) SKINS

The Issues

- Chemical usage: the use of chrome tanning and chemicals in leather processing.
 - › Chrome tanning became the most common and dominant form of tanning, adopted rapidly because the process was much faster than vegetable tanning and therefore cheaper to produce. There are varying reports on the impact of chrome tanning.
 - › Under certain conditions, trivalent chromium, the form most commonly used in tanning, can oxidise into hexavalent chromium, which is carcinogenic and can harm humans and animals when it leaches into the water supply.
- High water footprint and gas emission of livestock.
- Deforestation to make way for farming land- has huge environmental impact (see timber section).
- Animal welfare.

Questions/ Considerations

- Ask what type of chrome tanning is used. Approximately 0.5 to 0.6% of the population have a chromium VI allergy. For those who are allergic, even the slightest amount of chromate is enough to cause inflammatory skin reactions, such as swelling, blisters, itchy red spots and peeling.
- Explore alternatives: Look for alternatives to animal leathers using waste but avoid petrochemical based options which can be seen as replacing one issue with another.
 - › Leather alternatives made from food waste including fruits, seafood shells and coffee grounds.
 - › Leather alternatives made from sources including mushrooms, cactus, cork and fish.
 - › Bio leather: lab grown leather using cells, proteins and other living materials. Uses animal fat, blood and bones.

PHOTO: Designed by Woulfe
Photography Nick Smith

CHROME-BASED PROCESSES IN LEATHER TANNING HAVE LONG BEEN A CONCERN IN TERMS OF THEIR POTENTIAL ENVIRONMENTAL IMPACT.

Source: 'Major step forward for environmentally friendly leather tanning' European Commission.



(K) CERAMICS

The Issues

- Embodied energy in manufacture: some ceramics, particularly those with glazes can require extreme temperatures to manufacture. Well managed efficient kilns and non-toxic glazes can be chosen to ensure a more sustainable product.
- Use of virgin materials and high-water usage during production.
- Ceramics can be recycled though rarely are.

Questions/ Considerations

- Look for recycled content.
- Look for third party accreditations such as [Greenguard](#). This certification signifies the ceramic (floor, wall and porcelain) products meet the strict requirements for low chemical emissions in homes, businesses and commercial buildings.
- Avoid ceramic products which can easily break during manufacture, transport, installation and use.
- Consider glazes: these may make the product last longer but may prevent recycling. Can the product be reused another way. For example, broken tiles can be added to the bottom of plant pots for drainage).
- Ask whether the factories producing the ceramics have any ISO14001/2, EMAS, LEED or ECOLABEL accreditation. If not do they have systems in place to reduce their environmental impact such as recycling production water, recycling waste energy from kilns or using renewable energy in factories?

CLAY-BASED CERAMICS CAN HAVE A MUCH SMALLER CARBON FOOTPRINT THAN MODERN MATERIALS LIKE GLASS, CONCRETE AND STEEL THAT DOMINATE MODERN BUILDING TECHNIQUES. A SIMPLE CERAMIC TILE HAS AN EMBODIED ENERGY OF 2.5 MEGAJOULES PER KILO, COMPARED TO 227 FOR ALUMINIUM.

Source: Ceramics as digital technologies for more sustainable buildings. University of Liverpool.



PHOTO: Dry-pressed ceramic tiles
Designed by Woulfe
Photo credit: Nick Smith



PHOTO: Reclaimed stone tile floor
Photo credit: Lapidica

THE WORST WORKER EXPLOITATION IN THE WORLD IS IN THE RAW COMMODITY WORLD. IT IS THE MOST HIDDEN AND THE MOST DIFFICULT TO IMPROVE, BECAUSE THE BRANDS CONSUMERS KNOW AND ENGAGE WITH ARE NOT THE ONES WHO PURCHASE RAW MATERIALS.

Source: Responsible Sourcing Network.

(L) STONE

The Issues

- Poor and unsafe working conditions for miners
- Mining of resources: negative impact on the surrounding environment and communities.
- Slab marbles and stones are heavy to transport and resource intensive.
- High wastage during production, transport and installation. For every slab that is used an equal or greater amount of off-cut marble is wasted.

Questions/ Considerations

- Ask about material origins and supply chain involved. The [Ethical Stone Register](#) encourages companies involved in the production and supply chain of stone products, to register, declare and verify responsible and ethical sourcing practices.
- Consider alternatives:
 - › Recycled/reclaimed stone.
 - › Reprocessed waste/offcuts. Opt for terrazzo that is using a recycled content rather than virgin content. Ask which method is used.

(M) CONCRETE

Cement production is the third ranking producer of anthropogenic (man-made) CO₂ in the world after transport and energy generation.

The Issues

- The cement industry contributes seven per cent of global anthropogenic CO₂ emissions. Portland cement (the most widely used) requires quarrying which can cause airborne pollution (toxic dust), followed by further pollution from kiln firing.
- During installation and removal, workers are often exposed to silica dust which can cause lung diseases such as silicosis.
- Concrete causes significant damage to topsoil, often through creation of hard surfaces which stop ground water absorption, creating water run off/ flooding and soil erosion.
- Concrete is nonetheless is considered a fairly sustainable product since it consumes minimal energy during construction compared to other materials and lasts an extremely long time without requiring maintenance. Concrete can also build thermal mass which helps naturally control indoor temperatures, reducing the need for additional heating/ cooling energy use.

Questions/ Considerations

- Consider the application and how long the concrete finish will be in place. Make use of concrete in long term schemes and avoid in schemes where you know the product is likely to end up in landfill quickly.

- Are there alternatives that be used which will perform just as well or better? For example, hempcrete, recycled plastics, wood, mycelium, ferrock, ashcrete, or timbercrete.
- Retrofitting/renovating/reusing reduces embodied carbon significantly rather than starting from scratch.
- Concrete can be recycled and used as aggregate or as gravel for a wide range of applications. Larger pieces of concrete are often used to prevent erosion in streams or on shores.

CEMENT PRODUCTION IS THE THIRD RANKING PRODUCER OF ANTHROPOGENIC (MAN-MADE) CO₂ IN THE WORLD AFTER TRANSPORT AND ENERGY GENERATION.

Source: The World Business Council For Sustainable Development. The Cement Sustainability initiative.

PHOTO: Micro Cement wall and floor finishes
Absolute Project Management
Photo credit: Moon Street Studio

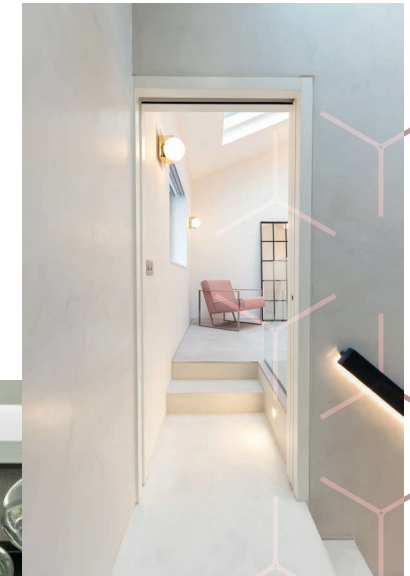


PHOTO: Designed by Woulfe
Photography Nick Smith



(N) PLASTER

The Issues

- The main environmental impacts associated with plasterboard result from the production process, transportation and disposal, however overall plasterboard is considered a sustainable material comparatively since it has smaller embodied energy and can be fully recycled.
 - › Plasterboard is typically made from gypsum and paper. Natural gypsum is mined in the UK, alternatively synthetic gypsum is made as a byproduct at coal fired power stations.
 - › Plasterboard is easily broken and damaged during transport and construction. Additionally, wasted plasterboard offcuts are assumed to account for 5-30% of new plasterboard production.
 - › Plaster and plaster board can be recycled though often aren't.
 - › If sent to landfill, gypsum in plasterboard can give off toxic fumes when disposed of alongside biodegradable waste. It should therefore be separated or recycled where possible.

Questions / Considerations

- Design out waste: better calculation of quantities to reduce wastage.
- Plasterboards are often 100% recyclable: look for recycled content when buying and recycling schemes when removing. Recycled plasterboard can be used in production of new plasterboard, as an ingredient for cement, or even to improve soil.

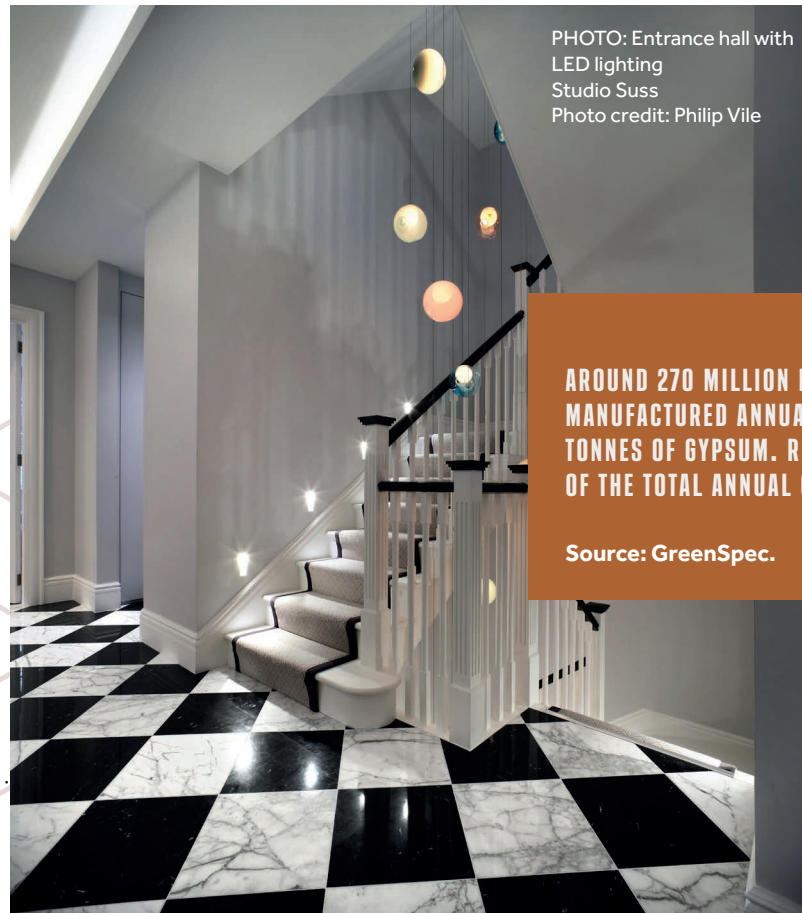


PHOTO: Entrance hall with LED lighting
Studio Suss
Photo credit: Philip Vile

AROUND 270 MILLION M2 OF PLASTERBOARD IS MANUFACTURED ANNUALLY USING SOME 3 MILLION TONNES OF GYPSUM. REPRESENTING AROUND 60% OF THE TOTAL ANNUAL OUTPUT.

Source: GreenSpec.

FURTHER READING

BOOKS:

- › 'The Re-Use Atlas: A Designer's Guide Towards a Circular Economy'
by Duncan Baker-Brown
- › 'Wasted - When Trash Becomes Treasure'
by Katie Treggiden
- › 'Cradle To Cradle - Remaking the Way We Make Things'
by Michael Braungart & William McDonough

ONLINE RESOURCES:

- › The Ellen MacArthur Foundation
- › Friends of the Earth
- › Global Forest Watch
- › GoodWeave
- › List of Goods Produced by Child Labor or Forced Labor (2020)
- › Healthy Materials Lab
- › House of Commons Environmental Audit Committee Toxic Chemicals in Everyday Life
- › Supply Chain School
- › Blue Patch Directory (sustainable British and Irish brands)
- › Building Green
- › Carbon Literacy
- › One Million Lives (mental health and wellbeing app)
- › Modern Slavery Act
- › Architects Climate Action Network (ACAN) Circular Series
- › Government guidance on measuring/reporting energy use and emissions
- › Slavery Calculator
- › Ecological Footprint Calculator
- › Ethical Consumer paint guide
- › Good Shopping Guide - Paint
- › How To Reduce Microplastics from Paint
- › Changing Streams
- › Government guidance on Transparency in Supply Chains
- › International Labour Standards on Forced Labour

ARTICLES:

- › <https://healthymaterialslab.org/product-health-reporting>
- › <https://www.soilassociation.org/take-action/organic-living/fashion-textiles/organic-cotton/>
- › <https://www.bbc.com/future/article/20200407-urban-mining-how-your-home-may-be-a-gold-mine>
- › <https://www.theguardian.com/environment/2019/mar/12/resource-extraction-carbon-emissions-biodiversity-loss>
- › <https://www.theguardian.com/sustainable-business/2016/oct/25/urban-mining-recycling-waste-buildings-offices-cities>
- › <https://goodweave.org/wp-content/uploads/2020/02/GWI-Remediation-Policy-logoupdate-v.4-Jan-2016.pdf>
- › <https://eandt.theiet.org/content/articles/2020/01/can-mining-ever-go-green/>
- › <https://www.ft.com/content/9194c7ee-9726-4462-ae04-e7c72c0818d4>
- › <https://www.theguardian.com/global-development/2016/jan/19/children-as-young-as-seven-mining-cobalt-for-use-in-smartphones-says-amnesty>
- › <https://www.theguardian.com/global-development/2018/oct/12/phone-misery-children-congo-cobalt-mines-drc>
- › <https://faraday.ac.uk/wp-content/uploads/2020/05/Insight-cobalt-supply-chain1.pdf>
- › <https://respect.international/responsible-cobalt-initiative-rci/>

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