FINISHES & INTERIORS SECTOR

The fundamentals of sustainable design in fit-out

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Programme

Introduction
Peter Kelly, Group Director of Sustainable Operations, ISG

Avoiding waste in the fit-out process
Dr Katherine Adams, Director, Re-usefully

Low carbon fit-out
Penny McCallum, Environmental Manager, BW

Re-use and the potential for urban mining
Adam Strudwick, Principal, Corporate Interiors, Perkins&Will

Peter Kelly
Group Director of Sustainable Operations, ISG

The fundamentals of sustainable design in fit-out

Dr Katherine Adams
Director, Re-usefully

Avoiding waste in the fit-out process

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Avoiding waste in the fit out process

28th February 2023

Katherine Adams and Gilli Hobbs, Reusefully Ltd

FIS Conference: Destination workspaces: places where people want to be

Global resources

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- UNEP report **Global Resources Outlook March 2019**
- **Since 1970 –** global population has **doubled**, the extraction of materials has **tripled**
- Extraction and processing of natural resources accounts for more than **90%** of our biodiversity loss and water stress & approximately **50%** of GHG emissions
- UK perspective:
  - Decline in consumption (linked to increased imports). Only **20%** of resources are from secondary sources in UK
  - Net importer e.g. Construction products/materials imports more than **double** the value of exports, resulting in a trade deficit of **£9 billion**

Construction, demolition and excavation waste

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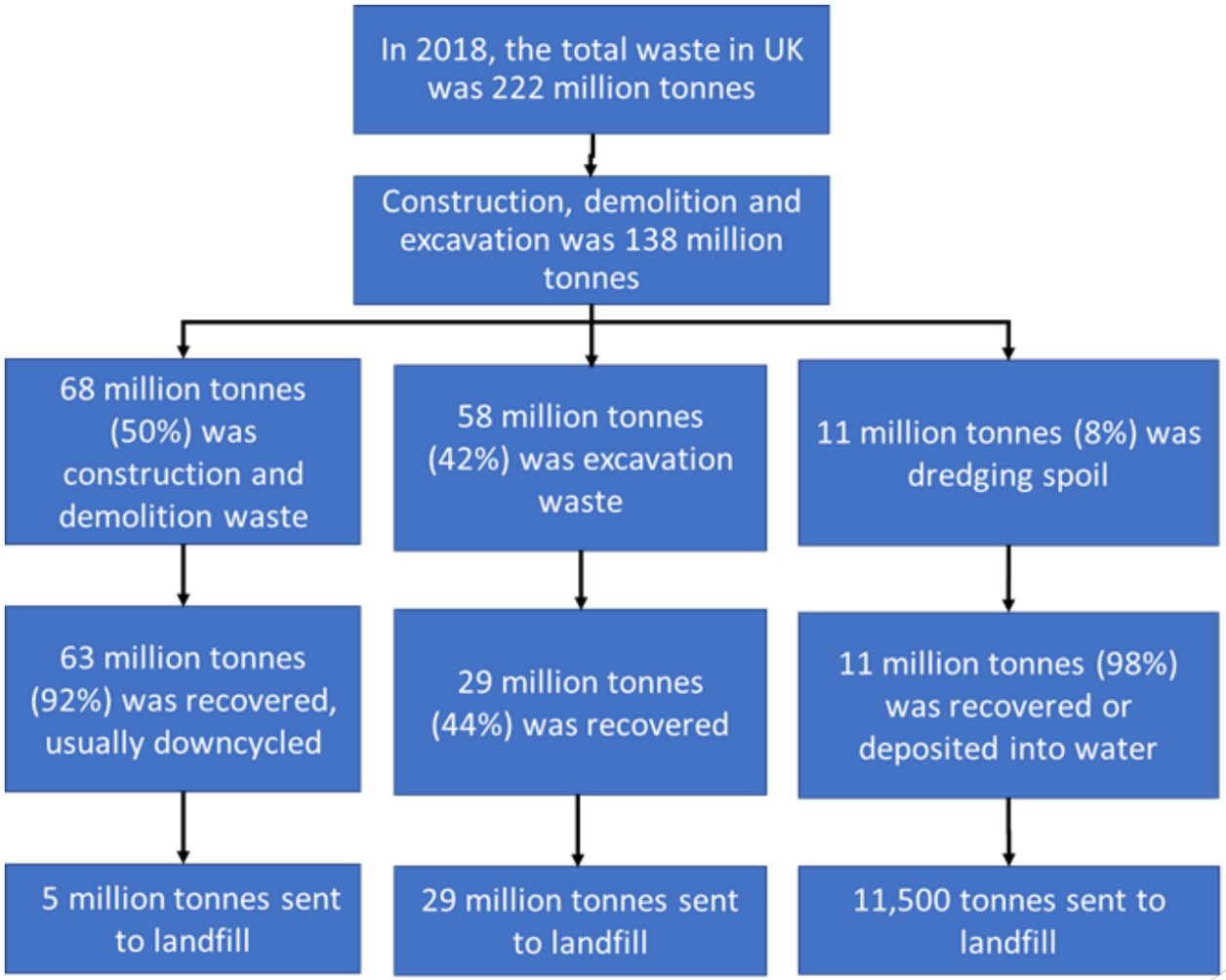
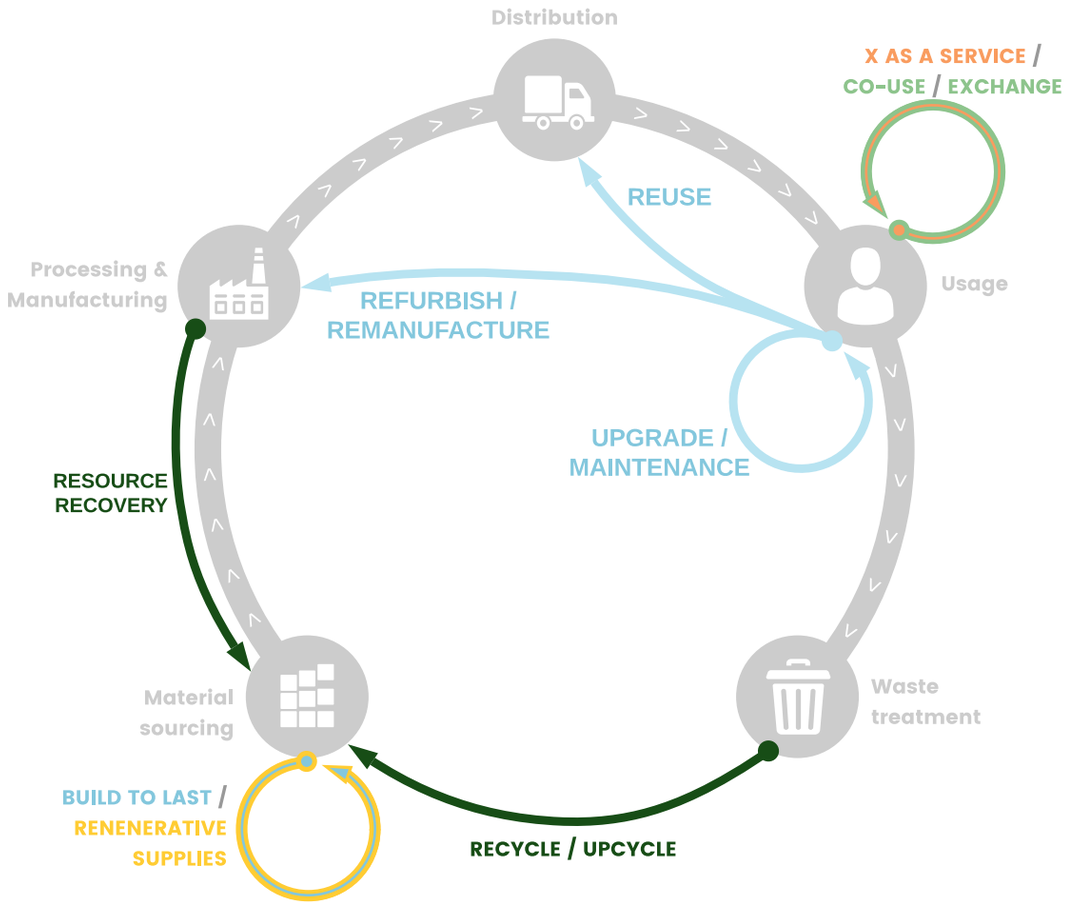


Circular economy

reusefully



https://root-sustainability.com/knowledgehub-circular-economy/

Embodied carbon and circularity

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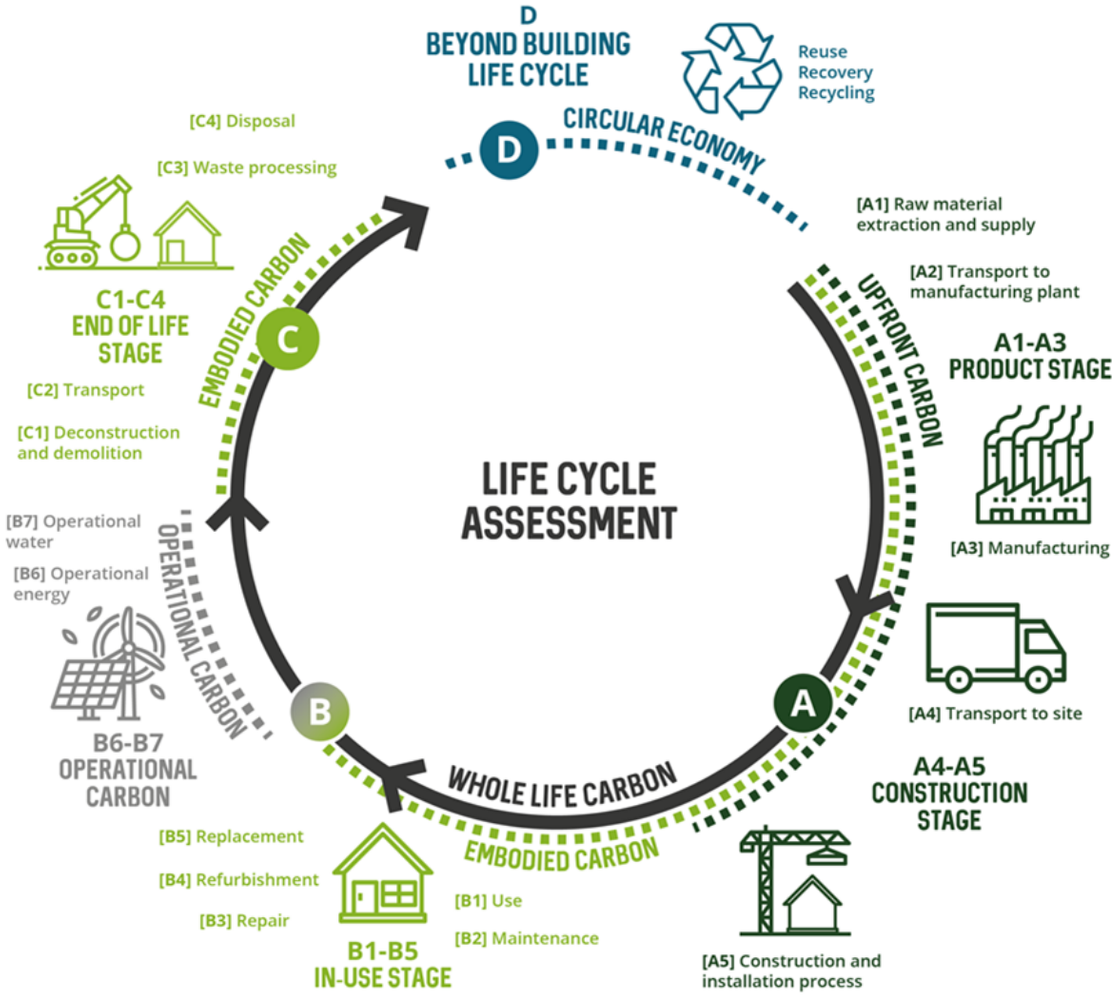

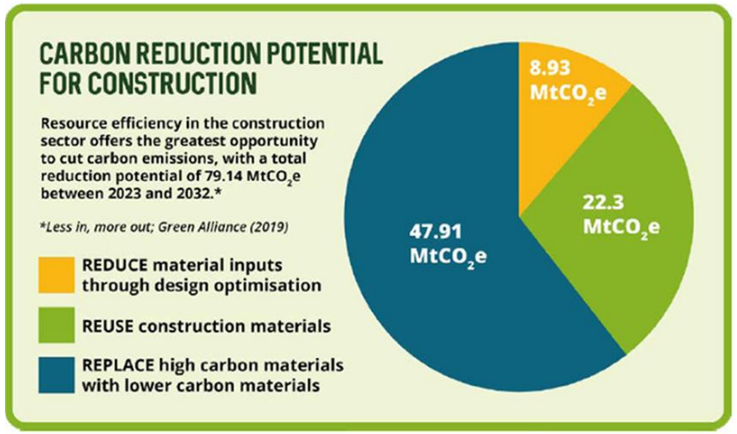

Figure 5
Opportunities from increasing resource efficiency in construction

Clients requirements/guidance

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Environmental requirements, KPIs and targets

THEME	CATEGORY	REFERENCE	KEY REQUIREMENTS, PERFORMANCE INDICATORS AND TARGETS	KPI UNIT / REQUIREMENT	COMM	RETAIL	RESI	P.REALM	OPS
ENVIRONMENTAL	CIRCULAR ECONOMY & MATERIALS	CE01	Target BREEAM WST01 pre-demolition audit and use the audit to explore where materials can be used onsite or elsewhere	REQUIREMENT					
		CE02	Develop a circular economy strategy. Prioritise re-use of existing structure/materials and follow BL Circular Economy principles						
		CE03	Develop a materials passport with End of Life (EoL) reuse scenarios for all materials and include in Whole Life Carbon Report (section D)						
		CE04	Design and specify for disassembly and reuse, align with BREEAM WST06						
		CE05	Compliance with BL Materials Schedule - prioritising materials with an Environment Product Declaration (EPD) and/or are extracted or manufactured within the UK or EU	%	100	100	100	100	100
		CE06	Achieve one of the following: Proportion of new materials (by weight/volume) designed and specified for disassembly and reuse with a take back scheme; or	%	≥30	TBC	≥30	TBC	TBC
		CE07	Design and specification of one construction package to be fully deconstructed and with a take back scheme/EoL scenario	report	✓	✓	✓	✓	✓
		CE08	Proportion of reused materials or with recycled content vs new materials	% value	50	TBC	50	TBC	TBC
		CE09	Unwanted resources* diverted from landfill and incineration	% tonnes	100	100	100	100	≥60
		CE10	Quantity of unwanted resources* recycled via upcycling	% tonnes	90	90	90	90	-
		CE11	Quantity of unwanted resources* recycled via downcycling	% tonnes	10	10	10	10	-
		CE12	Report quantity of unwanted resources* re-used, composted or recycled	% tonnes	-	-	-	-	80/70

*Unwanted resources refers to waste

√	Materials and Finishes
	Design for flexible layout and functions (e.g. consider demountable partitions)
	Design out the need for components (e.g. passive rather than active heating, ventilation and air conditioning (HVAC), avoiding surplus finishes and avoiding wet finishes such as paints)
	Specify reclaimed or remanufactured materials over new. These can be sourced from marketplaces and passport banks (e.g. Globechain)
	Prioritise reused products or those with high recycled content
	Select products and materials from suppliers who can demonstrate responsible sourcing credentials
	Use reused products or rental furniture. (See Grosvenor Partner Handbook for more information)
	Consider low-Volatile Organic Compound (VOC) alternatives for paints, varnishes, coatings, adhesives, carpets and composite wood
	Use timber from sustainable forests (FSC certified)
√	**Waste**
	Undertake a reuse audit of existing materials and fixtures in unit
	Create a fit-out waste management plan (see technical guide page 6 for more detail)
	Segregate waste during fit-out and in operation
	Set waste targets for your fit-out (see technical guide page 6 for options)
	Work with suppliers to reduce or eliminate packaging of materials/fixtures

Pre-demolition and refurbishment audits

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	Overall target for diversion from landfill	Targets for diversion from landfill by material type	Targets for reuse and recycling
Standard practice	√	–	–
Good practice	√	√	–
Best practice	√	√	√

- Code of Practice
- BREEAM and Ska credit
- GLA requirement (demolition)
- Post activity -evaluation of performance
- Closer link to design of new/replacement – what can be retained/reused
- Design for Disassembly/ Adaptability to facilitate future recovery (learn from PDAs today)
- BIM, asset management and material passports to track assets and cascade warranties/ reduced risk

Glass

reusefully

Facts

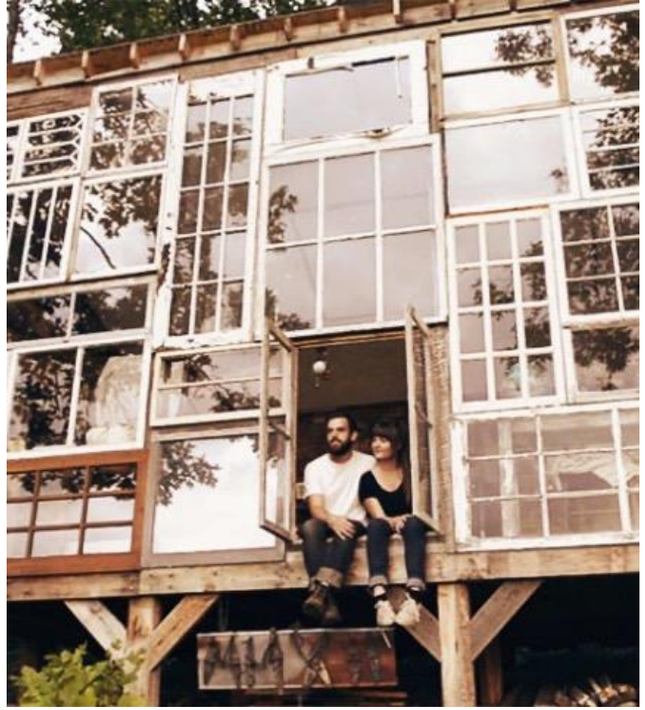
- 215,000 tonnes estimated to arise by 2025; from window replacement, façade and partitions
- Reduction in embodied carbon for new glass production when using recycled glass cullet (30% CO_2 reduction)
- Can be up to 35% recycled content but from pre-consumer sources

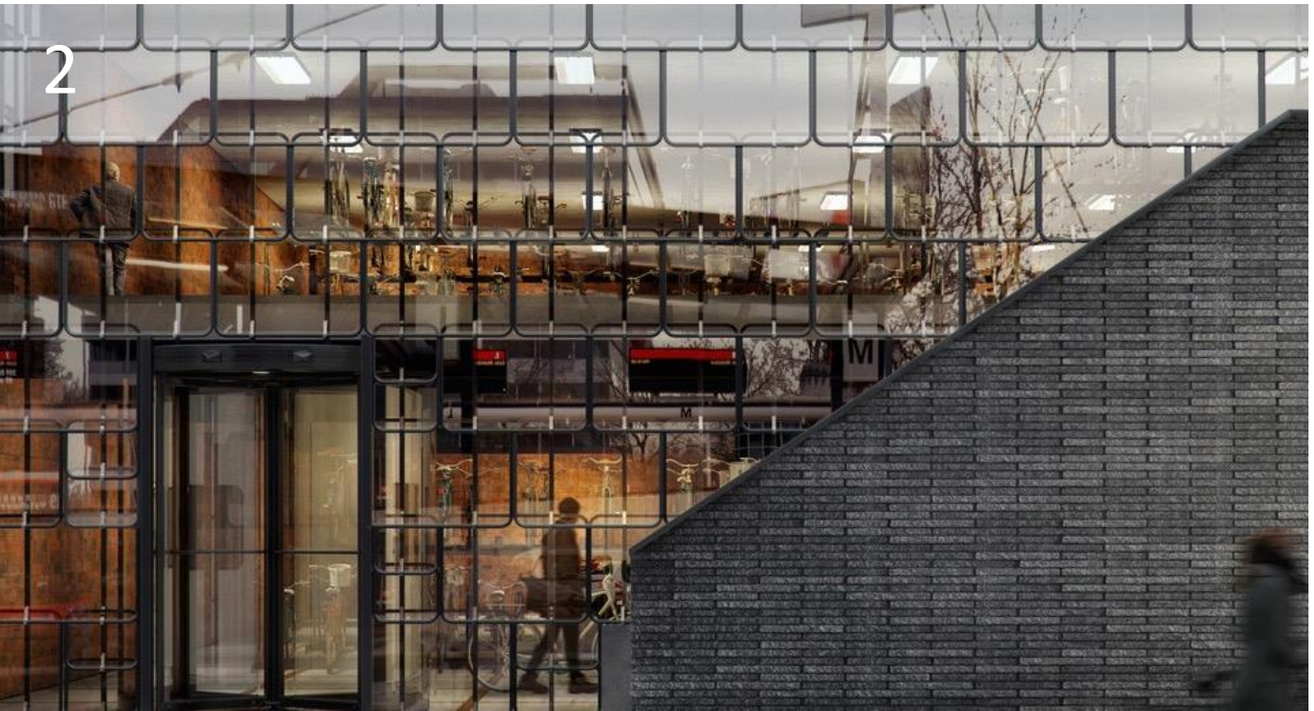
Reuse

- Little reuse of glass (recent example of take back of partitions)
- Handling requirements and storage
- Issue with older glass and thermal performance

Recycling

- Most crushed and used in aggregate
- Needs to be kept clean from contamination
- Manufacturers want flat glass back
- Some can be used in insulation





Glass - examples

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1. Circl, Amsterdam – reused Philips façade for internal meeting room

2. CIE Architekten – use of old train windows as bicycle parking facility in Endhoven

Timber

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Facts

- Just over 4 million tonnes of wood waste was collected in 2020.
- 65% (2.6 million tonnes) of this went to large-scale biomass plants and around 26% went to panel board manufacture (around 1 million tonnes)
- The recycled content as a proportion of the total wood content for board is on average approximately 70%. This will be a mixture of post and pre-consumer
- Not much is landfilled

Reuse

- Limited to architectural timber and items with reclamation value e.g. floorboards
- Some reuse via Community Wood Recycling
- Recycling dominates over reuse (large fall in materials being reclaimed)
- Little research into reuse of mass timber structural components

Recycling

- Perverse incentive to use wood waste for energy
- Limited recycling of panel board products (difficult to fibre length and glues)
- Issues with paint, laminates, melamine etc
- Wood is graded dependant upon quality for recycling

Timber – examples

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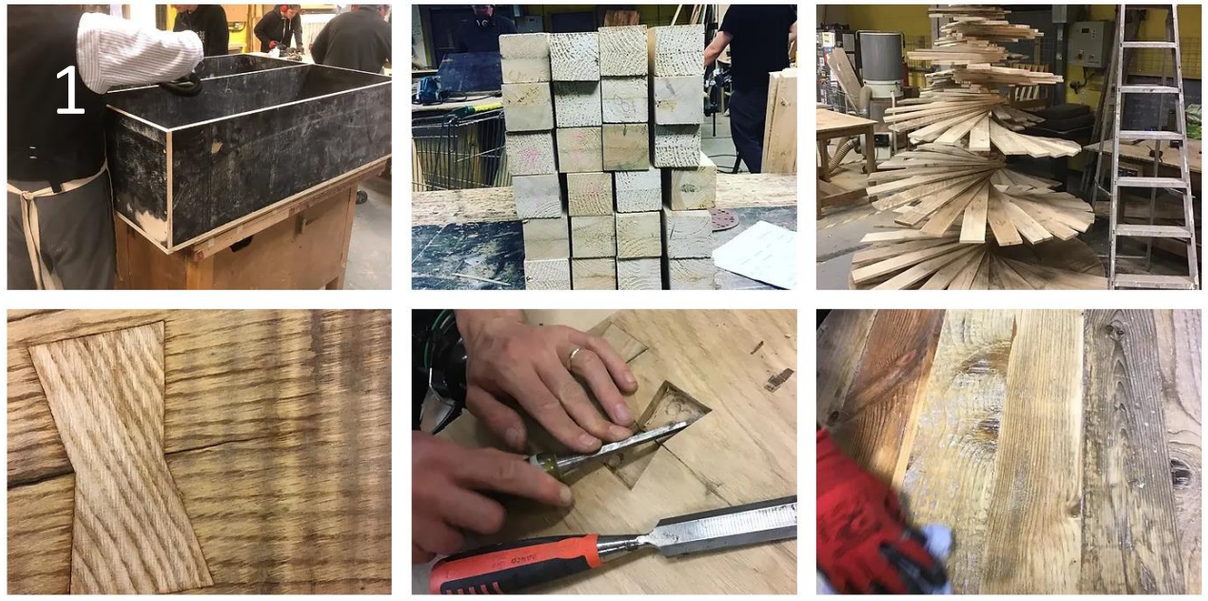
1. Community wood recycling – e.g. Brighton & Hove
2. Timber based products such as raised access flooring e.g. RMFEco range
3. Truly Reclaimed wood mark (Salvo)



Other materials

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- **Plasterboard:** difficult to reuse; not much from refurbishment and demolition goes back into manufacturing; some will get spread of land; some ‘disappears’; some to cement kilns; take back for new offcuts; recycled content is about 25% includes from FGD sources
- **Insulation:** a few examples of reuse e.g. but limited; some take back of mineral wool but limited; most sent to energy recovery and/or landfill
- **Plastics:** established scheme for recovery of vinyl (PVC – windows) and floors; most go to energy from waste; some recycling of plastic packaging e.g. paint pots; film likely to go to energy from waste
- **Carpet:** established routes for reuse of carpet tiles (if good condition), recycling is limited but some manufacturers take back; recycling depends on carpet type – some used for crumb e.g. equestrian surfaces
- **Lighting:** treated as WEEE waste; more manufacturers offering leasing, take back and remanufactured products but most lighting is downcycled (and fittings); fluorescent lighting is hazardous waste

LINK – Investigating the Use of AI to Facilitate Reuse in Fit-Outs

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- 18 month project, funded by Innovate UK, to investigate **the use of artificial intelligence and machine learning** to encourage the reuse of materials from fit-outs
- The partners are Reusefully, FIS, the University of Hertfordshire, Rasuta Technologies and Nazir Associates
- Development focuses on **image recognition technology** and a mobile app linked to a material reuse platform
- Contributions welcome!

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Thank you

Katherine Adams and Gilli Hobbs, Reusefully Ltd

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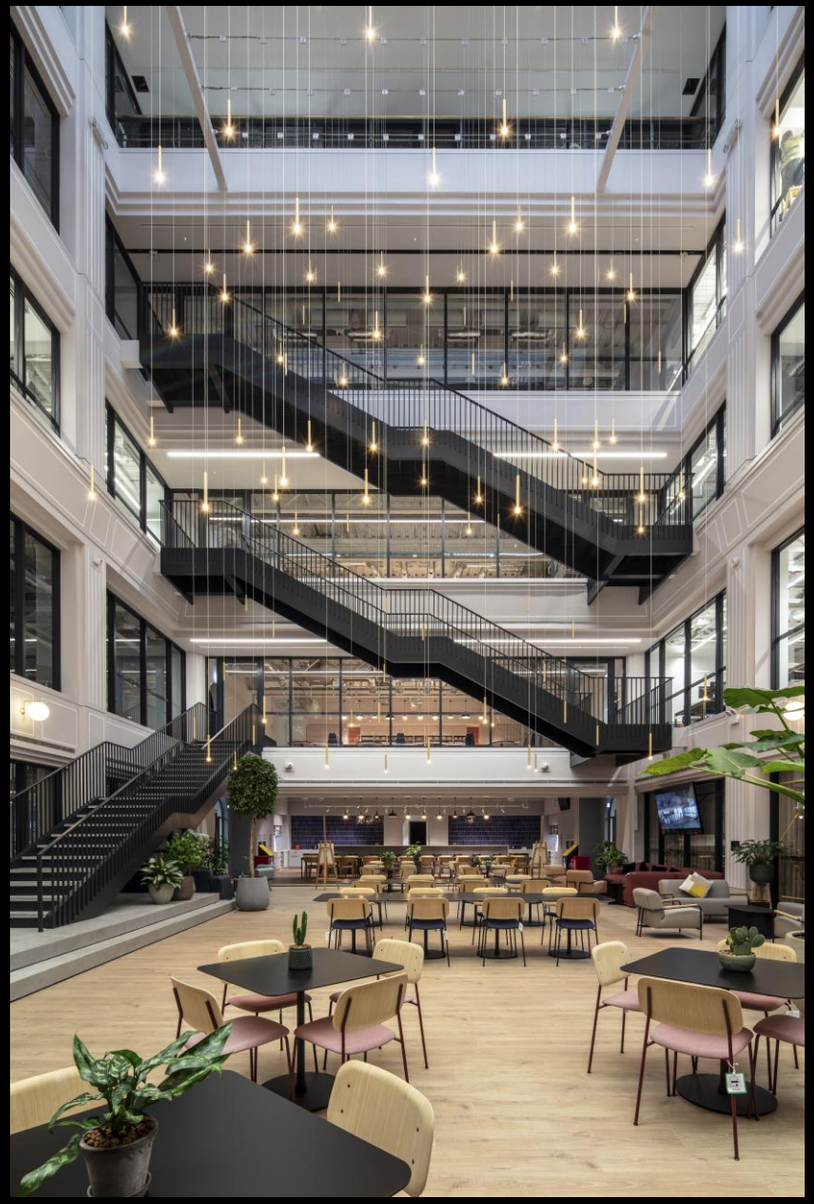
Penny McCallum
Environmental Manager, BW

Low carbon fit-out


BUILT WITH:
PERSONALITY
BW
WORKPLACE EXPERTS



Penelope McCallum
Environment Manager
BW
penny.mccallum@wearebw.com

BW
WORKPLACE EXPERTS

LOW CARBON FIT OUT

BW

Project Approach

BW
WORKPLACE EXPERTS

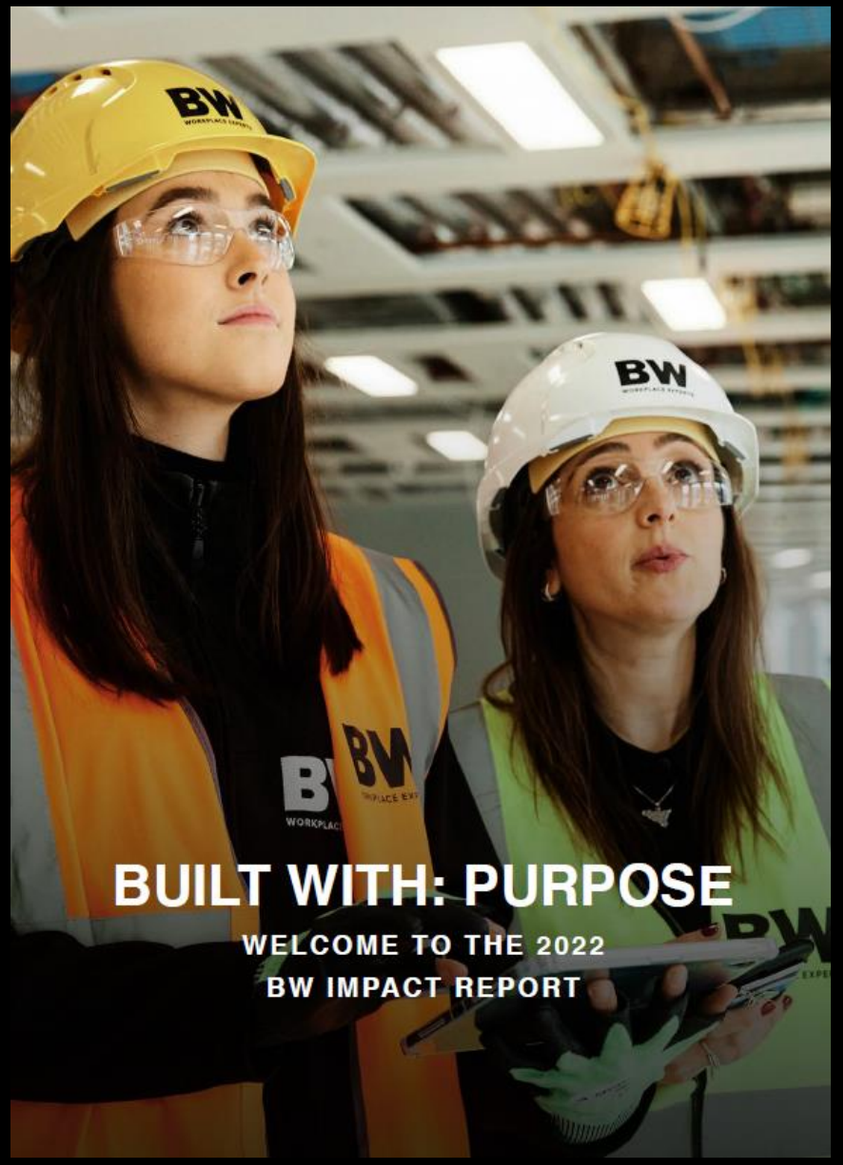
BW COMPANY – PATH TO NET ZERO

We have set a long -term goal of being Net Zero by 2030

We have minimal Scope 1 & 2

Currently verifying our targets through the SBTi

Measuring all site emissions



Our approach is to minimise impact on our supply chain
Understand our largest out puts
BREEAM compliance

IT BRINGS NEW PROBLEMS!

IT BRINGS NEW OPPORTUNITIES!

BW WORKPLACE EXPERTS

WHAT NEXT?

- 80% OF London’s office buildings have an EPC of E
- MEES Regulations require an uplift to B by 2030
- There is a risk of stranded assets if retrofit is not undertaken
- Address the performance gap
- Engage construction at an earlier stage
- Look at WLC and offset
- Follow the UKGBC roadmap to Net Zero

BW
WORKPLACE EXPERTS

Adam Strudwick
Principal, Corporate Interiors,
Perkins&Will

Re-use and the potential for urban mining

Perkins&Will

Sustainability in the Finishes and Interiors Sector

FINISHES & INTERIORS SECTOR

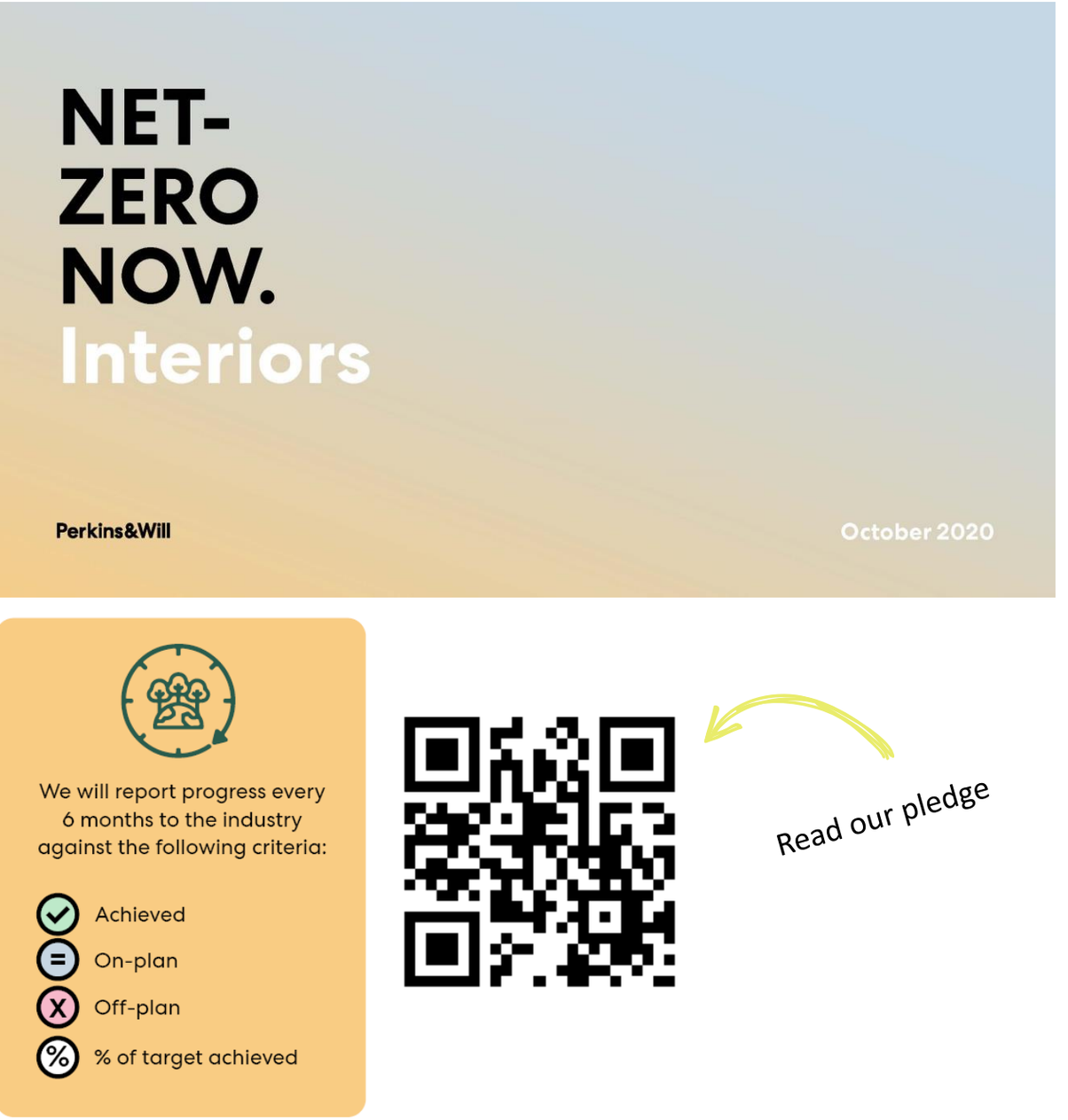
07/09/21

Our pledge

✔ In **Q4 2020** we will launch a **consultation process** with our key contractors, sub-contractors and supplier partners to ensure that our **supply chain** will meet our net-zero targets.

✔ By the end **2021** half of our projects will be designed to be **100% Circular.** By **2025** all of our projects will be designed to be **100% Circular.**

✔ By **2030** all of our projects will be **net-zero embodied carbon** as demonstrated through a Whole Life Carbon Assessment



The UK produced 830 megatons of CO2 last year, including imports.

You would need the equivalent of 830 million trees to absorb that amount of carbon from the atmosphere.

The built environment alone is responsible for 40% of the UK’s total carbon footprint.

Fit out is responsible for 40% of energy in a building, and 300 tonnes of fit out goes to landfill every day

The UK Government requires all greenhouse gas emissions to be net-zero by 2050.

All new buildings must operate at net zero carbon by 2030.

Every building must operate at net zero carbon by 2050

Everybody needs to be involved

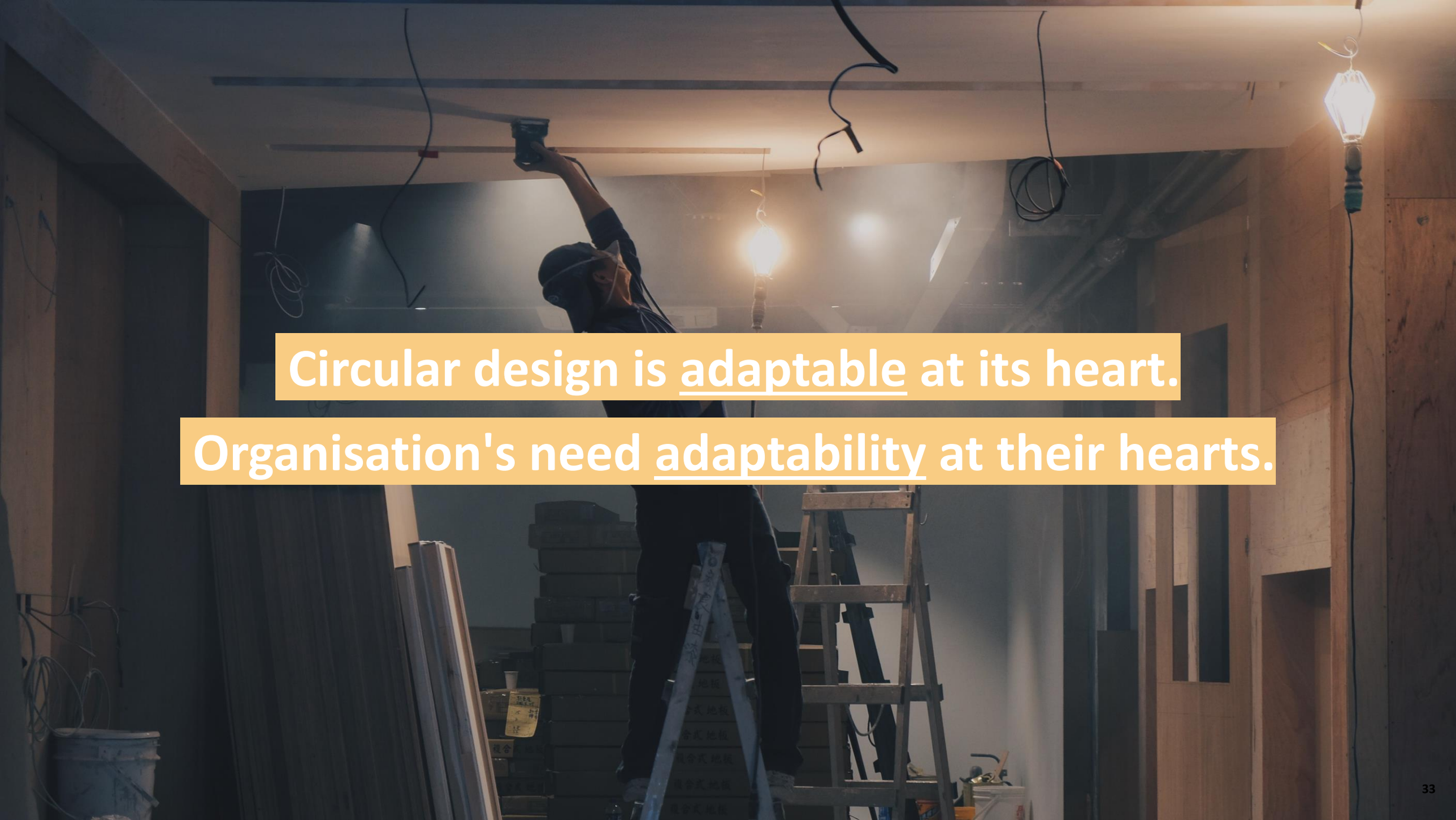
Investors

Developers

Occupiers

Designers

Supply Chain



Circular design is adaptable at its heart.

Organisation's need adaptability at their hearts.


Design for disassembly.
Reversible design.


Buildings as material banks.

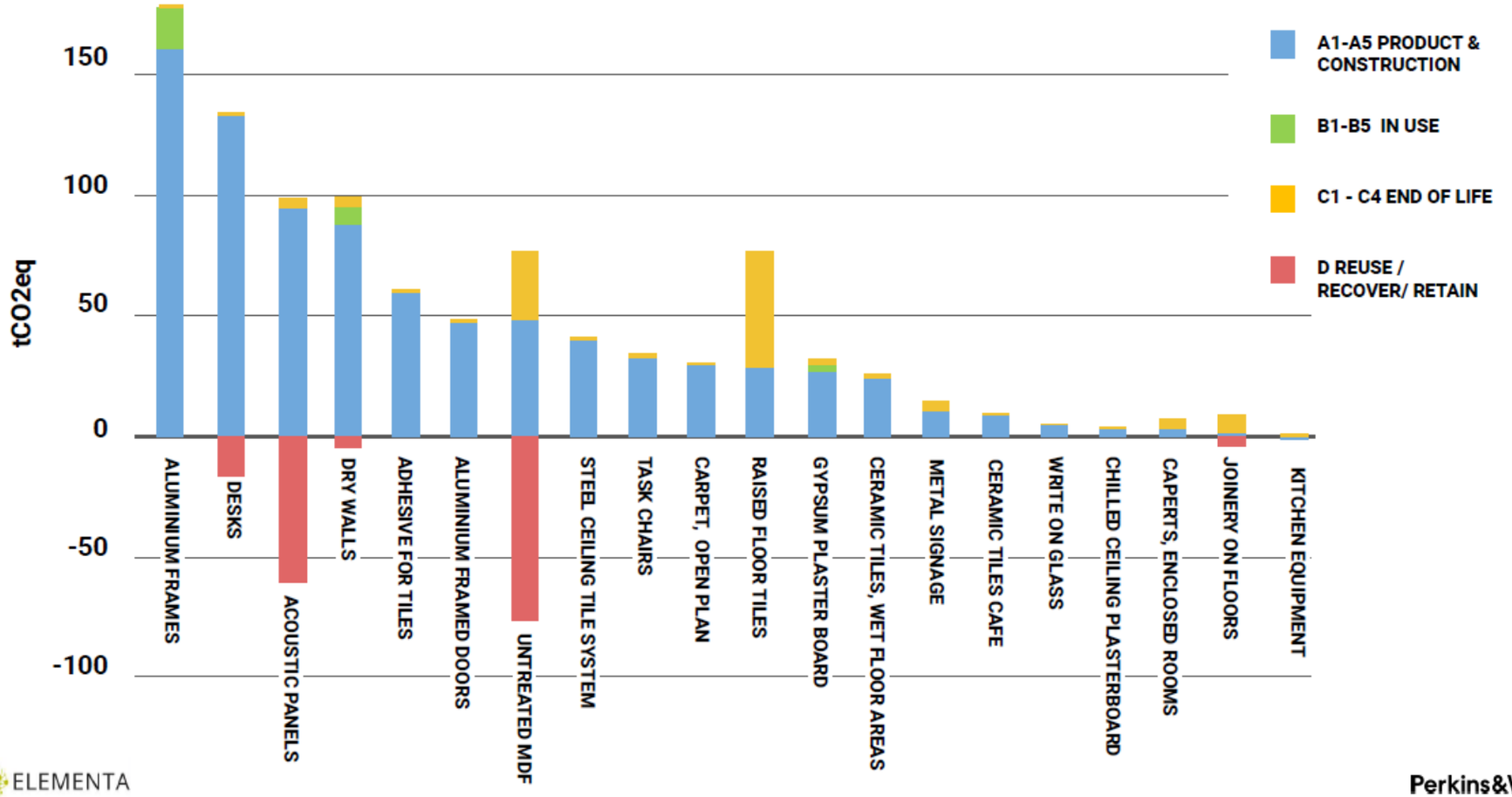
Component driven

Towards a new aesthetic

Measuring

Top 20 Products Carbon Contributors

The Current Design - Architecture



ELEMENTA

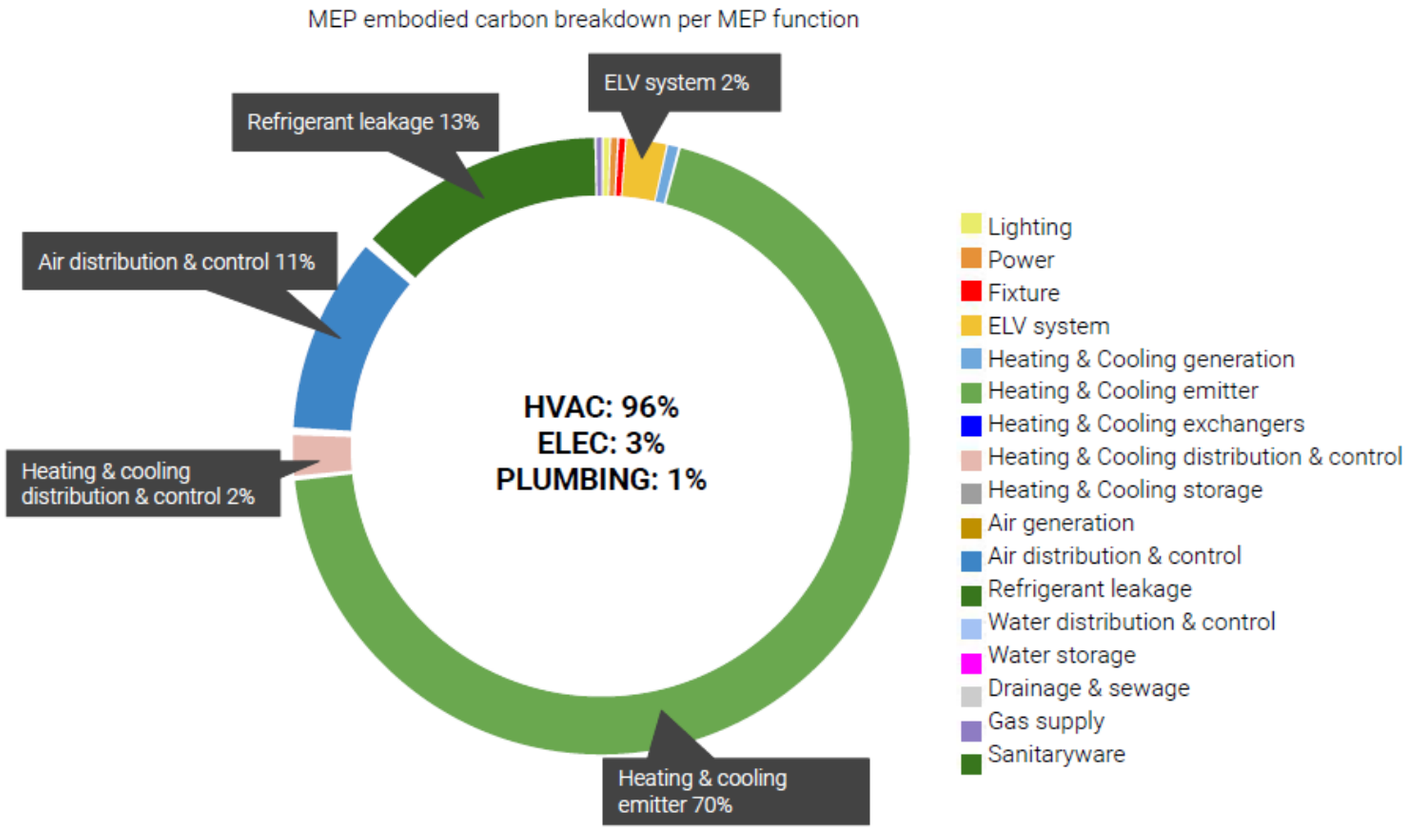
Perkins&Will

Measuring

Top 10 Products Carbon Contributors

The Current Design - MEP

1. Chilled ceiling
2. Refrigerant leakage
3. Attenuator
4. Fan coils
5. Duct work
6. Cable tray
7. Crac unit
8. Duct support
9. VRF cassettes
10. Chiller



Circularity

Recycle

Kettal
Acoustic Pavilion

Kettal
Acoustic Pavilion

Spacestore
Huddle

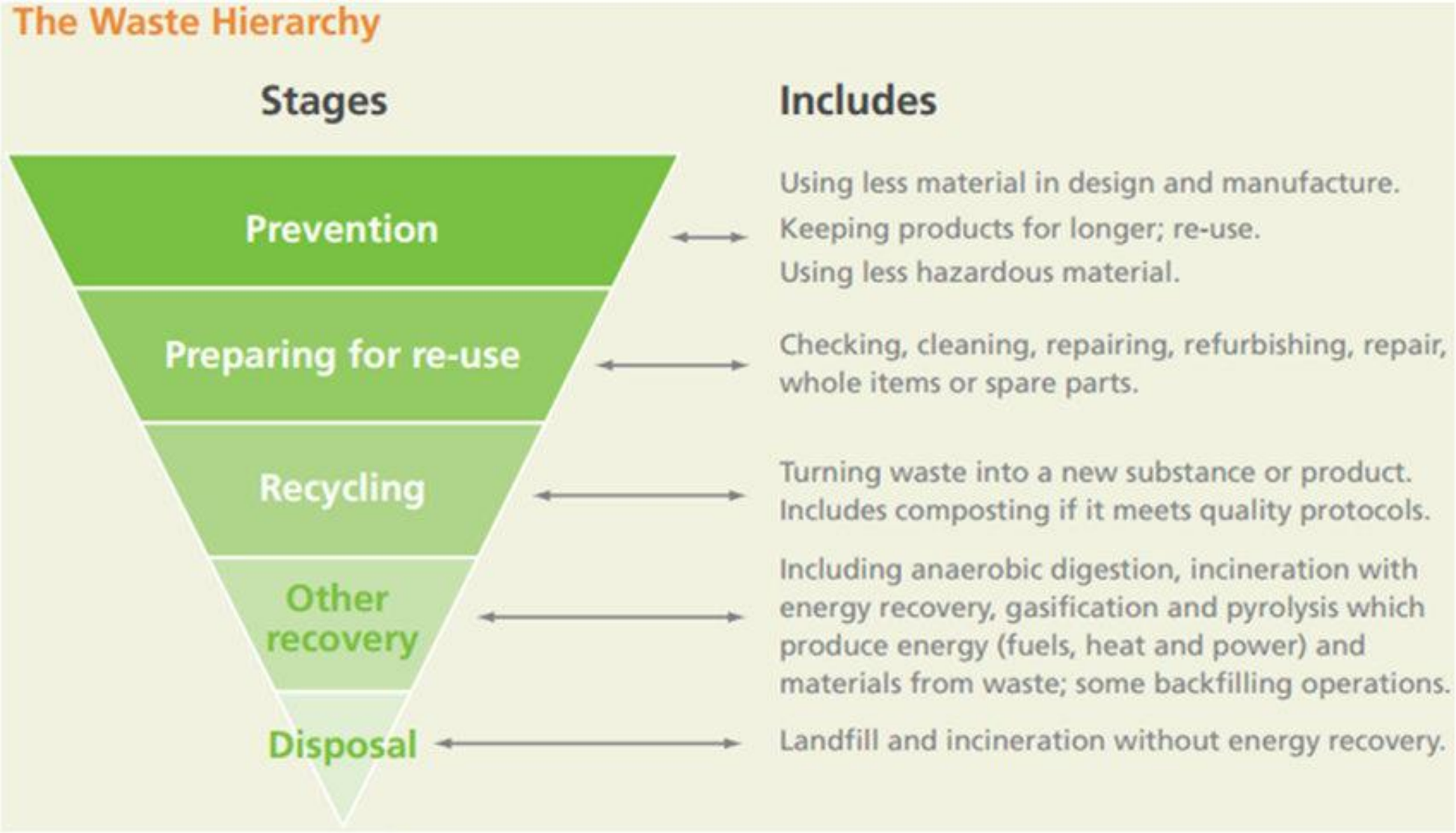
Radii
AMR

Optima
AMR

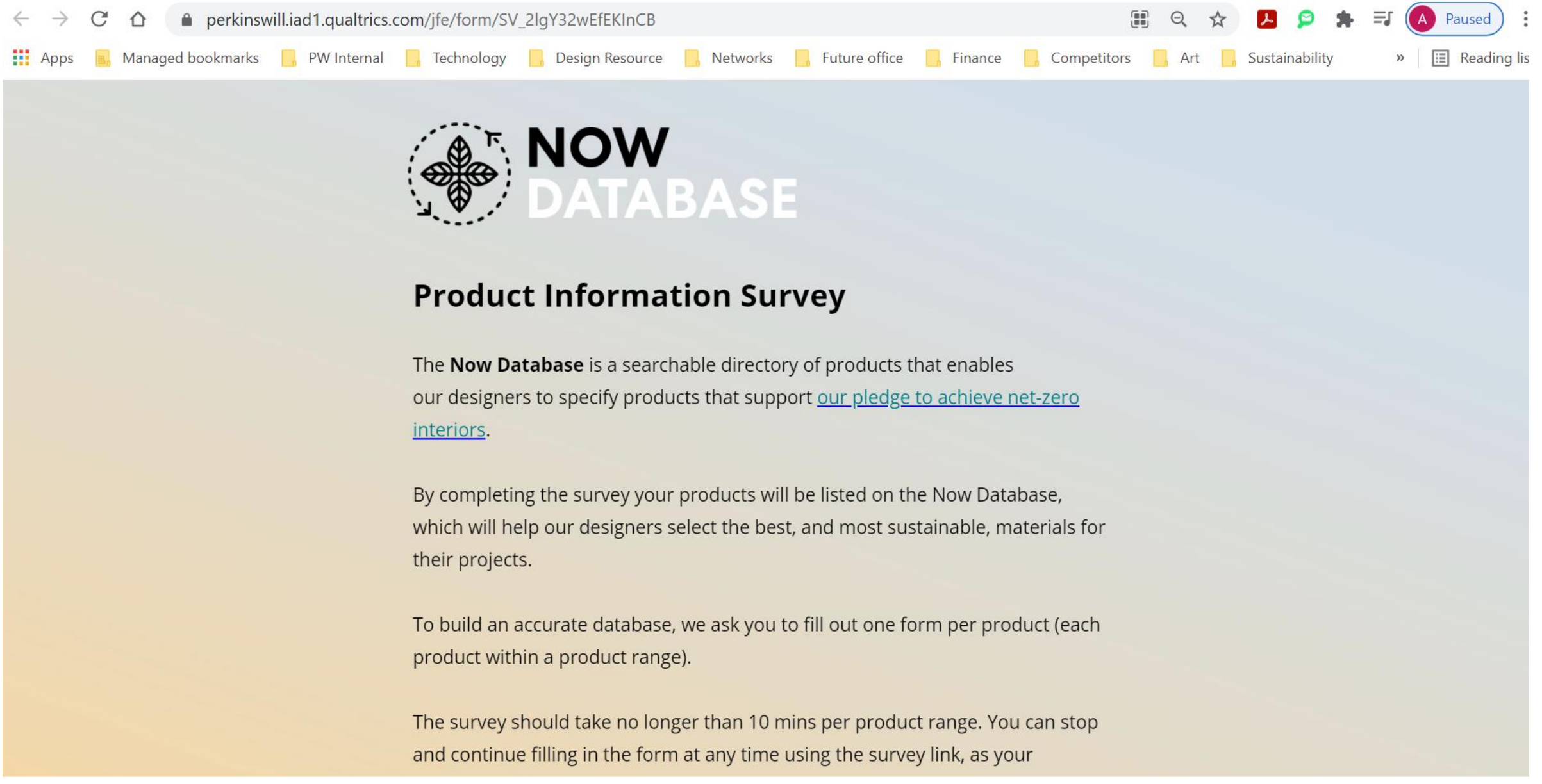
Reuse

Design for disassembly

Waste


The Waste Hierarchy
Stages
Includes
Prevention
Using less material in design and manufacture.
Keeping products for longer; re-use.
Using less hazardous material.
Preparing for re-use
Checking, cleaning, repairing, refurbishing, repair, whole items or spare parts.
Recycling
Turning waste into a new substance or product. Includes composting if it meets quality protocols.
Other recovery
Including anaerobic digestion, incineration with energy recovery, gasification and pyrolysis which produce energy (fuels, heat and power) and materials from waste; some backfilling operations.
Disposal
Landfill and incineration without energy recovery.

Now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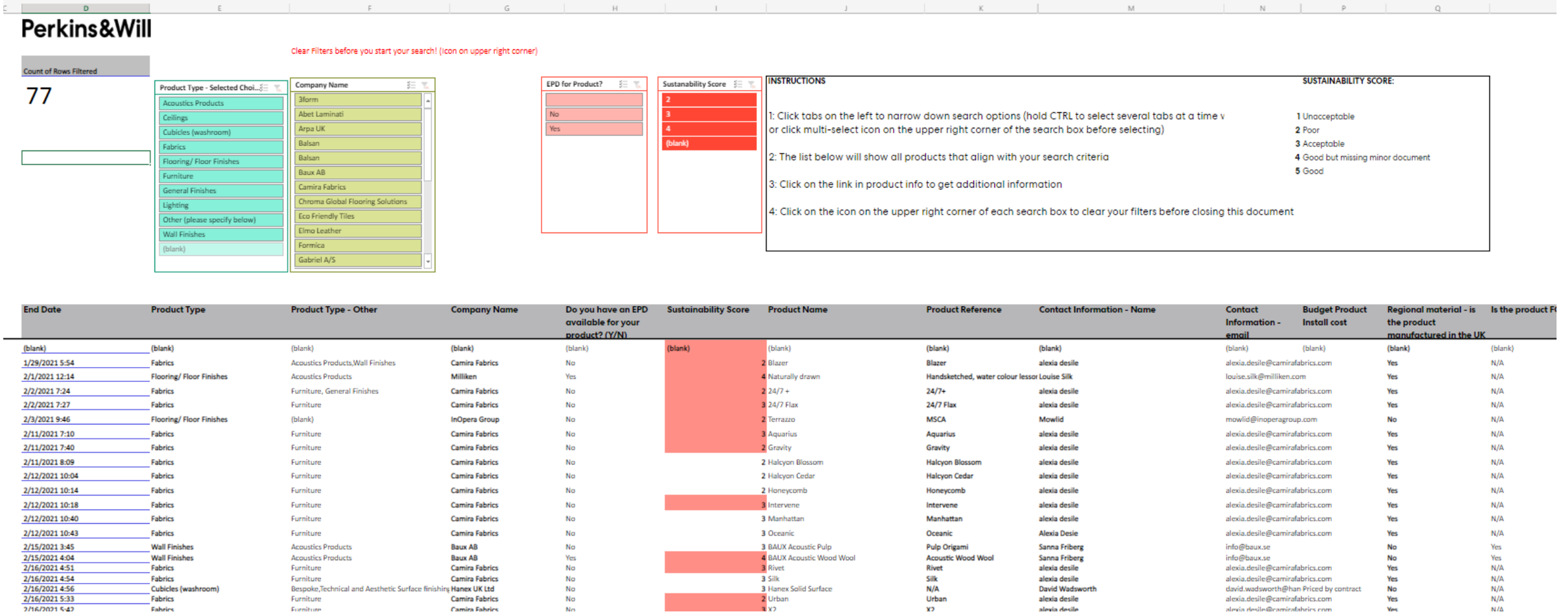
Paused
Apps
Managed bookmarks
PW Internal
Technology
Design Resource
Networks
Future office
Finance
Competitors
Art
Sustainability
Reading lis
NOW
DATABASE
Product Information Survey
The Now Database is a searchable directory of products that enables our designers to specify products that support our pledge to achieve net-zero interiors.
By completing the survey your products will be listed on the Now Database, which will help our designers select the best, and most sustainable, materials for their projects.
To build an accurate database, we ask you to fill out one form per product (each product within a product range).
The survey should take no longer than 10 mins per product range. You can stop and continue filling in the form at any time using the survey link, as your

Now



Perkins&Will

Clear Filters before you start your search! (Icon on upper right corner)

Count of Rows Filtered

77

Product Type - Selected Choi...
- Acoustics Products
- Ceilings
- Cubicles (washroom)
- Fabrics
- Flooring/ Floor Finishes
- Furniture
- General Finishes
- Lighting
- Other (please specify below)
- Wall Finishes
- (blank)

Company Name
- 3form
- Abet Laminati
- Arpa UK
- Balsan
- Balsan
- Baux AB
- Camira Fabrics
- Chroma Global Flooring Solutions
- Eco Friendly Tiles
- Elmo Leather
- Formica
- Gabriel A/S

EPD for Product?
- No
- Yes

Sustainability Score
- 2
- 3
- 4
- (blank)

INSTRUCTIONS

1: Click tabs on the left to narrow down search options (hold CTRL to select several tabs at a time v or click multi-select icon on the upper right corner of the search box before selecting)

2: The list below will show all products that align with your search criteria

3: Click on the link in product info to get additional information

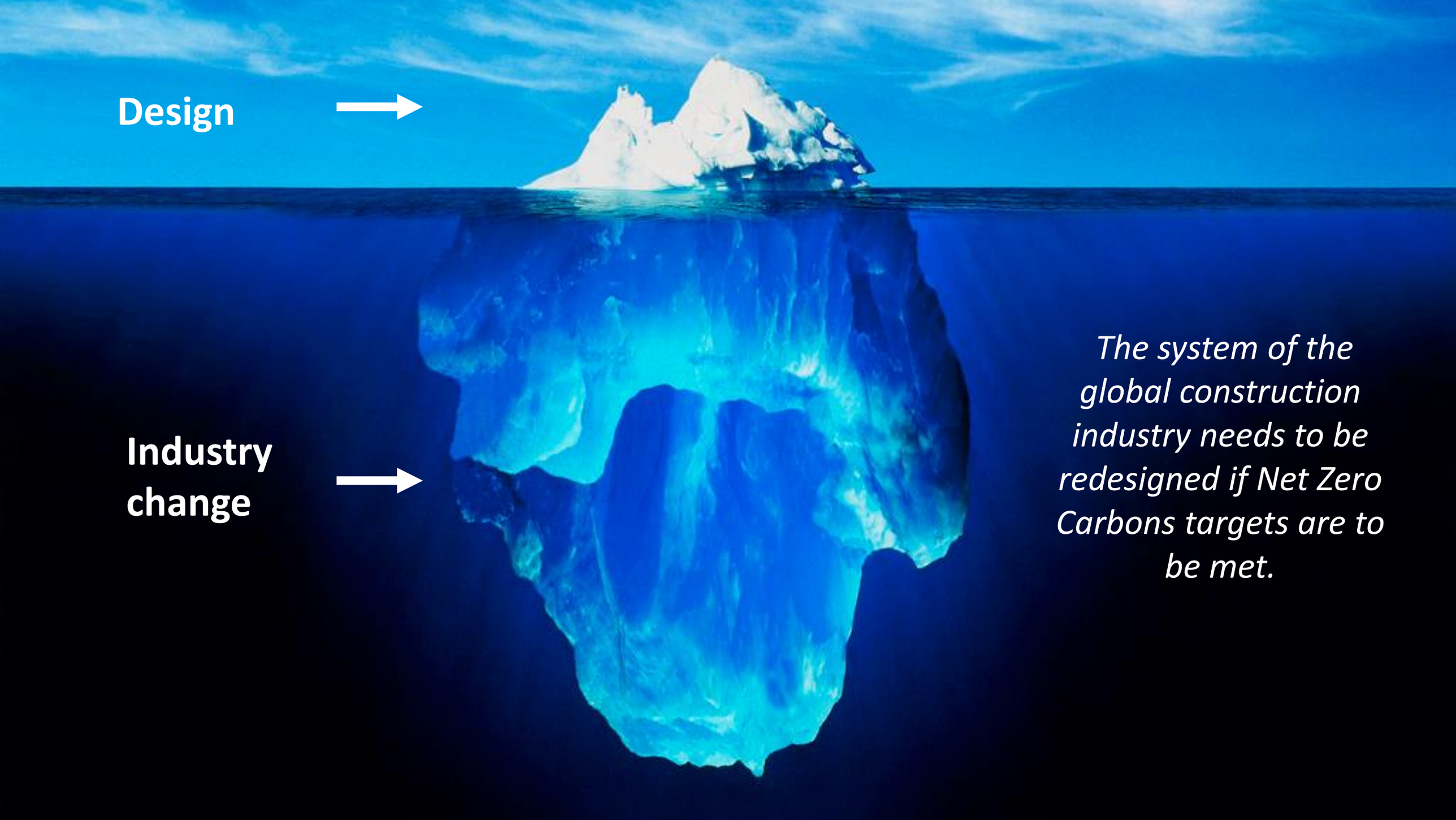
4: Click on the icon on the upper right corner of each search box to clear your filters before closing this document

SUSTAINABILITY SCORE:

1 Unacceptable
2 Poor
3 Acceptable
4 Good but missing minor document
5 Good

End Date	Product Type	Product Type - Other	Company Name	Do you have an EPD available for your product? (Y/N)	Sustainability Score	Product Name	Product Reference	Contact Information - Name	Contact Information - email	Budget Product Install cost	Regional material - is the product manufactured in the UK	Is the product F
(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)
1/29/2021 5:54	Fabrics	Acoustics Products,Wall Finishes	Camira Fabrics	No	2	Blazer	Blazer	alexia desile	alexia.desile@camirafabrics.com		Yes	N/A
2/1/2021 12:14	Flooring/ Floor Finishes	Acoustics Products	Milliken	Yes	4	Naturally drawn	Handsketched, water colour lesso	Louise Silk	louise.silk@milliken.com		Yes	N/A
2/2/2021 7:24	Fabrics	Furniture, General Finishes	Camira Fabrics	No	2	24/7 +	24/7+	alexia desile	alexia.desile@camirafabrics.com		Yes	N/A
2/2/2021 7:27	Fabrics	Furniture	Camira Fabrics	No	3	24/7 Flax	24/7 Flax	alexia desile	alexia.desile@camirafabrics.com		Yes	N/A
2/3/2021 9:46	Flooring/ Floor Finishes	(blank)	InOpera Group	No	2	Terrazzo	MSCA	Mowlid	mowlid@inoperagroup.com		No	N/A
2/11/2021 7:10	Fabrics	Furniture	Camira Fabrics	No	3	Aquarius	Aquarius	alexia desile	alexia.desile@camirafabrics.com		Yes	N/A
2/11/2021 7:40	Fabrics	Furniture	Camira Fabrics	No	2	Gravity	Gravity	alexia desile	alexia.desile@camirafabrics.com		Yes	N/A
2/11/2021 8:09	Fabrics	Furniture	Camira Fabrics	No	2	Halcyon Blossom	Halcyon Blossom	alexia desile	alexia.desile@camirafabrics.com		Yes	N/A
2/12/2021 10:04	Fabrics	Furniture	Camira Fabrics	No	2	Halcyon Cedar	Halcyon Cedar	alexia desile	alexia.desile@camirafabrics.com		Yes	N/A
2/12/2021 10:14	Fabrics	Furniture	Camira Fabrics	No	2	Honeycomb	Honeycomb	alexia desile	alexia.desile@camirafabrics.com		Yes	N/A
2/12/2021 10:18	Fabrics	Furniture	Camira Fabrics	No	3	Intervene	Intervene	alexia desile	alexia.desile@camirafabrics.com		Yes	N/A
2/12/2021 10:40	Fabrics	Furniture	Camira Fabrics	No	3	Manhattan	Manhattan	alexia desile	alexia.desile@camirafabrics.com		Yes	N/A
2/12/2021 10:43	Fabrics	Furniture	Camira Fabrics	No	3	Oceanic	Oceanic	Alexia Desile	alexia.desile@camirafabrics.com		Yes	N/A
2/15/2021 3:45	Wall Finishes	Acoustics Products	Baux AB	No	3	BAUX Acoustic Pulp	Pulp Origami	Sanna Friberg	info@baux.se		No	Yes
2/15/2021 4:04	Wall Finishes	Acoustics Products	Baux AB	Yes	4	BAUX Acoustic Wood Wool	Acoustic Wood Wool	Sanna Friberg	info@baux.se		No	Yes
2/16/2021 4:51	Fabrics	Furniture	Camira Fabrics	No	3	Rivet	Rivet	alexia desile	alexia.desile@camirafabrics.com		Yes	N/A
2/16/2021 4:54	Fabrics	Furniture	Camira Fabrics	No	3	Silk	Silk	alexia desile	alexia.desile@camirafabrics.com		Yes	N/A
2/16/2021 4:56	Cubicles (washroom)	Bespoke,Technical and Aesthetic Surface finishing	Hanex UK Ltd	No	3	Hanex Solid Surface	N/A	David Wadsworth	david.wadsworth@han	Priced by contract	No	N/A
2/16/2021 5:33	Fabrics	Furniture	Camira Fabrics	No	2	Urban	Urban	alexia desile	alexia.desile@camirafabrics.com		Yes	N/A
2/16/2021 5:42	Fabrics	Furniture	Camira Fabrics	No	3	X2	X2	alexia desile	alexia.desile@camirafabrics.com		Yes	N/A

Focus on re-designing the process, not the products


Design
Industry change
The system of the global construction industry needs to be redesigned if Net Zero Carbons targets are to be met.


We need to develop an industry
that makes and manages resources
in a way that is intrinsically circular

My 6 year old son tells me glass buildings are bad, but we shouldn’t use wood as it means cutting down trees.

FINISHES & INTERIORS SECTOR

Panel Debate

FIS

FINISHES & INTERIORS SECTOR

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