

**#CEweekLDN**

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 Circular London

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**ASBP**  
**WEBINAR**

# CE Week Webinar: Circular Economy, Reuse and Construction

Tuesday 2<sup>nd</sup> June, 14:00-15:30

**#CEweekLDN @asbp\_uk**

# Agenda

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- 14:00** **Welcome from The Alliance for Sustainable Building Products | Circular economy and construction: Opportunities and challenges** - Katherine Adams, Technical Associate, ASBP
- 14:20** **Case study: Green Tiles. How does reuse impact upon the design process**  
Colin Rice, Senior Architect, Cullinan Studio
- 14:35** **Reuse of steel from the oil and gas industries and challenges of reusing steel from existing buildings** - Roy Fishwick, Managing Director, Cleveland Steel and Tubes
- 14:50** **Embodied carbon for reuse – how does it work? Is it a useful metric?** - Jane Anderson, Director, Construction LCA and Board member, ASBP
- 15:05** **Discussion**
- 15:30** **Close**

## Who we are

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**Not-for-profit, mission led,  
membership organisation**



**“To accelerate the transformation to a healthy, low carbon built environment by championing the use of demonstrably sustainable building products”**

# What we do

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We organise events, participate in research projects, advocate product standards and inform policy across our three core themes:

## Health and well-being

Natural materials  
Indoor air quality  
Source control,  
VOCs, off-gassing  
Moisture control

## Resource efficiency

Circular economy  
Design for  
deconstruction  
Material re-use

## Product sustainability

Whole life carbon  
Robust product  
standards/EPDs  
Decision making  
tools/product  
databases

# Our members and partners



Over 70 members and partners from across the sector

Architects

Specifiers

Contractors

Product manufacturers

Housebuilders

Trade bodies

Academia and more

# New Masterclass Series

[www.asbp.org.uk/upcomingevents](http://www.asbp.org.uk/upcomingevents)



**In-depth sessions (2 hours), limited to 25 attendees,  
with interactive discussion and exercises.**

**REGISTRATION OPEN NOW  
DISCOUNTS WHEN BOOKING  
BOTH MASTERCLASSES**

**Thursday 2<sup>nd</sup> July, 13:00-15:00**

## **Biogenic Carbon in EPD and Building LCA**

with Jane Anderson and Mark Lynn

- An introduction to Biogenic Carbon
- How is sequestered carbon measured?
- What about carbon storage?      • What happens at the end of life?
- How is biogenic carbon reported in EN 15804+A1 and EN 15978?
- What will be different in EN 15804+A2?

**Thursday 24<sup>th</sup> September, 13:00-15:00**

## **Common pitfalls in EPD generation – a**

**verifier's view** with Jane Anderson

- What is a verifier looking for?
- Common problems and how to avoid them
- Mass balance issues
- Biogenic carbon
- Indicators
- Data quality
- Plausibility

# Tutorial series – Healthy Buildings

[www.asbp.org.uk/upcomingevents](http://www.asbp.org.uk/upcomingevents)

A new Healthy Buildings tutorial series with guest industry experts.

Thursday 11<sup>th</sup> June, 11:00-12:00

**Designing Healthy Buildings** with Carol Costello and Kristina Roszynski, Cullinan Studio

Thursday 25<sup>th</sup> June, 11:00-12:00

**Measuring Healthy Buildings** with John Jones, PPM Technology and Tim Robinson, Waverton Analytics



Thursday 9<sup>th</sup> July, 11:00-12:00

**Indoor Air Quality and Healthy Buildings** with Professor Stephen Holgate

World-renowned air quality expert and lead author of "The Inside Story – Health effects of indoor air quality on children and young people".



NATURAL FIBRE  
INSULATION GROUP



Supported by the ASBP  
Natural Fibre Insulation Group

# natureplus Webinar

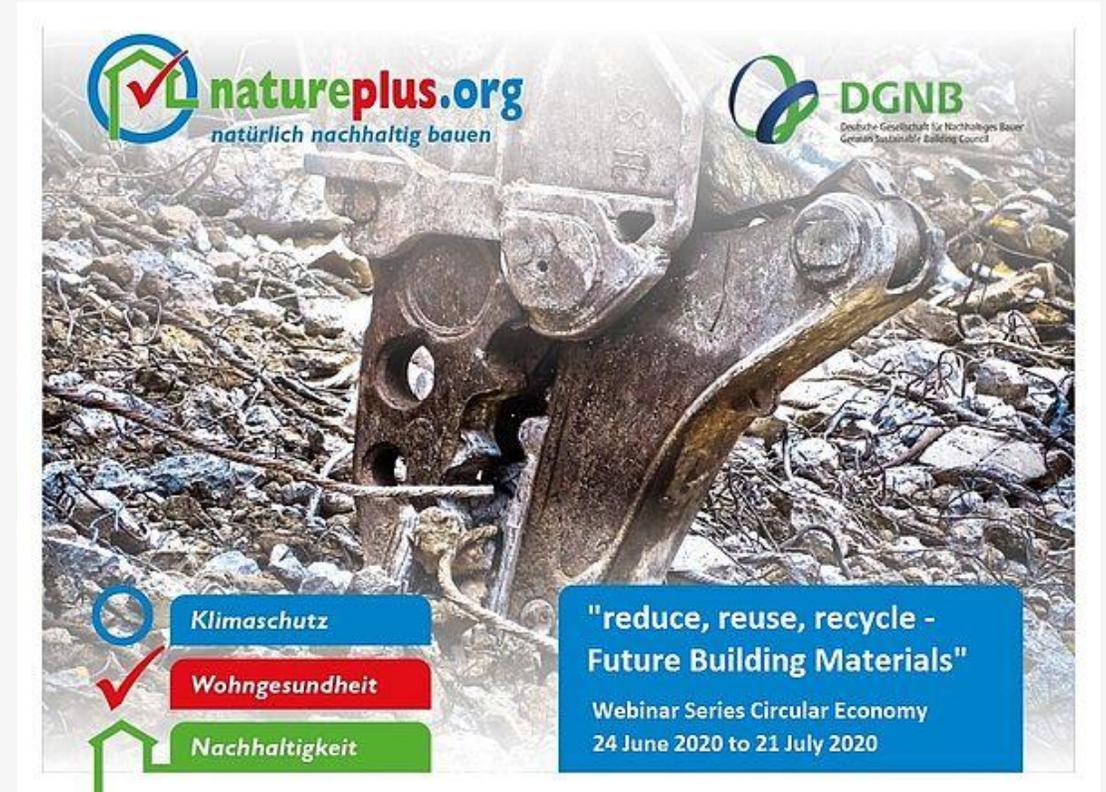
[www.asbp.org.uk/upcomingevents](http://www.asbp.org.uk/upcomingevents)

ASBP is the UK representative for the eco-label and association natureplus.

Monday 13<sup>th</sup> July, 15:30-16:30 CEST

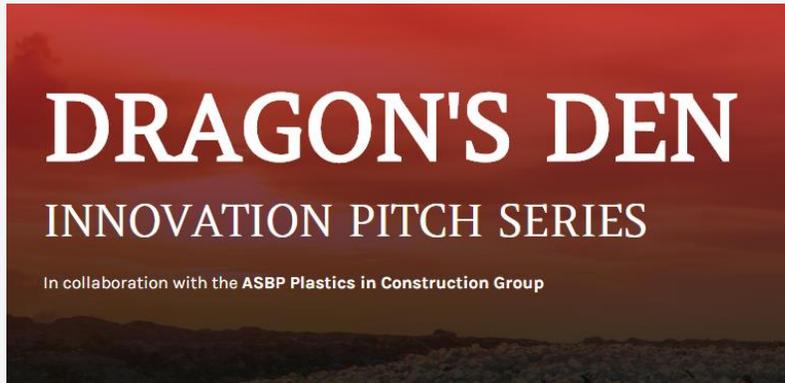
**CE in Europe – approaches and best practises**  
with Katherine Adams and speakers from across Europe

Find out more at [www.natureplus.org](http://www.natureplus.org)



# Plastics in Construction – Dragon's Den

[www.asbp.org.uk/upcomingevents](http://www.asbp.org.uk/upcomingevents)

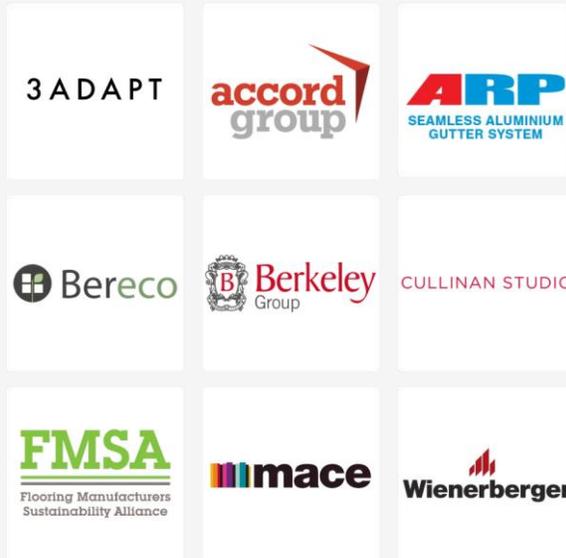


Thursday 18<sup>th</sup> June, 14:00-15:30

**Plastics in Construction Dragon's Den**

**Event #1 – Insulation (*Free to attend*)**

New pitch series looking for innovative alternatives to conventional plastic building products and packaging.



Contestants



**One pitch spot left! Contact us for more information**

Further rounds to be held in the autumn with a Grand Final in 2021!

- Single use plastics and packaging – Thursday 17th September
- Building services – Thursday 15th October
- Flooring, finishes & paints – Thursday 19th November
- Building elements (Walls, doors, windows, roofs) – Thursday 17th December

Supported by ASBP Plastics in Construction Group

## Get involved with the ASBP

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**Join as a member** – Standard (from £150) or Patron (from £1,000 per year)

**Sign up to our mailing list** – <http://bit.ly/ASBPnewsletter>

**Become a sponsor** – Support the ASBP Awards or Healthy Buildings 2021

**Join one of our specialist groups** – Natural Fibre Insulation, Plastics in Construction, Paints & Finishes (coming soon!)

**Register for one of our upcoming webinars** – Healthy Buildings Tutorials (11<sup>th</sup>, 25<sup>th</sup> June, 9<sup>th</sup> July), Plastics in Construction (18<sup>th</sup> June), Biogenic Carbon Masterclass (2<sup>nd</sup> July) and more!

<https://asbp.org.uk/upcomingevents>

# Contact us

**Katherine Adams** (Circular economy/resource efficiency)

[katherine@asbp.org.uk](mailto:katherine@asbp.org.uk)

**Richard Broad** (Digital/events)

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**Simon Corbey** (Membership/technical)

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**Debbie Mauger** (Social media/press)

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**@asbp\_uk**

# Circular economy in construction

**Katherine Adams**

Research and Technical Associate/Circular Economy Lead  
The Alliance for Sustainable Building Products

2<sup>nd</sup> June 2020

Part of #CEWEEKLDN

# ASBP and the circular economy

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**The Alliance for Sustainable Building Products (ASBP) has been active in the development of circular economy thinking for over five years.**

We have been involved in a number of successful collaborative research projects which have aimed to identify the barriers and make the business case for the 'reuse' of existing building components and the development of new 'reusable' products which can be dismantled and reused at end of life.



Technology Strategy Board  
Driving Innovation

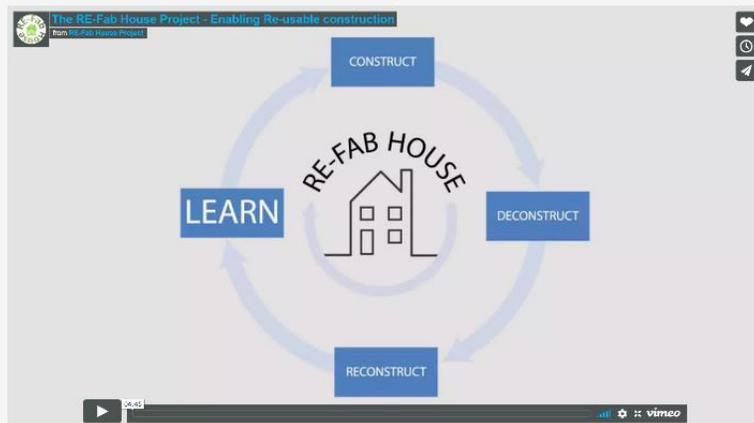
Innovate UK  
Technology Strategy Board

# ASBP research - The RE-FAB Project

The RE-Fab Project was a groundbreaking construction project which explored, developed and demonstrated new forms of construction allowing improved construction efficiencies, adaptation of buildings in use and the deconstruction and re-use of components at end of life.

**Stage One - TSB (now Innovate UK) funded project in 2013**

*Project partners:* ASBP, Bangor University, C-Tech Innovation, Cullinan Studio, EcoBond Cymru



[asbp.org.uk/  
activity/re-fab](https://asbp.org.uk/activity/re-fab)

**Stage Two - TSB (now Innovate UK) funded project, 2014-15**

*Project partners:*

ASBP – knowledge sharing

EcoBond Cymru – business case

ES Global - experts at demountable structures

Sir Robert McAlpine – project examples



# ASBP research – Steel re-use

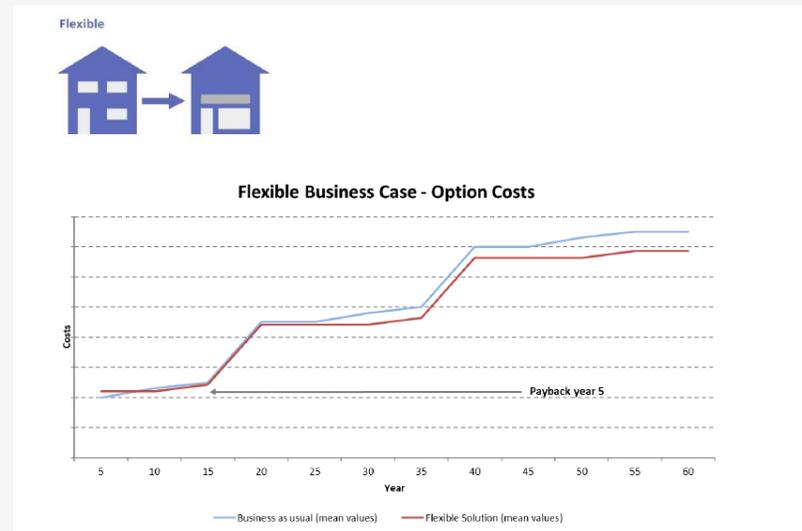
We took part in two Innovate UK funded projects on steel re-use. We examined the potential market for structural steel reuse and reported on the multiple barriers and pathways to overcome them. We also collaborated with University of Cambridge and Steel Construction Institute (SCI) on the development of a database to enable steel reuse and a business model to support it.

Cleveland Steel and Tubes supplied reused steel for a number of landmark buildings including the London Olympic Stadium and Wimbledon No.1 Court roof.



# ASBP research - Re-Usable Buildings Pathfinder Project

- Literature Review
- Case for Action
- Vision
- Road Map and Business Model
- Dissemination of Findings



[See the final report here](#)

# ASBP Reusable Products & Buildings Network

**Stakeholder network hosted by ASBP has met a number of times of the past few years. Guest speakers from Arup, UKGBC, Cleveland Steel, Verdextra, ALDstone.**

The aim of the ASBP Reusable Products and Buildings Network is to bring together forward-thinking organisations in the sector (clients, designers, manufacturers, contractors, demolition and more) to share learning, fill gaps in knowledge and further the awareness and development of reusable products and buildings that can contribute towards a more resource efficient built environment.



*Susana N ria Guerrero L pez, ALDStone presents at last meeting in October 2019*



*Re-use case study – 'The Conduit', Philippa Gill, Verdextra/EVORA*

**Currently looking for funding opportunities for further research and development. Looking to hold a Reuse Summit in late 2020/early 2021**

# Drivers for change

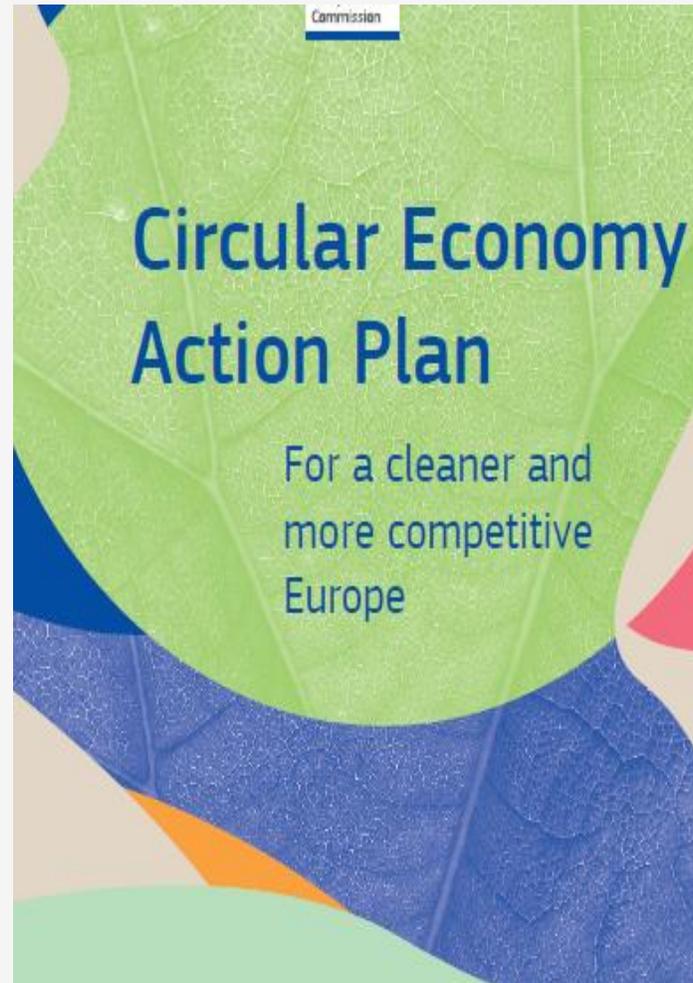
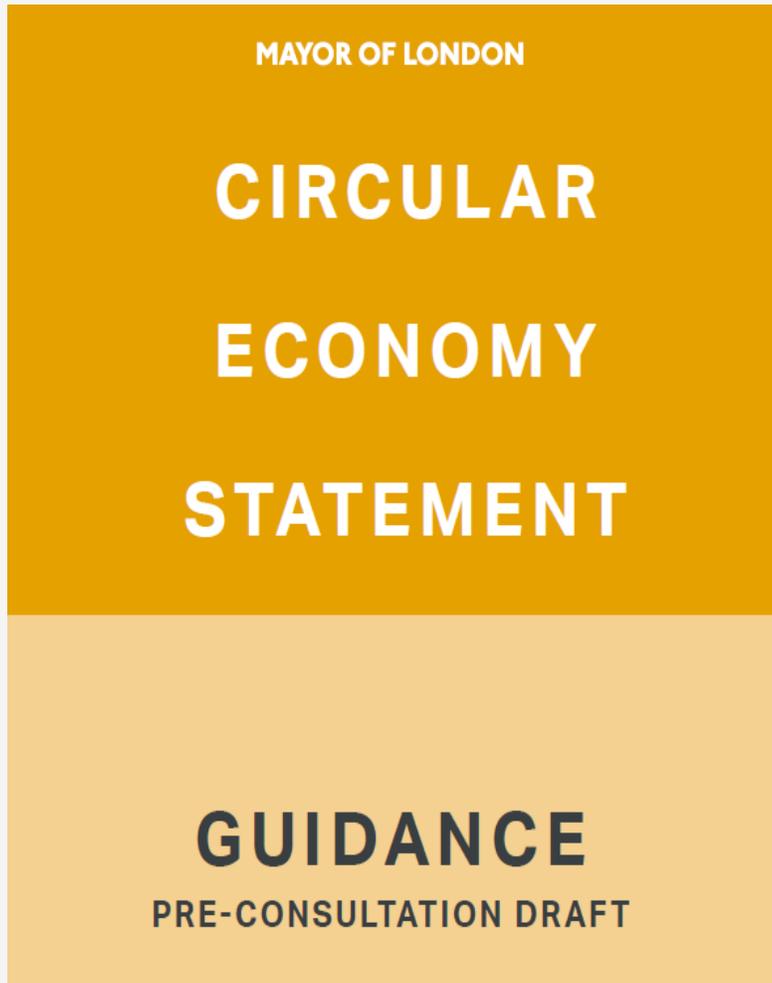
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Zero Avoidable Waste in construction means preventing waste being generated at every stage of a project's lifecycle, from the manufacture of materials and products, the design, specification, procurement and assembly of buildings and infrastructure through to deconstruction. At the end of life, products, components and materials should be recovered at the highest possible level of the waste hierarchy, i.e. reused before being recycled, whilst ensuring minimal environmental impact.



# Drivers for change

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**BREEAM**<sup>®</sup>

**SKArating**<sup>®</sup>



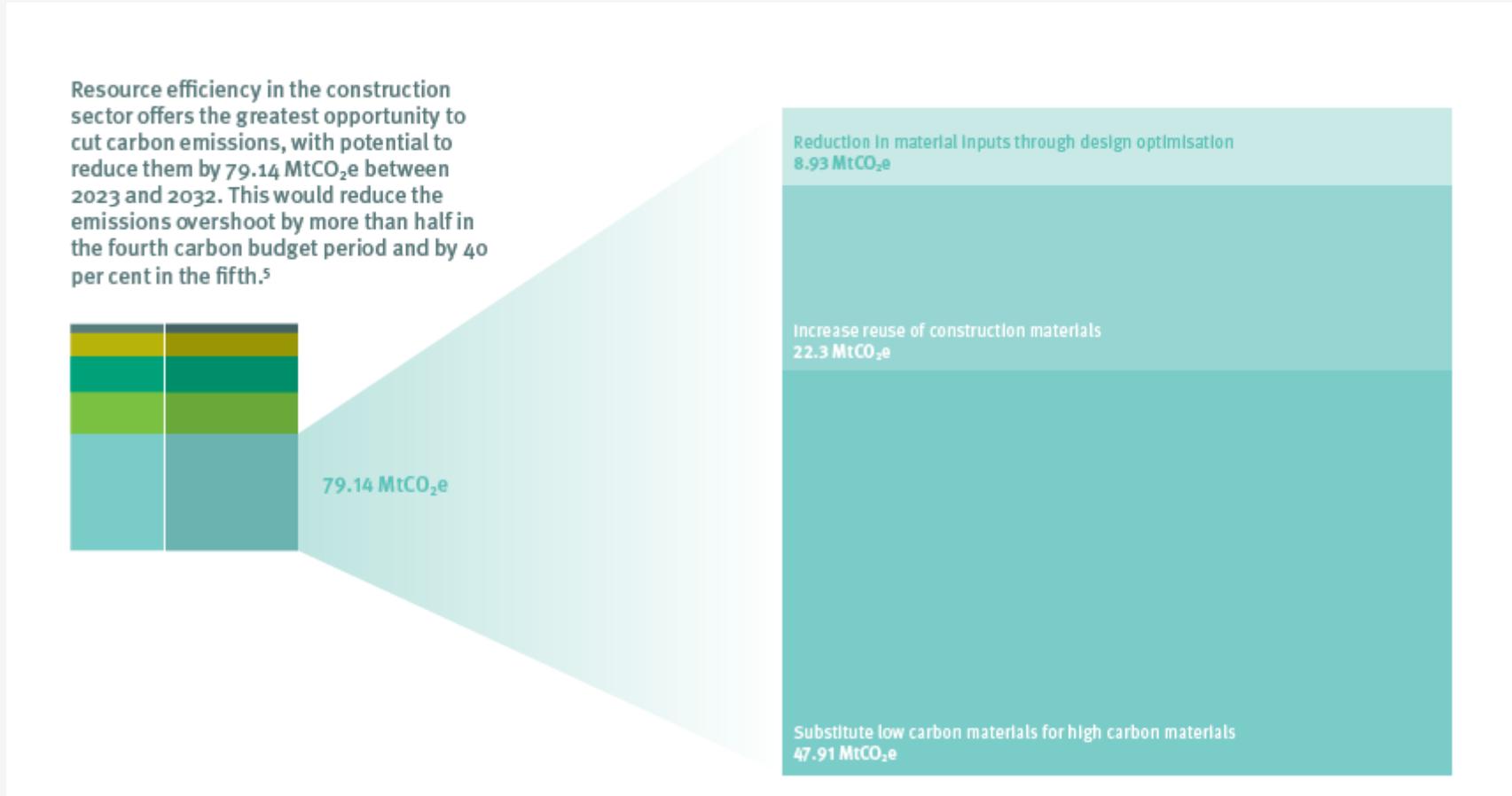
# Positive benefits (business)

Circular real estate business model					
	Flexible Spaces	Adaptable Assets	Relocatable Buildings	Residual Value	Performance Procurement
Description	Additional tenants occupy underutilised space in buildings	Buildings that can adapt to alternative uses over time	Buildings that can be reused multiple times across multiple sites	Tradable futures contracts related to value of recoverable materials at deconstruction	Extension of the product-as-a-service model to the whole building level
Lost value captured	Underutilised space	Premature demolition	Vacant land	Depreciated materials	Underperforming components
Testbed location	Milan	Aarhus	Amsterdam	Berlin	London
Testbed project	Tenanted commercial	Tenanted residential	Tenanted mixed-use	Tenanted retail	Build-to-rent residential
Financial returns	18% reduction in net present cost over 12 years	3% increase in internal rate of return over 60 years	26% increase in internal rate of return over 11 years	6% reduction in net present cost over 10 years	3% increase in internal rate of return over 30 years
Readiness					

Source: [Arup - Realising the value of the circular economy in real estate](#)

# Positive benefits (environmental)

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Source: Green Alliance – [Less in, more out: using resource efficiency to cut carbon and benefit the economy](#)

# Building Resource Management Hierarchy

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	Option
1.	Reuse of existing buildings incorporating design for future adaptation
2.	Design strategies for adaptability and longevity of new buildings
3.	Reuse of building assemblies (e.g. modular building)
4.	Reuse of building components (e.g. wall)
5.	Remanufacture of building components (e.g. building services)
6.	Reuse of building materials
7.	Recycling of materials
8.	Energy recovery of building elements, components and materials
9.	Landfill (for possible future recovery)

Source: [SEDA 2006 – Design for Deconstruction](#)

# Get the basics right

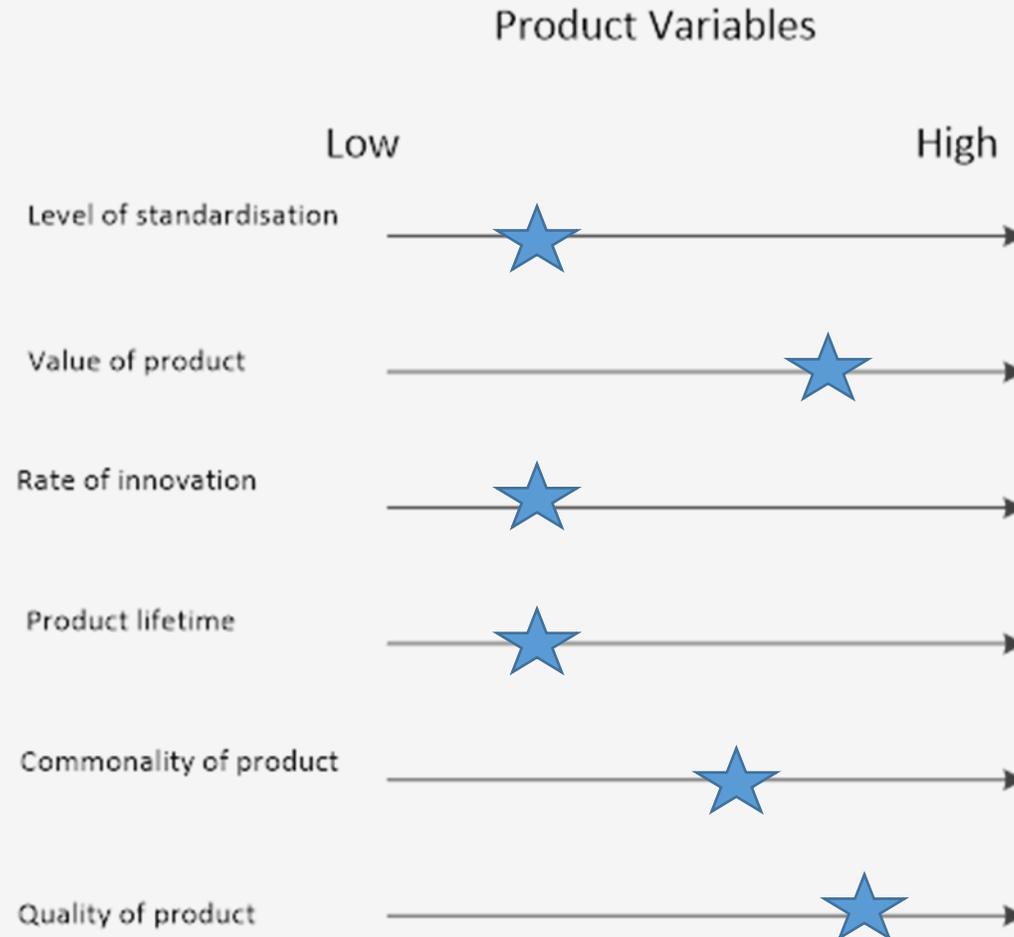
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- Use the right terminology (this may differ depending on who you are talking to)
- Keep it simple: reduce, reuse, recycle
- Start with what is already there
- Think end of life and next life
- Understand people's motivations - implications
- Connect the dots (people and processes)
- Be realistic
- Keep a 'watchful eye'



# Understanding circular economy opportunities

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# Reuse of construction products (BigRec survey)

Category	Estimate based on average 2011 tonnes	BigREc 2007 (England adjusted) tonnes	BigREc 1998 (England adjusted) tonnes
Iron & steel	47485	17,600	60,800
Concrete	1612	NA	NA
Lower value wood	4783	39,200	301,600
timber beams	10640	228,800	105,600
bricks	222369	678,240	336,000
roof slates and tiles	151737	80,536	232,000
stone	127262	458,960	880,000
flooring	27963	15,920	82,960
paving	139504	142,920	286,160
Stone, slate marble	2902	41,120	43,200
woodwork	5056	46,840	21,600
iron & brassware	8559	13,920	11,760
terracotta	2257	5,376	2,400
	<b>752130</b>	<b>1,786,472</b>	<b>2,373,680</b>

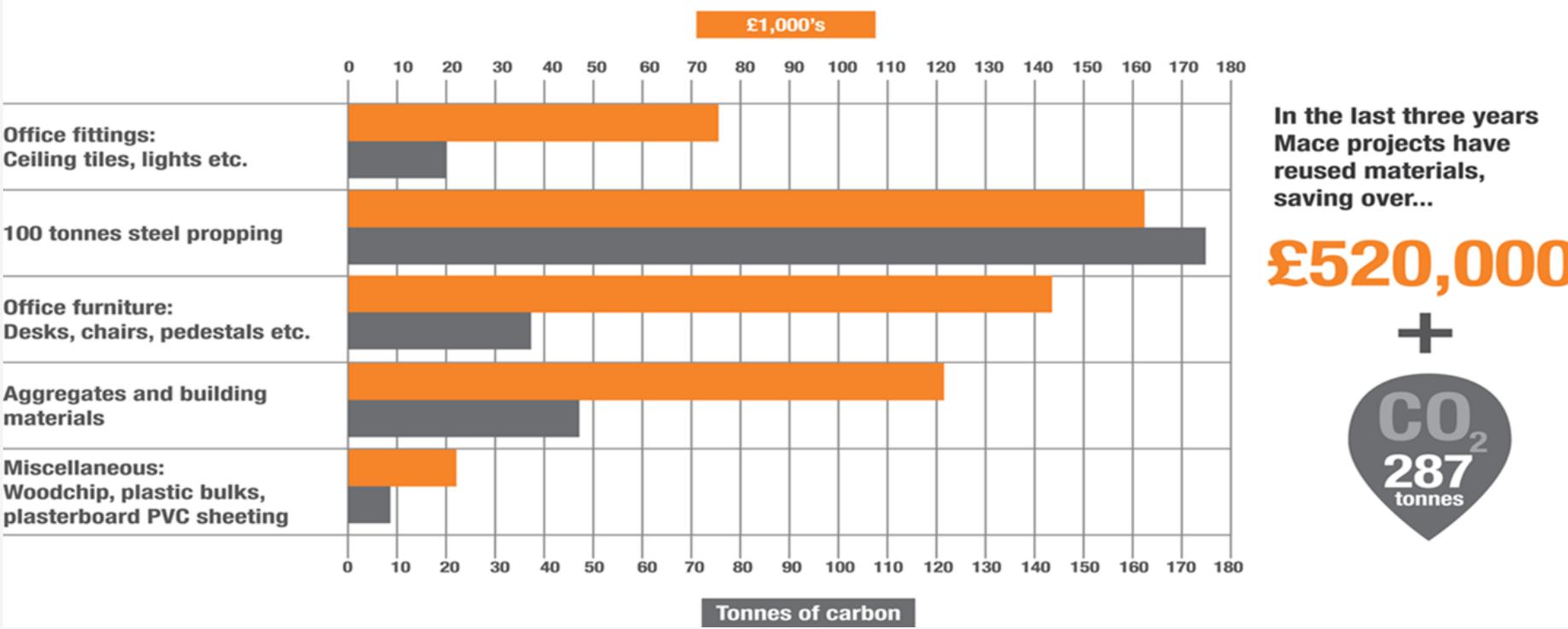
Table 13 Comparison of survey results for 2011, 2007 and 1998

# Example of reused products

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# Reuse examples: product level (Mace)



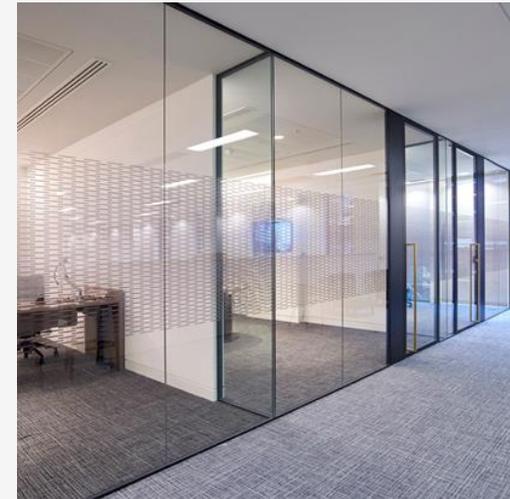
## Some challenges for current product reuse

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- Mismatch of supply and demand
- Storage and logistics
- Time for deconstruction v demolition
- Health and safety
- Reluctance to use products without appropriate tests
- Lack of data and information
- Low value of materials
- Design issues e.g. aesthetics
- Scalability

# Design for reuse

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## Some challenges for designing for reuse

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- Business case – may not pay back for some time
- More materials may be needed in the first instance
- Future uncertainty and change in technology/buildings etc
- Ability to keep information for the lifetime of the product(s) and building
- Products may be used within a component/element making them unsuitable for reuse
- Could be 'value engineered' out
- Competing issues e.g. building form
- Current lack of drivers

# Considerations for future reuse

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## **ISO 20887:2020 Sustainability in buildings and civil engineering works — Design for disassembly and adaptability — Principles, requirements and guidance**

- Easy access to components and services
- Durability
- Exposed connections
- Independence
- Avoidance of unnecessary finishes
- Supporting reuse (circular economy) business models
- Reuse(d), refurbish, remanufacture, recycle(d)
- Simplicity
- Standardisation
- Safety of disassembly

## Learning from 20 years(!) of experience in resource efficiency

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- Industry participation/buy in is crucial to develop practicable solutions
- Drivers for change absolutely necessary or things won't change
- It's easier to make complicated solutions than simple ones
- Exemplars are often 'cat walk' , need to adapt for 'high street'
- Incremental actual change is better than transformative theoretical –  
Should still aim high though
- Data (and understanding it) is vital
- Get the basics right

# Thank you

## **Katherine Adams**

Research and Technical Associate/Circular Economy Lead

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