Planning for Circular Economy

29th January 2026

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Introduction

Gilli Hobbs

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Welcome & agenda

- Introduction - **Gilli Hobbs, Reusefully**
- Low Carbon and Regenerative Development in Westminster - **Hrabrina Nikolova-Laxness, Westminster City Council**
- Circular Transformation for the Capital Region of Denmark - **Pernille Kernel, Capital Region of Denmark**
- Circular Economy in Construction - **Gilli Hobbs, Reusefully**
- Questions and panel discussion (please add your questions as we go through the presentations)

About the speakers

Gilli Hobbs has provided technical and expert input to sustainability related projects in the built environment for more than 30 years and has been highly focussed on the transition to circular construction since 2015. Amongst other work, she is currently Chair of B558/1 Circular Economy in Construction and co-lead for the European Working Group considering standards for pre-deconstruction and pre-redevelopment audits and evaluation.

Hrabrina Nikolova-Laxness is Principal Sustainability Officer for Westminster City Council. Westminster's commitment to reach net zero carbon by 2040 means that the circular economy and reducing embodied carbon is playing an increasingly prominent role in recent years. Hrabina's mission is to promote low carbon and regenerative development to support the council's Climate Emergency Action Plan and 2040 ambitions.

Pernille Kernel develops and leads broad project collaborations to create a circular transformation of the construction sector. The Capital Region has a population of nearly two million people and is now actively developing guidelines to follow new Danish selective demolition legislation, gathering together municipalities and market actors in physical material banks, and providing free advice on how to implement circularity in construction.

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What is a circular economy?

In a circular economy as much value as possible is obtained from resources already present within the system, thereby reducing overall demand for new materials and reducing waste.

- **Reuse, higher value recycling**
- Increasing the productivity and maintaining or **increasing the value of materials, products** and components by doing the same or more with less
- **Thinking in systems** – studying flows of material through industrialised systems, understanding links, how they influence each other and the consequences
- **Eliminating waste** by defining materials as either technical or biological nutrients enabling them to be within material loops
- **Regenerating natural systems**

(lots of other definitions…)

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Agenda

- Low Carbon and Regenerative Development in Westminster - **Hrabrina Nikolova-Laxness, Westminster City Council**
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Circular Economy in Construction

Meeting the planning brief and other requirements

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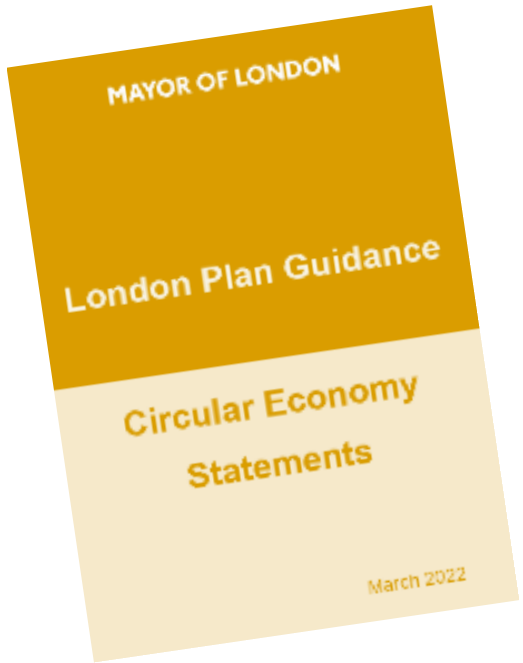
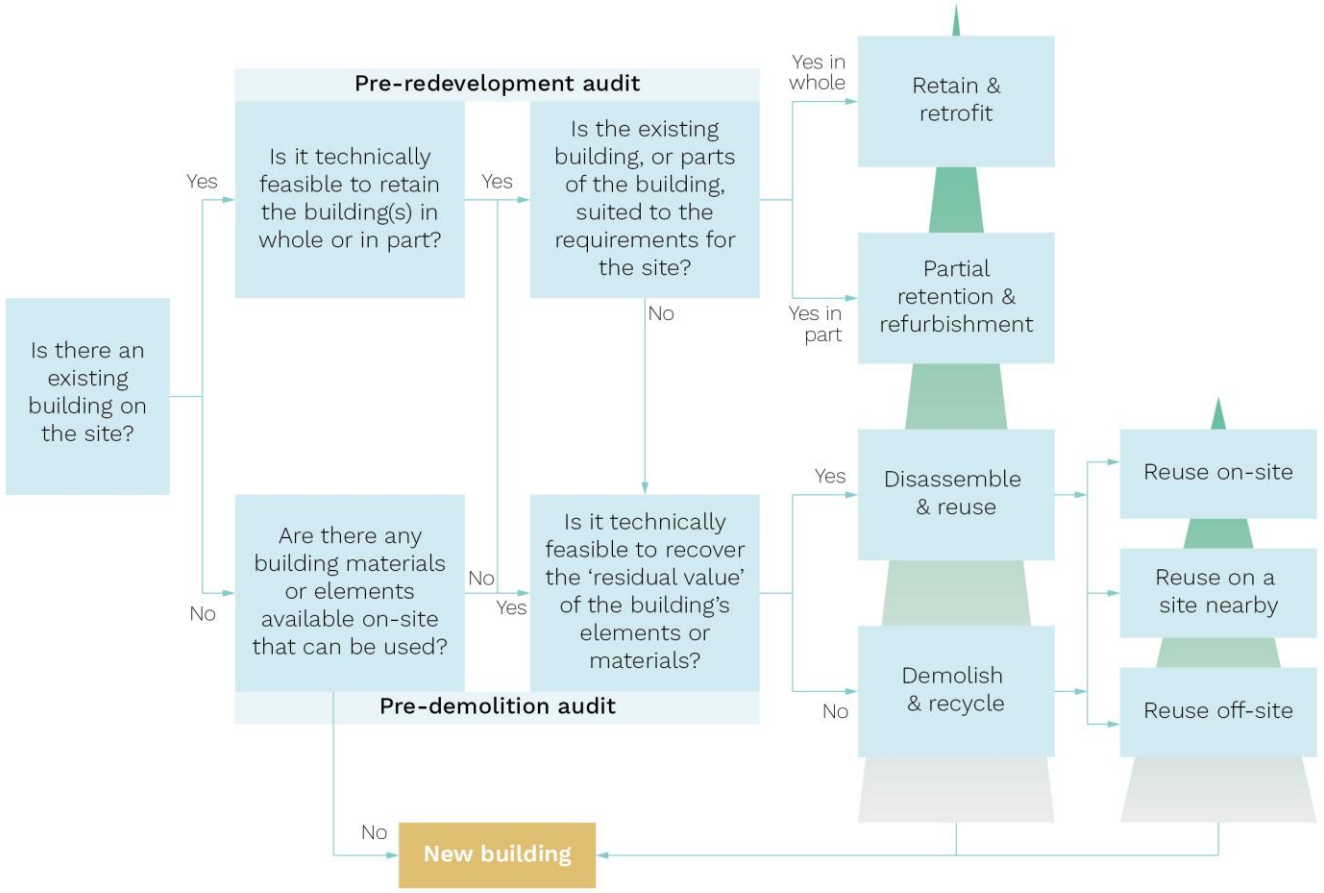
Driver: Planning





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Driver: Clients

Great Portland Estates is vowing to use at least 40% of reused materials on new construction sites and major refurbishments.

1,700 tonnes of recycled steel will be used by main contractor Mace at 30 Duke Street

The developer will start measuring the percentage of reused materials on jobs from next April using its newly developed 'Circularity Score'.

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Driver: BREEAM

Mat 06 – Material Efficiency
Encourages efficient use of materials during design and construction, reducing waste and promoting reuse

Wst 01 – Construction Waste Management
Credits for implementing a **resource efficiency plan**, minimizing waste, and diverting materials from landfill.

Wst 06 – Functional Adaptability
Rewards design strategies that allow buildings to be adapted or dismantled for reuse, a core circular economy principle.

Man 02 – Life Cycle Cost and Service Life Planning
Promotes long-term thinking and durability, reducing premature replacement and waste.

Man 03 – Responsible Construction Practices
Includes measures for minimizing waste and optimizing resource use during construction.

Innovation - Credits for advanced circular economy strategies

Wst 01 Key Components

1.Pre-Demolition Audit

- Quantify expected waste from demolition.
- Identify opportunities for reuse, recycling, and landfill diversion.

2. Resource Management Plan (RMP)

- Forecasting waste production.
- Documenting minimisation practices.
- Recording all waste arisings.
- Reviewing performance vs forecasts.
- Compliance with Waste Duty of Care.
- Applying Waste Hierarchy (reuse → recycle → disposal).

Credits Awarded For

- Setting and achieving waste reduction targets.
- Diversion of waste from landfill (measured in %).
- Exemplary Level - Higher diversion rates and advanced circular practices.

What This Means in Practice

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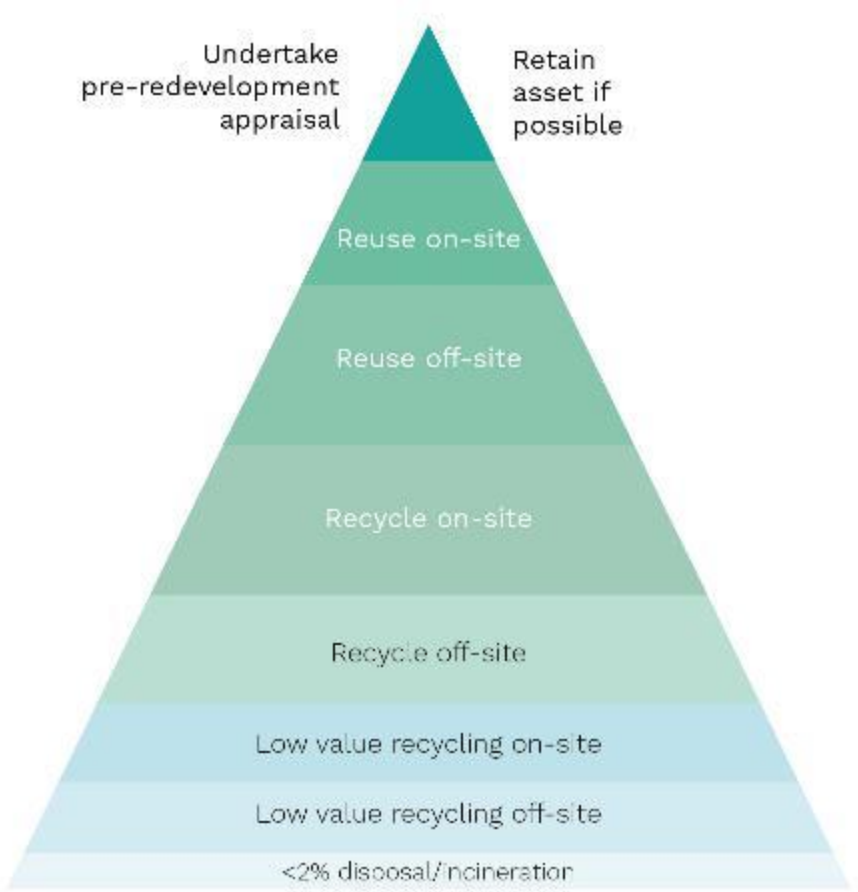
Circular Economy – Maximising Value



- Recommendations for reuse/higher value materials
- Relevant and helpful case studies
- Local organisations
- Advice on practicalities
- Potential carbon savings
- Increasing requirements for specific actions and to prove performance – metrics, post-deconstruction audits, social impact, carbon impact etc..

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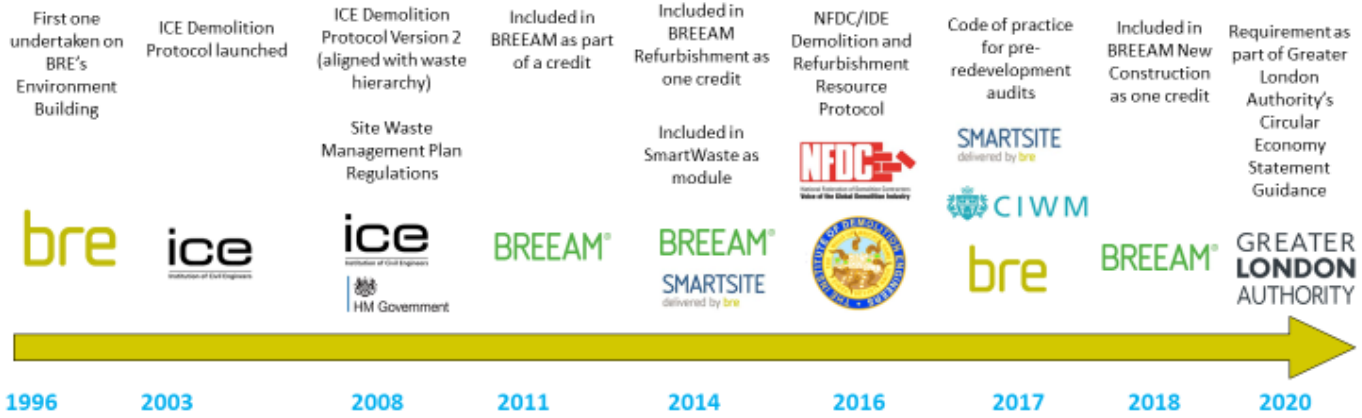
Pre-Deconstruction Audits (PDAs)

Assessment to determine what components and materials can be recovered at end-of-service life in an existing building

- Pre-demolition audits / Pre-refurbishment audits / In-use material audits (e.g. to optimise asset management)
- Also known as Material Audits/mapping/inventory, **Pre-Deconstruction Audits**

A history of pre-demolition audits in the UK



City of London's 'retrofit first' policy to come into force

22 JANUARY 2025 • BY WILL HURST

2026 EN Technical Report > Circular Economy Act

2024 > CoL/WCC

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PDA requirements – not standardised

When → Who → How → What/ Proof → What/ Report

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CEN TC 350 SC1 working groups

- WG1 Framework, principles and definitions
- WG4 Circularity related parts to a product, material and building passports/log-books
- WG5 Circularity Assessment
- WG6 Reuse of construction, products, and materials
- WG8 Pre-deconstruction and pre-redevelopment audits and evaluation
- WG7 Design for circularity at all levels for construction

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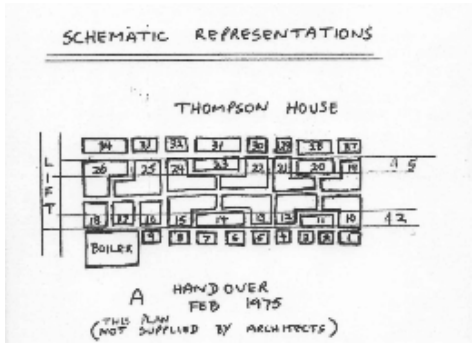
Material Audits – information gathering

- Public data – Google Streetview, EPCs, Ordnance Survey, planning archives
- Pre-existing surveys (e.g. asbestos, condition)
- Drawings – original and/or updated
- Sketches
- Site visit – measurements, notes, photos
- 3D imaging/scanning
- Information from building personnel



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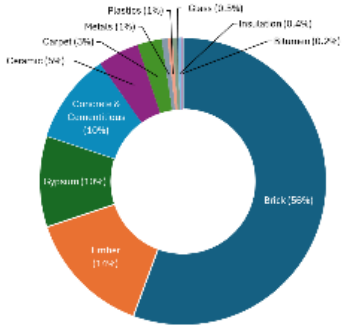
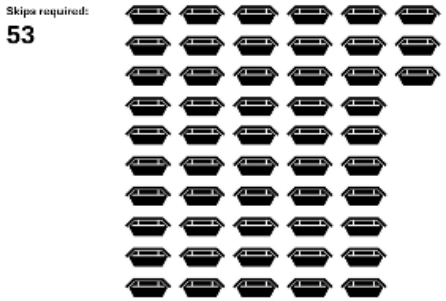
Material Audits – analysis & reporting

- Identify materials and components present, describe condition & location, photos
- Quantities of key components/materials
- Targets for % reuse, recycling, energy from waste/other, landfill
- Bulk volume / Number of skips
- Embodied carbon (avoided through reuse)
- **Detailed guidance: Methods/procedures, legal requirements, companies, initiatives**

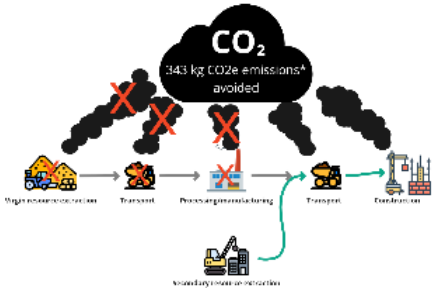
Overall Quantities



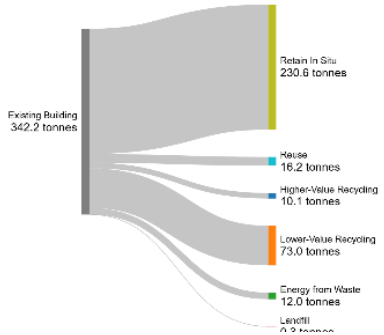
Skip Requirements



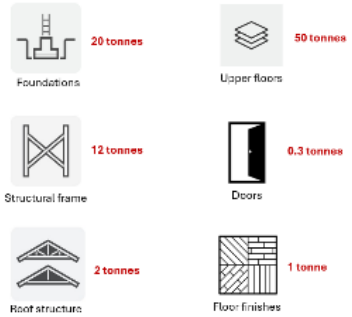
Waste & Carbon Impacts



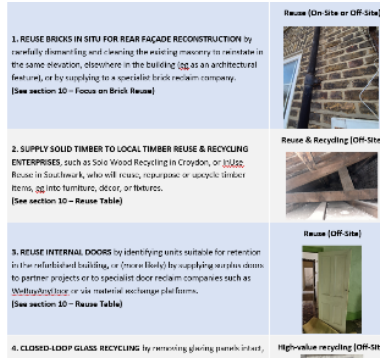
Circular Opportunities



Quantities by Source Element



Detailed Recommendations



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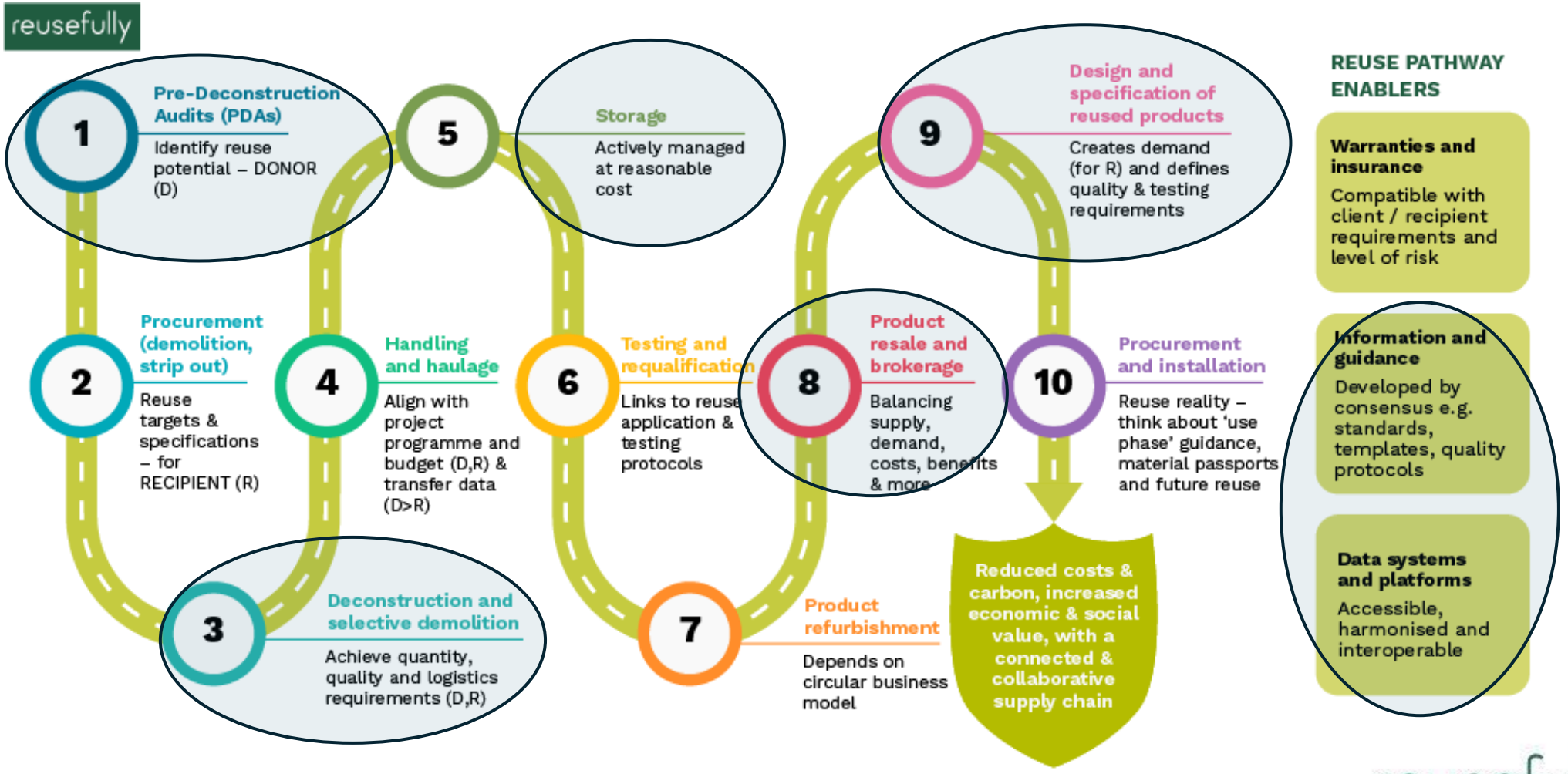
‘Reuse Pathway’ & LA influence/support



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Example - 35 Lincoln's Inn Fields

- Initial **pre-demolition audit** at the end of 2023 to identify materials and components suitable for reuse
- Now working closely with the design team and contractor to **implement circularity and reuse** in the development
- This includes the reuse of bricks, timber and other items
- Identifying challenges and opportunities.
- The client(LSE), contractor (McLaren), architects (DCA), sustainability consultants (BDP), demolition contractor (Deconstruct) and cost consultants (3PM) have played key roles in achieving high levels of retention and reuse.

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Example - 35 Lincoln's Inn Fields

7,500 tonnes retained: Concrete, Steel, Brickwork, Stone cladding

540 tonnes reuse and high value recycling:

- Bricks (reused onsite)
- Bricks (recycled into clay render onsite)
- Stone cladding (reused onsite as cladding, worktops etc)
- Ceramic tiles (reused from onsite and offsite)
- Parquet flooring (reused onsite)

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Direct donor – recipient matching

NEW: SAS330 Ceiling (Ref 62)

- SAS 330 ceiling system
  - 1199 x 300mm
  - Perf 1820
  - RAL 9010
  - Class A acoustic pad
  - 1000 no.

1,400 $kgCO_2e$

£25,000 (Eq new)

Available now

NEW: Ceiling & Luminaire raft (Ref 57)

- SAS 600 ceiling system
  - 1200x300mm
  - Acoustic pad
  - OB23 perforation
  - 80 no. infill panels, 32 no. end tiles
- Integrated Fagerhult LED Luminaires
  - DALI driver and delta diffuser
  - 15 no. standard + 15 no. emergency
  - Casing only works with this ceiling system

Obtained from Cat A space, installed for 6 months

- 5000 $kgCO_2e$
- £8000

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Material inputs tracker

Material inputs tracker

Component/Material	Status	Quantity (tonnes)	Quantity (alt units)
Acoustic suspended panels - Troldtekt	Active	TBC	TBC
Acoustic suspended panels - Autex Horizon	Active	TBC	TBC
Carpet tiles	Active	TBC	TBC
Drop rods	Active	TBC	TBC
Unistrut	Active	TBC	TBC
Cable trays	Active	TBC	TBC

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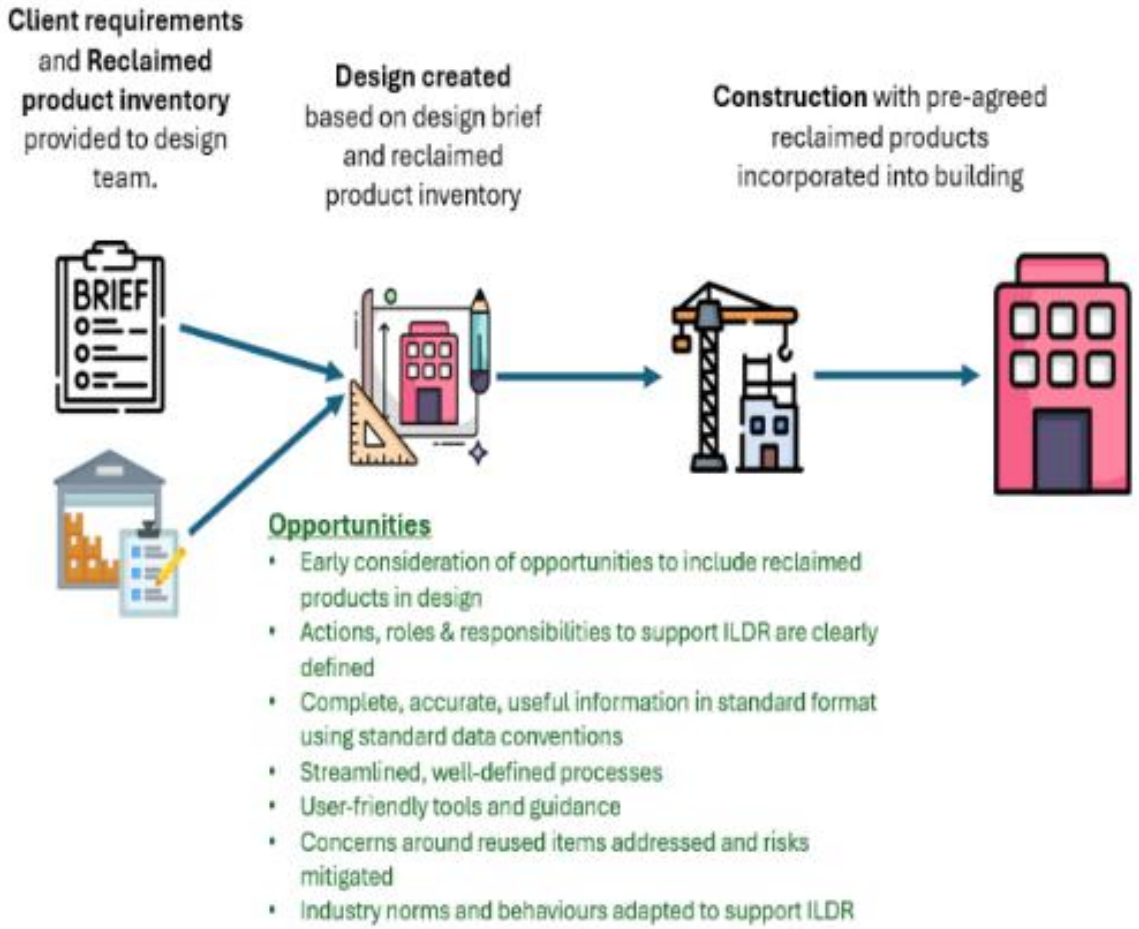
Inventory-led design for reuse



Digital marketplaces

Salvo – been around a long time, mostly (but not all) lower-volume higher-value salvage

Globechain – requires subscription, charity-focused

Romulus – Maconda system, B2B marketplace, City of London (40 HV, Barbican test case), Tower Hamlets, Hammersmith & Fulham

Enviromate – simple to use, focus on building materials

More platforms emerging/ adapting

Physical reuse hubs also being established alongside 'traditional' reclamation yards

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Circular business models – products

- Supplier takeback and remanufacture/recycling, e.g.
  - Carpet tiles (e.g. Interface)
  - Ceiling tiles (e.g. SAS)
  - Flat glass (closed loop recycling)
- Leasing e.g.
  - Façade (TU Delft Netherlands)
  - Lighting
  - Lifts
- Third party remanufacture, e.g.
  - Raised Access Flooring
  - Heating and cooling systems
  - Lighting

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Design for Disassembly and Adaptability

ISO 20887:2020 outlines 16 core principles for Design for Disassembly and Adaptability (DfD/A), aimed at improving sustainability in buildings and civil engineering works. These principles are grouped into two categories: disassembly and adaptability.

Design for disassembly and adaptability (DfD/A) – Principles, requirements and guidance

- **Adaptability Principles:**
  - Versatility, Convertibility, Expandability
- **Disassembly Principles:**
  - Ease of access (components & services), Independence, Avoidance of unnecessary treatments & finishes, Supporting reuse (circular economy) business models, Simplicity, Standardisation, Safety of disassembly
- **Other sections**:
  - Developing the client brief, Design Strategies, Levels & Scope of analysis
  - Documentation and information (such as Deconstruction plans, Material passports
  - Continuing implementation of DfD/A(through to eventual end of use/decommissioning)

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Circularity for fit-outs and interiors

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EU research to build upon – just a snapshot!

Completed

- BAMB – 10 years ago (www.bamb2020.eu)
- FCRBE (FCRBE Interreg)
- CIRCuIT (www.circuit-project.eu/)
- CityLoops (https://cityloops.eu/)

Ongoing

- RECREATE – precast concrete reuse (https://recreate-project.eu/)
- CisuFlo – circular flooring (www.cisuflo.eu/)
- DRASTIC – partitions, timber, steel reuse demonstrators (https://drasticproject.eu/demonstrators)

FCRBE Reuse Toolkit: Material Sheets

BAMB: Green Transformable Building Lab - Heerlen

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Thanks for Listening

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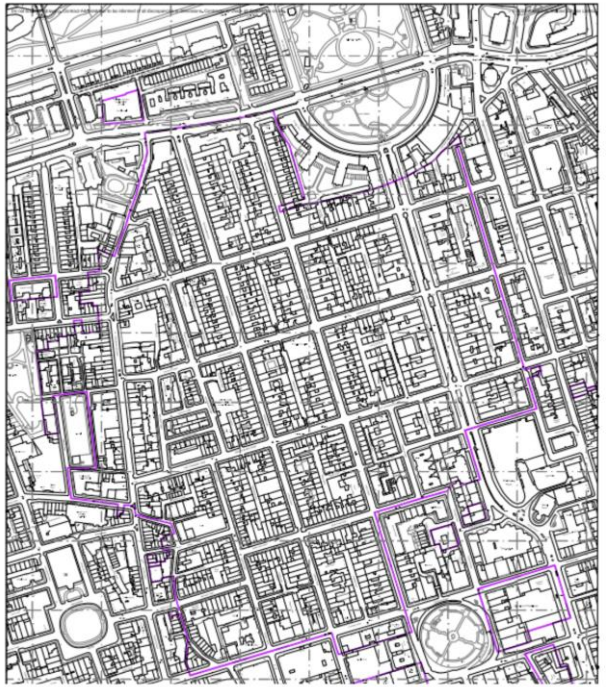
RETROFIT-FIRST FOR CIRCULAR CONSTRUCTION
Hrabrina Nikolova-Laxness

Retrofit Taskforce and the Howard de Walden Estate



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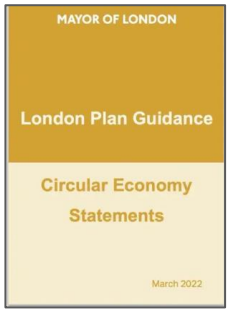
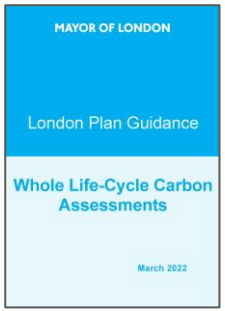
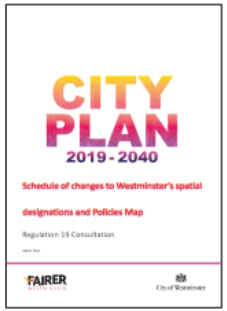
ZERO CARBON 2040
Westminster Climate Action

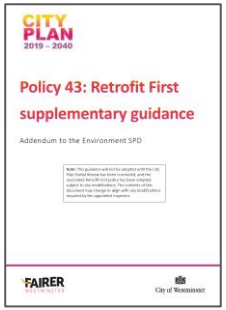
City of Westminster

Policy Hierarchy









National Level — NPPF (UK Government)

Three interdependent and mutually supportive objectives (Paragraph 8):

- Economic objective – supporting a strong, responsive, and competitive economy.
- Social objective – supporting strong, vibrant, and healthy communities.
- **Environmental objective** – protecting and enhancing the natural, built, and historic environment, including making effective use of land and helping to improve biodiversity, **use natural resources prudently**, and mitigate and adapt to climate change.

Paragraph 11:
“Plans and decisions should apply a presumption in favour of sustainable development.”

↓

Regional Level — Greater London Authority (London Plan)

The London Plan (2021) expands on NPPF principles for the London region.
Policy SI 2: Minimising greenhouse gas emissions, requiring Whole Life Carbon (WLC) assessments for major developments.
GLA Whole Life Carbon Guidance suggests benchmarks, but they are not part of main policy text.

↓

Local Level — Westminster City Council (WCC City Plan & Environmental SPD)

Conformity with the London Plan and NPPF.
City Plan (2021) Policy **38 Design principles** and **Environmental SPD (2022)** require:
WLC assessment and circular economy statements for major developments only

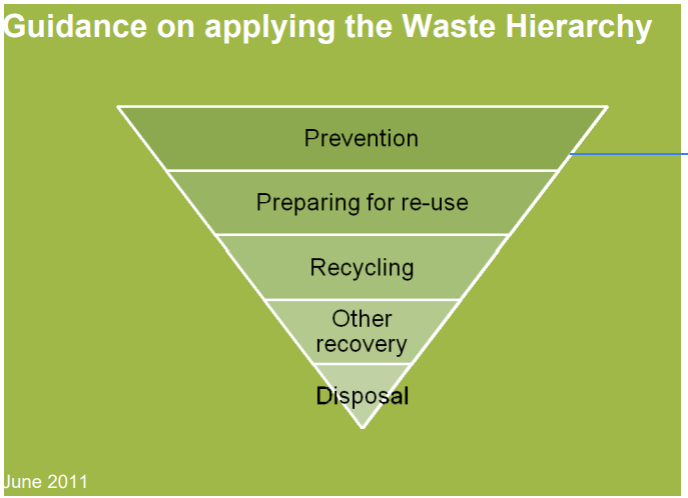
↓

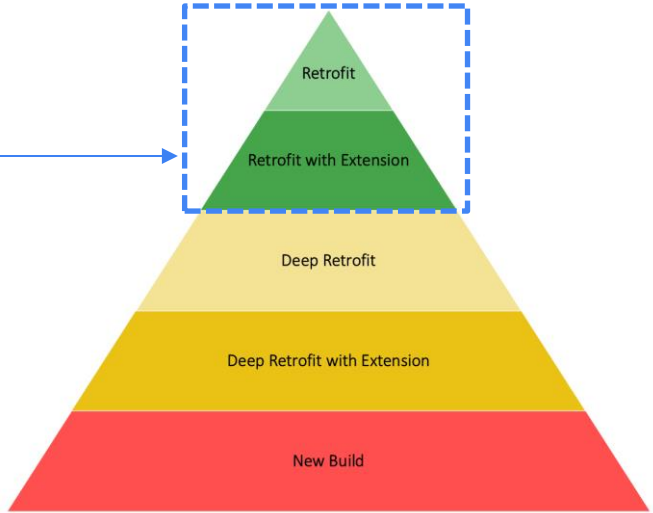
Local Level — Westminster City Council (WCC City Plan & Environmental SPD)

Proposed Policy 43 Retrofit-first – presumption of retention over demolition, WLC assessments and CE statements for **all schemes** involving the substantial demolition of structures above 1 storey, introducing upfront carbon benchmarks in policy text, and incentivising retrofit.

Policy Hierarchy

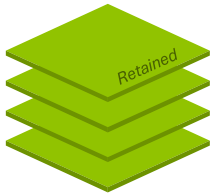
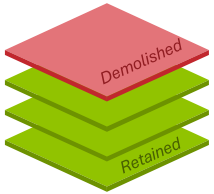
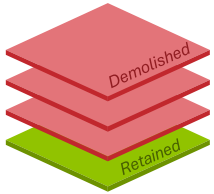
Department
for Environment
Food & Rural Affairs





WCC Retrofit First – Definitions

Level of Demolition

RETROFIT **RETROFIT W/ EXTENSION**	None / Minor Demolition 0% to 10% GIA		• Removal and replacement of **building envelope, finishes,** and **building services** • Localised works to **small areas** of **superstructure** and **substructure** to facilitate replacement works (or extension works)
DEEP RETROFIT **DEEP RETROFIT W/ EXTENSION**	Partial Demolition 11% to 50% GIA		• Removal and replacement of **building envelope, finishes, and building services** • Localised works to **areas** of **superstructure** and **substructure** to facilitate replacement works (or extension works)
NEWBUILD	Substantial Demolition >50% GIA		• Removal and replacement of **building envelope, finishes, and building services** • **Extensive** works to areas of **superstructure** and **substructure** to facilitate replacement works (or extension works)

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WCC Retrofit First – Document Requirements

	 *Level of Demolition*	 *Pre-redevelopment Audit*	 *Circular Economy Statement*	 *Whole Life Carbon Assessment*
RETROFIT	None / Minor Demolition			*Major only*
RETROFIT W/ EXTENSION	0% to 10% GIA			*Major only*
DEEP RETROFIT	Partial Demolition		*Major only*	*Major only*
DEEP RETROFIT W/ EXTENSION	11% to 50% GIA		*Major only*	*Major only*
NEWBUILD	Substantial Demolition >50% GIA	*Major and Minor*	*Major and Minor*	*Major and Minor*

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Retrofit First Upfront Carbon Limits

	ASPIRATION	***LIMIT** (Maximum)*
Major schemes - Commercial buildings (including commercial led mixed-use schemes)	**550** $kgCO_2e/m^2$ GIA	**650** $kgCO_2e/m^2$ GIA
Major schemes - Residential (including residential-led mixed-use schemes and hotels) **over 18 metres* in height**	**600** $kgCO_2e/m^2$ GIA	**700** $kgCO_2e/m^2$ GIA
Major schemes - Residential (including residential-led mixed-use schemes and hotels) **under 18 metres* in height**	**550** $kgCO_2e/m^2$ GIA	**650** $kgCO_2e/m^2$ GIA
Non-major schemes where policy applies, and development types not considered above & Major and non-major schemes delivering policy compliant affordable housing	**Lowest deliverable upfront embodied carbon**	

City of Westminster

63 New Bond Street

63 New Bond Street

New Bond Street Elevation With Existing Floor Levels

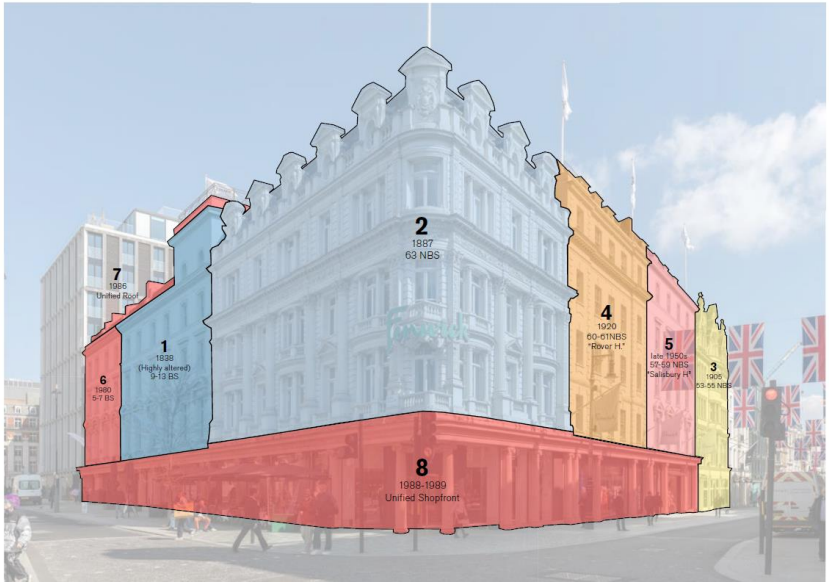

Image Source: Foster and Partners Design and Access Statement

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ZERO CARBON 2040
Westminster Climate Action

City of Westminster

Ebury Bridge housing – concrete reuse trial

	Recycled Fines	Volume (m3)	Total KgCo2e	KgCo2e per m3	KgCo2e Saving	Difference
Typical C30/40 Concrete	0%	7.0	2,459	351.3		
Xeroc **Full Scale** C30/40 Concrete	15%	7.0	1,905	272.1	79.2	22.6%
Xeroc **Full Scale** C30/40 Concrete	30%	7.0	1,582	225.9	125.4	35.7%

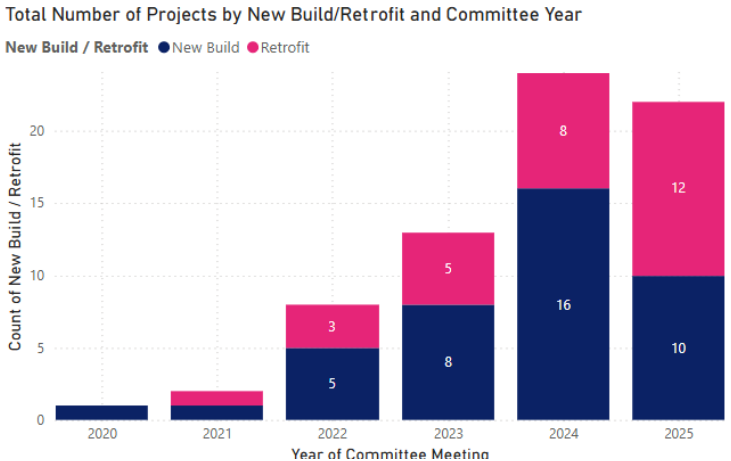
Image Source: Xeroc Low Carbon Concrete Case Study, https://xeroc.co.uk/case-studies/

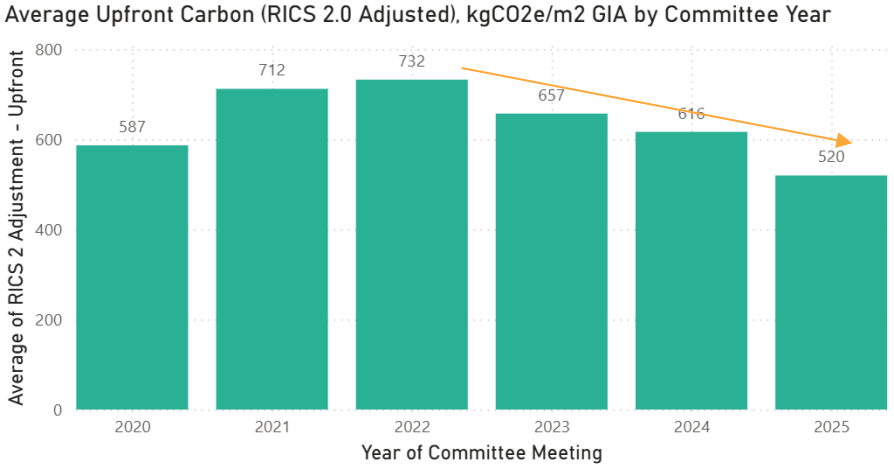
WCC suggested re-use targets

London Plan Guidance Circular Economy Statement Requirement	Westminster City Council (WCC) Circular Economy Statement Requirement

Circular Economy targets	• Required, as per London Plan Guidance
	• WCC Suggested Targets*:
	  ○ 20% recycled content by mass/value in new build elements
	  ○ 25% of materials, by mass/value, identified within the pre-deconstruction audit to be reused (on-site or off-site)
	  ○ 50% materials by mass/value to have digital material passports

A level playing field





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Region Hovedstaden

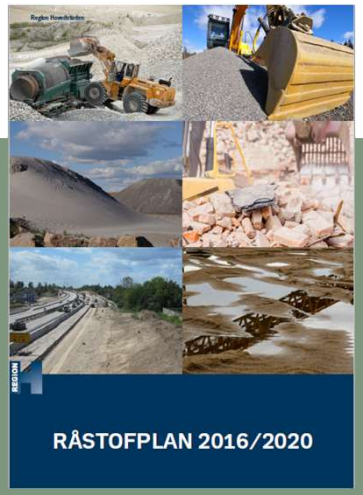
Supporting circular transition of the construction value chain

Pernille Kernel
Capital Region of Denmark

Region Hovedstaden

Building owner

Regional development



Raw material authority

Roles concerning construction and circularity

Region Hovedstaden
Center for Regional Udvikling og Center for Ejendomme

CityLoops

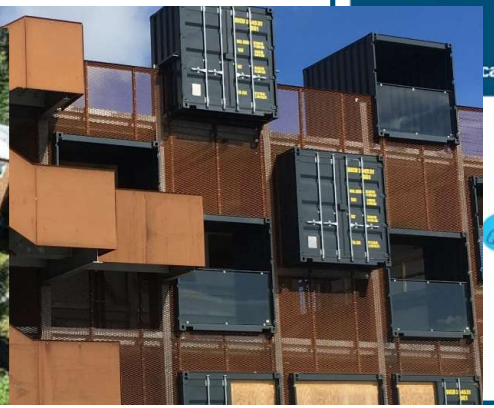
Horizon 2020 project from 2019-2023

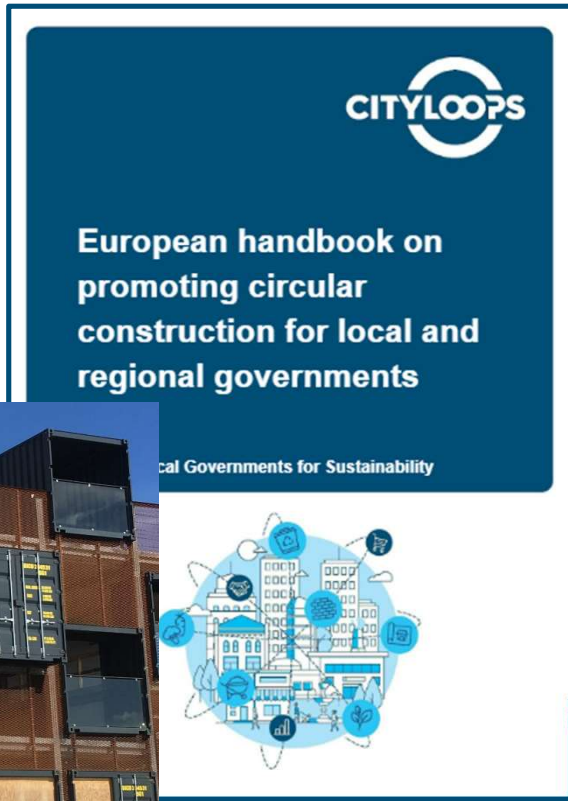
Apeldoorn, Bodø, Høje-Taastrup, Mikkeli, Roskilde, Seville

Developing methods and instruments and demonstrating solutions

1 handbook and 9 toolboxes with instruments and demonstration experiences

1) Planning and decision-making
2) Stakeholder engagement
3) Circular demolition
4) Data and material passports
5) Material banks and marketplaces
6) Recycling concrete
7) Circular soil handling
8) Circular procurement
9) Business cases





What made it work?

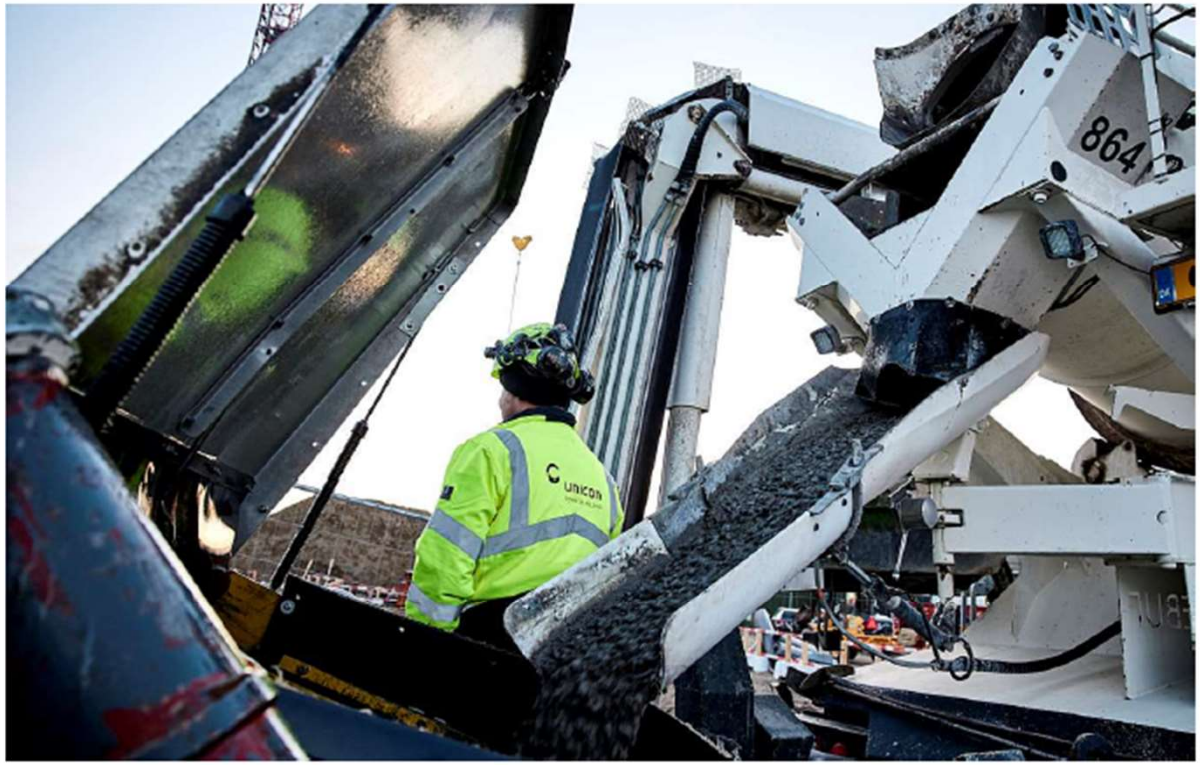
Cooperation between stakeholders

Willingness to try something new

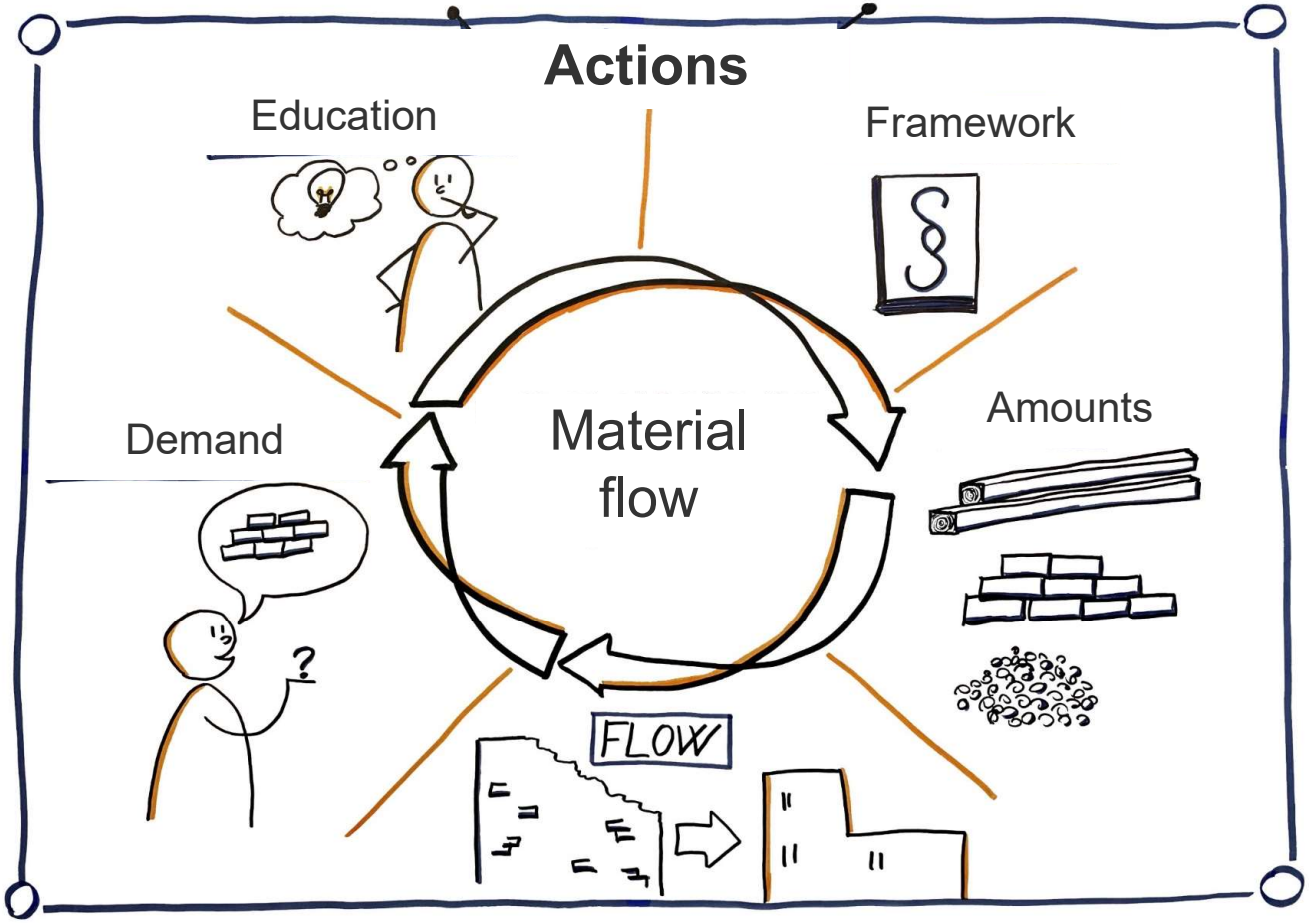
Appropriate timing between projects

Appropriate materials between projects

Willingess to invest (financially) in developing the process (innovation)



Regional programme for sustainable and circular construction



Framework conditions

Influencing and implementing framework conditions

EU Circular Economy Act

- Recommendations: Primary raw material supply crisis & CE as part of solution
- Joint call for action: Paris, Amsterdam, Vienna, Berlin…

Danish Law on selective demolition

- Entered into force in June 2025
- Demolitions above 250 m2
- Only address demolition not handling afterwards…
- Guidelines developed by & for the region – supporting development of national guidelines

Examples of framework conditions favoring circularity

LCA calculations promoting reused materials

- LCA limits – reused count as zero in Denmark
- CO2 demands for construction going down

Amendment to FAR Requirements to Incentivize Building Preservation Over Demolition

- Gladsaxe Municipality is seeking to amend the requirements for the plot's permissible floor area ratio (FAR)
- Allowable built-up area is reduced in cases of demolition compared with cases whith retrofit with extension

Available amounts

Of materials for reuse or recycling

The Donorbuilding platform

Initial idea: Overview of what is out there

Analysing the challenge:

- Materials before design
- Knowledge of future avaliable resources
- Timeliness in matchmaking

Solution: Donorbuilding platform

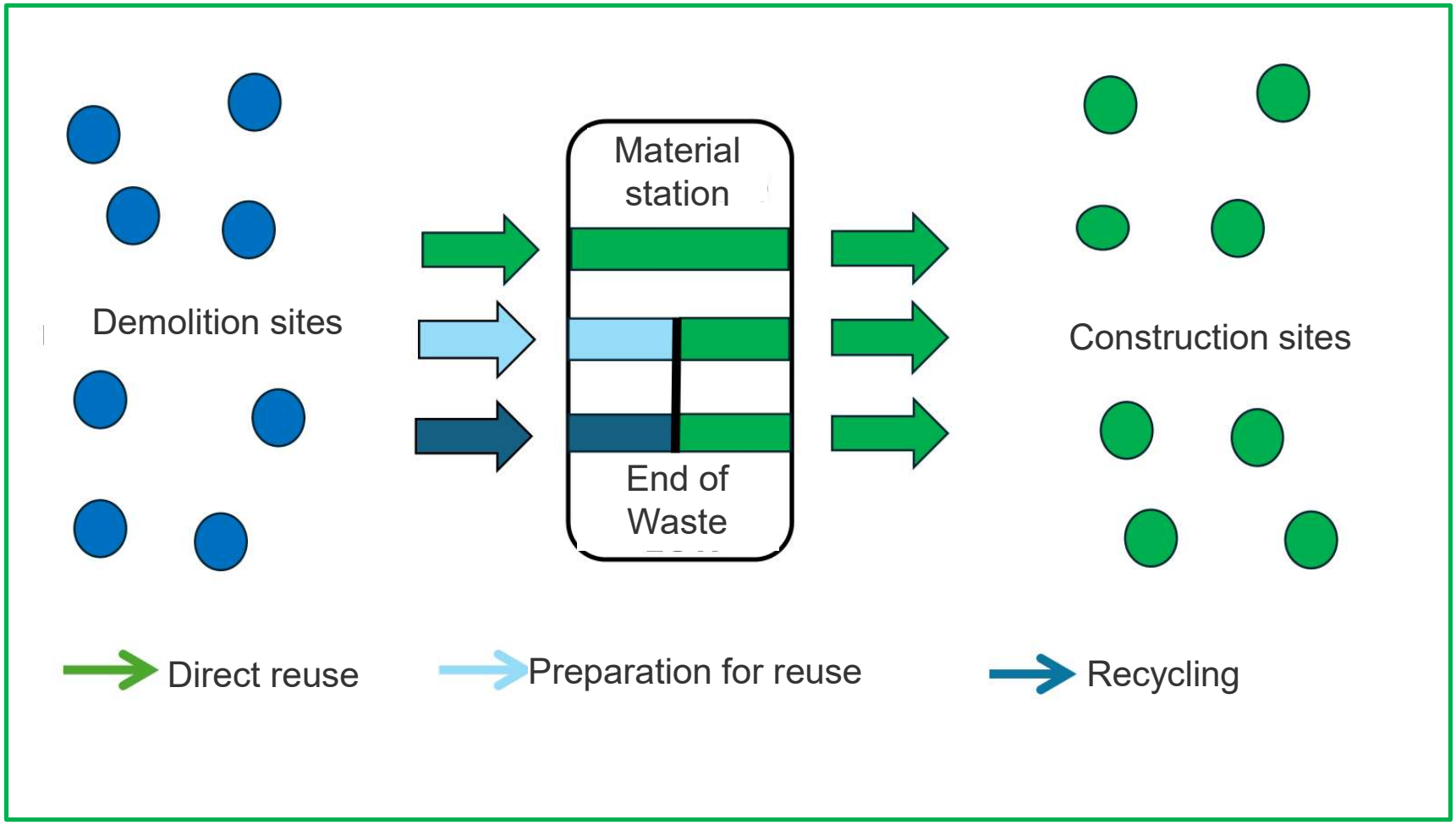
- Dating site for buildings for transformation/demolition and new construction
- Financed by the danish Public Digitalisation Fund

Flow

From demolition to construction

Material stations

Area for storing and preparing materials and waste from demolitions suited for reuse or recycling.
They can be both public or private.



Pushing for material stations

- The region bring together major public developers to help push for the establishment of more material stations (public or private)
- Studies done on the potential, the need, the legal framework, total costs, as well as consequences for public construction clients
- Working group of region and municipalities designing the concept
- Involving the market in early dialogue
- Looking for complementary funding

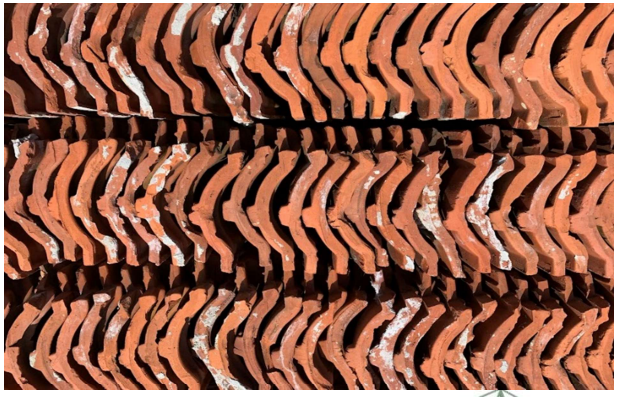



Demand

Taskforce on circularity in construction projects

- Analysed common issues
  - Tendering requirements, legal issues, risk management, documentation and quality
- Taskforce covering these different aspects
- 25 hours free consulting assistance financed by the region
- Large construction projects – all sorts
- Publish the examples





Region Hovedstaden

Thank you