

SUPPLY CHAIN SUSTAINABILITY



National Highways SMP Waste & Resource Efficiency Workshop

29th June 2022 – 9.30am to 11.30am

Overview

1. Legislation

2. Financial Implications

3. Waste and Resource Efficiency Management Planning

4. Q&A

Introduction

Waste Management Workshop - Outcomes



At the end of this short session you will:

- Have revisited some of your legal responsibilities under waste legislation
- Considered ways to improve site waste management and resource efficiency
- Be better placed to explain requirements to others.

Please Participate



If you have **QUESTIONS**, please feel free to speak up or write them down in the chat box



Cameras on and earphones help!
Please mute during presentations but feel free to unmute and speak up if you have a question
Please, ensure your line is **UNMUTED** during group discussions and **VIDEO** is on



We will use the platform **Jamboard** to engage in different activities



SLIDES will be distributed afterwards

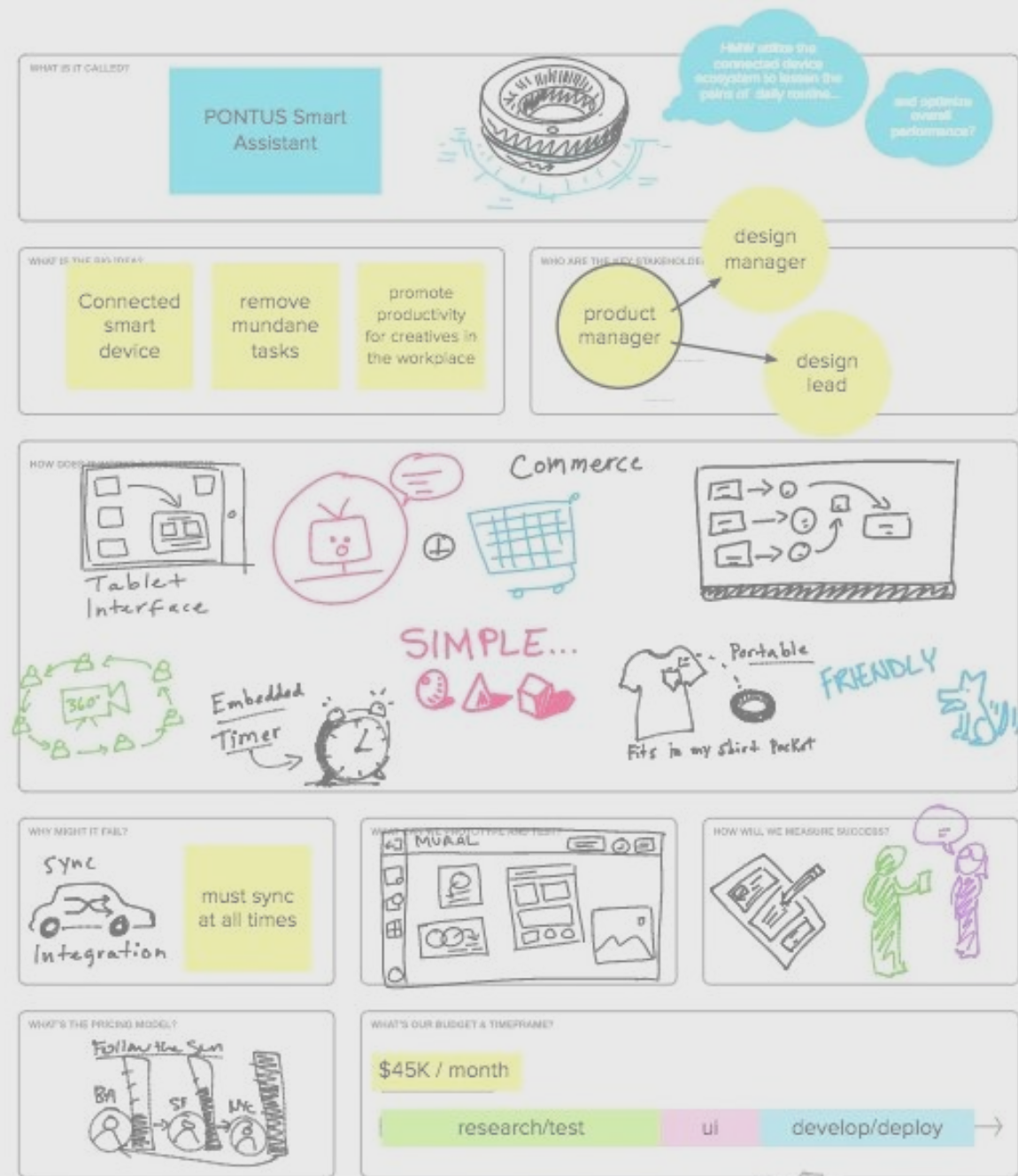
Introductions, using Jamboard and Chat box

- We will introduce Google Jamboard shortly – you just to open this as an interactive document via your browser – use the link we sent you by email or the one we have added in the Chat function of Zoom
- If you can't access Jamboard or have something else to ask, just use the Chat function. Again this is in the Zoom toolbar
- Also use this to add other comments, keep notes of anything you think could be useful to the group, add your questions etc
- Feel free to shout out – I'm very happy to be interrupted.

LINK: <https://jamboard.google.com/d/13OIt-VieM4-C0JY48e8uZmqv1Rv3F1nwY-xT4bCU6jQ/edit?usp=sharing>

Jamboard

- **FOLLOW** the **link** we sent to you
- **CREATE** a post it note, double click on an empty space and start writing
- To **MOVE** your post it note around, click on and drag it
- To **DELETE** your post it note, click on it and press the 'Delete' button on your keyboard
- PLEASE DON'T press the "clear form" button!



WE NEED YOUR FEEDBACK PLEASE



THIS LINK WILL BE AVAILABLE ON THE CHAT:
[ADD LINK](#)

What is Waste?

“Any substance or object that the holder discards, or intends to, or is required to discard.”

(Waste Framework Directive)



Stakeholders?

Who is interested?

The School's Waste & Resource Use Category Group

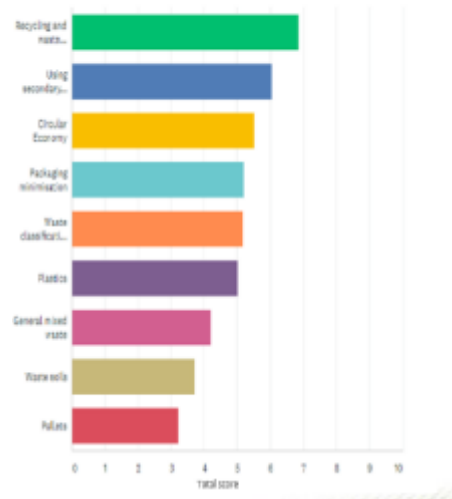


Refreshed
 -Landing page
 -Resources (new and old)



Material Exchange Platforms Mapping
 - Skanska collaboration

Q1. Which aspects of waste and resource efficiency are of interest to you and why? (Ranked from 1-9)



Surveys
 -Member interest
 - Partner plastic waste



Partner case studies

Leadership group support

Some items currently on our hitlist

Informing School on policy and legislative changes

Plastic Packaging Tax, Circular Economy, Producer Responsibility etc

Designing out waste

Guidance and events, promoting circularity

Packaging projects

Guidance, events, collaboration, research – Infra/Fit Out/M&E?

Construction project lifecycle waste

Developing resources to improve outcomes

Supporting procurement processes

Developing model tender questions and responses

Soils and aggregates

Improving understanding and performance

Plastics and aggregate reprocessing companies

Mapping and developing knowledge on how to engage

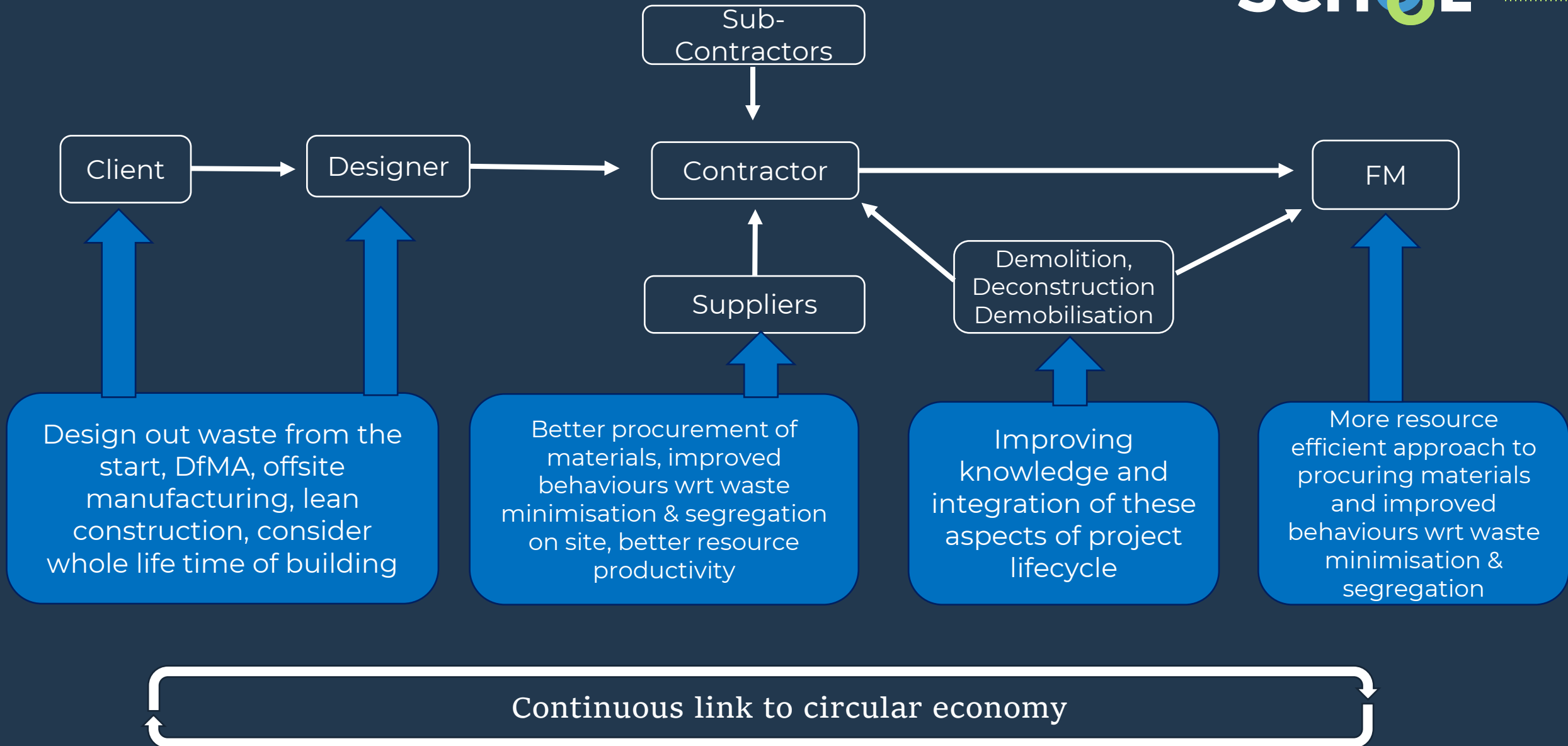
Collaboration with other groups

Addressing SDGs, working with Carbon Group on scope 3 etc

Social value

Research and collaboration opportunities

INTERVENTION POINTS





Legislation

What type is it?



“Inert”

- Non bio-degradable material
- E.g. Non-contaminated subsoil, aggregates, etc.



Non-hazardous

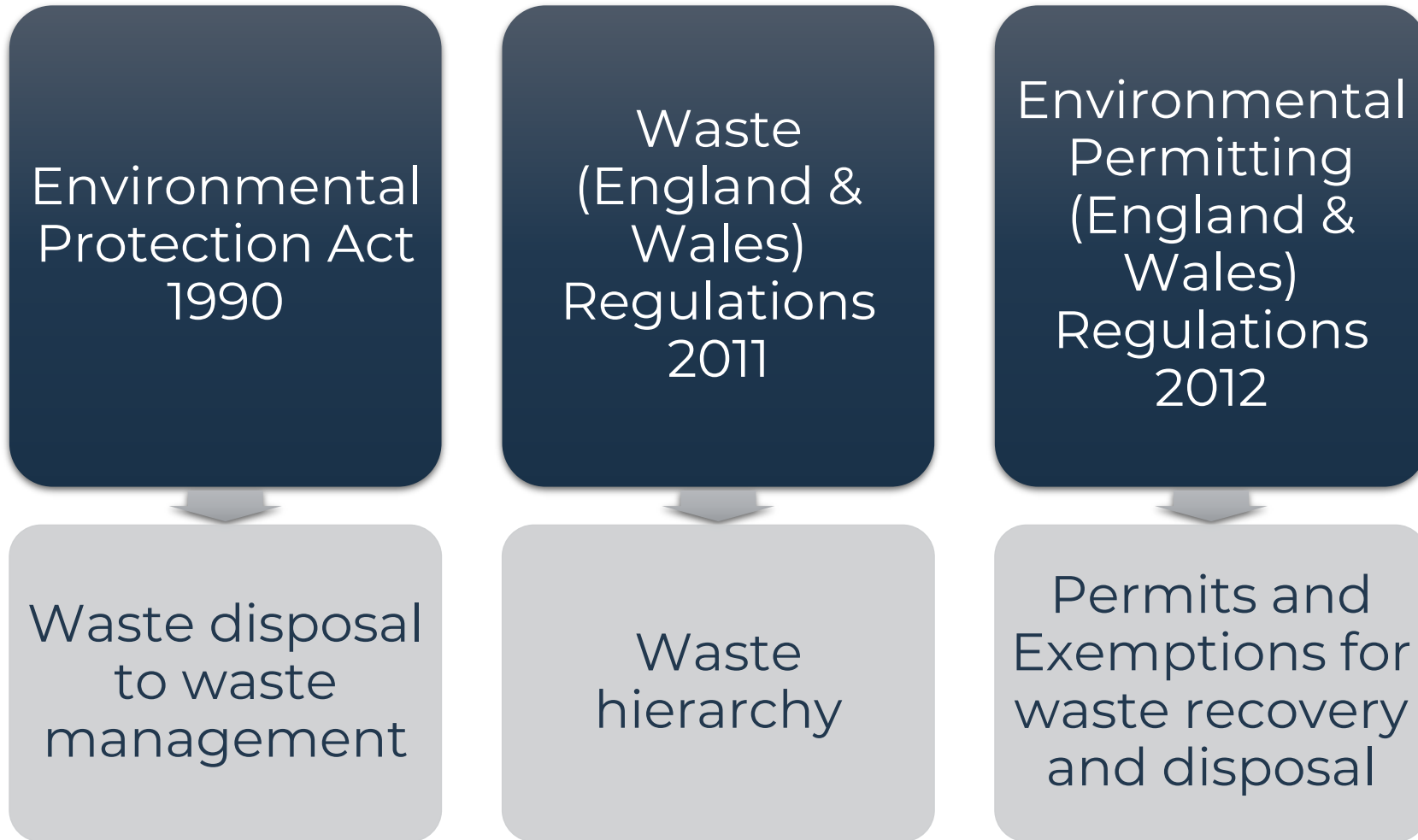
- Non-contaminated bio-degradable materials
- E.g. Topsoil, timber, metal, plastics



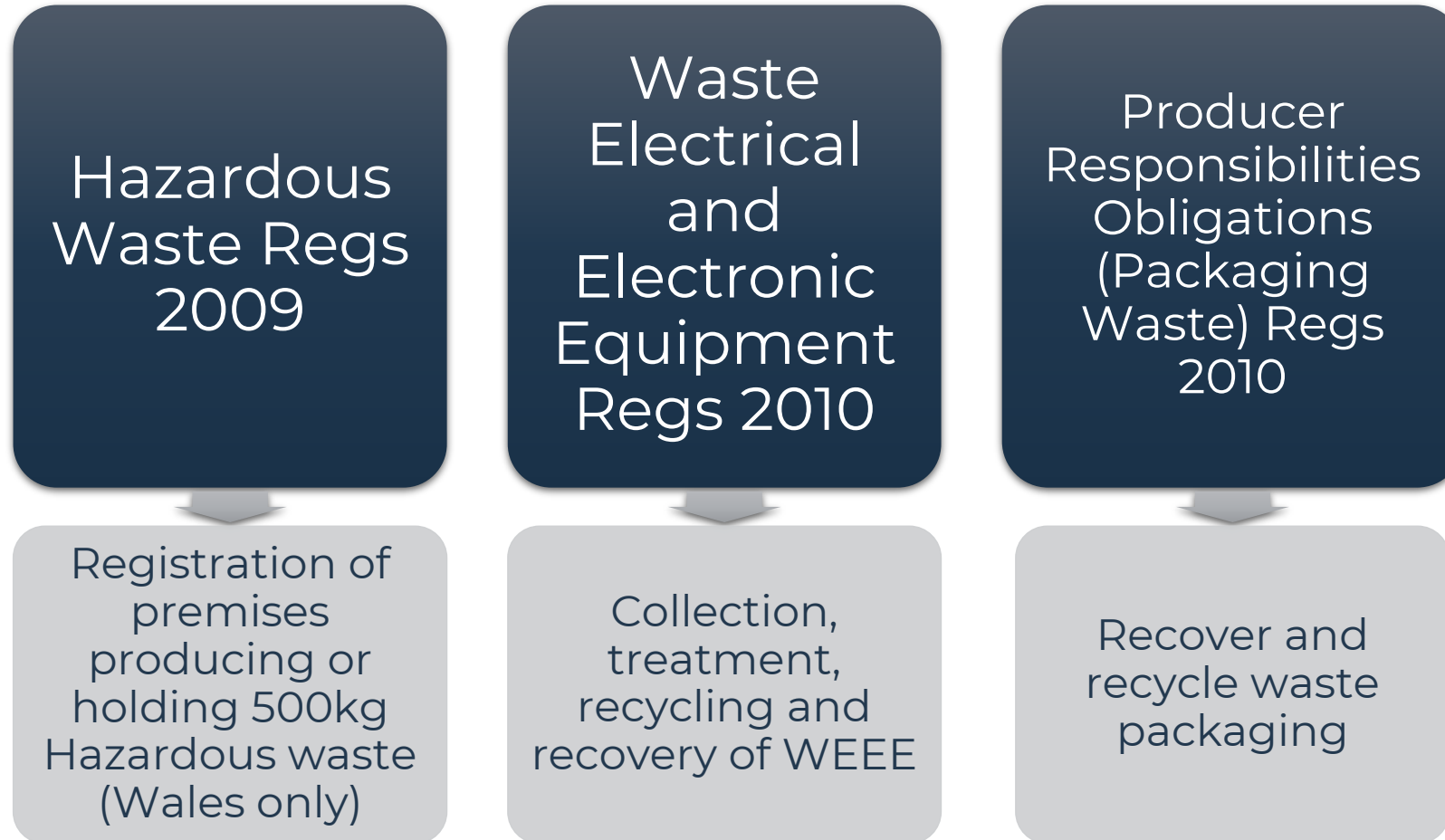
Hazardous

- Contaminated material and harmful materials
- E.g. Oils, paints and other organic liquids

Main Waste Legislation

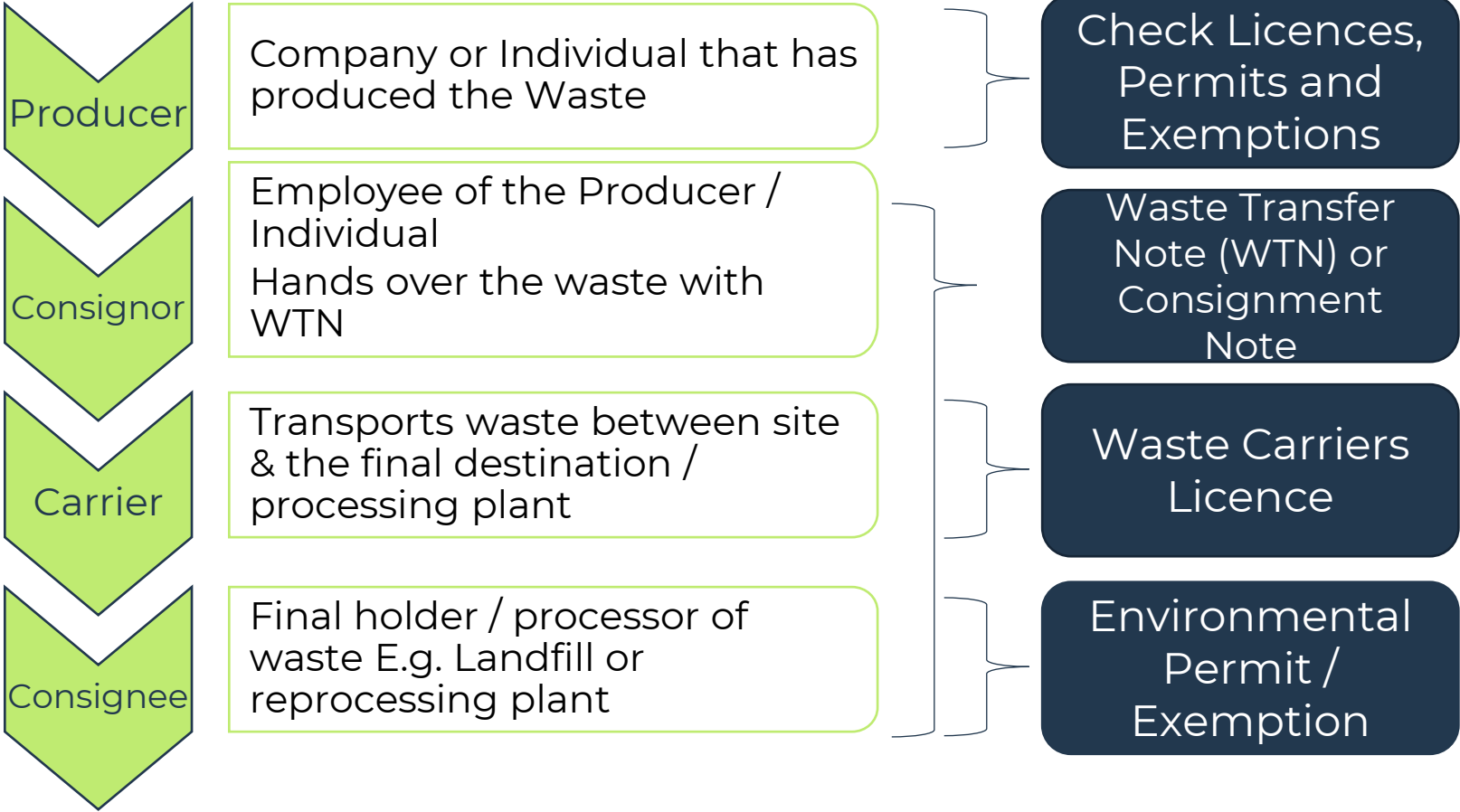


Main Waste Legislation



Environmental Protection Act 1990

Duty of Care



Environmental Protection Act 1990

Fines and Prosecutions

Deposit, treat, keeping waste in a manner likely to cause pollution of the environment or harm to human health

- £50,000 fine
- unlimited fine and/or 5 years imprisonment

Breach of Duty of Care - £5,000 or Unlimited fine

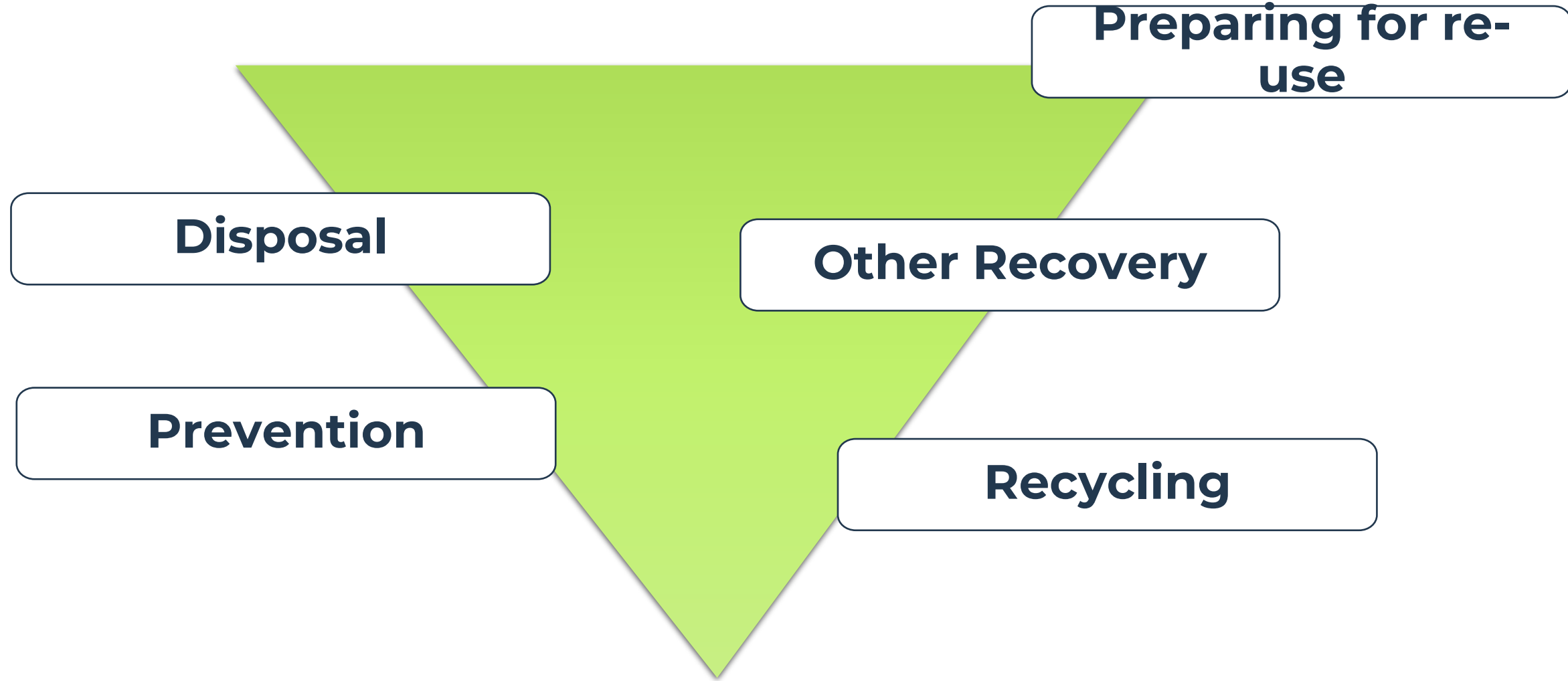
Directors' Liability

- May be punished in the same way as the company according to the offence

Fixed Penalty Notice - £300 fine

- 'civil sanctions / enforcement undertakings' can be imposed, legal action is avoided by 'voluntarily' making appropriate financial donations to environmental organisations.

The Waste Hierarchy



POLL: TWO QUESTIONS

1. Which do you think is the most sustainable option in the waste hierarchy?
 - Preparing for reuse
 - Other recovery
 - Recycling
 - Prevention
 - Disposal
2. Which do you think is the least sustainable option in the waste hierarchy?
 - Preparing for reuse
 - Other recovery
 - Recycling
 - Prevention
 - Disposal

The Waste Hierarchy



The Future?



What is a circular economy?

A circular economy is an alternative to a traditional linear economy (make, use, dispose) in which we keep resources in use for as long as possible, extract the maximum value from them whilst in use, then recover and regenerate products and materials at the end of each service life.

Ellen MacArthur Foundation

“The circular economy is based on three principles, driven by design:

- Eliminate waste and pollution*
- Circulate products and materials (at their highest value)*
- Regenerate nature*

It is underpinned by a transition to renewable energy and materials. A circular economy decouples economic activity from the consumption of finite resources. It is a resilient system that is good for business, people and the environment”

Source: <https://ellenmacarthurfoundation.org/topics/circular-economy-introduction/overview>

New and future UK Waste Regulations

- THE LONDON PLAN (2019) includes requirement for all major construction projects to produce Circular Economy statements, including how the project will enable building materials, components and products to be disassembled and re-used.
- UK/EU Circular Economy Strategy
- UK ENVIRONMENT ACT framework for increasing recycling, power to make regulations relating to regulation of hazardous waste in England, import, export and transit of waste, littering enforcement powers etc
- EXTENDED PRODUCER RESPONSIBILITY for packaging
- Net-zero by 2045 (Climate Change (Scotland) Act 2009)
- Scotland - Draft 4th National Planning Framework
- Scotland - Circular Economy Bill (consultation)
- Plastic Packaging Tax

Plastic Packaging Tax

A tax of £200 per tonne applied to any plastic packaging which does not meet a minimum 30% recycled content threshold



- Applies to manufacturers, converters & importers
- Joint & several liability being considered – someone in the supply chain needs to pay if not producer
- Tax is priced to discourage use of virgin material
- Applies from April 2022.

The Routemap for Zero Avoidable Waste in Construction

Introduction

Waste costs the construction industry an estimated £11 billion per annum and emits 3.5 million tonnes of CO2e, yet waste can be reduced, materials used more efficiently, and buildings and structures at end of life repurposed, refurbished or dismantled to enable products and materials to be a resource for new activities.

This Routemap aims to catalyse actions by all parts of the supply chain to reduce and ultimately eliminate all avoidable waste. It adopts the interpretation of Zero Avoidable Waste in construction published by the Green Construction Board (GCB) in 2020 and adopts the principles of the waste hierarchy and life cycle assessment.

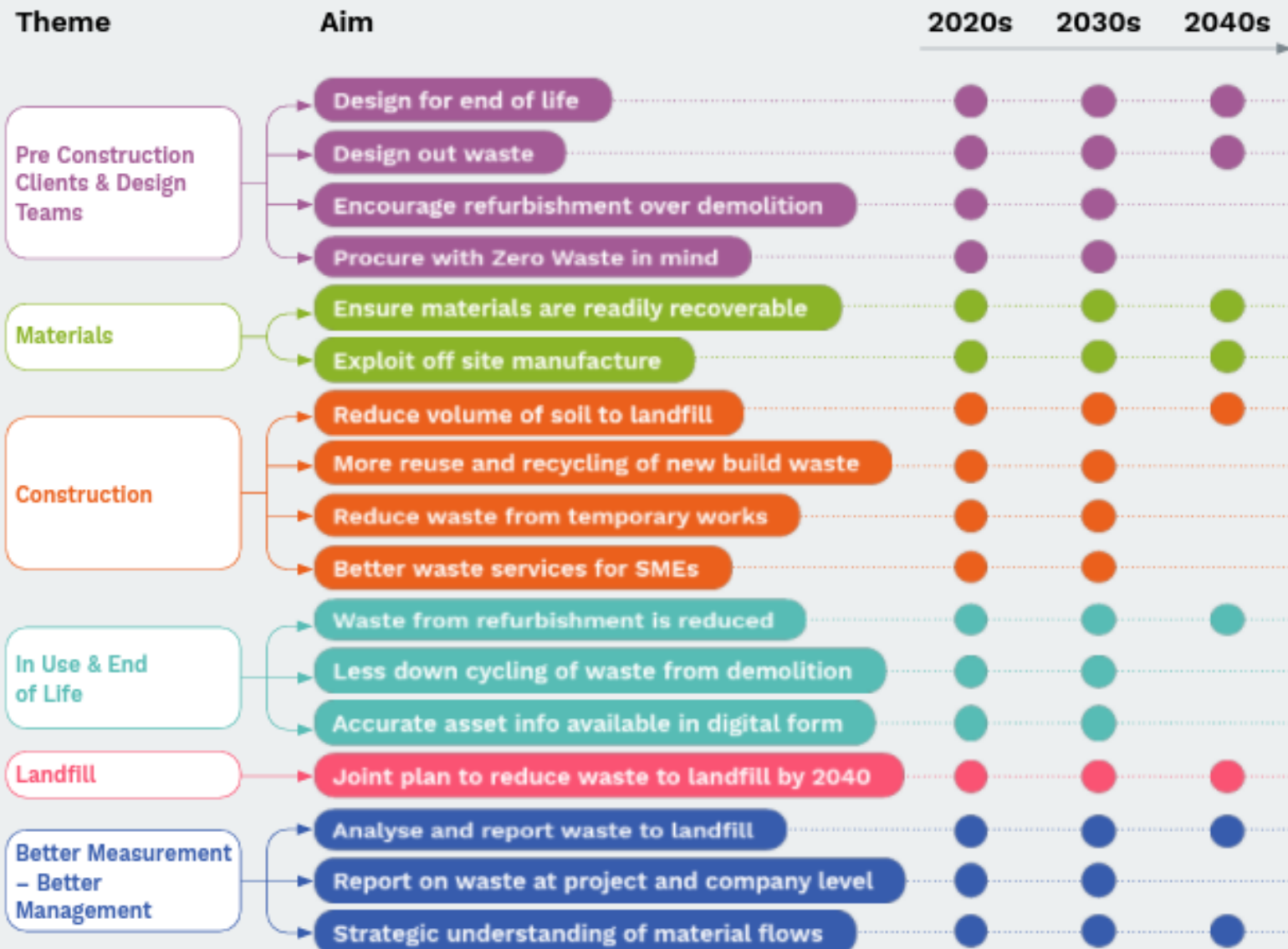
The Routemap is an interactive infographic identifying aims, actions, context and guidance. Click on an Aims button and a new page appears. Hover over Context and an explanation appears. Click Guidance and a new page links to published guidance.

It has been prepared by the GCB's Resources and Waste Task Group with the principal authors being Katherine Adams, Rob Pearce and Jane Thornback. The project received financial support from BEIS, and was in collaboration with Defra.

[Click for Context](#)

[Targets and Guiding Principles](#)

[Click for Acknowledgements](#)



Design out waste

Aim: The use of materials is optimised in the design of the buildings and structures and waste is designed out throughout the design and construction process

2020s

- Waste reduction targets are commonplace in most construction projects.
- Professional institutions develop training and CPD.
- BS8895 is widely adopted throughout the design process for major projects.

2030s

- By 2030 costs are reduced by 10% through designing out waste and material optimisation.

2040s

- The amount of waste generated from new build construction is minimal.

[Click for Guidance](#)

Act now

- Clients, design teams and contractors set project waste reduction targets during design and construction.
- Design teams share their learnings and best practice on designing out waste within their practices and externally through their networks.
- Design teams write up case studies on how designing out waste has been considered within the design process and what changed as a result.
- Design teams implement waste reduction practices in their design work.
- Design teams undertake material optimisation through design choices and material selection working with manufacturers.
- Professional institutions and universities and colleges include designing out waste in training, CPD and academic courses.
- If participating in environmental certification schemes, such as BREEAM, LEED etc pursue the credits that relate to waste reduction and material efficiency.
- At project level, contractors and quantity surveyors, reduce the wastage allowances that are set for materials and do not over order.
- Contractors incentivise subcontractors to reduce waste.
- Contractors and subcontractors manage materials on site carefully to avoid damage.
- Manufacturers and contractors collaborate to implement reusable packaging schemes.

Project lifecycle waste web feature

A practical guide to

Reducing construction lifecycle waste

These resources help users from all parts of the built environment value chain reduce construction lifecycle waste.

Explore themes and topics for practical examples, learning about the different stages and aspects of a wide variety of construction projects.

<https://www.supplychainschool.co.uk/partners/groups/waste-group/>

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From procuring with zero waste in mind to encouraging refurbishment instead of demolition

2. Materials

Learn how to ensure materials are readily recoverable, and about the use of low carbon and circular materials.

3. Construction

Actions that can be taken on the construction site to reduce waste to landfill and encourage reuse and recycling

4. In Use and End of Life

Find out more about how waste can be mitigated during refurbishment and demolition of buildings

5. Eliminating Landfill

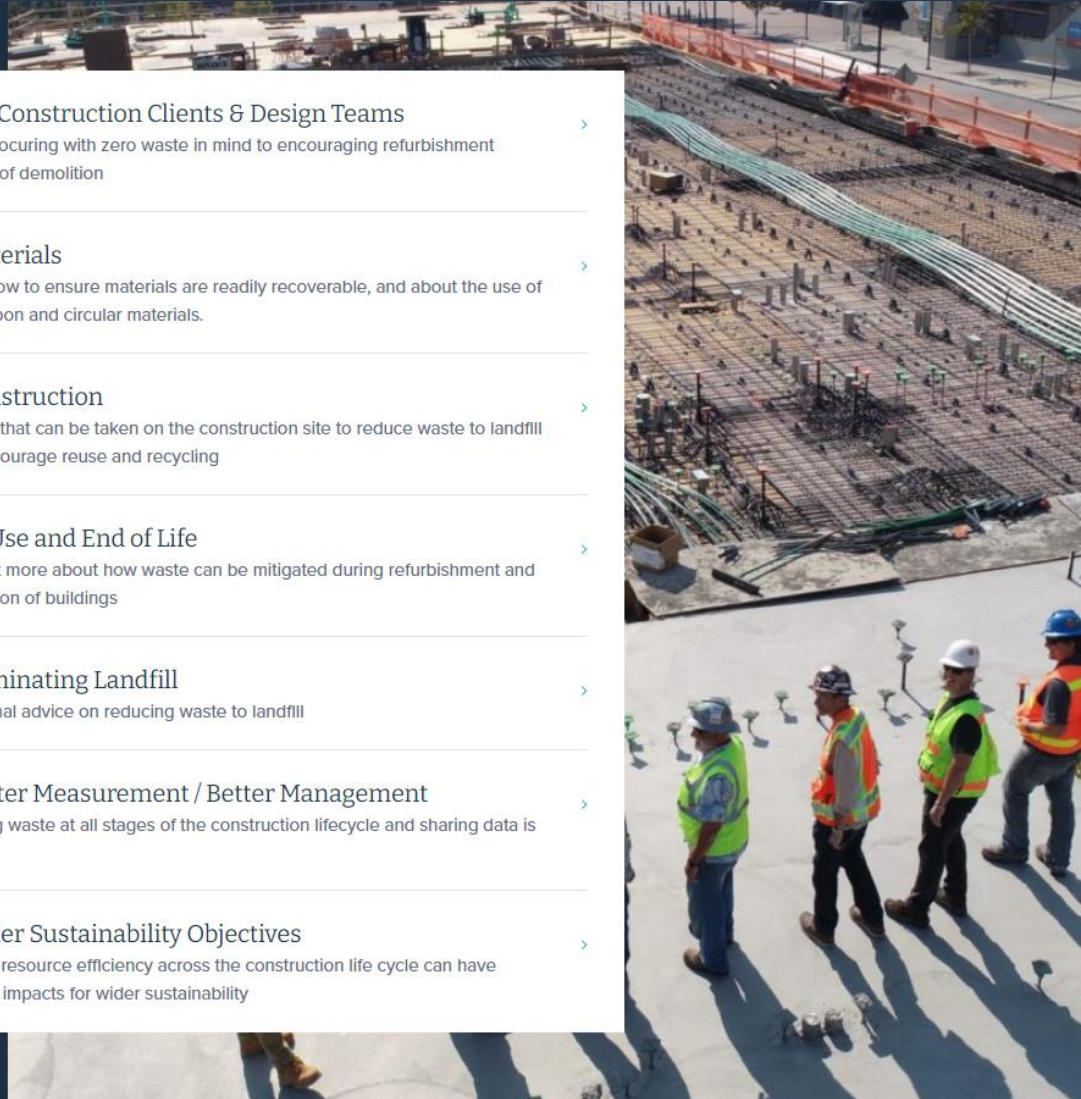
Additional advice on reducing waste to landfill

6. Better Measurement / Better Management

Tracking waste at all stages of the construction lifecycle and sharing data is vital

7. Wider Sustainability Objectives

Greater resource efficiency across the construction life cycle can have positive impacts for wider sustainability





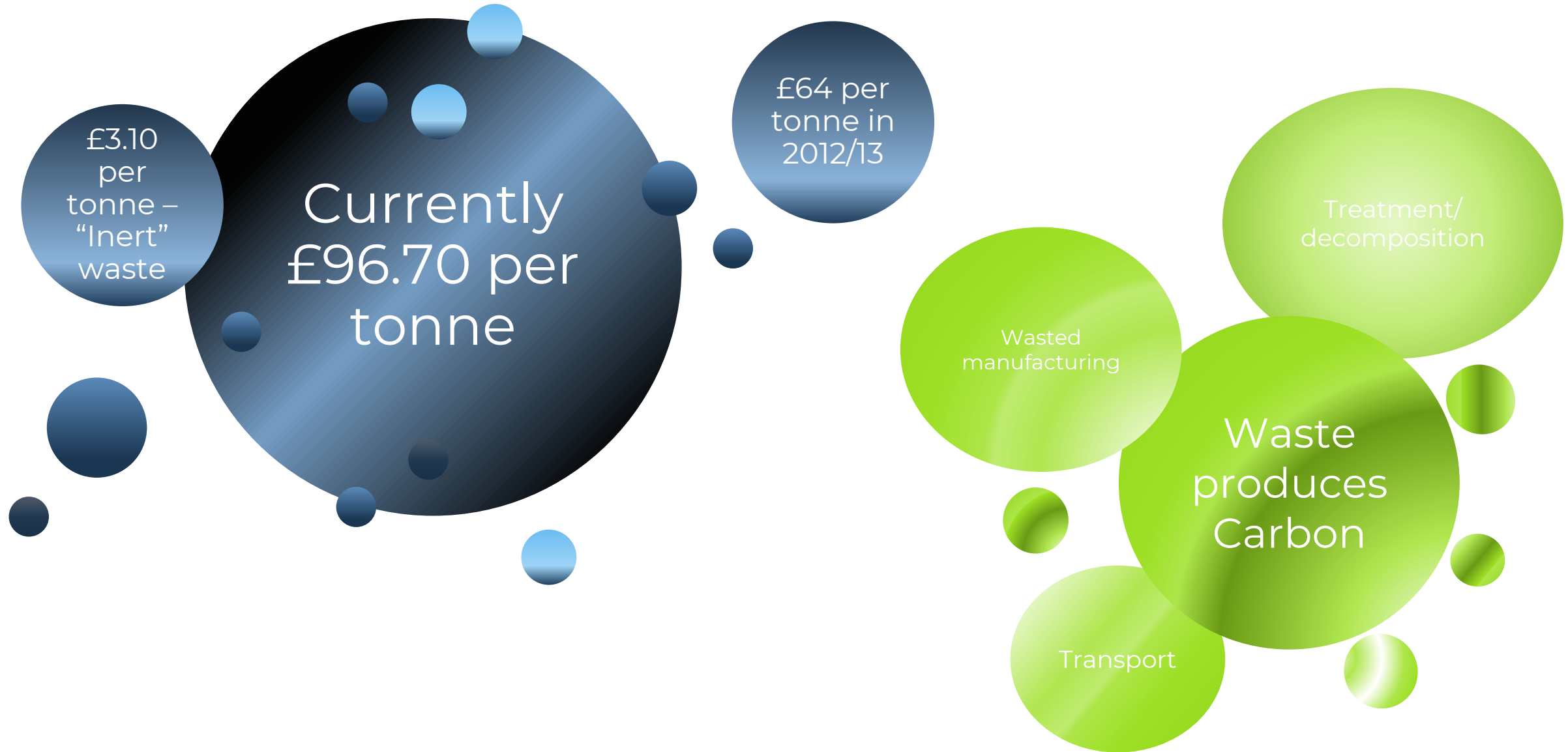
Financial Implications

Waste Facts

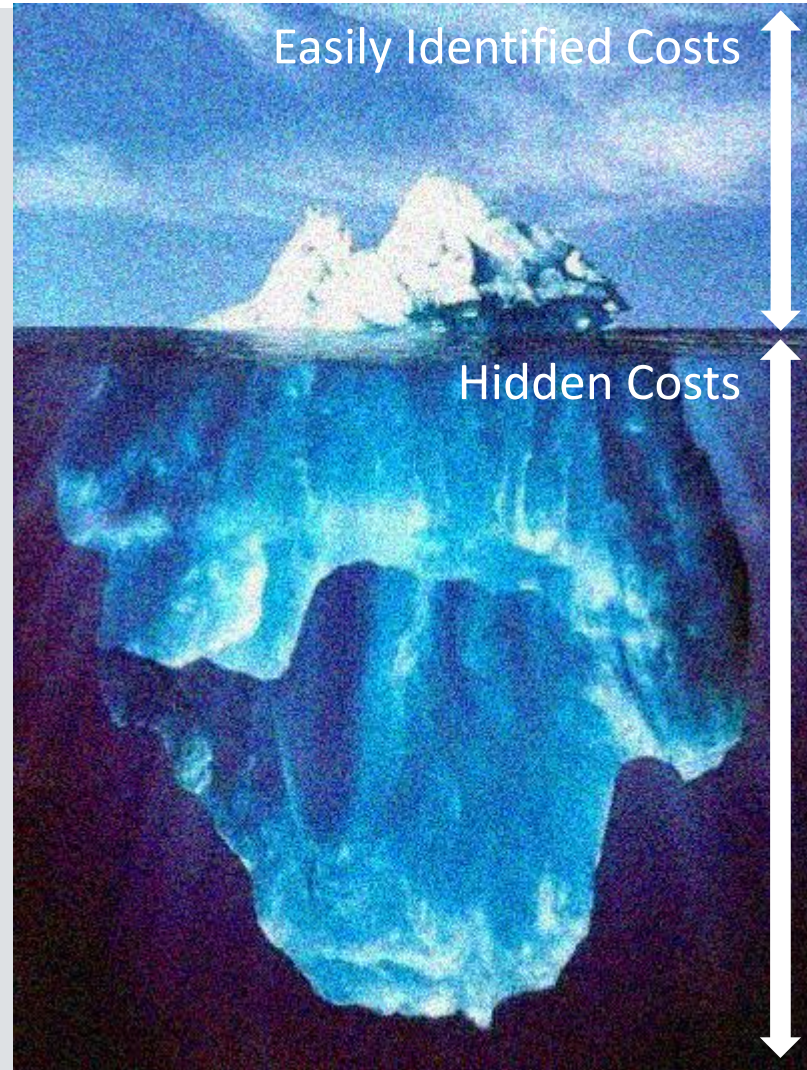
Construction Demolition and Excavation Industry



Landfill Tax



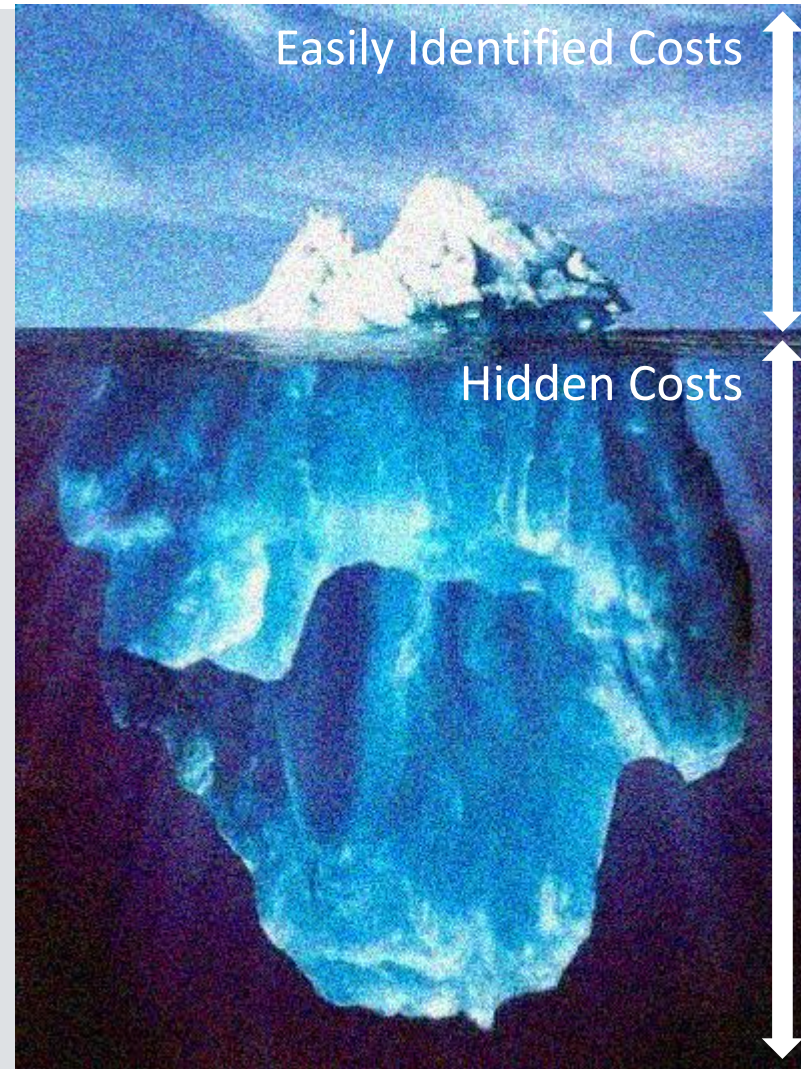
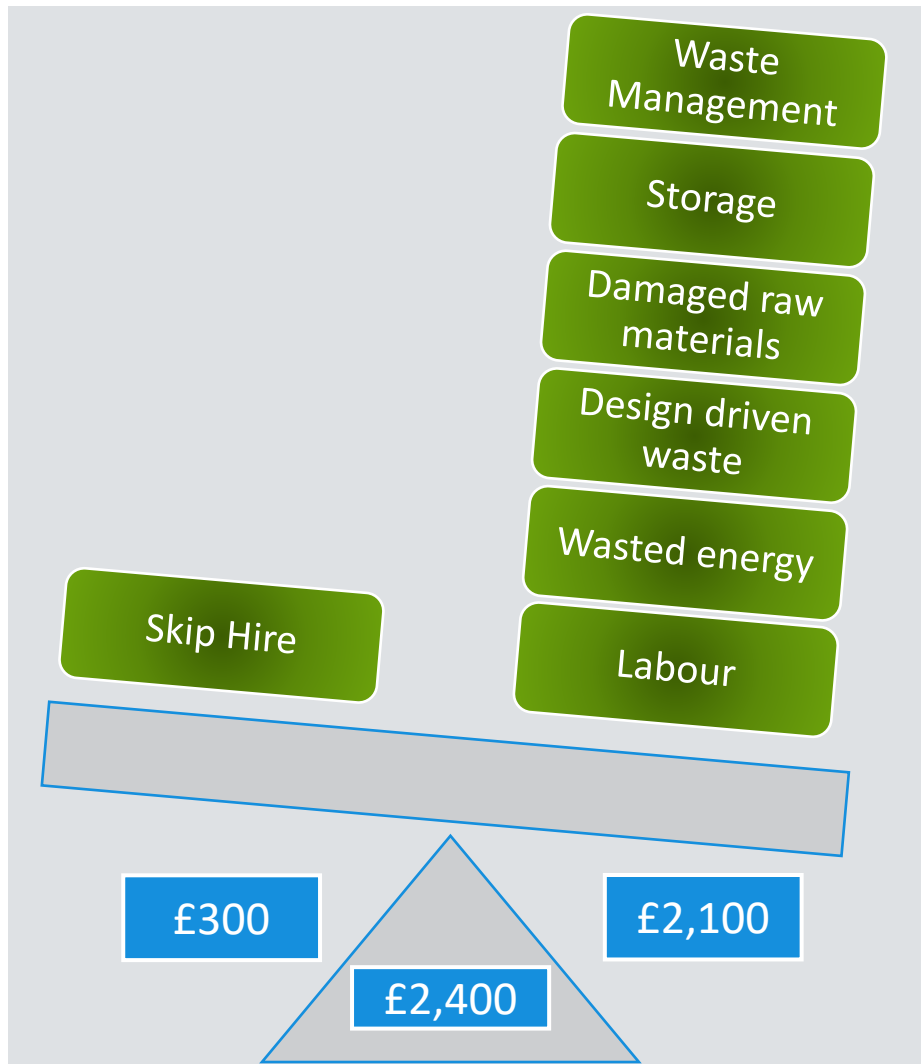
True Cost of Waste



JAMBOARD EXERCISE

What are the other contributing factors to the true cost of waste?

True Cost of Waste

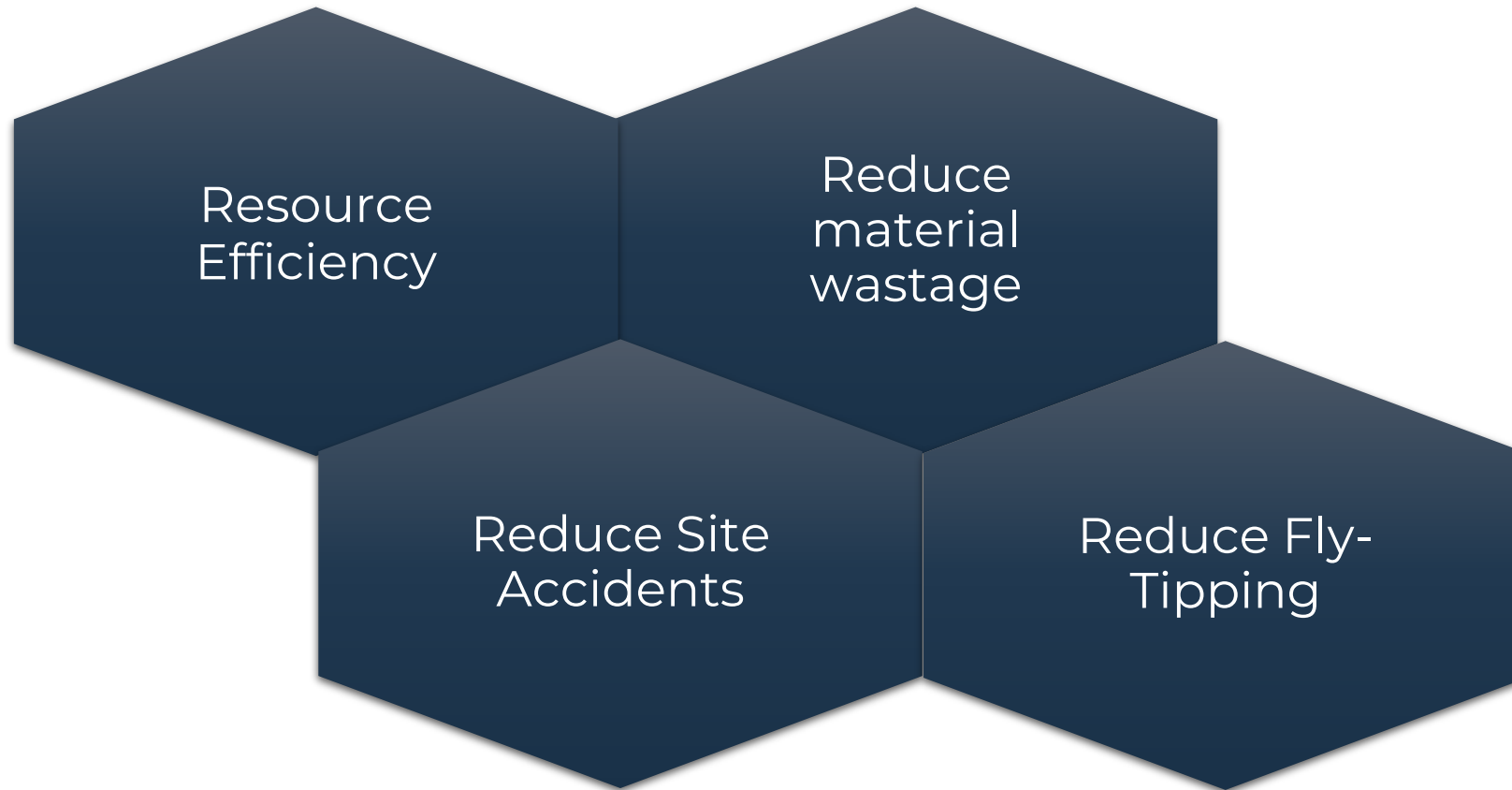




Waste Management & Reduction

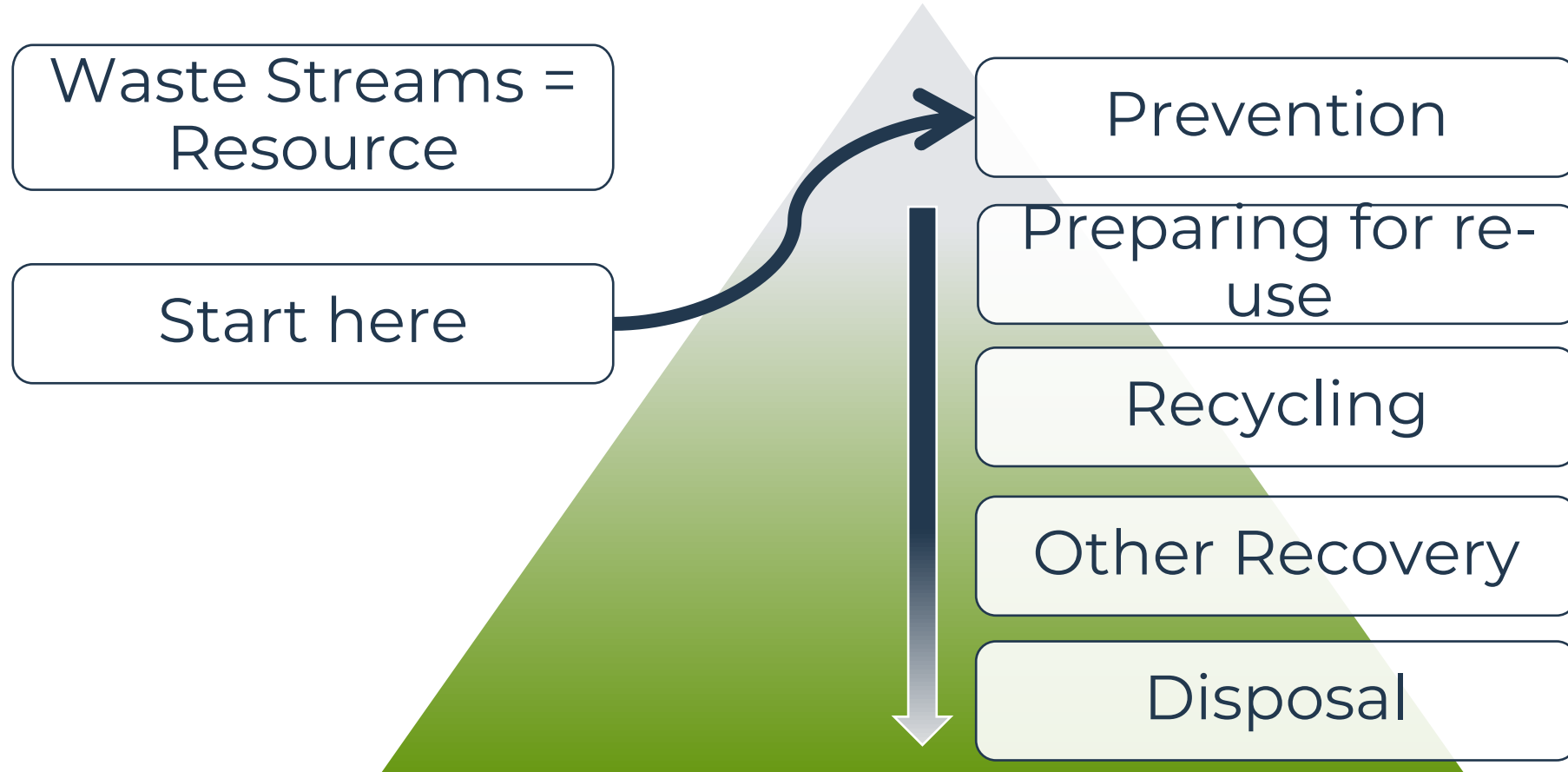
Waste Management Planning

Why bother?



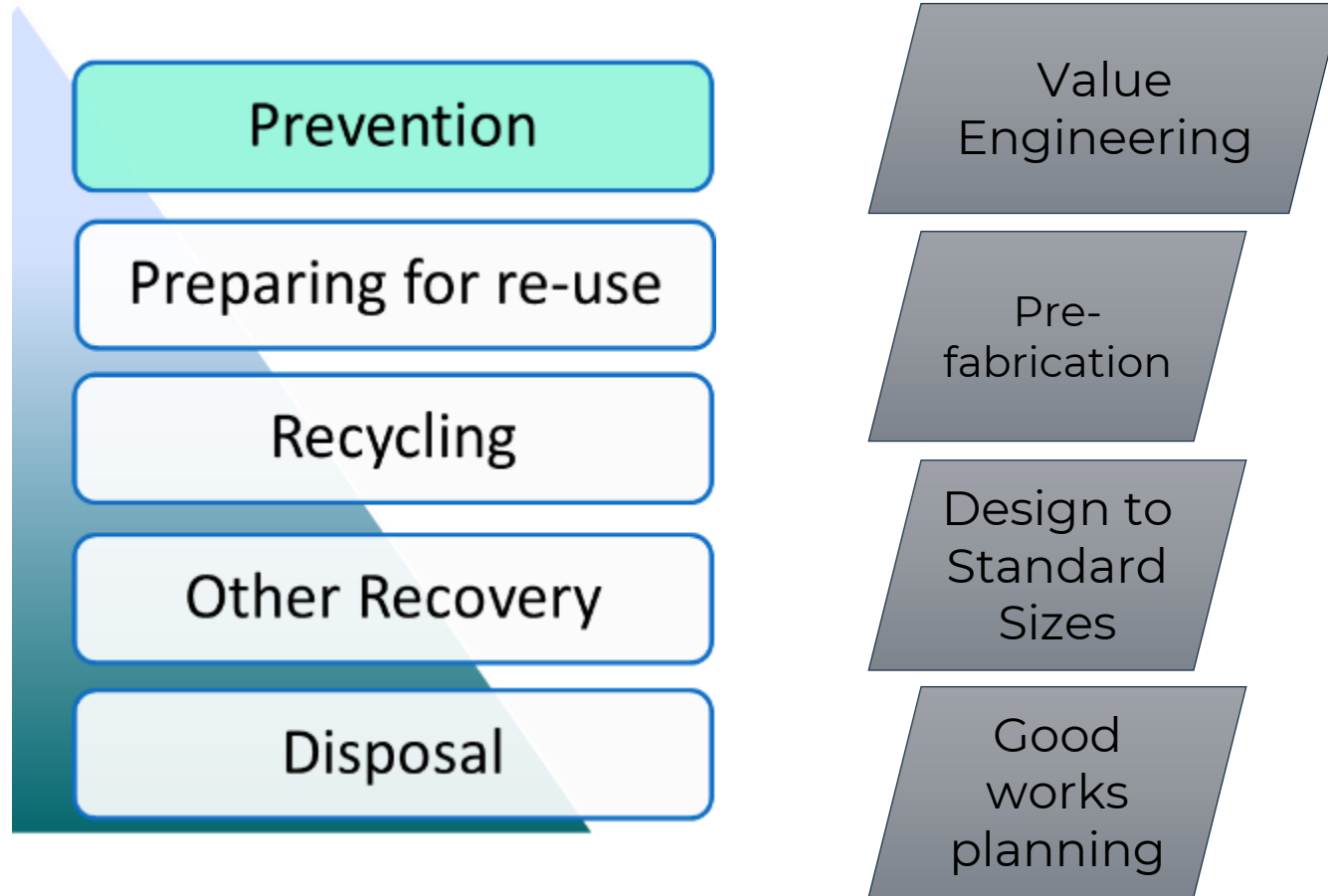
Waste Management Planning

Hierarchy - legislative requirement!



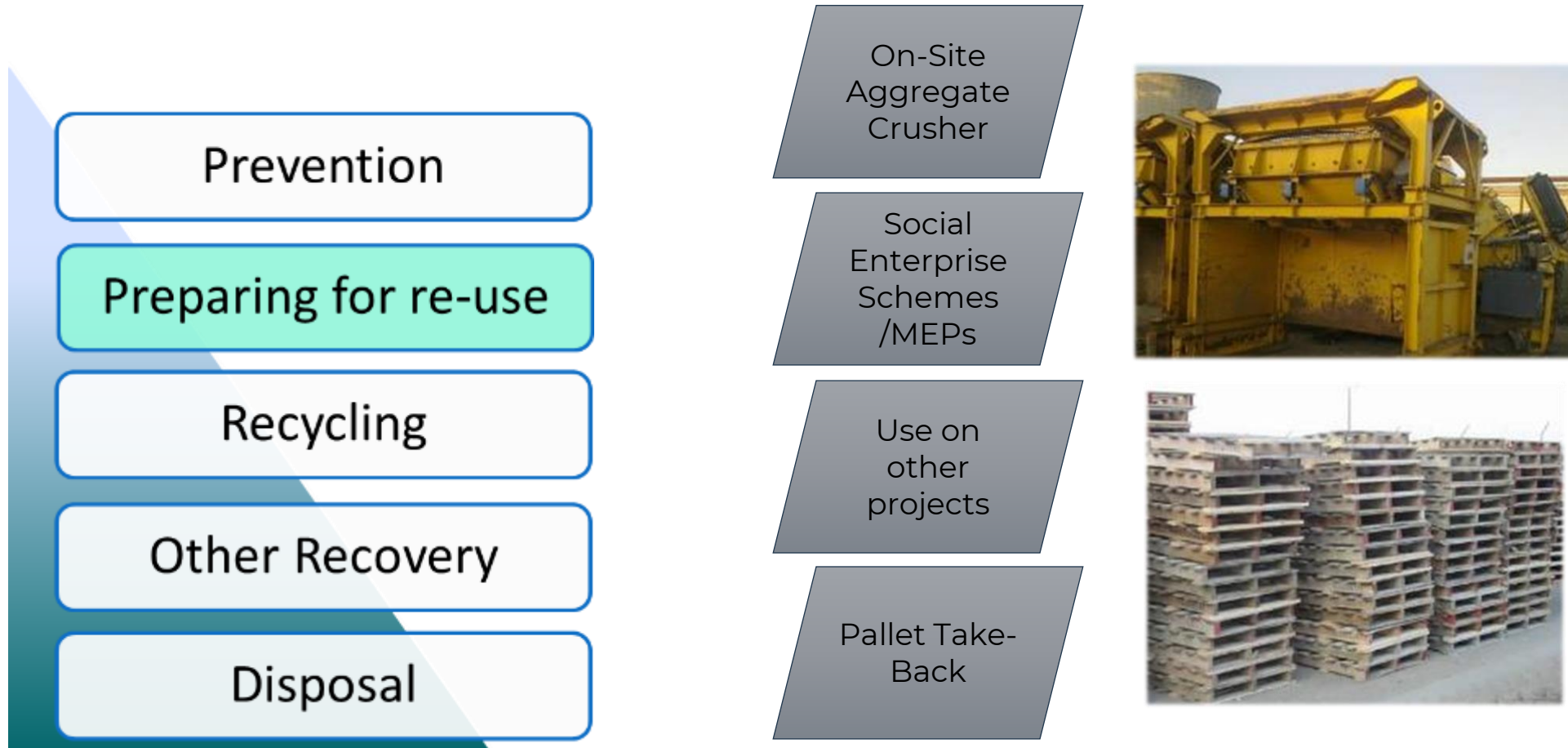
Waste Management Planning

Designing out waste



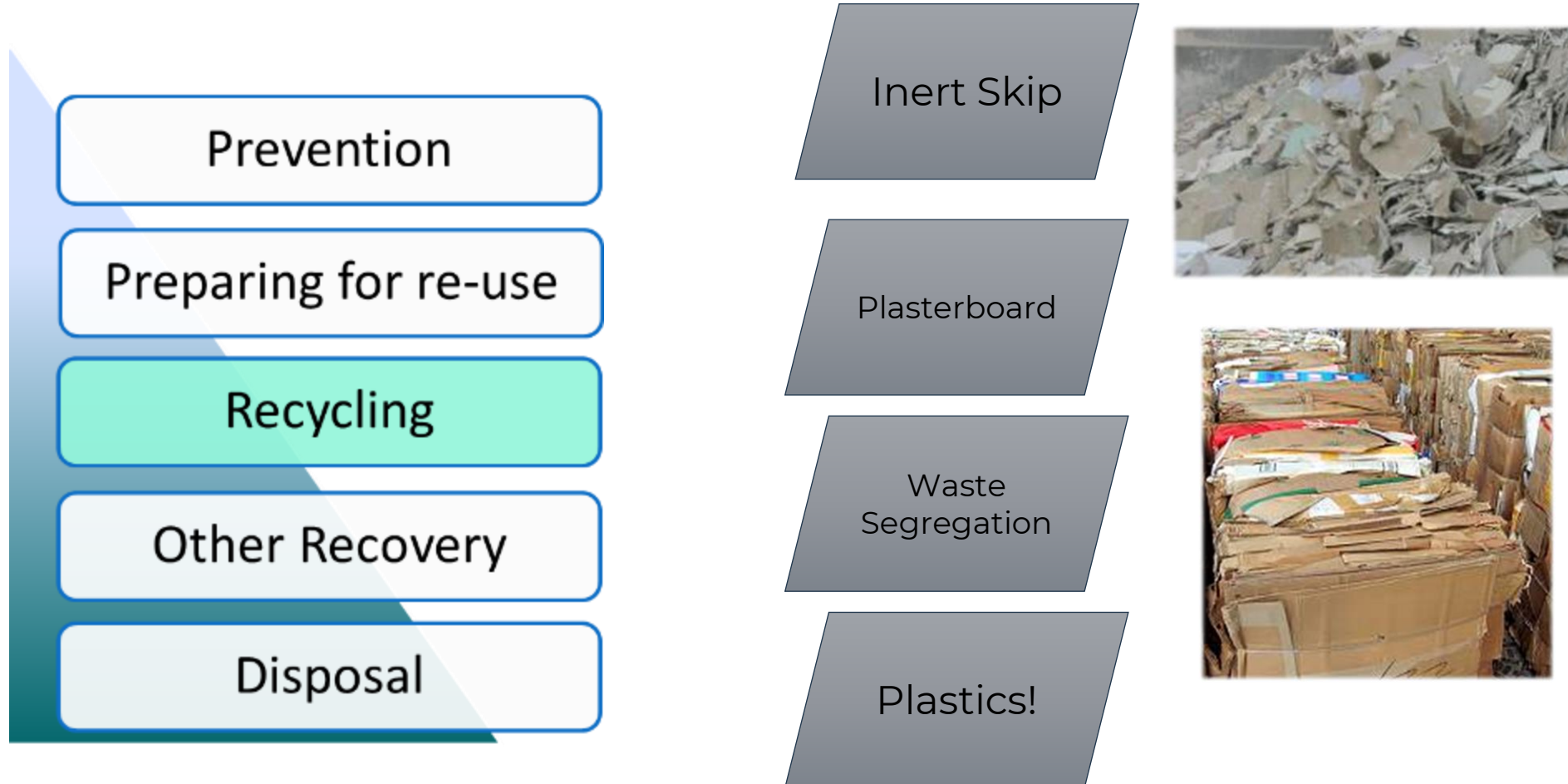
Waste Management Planning

What could we do?



Waste Management Planning

What can we do?



Waste Management Planning

Training and Awareness



- Appropriate Training
- Specific Trades
- Waste Minimisation



- In-House and Sub-Contracted employees
- Waste Management Plan available for all

Waste Management Planning

Good Housekeeping



Plan for efficient materials and waste handling



Set indicative targets on trades and sub-contracts



Early planning essential

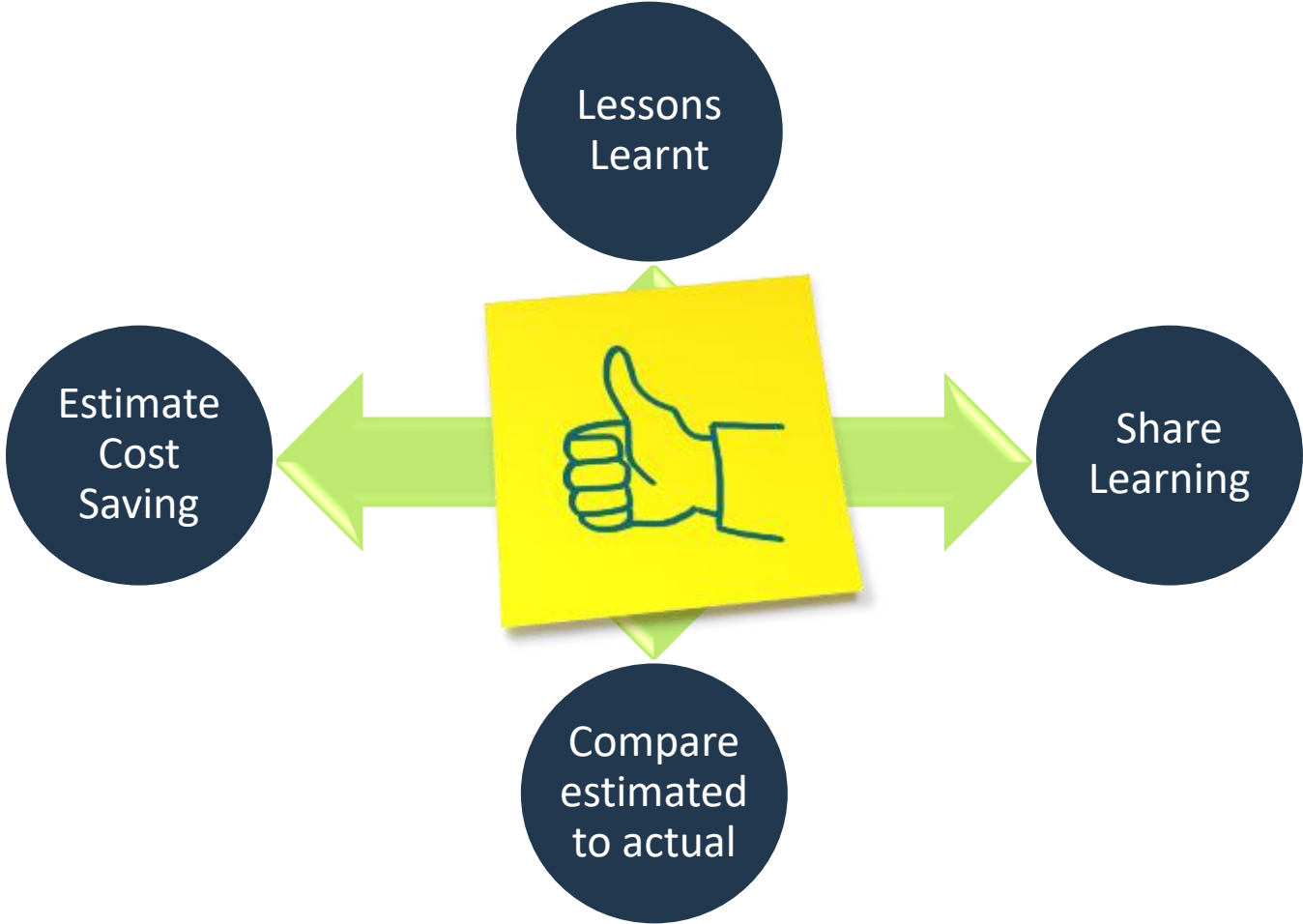
Waste Management Planning

Measure



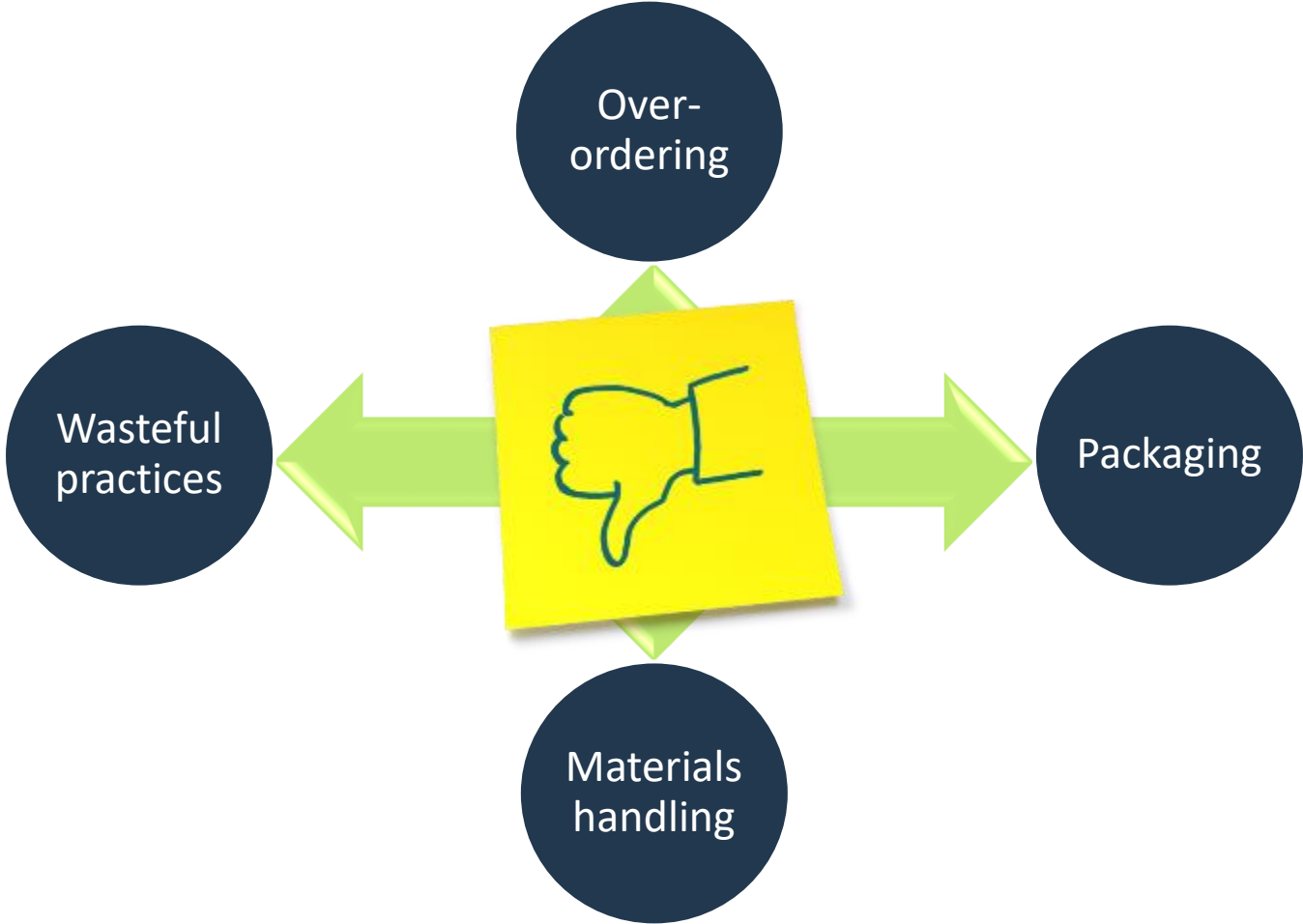
Waste Management Planning

Review



Keep an eye on the enemies!

Review

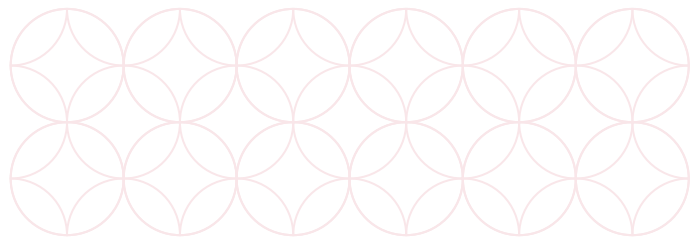




SUSTAINABILITY

WASTE REDUCTION CASE STUDY

OCTOBER 2021



WASTE RESEARCH PROJECT



Built Oxford House type in 3 different regions - Yorkshire, Lancashire and the South East.

Carefully segregated waste from each plot in to different containers for individual waste streams.



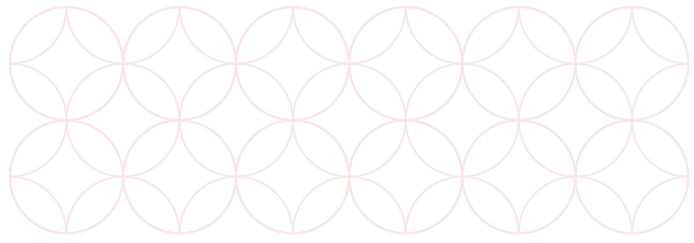
A VISUAL REPRESENTATION...

1 SKIP FULL OF WASTE WOOD

CONTAINER WITH 8 TONNE BAGS OF PLASTIC/CARDBOARD PACKAGING

1 SKIP OF INERT WASTE

5 TONNE BAGS OF PLASTERBOARD



OFFCUTS



PLASTERBOARD



TIMBER



ELECTRICAL WIRES



ANGLE BEADING



CHIPBOARD FLOORING



PLASTIC PIPING

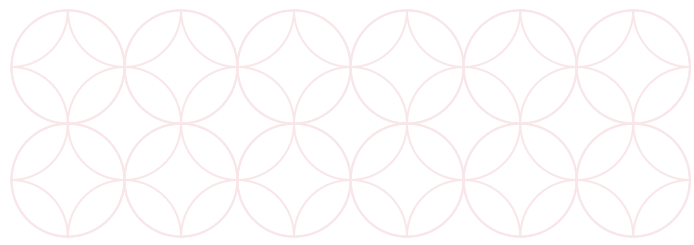
PREVENTION + REDUCTION

The Waste Hierarchy



Following the waste hierarchy, during the waste project I tried to focus mostly on ideas which could help to prevent and reduce waste.

Therefore the findings here are mostly relating to preventing/reducing waste, but there will be a short section at the end about recycling.



OVER ORDERING

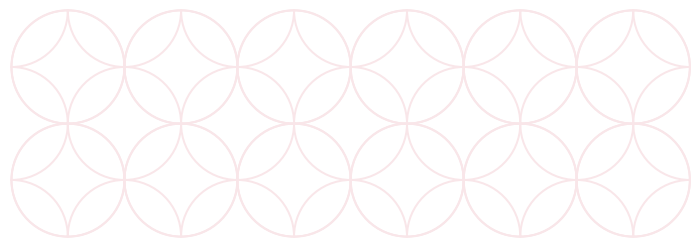
Leftover items:

skirting boards, architraves, timber, soffits & fascias, chipboard flooring, staircase balustrades parts, bricks, blocks, tiles, plastic guttering.

'Double' cost to the business:

- 1) Materials purchased but not required.
- 2) Costs associated with transporting, offloading, storing and disposing of the surplus items.





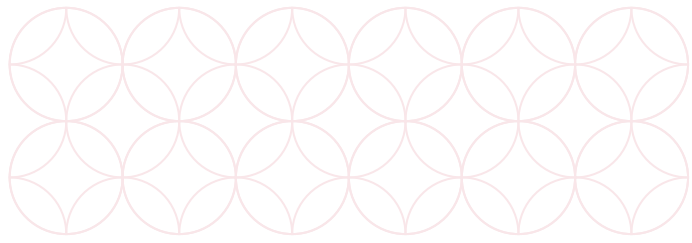
PACKAGING



Packaging included shrink wrap, plastic banding and containers for adhesive and paint.

Most packaging waste was generated from the second fix - kitchen and bathroom appliances, radiators and towel radiators, shower screens, door casing wrapping, staircase balustrade wrapping and straps.





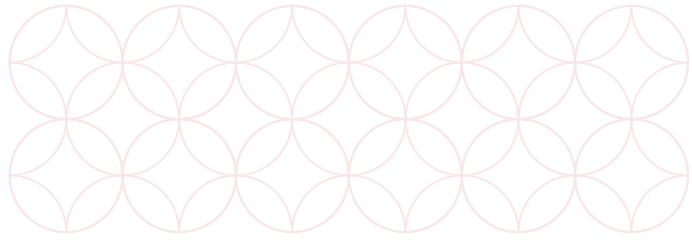
INEFFICIENT USE OF MATERIALS



Have the plasterers opened significantly more bags of plaster than can be realistically used before setting?



Traditional low prioritisation of materials costs?



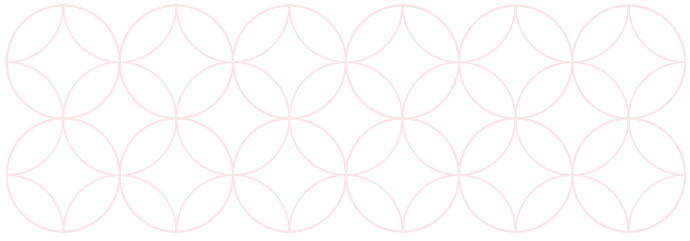
MATERIAL HANDLING



Batch of roof tiles were delivered cracked - damaged during transportation or offloading?



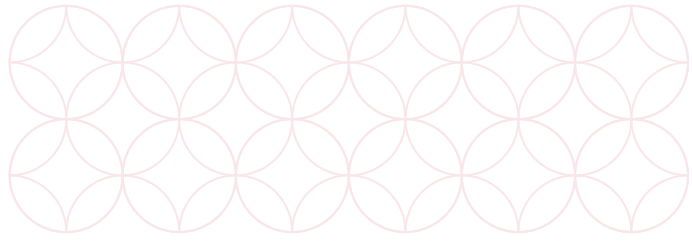
Other products damaged during installation: plasterboard, angle beading, roof tiles, a bath panel and these could not be used.



MATERIAL PROTECTION



Some sites were better than others at protecting materials.
Eg use of Brick Jackets (cost £3 each, re-usable) vs not protecting bricks > leading to damage



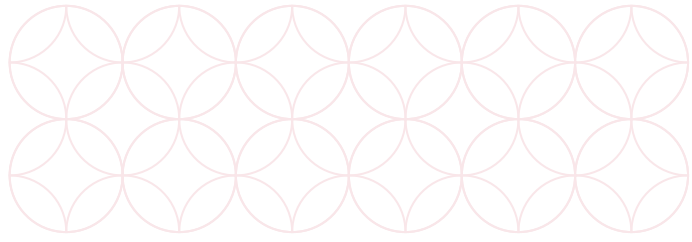
SUPPLY CHAIN ISSUES



WHAT SHALL WE
DO WITH THESE?

Long lead-times and material supply issues are making it harder for sites to reject incorrect or inadequate deliveries.

Sites don't want to wait weeks for a new delivery.

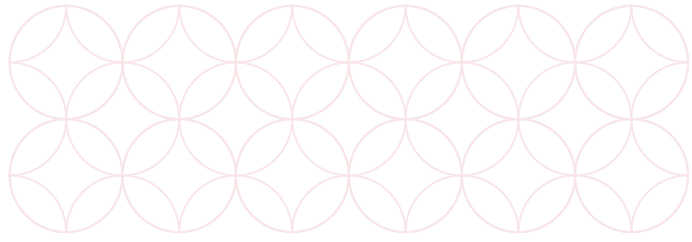


SUPPLIER/MANUFACTURER ERROR

Granite worktop for kitchen of plot 121 was manufactured 5mm too short on either side (expensive mistake!)

Some deliveries were incorrect, short in quantity or late.





FREQUENT DESIGN CHANGES

Frequent design changes can cause issues for sites and suppliers.

This batch of rood products was delivered to a waste project plot, for a previous / outdated version of the Oxford House type.

If the products can't be used on another plot then they may end up as waste.



Tension/restraint straps (60 x £1.48 each = £88.80)



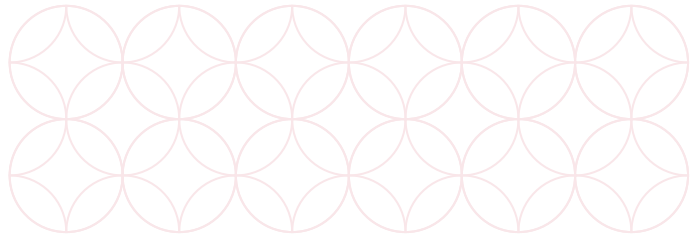
Joist hangers (14 x £3.11 each = £43.54)



Framing anchors (62 x £0.30 each = £18.60)



Joist caps (15 x £2 each = £30)



COMPLEX DESIGN FEATURES

Bespoke door under the stairs was specially manufactured for Redrow and needed to be cut to size on site.

Door was damaged and chipped during cutting and installation and had to be repaired by an external repair worker who filled and painted the door – costing time and money.





REDUCING WASTE **NEXT STEPS**

APRIL 2021

WASTE + BUILDABILITY WORKING GROUP

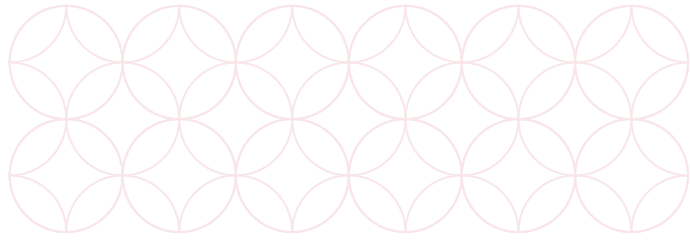
The research project has given us many good starting points for reducing our waste and identified quick win opportunities.

Working group has been established internally, with various heads of departments eg Commercial, Technical, Construction and Sales. Meeting every other month.

Aims:

- Implement some of the improvement opportunities identified in the research project.
- Determine waste reduction priorities for Redrow, taking various departments and experiences into consideration.
- Identify ways to enhance buildability, in turn improving elements of project performance (eg time, cost)



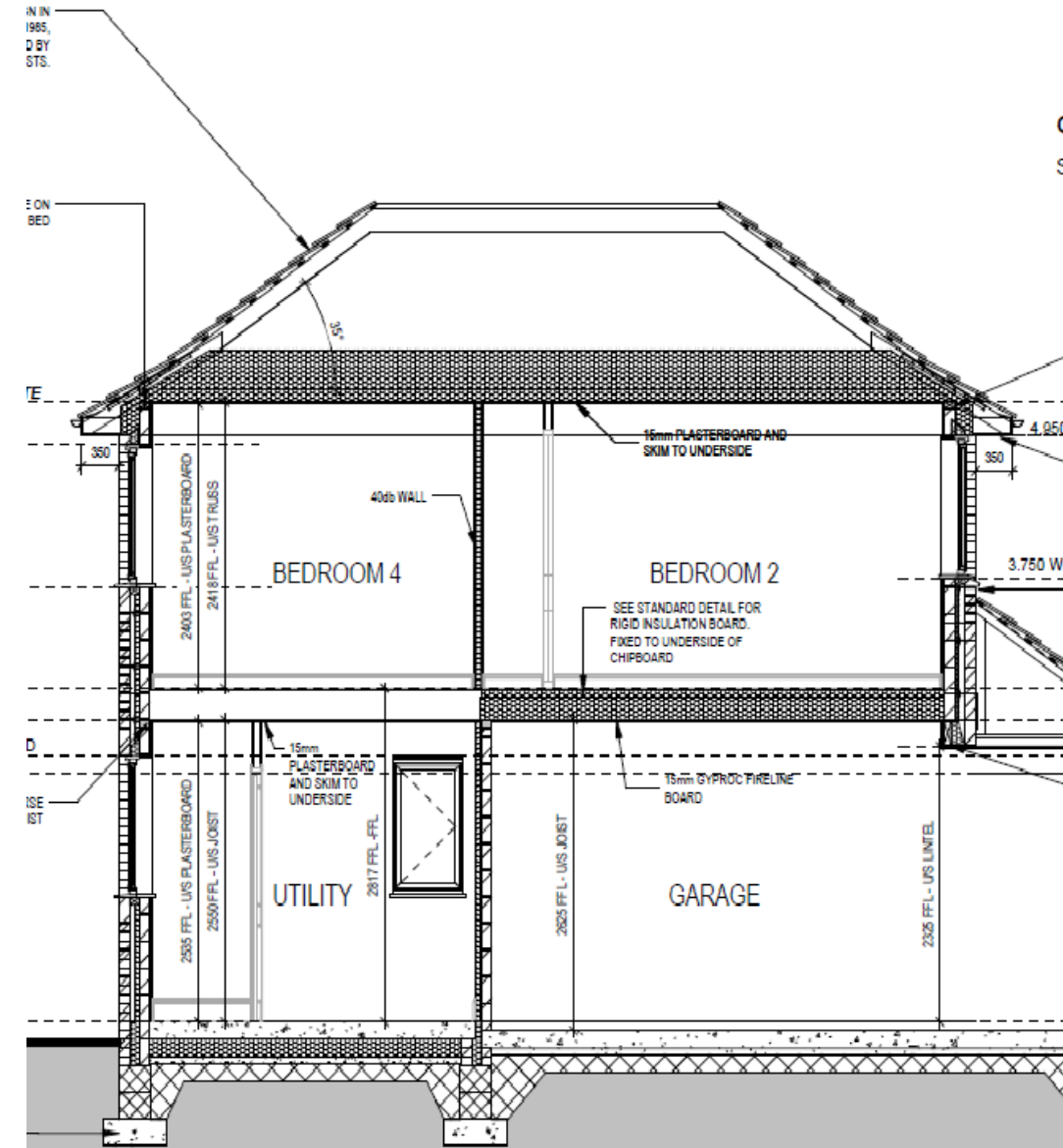


Source: REDROW – Supply Chain Sustainability School waste reduction case study webinar

DESIGNING OUT WASTE

We have made some changes to our designs to reduce offcuts or waste generated from complex design features.

- Redesigned the under stairs cupboard and make it more open.
- Simplified skirt/arch lengths used... we used to have large skirt+arch down vs small skirt+arch up.
- Removed internal nibs and reviewed internal inlets/small walls.
- Reduced ground floor ceiling level by 65mm and removed a single course of brickwork, so we can use 2.4m timber instead of 3m (reducing offcuts)



We need to move towards a more Circular model

We want to keep materials and resources in use for as long as possible and avoid waste....

How can you help? And how can we help you?

**Can you think of
any good
examples of
circularity in your
business?**

**Or things that
went less well?
Why??**

***Or things you
could introduce
that would benefit
you and your
customers?..***

SCHOOL RESOURCES TO HELP YOU

1. 'Introduction to Waste' e-learning – available [here](#)
2. MEP map:
 - Feedback template ✓
 - Promotion & marketing ✓
 - Courtesy email to organisations ✓
 - New recommendations received ✓
 - *Now need to be added*
 - *New tags for social enterprises and academic institutions to be added*

Disclaimer:

The Material Exchange Platform (MEP) Map has been set up to provide a searchable 'directory' of information on the location and characteristics of a variety of Materials Exchange Platforms across the UK. You may have surplus stock from a recently finished project, or are looking for second hand upcycled furniture; these are some examples of how you might use MEPs.

NB: The map is as a meta data tool. The School has collated existing publicly available information on MEPs presenting it in one, easily-accessible place. Other than checking the continued existence of any given MEP, we have not added any further information, comment or qualification as to its nature. Moreover, the School is neither endorsing, recommending nor rating any of the material exchange platforms within the map. It is for the map user to do their own due diligence on any MEPs for which they get results.



Project lifecycle waste web feature

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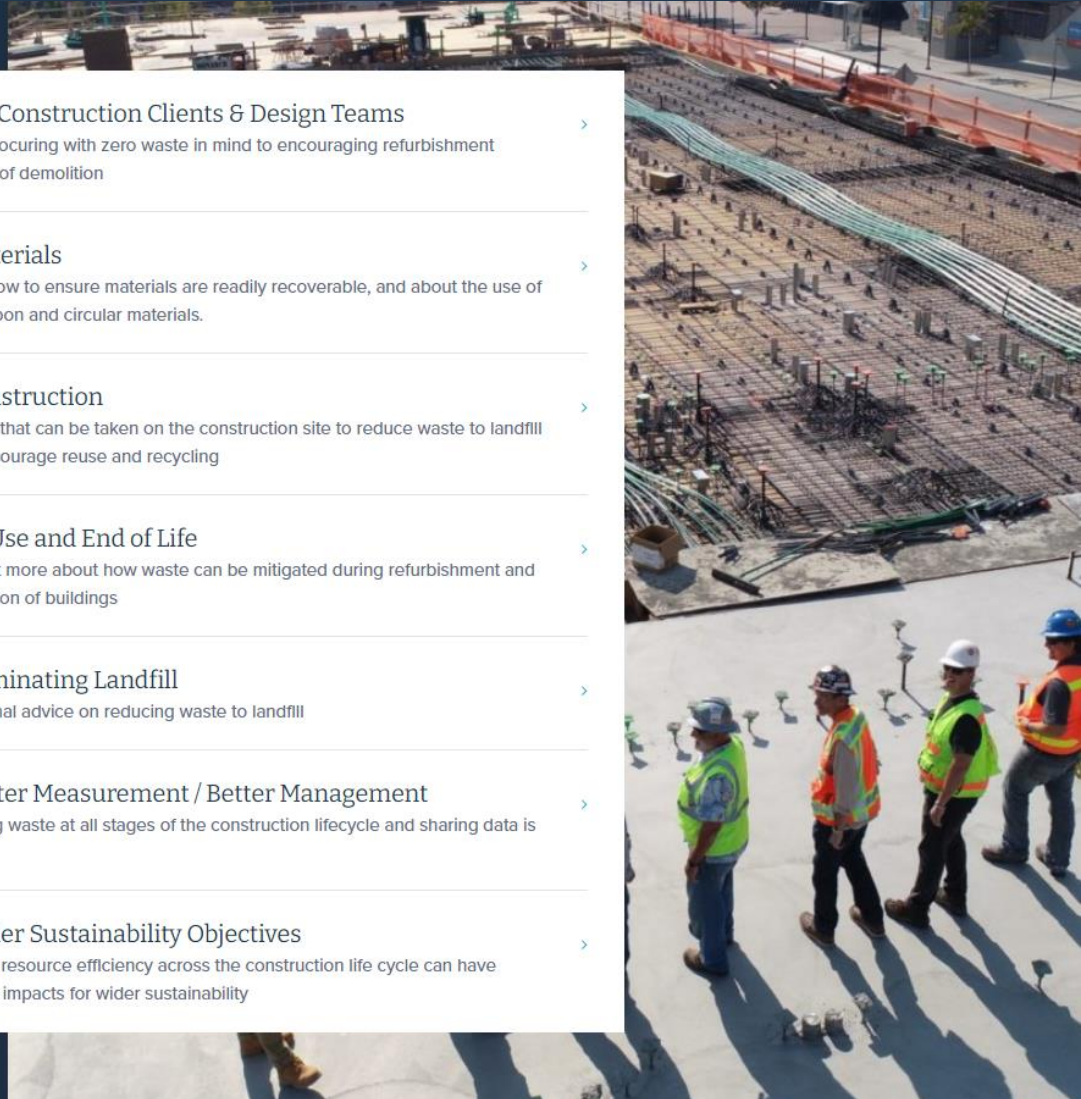
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Further learning

Training and Awareness – loads of content in the School library



VIRTUAL: Circular Economy Workshop

Join this event to understand the drivers for moving ...

Tuesday, 21 July 2020, 11:30 AM - 1:00 PM



VIRTUAL: A Circular Economy case study: Whitecroft Lighting and BAM

Join this discussion with BAM and Whitecroft Lighting ...

Monday, 3 August 2020, 1:00 PM - 2:00 PM



Wales and the Circular Economy

The opportunities and benefits for Wales for developing a ...



"Towards the Circular Economy" reports

Ellen MacArthur Foundation



Circular Economy and Resource Efficiency

European Commission: Circular Economy and Resource ...



Circular Economy for SMEs - Project Summary

Project summary and details of European partnerships



European Circular Economy project in Wales

European Circular Economy project kicks off in Wales



Circular Economy Metrics Case Study: Asphalt

Three of Tarmac's asphalt products were selected to ...



Circular Economy Metrics Case Study: Built Assets

Case study: how progress towards the circular economy ...



CE Indicators and Metrics Tool

Created to calculate the values of Circular Economy Key ...



CE Indicators and Metrics Tool Guidance

Circular Economy Indicators and Metrics Tool Guidance



Embedding Circular Economy Principles

Top Tips for Embedding Circular Economy Principles in the ...

Some dates for your diary

Reducing Waste in Construction in a World with Accurate Progress Tracking

- Monday, 11 July, 13:00-14:00
- Register [here](#)

Plastic Packaging tax with HMRC Lunch 'n' Learn

- Weds, 13 July, 13:00-14:00
- Register [here](#)

Reducing Project lifecycle Waste

- **Monday, 25th July, 11:00-13:00**
- A session to set out the challenge of minimising waste at all stages of the built environment life cycle and showcase School partner and member innovations to help solve the issues.

IF YOU HAVE A PROJECT YOU THINK OTHERS WOULD LIKE TO HEAR ABOUT PLEASE LET US KNOW. WE STILL HAVE A COUPLE OF SLOTS FOR JULY 25TH

QUESTIONS & YOUR FEEDBACK PLEASE

[LINK FOR FEEDBACK](#)



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