CONSTRUCTION & DEMOLITION RESEARCH 2024

EPA Circular Economy Programme and Ipsos B&A

CIRCULAR ECONOMY PROGRAMME

The Driving Force for Ireland's Move to a Circular Economy

Overview of research

Behavioural insight is a foundation of the EPA's Circular Economy Programme, providing evidence to inform policy, to inform behavioural change interventions and to inform awareness campaigns.

The EPA contracted Ipsos B&A to conduct research to understand the attitudes and practices towards waste circularity within the Construction and Demolition (C&D) industry in Ireland.

Through interviews with those working in the construction sector, this work sought to identify the attitudes to waste generation, the drivers for excessive waste in the sector and identifying the barriers and opportunities to reducing waste generation (including reuse) from design stage (client scope/specifications) to delivery of infrastructure projects.

14 in depth interviews were completed in August/September 2024. The sample included clients, design/engineers as well as contractors in the industry. Each interview was up to 1 hour in length and was completed over Zoom.

Our sample was attained through contacts received from the EPA. Prior to participating in the interview, interviewees were reassured of the confidentiality of their responses – and in this research report, we have ensured that no comments are included that would identify any individual who participated.

Background on C&D waste generation in Ireland

In 2023, 9 million tonnes of construction & demolition waste were generated in Ireland (EPA, 2025). Soil & stone waste made up the bulk of the tonnage (81%), followed by mixed C&D waste (8%), waste concrete, brick, tile and gypsum (7%) and bituminous materials (1%). The proportion of segregated C&D waste (wood, paper, glass, plastic and metal) was 3%.

Greater levels of C&D waste prevention can be achieved by employing best practice circular construction activities. This includes designing out waste from the earliest stages of planning the project, increased application of the by-products and end-of-waste regulatory mechanisms (Regulations 27 and 28) by clients and the construction sector and maximising the use of resources in C&D projects in line with the EPA's *Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects* (EPA, 2021).

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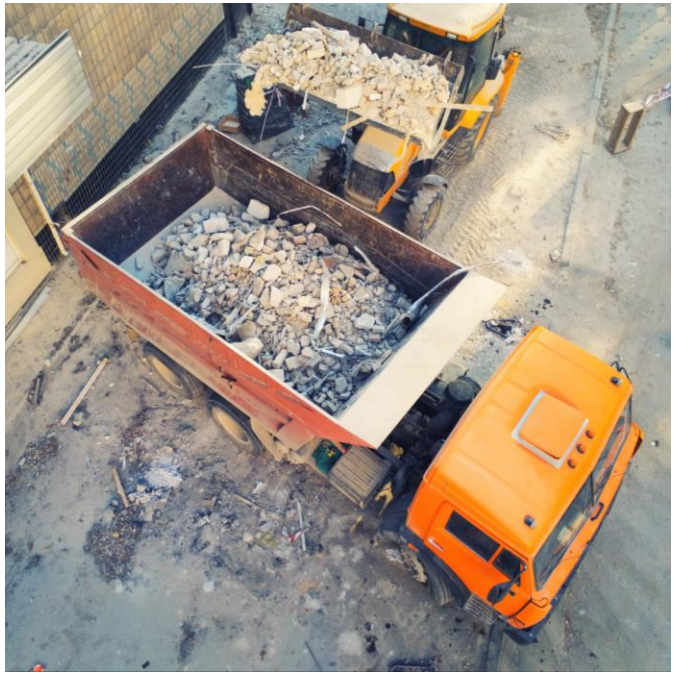
Section 1: The current context

The linear model is deeply engrained in the sector

- A linear approach appears to be **deeply rooted in traditional construction practices, processes and behaviours**.
- In reality, because of this embedded linear model, the **default behaviour is typically to 'use new' over considering 'reuse' or circularity.**
- Stakeholders primarily still view potential by-product materials in the construction and demolition process as **"waste" rather than "resources" that could be used again elsewhere.** Embedding circularity practice into projects is not seen as "business as usual" but more as occasional innovation project.



Cost and time pressures were identified as significant barriers (e.g. higher costs of second-hand materials, time to source and classify reuse materials). Changing common practices will require a concerted change management effort.

"There is increasing appreciation for waste management in construction, driven by stricter guidelines, desire to minimise costs, and general focus on sustainability. However, practices still feel quite linear without much circularity or producer responsibility"

Where is waste occurring in the C&D industry?

- Waste encompasses a **broad spectrum of materials** including concrete, masonry, timber, metals, plasterboard, carpets, ceiling tiles, and furnishings.
- **Concrete is frequently noted** as one of the largest waste streams, largely due to its extensive use and the challenges associated with its recycling and disposal.
- **Soil & stone waste is also noted as an area of concern**. Although aware of potential contamination issues (e.g. heavy metals or pyrite), many **frustrated at having to send soil to landfill** during construction projects.
- During renovations or redevelopments, interior components such as carpet tiles, raised access floors, and partitions are **stripped out and often discarded**.
- An often-underestimated area of waste is the accumulation of **offcuts** from materials like plasterboard and timber.
- Additionally, **plastic waste**, often stemming from packaging and transportation materials, constitutes a **significant portion of construction site waste**. These materials are typically discarded immediately upon arrival.

While recycling of materials like timber, metals (especially aluminum) and glass appears more established, a missed opportunity is felt to be the reuse of crushed concrete and soil in particular which appears to often end up in landfills.

There is a belief that some C&D waste is unavoidable

No matter how good a project's waste management principles are, stakeholders agree that there will likely be some waste during construction and demolition projects. For example, due to;

MATERIAL SPECIFICATIONS:

Certain materials may not meet the **technical specifications required for reuse or recycling**. For example, specific structural components might not be reusable due to **safety standards**.

CONTAMINATION:

Materials like soil can be **contaminated with hazardous substances**, making them unsuitable for reuse without **extensive and costly treatment.**

BESPOKE DESIGNS:

Modern buildings often have bespoke designs that make disassembly and reuse of components challenging. Unique or **custom-made materials** might not be easily repurposed for other projects.

PRODUCT INTEGRITY:

Product quality deterioration over time means some **products are not feasible for reuse.**

Amongst stakeholders, there is acceptance that some waste is an unavoidable part of the C&D process.

However, there is widespread agreement that change needs to happen

- **Designer/engineers and clients** note an **increase in consideration of incorporating waste reduction policy**
  - Into procurement for clients - often tied to company sustainability goals. Many companies have committed to achieving net zero carbon emissions, which requires them to adopt more sustainable practices across their operations.
  - Designers/engineers also note adopting innovative practices such as prefabricated off-site construction. Reuse and recycling taken into consideration in design plans (especially when requested by client).
- Many **contractors** **note that they have been actively engaged in waste reduction strategies** over the past number of years
  - Many contractors have waste reduction plans in place and are allocating resources (e.g. sustainability managers who champion internally).
  - Behaviour driven largely by increasing cost of waste disposal.
- Historically, waste management has been considered a peripheral concern, often addressed through ad-hoc measures such as on-site skips.

Attention and effort towards reducing waste in the C&D industry does appear to be growing – albeit it is still at a very early stage of adoption.

Section 2: Circularity in the C&D industry

Client demand appears to be a main driver of adoption of sustainability practices

- Client demand appears to be playing a **crucial role in driving the adoption of sustainable practices in the C&D industry** (where currently occurring).
- Increasingly, clients appear to be requesting sustainable practices driven by their **corporate sustainability goals and reporting requirements**.
- This shift is particularly evident among some client groups, such as **multinational corporations** and **public sector organisations**, who appear to have the **resources and higher levels of motivation to prioritise sustainability during development.**
- Clients that want to demonstrate their commitment to sustainability, can in turn drive demand for sustainable construction practices. For instance, clients may require projects to achieve specific environmental certifications, such as LEED or BREEAM, which mandate comprehensive resource and waste management and sustainability practices.

Client demand not only influences the competitive landscape, encouraging contractors to enhance their resource and waste tracking tracking and reduction efforts, but also dictates contractual procurement requirements that emphasise sustainability initiatives.

Larger businesses appear to be leading the charge

- Larger contractors, driven by the potential for cost savings and marketing advantages, appear more likely to adopt comprehensive resource and waste management practices.
- These firms are outlined as more likely to recognise the financial benefits of efficient resource management and waste minimisation, as well as the competitive advantage of demonstrating strong sustainability credentials.
- In contrast, it is noted **that smaller C&D businesses may lack the resources and expertise to implement comprehensive resource and waste management systems**

"The larger contractors can put more resources behind waste management, as opposed to the smaller contractor, where it might be, you know, your office manager or admin person, who is organising a skip to be on site for two weeks, as opposed to dedicated waste management professional in one of the larger organisations."

As a result, some note the practices of smaller contractor businesses are often limited to basic waste segregation.

There are some financial levers driving motivation to change too

- Keeping pace with private developers who are pursuing EU Taxonomy* alignment to access **green funding** and **lower interest rates** from banks is another significant driver for clients
  - Early days on this but appears it is likely to become a more prominent driver in the coming years
  - Strengthening the case for **circularity offering financial benefits.**

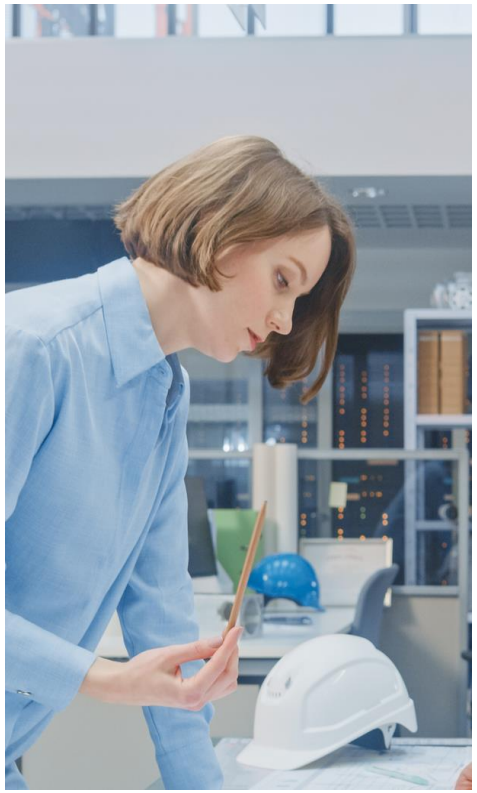
- However, at the moment, for most, the spontaneous assumption is that integrating circularity into a project will **likely not lead to substantial financial gains**
  - In fact, the assumption is that it will lead to longer lead times, and as a result perhaps greater cost.

**Pursuing EU Taxonomy alignment" refers to the process of ensuring that an organisation's economic activities meet the criteria set out in the EU Taxonomy Regulation, a classification system established by the European Union to define what constitutes an environmentally sustainable activity.*

"We have to keep track with the private developers of this world. So therefore, if they're hitting EU taxonomy alignment, then we have to hit it to get access to green funds through the banks and immediately then you're getting lower interest rates"

Design/engineers as key agents of change

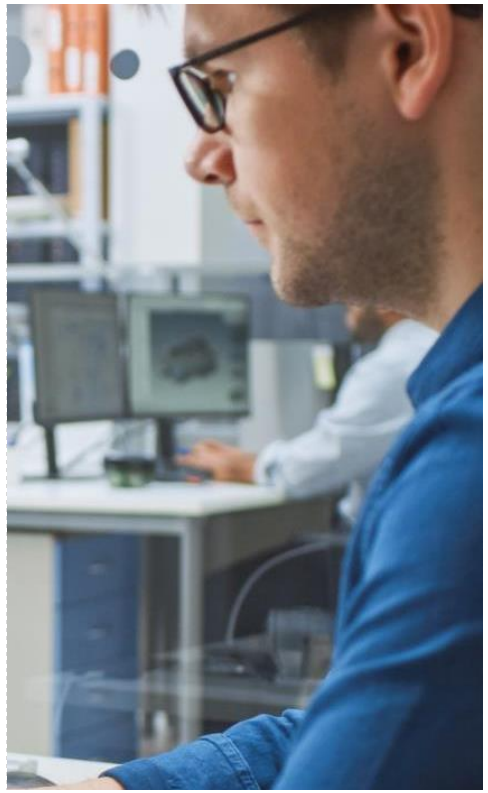
- Designers and engineers are considered to play a crucial role in **ensuring that there is efficiency in use of materials during a project**
  - Appearing to be the **most knowledgeable** about different types of materials that can be used, potential substitute options, what is happening in other countries etc.
  - As such, their ability to suggest implementation solutions for waste reduction and circularity is viewed as important point in the construction and demolition process.
- There is also acknowledgement and agreement that **by designing buildings with flexibility and adaptability in mind, designers/engineers can help reduce the need for future demolitions and enable the reuse and recycling of materials**
  - For instance, using modular components and designing for disassembly can significantly enhance the circularity of construction projects
  - Increased levels of motivation to consider retaining existing structures (but not always possible).



Acknowledgement from all stakeholders of the critical role that designers/engineers play in waste management and circular economy adoption.

But designing with the end in mind? Not quite yet.

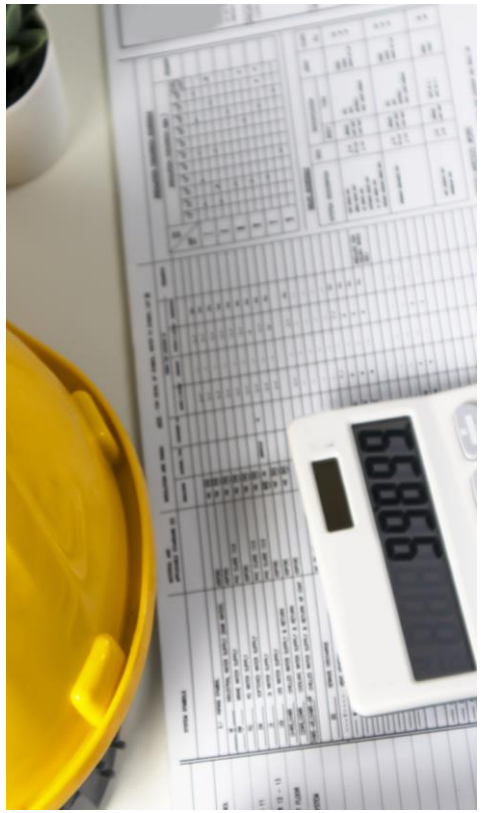
- 'Designing for disassembly' is **acknowledged as an important step** in embedding circularity by designers/engineers. However, there is little engagement with this practice at present.
- Amongst designers and engineers the focus is on;
  - Achieving **optimal operational usage**.
  - Design quality (**aesthetics and living/using experience**).
- On top of this, **it does not appear that clients are demanding designs that facilitate disassembly or reuse.**
- Buildings have also become much more bespoke and complicated in their design over time, making **disassembly and reuse potentially harder**.



Designers and engineers often do not feel compelled to prioritise the future benefits of designing buildings for disassembly. In addition, there is uncertainty around building life span and future use requirements. Furthermore, such considerations appear to hold little value for clients, who are more concerned with immediate project outcomes, operational experience and costs.

Contractors are increasingly required to have clarity on their waste/resource management processes

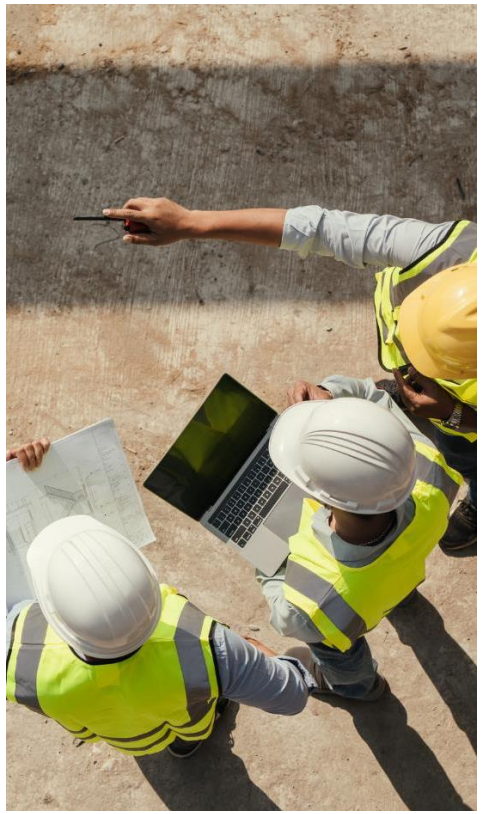
- Following instruction from clients and designers/engineers, contractors appear to be increasingly **incorporating waste reduction and management requirements into subcontractor contracts.**
- These contracts often **mandate contractors to clearly outline the types of waste expected**, methods for handling and disposing of waste, and targets for waste reduction and recycling.
- As **ESG (Environmental, Social, and Governance) reporting becomes more important**, the ability to demonstrate strong waste reduction and recycling practices is considered to be emerging as a competitive differentiator, especially for larger subcontractors.
- Some contractors also have **digital platforms** that they use to track waste streams, volumes, and destinations. The data required for the measurement is coming from subcontracted waste disposal partners (not in real time, but on a periodic basis).



Action on waste/resource management by contractors appears to be responding to market competition as opposed to regulatory requirements.

Contractors are considered key agents of change

- Contractors are considered pivotal for implementing good resource and waste management practices and circularity in the C&D industry.
- When discussing this topic with contractors, the language typically used refers to **'resource management' and 'waste minimisation'**
  - Circularity is less spontaneously mentioned.
- Contractors are motivated to engage in good waste management processes due to;
  - **Financial considerations** (cost savings from efficiency)
  - But also, in **compliance with environmental standards** (which many note as important and becoming more important in the future).

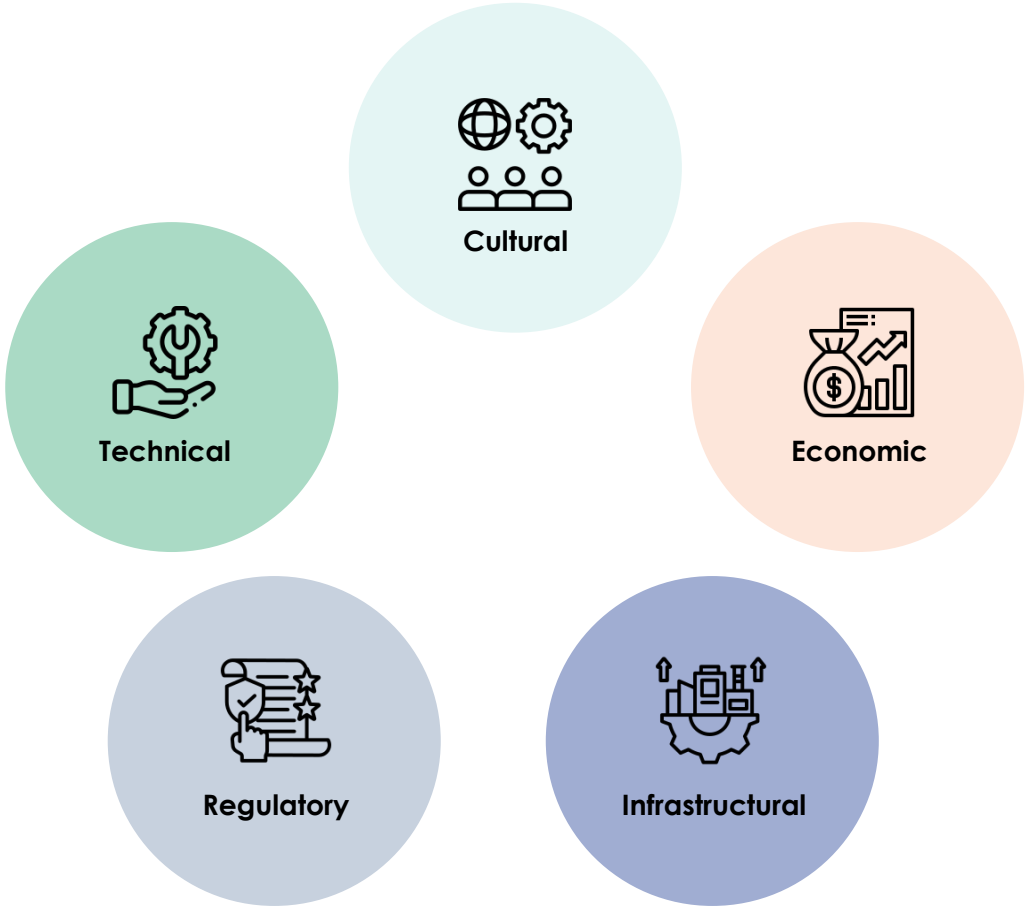


Cost savings are called out as a main motivator to better practice in resource and waste management amongst contractors. In addition, management are acutely aware of potential future requirements regarding compliance and standards and appear to be taking action.

Section 3: Current barriers to waste reduction and circularity adoption

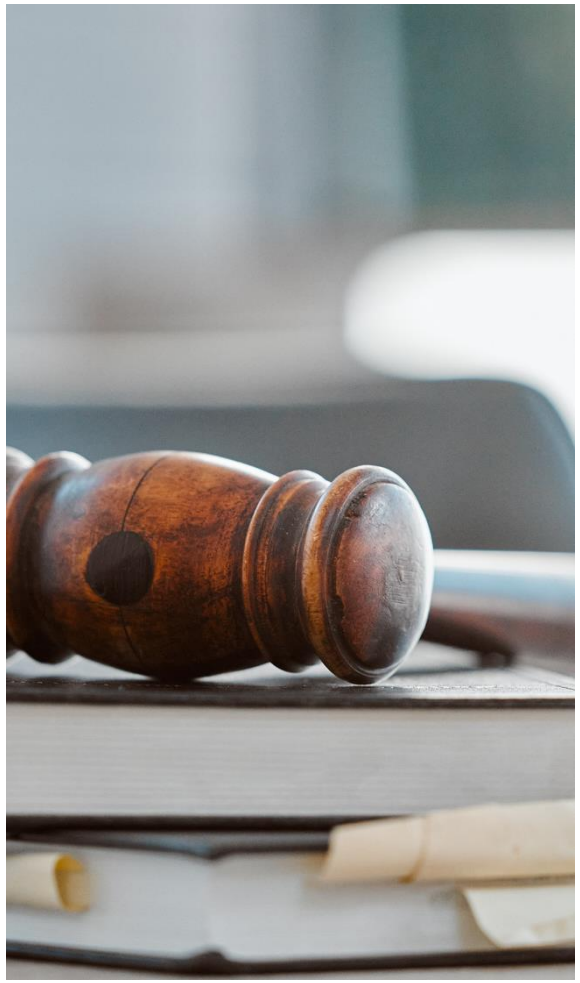
Despite the compelling case for waste reduction and circular practices, several barriers hinder this in the C&D industry.

These barriers include technical, economic, regulatory, cultural, and infrastructural challenges.



It's assumed to be difficult

Cultural



- As previously noted, the experience of stakeholders is that the linear model is **deeply embedded in Ireland.**
- Moving from linear to circularity requires going against the **grain in process and planning.**
- As such, engaging in reuse or recycling is often **perceived and assumed to be more difficult, more time-consuming and more expensive.**
- **In an industry in which timelines and costs rule supreme**, **circularity is felt to inject uncertainty into the process, which can result in risk aversion.**

The perceived complexity and potential "headaches" results in stakeholders often defaulting to the default behaviours.

Cultural

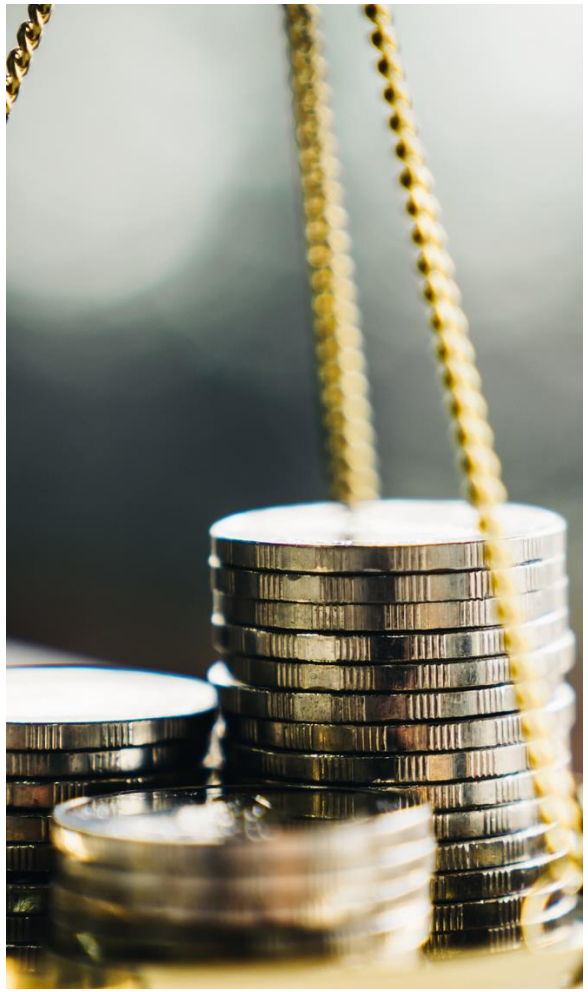
There is a need to change the goal posts

- On-site culture towards waste in the construction industry is multifaceted and evolving. Currently, success is often defined by 'diverting from landfill' which is the least favoured treatment option on the waste hierarchy. However:
  - There is a growing recognition of the need to reduce waste and adopt more sustainable practices (due to rising disposal costs, and client demands for sustainable and circular economy credentials)
  - Recognition of the need for adoption of innovative practices such as modular design
  - Better use of skip segregation (albeit can be challenging at times in city centre locations due to space restrictions).
  - There is also an increasing emphasis on education and awareness, with companies investing in training programs to improve understanding of sustainable material use among decision-makers, designers, and site managers.

There is clear momentum in reducing waste where possible on site. However, there is a need to shift the goalposts in terms of what defines success. A further step is needed in which success is defined beyond 'diverted from landfill'.

Economic

Economic incentives are not currently aligned



- Economic barriers, such as the cost and effort to refurbish and upgrade existing assets to meet current standards, often make it more feasible to demolish and start fresh.
- In addition, buying new is considered (rightly or wrongly) to be the **cheaper and more straightforward option.**
- The cost of recycled materials, including testing and processing, is perceived to be higher than that of virgin materials, which can deter companies from adopting circular practices.

In order to get buy in we need to ensure that incentives nudge circular practices.

Technical

There needs to be a baseline understanding of 'circularity' in the industry

- The understanding of circular economy principles within the Irish C&D industry is still at an early stage.
  - Use of terms such as 'circular economy' and 'embodied carbon' is growing.
  - Circularity is acknowledged as increasingly important but does not yet appear to be directly factored into decision-making.

- Stakeholders in the industry also use multiple other terms when discussing the circular economy - such as LEAN, resource management, waste management and many more. These terms are used interchangeably, with many believing that there is a strong correlation with these existing plans/behaviours and circular economy principles.

"I think that the construction industry in Ireland still has a limited understanding of circular economy principles. Many contractors are approaching 'resource waste management plans' the same way as traditional 'construction waste management plans'."

High awareness of circular economy (note: interviews were with a sample of senior level individuals), but many fail to separate out circularity from other, often established waste/resource management approaches.

Outdated specifications and procurement models

Regulatory

- Regulatory challenges, such as **outdated specifications and procurement models, do not prioritise circularity.**
- Current regulations and codes often **assume the use of virgin materials**, making it **difficult to integrate non-virgin materials into construction projects**.
- Contracts and procurement methods incentivise new construction over reuse of existing materials or products.
- This can prompt a **risk averse mindset** (especially amongst designers/engineers).
- Some note regulation is 'overly cautious' and needs to innovate to accommodate new ways of construction and demolishing.

Current regulation appears to be limiting adoption. Changing this is complex, but according to interviewees would likely have the most significant impact on adoption of circular economy principles.

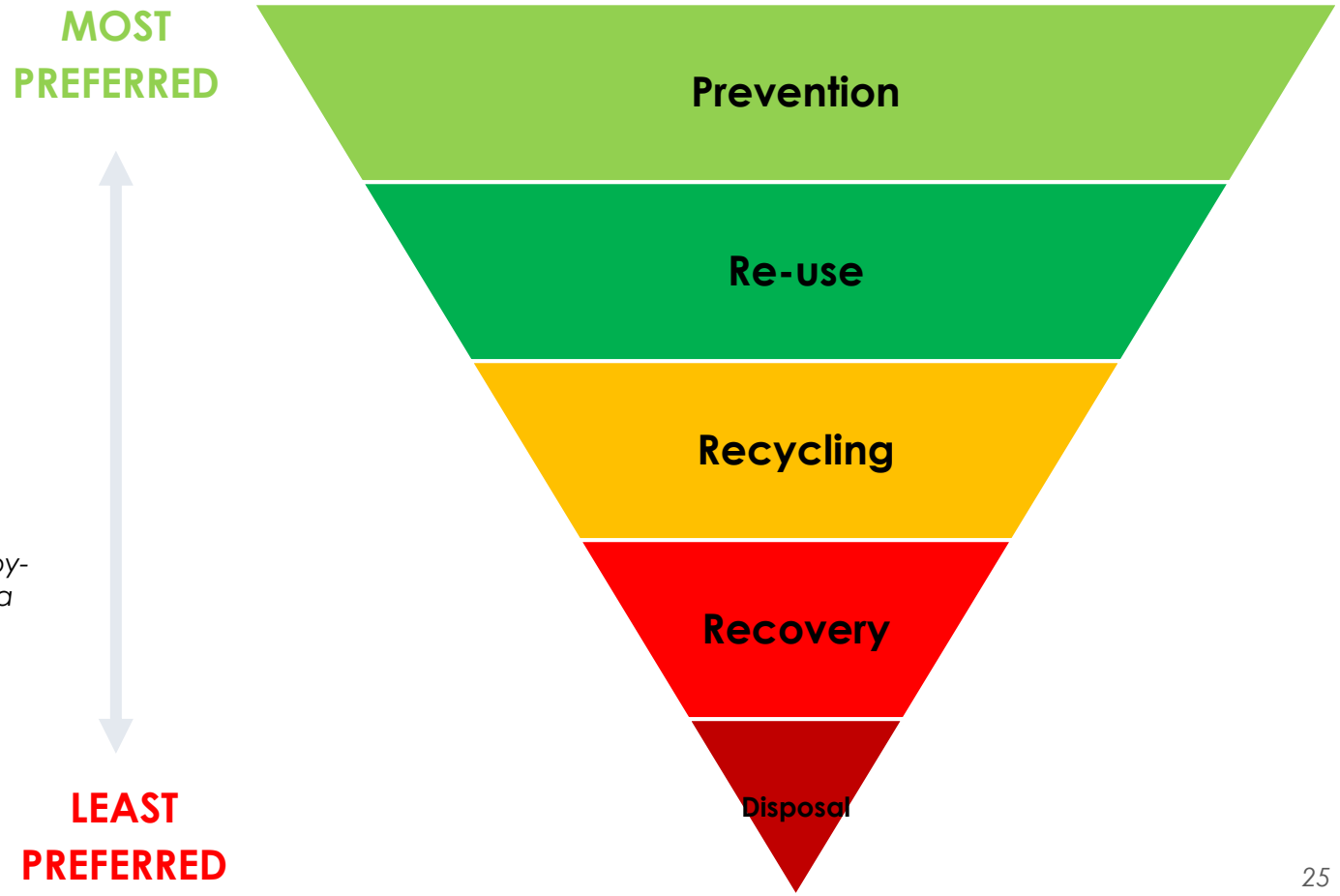
Regulation 27 (By-product) and Regulation 28 (End-of-waste)

Regulatory

- Regulations 27* and 28** have been a **step in the right direction** for **facilitating the prevention and recycling of C&D materials and waste**, contributing to circular economy practices.
- For example, concrete and brick are noted as being problematic but recent regulatory changes allowing them to become by-products is positive.

Regulation 27 (By-product): A production residue can be considered a by-product. The initial assessment as to whether a residue is a by-product or a waste is made by the producer. The relevant person is required to notify the EPA if they decide the material is a by-product. A by-product test is made up of four conditions.

***Regulation 28 (End-of-waste): Waste ceases to be waste when it has been 'fully recovered' at a waste authorised facility and meets specific criteria showing it can be safely used as a secondary material without causing adverse impacts to the environment or human health.*



Regulatory

However, there are issues that are experienced with Regulation 27/28

CUMBERSOME PROCESS:

Many participants noted that the Regulation 27 process is perceived as **slow and bureaucratic**. The time it takes to get determinations can be a **significant barrier**, and it typically **does not align with construction timelines.**

This discourages contractors from pursuing reuse opportunities, as they risk having to re-excavate materials at huge costs if determinations are delayed.

LACK OF CLARITY:

There is a **sense of ambiguity around the criteria and standards required for materials to qualify as by-product.**

- Rules appearing to vary based on where the material is going.

This uncertainty makes it difficult for contractors to plan effectively and increases the perceived risk of non-compliance.

LOGISTICAL ISSUES:

Transporting materials classified under Regulation 27 can be **challenging due to misunderstanding around waste permit requirements.**

- Materials that have been classified as by-product (i.e. non-waste) by the operator are then incorrectly transported as a waste by collectors. This results in materials for reuse being treated similarly to waste, which causes confusion.

To support uptake of Regulation 27 and Regulation 28, making the process more timely and providing clarity regarding criteria and standards and the legal requirements regarding transport of by-product materials would be useful to the sector

Infrastructural

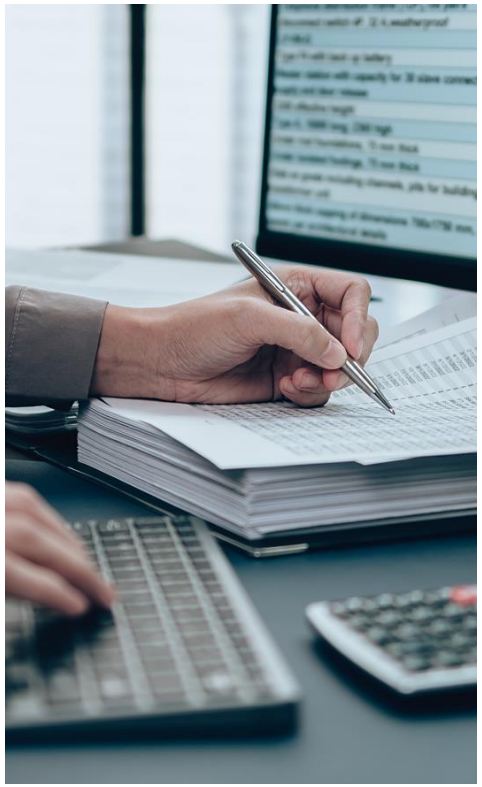
The marketplace is fragmented and runs on the grapevine

- A significant challenge is the market for non-virgin (secondary) construction materials, which is **underdeveloped in Ireland**.
- Aligning timing, incentives and practices between the many stakeholders (landowners, designers, contractors, clients) to enable reuse and recycling is challenging, especially on complex projects.
- Allocating of non-virgin materials appears to rely on **informal channels of communication** and the need to know who in the industry is looking to offload or take material.
- In addition, there are **limited takeback schemes**. Plasterboard takeback scheme welcomed but it is felt that more incentives like this need to be rolled out.

Ireland lacks physical and digital platforms for exchanging reusable materials. This makes sourcing and specifying secondary materials more difficult and costly compared to business-as-usual linear options.

Infrastructural

Data management has room for improvement



- Obtaining accurate and timely data from waste management companies is an issue that many contractors find themselves experiencing. Some note **months-long delays in getting data**, which hinders effective waste tracking and reporting and their ability to adapt to situations in real time.
- Some construction businesses appear more advanced than others. Some businesses have software for waste forecasting.
- However, it is noted that **waste management companies could do more at providing timely, digital data to construction companies so they can properly track waste ~~data~~**.
- However, getting this data is challenging. Unlike energy or water, which can be easily measured with meters, **waste is more challenging to track accurately**.

Better and integrated data management would improve efficiencies and highlight opportunities to collaborate across the value chain.

Section 4: Opportunity areas for the C&D industry

Opportunity areas for the C&D industry

Regulatory Frameworks: Streamlining and updating regulations to facilitate easier reuse and recycling of materials. This includes simplifying processes like Regulation 27/28 to better align with construction timelines.

Procurement: Mandatory lifecycle assessments and lifecycle costing for planning applications could drive more sustainable practices.

Culture: Increasing awareness and understanding of circular economy principles among stakeholders to promote sustainable material use and waste reduction strategies. Case studies shift attitudes, but training is important too.

Economic Incentives: Implementing financial incentives to make circular practices more economically attractive compared to traditional linear models. e.g. tax breaks for using recycled materials.

Infrastructure and Systems: Developing infrastructure and systems to support material exchanges, quality assurance, developing material passports and testing facilities for reused materials to ensure their safe and effective use.

Coordination and Collaboration: Enhancing coordination among projects to match material supply with demand and facilitate the reuse of materials across different sites.

Technological Advancements: Leveraging technology to improve waste tracking, material recovery processes, and the development of new, sustainable materials.

Consultancy: The need for more "hand-holding" support to the industry in adopting circular practices. Raise awareness of the EPA's *Best Practice Guidelines for Resource and Waste Management Plans for C&D Projects* in the sector.

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RESEARCH 2024

TO FIND OUT MORE:

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