

Circularity in the Built Environment

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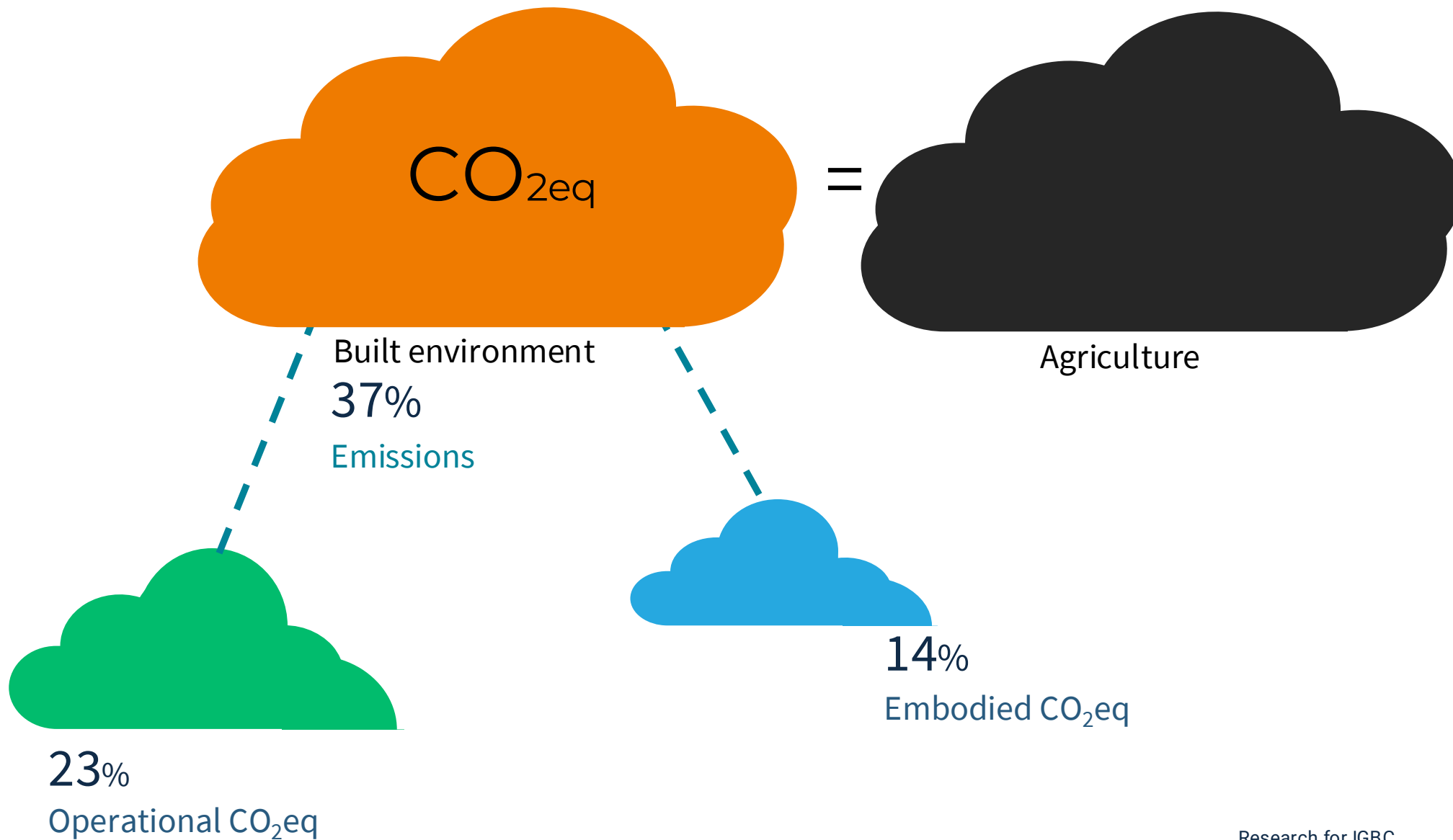




- Who we are
- Whole Life Carbon
- Decarbonisation through circularity
- Better use of existing buildings
- Reuse of Materials

Objective

Why reuse sits at the **heart of circularity**, and how **scaling reuse of materials and buildings is essential** to meeting carbon targets.



Research for IGBC
UCD Kinnane, Hegarty, Wall



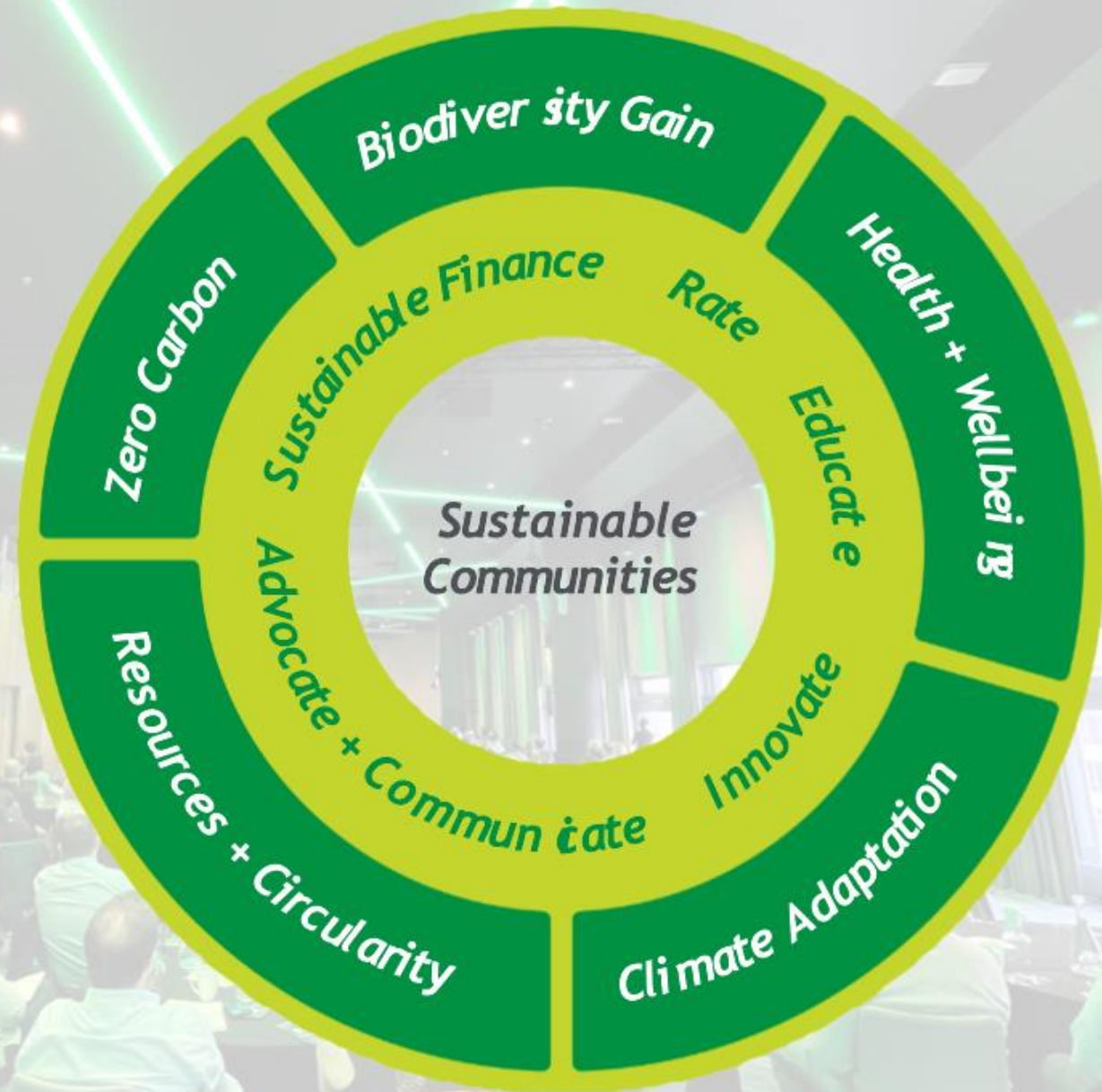
IRISH GREEN BUILDING COUNCIL

Who We Are

The Irish Green Building Council (IGBC) is a fully inclusive organisation of all those willing to work together within the built environment to transition to sustainability in the shortest time possible.

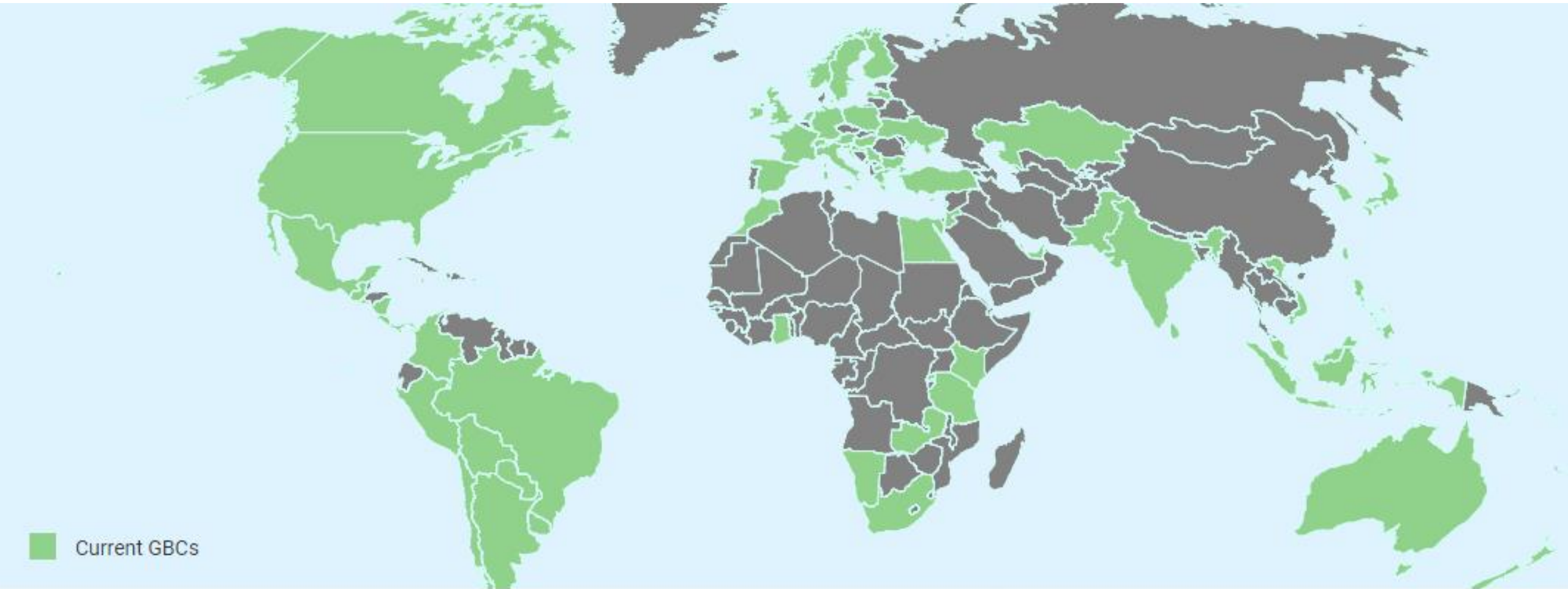
We are the leading authority on green building best practices in Ireland, with a network of over 450 organisations spanning the entire built environment industry.

We are affiliated with the [World Green Building Council](#), a network of over 80 national Green Building Councils worldwide with a total membership of over 27,000 of the most progressive international organisations and businesses. This international network allows us to share best practice, influence European policy and global actions.



World Green Building Council

A Global movement for Change



IGBC

IRISH GREEN BUILDING COUNCIL

Platinum Members



Gold Members



Silver Members





THE FULL CARBON PICTURE: THE WHOLE LIFE CARBON

What is WLC?

Whole Life Carbon (WLC) is the **total greenhouse gas** impact of a building across its entire lifespan

Embodied Carbon (EC)

The emissions locked into everything that goes into making, building, maintaining and eventually removing the structure

Operational Carbon (OC)

The emissions from actually running the building — heating, cooling, lighting, hot water, and other energy use during occupancy.

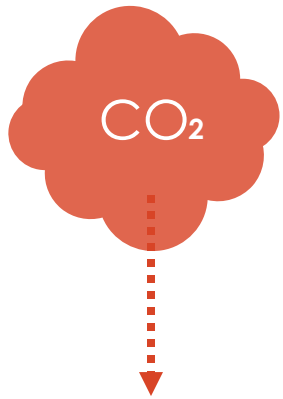
WLC Framework

The standard framework for measuring it (**EN 15978, adopted in the RICS** Whole Life Carbon Assessment standard)



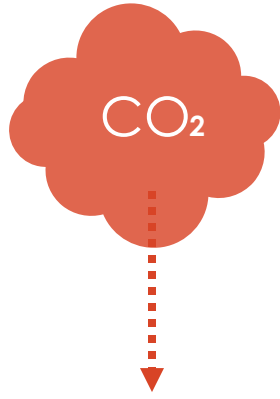
Life Cycle Global Warming
Potential Assessment

2028



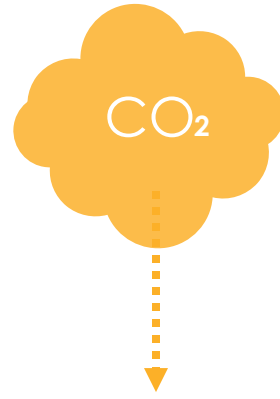
Product

Raw material supply
Manufacturing



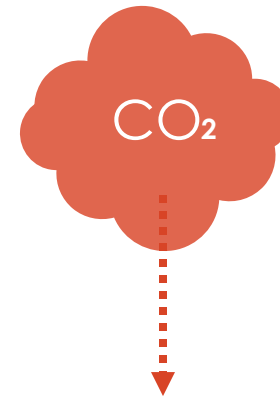
Construction

Manufacturing +
Construction phase



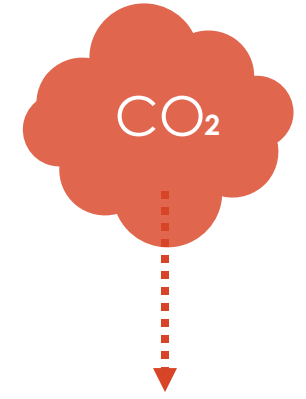
Use

Operations



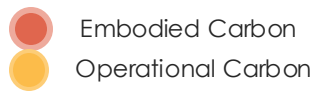
Maintenance

Maintenance + Repair



End of Life

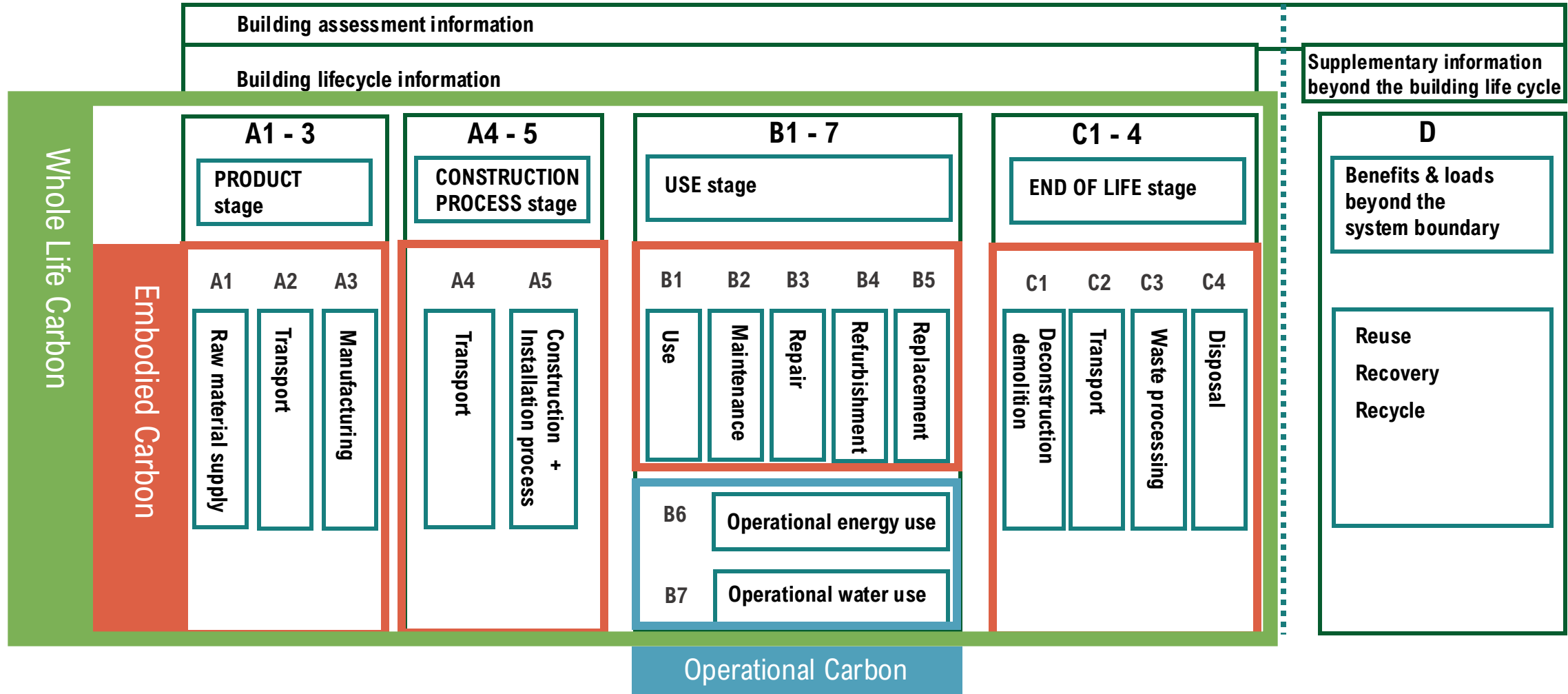
Deconstruction +
Demolition
Waste Processing + Disposal



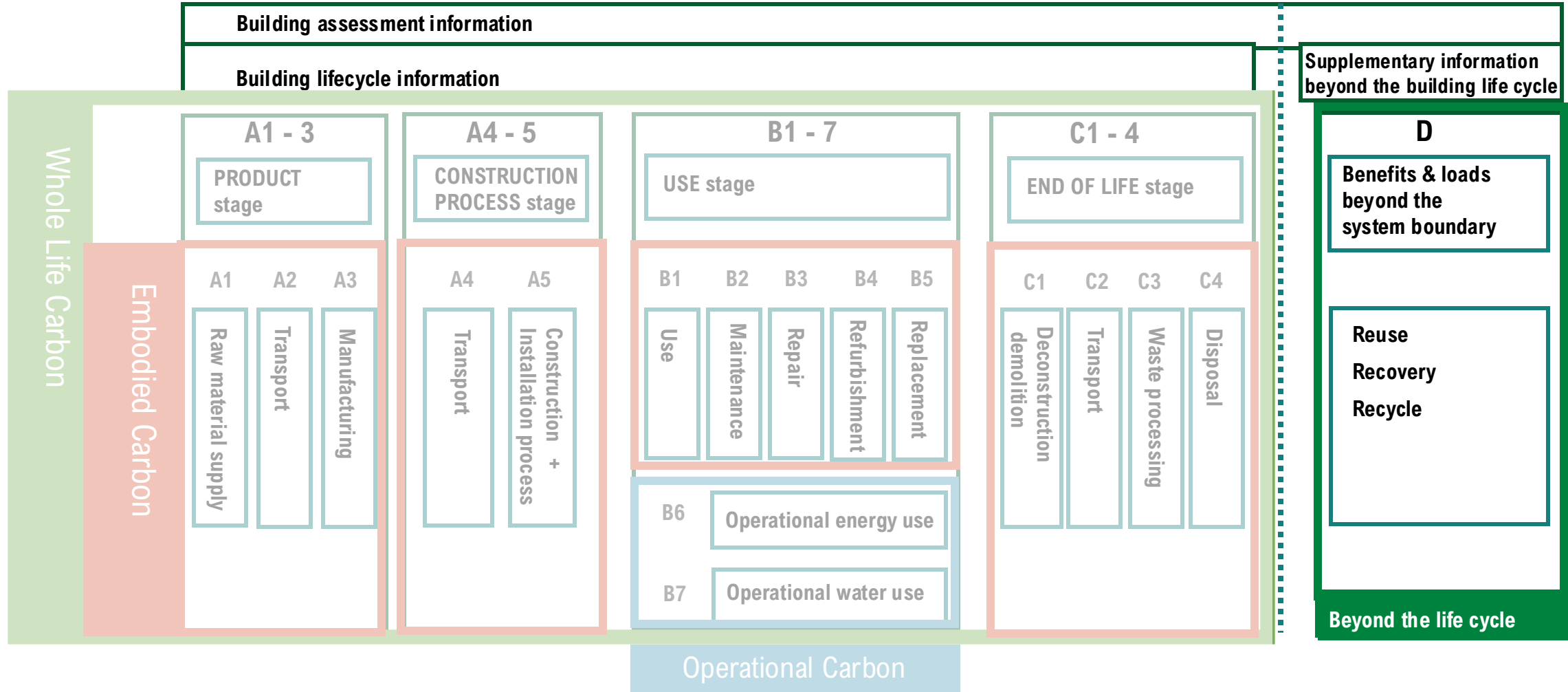
Embodied Carbon

Operational Carbon

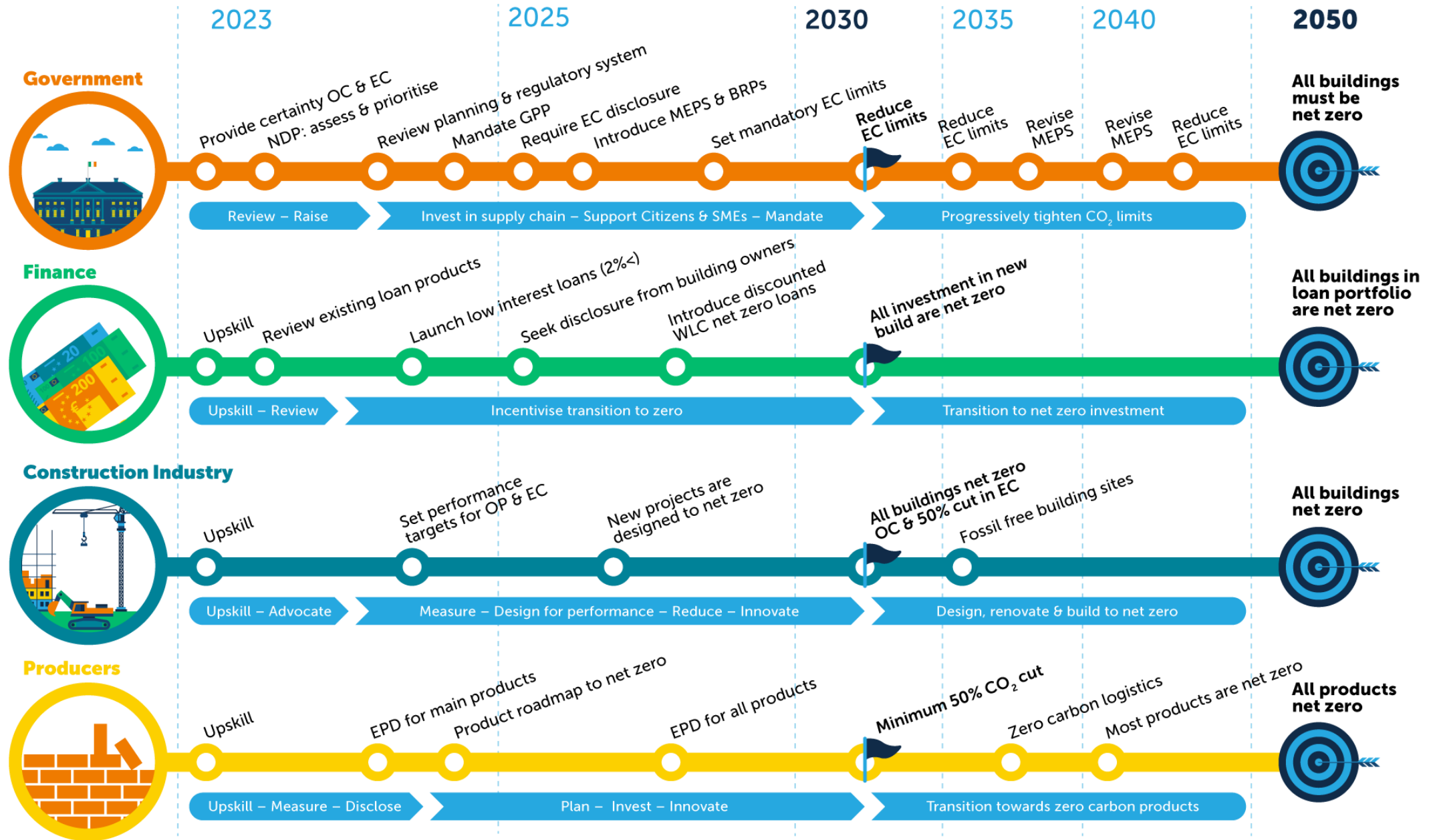
EN 15978 Reporting Modules



EN 15978 Reporting Modules



Building A Zero Carbon Ireland:
Industry Insights & Actions - Summary - Irish Green Building Council



1. **Avoid new construction** by prioritising alternatives to building new – **retain, retrofit, refurbish existing buildings or disassemble and reuse materials** (material salvage)
2. **Minimise the use of virgin materials**
3. **Use low carbon materials and technologies** (bio-based, reused and recycled materials)
4. More efficient/leaner design (use less materials, right-size buildings)
5. Design for circularity (adaptability and disassembly)

WHOLE LIFE CARBON

The summary of every greenhouse-gas emission and removal tied to a building across its full life — embodied carbon in materials and construction, plus operational carbon in use

CIRCULARITY

Design and material strategies that keep buildings, components and materials in use for as long as possible and recover their value at the end of life, instead of extract–use–dispose.



DECARBONISATION THROUGH CIRCULARITY

Why This Matters

8M

tonnes of construction
and demolition waste in
2024

(EPA, 2026)

2.1%

circular material use rate by 2023
(EU average ~12%)

meaning

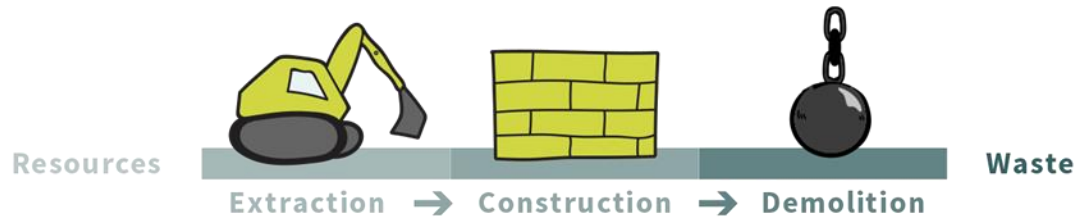
~98%

of material sources come from virgin resources
(EU 88%)

(EPA, 2026)

Ireland is not on track to meet its 2030 climate targets. **Addressing this will require better use of the existing building stock, scaling up circularity strategies, strengthening supply chain resilience, and transitioning to lower embodied carbon construction products and systems.**

LINEAR ECONOMY



This means designing and producing products in a way that makes them **more resource-efficient, durable, functional, modular, and easy to upgrade, disassemble, and repair.**

Prevention

Preparing for Re-Use



**CIRCULAR
BUILD**

Circular Business Models

**Circular Design Processes
+ Procurement**

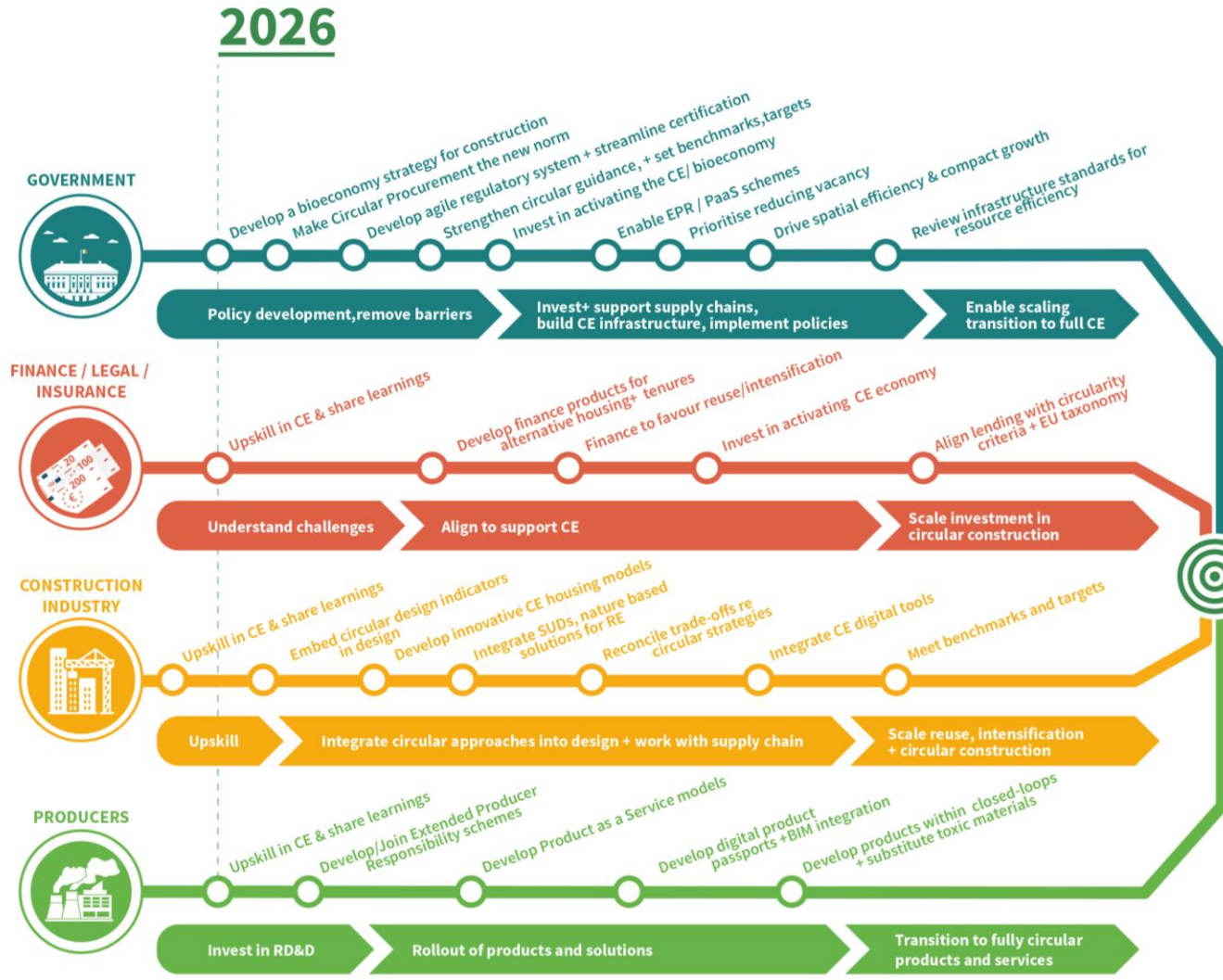
Recycling

**Circular Renovation
+ Retrofit**

Recovery

**Circular
Materials+
Resources**

Building A Circular Ireland - Roadmap - Irish Green Building Council



VALUE OUR EXISTING BUILDING STOCK

50% - 75% reduction in underuse/vacancy in the building stock achieved

PLAN FOR RESOURCE EFFICIENCY

Optimised infrastructure to development ratios achieved through good planning

All communities have access to a full range of affordable life stage appropriate housing ensuring better use of the housing stock.

DESIGN FOR CIRCULARITY

100% buildings adopt Design for Adaptability / Deconstruction approaches.

Improve resource efficiency by 40-50% over baseline

Optimise use of regenerative & bio-based materials within viable capacity

CLOSE MATERIAL LOOPS

100% materials from deconstruction are reused/recycled

100% of materials are either from, or can enter non-toxic closed-loop supply chains.

Optimised use of regenerative & bio-based materials within viable capacity.

CHANGE BUSINESS MODELS

All materials within Extended Producer Responsibility (EPR) schemes

Product as a Service is widely used

1

Value our Existing Building Stock



BETTER USE OF EXISTING BUILDINGS

“The greenest and lowest-carbon is the one that already exists”



*“The greenest and lowest-carbon is the one that already exists, and **IT IS IN USE**”*



163,433 vacant dwellings in Ireland (CSO, 2022)



Vacant to Viable - Report into the reuse of existing buildings

OBJECTIVE:

Assess the perceived and actual Building Regulation impediments to reuse of existing buildings and develop mitigation recommendations.

LEAD:

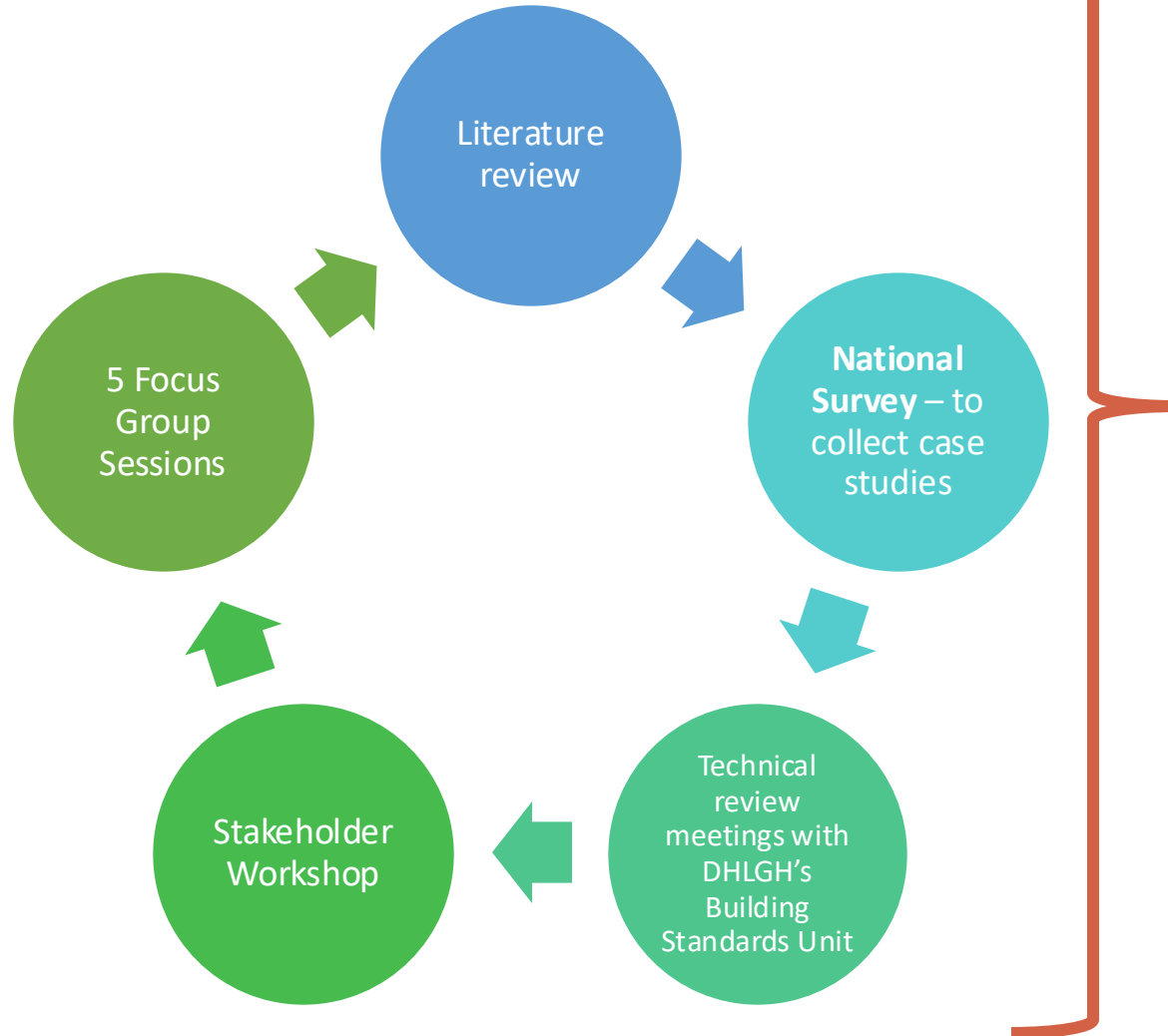
- Irish Green Building Council (IGBC) - Lead

PARTNERS:

- University College Dublin (UCD)



Process

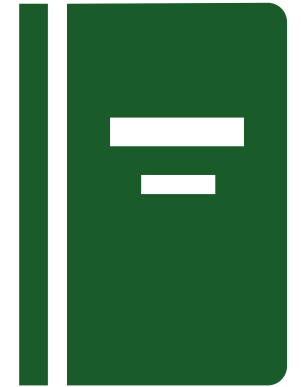


Objective

The project distinguished perceived from actual regulatory **barriers** and developed evidence-based **potential recommendations** to create a more enabling regulatory environment

Outcome

Recommendations Report
Currently under peer review



“Genius Gems”

Specific technical **compliance pathways, already available within the existing regulatory system** but not widely known or used, that can resolve common barriers without the loss of historic fabric. For example:

- BRE documents BR128 and BR208 permit one-hour fire resistance to be achieved without removing historic floorboards or party walls.

“Hidden Myths”

Widespread but **incorrect assumptions** about what the Building Regulations actually require. Examples identified include:

- A common belief that converting the upper floors above a shop to residential use automatically triggers a mandatory lift installation.
- A common misunderstanding that an unheated garage attached to a dwelling must be insulated under Part L or the EU Energy Performance of Buildings Directive (EPBD)
- A widespread misunderstanding is that Part L applies to Protected Structures

Draft Challenges – Feedback from Industry

01

Part B – Fire Safety

Difficulty achieving fire resistance standards (e.g. 60-minute compartmentation) without stripping historic fabric, uncertainty over retaining existing narrow staircases, and delays or inconsistency in Fire Safety Certificate processes.

02

Part M – Access and Use

Widespread misconception that lifts and full accessibility upgrades are always mandatory on reuse, causing unnecessary cost and abandonment; genuine confusion over when Part M applies in material-change-of-use scenarios.

03

Part L – Conservation of Fuel and Energy

Energy performance requirements can conflict with conservation goals, as thermal upgrades in traditional buildings risk introducing moisture problems or damaging historic fabric.

04

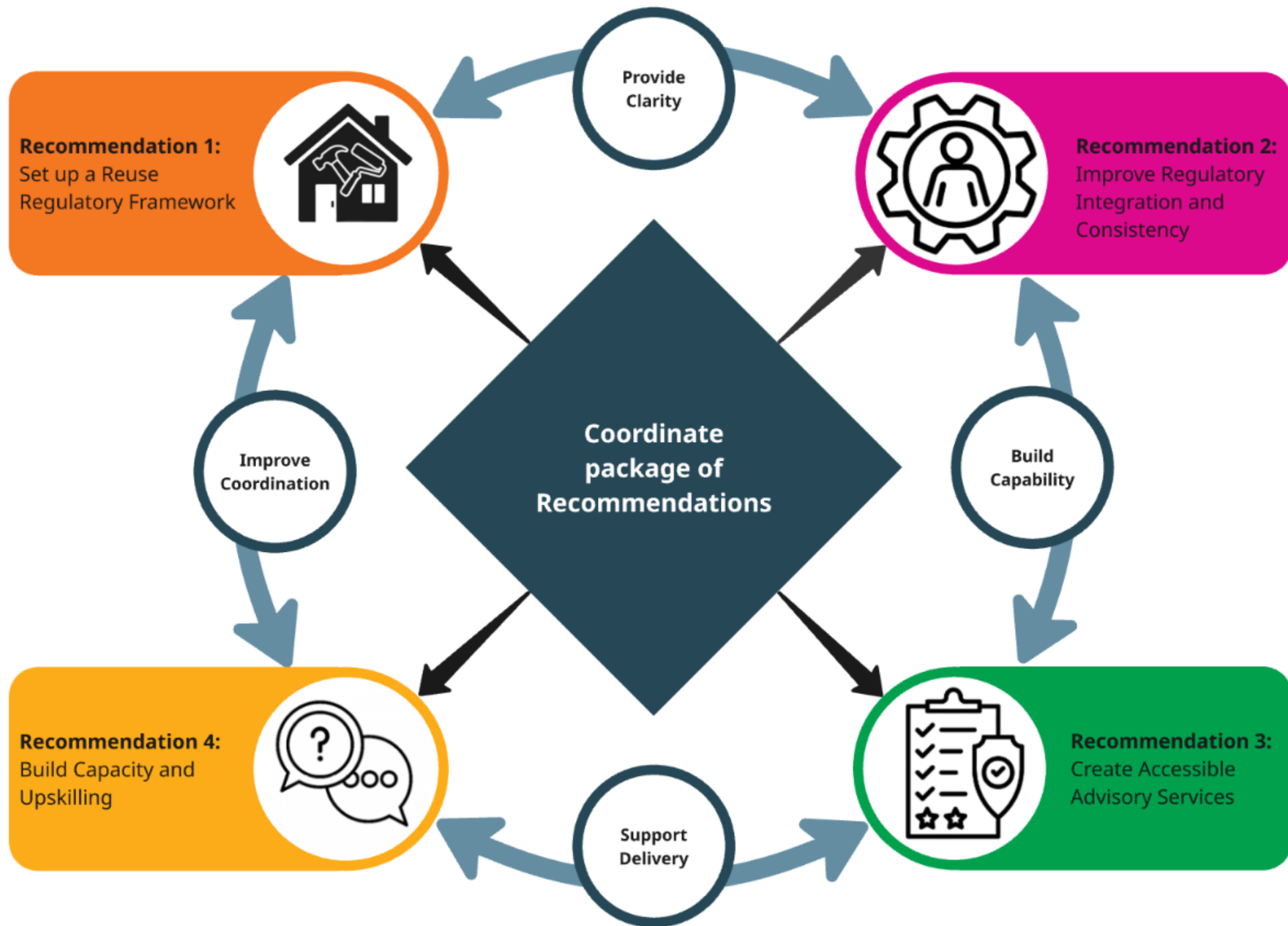
Part A – Structure

Existing structures (undersized joists, older foundations, historic steel) must be assessed against modern loading and performance standards, often clashing with service upgrades

05

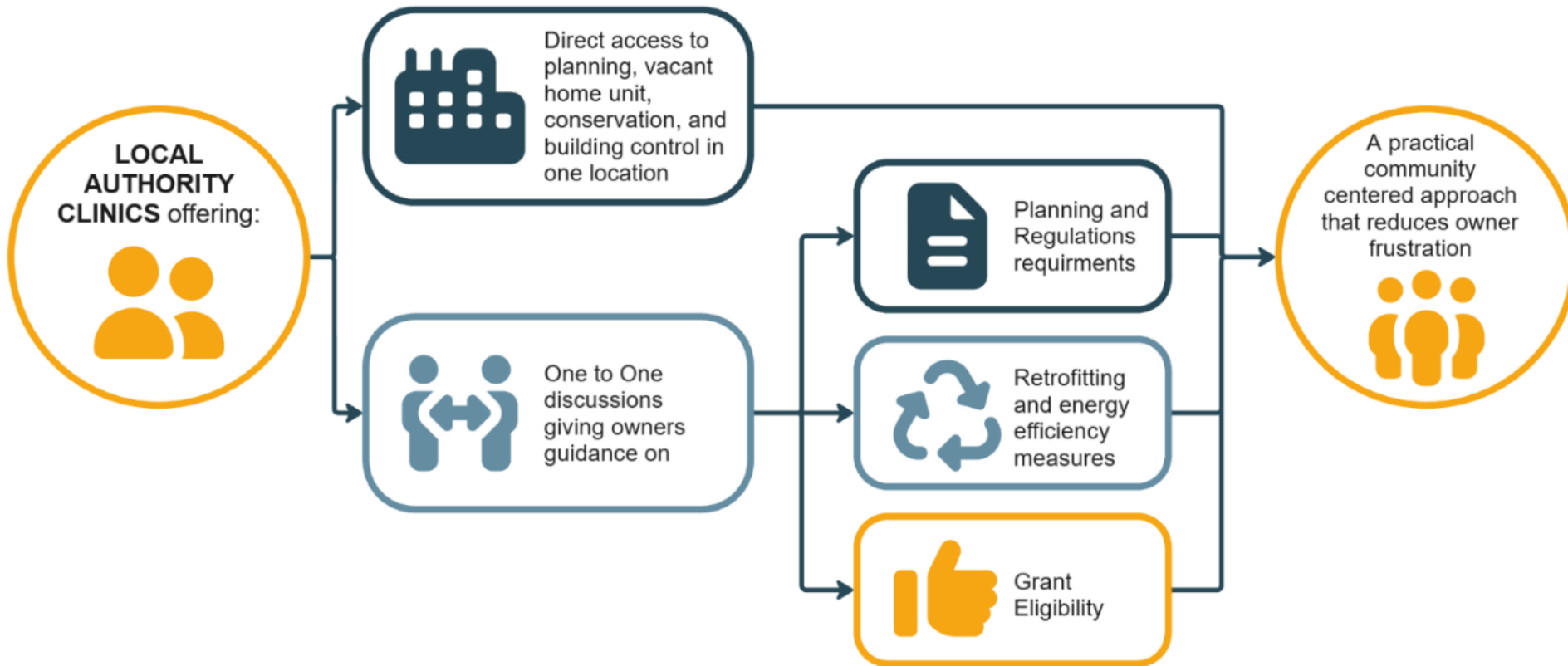
Part E – Sound

Acoustic compliance is difficult to achieve with traditional timber floors and walls, compounded by a lack of reuse-specific Acceptable Construction Details.



Mayo County Council

Mayo County Council (Mayo CoCo) organised information evenings and clinics, bringing together multiple agencies and experts in one place, allowing building owners to receive real-time, coordinated advice on how to renovate existing buildings. This approach reduced duplication, improved understanding of regulatory requirements, increased awareness of available grants and support, and empowered owners to move forward with greater confidence.

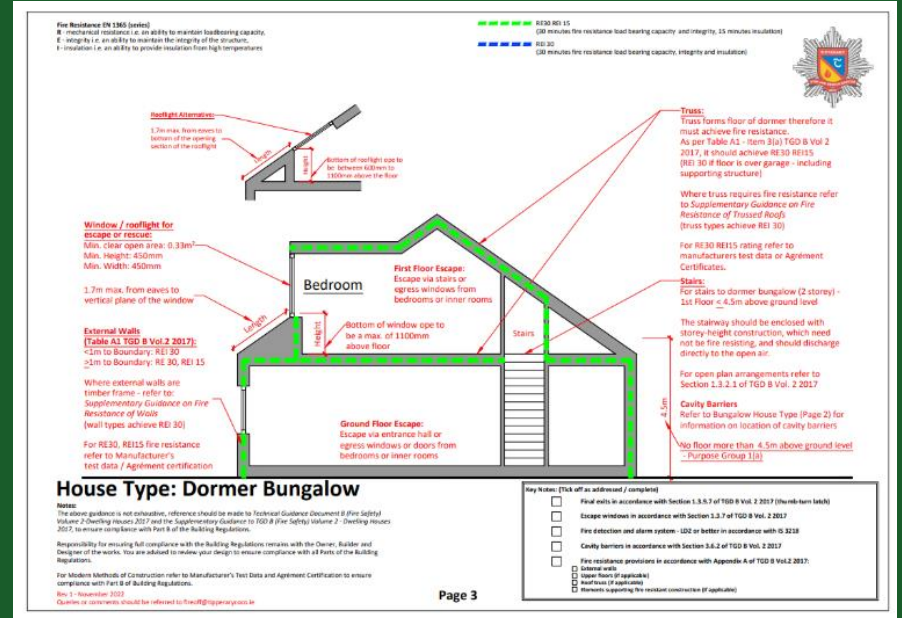
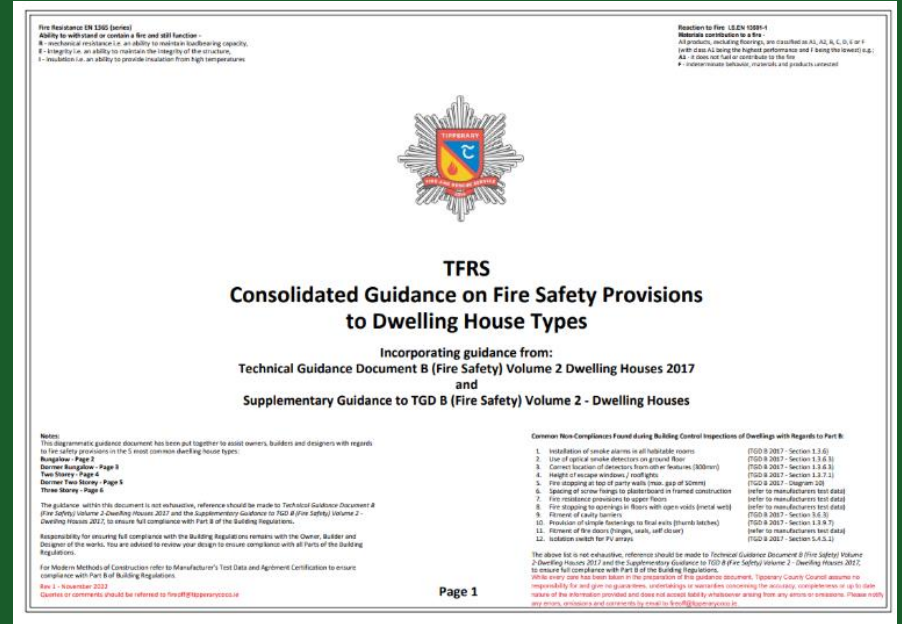


Tipperary County Council

Tipperary County Council (Tipperary CoCo) has published on their website a consolidated guidance TGD B vol. 2 2017, in which ACD and recording webinars can be found. Tipperary CoCo diagrammatic guidance document has been put together to assist owners, builders and designers with regard to fire safety provisions in the 5 most common dwelling house types:

- Bungalow
- Dormer Bungalow
- Two Storey
- Dormer Two Storey
- Three Storey

The guidance within this document is not exhaustive; reference should be made to Technical Guidance Document B (Fire Safety) Volume 2-Dwelling Houses 2017 and the Supplementary Guidance to TGD B (Fire Safety) Volume 2 - Dwelling Houses 2017, to ensure full compliance with Part B of the Building Regulations. Responsibility for ensuring full compliance with the Building Regulations remains with the Owner, Builder and Designer of the works. While this consolidated guidance, TGD B Volume 2 2017, was primarily developed for new-build developments, it may also be used as an effective reference and template for existing buildings.





REUSE OF MATERIALS

Perceived Industry Barriers to Reused Materials

*Feedback from building professionals on why secondary and reused materials remain difficult to specify with confidence
Based on the following IGBC projects: CMEx, Transition to a Circular Economy and Regulatory Sandbox*

- **Uncertainty about compliance** treatment of secondary or reused materials: How secondary or reused materials should be assessed for Building Regulations
- **No clear recertification / conformity pathway** for reused products: The absence of recertification pathways for secondary materials adds further uncertainties for building professionals
- **Insurance and risk aversion**: standard insurance policies exclude pre-existing/reused materials (no coverage)
- **Lack of infrastructure**: no formal marketplace, storage facilities or take back schemes that connect projects with reclaimed material at the right time
- **Uncertainty about the definition of waste** under the End of Waste (Article 28)

Potential Solutions Industry Identified

- **Guidance:** Building-control-focused guidance notes that explain how reused and secondary materials can meet Building Regulations (e.g. structural, fire); what evidence is acceptable (test reports, declarations, certifications)
- **Training on secondary/reused materials:** For all levels of the supply chain, using case studies to show how compliance was demonstrated in practice, ensuring that possible pathways to proof compliance are understood by all relevant actors
- **Recertification / conformity pathways:** A recognised route for assessment and recertification of reused products (e.g. via third-party certification)

Construction Materials Exchange | Irish Green Building Council



Enfield Council
Construction
Material Exchange

Material Passports - Irish Green Building Council

Pioneering and promoting the Material Passport technology in the Irish Construction Sector

IPUT Kingspan savills walls bam

Construct Innovate Built Environment Research Ireland

madaster IGBC IRISH GREEN BUILDING COUNCIL



Decarbonisation through Circularity

The Potential of Reusing Materials

CMEx Case Study

- Reusing this granite on CMEx material means that **214 kgCO₂- eq** emissions associated with producing a new material are mitigated.
- This approach **minimises the carbon footprint** and offers **financial benefits** by **lowering the costs** of acquiring new materials.
- All Resources Passports can be accompanied by an estimate of the **end-of-life value** for both reuse and re-cycle options



The Potential of Reusing Materials

Steel Reuse Case Study – Treasury Building, IE

Key drivers for steel reuse

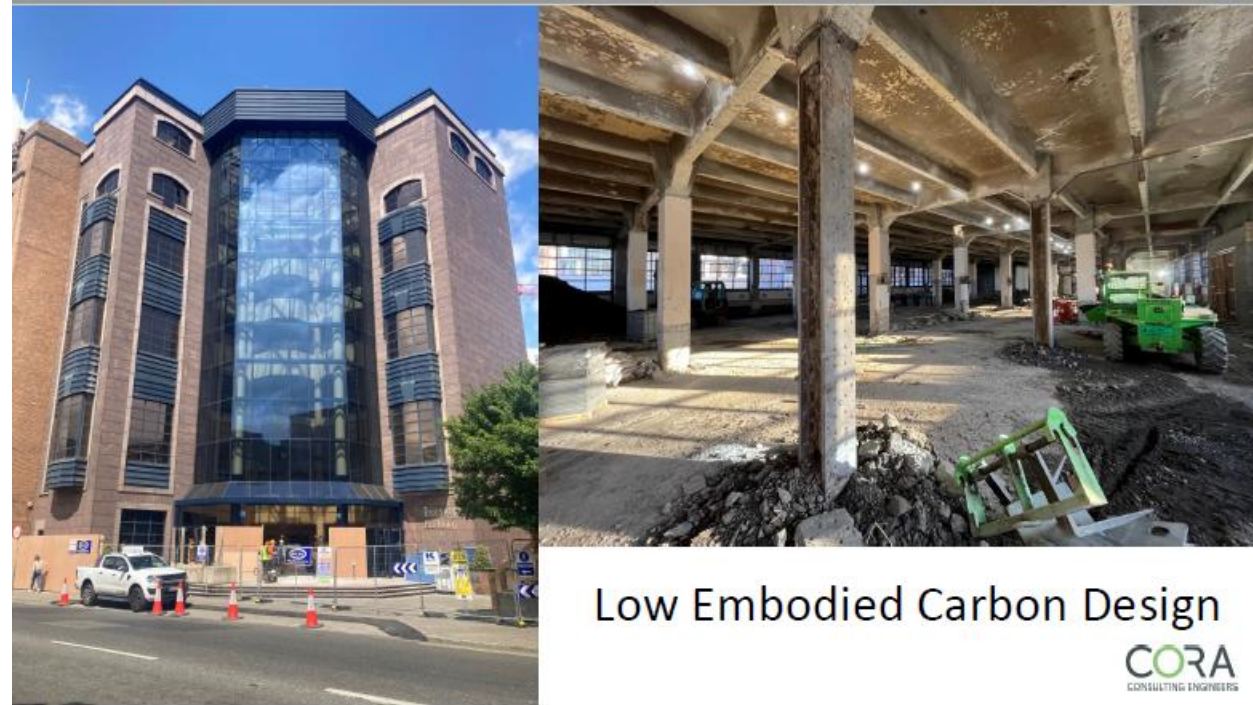
The vision for the new building was to provide the end-user with the **most sustainable and intelligent digital building** to date in Ireland.

Amount of steel reused

Dismantling and reuse of **85 tonnes of structural steel** within the building

Embodied carbon savings

207kgCO₂e/m² Embodied Carbon achieved, far surpassing the target of 500kgCO₂e/m²



Low Embodied Carbon Design

CORA
CONSULTING ENGINEERS

Looking Ahead

There is an opportunity to better support reuse, adaptive reuse, and intensification of use over demolition and new construction.

Energy Performance Building Directive (EPBD) - Integration of **lifecycle thinking** into the EPBD - for the first time.

AIM: Encourage better design and better choices of materials.

The revised **Construction Products Regulation (EU) 2024** introduces stronger requirements on circularity and environmental performance (e.g. durability, reusability, recycled content, embodied carbon). Clear, consistent sector guidance on how to address reuse, disassembly and circularity in building control decisions would:

- Reduce uncertainty for designers and contractors.
- Support Ireland's decarbonisation and circular economy targets.

[Life-Cycle Global Warming Potential \(GWP\) | SEAI](#)



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Circular Economy and reuse of materials

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Whole Life Carbon and reuse of existing buildings

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Website: www.igbc.ie

1. According to your knowledge, how do you think the NBCO can help to encourage reuse?
2. Do you know any case in Ireland that reused materials were used?
3. Do you know any other Local Authority that has implemented a One-stop-Shop/Advisory clinic or something similar? if yes please name it

