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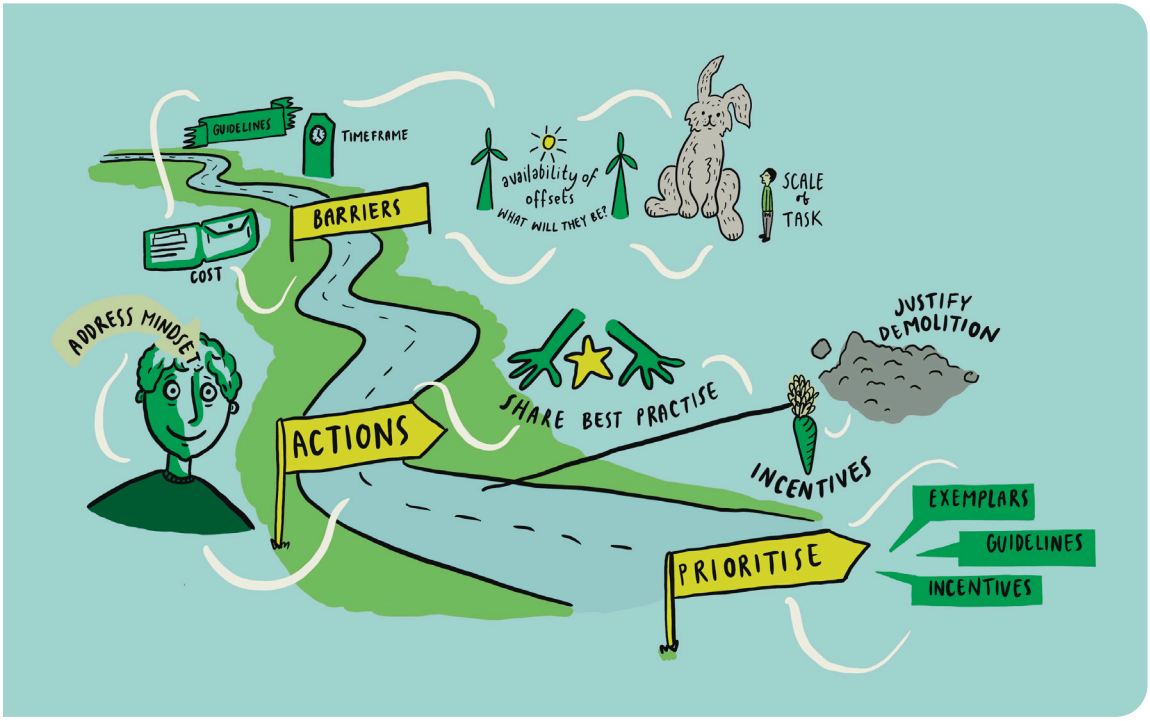
IGBC
IRISH GREEN BUILDING COUNCIL

LIFE Level(s)

Towards a fully decarbonised built environment

Key stakeholders' Workshop

25 September 2020



Introduction

On 25th September 2020, 50 experts across the building industry reflected and workshopped the question:

"What would it take to embed whole life carbon thinking in the design of our buildings to reach carbon neutrality by 2050?".

The answer was a resounding **"Government must lead"**, followed with, "State agencies need a mandate."

Most of the industry and policy focus to date has been on tackling operational emissions. Our objective was to listen to the experts on how to move to a fully decarbonised built environment across the whole life cycle by 2050 in line with the Paris Agreement.

The workshop was organised by the Irish Green Building Council and funded by the Environmental Protection Agency, with support from the EU Life Level(s) project.

Carbon Neutrality by 2050 is impossible without tackling whole life carbon of buildings.

In order to achieve carbon neutrality, we will need to eliminate the very substantial emissions from the construction sector including the transport, manufacturing and construction site related emissions.

What is carbon neutrality?

Carbon neutrality refers to achieving net zero carbon dioxide emissions by reducing emissions as much as possible, with any remaining carbon balance offset.

What is whole life carbon?

Whole life carbon means all the CO_2 equivalent emissions associated with the mining, quarrying, industrial production, transport of building materials, construction work, operation, maintenance, renovation and finally the deconstruction and disposal of buildings.

Key Points to Consider to Truly Decarbonise

UP TO

70%

of lifetime CO_2 may be emitted before apartments are occupied and operational carbon begins

Situation in Ireland

In Ireland, the huge upfront CO_2 impacts of new buildings are not measured or regulated at national or local authority level and the benefits of retaining existing buildings are not assessed. These emissions, happening before new dwellings are occupied, account for 50% - 70% of lifetime CO_2 emissions of new apartments*.

The remainder of operational emissions is measured through the Building Energy Rating (BER) and building regulations happen over the following 60 years. Though in reality the operational emissions will decline as electricity is decarbonised. This means upfront embodied carbon is becoming much more important.

*Based on analysis of some recently constructed Irish and UK constructed apartment blocks – Carbon Heroes One Click LCA

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actions related to embodied carbon in the Built Environment section of the National Climate Action Plan 2019

To start with, embodied carbon is not considered in Ireland's Climate Action Plan 2019. None of the 28 actions within the built environment category refer to it. The Climate Action Plan recognises that it is not enough to decarbonise electricity and heating in isolation from first reducing energy demand through building retrofits. Likewise it should recognise that it is not enough to decarbonise in isolation sectors such as transport and industry, disconnecting them from the construction activities which drive these emissions.

Operational carbon

We generally refer to operational carbon in buildings as the carbon regulated through Part L of the building regulations, namely, heating, cooling, hot water, lighting and all fixed fans and pumps needed to operate the building. This does not cover the often very substantial emissions related to energy required to operate any equipment brought into the building, computers, kitchen equipment, appliances such as televisions and washing machines etc. These are sometimes referred to as plug loads.

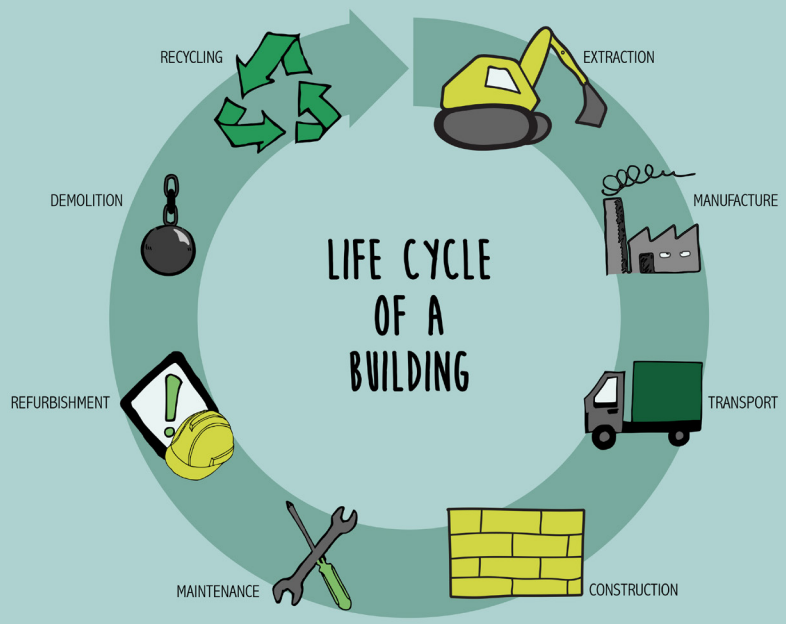
The measurement CO_2eq

GHG emissions are often measured in carbon dioxide (CO_2) equivalent. To convert emissions of a gas into CO_2 equivalent, its emissions are multiplied by the gas' Global Warming Potential (GWP). The GWP considers the fact that many gases are more effective at warming Earth than CO_2, per unit mass. Metric tons of carbon dioxide equivalent or MTCO2e is the unit of measurement.

Source: EPA

Carbon emissions are evaluated in terms of global warming potential (GWP) which is quantified in units of carbon dioxide equivalence. A kilogram of carbondioxide therefore has a GWP of 1 kg CO2eq.

Source: World Green Building Council



Measuring and reducing

whole life carbon of buildings will reduce emissions from the building sector, and transport and industrial emissions related to it.

This approach would **help transition to a circular economy**.

How could this be addressed in Ireland?

Measuring and reducing whole life carbon of buildings will make carbon neutrality possible. It would not only reduce emissions from the building sector, but also transport and industrial emissions related to it.

This approach would also radically reduce related waste and help transition to a circular economy.

What does circular economy mean?

Looking beyond the current take-make-waste extractive industrial model a circular economy aims to redefine growth, focusing on positive society wide benefits. It entails gradually decoupling economic activity from the consumption of finite resources and designing waste out of the system.

Source: Ellen Mac Arthur Foundation

2x **Ireland's construction aggregates per capita in comparison to EU average**

Ireland consumes double the EU average of construction aggregates per capita. This indicates economic and environmental inefficiencies in the construction sector.

Source: Essential Aggregates Report - Irish Concrete Federation

1/8 **"Calculations show that whole life carbon in a retrofitted housing project can be one eighth the amount of a new build project" - EPA workshop**

11% Percentage of global CO_2 emissions from upfront embodied carbon.

Globally buildings and construction together account for 39% of energy-related carbon dioxide (CO_2) emissions of which 11% is estimated to be from upfront embodied carbon.

What the industry said

1. Government must lead by example and send a clear signal to the industry

Integrate whole life carbon into public procurement in 2021

The public sector must lead by example. Public authorities' purchasing power can serve as a powerful driver of the demand for truly sustainable buildings. The OGP's "Circular 20/2019: Promoting the use of Environmental and Social Considerations in Public Procurement" should be revised and clarified to include Life Cycle Assessment. It incorporates green criteria but only if it meets current financial constraints.

Government must lead

Public authorities' purchasing power must be used to drive the demand for truly sustainable buildings.

Revise public spending code to include a shadow price of carbon by 2025 across the full life cycle.

Request EPD as part of Green Public Procurment (GPP) hence encouraging manufacturers to disclose and reduce the impact of their products.

The workshop revealed that this is interpreted too narrowly as life cycle costs and future cost of carbon is not considered. Better costing of carbon in public procurement could be a game changer. The public spending code should be revised to improve the approach to shadow price of carbon across the full life cycle. Public procurement could also be used to incentivise manufacturers to transparently disclose and reduce the environmental impact of their products through **Environmental Product Declaration** (EPD).

Government must send a clear message to the industry that a whole life approach to carbon neutrality is an absolute priority for new and existing buildings. Long-term commitments, such as net-zero carbon buildings by 2030 are critical to provide security for investors and the construction sector.

Environmental Product Declaration - EPD

EPDs are a standardised way for manufacturers to display information on the environmental impact of building products, including global warming potential.

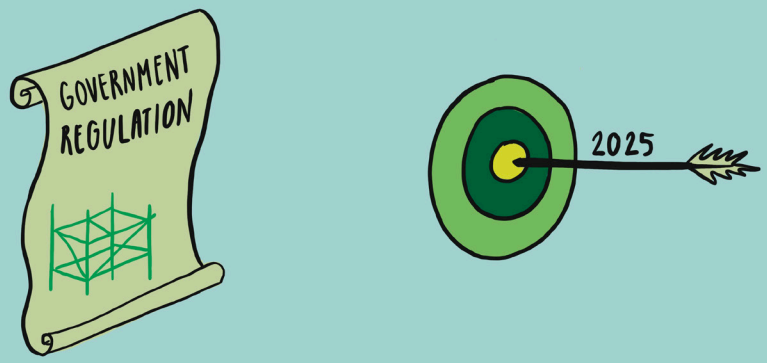
Ultimately, EPDs allow architects and other building product specifiers to make more informed choices about the materials they use.

2. Integrate whole life carbon into Public Procurement in 2021

Integrate whole life carbon into local authorities' development plans in 2022

Require whole life carbon measurement to EN 15978 standard on all large-scale development in local authority's development plans particularly where demolition is proposed. Many of the development plans will be revised in 2022 and this is an opportunity to update.

3. Regulate whole life carbon in buildings by 2025



Regulate whole life carbon in buildings by 2025

Feedback from the industry indicates that apart from market leaders, clients will not ask for life cycle assessment until it is a legal requirement. Countries such as Finland, France or the Netherlands have already legislated on this.

The European Commission has now developed the Level(s) framework to standardise how this can be integrated into regulations and procurement. In taking this step, we would give the Irish construction industry a competitive edge, while simultaneously reducing our carbon footprint.

In the short term, review fire safety regulations in relation to timber buildings, and regulate on re-use of materials (demolition/ refurbishment) and aggregates.

Level(s)

Level(s) is a common European approach to assess and report on the sustainability of buildings. It was developed to help design and construct sustainable buildings with the whole lifecycle in mind. Using existing standards, the voluntary Level(s) framework provides a common language for building sustainability, which other initiatives can also use.

Within the Level(s) framework, each indicator is designed to link the individual building's impact with the priorities for sustainability at a European level. This focuses the Level(s) user on a manageable number of essential concepts and indicators at building level that contribute to achieving EU and Member State environmental policy goals.

Source: European Commission

4. Develop simple carbon footprint tools that can be used at the early stage of the design

Develop Tools

A number of tools already exist and should be better promoted, but additional tools are needed.

Tools that exist already

- One click LCA
- London Energy Transformation Initiative (LETI)
- EPD Ireland
- RICS Guidance
- Finnish Method for the Whole Life Carbon Assessment of Buildings

Additional tools needed

- Guidance on how to procure a building using LCA
- Basic carbon footprint tools that can be used quickly in early planning for the time poor
- Good guidance and case studies for different typologies

Why is it important at a European level?

A 2050 roadmap for reducing whole lifecycle carbon emissions in buildings will be developed by 2023.

The EU's Renovation Wave initiative launched in October 2020, highlights the importance of circularity and LCA in renovation, specifically referencing the Level(s) framework.

The EU's Circular Economy Action Plan specifically highlights the use of Level(s) and of LCA and circularity indicators.

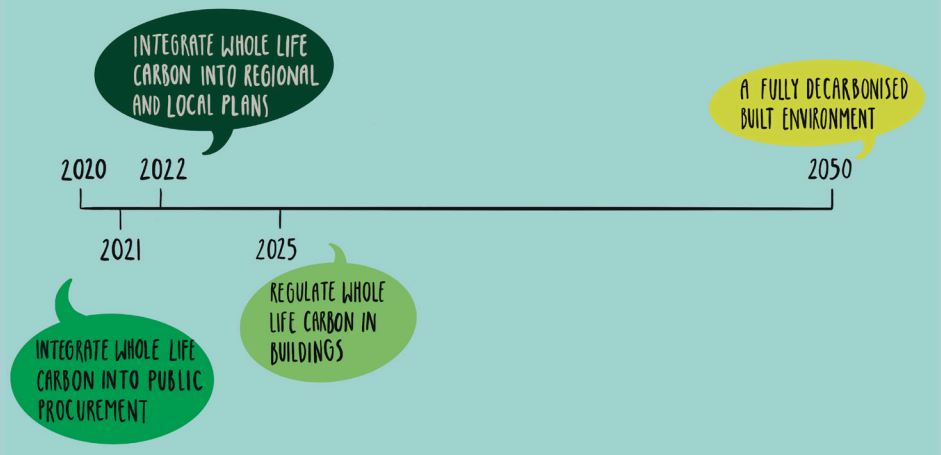
The strategy for a sustainable built environment to be published in 2021 must be designed to ensure coherence across relevant policy areas - carbon, energy, resource efficiency and management of construction and demolition waste.

It is highly likely that resources efficiency and embodied carbon will be considered in the revised Energy Performance of Buildings Directive (EPBD) to be published in 2021.

5. Raise awareness, train the industry and develop new tools

Raise awareness about the importance of taking a whole life carbon approach and train the industry

Raise awareness about the importance of whole life carbon and life cycle assessment (LCA) at senior level and not only among technical people. Procurers, developers, contractors and product manufacturers must all be aware of it. Train specifiers, procurers and building professionals.



Why should Ireland act now?

- To reach carbon neutrality
- To bring in additional investment for new homes and renovation. A growing number of investors already set broader environmental requirements for the assets they purchase and operate in Ireland.
- To increase new specialist job opportunities.

Illustrations by Maia Thomas

This workshop has been supported by the Environmental Protection Agency

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