



2023

BUILDING

WITH WOOD

POSITION PAPER



green
party
comhaontas glas

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1.0 Introduction

38% of energy CO₂ emissions globally are related to the construction and building sector. In Ireland this sector accounts for around 37% of carbon emissions¹, equalling that of agriculture². This 37% of carbon emissions is comprised of approximately 23% operational emissions associated with the energy we use to heat, cool and light our buildings and a further 14% of the emissions consisting of embodied carbon emissions emanating from the production and transport of construction materials, the construction process itself, and the maintenance, repair and disposal of buildings and infrastructure.³

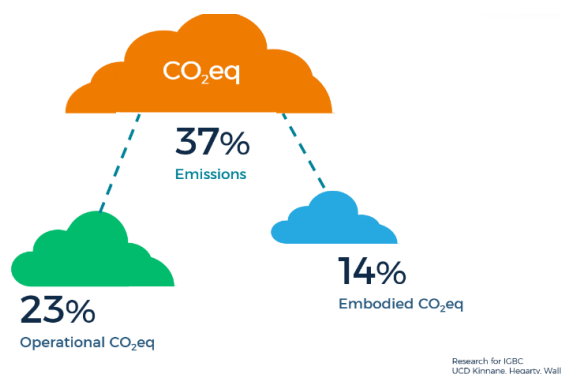


Figure 1: CO₂ Emissions

Concrete is the most commonly used building material in Ireland. A House that is built with concrete elicits typically 40% more carbon per m²⁴ than if the same house was built from

more sustainable materials such as timber. It is recognised that the decarbonisation of our built environment needs to address the wider impact of embodied emissions. Ireland subsequently urgently needs to embrace low-carbon construction methodologies at a meaningful scale. According to the Irish Timber Frame Manufacturers’ Association (IFTMA) the market share has grown 11% since 2019.

Reducing the carbon footprint of the built environment is key to tackling climate change and to achieving our Net Zero ambitions. The Climate Action Plan for Ireland has a target of a 51% reduction in greenhouse gas emissions by 2030 and to also have a climate neutral economy by 2050. This cannot be achieved by relying on current construction materials; concrete, brick and steel.

The European Commission is aiming at minimising the environmental effects of the built environment by 2035 as part of the Energy Performance of Building Directive. In terms of measuring carbon in the built environment, the European Commission has established the Level(s)⁵ framework to provide common indicators to address life cycle and environmental performance of buildings

¹ <https://www.igbc.ie/wp-content/uploads/2022/05/22-WLC-IGBC-Build-Green-Now-P1-and-P2.pdf>

² <https://www.epa.ie/our-services/monitoring--assessment/climate-change/ghg/agriculture/>

³ https://data.oireachtas.ie/ie/oireachtas/committee/dail/33/joint_committee_on_housing_local_government_and_heritage/reports/2022/2022-10-14_report_on_embodied-carbon-in-the-built-environment_en.pdf

⁴ <https://www.engineersireland.ie/Covid-19-information-base/embodied-carbon-in-masonry-construction-versus-timber-frame-construction-in-housing>

⁵ Level(s) EU Sustainable Buildings Framework <https://lifelevels.eu/>.

across the EU. Netherlands, France and Denmark has introduced limit values for embodied carbon which is driving a move to lower carbon construction and bio-based materials. Outside of the E.U. wood framed housing is continuing to grow in popularity in particular USA and Canada. In addition, The London Energy Transformation Initiative (LETI London) has produced a detailed guide to building for net zero whole life carbon in buildings⁶.

The new EU Forest Strategy for 2030 endorses the promotion of wood products and the incentivisation of construction engineers and architects to design buildings built with wood.

The recent Oireachtas Committee Report on Embodied Carbon⁷ calls for the measuring of embodied carbon at the point of building design. The report also addresses the issues in Building Regulations which adversely impact on the use of timber in Ireland. The significance of supporting indigenous industries involved in Modern Methods of Construction (MMC) and developing revised public procurement rules to support the use of low carbon building materials is also noted.

⁶ LETI Embodied Carbon Primer, Supplementary guidance to the Climate Emergency Design Guide https://b80d7a04-1c28-45e2-b904-e0715cface93.filesusr.com/ugd/252d09_8ceffcbcafdb43cf8a19ab9af5073b92.pdf

The Green Party is advocating for the measuring of whole life carbon at the design stage as soon as possible. The Irish Green Building Council Report 2022⁸ indicates that if we continue to build the way we have always built we will not achieve our 2030 climate obligations.

2.0 Creation of a Working Group

The Green Party is calling for the immediate establishment of a formal working group between the Department of Agriculture, Food and the Marine, the Department of Housing, Local Government and Heritage, and the Department of Enterprise, Trade and Employment to devise and implement the necessary policies and legislative changes required to remove existing barriers to the increased use of timber in construction – timber frame can easily deliver buildings cost effectively over 10m in height and mass timber can deliver at medium and high rise levels effectively at up to 80m in height.

In addition, the Working Group should consult and work with industry, third level institutions and other state bodies to continue to increase the knowledge among construction

⁷https://data.oireachtas.ie/ie/oireachtas/committee/dail/33/joint_committee_on_housing_local_government_and_heritage/reports/2022/2022-10-14_report-on-embodied-carbon-in-the-built-environment_en.pdf

⁸ https://www.igbc.ie/wp-content/uploads/2022/10/WLC-UCD-IGBC_30.09.22_V4.0_MidRes.pdf

professionals and the wider public of the benefits of timber as a construction material.

The Working Group should also ensure a significantly increased use of wood as a construction material through public procurement, and through the introduction of ‘wood first’ policies and whole life carbon reporting in construction regulation.

2.1 Focus of the Working Group

1. Revise the regulatory barriers limiting the use of timber, removing the need for fire officers and fire brigade to have to ‘interpret’ the regulations and explicitly allow design of buildings built in timber over 10m in height.
2. Implement key policy supports to prioritise low carbon building materials and sustainable procurement.
3. Demonstrate and test new forms of off-site timber building systems.
4. Provide education, training, and public awareness.



Figure 2: Removing Regulatory Barriers Limiting the Use of Timber

3.0 Irish Forestry Potential

Since the 1990s, the Irish State has invested almost €3 billion in the forestry sector in the form of grants, premiums and supports measures. Total annual investment by the Department of Agriculture, Food and Marine into the forestry sector is circa €100 million euros. This investment in planting in recent years will lead to a doubling of Ireland's forecasted supply to nearly 7 million cubic metres annually by 2035, and this offers significant potential to develop and create new markets and products from our timber.'

3.1 Economic Contribution

The economic contribution of Irish Forestry to the economy is estimated at over €2 billion per annum as noted in a recent study by COFORD - Council for Forest Research and Development

on the Economic Activity and Employment Levels in the Irish Forest Sector⁹.

Ireland’s forest products sector is recognised as a European market leader. With annual export sales of €573 million, the sector has invested significantly over the last decade. A cumulative investment of more than €200 million has been made to develop modern, state-of-the-art processing facilities with the projected capacity to process the forecast increase in fibre supply. These investments have been in process efficiency, machining and grading accuracy, and kiln drying technology enabling our sawmills to compete internationally.

The combined estimate for direct and indirect employment levels is 3,500 for the forestry and harvesting sector and 5,900 for the manufacturing of wood and wood products sector. These levels show a significant contribution to employment from forestry, mostly in rural areas. Scotland have led the way in establishing a strong timber industry which accounts for €771 million of Gross Added Value every year and provides more than 30,000 jobs.¹⁰

3.2 Construction

Forests can provide quality construction grade timber and panel products for new builds and renovation, pallets for international transport of goods, landscape garden products and fencing for our homes and gardens and can produce heat and energy from forest residues and small diameter fibre in the form of pellets, chip and firewood. No part of the tree goes to waste and all timber derives from sustainably managed forests. Producing the wood that we use in constructing and heating our homes requires many inputs along the forest chain over an extended period. This includes people employed in nurseries growing the seedlings, those establishing and regenerating forests, and the many involved in harvesting those trees.



Figure 3: Irish Forestry Potential

⁹ The study has been funded by the Minister’s Department, and authored by Henry Phillips and Forestry Services Ltd.

¹⁰<https://forestryandland.gov.scot/what-we-do/timber-industry>

Growing Ireland’s capacity to build more with timber through the greater use of off-site timber frame, cross laminated timber and mass timber buildings could significantly increase the overall capacity to build homes in the State while also supporting our local indigenous forestry and forest products industries.

3.3 Environmental Benefits

Increased afforestation is a key part of our Climate Action Plan. Forests have the potential to bring many of positive environmental benefits, from cleaner air, increased biodiversity, important habitats for many species, flood storage, and recreational benefits too. The improved licensing regime for afforestation and deforestation is very important to ensure good practice in forest locations and species mix.

3.4 Tourism

A highlight this year has been the redevelopment of Avondale House and Forest Park. This is €16 million project, in partnership with Fáilte Ireland, Coillte and EAK. Avondale Forest Park is also open to visitors to explore and enjoy the established walking and cycling trails, orienteering courses, and recreation area. The tower and walkway structures showcase the use of locally sourced high-quality low carbon Irish Douglas fir and the main buildings feature some of the largest and longest span cross laminated timber (CLT) structures made using commercial Sitka spruce

timber. They demonstrate the variety of ways to which Irish-grown timber can innovatively be used in engineered structural timber applications. Avondale won the tourism and hospitality project of the year award at the Irish Building and Design Awards.

3.4 Future Potential

The €1.3 billion euro investment in forestry for Ireland, announced by Minister Pippa Hackett will represent the largest ever investment by an Irish Government in tree-planting. The next Forestry Programme will deliver for climate, biodiversity and water quality, and annual payment rates will increase for all forest types.

Furthermore, Coillte’s Forestry Strategic Ambitions include the Production of 25m cubic metres of certified Irish timber, to support the construction of 300,000 homes by 2030 and the promotion the use and benefits of wood products to increase the level of timber homes from 20% to 80% by 2050.



Figure 4: Avondale House and Forest Park

4.0 Modern Methods of Construction

The National Development Plan proposes the building of 400,000 new homes. ‘*The Housing for All*’ initiative could subsequently push emissions from the built environment to three times the national target by 2030, with embodied carbon expected to increase by a factor of 5 in the same timeframe, accounting for 40% of residential emissions.

In the context of our housing crisis, it is imperative that we start to build homes much faster. There is a significant opportunity with timber. Building with timber in housing is much faster than traditional concrete and block homes that are common in Ireland.

The Construction Professionals Skillnet Report, April 2022, defines Modern Methods of Construction MMC as “an approach to constructing buildings using methods such as off-site manufacturing, modular construction panels or light steel framing, structural insulated panels or cross-laminated timber”.¹¹

The process of building with wood is cleaner, cost efficient and creates less waste. Wood can also be used in ‘modular housing’ forms.

¹¹ <https://www.skillnetireland.ie/wp-content/uploads/2022/05/Modern-Methods-of-Construction-Defining-MMC-Business.pdf>

Construction on site is fast and efficient. Irish grown timber can deliver faster, affordable, and greener homes. BCP Capital note that prefabricating in timber within the built environment reduces waste by up to 90%, reduces deliveries to sites by 85%-90%, utilises 67% less energy, provides up to 50% saving on construction programmes, and reduces costs by 20%. Cross laminated timber in the manufacturing process produces zero waste and is often safer than steel and concrete in a fire as the protective charring effect is entirely and accurately predictable.

In terms of Modular Housing the process takes approx. 10-16 weeks and due to the off-site manufacturing, the environmental impact is minimised.

*Figure 5: MMC assembling a wood framed house*

Wood framed housing or wood as the primary construction method is common in many other countries, in particular USA, Canada, and the

Scandinavian countries. Wood is also a far better material in terms of its insulation properties.

Beyond Zero Homes which is a group of organisations that build zero carbon timber frame houses¹² demonstrate how beautiful, affordable, healthy homes can be developed with minimal impact on the environment throughout their lifecycle demonstrating how the climate emergency can be met with sustainable products and building strategies that are already in existence.

The Irish Green Building Council noted that timber frames account for more than 75% of newly constructed homes in Scotland but only 24% in Ireland.¹³ According to a recent members survey by the Irish Timber Frame Manufacturers Association (ITFMA), timber frame units accounted for 48% of all houses built in low-rise housing schemes in 2021.¹⁴

There are numerous companies in Ireland that specialise in using timber as a construction product and there are producers in Ireland that are capable of producing lower carbon cement, concrete and brick. The Construction

Professionals Skillnet Report, April 2022 notes that there are over 100 Irish off-site manufacturing companies located around the country, manufacturing and supplying various 2D, 3D, sub-assemblies and bespoke modular solutions for Irish and International (mostly mainland European) clients.

Enterprise Ireland has advised that they support and encourage companies to promote international diversification as a means of scaling up, with involvement in additional markets able to provide firms with the assurance they need to make necessary investments in capital or research.



Figure 6: MMC Off-site Construction

5.0 Modification the Technical Guidance Document ‘B’

The Joint Committee on Housing, Local Government and Heritage document entitled “*Embodied Carbon in the Built Environment*” published in October 2022 recommended that

¹² <https://www.beyondzerohomes.co.uk/>

¹³ https://data.oireachtas.ie/ie/oireachtas/committee/dail/33/joint_committee_on_housing_local_government_and_heritage/reports/2022/2022-10-14_report-on-embodied-carbon-in-the-built-environment_en.pdf

¹⁴ <https://constructionnews.ie/timber-frame-housing/>

TGD-B be amended to “permit timber-based buildings over 10m in a manner to ensure the highest levels of safety and the lowest embodied carbon content”.

Currently, Local authorities are not willing to accept alternative approaches to Clause 3.2.5.2 which effectively limits the use of CLT to buildings with a top storey height of 10m (i.e. 3 / 4 storey buildings depending on floor-to-floor heights).

In the UK Structural timber use in exterior walls of 11m to 18m are permitted. The newly published update to Approved Document B from the Department for Levelling Up, Housing and Communities, has ruled that structural timber is approved for use within the external walls of buildings between 11 and 18 metres. The government’s decision was in line with the response from the timber industry. There are stipulations pertaining to ‘residential’ purpose buildings with a storey of 11m or more in height, whereby elements such as cladding, balconies, and other external surfaces must achieve class A1 or A2-s1, d0.¹⁵

Compared to the UK, where over 600 CLT buildings have been constructed, this form of construction is relatively new to Ireland and until recently has been limited to single storey dwellings. Due to the restrictions in current

Irish regulations regarding CLT construction, we need to educate Irish design professionals and the fire service in Ireland to ensure we are delivering to the highest standards.

Designers and fire officers from countries that are leading the way with timber construction such as Canada, Scotland, Sweden, Norway, Austria and the United States with experience in delivering these types of buildings could provide very useful guidance for both Irish designers and fire officers in developing acceptable design solutions for Ireland.¹⁶

Studies by the Forest Service, U.S. Department of Agriculture, note that a seven-inch-thick CLT floor has a fire resistance of two hours whereas steel is prone to sudden collapse.¹⁷

The International Building Code (IBC), which many countries and US states use as a base model for their own regulations, have allowed timber buildings to rise to 18 stories for the first time since 2021. To date, over 197 buildings between 5 and 18 stories tall have been completed across the globe. The tallest being Mjostarnet Norway in 2019 which stands at 18 storeys.

¹⁵ <https://www.ttjonline.com/news/structural-timber-allowed-for-buildings-between-11m-and-18m-in-height-9791869>

¹⁶ [TimberMultiStoreyConstruction310717.pdf \(coford.ie\)](https://www.coford.ie/TimberMultiStoreyConstruction310717.pdf)

¹⁷ <https://www.fs.usda.gov/features/turning-heat-fires-test-performance-tall-wood-buildings>

The amendment of 3.2.5.2 from the revised draft of TGD-B is required for Ireland to follow suit with its European counterparts.



Figure 7: Mjostarnet, Norway

6.0 Conclusion

It can be inferred from this paper that there is a huge opportunity to build with timber in Ireland. Not only does building with timber offer a solution for Ireland to reach its climate targets for the built environment but also to help deliver on our housing objectives. Without adopting a change to more sustainable and efficient building methods and materials we cannot meet both our housing needs and climate target.

The climate emergency will require forestry to play a more central and innovative role in making the transition to a low carbon, climate resilient and environmentally sustainable economy.

Global demand for wood and wood-based alternatives over more carbon-intensive materials will increase significantly, thereby increasing demand and opportunities for innovative sustainable products and green

investments. The forecasted increase in timber up to 2035 will also help sustain this demand for sustainable products, in turn providing significant job opportunities in this industry, allowing for significant expansion of the use of timber in construction.



Figure 8: A High Rise Wood Framed Building Sweden

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Glossary of Terms

Cross Laminated Timber: CLT “Cross Laminated Timber” is a solid, static load-bearing timber panel that is ideal for many structural requirements thanks to its flexible dimensions and outstanding physical properties.¹⁸

Embodied carbon: Embodied carbon is the amount of carbon emitted during the construction of a building. The extraction of raw materials, the manufacturing and refinement of materials, transportation, installation and disposal of old supplies can all produce embodied carbon emissions.¹⁹

Modern methods of construction: Modern Methods of Construction (MMC) describes an approach to constructing buildings using methods such as off-site manufacturing, modular construction panels or light steel framing, structural insulated panels or cross-laminated timber.²⁰

Mass Timber: Mass timber uses state-of-the-art technology to glue, nail, or dowel wood products together in layers. The results are large structural panels, posts, and beams.²¹

Operational Carbon: Operational carbon is the amount of carbon emitted once a building is in use.

Timber Frame: A timber-framed house is a house where the primary load-bearing structure is made of timber.²²

Whole life carbon: Whole Life-Cycle Carbon (WLC) emissions are the carbon emissions resulting from the materials, construction and

the use of a building over its entire life, including its demolition and disposal. A Whole Life Cycle Carbon assessment provides a true picture of a building’s carbon impact on the environment.²³

¹⁸ <https://www.cedarlan.ie/c-l-t-cross-lam-timber>

¹⁹ <https://www.rpsgroup.com/services/environment/sustainability-and-climate-resilience/expertise/what-is-embodied-carbon/#:~:text=Embodied%20carbon%20is%20the%20amount,all%20produce%20embodied%20carbon%20emissions.>

²⁰ <https://www.skillnetireland.ie/wp-content/uploads/2022/05/Modern-Methods-of-Construction-Defining-MMC-Business.pdf>

²¹ <https://www.naturallywood.com/topics/mass-timber/#:~:text=Mass%20timber%20uses%20state%20of,are%20known%20as%20mass%20timber.>

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