ARUP

An Roinn Fiontar, Turasóireachta agus Fostaíochta
Department of Enterprise, Tourism and Employment

An Roinn Talmhaíochta, Bia agus Mara
Department of Agriculture, Food and the Marine

TIMBER IN CONSTRUCTION
STEERING GROUP

Market Opportunities for

Timber in Construction in Ireland

Final Report | October 2025

Appendices

Appendices

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Appendix A

A.1 Glossary

C16 / C24	Strength classes for structural timber used in construction, indicating load-bearing capacity.
Carbon Displacement	The reduction in carbon emissions achieved by substituting high-carbon materials with lower-carbon alternatives like timber.
Cross-Laminated Timber (CLT)	A type of MET made by gluing layers of solid-sawn lumber together at right angles.
Embodied Carbon	The total greenhouse gas emissions generated to produce a building material.
Engineered Wood Products (EWP)	Wood products manufactured by binding or fixing strands, particles, fibres, or veneers of wood together with adhesives.
European Technical Assessment (ETA)	A document providing information on the performance of a construction product, used across the EU.
Glued Laminated Timber (Glulam)	A structural timber product made by gluing together layers of timber.
Hybrid Construction	Combining timber with other materials like steel or concrete to meet performance requirements.
Irish Agrément Certification	A national certification for construction products not covered by harmonised European standards.
Mass Engineered Timber (MET)	A category of timber products engineered for strength and stability, including CLT and Glulam.
Modular Construction	A method where buildings are constructed off-site in modules and then assembled on-site.
Panel Products	Wood-based panels such as OSB, MDF, and plywood used in construction.
Sawn Timber	Timber that has been cut from logs into planks or boards.
Scenario Modelling	A method of forecasting future outcomes based on different assumptions or policy pathways.
Technical Guidance Document (TGD)	Documents that provide guidance on how to comply with the Irish Building Regulations.
Whole Life-Cycle Carbon	The total carbon emissions over the entire life of a building, including embodied and operational carbon.
Wood First Policy	A policy approach that prioritises the use of timber in construction, especially in public buildings.

Appendix A

A.2 Glossary

Timber Product Category	Timber Products	Common Uses
Timber Build Systems	Traditional Build	Residential walls, roofs, and floors; Barns, pavilions, open-plan homes
	Studs used for Timber Frame	Residential walls, roofs, and floors;
	Logs	Cabins, traditional homes
Mass Engineered Timber (MET)	Cross-Laminated Timber (CLT)	Wall, floor and roof panels, off-site systems
	Glue-Laminated Timber (Glulam)	Beams, columns, bracing, floor/roof panels, bridges, off-site systems
	Laminated Veneer Lumber (LVL)	Beams, columns, bracing, headers, rim boards
Panel Products	Panels used for Timber Frame	Walls, roofs, floors
	Plywood	Sheathing (wall, roof and floor)
	Oriented Strand Board (OSB)	Subflooring, sheathing (wall, roof and floor), offsite manufactured closed panel systems, off-site systems
Hybrid Systems	Timber + Concrete	Floors (long spanning)
	Timber + Steel	Bridges, taller buildings, longer spans

Appendix A

A.2 Glossary

Term	Definition
Low-rise building	Buildings with a height **less than 11 m**, measured from the lowest external grade level to the topmost occupied floor level.
Medium-rise building	Buildings with a height **between 11 m and 20 m**, measured from the lowest external grade level to the topmost occupied floor level.
High-rise building	Buildings with a height **between 20 m and 30 m**. Buildings over 30 m are considered ‘very high rise’.

Appendix A

A.3 List of Abbreviations

CAGR – Compound Annual Growth Rate
CAP – Climate Action Plan
CLT – Cross-Laminated Timber
CSO – Central Statistics Office
DAFM – Department of Agriculture, Food and the Marine
DETE – Department of Enterprise, Tourism and Employment
DHLGH – Department of Housing, Local Government and Heritage
EPBD – Energy Performance of Buildings Directive
ETA – European Technical Assessment
EU – European Union
EWP – Engineered Wood Product
FESLUP – Forest Estate Strategic Land Use Plan
Glulam – Glued Laminated Timber
IFSIP – Ireland's Forest Strategy Implementation Plan
IGBC – Irish Green Building Council
MDF – Medium-Density Fibreboard
MET – Mass Engineered Timber
MMC – Modern Methods of Construction
NDP – National Development Plan
NRV – Net Realisable Volume
NTS – National Technical Specification
OSB – Oriented Strand Board
RMI – Repair, Maintenance, and Improvement
TG – Thematic Group
TGD – Technical Guidance Document
UNECE - United Nations Economic Commission for Europe
WLCA - Whole Life Carbon Assessment

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Appendix A

A.5 Timber Frame Volumes

The table presents a comprehensive overview of the material volumes typically used in constructing a timber frame house, based on data gathered from 1,000 buildings. It breaks down the key components offering an averaged snapshot of what goes into a standard build. This data-driven approach helps quantify the scale and distribution of materials, providing a practical reference for estimating supply needs and understanding the structural makeup of timber frame construction.

Understanding these volumes is important as it establishes a baseline for the report clarifying what goes into a typical timber frame house. By grounding the report in real-world data, the table ensures that subsequent analysis and recommendations are both relevant and actionable.

For the purpose of the study the GFA (Gross Floor Area) for scheme homes is assumed to be 117m^2

	per unit (m^3)	Percentage of the unit
OSB	2.20	12%
Glulam	1.42	8%
CLS 140mm	4.58	25%
CLS 89mm	3.73	21%
Misc. Timbers	1.31	7%
OSB 18mm	1.41	8%
I-Beams	0.59	3%
Joists/Rafters	0.66	4%
CLS 63mm	1.58	9%
TR26-metal web joists	0.64	4%
	18.16	**100%**

Appendix A

A.6 Benchmarking Ireland's Cascading Wood Usage and Wood Fibre Production

- Wood fibre insulation is made from timber by-products such as scantlings and sawdust, materials that would otherwise decompose in forests, releasing CO_2 and methane unnecessarily.
- Producing wood fibre insulation locally in Ireland could:
  - Replace imported wood fibre and hydrocarbon-based insulation
  - Reduce Ireland's carbon footprint
  - Support national climate targets
- Currently, Ireland:
  - Exports most of its wood-based panels (e.g. OSB, MDF)
  - Imports wood fibre insulation
  - Misses out on the economic and environmental benefits of domestic production
- Greater recognition of wood fibre in national timber strategies could unlock rural jobs, value-added manufacturing, and carbon reduction.

Aspect	Ireland	European Countries
Wood Fibre Production	Underutilised sawmill residue Insulation products are imported, not produced domestically	Larger and more diversified production including significant use of wood fibre for insulation and structural applications — e.g.: <u>Sweden & Finland</u> Large-scale producers of softwood pulpwood and engineered wood panels Efficient domestic use and export of wood fibre products Strong domestic forestry sectors supporting large-scale production <u>Germany & Austria</u> Near 100% utilisation of domestic wood resources (Babuka & Sujova, 2019). High-value production of pulp, MDF, particleboard, and fibreboard Strong processing capacity for sheet materials and engineered wood products Generate more value from pulp and panels than from sawn lumber
Domestic Use of Wood Fibre Products	Limited use of domestic wood fibre insulation	- Widely used in buildings for insulation, acoustics, retrofits - Wood fibre use is integrated into green building codes and sustainability frameworks (Le Pierrès, 2024).
Environmental and Economic Benefits	Underutilised potential to capture CO2, reduce methane emissions from residual wood, diversification of product offerings, and rural job creation.	- Strategic investment in infrastructure and cascading use - E.g. Germany: Subsidised bio-based insulation (e.g. wood fibre) to cover 50% of extra cost (Le Pierrès, 2024). - Supports bioeconomy, climate goals, circular economy, and low-carbon construction (Ecological Building Systems, 2024).

Appendix B

B.1 Methodology - Double Diamond Approach

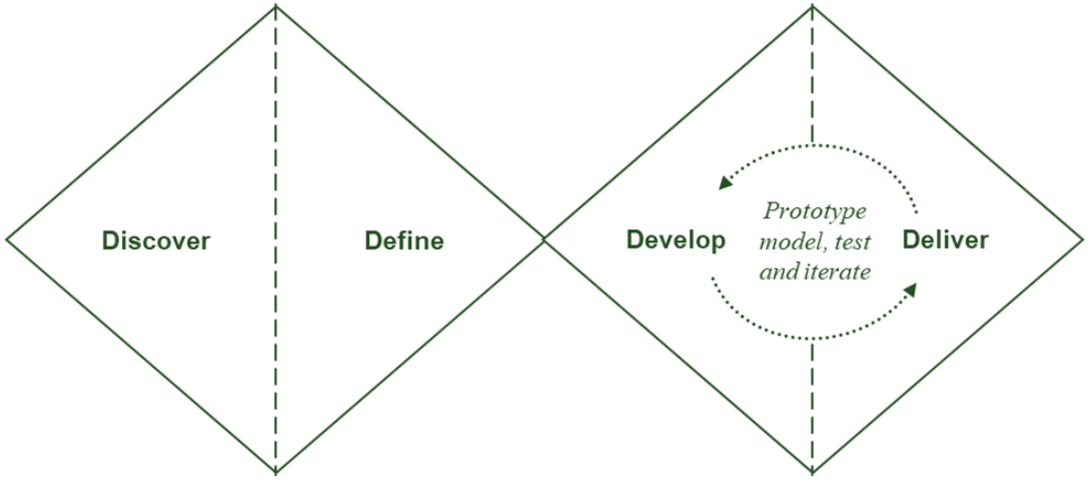
The Double Diamond methodology was adopted to guide the research, engagement, and modelling process, ensuring a structured and iterative approach to problem-solving. The methodology begins by going wide to explore the landscape through broad stakeholder engagement and data collection. It then narrows in to define key insights and develop a scenario model that quantifies timber's potential.

From there, the process expands again to explore a wide range of potential solutions, before converging on a focused set of SMART strategic recommendations. This iterative approach ensures that the final outputs are both evidence-based and aligned with market needs.

This framework comprising four phases: Discover, Define, Develop, and Deliver enabled Arup to explore the timber construction landscape in Ireland broadly before narrowing in on specific challenges and opportunities.

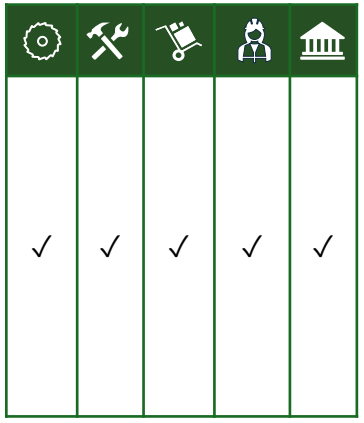
In the Discover phase, extensive stakeholder engagement was conducted, including surveys and interviews across the timber value chain, to gather insights on current practices, barriers, and perceptions. These findings were analysed and synthesised during the Define phase, where key themes such as regulatory constraints, limited awareness, policy gaps, and supply chain challenges were identified and prioritised.

The Develop and Deliver phases focused on translating these insights into practical outputs: a scenario-based Excel model and a set of strategic recommendations. The model simulates future timber use under varying conditions, while the recommendations aim to address the systemic barriers identified earlier. This approach ensured that the final outputs were grounded in real-world data and stakeholder experience and aligned with Ireland's climate and housing goals.



Appendix B

B.2 Key Insights and Alignment Across Surveyed Stakeholder Groups

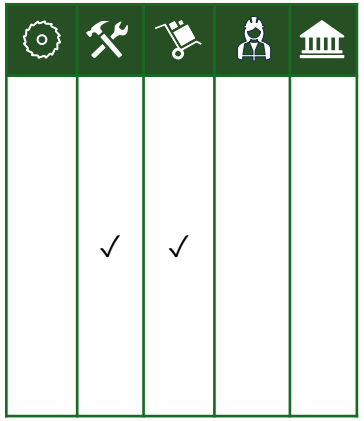


Timber Familiarity

A key barrier to the adoption of timber in construction in Ireland is the limited practical experience and familiarity among industry professionals, particularly engineers, architects, and manufacturers. While Mass Engineered Timber (MET) offers significant environmental and performance benefits, many stakeholders lack the hands-on knowledge required to design and build with these materials effectively and safely.

This gap in expertise is largely due to insufficient opportunities for early-career professionals to gain practical exposure to timber construction. Many companies do not provide structured training or development programmes focused on timber, meaning that new hires often enter the workforce without the necessary skills to work confidently with timber systems. As a result, there is a strong tendency to default to more familiar materials like concrete and steel, even when timber may be the more sustainable or efficient choice.

The limited use of MET in the Irish market further compounds this issue. Because it is not yet widely adopted, stakeholders often lack awareness of its benefits, applications, and performance characteristics. This unfamiliarity leads to hesitation around investment, particularly when timber solutions are perceived as more complex or costly due to the need for specialised design and construction knowledge. Without a strong base of experienced professionals or widespread industry support, early adopters face higher costs and greater risk, which in turn slows broader market uptake.



Perceptions of Irish Timber

Although Irish-grown C16 timber is available and can meet structural grading standards, many timber product manufacturers continue to favour imported C16 and C24 timber. This is partly due to perceptions that imported timber offers more consistent quality, longer spans, and better visual appearance, factors that are especially important in structural applications like timber frame construction.

Another key driver of this preference is the slightly lower price of imported timber. While the cost difference is small, it can be significant for manufacturers operating on tight margins, where even minor variations affect competitiveness. Imported timber is also seen as more reliable in terms of grading consistency and lower rejection rates, particularly for longer lengths.

Irish timber, by contrast, is more commonly used in renovation and extension projects, where structural demands may be lower. Overcoming these perceptions, and improving confidence in the quality, consistency, and value of native timber, will be essential to increasing its use in mainstream construction.

Key Sawmills | Manufacturers | Builder Merchants/ Import Agents | Architects, Developers, Quantity/Building Surveyors | Government Agencies, Universities, NGOs, Associations

Appendix B

B.2 Key Insights and Alignment Across Surveyed Stakeholder Groups

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Shortage of Skilled Labour

The shortage of skilled professionals is a critical barrier to the growth of timber construction in Ireland. This gap spans the entire value chain, from design and engineering to manufacturing and on-site installation. Skilled personnel are in short supply across the construction industry, and this is particularly acute in timber, where specialised knowledge is essential for working with systems like CLT, Glulam, and timber frame.

Manufacturers and contractors report persistent difficulties in sourcing and retaining skilled operatives, including factory workers, site crews, and trades such as saw doctors. The issue is compounded by the near absence of dedicated training pathways or apprenticeships focused on timber construction. There is considered to currently be no structured trade-specific training to build a pipeline of skilled timber workers.

High employment levels and strong demand across the construction sector further limit the availability of labour. In this context, even small gaps in skills or capacity can constrain output. Several stakeholders noted that a lack of on-site knowledge has led to improper handling or installation of timber components, resulting in delays and reinforcing negative perceptions about timber's reliability. Manufacturers consistently cite the shortage of skilled labour as one of the main barriers to growth, limiting both capacity and confidence in the sector.

✓	✓		✓	✓

Timber-Focused Education

Ireland's third-level engineering and architecture courses generally lack comprehensive modules on timber construction, leaving graduates underprepared to work with timber systems. Unlike countries such as Scotland, Canada, and those in Scandinavia, where timber is well integrated into curricula, Irish graduates are typically trained in steel, concrete, and masonry, with little exposure to timber design or performance.

This educational gap contributes to a broader industry reluctance to adopt timber-based solutions. Without foundational knowledge, new entrants to the workforce are less confident working with timber, and companies struggle to find employees with the necessary expertise to design, manufacture, or build with modern MET systems.

The issue is further compounded by the decline of wood technology and forestry courses in some institutions, and the absence of dedicated training programmes or apprenticeships. This lack of structured education and training limits the industry's ability to innovate and scale up sustainable timber construction.

Key Sawmills | Manufacturers | Builder Merchants/ Import Agents | Architects, Developers, Quantity/Building Surveyors | Government Agencies, Universities, NGOs, Associations

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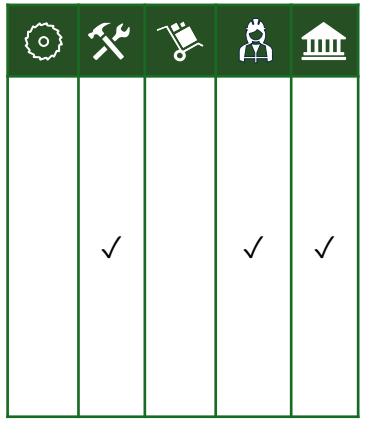
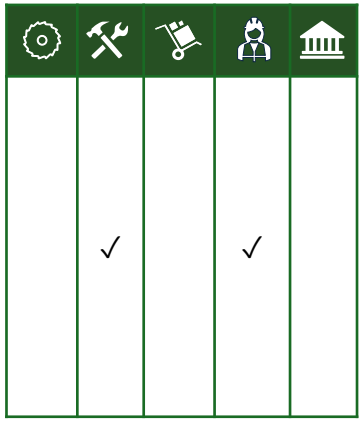


Fire Safety and Building Regulations

Fire safety regulations in Ireland present a significant challenge to the wider adoption of timber in construction, particularly for mid-rise and larger buildings. While the Building Regulations 1997–2024 set out functional performance requirements, Technical Guidance Document B (TGD B) provides a commonly accepted route to compliance for fire safety.

TGD B currently permits the use of timber in buildings up to 11 metres in height, but detailed guidance on fire-safe design using timber, especially for timber frame or mass engineered timber (MET) systems, is limited beyond low-rise domestic contexts. As a result, designers must often rely on bespoke, first-principles approaches or international guidance to demonstrate compliance for taller or more complex timber buildings.

Although alternative compliance routes are legally permitted, the absence of a consistently applied or widely accepted framework creates uncertainty. This can lead to cautious or negative interpretations by fire officers and building control authorities, making it more difficult for architects and developers to pursue timber solutions confidently.



Inconsistent Enforcement

A barrier to timber adoption in Ireland which was highlighted is the inconsistent interpretation and enforcement of fire safety regulations across local authorities. Many Building Control and Fire Officers lack training in modern timber design, particularly in performance-based fire engineering. This knowledge gap leads to a reluctance to approve timber-based solutions, often due to misconceptions about timber's fire resistance, durability, and structural integrity.

Without adequate understanding, officers tend to default to conservative, prescriptive approaches, making it difficult for developers and architects to pursue alternative timber designs. This is compounded by significant variation in how regulations are applied between regions, creating uncertainty and risk for project teams.

One example involved a local Fire Officer rejecting timber frame duplexes above masonry ground floors, a design accepted elsewhere. The decision was later overturned by An Bord Pleanála, but the case highlights how inconsistent enforcement can delay projects and deter innovation.

Key Sawmills | Manufacturers | Builder Merchants/ Import Agents | Architects, Developers, Quantity/Building Surveyors | Government Agencies, Universities, NGOs, Associations

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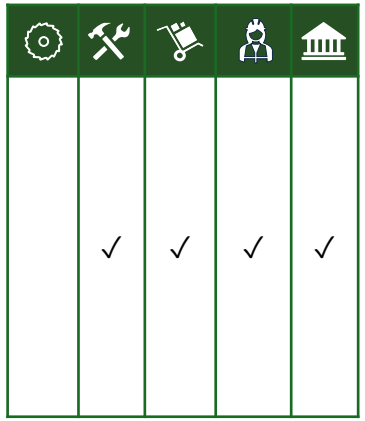
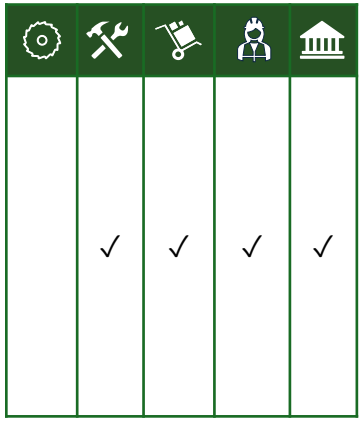


Recognition of European Technical Assessments (ETAs)

Surveyed stakeholders experienced limited and inconsistent recognition of European Technical Assessments (ETAs) for products like cross-laminated timber (CLT) in Ireland. ETAs are a valid route to CE marking under the EU Construction Products Regulation, but surveyed stakeholder noted their experience that integration into Irish regulatory and procurement processes has been uneven. ETAs are recognised and accepted in Ireland but seldom provide enough information to demonstrate compliance with Irish building regulations and therefore Irish builders may face extra documentation that increases costs and complexity when using proven timber systems.

Stakeholders called for greater clarity and consistency in how EU-recognised certifications like CE marks and ETAs are treated in Ireland.

Stakeholders suggested that streamlined recognition of ETAs could encourage the uptake of high-performance timber products.



Specific Irish Agrément Certifications

Surveyed stakeholders identified Irish Agrément certification as a regulatory hurdle facing timber construction in Ireland. Agrément certification is intended to support the use of innovative products not covered by national standards, but stakeholders argue that in practice it can duplicate existing approvals, particularly for products like CLT and Glulam that already hold European Technical Assessments (ETAs) or other international certifications.

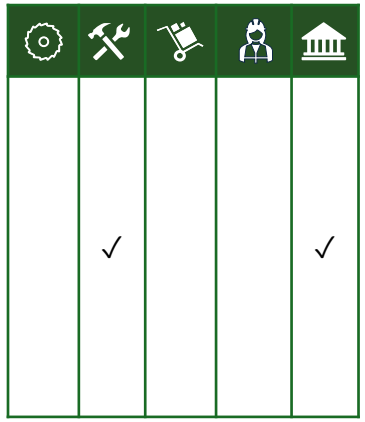
Manufacturers and specifiers frequently report confusion around whether Agrément certification is mandatory, what the process entails, how long it takes, and what the associated costs are. This can delay project timelines, increase administrative burden, and add financial strain, especially for smaller suppliers or early-stage projects.

A perceived lack of clarity as to Irish and European certification pathways creates a disincentive to specify modern timber products, even those widely accepted and used across other EU markets.

Key Sawmills | Manufacturers | Builder Merchants/ Import Agents | Architects, Developers, Quantity/Building Surveyors | Government Agencies, Universities, NGOs, Associations

Appendix B

B.2 Key Insights and Alignment Across Surveyed Stakeholder Groups



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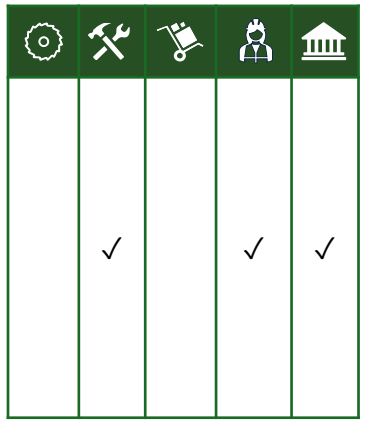
Mandating Timber Use

Ireland currently lacks a national “wood first” policy that would prioritise timber in public procurement, planning, or construction frameworks where appropriate. Without such a mandate, timber is not systematically considered in public building projects, despite its environmental and performance benefits.

Other countries have adopted “wood first” policies or set minimum timber usage targets to encourage uptake. In Ireland, the absence of clear government direction, combined with rigid planning and regulatory processes, limits timber’s visibility and viability in public construction. A more pragmatic and supportive policy framework could help normalise timber use and accelerate its adoption across the sector.



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Incentives for Timber Use

Ireland currently offers no financial or regulatory incentives to support the use of timber in construction, unlike countries such as France, Scotland, or Austria, where targeted policies have helped mainstream timber through subsidies, procurement preferences, and technical support.

This absence of support makes timber less competitive than conventional materials like concrete and steel, especially given the added costs and regulatory hurdles associated with timber in Ireland. Stakeholders have highlighted that incentives could play a crucial role in de-risking early adoption, stimulating demand, and encouraging investment in timber-based Modern Methods of Construction (MMC).

Timber MMC offers clear benefits, faster build times, reduced emissions, and higher quality through off-site manufacturing, yet its potential remains underutilised. Without incentives to support skills development, digital design, and manufacturing infrastructure, Ireland risks falling behind in adopting more sustainable and efficient construction methods.

Additionally, the lack of incentives extends to the supply side. Despite national targets to increase forest cover, progress has been slow due to fragmented policy, limited afforestation support, and bureaucratic delays. A more coordinated approach, including international knowledge transfer and policy benchmarking, could help Ireland unlock timber’s full potential and align construction practices with climate goals.

Key Sawmills | Manufacturers | Builder Merchants/ Import Agents | Architects, Developers, Quantity/Building Surveyors | Government Agencies, Universities, NGOs, Associations

Appendix B

B.2 Key Insights and Alignment Across Surveyed Stakeholder Groups

	✓		✓	✓

Procurement Barriers

Public sector procurement rules in Ireland present a significant barrier to the use of timber, particularly mass engineered timber (MET). These rules often require multiple competitive suppliers to ensure transparency and value for money, yet Ireland's limited domestic production and reliance on imports make this difficult. As a result, timber is frequently excluded from public tenders, especially for schools, healthcare facilities, and social housing.

This is compounded by long lead times, supply chain constraints, and limited manufacturing capacity, which increase project risk and cost. Public contracts also favour traditional design-bid-build models, limiting early engagement with timber specialists and reducing opportunities to integrate timber solutions from the outset.

High tendering costs, low margins, and the absence of a multi-year pipeline, combined with emergency-based builds, make investment in timber production financially risky. The absence of Modular Housing Contracts from the State and limited engagement from contracting authorities, aside from the Department of Education, further reduce predictable demand and undermine the viability of long-term investment in MET infrastructure.

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Whole Life Carbon Assessment

Stakeholders consistently identified the introduction of Whole Life Carbon Assessment (WLCA) requirements as a major market opportunity for timber in Ireland. Currently, WLCA is not mandated at planning or building control stages, and assessments often rely on international datasets that don't fully capture the carbon benefits of local materials like timber.

This is expected to change under the recast Energy Performance of Buildings Directive (EPBD), which will require disclosure of whole life carbon for all new buildings by 2030.

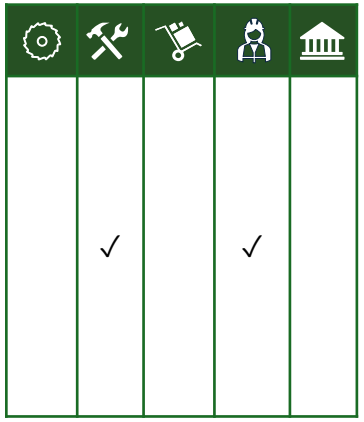
It was noted that Ireland should follow other European countries, such as France and Denmark, in introducing lifecycle Global Warming Potential (GWP) limit values per square metre. This would help drive demand for low-carbon materials like timber and make their benefits more visible in project decision-making.

Stakeholders see WLCA as a key enabler for timber adoption, particularly if embodied carbon targets and thresholds are introduced.

Key Sawmills | Manufacturers | Builder Merchants/ Import Agents | Architects, Developers, Quantity/Building Surveyors | Government Agencies, Universities, NGOs, Associations

Appendix B

B.2 Key Insights and Alignment Across Surveyed Stakeholder Groups

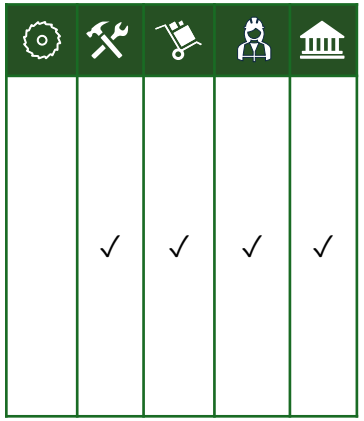


Legacy Mindset

The limited uptake of timber-based Modern Methods of Construction (MMC) in Ireland is not due to resistance, but rather the persistence of traditional construction culture. Stakeholders noted that the sector remains heavily reliant on conventional materials and on-site methods, with limited exposure to the benefits of timber MMC, such as faster build times, improved quality, and reduced environmental impact.

Despite growing demand for quicker, more sustainable construction, particularly in housing, education, and healthcare, timber MMC remains underutilised. This is largely due to a lack of awareness and confidence among designers, contractors, and clients, many of whom are unfamiliar with contemporary timber systems and their performance.

To shift this culture, stakeholders emphasised the need for investment in skills development, digital design tools (like BIM), and manufacturing infrastructure. Education and demonstration of best practices will be key to building trust and unlocking timber's potential to support Ireland's housing delivery and climate goals..



Limited Product Manufacturing

Stakeholders highlighted the lack of domestic manufacturing for key engineered wood products, particularly Cross-Laminated Timber (CLT), as a major constraint on the growth of timber construction in Ireland. The sector remains heavily reliant on imports, which introduces added logistics costs, longer lead times, and exposure to international market volatility.

This dependence makes timber less cost-competitive compared to conventional materials that are readily available from local suppliers. It also increases procurement risks, especially for larger or more complex projects, where supply certainty, quality assurance, and delivery timelines are critical.

The limited domestic supply base also presents challenges for public sector projects, which must meet strict requirements around supplier competition, cost transparency, and risk mitigation. In some cases, this has discouraged the specification of mass timber solutions in public buildings due to concerns over supplier capacity and compliance.

Key Sawmills | Manufacturers | Builder Merchants/ Import Agents | Architects, Developers, Quantity/Building Surveyors | Government Agencies, Universities, NGOs, Associations

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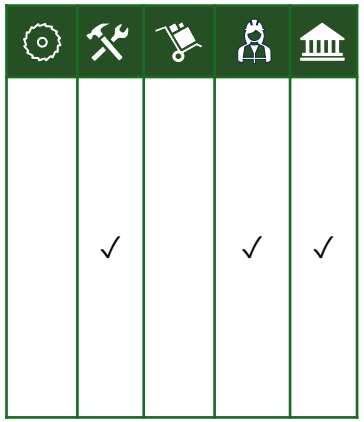
B.2 Key Insights and Alignment Across Surveyed Stakeholder Groups



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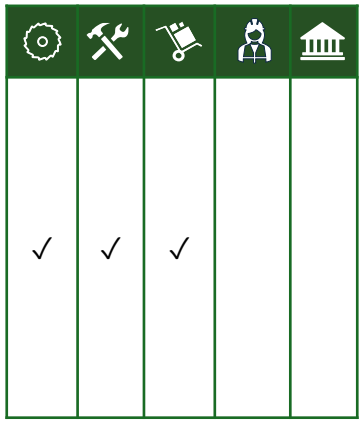
Reliance on imported Timber

While some timber manufacturers meet specific needs through domestic supply, stakeholders reported a strong reliance on imported C16 and C24 timber to meet both volume and quality demands. This is especially true for MET products, where consistency, longer lengths, and visual quality are critical.

Concerns about drying defects, faster growth, and variability in Irish-grown timber contribute to this preference, despite native C16 meeting the same structural standards. Well-established international supply chains and slight price differences also make imports more attractive.

This dependency exposes manufacturers to price volatility, currency fluctuations, and extended logistics, making it harder to maintain stable pricing and adding complexity to project planning. Strengthening confidence in native timber and improving domestic supply chain capacity will be key to reducing this reliance.



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Timber Supply Constraints

Stakeholders reported increasing difficulty in securing sufficient volumes of timber, citing restrictions on both planting and felling as key constraints. Reduced planting rates, storm-related damage, and delays in felling licences are all contributing to long-term supply uncertainty.

Despite national targets to increase forest coverage to 18%, stakeholders expressed concern that current forest management and planting strategies are falling short. Current low levels of afforestation are expected to result in a shortage of Irish-grown timber within the next 20 years. To address this, there is a strong call to return to the higher planting rates, with one respondent citing 1990s levels (around 15,000 hectares per year) and to improve coordination across the forestry and construction supply chain.

Stakeholders emphasised a need to balance commercial timber production with ecological goals, prioritising mixed-species planting and native woodlands to ensure long-term sustainability. Learning from countries like Scotland, they stressed the importance of streamlining processes from grant application to planting and replanting.

Given the projected growth in demand for timber construction products, particularly timber frame and MET, addressing domestic supply constraints is critical to ensuring Ireland can meet future market opportunities

Key Sawmills | Manufacturers | Builder Merchants/ Import Agents | Architects, Developers, Quantity/Building Surveyors | Government Agencies, Universities, NGOs, Associations

Appendix C

R-05: Publication on innovative uses of timber and technical guidance and delivery of training

C.1. Timber for Vertical Extensions in Urban Areas ("Top Hat" Extensions)

Timber's lightweight nature and high strength-to-weight ratio make it an ideal material for vertical extensions to existing buildings, particularly in dense urban environments. Using off-site timber systems for "top hat" extensions allows additional floors to be added with minimal structural disruption and reduced load impact on existing foundations. These systems can be rapidly installed, often without requiring occupants to vacate the premises, making them especially suitable for residential and mixed-use buildings in city centres. The reduced construction time and quieter installation process also help mitigate the impact on surrounding communities and businesses.

This approach aligns with Ireland's urban densification goals and offers a scalable solution to increase housing stock without expanding the urban footprint. Timber-based vertical extensions can be integrated into planning strategies for cities like Dublin, Cork, and Galway, where space is limited but demand for housing is high. By leveraging modular timber systems, developers can unlock new value from existing assets while contributing to climate goals through lower embodied carbon.

However, the publication needs to consider the technical aspects of achieving compliance with the Building Regulations, particularly in terms of fire safety. Clear guidance is essential to ensure that timber extensions meet the necessary safety standards, especially when applied to mid-rise buildings in populated urban settings. Addressing these regulatory requirements will be critical to building confidence among stakeholders and enabling broader adoption.

The publication should outline technical pathways, regulatory considerations, and funding mechanisms to support this innovative application. By doing so, it can help bridge the gap between policy ambition and practical implementation, ensuring that timber plays a meaningful role in Ireland's urban development strategy.

C.2. Timber in Schools, Healthcare Centres, and Public Housing

Public sector buildings such as schools, healthcare centres, and social housing developments present a significant opportunity for timber adoption. These projects are often publicly funded and subject to sustainability mandates, making them ideal candidates for low-carbon construction materials. Timber's light weight nature, rapid build potential, and biophilic benefits make it particularly well-suited for educational and healthcare environments, where indoor air quality and occupant wellbeing are paramount.

Aligning timber use with government procurement frameworks can accelerate its adoption in public infrastructure. The publication should detail how timber can be prioritised in these sectors through updated design guidance, procurement incentives, and lifecycle carbon accounting. By showcasing successful case studies and quantifying the carbon savings, the paper can help embed timber into Ireland's public building strategies, supporting both climate action and community resilience.

Appendix C

R-05: Publication on innovative uses of timber and technical guidance and delivery of training

C.3. Hybrid Construction Solutions

There is a growing need to explore hybrid construction solutions that combine timber with materials such as concrete or steel to address both sustainability and performance requirements in the Irish construction sector.

By adopting hybrid construction methods, Ireland can accelerate the integration of timber into a broader range of building typologies without compromising on safety or compliance. These systems also offer design flexibility and can help bridge the gap between conventional construction practices and emerging low-carbon alternatives. Promoting hybrid solutions through demonstration projects, technical guidance, and regulatory alignment would support innovation and de-risk timber adoption, ultimately enabling a more resilient and sustainable built environment. Examples of projects overseas include:

Sweden and Norway: Scandinavian countries have been pioneers in using CLT in combination with concrete cores or steel framing.

Germany and Austria: These countries have a long tradition of engineered timber and have developed advanced hybrid timber-concrete floors, enhancing fire resistance and acoustic performance in mid-rise buildings.

Canada: In cities like Vancouver and Toronto, hybrid timber structures are increasingly being used for residential buildings up to 6 storeys, supported by progressive building codes and incentives for low-carbon construction.

C.4. Timber-Based MMC for Rapid-Build Scheme Homes

MMC using timber offer a transformative opportunity to deliver high-quality, rapid-build housing at scale. Timber frame and modular systems can be prefabricated off-site, reducing build times, improving quality control, and minimising on-site disruption. These systems are particularly well-suited for scheme homes, where speed, cost-efficiency, and repeatability are critical. Timber MMC also supports labour efficiency, addressing Ireland's construction workforce shortages.

The publication should detail how timber MMC can be integrated into national housing strategies, including Housing for All, and supported through funding and procurement reform. It should highlight the carbon benefits, cost savings, and scalability of timber MMC, and propose pathways for expanding domestic manufacturing capacity. By aligning timber MMC with Ireland's housing and climate goals, the paper can help unlock its full market potential.

Appendix C

R-05: Publication on innovative uses of timber and technical guidance and delivery of training

C.5. Timber-Derived Insulation and Interior Finishes

Timber-derived insulation materials and interior finishes offer additional opportunities to reduce embodied carbon and improve indoor environmental quality. Products such as wood fibre insulation, timber wall panelling, and engineered wood flooring contribute to healthier indoor environments by regulating humidity, reducing VOC emissions, and enhancing thermal comfort. These materials also support circular economy principles, as they are renewable, recyclable, and often locally sourced.

The paper should showcase the role of timber-based interior products in achieving building performance standards and wellness certifications. It should also explore how these materials can be integrated into retrofit programmes and new builds, particularly in public housing and educational facilities. By detailing the environmental and health benefits, the paper can position timber-derived finishes as essential components of sustainable construction in Ireland.

C.6. Retrofitting Existing Buildings

Timber is exceptionally well-suited for retrofitting applications due to its lightweight, adaptable, and low-disruption characteristics. In the context of rear and side extensions (common in Ireland's suburban and rural housing) timber frame and panel systems enable rapid construction with minimal disturbance to occupants. These systems offer design flexibility, allowing for large window openings, overhangs, and cantilevered forms that enhance both functionality and aesthetics.

Internally, timber provides a practical solution for structural upgrades in older buildings. Timber beams and joists can replace or reinforce aging or damaged elements without the complexity and weight of steel or concrete. Engineered timber products such as glulam can be custom-sized to fit irregular or constrained spaces, making them ideal for retrofit scenarios.

Roof replacement and insulation upgrades represent another high-impact retrofit opportunity. Timber rafters and SIP systems can be used to retrofit pitched roofs, improving airtightness and thermal performance. The speed and simplicity of timber-based roof retrofits can significantly reduce project timelines and disruption, especially in occupied buildings.

Timber is also highly effective in façade upgrades and thermal envelope improvements. Over-cladding with timber systems can transform the appearance and performance of outdated façades, particularly in social housing or mid-century buildings. These systems add insulation, improve airtightness, and enhance visual appeal all with minimal disruption to occupants.

Finally, timber enables flexible and efficient adaptive reuse of existing structures. In warehouse, barn, or office-to-residential conversions, timber allows for reconfigurable interior layouts and rapid installation of floors, partitions, and mezzanines. Engineered timber products provide excellent acoustic performance and structural adaptability, while exposed timber finishes add architectural character. These qualities make timber a compelling material for repurposing underused buildings into modern, energy-efficient spaces.

Appendix D

Timber Usage in Construction in Ireland – Overview

Sawnwood and Panels' Trade Balance by End Use by Flow Type and Year

	End Use	Flow	2025	2026	2027	2028	2029	2030
Trade Balance (m³)	Construction	Domestic Prod..	878K m³	885K m³	892K m³	899K m³	906K m³	913K m³
		Imports	345K m³	393K m³	437K m³	507K m³	529K m³	632K m³
		Exports	-557K m³	-549K m³	-540K m³	-531K m³	-522K m³	-512K m³
		Total	665K m³	730K m³	789K m³	876K m³	914K m³	1,033K m³
	Fencing	Domestic Prod..	126K m³	127K m³	128K m³	129K m³	131K m³	132K m³
		Imports	45K m³	51K m³	55K m³	66K m³	67K m³	76K m³
		Exports	-27K m³	-26K m³	-25K m³	-24K m³	-24K m³	-23K m³
		Total	144K m³	152K m³	158K m³	171K m³	174K m³	185K m³
	Pallets/Packaging	Domestic Prod..	615K m³	619K m³	623K m³	627K m³	632K m³	636K m³
		Imports	261K m³	300K m³	341K m³	380K m³	410K m³	519K m³
		Exports	-399K m³	-400K m³	-400K m³	-400K m³	-400K m³	-400K m³
		Total	476K m³	519K m³	564K m³	608K m³	642K m³	755K m³
	Other	Domestic Prod..	259K m³	260K m³	261K m³	263K m³	264K m³	266K m³
		Imports	175K m³	202K m³	232K m³	253K m³	279K m³	364K m³
		Exports	-424K m³	-432K m³	-440K m³	-447K m³	-455K m³	-463K m³
		Total	10K m³	30K m³	54K m³	69K m³	88K m³	167K m³
% Difference in Trade Balance (m³) from the First along Year	Construction	Domestic Prod..	0.0%	0.8%	0.8%	0.8%	0.8%	0.8%
		Imports	0.0%	14.2%	12.6%	13.7%	11.3%	12.9%
		Exports	0.0%	1.5%	1.6%	1.6%	1.6%	1.7%
		Total	0.0%	9.7%	8.9%	9.6%	8.3%	9.2%
	Fencing	Domestic Prod..	0.0%	0.9%	0.9%	0.9%	0.9%	0.9%
		Imports	0.0%	13.5%	11.1%	14.0%	10.7%	11.1%
		Exports	0.0%	3.0%	3.1%	3.2%	3.3%	3.3%
		Total	0.0%	5.6%	4.9%	6.0%	4.9%	5.2%
	Pallets/Packaging	Domestic Prod..	0.0%	0.7%	0.7%	0.7%	0.7%	0.7%
		Imports	0.0%	14.9%	14.3%	13.4%	12.0%	14.8%
		Exports	0.0%	-0.1%	-0.1%	0.0%	0.0%	0.0%
		Total	0.0%	9.0%	8.8%	8.5%	7.8%	9.7%
	Other	Domestic Prod..	0.0%	0.5%	0.5%	0.5%	0.5%	0.5%
		Imports	0.0%	15.4%	15.3%	13.2%	12.4%	15.8%
		Exports	0.0%	-1.8%	-1.8%	-1.8%	-1.8%	-1.8%
		Total	0.0%	208.8%	136.0%	92.2%	73.5%	76.5%
% of Total Trade Balance (m³) along End Use	Construction	Domestic Prod..	47%	47%	47%	47%	47%	47%
		Imports	42%	42%	41%	42%	41%	40%
		Exports	40%	39%	38%	38%	37%	37%
		Total	51%	51%	50%	51%	50%	48%
	Fencing	Domestic Prod..	7%	7%	7%	7%	7%	7%
		Imports	5%	5%	5%	6%	5%	5%
		Exports	2%	2%	2%	2%	2%	2%
		Total	11%	11%	10%	10%	10%	9%
	Pallets/Packaging	Domestic Prod..	33%	33%	33%	33%	33%	33%
		Imports	32%	32%	32%	31%	32%	33%
		Exports	28%	28%	28%	29%	29%	29%
		Total	37%	36%	36%	35%	35%	35%
	Other	Domestic Prod..	14%	14%	14%	14%	14%	14%
		Imports	21%	21%	22%	21%	22%	23%
		Exports	30%	31%	31%	32%	32%	33%
		Total	1%	2%	3%	4%	5%	8%
Trade Balance (m³)	Total		1,295K m³	1,431K m³	1,566K m³	1,724K m³	1,819K m³	2,140K m³
% Difference in Trade Bala..	Total		0.0%	10.5%	10.0%	10.0%	8.9%	10.6%
% of Total Trade Balance (..	Total		100%	100%	100%	100%	100%	100%

Sawn Wood and Panels' Trade Balance by End Use by Year

End Use		2025	2026	2027	2028	2029	2030
Construction	Trade Balance (m³)	665K m³	730K m³	789K m³	876K m³	914K m³	1,033K m³
	% Difference in Trade Bala..	0.0%	9.7%	8.9%	9.6%	8.3%	9.2%
	% of Total Trade Balance (..	51%	51%	50%	51%	50%	48%
Fencing	Trade Balance (m³)	144K m³	152K m³	158K m³	171K m³	174K m³	185K m³
	% Difference in Trade Bala..	0.0%	5.6%	4.9%	6.0%	4.9%	5.2%
	% of Total Trade Balance (..	11%	11%	10%	10%	10%	9%
Pallets/Packaging	Trade Balance (m³)	476K m³	519K m³	564K m³	608K m³	642K m³	755K m³
	% Difference in Trade Bala..	0.0%	9.0%	8.8%	8.5%	7.8%	9.7%
	% of Total Trade Balance (..	37%	36%	36%	35%	35%	35%
Other	Trade Balance (m³)	10K m³	30K m³	54K m³	69K m³	88K m³	167K m³
	% Difference in Trade Bala..	0.0%	208.8%	136.0%	92.2%	73.5%	76.5%
	% of Total Trade Balance (..	1%	2%	3%	4%	5%	8%
Grand Total	Trade Balance (m³)	1,295K m³	1,431K m³	1,566K m³	1,724K m³	1,819K m³	2,140K m³
	% Difference in Trade Bala..	0.0%	10.5%	10.0%	10.0%	8.9%	10.6%
	% of Total Trade Balance (..	100%	100%	100%	100%	100%	100%

Timber End Use Definitions

- **Construction**: timber used in construction as **structural components** (e.g. beams, joists, studs), for r**oofing, flooring, cladding.** Includes both **residential** and **commercial** buildings.
- **Fencing**: timber used for b**oundary fences**, **agricultural enclosures**, **garden panels.** Includes **posts**, **rails**, and **panels.**
- **Pallets / Packaging: Transport pallets** for goods handling. **Crates, boxes, and cases** for industrial packaging.
- **Other**: **Furniture and joinery**, **Wood fuel and biomass**, **Crafts**, **landscaping**, railway sleepers, utility poles, Includes non-structural and non-industrial applications.

Source: UNECE (2025) Data on Forest Products Production and Trade, data up to 2022, 2023-2025 is based on a linear projection and assumptions. See timber market simulation model for details.

Appendix D

Timber Usage in Construction in Ireland – Overview

Year of Year		Scenario 1 -..	Scenario 2 -..	Scenario 3 -..
2025	Estimated Volume (m³)	668K m³	687K m³	760K m³
	Estimated Value (€)	178M €	183M €	202M €
	DisplacedCarbon (tCO_2e)	0.7M tCO_2e	0.8M tCO_2e	0.9M tCO_2e
	Carbon Reduction Potential (tCO_2e)	0.5M tCO_2e	0.6M tCO_2e	0.7M tCO_2e
2026	Estimated Volume (m³)	733K m³	769K m³	845K m³
	Estimated Value (€)	201M €	212M €	234M €
	DisplacedCarbon (tCO_2e)	0.8M tCO_2e	0.9M tCO_2e	1.1M tCO_2e
	Carbon Reduction Potential (tCO_2e)	0.6M tCO_2e	0.7M tCO_2e	0.8M tCO_2e
2027	Estimated Volume (m³)	795K m³	835K m³	948K m³
	Estimated Value (€)	224M €	237M €	270M €
	DisplacedCarbon (tCO_2e)	1.0M tCO_2e	1.1M tCO_2e	1.4M tCO_2e
	Carbon Reduction Potential (tCO_2e)	0.7M tCO_2e	0.8M tCO_2e	1.1M tCO_2e
2028	Estimated Volume (m³)	881K m³	959K m³	1,131K m³
	Estimated Value (€)	259M €	284M €	339M €
	DisplacedCarbon (tCO_2e)	1.2M tCO_2e	1.4M tCO_2e	1.9M tCO_2e
	Carbon Reduction Potential (tCO_2e)	0.9M tCO_2e	1.1M tCO_2e	1.4M tCO_2e
2029	Estimated Volume (m³)	919K m³	1,051K m³	1,341K m³
	Estimated Value (€)	277M €	321M €	419M €
	DisplacedCarbon (tCO_2e)	1.4M tCO_2e	1.8M tCO_2e	2.6M tCO_2e
	Carbon Reduction Potential (tCO_2e)	1.0M tCO_2e	1.3M tCO_2e	2.0M tCO_2e
2030	Estimated Volume (m³)	1,038K m³	1,245K m³	1,850K m³
	Estimated Value (€)	316M €	390M €	605M €
	DisplacedCarbon (tCO_2e)	1.6M tCO_2e	2.3M tCO_2e	3.7M tCO_2e
	Carbon Reduction Potential (tCO_2e)	1.2M tCO_2e	1.7M tCO_2e	2.8M tCO_2e
Grand Total	Estimated Volume (m³)	5,035K m³	5,545K m³	6,873K m³
	Estimated Value (€)	1,455M €	1,627M €	2,068M €
	DisplacedCarbon (tCO_2e)	6.7M tCO_2e	8.3M tCO_2e	11.6M tCO_2e
	Carbon Reduction Potential (tCO_2e)	5.0M tCO_2e	6.2M tCO_2e	8.8M tCO_2e

Source: Timber Market Simulation Model.

Appendix D

Timber Usage in Construction in Ireland – Scenario 1 – 2025 Estimate

			Timber Build System				MET			Panel Products				Hybrid Systems			
Year of Year	Segment	Typology	Traditional Build	Sawn Wood for TF	Logs	Total	CLT	Glulam	Total	OSB	Plywood	Panels for TF	Total	Timber × Concrete	Timber × Steel	Total	**Grand Total**
2025	Residential	Scheme House	105K m³ 33M €	127K m³ 38M €	2K m³ 0M €	235K m³ 72M €	2K m³ 1M €	6K m³ 4M €	8K m³ 5M €	42K m³ 2M €	6K m³ 1M €	16K m³ 5M €	65K m³ 8M €				**307K m³ 85M €**
		Single Dwellings	42K m³ 13M €	6K m³ 2M €	1K m³ 0M €	49K m³ 15M €	0K m³ 0M €	1K m³ 0M €	1K m³ 1M €	15K m³ 1M €	3K m³ 0M €	1K m³ 0M €	19K m³ 1M €				**68K m³ 17M €**
		Apartments - Conventional	74K m³ 23M €	9K m³ 3M €	1K m³ 0M €	84K m³ 26M €	0K m³ 0M €	1K m³ 1M €	1K m³ 1M €	56K m³ 3M €	11K m³ 1M €	8K m³ 2M €	75K m³ 6M €	1K m³ 0M €	0K m³ 0M €	1K m³ 0M €	**161K m³ 34M €**
		Apartments - MET	1K m³ 0M €	1K m³ 0M €		1K m³ 0M €	0K m³ 0M €	1K m³ 1M €	1K m³ 1M €	1K m³ 0M €	0K m³ 0M €	0K m³ 0M €	1K m³ 0M €	0K m³ 0M €		0K m³ 0M €	**3K m³ 1M €**
		Total	**222K m³ 70M €**	**143K m³ 43M €**	**4K m³ 1M €**	**369K m³ 113M €**	**3K m³ 1M €**	**8K m³ 6M €**	**11K m³ 8M €**	**114K m³ 6M €**	**20K m³ 2M €**	**25K m³ 7M €**	**158K m³ 15M €**	**1K m³ 0M €**	**0K m³ 0M €**	**1K m³ 0M €**	**539K m³ 136M €**
	Non-Residential	Office	13K m³ 4M €	5K m³ 2M €		18K m³ 6M €	1K m³ 0M €	1K m³ 1M €	2K m³ 1M €	6K m³ 0M €	1K m³ 0M €	1K m³ 0M €	8K m³ 1M €	0K m³ 0M €	0K m³ 0M €	0K m³ 0M €	**28K m³ 8M €**
		Public	2K m³ 1M €	0K m³ 0M €	0K m³ 0M €	2K m³ 1M €	0K m³ 0M €	0K m³ 0M €	0K m³ 0M €	0K m³ 0M €	0K m³ 0M €	0K m³ 0M €	1K m³ 0M €	0K m³ 0M €		0K m³ 0M €	**3K m³ 1M €**
		Retail	19K m³ 6M €	3K m³ 1M €		22K m³ 7M €	0K m³ 0M €	1K m³ 1M €	1K m³ 1M €	10K m³ 0M €	2K m³ 0M €	1K m³ 0M €	13K m³ 1M €	0K m³ 0M €	0K m³ 0M €	0K m³ 0M €	**35K m³ 9M €**
		Industrial	0K m³ 0M €	0K m³ 0M €		0K m³ 0M €	6K m³ 3M €	14K m³ 11M €	20K m³ 14M €	3K m³ 0M €	1K m³ 0M €	0K m³ 0M €	4K m³ 0M €	0K m³ 0M €	0K m³ 0M €	0K m³ 0M €	**25K m³ 14M €**
		Other	18K m³ 6M €	10K m³ 3M €	0K m³ 0M €	28K m³ 9M €	0K m³ 0M €	1K m³ 1M €	1K m³ 1M €	7K m³ 0M €	1K m³ 0M €	1K m³ 0M €	9K m³ 1M €	0K m³ 0M €	0K m³ 0M €	0K m³ 0M €	**38K m³ 10M €**
		Total	**51K m³ 16M €**	**19K m³ 6M €**	**0K m³ 0M €**	**70K m³ 22M €**	**7K m³ 3M €**	**17K m³ 13M €**	**25K m³ 17M €**	**26K m³ 1M €**	**5K m³ 0M €**	**2K m³ 1M €**	**33K m³ 3M €**	**1K m³ 0M €**	**0K m³ 0M €**	**1K m³ 1M €**	**129K m³ 42M €**
	Total		**273K m³ 86M €**	**161K m³ 48M €**	**5K m³ 1M €**	**439K m³ 135M €**	**11K m³ 5M €**	**25K m³ 20M €**	**36K m³ 24M €**	**140K m³ 7M €**	**24K m³ 2M €**	**27K m³ 8M €**	**192K m³ 18M €**	**1K m³ 1M €**	**1K m³ 0M €**	**2K m³ 1M €**	**668K m³ 178M €**
Grand Total			**273K m³ 86M €**	**161K m³ 48M €**	**5K m³ 1M €**	**439K m³ 135M €**	**11K m³ 5M €**	**25K m³ 20M €**	**36K m³ 24M €**	**140K m³ 7M €**	**24K m³ 2M €**	**27K m³ 8M €**	**192K m³ 18M €**	**1K m³ 1M €**	**1K m³ 0M €**	**2K m³ 1M €**	**668K m³ 178M €**

Source: Timber Market Simulation Model.

Appendix D

Timber Usage in Construction in Ireland – Scenario 1 – 2030 Estimate

			Timber Build System				MET			Panel Products				Hybrid Systems			
Year of Year	Segment	Typology	Traditional Build	Sawn Wood for TF	Logs	Total	CLT	Glulam	Total	OSB	Plywood	Panels for TF	Total	Timber × Concrete	Timber × Steel	Total	**Grand Total**
2030	Residential	Scheme House	96K m³ 30M €	300K m³ 90M €	4K m³ 1M €	400K m³ 121M €	13K m³ 6M €	31K m³ 24M €	44K m³ 30M €	47K m³ 2M €	12K m³ 1M €	58K m³ 18M €	117K m³ 21M €				**561K m³ 172M €**
		Single Dwellings	33K m³ 10M €	12K m³ 3M €	1K m³ 0M €	46K m³ 14M €	2K m³ 1M €	4K m³ 3M €	5K m³ 3M €	16K m³ 1M €	2K m³ 0M €	5K m³ 1M €	23K m³ 2M €				**75K m³ 20M €**
		Apartments - Conventional	40K m³ 12M €	27K m³ 8M €	1K m³ 0M €	67K m³ 21M €	1K m³ 0M €	3K m³ 2M €	4K m³ 2M €	46K m³ 2M €	9K m³ 1M €	37K m³ 11M €	92K m³ 14M €	1K m³ 0M €	0K m³ 0M €	1K m³ 0M €	**163K m³ 38M €**
		Apartments - MET	2K m³ 1M €	5K m³ 2M €		7K m³ 2M €	3K m³ 1M €	6K m³ 5M €	9K m³ 6M €	5K m³ 0M €	1K m³ 0M €	4K m³ 1M €	9K m³ 1M €	2K m³ 1M €	0K m³ 0M €	2K m³ 1M €	**27K m³ 10M €**
		Total	**171K m³ 54M €**	**343K m³ 103M €**	**6K m³ 1M €**	**521K m³ 158M €**	**19K m³ 8M €**	**43K m³ 34M €**	**62K m³ 42M €**	**113K m³ 6M €**	**24K m³ 2M €**	**103K m³ 31M €**	**241K m³ 39M €**	**2K m³ 1M €**	**0K m³ 0M €**	**3K m³ 1M €**	**826K m³ 240M €**
	Non-Residential	Office	5K m³ 1M €	11K m³ 3M €		15K m³ 5M €	3K m³ 2M €	3K m³ 3M €	7K m³ 4M €	9K m³ 0M €	1K m³ 0M €	3K m³ 1M €	13K m³ 1M €	1K m³ 0M €	0K m³ 0M €	1K m³ 0M €	**36K m³ 11M €**
		Public	1K m³ 0M €	2K m³ 0M €	0K m³ 0M €	2K m³ 1M €	1K m³ 0M €	1K m³ 1M €	2K m³ 1M €	1K m³ 0M €	0K m³ 0M €	0K m³ 0M €	1K m³ 0M €	0K m³ 0M €	0K m³ 0M €	0K m³ 0M €	**5K m³ 2M €**
		Retail	18K m³ 6M €	8K m³ 2M €		26K m³ 8M €	2K m³ 1M €	5K m³ 4M €	7K m³ 4M €	22K m³ 1M €	3K m³ 0M €	6K m³ 2M €	31K m³ 3M €	0K m³ 0M €	0K m³ 0M €	1K m³ 0M €	**64K m³ 16M €**
		Industrial	1K m³ 0M €	0K m³ 0M €	0K m³ 0M €	1K m³ 0M €	13K m³ 6M €	29K m³ 23M €	42K m³ 28M €	4K m³ 0M €	1K m³ 0M €	1K m³ 0M €	6K m³ 1M €	0K m³ 0M €	0K m³ 0M €	1K m³ 1M €	**50K m³ 30M €**
		Other	13K m³ 4M €	24K m³ 7M €	0K m³ 0M €	37K m³ 11M €	2K m³ 1M €	5K m³ 4M €	7K m³ 5M €	9K m³ 0M €	1K m³ 0M €	3K m³ 1M €	13K m³ 1M €	1K m³ 0M €	0K m³ 0M €	1K m³ 0M €	**58K m³ 18M €**
		Total	**36K m³ 11M €**	**45K m³ 13M €**	**0K m³ 0M €**	**81K m³ 25M €**	**21K m³ 9M €**	**43K m³ 34M €**	**64K m³ 43M €**	**45K m³ 2M €**	**6K m³ 1M €**	**13K m³ 4M €**	**64K m³ 7M €**	**2K m³ 1M €**	**1K m³ 1M €**	**3K m³ 2M €**	**213K m³ 76M €**
	Total		**208K m³ 65M €**	**388K m³ 116M €**	**6K m³ 1M €**	**602K m³ 183M €**	**39K m³ 17M €**	**87K m³ 67M €**	**126K m³ 85M €**	**158K m³ 8M €**	**30K m³ 3M €**	**116K m³ 35M €**	**305K m³ 46M €**	**4K m³ 2M €**	**2K m³ 1M €**	**6K m³ 3M €**	**1,038K m³ 316M €**
Grand Total			**208K m³ 65M €**	**388K m³ 116M €**	**6K m³ 1M €**	**602K m³ 183M €**	**39K m³ 17M €**	**87K m³ 67M €**	**126K m³ 85M €**	**158K m³ 8M €**	**30K m³ 3M €**	**116K m³ 35M €**	**305K m³ 46M €**	**4K m³ 2M €**	**2K m³ 1M €**	**6K m³ 3M €**	**1,038K m³ 316M €**

Source: Timber Market Simulation Model.

Appendix D

Timber Usage in Construction in Ireland – Scenario 2 – 2025 Estimate

			Timber Build System				MET			Panel Products				Hybrid Systems			
Year of Year	Segment	Typology	Traditional Build	Sawn Wood for TF	Logs	Total	CLT	Glulam	Total	OSB	Plywood	Panels for TF	Total	Timber × Concrete	Timber × Steel	Total	**Grand Total**
2025	Residential	Scheme House	107K m³ 34M €	129K m³ 39M €	2K m³ 0M €	238K m³ 73M €	2K m³ 1M €	6K m³ 4M €	8K m³ 6M €	43K m³ 2M €	7K m³ 1M €	16K m³ 5M €	65K m³ 8M €				**312K m³ 86M €**
		Single Dwellings	42K m³ 13M €	6K m³ 2M €	1K m³ 0M €	49K m³ 15M €	0K m³ 0M €	1K m³ 0M €	1K m³ 1M €	15K m³ 1M €	3K m³ 0M €	1K m³ 0M €	19K m³ 1M €				**68K m³ 17M €**
		Apartments - Conventional	74K m³ 23M €	9K m³ 3M €	1K m³ 0M €	84K m³ 26M €	0K m³ 0M €	1K m³ 1M €	1K m³ 1M €	56K m³ 3M €	11K m³ 1M €	8K m³ 2M €	74K m³ 6M €	1K m³ 0M €	0K m³ 0M €	1K m³ 0M €	**161K m³ 34M €**
		Apartments - MET	1K m³ 0M €	1K m³ 0M €		1K m³ 0M €	0K m³ 0M €	1K m³ 1M €	1K m³ 1M €	1K m³ 0M €	0K m³ 0M €	0K m³ 0M €	1K m³ 0M €	0K m³ 0M €		0K m³ 0M €	**3K m³ 1M €**
		Total	**223K m³ 70M €**	**145K m³ 43M €**	**4K m³ 1M €**	**372K m³ 114M €**	**3K m³ 2M €**	**8K m³ 6M €**	**11K m³ 8M €**	**114K m³ 6M €**	**20K m³ 2M €**	**25K m³ 8M €**	**159K m³ 15M €**	**1K m³ 0M €**	**0K m³ 0M €**	**1K m³ 0M €**	**544K m³ 138M €**
	Non-Residential	Office	14K m³ 4M €	5K m³ 2M €		19K m³ 6M €	1K m³ 0M €	1K m³ 1M €	2K m³ 1M €	6K m³ 0M €	1K m³ 0M €	1K m³ 0M €	8K m³ 1M €	0K m³ 0M €	0K m³ 0M €	0K m³ 0M €	**29K m³ 8M €**
		Public	2K m³ 1M €	0K m³ 0M €	0K m³ 0M €	2K m³ 1M €	0K m³ 0M €	0K m³ 0M €	0K m³ 0M €	0K m³ 0M €	0K m³ 0M €	0K m³ 0M €	1K m³ 0M €	0K m³ 0M €		0K m³ 0M €	**3K m³ 1M €**
		Retail	21K m³ 7M €	3K m³ 1M €		24K m³ 8M €	0K m³ 0M €	1K m³ 1M €	1K m³ 1M €	14K m³ 1M €	2K m³ 0M €	1K m³ 0M €	17K m³ 1M €	0K m³ 0M €	0K m³ 0M €	0K m³ 0M €	**43K m³ 10M €**
		Industrial	0K m³ 0M €	0K m³ 0M €		0K m³ 0M €	7K m³ 3M €	16K m³ 12M €	22K m³ 15M €	3K m³ 0M €	1K m³ 0M €	0K m³ 0M €	4K m³ 0M €	0K m³ 0M €	0K m³ 0M €	0K m³ 0M €	**27K m³ 16M €**
		Other	19K m³ 6M €	11K m³ 3M €	0K m³ 0M €	30K m³ 9M €	0K m³ 0M €	1K m³ 1M €	1K m³ 1M €	7K m³ 0M €	1K m³ 0M €	1K m³ 0M €	9K m³ 1M €	0K m³ 0M €	0K m³ 0M €	0K m³ 0M €	**40K m³ 11M €**
		Total	**56K m³ 17M €**	**20K m³ 6M €**	**0K m³ 0M €**	**76K m³ 23M €**	**8K m³ 4M €**	**19K m³ 15M €**	**27K m³ 18M €**	**31K m³ 2M €**	**6K m³ 1M €**	**3K m³ 1M €**	**39K m³ 3M €**	**1K m³ 0M €**	**0K m³ 0M €**	**1K m³ 1M €**	**143K m³ 45M €**
	Total		**279K m³ 88M €**	**165K m³ 49M €**	**5K m³ 1M €**	**448K m³ 138M €**	**12K m³ 5M €**	**27K m³ 21M €**	**39K m³ 26M €**	**145K m³ 7M €**	**25K m³ 3M €**	**28K m³ 8M €**	**198K m³ 18M €**	**1K m³ 1M €**	**1K m³ 0M €**	**2K m³ 1M €**	**687K m³ 183M €**
Grand Total			**279K m³ 88M €**	**165K m³ 49M €**	**5K m³ 1M €**	**448K m³ 138M €**	**12K m³ 5M €**	**27K m³ 21M €**	**39K m³ 26M €**	**145K m³ 7M €**	**25K m³ 3M €**	**28K m³ 8M €**	**198K m³ 18M €**	**1K m³ 1M €**	**1K m³ 0M €**	**2K m³ 1M €**	**687K m³ 183M €**

Source: Timber Market Simulation Model.

Appendix D

Timber Usage in Construction in Ireland – Scenario 2 – 2030 Estimate

Year of Year	Segment	Typology	Timber Build System				MET			Panel Products				Hybrid Systems			Grand Total
			Traditional Build	Sawn Wood for TF	Logs	Total	CLT	Glulam	Total	OSB	Plywood	Panels for TF	Total	Timber × Concrete	Timber × Steel	Total	
2030	Residential	Scheme House	113K m³ 35M €	352K m³ 106M €	5K m³ 1M €	469K m³ 142M €	16K m³ 7M €	37K m³ 28M €	52K m³ 35M €	55K m³ 3M €	14K m³ 1M €	68K m³ 20M €	136K m³ 25M €				**658K m³ 202M €**
		Single Dwellings	34K m³ 11M €	12K m³ 4M €	1K m³ 0M €	48K m³ 15M €	2K m³ 1M €	4K m³ 3M €	5K m³ 4M €	17K m³ 1M €	2K m³ 0M €	5K m³ 1M €	24K m³ 3M €				**78K m³ 21M €**
		Apartments - Conventional	39K m³ 12M €	27K m³ 8M €	1K m³ 0M €	67K m³ 20M €	1K m³ 0M €	2K m³ 2M €	4K m³ 2M €	38K m³ 2M €	8K m³ 1M €	30K m³ 9M €	76K m³ 12M €	1K m³ 0M €	0K m³ 0M €	1K m³ 0M €	**147K m³ 35M €**
		Apartments - MET	5K m³ 1M €	11K m³ 3M €		16K m³ 5M €	6K m³ 3M €	14K m³ 11M €	20K m³ 13M €	14K m³ 1M €	3K m³ 0M €	11K m³ 3M €	27K m³ 4M €	4K m³ 2M €	0K m³ 0M €	4K m³ 2M €	**67K m³ 24M €**
		Total	**191K m³ 60M €**	**402K m³ 120M €**	**7K m³ 1M €**	**600K m³ 182M €**	**24K m³ 11M €**	**57K m³ 44M €**	**81K m³ 55M €**	**123K m³ 6M €**	**26K m³ 3M €**	**114K m³ 34M €**	**264K m³ 43M €**	**4K m³ 2M €**	**1K m³ 0M €**	**5K m³ 2M €**	**948K m³ 282M €**
	Non-Residential	Office	5K m³ 2M €	12K m³ 4M €		17K m³ 5M €	4K m³ 2M €	4K m³ 3M €	8K m³ 5M €	11K m³ 1M €	2K m³ 0M €	3K m³ 1M €	16K m³ 2M €	1K m³ 0M €	0K m³ 0M €	1K m³ 1M €	**42K m³ 12M €**
		Public	1K m³ 0M €	2K m³ 1M €	0K m³ 0M €	3K m³ 1M €	1K m³ 0M €	1K m³ 1M €	2K m³ 1M €	1K m³ 0M €	0K m³ 0M €	0K m³ 0M €	1K m³ 0M €	0K m³ 0M €	0K m³ 0M €	0K m³ 0M €	**6K m³ 2M €**
		Retail	23K m³ 7M €	10K m³ 3M €		33K m³ 10M €	3K m³ 1M €	6K m³ 5M €	9K m³ 6M €	33K m³ 2M €	5K m³ 0M €	9K m³ 3M €	47K m³ 5M €	1K m³ 0M €	0K m³ 0M €	1K m³ 0M €	**89K m³ 21M €**
		Industrial	1K m³ 0M €	1K m³ 0M €	0K m³ 0M €	1K m³ 0M €	20K m³ 9M €	47K m³ 36M €	67K m³ 45M €	7K m³ 0M €	1K m³ 0M €	2K m³ 1M €	9K m³ 1M €	1K m³ 0M €	1K m³ 1M €	1K m³ 1M €	**79K m³ 47M €**
		Other	18K m³ 6M €	34K m³ 10M €	1K m³ 0M €	53K m³ 16M €	3K m³ 1M €	7K m³ 5M €	10K m³ 6M €	12K m³ 1M €	2K m³ 0M €	3K m³ 1M €	17K m³ 2M €	1K m³ 0M €	0K m³ 0M €	1K m³ 1M €	**81K m³ 25M €**
		Total	**48K m³ 15M €**	**59K m³ 18M €**	**1K m³ 0M €**	**107K m³ 33M €**	**30K m³ 13M €**	**65K m³ 50M €**	**94K m³ 63M €**	**63K m³ 3M €**	**9K m³ 1M €**	**18K m³ 5M €**	**90K m³ 9M €**	**3K m³ 1M €**	**2K m³ 1M €**	**5K m³ 3M €**	**297K m³ 108M €**
	Total		**239K m³ 75M €**	**460K m³ 138M €**	**7K m³ 1M €**	**707K m³ 215M €**	**54K m³ 24M €**	**121K m³ 94M €**	**175K m³ 118M €**	**186K m³ 9M €**	**35K m³ 4M €**	**132K m³ 40M €**	**354K m³ 53M €**	**7K m³ 3M €**	**2K m³ 2M €**	**9K m³ 5M €**	**1,245K m³ 390M €**
Grand Total			**239K m³ 75M €**	**460K m³ 138M €**	**7K m³ 1M €**	**707K m³ 215M €**	**54K m³ 24M €**	**121K m³ 94M €**	**175K m³ 118M €**	**186K m³ 9M €**	**35K m³ 4M €**	**132K m³ 40M €**	**354K m³ 53M €**	**7K m³ 3M €**	**2K m³ 2M €**	**9K m³ 5M €**	**1,245K m³ 390M €**

Source: Timber Market Simulation Model.

Appendix D

Timber Usage in Construction in Ireland – Scenario 3 – 2025 Estimate

			Timber Build System				MET			Panel Products				Hybrid Systems			
Year of Year	Segment	Typology	Traditional Build	Sawn Wood for TF	Logs	Total	CLT	Glulam	Total	OSB	Plywood	Panels for TF	Total	Timber × Concrete	Timber × Steel	Total	**Grand Total**
2025	Residential	Scheme House	126K m³ 40M €	152K m³ 46M €	3K m³ 1M €	281K m³ 86M €	3K m³ 1M €	7K m³ 5M €	10K m³ 7M €	50K m³ 2M €	8K m³ 1M €	19K m³ 6M €	77K m³ 9M €				**368K m³ 101M €**
		Single Dwellings	43K m³ 13M €	6K m³ 2M €	1K m³ 0M €	50K m³ 15M €	0K m³ 0M €	1K m³ 0M €	1K m³ 1M €	16K m³ 1M €	3K m³ 0M €	1K m³ 0M €	20K m³ 1M €				**70K m³ 17M €**
		Apartments - Conventional	74K m³ 23M €	9K m³ 3M €	1K m³ 0M €	84K m³ 26M €	0K m³ 0M €	1K m³ 1M €	1K m³ 1M €	62K m³ 3M €	12K m³ 1M €	9K m³ 3M €	83K m³ 7M €	1K m³ 0M €	0K m³ 0M €	1K m³ 0M €	**170K m³ 35M €**
		Apartments - MET	1K m³ 0M €	1K m³ 0M €		1K m³ 0M €	0K m³ 0M €	1K m³ 1M €	1K m³ 1M €	1K m³ 0M €	0K m³ 0M €	0K m³ 0M €	1K m³ 0M €	0K m³ 0M €		0K m³ 0M €	**3K m³ 1M €**
		Total	**244K m³ 77M €**	**168K m³ 51M €**	**5K m³ 1M €**	**417K m³ 128M €**	**4K m³ 2M €**	**9K m³ 7M €**	**13K m³ 9M €**	**129K m³ 6M €**	**22K m³ 2M €**	**29K m³ 9M €**	**180K m³ 17M €**	**1K m³ 0M €**	**0K m³ 0M €**	**1K m³ 0M €**	**611K m³ 155M €**
	Non-Residential	Office	14K m³ 4M €	6K m³ 2M €		19K m³ 6M €	1K m³ 0M €	1K m³ 1M €	2K m³ 1M €	7K m³ 0M €	1K m³ 0M €	1K m³ 0M €	8K m³ 1M €	0K m³ 0M €	0K m³ 0M €	0K m³ 0M €	**30K m³ 8M €**
		Public	2K m³ 1M €	0K m³ 0M €	0K m³ 0M €	2K m³ 1M €	0K m³ 0M €	0K m³ 0M €	0K m³ 0M €	1K m³ 0M €	0K m³ 0M €	0K m³ 0M €	1K m³ 0M €	0K m³ 0M €		0K m³ 0M €	**3K m³ 1M €**
		Retail	22K m³ 7M €	3K m³ 1M €		25K m³ 8M €	0K m³ 0M €	1K m³ 1M €	1K m³ 1M €	14K m³ 1M €	3K m³ 0M €	1K m³ 0M €	18K m³ 1M €	0K m³ 0M €	0K m³ 0M €	0K m³ 0M €	**45K m³ 10M €**
		Industrial	0K m³ 0M €	0K m³ 0M €		0K m³ 0M €	7K m³ 3M €	17K m³ 13M €	24K m³ 16M €	3K m³ 0M €	1K m³ 0M €	0K m³ 0M €	4K m³ 0M €	0K m³ 0M €	0K m³ 0M €	0K m³ 0M €	**29K m³ 17M €**
		Other	19K m³ 6M €	11K m³ 3M €	0K m³ 0M €	31K m³ 9M €	0K m³ 0M €	1K m³ 1M €	1K m³ 1M €	7K m³ 0M €	1K m³ 0M €	1K m³ 0M €	9K m³ 1M €	0K m³ 0M €	0K m³ 0M €	0K m³ 0M €	**42K m³ 11M €**
		Total	**57K m³ 18M €**	**20K m³ 6M €**	**0K m³ 0M €**	**78K m³ 24M €**	**9K m³ 4M €**	**20K m³ 16M €**	**29K m³ 19M €**	**32K m³ 2M €**	**6K m³ 1M €**	**3K m³ 1M €**	**41K m³ 3M €**	**1K m³ 0M €**	**0K m³ 0M €**	**1K m³ 1M €**	**149K m³ 47M €**
	Total		**301K m³ 95M €**	**189K m³ 57M €**	**5K m³ 1M €**	**495K m³ 152M €**	**13K m³ 6M €**	**29K m³ 23M €**	**42K m³ 28M €**	**161K m³ 8M €**	**28K m³ 3M €**	**32K m³ 10M €**	**221K m³ 20M €**	**1K m³ 1M €**	**1K m³ 0M €**	**2K m³ 1M €**	**760K m³ 202M €**
Grand Total			**301K m³ 95M €**	**189K m³ 57M €**	**5K m³ 1M €**	**495K m³ 152M €**	**13K m³ 6M €**	**29K m³ 23M €**	**42K m³ 28M €**	**161K m³ 8M €**	**28K m³ 3M €**	**32K m³ 10M €**	**221K m³ 20M €**	**1K m³ 1M €**	**1K m³ 0M €**	**2K m³ 1M €**	**760K m³ 202M €**

Source: Timber Market Simulation Model.

Appendix D

Timber Usage in Construction in Ireland – Scenario 3 – 2030 Estimate

Year of Year	Segment	Typology	Timber Build System				MET			Panel Products				Hybrid Systems			Grand Total
			Traditional Build	Sawn Wood for TF	Logs	Total	CLT	Glulam	Total	OSB	Plywood	Panels for TF	Total	Timber × Concrete	Timber × Steel	Total	
2030	Residential	Scheme House	140K m³ 44M €	438K m³ 131M €	6K m³ 1M €	584K m³ 177M €	19K m³ 9M €	45K m³ 35M €	65K m³ 44M €	67K m³ 3M €	17K m³ 2M €	84K m³ 25M €	168K m³ 30M €				**818K m³ 251M €**
		Single Dwellings	39K m³ 12M €	14K m³ 4M €	2K m³ 0M €	55K m³ 17M €	2K m³ 1M €	4K m³ 3M €	6K m³ 4M €	22K m³ 1M €	3K m³ 0M €	6K m³ 2M €	31K m³ 3M €				**92K m³ 24M €**
		Apartments - Conventional	38K m³ 12M €	26K m³ 8M €	1K m³ 0M €	65K m³ 20M €	1K m³ 0M €	2K m³ 2M €	3K m³ 2M €	19K m³ 1M €	4K m³ 0M €	16K m³ 5M €	39K m³ 6M €	0K m³ 0M €	0K m³ 0M €	1K m³ 0M €	**108K m³ 29M €**
		Apartments - MET	23K m³ 7M €	53K m³ 16M €		76K m³ 23M €	29K m³ 13M €	67K m³ 52M €	95K m³ 64M €	77K m³ 4M €	15K m³ 2M €	61K m³ 18M €	154K m³ 24M €	17K m³ 8M €	2K m³ 1M €	19K m³ 9M €	**344K m³ 120M €**
		Total	**241K m³ 76M €**	**531K m³ 159M €**	**8K m³ 1M €**	**780K m³ 236M €**	**51K m³ 22M €**	**119K m³ 92M €**	**169K m³ 115M €**	**185K m³ 9M €**	**39K m³ 4M €**	**167K m³ 50M €**	**392K m³ 63M €**	**18K m³ 8M €**	**2K m³ 2M €**	**20K m³ 9M €**	**1,361K m³ 424M €**
	Non-Residential	Office	7K m³ 2M €	17K m³ 5M €		24K m³ 7M €	5K m³ 2M €	5K m³ 4M €	11K m³ 7M €	18K m³ 1M €	3K m³ 0M €	5K m³ 2M €	25K m³ 3M €	1K m³ 0M €	0K m³ 0M €	1K m³ 1M €	**61K m³ 17M €**
		Public	1K m³ 0M €	3K m³ 1M €	0K m³ 0M €	4K m³ 1M €	1K m³ 0M €	2K m³ 2M €	3K m³ 2M €	1K m³ 0M €	0K m³ 0M €	0K m³ 0M €	2K m³ 0M €	0K m³ 0M €	0K m³ 0M €	0K m³ 0M €	**10K m³ 4M €**
		Retail	35K m³ 11M €	15K m³ 5M €		50K m³ 16M €	4K m³ 2M €	9K m³ 7M €	13K m³ 9M €	57K m³ 3M €	8K m³ 1M €	16K m³ 5M €	81K m³ 9M €	1K m³ 0M €	0K m³ 0M €	1K m³ 1M €	**145K m³ 33M €**
		Industrial	1K m³ 0M €	1K m³ 0M €	0K m³ 0M €	3K m³ 1M €	36K m³ 16M €	84K m³ 66M €	121K m³ 82M €	11K m³ 1M €	2K m³ 0M €	3K m³ 1M €	16K m³ 2M €	1K m³ 1M €	1K m³ 1M €	3K m³ 2M €	**142K m³ 85M €**
		Other	29K m³ 9M €	56K m³ 17M €	1K m³ 0M €	86K m³ 26M €	5K m³ 2M €	11K m³ 8M €	16K m³ 11M €	19K m³ 1M €	3K m³ 0M €	5K m³ 2M €	27K m³ 3M €	1K m³ 1M €	1K m³ 0M €	2K m³ 1M €	**131K m³ 41M €**
		Total	**74K m³ 23M €**	**92K m³ 28M €**	**1K m³ 0M €**	**167K m³ 51M €**	**51K m³ 22M €**	**112K m³ 87M €**	**163K m³ 110M €**	**106K m³ 5M €**	**15K m³ 2M €**	**30K m³ 9M €**	**151K m³ 16M €**	**5K m³ 2M €**	**3K m³ 2M €**	**8K m³ 4M €**	**489K m³ 181M €**
	Total		**315K m³ 99M €**	**623K m³ 187M €**	**9K m³ 2M €**	**947K m³ 288M €**	**102K m³ 45M €**	**231K m³ 179M €**	**333K m³ 224M €**	**291K m³ 15M €**	**54K m³ 5M €**	**197K m³ 59M €**	**542K m³ 79M €**	**22K m³ 10M €**	**5K m³ 4M €**	**27K m³ 14M €**	**1,850K m³ 605M €**
Grand Total			**315K m³ 99M €**	**623K m³ 187M €**	**9K m³ 2M €**	**947K m³ 288M €**	**102K m³ 45M €**	**231K m³ 179M €**	**333K m³ 224M €**	**291K m³ 15M €**	**54K m³ 5M €**	**197K m³ 59M €**	**542K m³ 79M €**	**22K m³ 10M €**	**5K m³ 4M €**	**27K m³ 14M €**	**1,850K m³ 605M €**

Source: Timber Market Simulation Model.