



Processing / Products No. 4

- ▶ Traditionally Coillte was the only supplier of roundwood to the processing sector in Ireland. There are now over 11,000 forest owners, and they need a greater understanding of the end uses for the roundwood that they produce.
- ▶ The forest industry in Ireland is developing at a great pace and important milestones were reached in 2001:
  - production of roundwood on the island surpassed 3 million m<sup>3</sup>.
  - the sawmilling sector sold more than 1 million m<sup>3</sup> of sawnwood.
  - sawnwood exports exceeded 300,000 m<sup>3</sup>.
  - total industry value exceeded €500 million.
- ▶ All wood products are now internationally traded and cost competitiveness is vital to the future development of the timber and forest industry in Ireland.
- ▶ Timber is the most environmentally-friendly building material as there is minimal wastage throughout the supply chain – every fibre that leaves the forest has an end use – logs, woodchip, sawdust, bark.
- ▶ To ensure that markets exist for roundwood logs, there must be markets for timber and other wood products. To assist this market development all forest owners and timber growers should be advocates for the greater use of wood products and the specification of timber as the building material of choice.

## Uses of Home-grown Irish Timber

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### Current roundwood production

Production from Irish forests has increased dramatically over the past 50 years. In particular, the production of roundwood on the island of Ireland has increased from about 500,000 m<sup>3</sup> in 1979 to about 3.3 million m<sup>3</sup> in 2003 – this is a 560% increase in the last 24 years. The public sector (Coillte in the Republic of Ireland and the Northern Ireland Forest Service in Northern Ireland) accounts for 95% of the annual production, with the private sector supplying the remainder. However, this situation will begin to change over the next 15 years, with the private sector contribution set to increase to almost 25%.

Roundwood is generally traded in the following categories:

- ▶ Pulpwood 3.0 m length; 7-12 cm top diameter.
- ▶ Stakewood 1.5 – 1.8 m length; 7-12 cm top diameter; very straight.
- ▶ Pallet wood 2.5 – 3.1 m length; 12-20 cm top diameter.
- ▶ Sawlog 3.7 – 6.9 m length; > 20 cm top diameter.



- ▶ Roundwood production from Irish forests has increased dramatically in the past 24 years, and supply from private plantations is set to continue this trend.

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## Future production potential

Private sector afforestation has increased significantly over the past 20 years and this resource is now poised to play a major part in future roundwood supply. The Coillte and Northern Ireland Forest Service resources are optimised and potential supply from these sources will level off for the next decade or two, leaving the private sector to supply any extra volume to the Irish processing sector. Figure 1 shows the potential production of roundwood up to 2015.

This change in the supply dynamics of roundwood in Ireland raises a number of key points:

- ▶ The potential production of roundwood from the forests of Ireland will reach 5 million m<sup>3</sup> per annum by the year 2015.
- ▶ The vast majority of this production will be softwood.
- ▶ Coillte will continue to be the dominant supplier of roundwood over the forecast period 2001-2015. However, Coillte's share of the total roundwood market could drop from 84% in 2001 to 66% by 2015.
- ▶ The private sector's market share could rise to 23% by 2015.

- ▶ The supply from the Northern Ireland Forest Service rises in line with the total supply and its market share will remain constant at 11%.
- ▶ When total supply is analysed by product assortment the following trends develop over the forecast period 2001-2015:
  - Pulpwood supply will rise by 81% from 835,000 m<sup>3</sup> to 1,508,000 m<sup>3</sup>;
  - Small sawlog supply will rise by 10% from 1,261,000 m<sup>3</sup> to 1,393,000 m<sup>3</sup>;
  - Large sawlog supply will rise by 40% from 1,495,000 m<sup>3</sup> to 2,091,000 m<sup>3</sup>;
  - The private sector will account for all of the increased pulpwood production.

## Current markets for home-grown roundwood

The production of roundwood from the forest of Ireland in 2003 reached a record level of 3.3 million m<sup>3</sup>. Figure 2 outlines the flowchart of this material from the forest to the market.

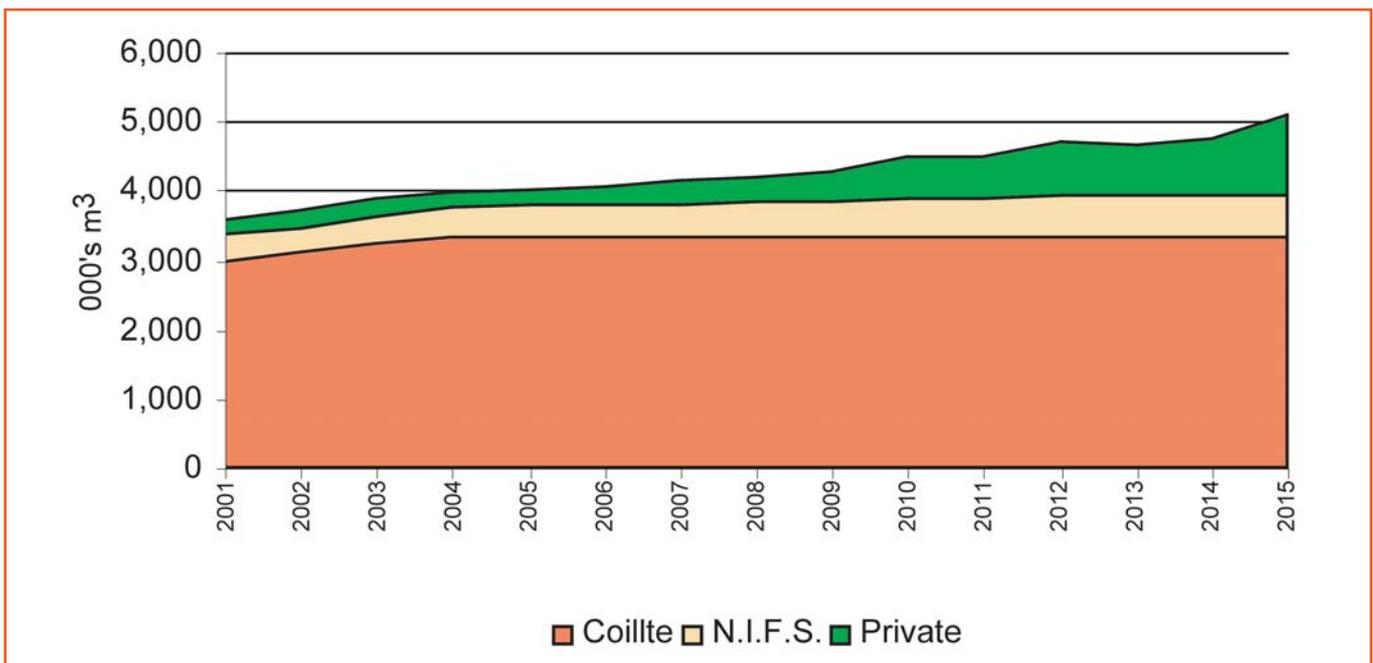
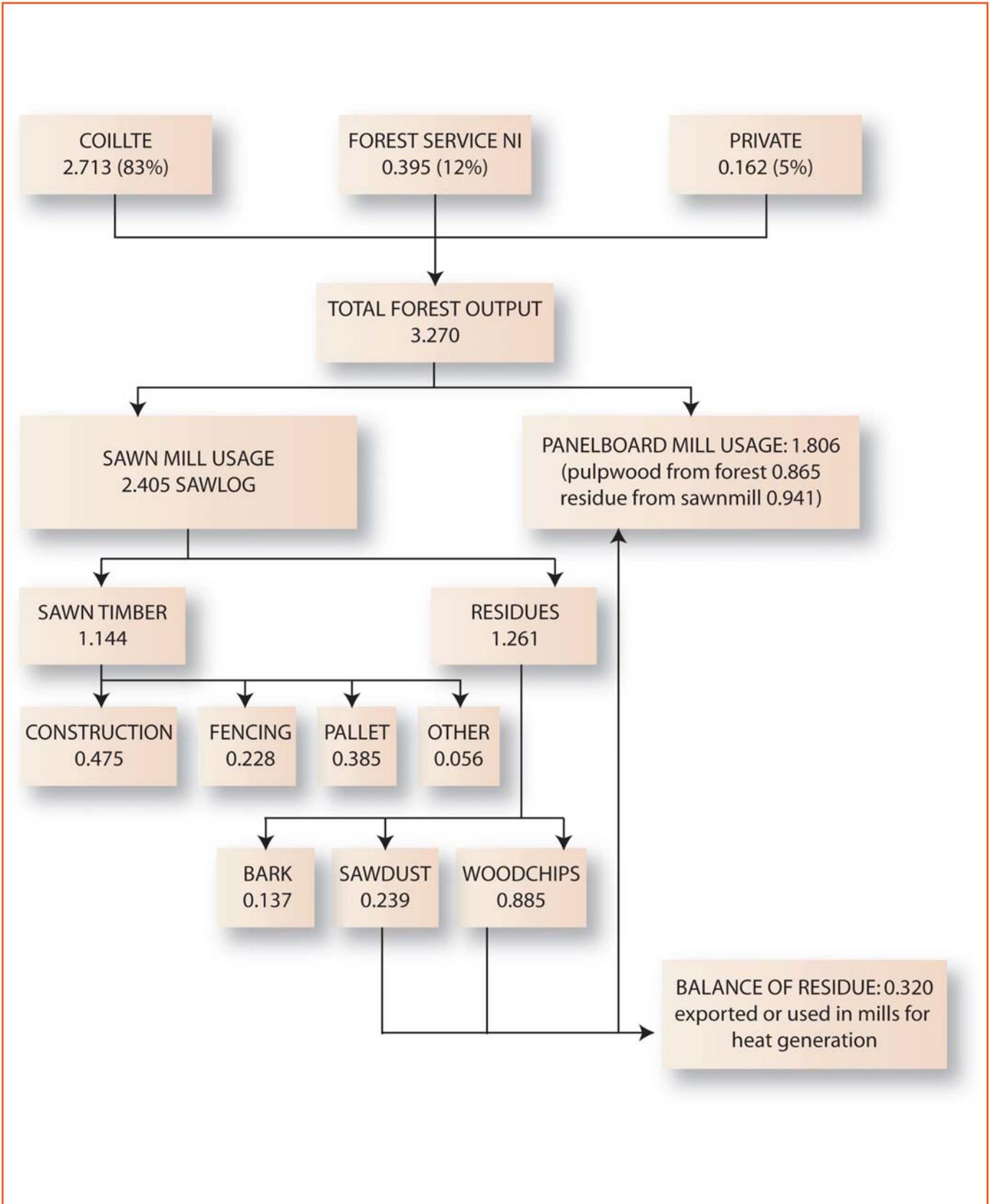


FIGURE 1: Potential roundwood production from the forests of Ireland (Gallagher and O'Carroll 2001).



**FIGURE 2:** Flow of roundwood (million m<sup>3</sup>) from forest to markets in 2003 (Magner 2003).

## Panelboard

Pulpwood is small diameter logs, usually of 3 m length with a top diameter of 7 cm. It is typically generated from thinning operations and from the tops of trees in clearfells. Sawmill residues, often termed co-products, include all of the material remaining after sawnwood is taken from logs, as well as woodchips, sawdust, offcuts, sawdust and bark.

Pulpwood has two main uses: stake production and panelboard production. If the trees are sufficiently straight the pulpwood may be extracted in the form of stakewood. This is normally 1.6 to 1.8 m in length. However, the majority of pulpwood produced is not suitable for stake production and is purchased by one of the panelboard mills in the country, or can be exported. Generally speaking, exporting is used as a release valve through which periodic surplus supply of pulpwood can be sold. Due to the low relative value of pulpwood, exporting is rarely a financially attractive option. The panelboard mills in Ireland produce a range of products as outlined below.

## MDF

Medium density fibreboard (MDF) is produced by Weyerhaeuser Europe Ltd in Clonmel, Co Tipperary under the brand name Medite. The Medite brand is the market leader in Europe and the company produces about 350,000 m<sup>3</sup> of product every year. In excess of 80% of this



is exported, mostly to the UK but also to mainland European countries such as France, Germany, the Netherlands, Belgium and Luxemburg.

The product is produced from both pulpwood and woodchip. All pulpwood is first debarked and then chipped to certain size tolerances. The woodchip is then ground into fibres. Resin is then added to the fibre and the mixture is dried and pressed together in a large continuous press where it is exposed to heat and pressure which activates the resin and binds the fibres together. The product is then cooled, sanded and cut to customer size specifications. It is sold in a range of thicknesses from 3 mm to 30 mm. It is also available in a range of grades, including fire retardant, moisture resistant, exterior grade and high density for flooring applications.

## OSB

Oriented Strand Board (OSB) is produced by SmartPly Europe Ltd in Belview, Co Waterford. The company sells about 200,000 m<sup>3</sup> per year and exports to the UK and Europe.

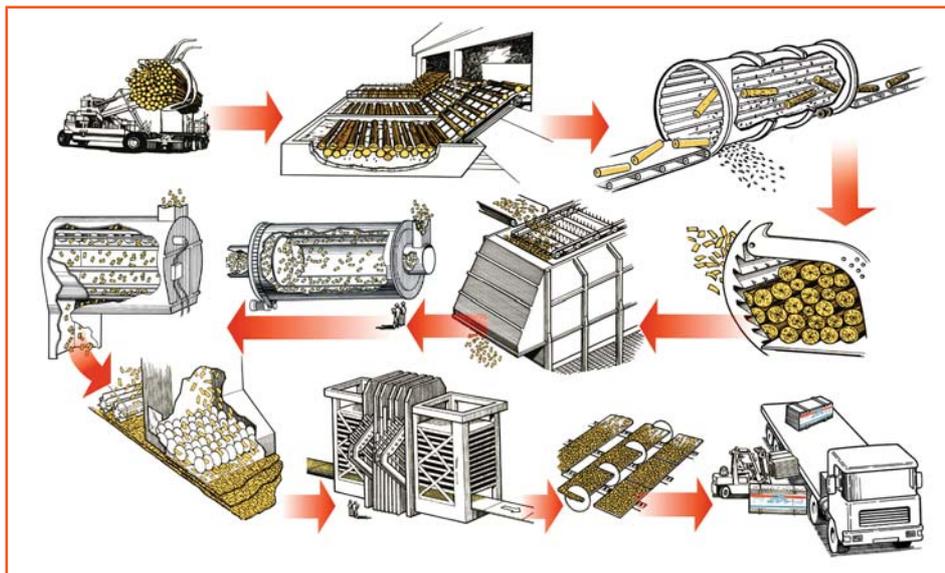
The product comes in a range of thicknesses and grades, each grade being produced with particular end use application requirements in mind. A list of grades and their uses is given in Table 1. Increasingly it is becoming the panelboard of choice among timber-frame housing manufacturers.

The production of SmartPly is illustrated in Figure 3. The product is made from conifer pulpwood, normally Sitka spruce or lodgepole pine. The logs are debarked then cut into flakes in a waferiser. Following drying and blending with resins the flakes are laid out in alternating directions to form the board. The boards are then pressed with heat and pressure to form the product. Finishes and sizes depend on customer specifications.

- ◀ The use of Medite MDF in many high profile applications throughout Europe is testament to the quality of Irish-made wood products. Medite MDF, produced at the Weyerhaeuser Europe facility in Clonmel, was used with impressive results at the reception area of the European Bank for Restoration and Development.

**TABLE 1:** SmartPly products and their applications.

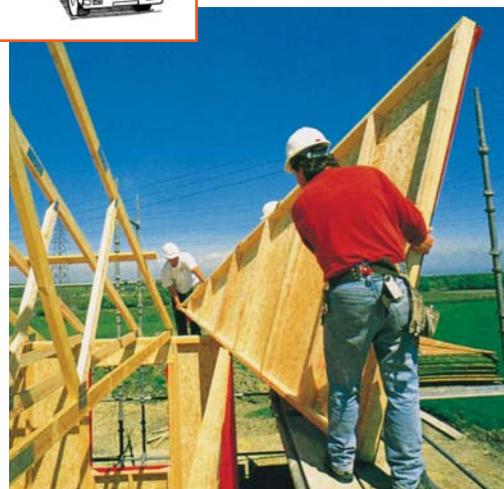
PRODUCT NAME	PARTICULAR CHARACTERISTICS	END USE APPLICATIONS
SmartPly 3	Suitable for structural use in humid conditions	Roofing, flooring, hoarding and wall sheathing
SmartPly 2	Suitable for structural use in dry conditions and non-structural use	Boarding-up, temporary form-work, packaging, signboards
SmartPly T&G	Tongue-and-grooved for simple, precise installation	Flooring
SmartFloor	Tongue-and-grooved flooring panel product incorporating a heavy-duty peel-off film to protect the floor surface	Flooring
SmartFrame	High racking strength and good all-round performance, SmartFrame is manufactured with zero-added formaldehyde to meet the specific demands of timber-frame	Timber-frame wall sheathing and modular building applications
SmartSite	Incorporates a smooth, easy-to-paint overlay	Ideal for site-hoarding, billboards and shop-fitting



**FIGURE 3:** Production process of SmartPly.



▲ SmartFloor is a versatile tongue-and-grooved product for flooring.



▲ SmartFrame is used extensively in timber-frame housing.

## Chipboard

Chipboard, or particleboard, is one of the longest established panelboard products. It has been manufactured in Ireland by Finsa in Scariff, Co Clare, for the past 40 years. The company produces about 100,000 m<sup>3</sup> every year for use on the Irish, UK and European markets. Finsa has become a well established supplier to the furniture and building industry.

The product is made from pulpwood, woodchip and sawdust. The company produces a wide range of particle boards in different qualities and sizes. It is also available as tongue-and-grooved board and with enhanced moisture resistant properties. The product consists of a very fine surface and a homogeneous internal layer. The most common applications are in the furniture industry and construction. Increasingly chipboard is veneered with melamine for hardwood finishes.

## Moulded door skins

The majority of internal doors used in Ireland are now in the form of two sheets of moulded door skins fixed to a solid timber frame. These door skins are produced in Ireland by Masonite Europe Ltd at its state-of-the-art production facility in Carrick-on-Shannon, Co Leitrim. The factory is a €120 million investment and produces door facings for all of the major door manufacturers throughout Europe.

Masonite door facings are available in a range of styles and options, all pre-primed and ready for finishing. The range consists of 2, 3, 4 and 6 panel facings including smooth and textured wardrobe sets and also a wall paneling system. Their interior door facings are available many sizes and can be used in the manufacture of a wide range of performance doors, including one-hour fire, heavy duty, glazing and sound-reducing styles.

The manufacturing process is similar to that for general MDF. However, at the pressing stage special platens are used which give the door facings their profile and finish. Masonite Europe Ltd's plant in Carrick-on-Shannon only uses woodchip from sawmills. Although it does not use logs directly from the forest it creates an invaluable outlet for sawmill residues in the north west. This helps to ensure the sustained economic viability of the sawmills and therefore protects existing markets for roundwood logs.



**FIGURE 7:** Examples of textured door facings from the Masonite Europe Range (above). Masonite also produce a wall paneling system (below).



## Sawn timber

Irish sawmills process all available sawlogs in Ireland. Although there are about 100 sawmills in Ireland, almost 75% of the sawlog volume is processed by the five major mills – Balcas (Fermanagh and Leitrim), ECC (Galway), Glennon Bros (Fermoy and Longford), Grainger's (Cork) and Murray Timber (Carlow and Galway). Almost 96% of the available volume is processed by the members of the Irish Timber Council, which includes the above five sawmills as well as Aughrim (Galway), Bamagher (Offaly), Coolrain (Laois), Laois Sawmills (Laois), Palfab (Cork) and Woodfab Timber (Wicklow).

The main markets served by these sawmills are:

- ▶ *Construction (structural timber):* Typical uses include ceiling/floor joists, rafters, tiling battens, purlins and wall studs.

- ▶ *Fencing*: Products supplied include posts and rails for roadside and farm fencing, D-rails, gravel boards and feather-edge boards.
- ▶ *Pallets and Packaging*: Increasing exports of a range of products have driven the demand for wood pallets and packaging.
- ▶ *Decking and Landscaping*: In addition to the growing decking market, this category includes garden and patio furniture, ornamental garden structures (e.g. bridges), garden sheds and crafted wood signs.
- ▶ *Other machined timber*: This category includes paneling, flooring, skirting, architrave, soffit boards, ship lap boards and tongue-and-groove (T&G) boards.

## Potential new markets

Although current roundwood supplies are fully utilised serving the markets outlined above, it is strategically important that the sector continually strives to develop new markets. A number of new markets are emerging and offer real opportunities for the forest and wood products sector in Ireland. These new opportunities include:

### Energy

Wood biomass (chips, sawdust, bark, pulpwood, forest residues) can be used to generate heat, electricity or a combination of both. Sawdust can be dried and compressed to manufacture wood pellets that can be used to heat homes, offices, apartment, hotel and other large buildings. Wood pellets can become a significant natural, renewable fuel resource in Ireland to displace imported, polluting, fossil fuels. Alternatively, the wood biomass could be converted to liquid biofuels, such as ethanol, through acid or enzyme hydrolysis. More information on wood as an energy source is given in *COFORD Connects Note – Socio-Economic Aspects of Forestry – No. 1*.



- ▶ Wood pellets - a real alternative to imported coal and oil.

## Engineered wood products

Timber is a natural product and as such it can be quite variable in terms of quality, particularly if the forests from which it is derived are not carefully managed. However, in general terms timber has one of the best strength:weight ratios of any construction material. A range of new products is emerging that optimises this strength advantage while overcoming the heterogeneous characteristic of wood. These products include I-beams and glulam. The latter is aimed as replacing solid timber for narrow to medium spans, such as ceiling joists, while glulam aims to displace steel and concrete in medium to wide spans, such as in swimming pools and sports arenas.



I-beams are being used to replace solid timber in applications such as ceiling joists.



## Wood-polymer composites

Mixing dry wood fibre with recycled plastic to produce moulded wood-polymer composite material is growing in popularity in the US and is beginning to emerge in Ireland. The products can be painted with a wide range of colours and a woodgrain effect can be added. They are easy to maintain and have a good natural durability. In the US the main target market has been decking and garden furniture. However, tests are ongoing to produce products for outdoor joinery such as window and doors.

## Conclusion

The Irish timber processing sector has invested €100 million in the past 3 to 5 years to ensure the long term viability of the forest industry. This note outlines the wide range of products and end use application that can be supplied from home-grown softwoods. However, the processing sector is a dynamic one and future developments may see the production of engineered wood products, solid biofuels and wood polymer composites.

## References

- Gallagher, G. and O'Carroll, J. 2001. *Forecast of Roundwood Production from the Forest of Ireland 2001-2015*. COFORD, Dublin.
- Magner, D. 2003. *Irish Sawmills: Maximising the forest resource*. ITGA Yearbook 2004. ITGA, Dublin.



▲ Examples of wood-polymer composites used  
▼ in external applications. [Source: [www.trex.com](http://www.trex.com)]

