An overview of wood fibre use in Ireland (2010)

Eoin O'Driscoll

Data sources[1]: The data contained in this overview have been compiled from the UNECE Timber Committee Market Report for Ireland (2010) and from the EUROSTAT Joint Forest Sector Questionnaire (JFSQ) for Ireland (2010). Both of these reports were compiled on behalf of the Department of Agriculture, Fisheries and Food (DAFF) by Drima Marketing.

Irish roundwood harvest

In 2010, 2.88 million m^3 of roundwood was harvested in the Republic of Ireland; 2.7 million m^3 of which was utilised by the processing sector (Table 1) with the balance of 199,000 m^3 being used for firewood (Table 4). Private forest harvest grew by 356% over 2009 driven by strong demand for roundwood across all assortments. 82% of the roundwood which was processed in the Republic of Ireland was supplied by Coillte with 17% provided by the private forest sector. The balance was supplied by imports (Table 1).

Table 1: Roundwood (000 m^3 overbark (OB)) available for processing (2008-10)

	2008	2009	2010
Log imports less exports	106	-63	28
Coillte	2,279	2,354	2,217
Private	118	130	463
Roundwood processed	2,503	2,421	2,708
Of which			
Sawlog	1,619	1,602	1,603
Stakewood	80	88	118
Pulp	804	731	987

Sources and uses of wood fibre

The wood fibre sources for the processing and wood energy sectors in the Republic of Ireland are shown in Table 2, while the product output is in Table 3.

[1] *Further information regarding the data contained in this review can be found on the following websites; http://www.unece.org/fileadmin/DAM/timber/country-info/Ireland.pdf and http://faostat.fao.org/site/628/default.aspx*

In value terms, exports of forest products grew by 18% in 2010 to reach €286 million, €179 million of which comprised wood-based panels. The balance comprised paper and sawn timber exports (Table 4). In 2010, export volumes of wood-based panels and sawn timber rose by 14% and 10% respectively, while the exports of paper and paper board products declined by 3%.

Table 2: Sources of wood fibre (000 m^3 OB) (2008-2010)

	2008	2009	2010
Roundwood	2,503	2,421	2,708
Sawmill residues	846	838	842
Wood-based panel residues	106	94	101
Post-consumer recovered wood	208	200	280
TOTAL	3,663	3,553	3,931

Table 3: Uses of wood fibre (000 m^3 OB) (2008-2010)

	2008	2009	2010
Sawmilling	1,619	1,602	1,603
Wood-based panels	1,462	1,286	1,400
Round stakes	80	88	118
Wood biomass energy use by the forest products sector	378	431	554
Other uses			
Horticultural bark mulch	44	54	27
Wood chip for commercial biomass use	30	55	39
Exports of forest product residues	50	37	58
Other uses			132
TOTAL	3,663	3,553	3,931

Irish firewood market

A recent study has shown that the Irish market for firewood has grown by 35% over the period 2006-2010. In 2010, almost 200,000 m^3 of firewood (roundwood equivalent) was sold in Ireland, at a value of €29 million (Table 4). The estimated production level, based on new methodologies, is significantly above previous estimates and shows that the Irish firewood market is providing a steady and a growing market for farm forest thinnings.

Table 4: Estimated volume and value of the domestic firewood market in Ireland (2006-2010)

	000 m^3 OB	⇔million
2006	147	21.35
2007	159	23.03
2008	171	24.83
2009	184	26.75
2010	199	28.80

Roundwood supply and demand to 2020

Over the next 17 years, the supply of roundwood to be harvested from Irish forests will increase significantly. A recent COFORD report shows that over the period to 2028 the production capacity of Ireland's forests will almost double to 7 million cubic metres, from the current 3.8 million. Almost all of the increase in supply is set to come from privately-owned forests in the Republic; those areas established over the past 25 years on foot of State/EU and private sector investment (Table 5). Considerable scope exists to expand wood energy production. This is in addition to supplies for sawmilling and board manufacture.

Table 5: Forecast of potential net realisable volume production by assortment category from the private forest estate in the Republic of Ireland (000 m^3 OB) (2011-2028).

	Tip -7cm	7-13 cm	14-19 cm	20cm +	Total
2011	39	225	90	55	409
2012	39	225	102	57	423
2013	35	190	106	73	404
2014	41	229	150	45	465
2015	47	264	183	57	551
2016	52	297	196	72	617
2017	64	377	284	91	816
2018	56	317	191	122	686
2019	65	366	290	195	916
2020	78	492	486	262	1,318
2021	85	485	555	463	1,588
2022	84	483	528	404	1,499
2023	93	502	784	848	2,227
2024	84	490	657	617	1,848
2025	72	427	634	703	1,836
2026	76	441	715	886	2,118
2027	101	544	1,209	1,605	3,459
2028	96	519	1,090	1,620	3,325

Realising such an increase in potential production will entail significant capital investment in roads, harvesting equipment and in information technology (IT) systems by forest owners, contractors and by the State.

The overall demand for roundwood on the island of Ireland is forecast to increase from 4.295 M m^3 in 2011 to 6.038 M m^3 by 2020 (Table 6).

Table 6: Estimated roundwood (000 m^3 OB) demand on the island of Ireland in 2011 and 2020

	2011	2020
Conventional demand	3,456	3,830
Demand for forest-based biomass for energy production	1,589	3,084
Residues from conventional demand which are used to meet energy demand	-750	-876
TOTAL	4,295	6,038

Based on scenario modelling, the Sustainable Energy Authority of Ireland (SEAI) forecast that by 2020, the demand for biomass for energy in the Republic of Ireland will be 53 M GJ. Forest-based biomass and waste resources could deliver about 9 M GJ each, with agricultural residues having the potential to supply a further 8 M GJ. The balance of supply is likely to comprise indigenous purpose-grown energy crops and imported biomass (Table 7).

Table 7: Estimated supply streams which will be available to meet the biomass demand for energy production in the Republic of Ireland in 2020.

	Estimated annual supply	
	Million GJ	%
Biomass segregated from waste stream	9	17
Forest-based biomass	9	17
Agricultural residues	8	15
Indigenous purpose-grown energy crops and imported biomass	27	51
TOTAL	53	100
Roundwood equivalent at 40-45% moisture content M m^3	7.5	
Roundwood equivalent at 40-45% moisture content M tonnes	5.5	

The demand for forest-based biomass for energy in 2011 and in 2020 is an aggregate of the demand for combined heat and power (CHP), heat only and co-firing. The expected demand for forest-based biomass in 2011 and 2020 is shown in Table 8.

Table 8: Estimated demand for forest-based biomass for energy production on the island of Ireland in 2011 and 2020.

	2011	2020	2011	2020
	Estimated demand 000 m^3 OB/annum		% of total demand	
Combined heat & power (CHP)	388	1,550	24	50
Heat only	1,092	1,425	69	46
Co-firing	109	109	7	4
TOTAL	1,589	3,084	100	100

To meet the 2020 renewable energy target, the demand for forest-based biomass for energy production will need to double over the period 2011 to 2020 (Table 6 & 8). This is a challenging target. However, experience in Scotland and in Austria has shown that biomass use can grow to meet challenging renewable energy targets. To meet the stated targets for renewable energy by 2020, the gross demand for forest-based biomass for energy production will increase 2-fold, from 1.589 M m^3 in 2011 to 3.084 M m^3 in 2020. Such a steep increase in wood biomass demand will require a significant investment in the sectoral supply chain, and will significantly increase the competition for wood fibre.

Achieving renewable energy targets will require significant investment in biomass fuelled CHP. Before becoming operational, such facilities have a minimum 2-year lead-in period.

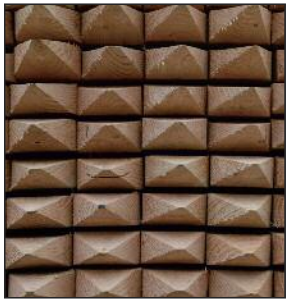
Private forest estate

The private forest sector now accounts for 46% of the national forest estate or 5% of total land area of the Republic of Ireland. There are approximately 19,500 private forest owners, of which 84% are classed as farmers and they own 340,000 ha.

During the period (1981-2010), over 247,000 ha of forest were established by private growers in Ireland, 220,000 ha being planted since 1990. Data for 2010 shows that the rate of afforestation has increased over 2009 and was the highest since 2006 (Table 9).

Table 9: Afforestation (Ha) in the Republic of Ireland by ownership category (2005-2010)

	State	Private	Total
2005	64	10,032	10,096
2006	25	8,012	8,037
2007	0	6,947	6,947
2008	67	6,182	6,249
2009	35	6,613	6,648
2010	4	8,310	8,314



2010 was one of the worst years on record for forest fires, with over 800 ha of Coillte's forests lost during the year. There was also significant fire damage to private woodlands.

Forest products trade (2007-2010)

Since 2009, Ireland has become a net exporter (in volume terms) of sawn timber (Table 7), largely due to the collapse of the domestic construction market and increased levels of exports to the UK. The value of wood-based panel exports (a net export category for some time) rose by over 40% in 2010 (Table 10).

Since 2007, the trend (in value terms) has been for Ireland to become a net exporter of sawn timber, largely due to the collapse of the domestic construction market and increased levels of exports to the UK. The value of wood-based panel exports (a net export category for some time) rose by over 40% in 2010 (Table 11).

Table 10: Timber trade (2007-2010)

	Imports							
	2007	2008	2009	2010	2007	2008	2009	2010
	000 m^3 UB				€million			
Sawn timber	724	412	232	242	251	141	66	74
Wood-based panels	358	264	181	166	146	108	68	65
	000 tonnes							
Pulp products	31	29	32	41	22	20	22	31
Paper & paper-board products	546	526	379	370	467	520	308	313
TOTAL					886	789	464	483
	Exports							
	000 m^3 UB				€million			
Sawn timber	381	389	564	621	71	54	51	63
Wood-based panels	757	614	580	660	262	195	147	179
	000 tonnes							
Pulp products	0	2	0	1	0	0	0	0
Paper & paper-board products	85	77	45	33	92	69	45	44
TOTAL					425	318	243	286

Table 11: Balance of trade in the value of forest products (€million) (2007-2010)

	2007	2008	2009	2010
Sawn timber	-180	-87	-15	-11
Wood-based panels	116	87	79	114
Pulp products	-22	-20	-22	-31
Paper and paper-board products	-375	-451	-263	-269
TOTAL	-461	-471	-221	-197

Sawmill output (2010)

In 2010, Irish sawmills processed 1.7 million m^3 of roundwood, generating 0.8 million m^3 of sawn timber. In line with the reduction in construction activity, the size of the domestic sawn timber market declined by 46% over the period 2008-2010. Over the same period, sawn timber exports grew by 60% (Table 12).

The primary products of the sawmilling sector are construction/structural timber, pallets/packaging and fencing products. Until recently, Irish structural timber was largely sold on the home market, with pallet and fencing products making up the bulk of sawn timber exports. However, in recent years, Irish sawmillers have developed new products and export markets such as planed all over (PAO)/eased edge timber studding, fencing products and acoustic barriers.

The development of new products has required considerable investment in both sawmill processing and in marketing and sales development in key export markets. In 2010, exports of Irish sawn timber (in volume terms) increased by 10% over 2009 (Table 12). However, in recent years, structural/construction timber exports have increased significantly. These are largely sold in Northern Ireland and in GB. Over the period 2000-2010, the volume of sawn softwood which has been exported by the sawmill sector has increased by 227% (Table 13). New markets for sawn timber have been developed in France, the Netherlands and Turkey. In 2010, Glennon Brothers won the industry category of the Ernst and Young Entrepreneur of the Year Awards.

Table 12: Share of domestic sawn timber (000 m^3 UB) market (2008-2010)

	2008	2009	2010
Domestic production (softwood)	701	772	772
Domestic production (hardwood)	1	2	0
Exports	-389	-564	-621
Imports	412	232	242
TOTAL	725	442	393
% of 2008 market		61	54

Table 13: Exports of sawn softwood (2000-2010)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
000 m^3 UB	274	336	485	502	495	428	447	374	387	564	621

Wood residues (2010)

Wood residues are primarily used as feedstock for sawmill kilns and for the wood based panel (WBP) sector. Post-consumer recovered wood (PCRW) is increasingly being used for wood energy and for the manufacture of particleboard. Over the period 2008-2010, the production of wood residues increased by 18% (Table 14).

Table 14: Production of wood residues (2008-2010)

	2008	2009	2010
	000 m^3 roundwood equivalent		
Bark	203	215	222
Wood chip	470	517	517
Sawdust	152	200	204
Post-consumer recovered wood	208	200	280
TOTAL	1,033	1,132	1,223

Panel sector (2010)

In 2010, 758,000 m^3 of WBP were produced from 1.40 million m^3 of wood fibre, a 7% increase over 2009 (Table 15). 87% of the WBP which were manufactured in the Republic of Ireland were exported (660,000 m^3, to a value of €179 million (Table 10). Exports were dominated by oriented strand board (OSB), medium density fibreboard (MDF), and doors which are manufactured by SmartPly, Medite and Masonite. Key export markets for WBP are the UK and the Benelux countries. In 2010, the Irish WBP sector was the second largest exporter of particleboard and OSB to the UK and the largest exporter of MDF to the UK.

Table 15: Production of wood-based panels (000 m^3 UB) (2008-2010)

	2008	2009	2010
TOTAL production	779	709	758

Wood biomass overview

The use of forest-based biomass for energy production is dominated by the forest products sector, which uses it for process drying and for energy purposes. Since 2007, the use of forest-based biomass for energy production by commercial and domestic users has risen considerably (Table 12).

Between 2005 and 2009, the domestic use of forest-based biomass for the production of energy grew by 18% per annum. The input and output of the forest-based biomass energy sector is shown in Tables 16, 17 and 18.

In 2010, 34% of the roundwood harvested in the Republic of Ireland was used for the production of biomass energy (Table16). Since 2006, the use of wood biomass energy in Ireland has resulted in a total emissions saving of 2.03 million tonnes of carbon dioxide (CO_2).

A recent study has shown that the Irish market for firewood has grown by 35% over the period 2006-2010. In 2010, 199,000 m^3 of roundwood was sold in Ireland to a value of €28.80 million. The harvest level is significantly above that which had been estimated for previous years and shows that the Irish firewood market is providing a steady and a growing market for first thinnings.

Table 16: Use of forest-based biomass as a percentage of total roundwood harvest (2010)

Category	000 m^3 OB
Forest-based biomass used for electricity generation by Edenderry Power	79
Forest-based biomass used for energy production and process drying in sawmills and wood-based panel mills	475
Pulp chipped for biomass use by commercial users	39
Domestic use of firewood	199
Short rotation coppice	1
Wood pellets and briquettes	121
Charcoal	2
TOTAL	916
Pulpwood chipped for pellet production	38
Sawdust used for pellet production	30
TOTAL	984
Roundwood harvest	
Roundwood available for processing	2,708
Firewood harvest	199
TOTAL	2,907
Forest-based biomass use expressed as a % of total roundwood harvest	33.85%

Table 17: Use of forest-based biomass for energy production (000 m^3 UB) (2008-2010)

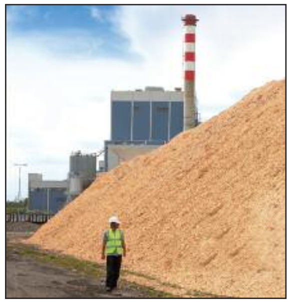
	End use	2008	2009	2010
Firewood	Domestic heating	171	184	199
Roundwood chipped in forest	Commercial heating	63	53	39
Short rotation coppice (SRC)	Commercial heating	1	4	1
Wood pellets & briquettes	Domestic /commercial heating	82	110	121
Charcoal	Domestic use	2	2	2
Wood biomass energy use by the energy & forest products industry	Process drying/heating / combined heat and power	384	438	554
Total		703	791	916
Percentage forest products use		55	55	60

Table 18: Output of the forest-based biomass energy sector (2008-2010)

	Unit	2008	2009	2010
	Output			
Heat	TJ	4,857	5,273	6,306
Electricity	TJ	112	240	372
TOTAL	TJ	4,969	5,513	6,678
Tonnes CO_2 abated	000 tonnes	380	422	511

Four million tonnes of milled peat are harvested each year in Ireland from over 20,000 ha of peatland. The main markets are power generation, briquette manufacture and horticultural products. Around 3.08 million tonnes are used at three peat-fired power plants.

These generate an annual electrical output of 378 MWe, providing 6% of Ireland's total primary energy requirement (TPER). This process emits 2.8 million tonnes of carbon dioxide per annum, accounting for 4.1% of Irish greenhouse gas (GHS) emissions. Research has shown that co-firing of peat with wood biomass could reduce GHG emissions from peat burning power stations by up to 30%.



Edenderry Power, a peat-burning power station operated by Bord Na Móna is increasing the use of biomass in co-firing with peat. By 2020, it is estimated that 500,000 tonnes of biomass will be used by Edenderry Power (Table 19), supplied by local and imported biomass.

The types and volume of biomass used by Edenderry Power over the period 2008-2010 are shown in Table 20 (overleaf).

Table 19: Co-firing of biomass at Edenderry Power (2007-2020)

	Wood biomass used 000 wet tonnes
2007	na
2008	18
2009	66
2010	111
2016f	300
2020f	500

Table 20: Biomass use at Edenderry Power (000 Tonnes) by category and usage (2008-2010)

Biomass category	Biomass type	2008	2009	2010
Forest-based biomass	Woodchip	10	43	52
	Sawdust	7	9	9
Energy crops	Willow chips	1	0	5
	Miscanthus	0	0	2
Dry materials	Wood pellets	1	14	20
	Palm kernel shells	0	0	17
	Almond shells	0	0	5
	Other agri-residues	0	0	1
TOTAL		19	66	111

Table 21: Output of forest-based biomass fuelled CHP plants on the island of Ireland (2010)

	Feedstock	Electricity capacity MWe	Heat capacity MWth
Balcas Fuel, Enniskillen, Co Fermanagh	Sawmill residues	2.7	10.0
Grainger Sawmills, Enniskeane, Co Cork	Sawmill residues	2.0	4.0
Munster Joinery Ltd., Ballydesmond, Co Cork	Joinery residues	3.0	-
TOTAL		7.7	14.0

Eoin O'Driscoll, Consultant, Drima Marketing (www.drima.com).

There are three commercial combined heat and power (CHP) plants on the island of Ireland which are fuelled using forest-based biomass; Balcas Fuel Ltd., Grainger Sawmills Ltd. and Munster Joinery Ltd.

The heat and electricity capacities of these facilities are shown in Table 21.