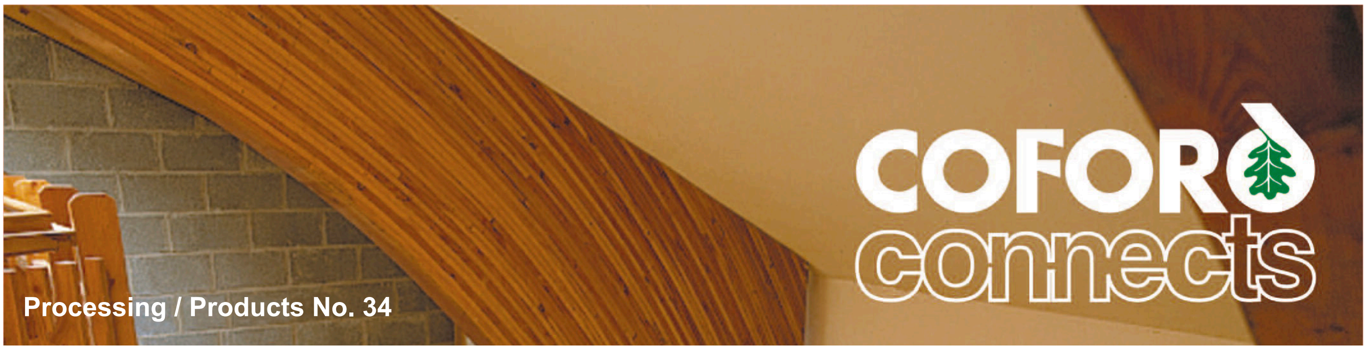

- *Including firewood, 3.04 million m[3] of roundwood was harvested in the Republic of Ireland in 2013.*
- *Roundwood available for processing in the Republic of Ireland in 2013 was 2.85 million m[3].*
- *There was strong demand for wood fibre across all assortments.*
- *In value terms, exports of wood products were €339 million, €199 million of which comprised wood-based panels.*
- *Sawn timber exports grew by 54% over the period 2008-2013.*
- *Sawn timber and wood-based panel exports in 2013 were worth €280 million.*
- *The Irish market for firewood has grown by 34% over the period 2008-2013.*
- *Sawmill output in 2013 was 825,000 m[3] of sawn timber and 106,000 m[3] of round stakes.*
- *Wood-based panel output was 739,000 m[3].*
- *In 2013, 34% of roundwood harvest was used for energy production.*

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Woodflow and forest-based biomass energy use on the island of Ireland (2013)

Gordon Knaggs[1] and Eoin O'Driscoll[2]

Introduction

This COFORD Connects Note provides the 2013 woodflows for the Republic of Ireland and for the island of Ireland, together with an analysis of the use of forest-based biomass for energy production. It is largely based on national wood harvest and forest product trade data, compiled on behalf of the Department of Agriculture, Food and the Marine, and used to complete the annual Joint Forest Sector Questionnaire (JFSQ), run by EUROSTAT, the UNECE Forestry and Timber Committee, the Food and Agriculture Organisation (FAO) and the International Tropical Timber Organisation (ITTO). JFSQ and other data sources are used to compile global forest statistics and can be accessed at the FAOSTAT website[3,4].

Sources and uses of roundwood available for processing in the Republic of Ireland

In 2013, 3.04 million m[3] of roundwood was harvested in the Republic of Ireland (Table 1)[5].

Table 1: Total roundwood harvest including firewood in the Republic of Ireland (2008-2013)[6].

	2008	2009	2010	2011	2012	2013
	000 m³ OB					
Coillte harvest	2,337	2,428	2,517	2,492	2,485	2,588
Private harvest	118	155	387	460	354	448
TOTAL	2,455	2,583	2,904	2,952	2,839	3,036

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3. http://faostat.fao.org/site/626/default.aspx#ancor
4. Domestic production of harvested wood products (mainly sawn timber and panel products) will, from 2012 onwards, form part of the national calculation of greenhouse gas (GHG) emissions and removals under the Kyoto Protocol.
5. Historic harvest and trade data for the period 1961-2013 can be found on the FAOSTAT website: http://faostat.fao.org/site/626/default.aspx#ancor
6. The split of harvest between Coillte and the private sector has been revised from that shown in previous editions of Woodflow. This is based on updated harvest data for the period shown.

In 2013, 2.85 million m^3 of roundwood was processed in the Republic of Ireland[7], a 10% increase on 2012 (Table 2).

Table 2: Roundwood available for processing in the Republic of Ireland (2008-2013).

	2008	2009	2010	2011	2012	2013
	000 m^3 OB					
Commercial softwood						
Imports less exports	106	-63	28	55	-18	49
Coillte	2,279	2,354	2,217	2,299	2,269	2,474
Private sector	118	130	463	386	343	328
Commercial hardwood						
Imports less exports						-1
Coillte	1	3		1	1	2
Private sector				1	1	1
TOTAL	2,504	2,424	2,708	2,742	2,596	2,853

Wood fibre sources for the processing and wood energy sectors and residue outturn are shown in Table 3; uses are in Table 4[8,9]. Wood residues are primarily used as a feedstock for sawmill kilns and for process heat in the manufacture of wood-based panels (WBP).

Table 3: Sources of softwood fibre (2008-2013)[10].

	2008	2009	2010	2011	2012	2013
	000 m^3 OB roundwood equivalent (RWE)[11]					
Roundwood[12]	2,503	2,421	2,708	2,740	2,594	2,851
Sawmill residues[13]	846	838	842	829	853	897
WBP residues[14]	106	94	101	115	104	110
Residue imports						108
Harvest residues				40	30	30
Post-consumer recovered wood (PCRW)	208	200	280	270	250	250
TOTAL	3,663	3,553	3,931	3,994	3,882	4,246

Table 4: Uses of softwood fibre (2008-2013).

	2008	2009	2010	2011	2012	2013
	000 m^3 OB RWE					
Sawmilling	1,619	1,602	1,603	1,580	1,622	1,710
Round stake	80	88	118	116	131	117
Wood-based panels	1,462	1,286	1,400	1,340	1,276	1,407
Wood-biomass energy use by the forest products sector[15]	378	431	554	572	611	704
Other uses						
Horticultural bark mulch	44	54	27	34	40	50
Wood chip for commercial biomass use	30	55	39	41	30	100
Export of forest product residues	50	37	58	196	112	88
Other uses[16]			132	115	60	70
TOTAL	3,663	3,553	3,931	3,994	3,882	4,246

In 2013, 739,000 m^3 of wood-based panels (WBP) were produced from an intake of 1.41 million m^3 of wood fibre[17], a 5% increase over 2012 (Table 5). A very high proportion (90%) of WBP manufacture was exported; 665,000 m^3, to a value of €199 million (Table 6). WBP exports mainly comprised oriented strand board (OSB) and medium density fibreboard (MDF), manufactured by Masonite, Medite and Smart*Ply*. Key export markets were the UK and the Benelux countries.

In 2013, sawmill roundwood intake was 1.71 million m^3, which was converted to 0.82 million m^3 of sawn timber[18] (Tables 4 & 5).

Table 5: Production of sawn timber and wood-based panels (2008-2013)[19].

	2008	2009	2010	2011	2012	2013
	000 m^3					
Construction timber	267	294	293	289	297	313
Pallet/packaging	232	255	255	251	258	272
Square edge fencing	190	209	209	206	211	223
Other	13	14	15	15	15	16
TOTAL sawn timber	702	772	772	761	781	824
TOTAL wood-based panels	779	709	758	736	704	739

7. *Excluding firewood and hardwood.*
8. *UNECE Joint Wood Energy Enquiry (2009-2014) and EUROSTAT Joint Forest Sector Questionnaire (2009-2014).*
9. *Wood fibre that is reused is counted twice in this model.*
10. *UNECE Joint Wood Energy Enquiry (2009-2014) & EUROSTAT Joint Forest Sector Questionnaire (2009-2014).*
11. *RWE: roundwood equivalent*
12. *Data is from Table 1.*
13. *A breakdown of sawmill residues is shown in Annex A4.*
14. *Includes bark (from the debarking lines at Medite &* Smart*Ply) and sawdust from the sanding of wood-based panels. A breakdown of WBP residues is provided in Annex A4.*
15. *Wood-biomass energy is used by the forest products sector for process drying, heating and for the generation of electricity.*
16. *Other uses includes the production of wood pellets.*
17. *Includes pulpwood, wood chips, sawdust and post-consumer recovered wood (PCRW).*
18. *Includes the production of round stake.*
19. *EUROSTAT Joint Forest Sector Questionnaire (2009-2014).*

Trade in timber products and balance and self-sufficiency in sawnwood

In 2013, exports of forest products from the Republic of Ireland were valued at €339 million, a 12% increase on 2012. Wood-based panels accounted for €199 million, the balance comprising paper and sawn timber exports (Table 6). Export volumes of WBP increased by 11% over 2012 (Table 6).

In value terms, Ireland became a net exporter of sawn timber in 2010. This was for the first time since 1961, when global forest products statistics began to be compiled by the FAO[20] (Table 7). It marked the continuation of a trend apparent since 2008 (and more apparent in the case of export volumes) with the gap between the value of exports and imports closing due to the collapse of the domestic construction market and increased levels of exports, mainly to the UK.

Over the period 2011-2013, consumption of sawn timber in the Republic of Ireland grew by 7%. In 2013, 67% of the Irish market for sawn softwood timber was supplied by domestic production with the balance being imported. Over the same period, only 4% of the Irish market for sawn hardwood was supplied domestically (Table 8).

Table 6: Timber and paper products trade, volume and value (2008-2013)[21].

	Imports											
	2008	2009	2010	2011	2012	2013	2008	2009	2010	2011	2012	2013
	000 m³						€ million					
Sawn timber	412	232	242	201	145	134	141	66	74	64	54	51
Wood-based panels	264	181	166	195	204	194	108	68	65	68	75	78
	000 tonnes											
Pulp products	29	32	41	54	47	50	20	22	31	45	45	41
Paper and paper-board products	526	379	370	383	415	428	520	308	313	333	339	340
TOTAL							789	464	483	510	513	510
	Exports											
	2008	2009	2010	2011	2012	2013	2008	2009	2010	2011	2012	2013
	000 m³						€ million					
Sawn timber	389	564	658	619	534	601	54	51	85	83	73	81
Wood-based panels	614	580	660	616	630	665	195	147	179	173	179	199
	000 tonnes											
Pulp products	2		1									
Paper and paper-board products	77	45	33	59	68	81	69	45	44	52	51	59
TOTAL							318	243	308	308	303	339

Table 7: Overall balance of trade in the value of timber products (2008-2013)[22].

	2008	2009	2010	2011	2012	2013
	€ million					
Sawn timber	-87	-15	11	19	19	30
Wood-based panels	87	79	114	105	104	121
Pulp products	-20	-22	-31	-45	-45	-41
Paper and paper-board products	-451	-263	-269	-281	-288	-281
TOTAL	-471	-221	-175	-202	-210	-171

Table 8: Self-sufficiency in sawnwood (2008-2013)[23].

	Sawn softwood						Sawn hardwood					
	2008	2009	2010	2011	2012	2013	2008	2009	2010	2011	2012	2013
	000 m³ UB											
Domestic production	696	772	772	760	782	824	1	3		1	1	1
Exports	387	563	658	619	534	601	2	1	1	1		
Imports	346	191	205	169	116	108	65	41	37	32	28	26
TOTAL consumption[24]	655	400	319	310	364	331	64	43	36	32	29	27
% of sawn timber market which is supplied by domestic production	47	52	36	45	68	67	2	7		3	3	4

20. *http://faostat.fao.org/site/626/default.aspx#ancor*

21. *Includes import/export figures for sawn timber, wood-based panels and pulp/paper products only. Data are taken from Ireland's EUROSTAT Joint Forest Sector Questionnaire (JFSQ) returns (2009-2014). Roundwood, sawmill residues and secondary processed timber products are not included. Trade data for the JFSQ is provided by the Central Statistics Office (CSO); www.cso.ie*

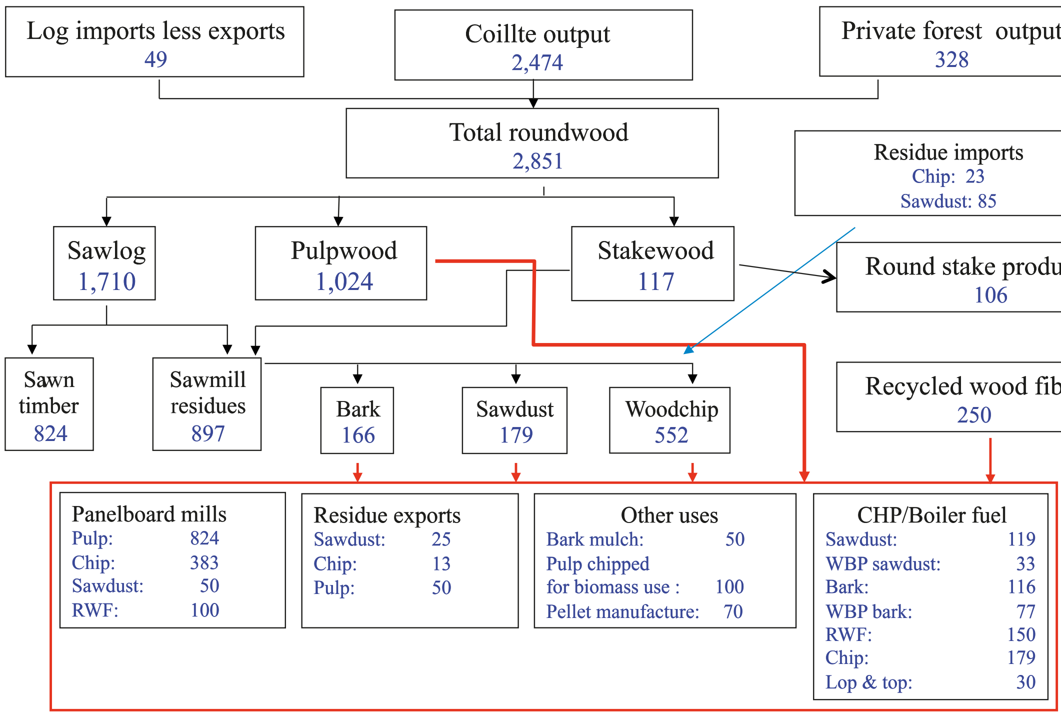
22. *Negative values show a surplus of imports over exports.*

23. *Central Statistics Office; www.cso.ie & EUROSTAT Joint Forest Sector Questionnaire (2009-2014).*

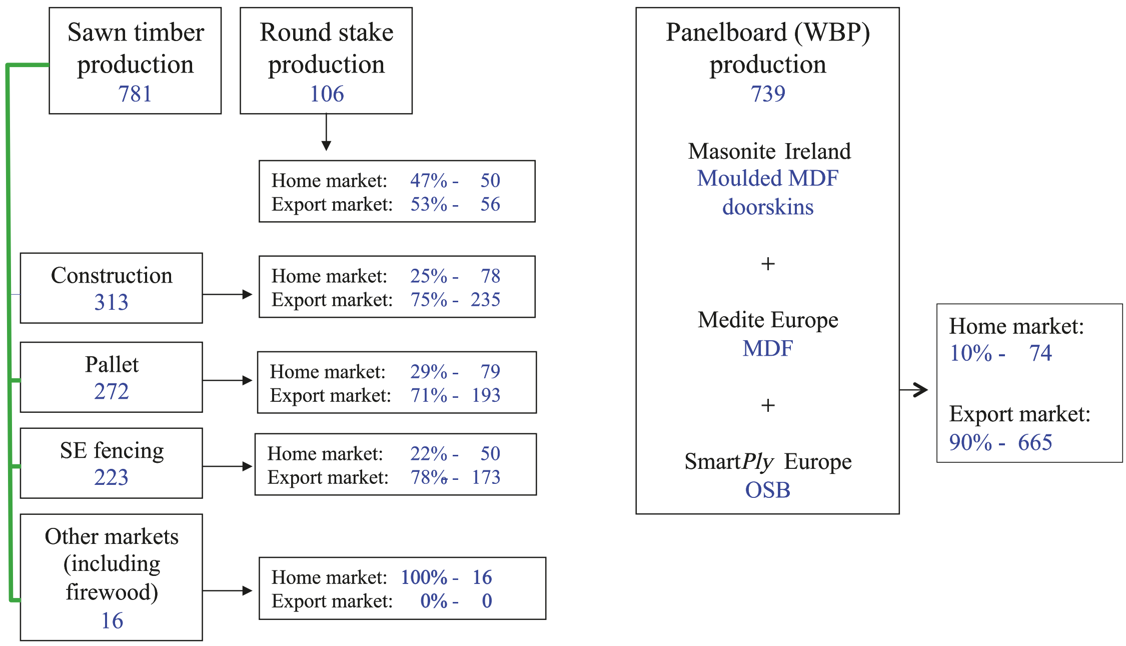
24. *Total consumption is calculated as follows: domestic production + (imports-exports).*

Woodflow for the Republic of Ireland in 2013

Figure 1: Woodflow for the Republic of Ireland for 2013 (000 m³) [overbark]



Breakdown of 2013 wood products (000 m³)



All island woodflow (2011-2013)

The all island woodflow for the period 2011-2013 is provided in Annex A. In 2013, the volume of roundwood processed on the island of Ireland was 3.52 million m^3, an 8% increase over 2012 (A1). Over the same period, the output of sawn timber increased by 4.5% (A2), while wood-based panel output increased by 5% over 2012 (A5).

Forest-based biomass use for energy production and relationship with national policies and goals

In 2013, 34% of the roundwood harvested in the Republic of Ireland was used for energy generation, mainly within the forest products sector (Table 9). Since 2006, the use of wood-biomass energy in Ireland has resulted in an estimated greenhouse gas (GHG) emission saving of 3.67 million tonnes of carbon dioxide (CO_2). Wood-biomass fuels used by the sector are shown in Table 9.

In 2013, the output of the forest-based biomass energy sector grew by 13.8% over 2012 (Table 10). In 2013, 230,000 m^3 of firewood was used in the Republic of Ireland to a value of €33 million, showing that it is providing a steady and a growing market for first thinnings (Table 11). In addition, firewood is also harvested by forest owners for their own use.

Table 9: Use of forest-based biomass and as a proportion of total roundwood harvest (2008-2013)[25].

	2008	2009	2010	2011	2012	2013
	000 m³ OB RWE					
Wood-biomass use by the energy[26] and forest products industry	384	438	554	572	611	660
Roundwood chipped for primary energy use	63	53	39	41	30	100
Domestic firewood use	171	184	199	214	225	230
Short rotation coppice (SRC)	1	4	1	5	5	5
Wood pellets and briquettes	82	110	121	129	144	161
Charcoal	2	2	2	5	2	1
TOTAL	703	791	916	966	1,017	1,157
Of which supplied from domestic resources	676	737	841	896	910	1,034
Roundwood harvest						
Roundwood available for processing	2,504	2,424	2,708	2,740	2,594	2,852
Firewood harvest	171	184	199	214	225	230
Total roundwood harvest	2,675	2,608	2,907	2,954	2,819	3,082
Wood-biomass use as a % of total roundwood harvest	25.3	28.3	28.9	30.3	32.3	33.5

Table 10: Output use of forest-based biomass and associated greenhouse gas emissions mitigation (2008-2013)[27].

	Unit	2008	2009	2010	2011	2012	2013
		Output					
Heat	TJ	4,857	5,273	6,306	6,604	6,808	7,002
Electricity	TJ	112	240	372	378	477	491
TOTAL	TJ	4,969	5,513	6,678	6,982	7,285	7,493
CO_2 abated	000 tonnes	380	422	511	534	557	573

Table 11: Volume and value of the domestic firewood market in the Republic of Ireland (2008-2013)[28].

	000 m³ OB	€ million
2008	171	24.83
2009	184	26.75
2010	199	28.80
2011	214	30.97
2012	225	32.56
2013	230	33.33

Contribution of renewables to heat and electricity demand[29]

Renewable heat (RES-H)[30]

Renewable energy contributing to Ireland's thermal energy requirements is dominated by industrial biomass use, in particular the use of waste wood to produce heat in fibre board manufacture, joineries and wood processing plants and by the use of tallow from rendering plants to produce heat.

In 2012, renewable heat (RES-H) accounted for 5.2% of all thermal energy. RES-H grew from 2.6% in 1990 to 5% in 2011. Since 2005, the use of renewable heat by industry has remained relatively static since while use in the residential and services sectors has increased by 122% and 400% respectively, albeit from quite low bases. Over the period 1990-2012, the overall use of renewable heat grew by 10.8%.

Renewable electricity (RES-E)[31]

Wind energy dominates this sector. Over the period 1990-2012, the share of electricity from renewable energy has increased fourfold, from 4.9% to 19.6%. Most of this increase has taken place since 2000. The breakdown of renewable electricity by type for the period 1990-2012 is shown in Table 12.

25. *Source: UNECE Joint Wood Energy Enquiry (JWEE); 2009 -2014.*
26. *This includes co-firing of wood-biomass at Edenderry Power; www.edenderrypower.ie*
27. *UNECE Joint Wood Energy Enquiry (2009-2014).*
28. *drima market research study*
29. *At the time of writing, data for 2013 was not available.*
30. *http://www.seai.ie/Publications/Statistics_Publications/Renewable_Energy_in_Ireland/Renewable-Energy-in-Ireland-2012.pdf*
31. *http://www.seai.ie/Publications/Statistics_Publications/Renewable_Energy_in_Ireland/Renewable-Energy-in-Ireland-2012.pdf*

Table 12: Generation of renewable electricity in Ireland (1990-2012) by source[32].

	1990	2000	2005	2006	2007	2008	2009	2010	2011	2012
	GWh									
Hydro	753	812	760	757	745	757	754	754	752	759
Wind		240	1,102	1,624	2,031	2,391	2,936	3,227	3,830	4,247
Biomass			8	8	14	33	65	111	137	244
Landfill gas		95	106	108	139	159	169	184	181	175
Biogas			16	12	17	17	17	22	21	21
TOTAL	753	1,147	1,992	2,509	2,946	3,357	3,941	4,298	4,921	5,446

Abbreviations

Abbreviation	Description
AD	Anaerobic digestion
BF	Boiler fuel
CHP	Combined heat & power
GHG	Greenhouse gas
GHS	Greener homes scheme
GWh	Gigawatt hour
kW	Kilowatt
m^3	Cubic metre
LPG	Liquid petroleum gas
MDF	Medium density fibreboard
MWe	Megawatt electricity
MWh	Megawatt hour
MWth	Megawatt thermal
NA	Not available
NIFS	Northern Ireland Forest Service
OB	Overbark
OSB	Oriented strand board
PAO	Planed-all-over
PB	Particleboard/chipboard
PCRW	Post-consumer recovered wood
REFIT	Renewable energy feed in tariff
RES	Renewable energy source
RES-E	Renewable electricity
RES-H	Renewable heat
RES-T	Renewable energy used in transport
RWE	Roundwood equivalent
RWF	Re-cycled wood fibre. This is also known as post-consumer recovered wood (PCRW)
SE	Square edged
SEAI	Sustainable Energy Authority of Ireland
TJ	Terajoule
TPER	Total primary energy requirement
UB	Underbark
WBP	Wood-based panels
WBP B	Bark arising from roundwood used in the production of wood-based panels
WBP SD	Sawdust from sanding of wood-based panels

[32] *http://www.seai.ie/Publications/Statistics_Publications/Renewable_Energy_in_Ireland/Renewable-Energy-in-Ireland-2012.pdf*

Annex A: All island woodflow (2011-2013) and breakdown of use categories

A1: Softwood fibre processed[33].

	2011			2012			2013		
	ROI	NI	Total	ROI	NI	Total	ROI	NI	Total
					000 m³ OB				
Roundwood source									
Imports less exports[34]	55	185	240	-18	200	182	49	204	253
NIFS[35]		473	473		428	428		422	422
Coillte[36]	2,299		2,299	2,269		2,269	2,474		2,474
Private[37]	386	30	416	343	40	383	328	40	368
Roundwood processed	2,740	688	3,428	2,594	668	3,262	2,851	666	3,517
Sawlog	1,580	427	2,007	1,622	414	2,036	1,710	415	2,125
Stakewood	116	117	233	131	114	245	117	116	233
Pulpwood	1,044	144	1,188	841	140	981	1,024	135	1,159
Roundwood processed	2,740	688	3,428	2,594	668	3,262	2,851	666	3,517
PCRW[38, 39]	270	60	330	250	60	310	250	60	310
Fibre total including PCRW	3,010	748	3,758	2,844	728	3,572	3,101	726	3,827

A2: Sawmill input/output.

	2011			2012			2013		
	ROI	NI	Total	ROI	NI	Total	ROI	NI	Total
					000 m³ OB				
Input[40]									
Sawlog	1,580	427	2,007	1,622	414	2,036	1,710	415	2,125
Stakewood	116	117	233	131	114	245	117	111	228
TOTAL	1,696	544	2,240	1,753	528	2,281	1,827	526	2,353
Output[41, 42]									
Sawn timber	761	205	966	781	199	980	824	200	1,024
Round stakes	106	101	207	119	98	217	106	100	206
Sawmill residues	829	238	1,067	853	231	1,084	897	226	1,123
TOTAL	1,696	544	2,240	1,753	528	2,281	1,827	526	2,353

33. *Roundwood available for processing excludes both hardwood and firewood.*
34. *Sources: Coillte, NIFS, Forestry Commission (GB), trade estimates.*
35. *Source: Northern Ireland Forest Service (NIFS).*
36. *Source: Coillte.*
37. *Sources: Private forest management companies, Forestry Commission (GB).*
38. *Sources: EPA, Environment Service (NI), Trade Estimates, Joint Wood Energy Enquiry (JWEE) [2010-2014], WRAP UK.*
39. *PCRW: Post-consumer recovered wood.*
40. *Sources: Coillte, NIFS, private forest management companies, Forestry Commission (GB) and trade estimates.*
41. *Sawmill output data has been checked against industry estimates.*
42. *Sources: Forestry Commission (GB) sawmill survey and industry expert opinion.*

A3: Sawmill output by market/end use[43, 44, 45].

	2011							2012							2013						
	ROI			NI			Total	ROI			NI			Total	ROI			NI			Total
	Hm	Exp	T	Hm	Exp	T		Hm	Exp	T	Hm	Exp	T		Hm	Exp	T	Hm	Exp	T	
	000 m³ UB																				
Construction	58	231	289	35	35	70	359	80	217	297	34	34	68	365	78	235	313	36	37	73	386
Pallet/packaging	63	188	251	20	23	43	294	64	194	258	20	22	42	300	79	193	272	18	19	37	309
SE fencing[46]	70	136	206	44	44	88	294	89	122	211	42	43	85	296	50	173	223	43	43	86	309
Round stakes	42	64	106	40	61	101	207	48	71	119	38	60	98	217	50	56	106	40	60	100	206
Other markets	15		15	4		4	19	15		15	4		4	19	16		16	4		4	20
TOTAL			867			306	1,173			900			297	1,197			930			300	1,230

A4: Feedstock for WBP, biomass energy & other uses.

	2011			2012			2013		
	ROI	NI	Total	ROI	NI	Total	ROI	NI	Total
	000 m³ OB								
Pulpwood[47]	1,044	144	1,188	841	140	981	1,024	135	1,159
PCRW[48]	270	60	330	250	60	310	250	60	310
Sawmill residues[49]									
Woodchip imports				4		4	23		23
Sawdust imports				47		47	85		85
Bark	154	34	188	159	33	192	166	33	199
Sawdust	165	42	207	170	41	211	179	41	220
Woodchip	510	146	656	524	141	665	552	141	693
Woodchip from stakes		16	16		16	16		16	16
WBP residues[50]									
Bark	82		82	73		73	77		77
Sawdust	33		33	31		31	33		33
Woodchip									
TOTAL	2,258	442	2,700	2,099	431	2,530	2,389	426	2,815

A5: WBP input/output[51,52].

	2011			2012			2013		
	ROI	NI	Total	ROI	NI	Total	ROI	NI	Total
	000 m³ OB								
Pulpwood	900		900	811		811	824		824
PCRW[53]	90		90	100		100	100		100
Sawdust[54]				41		41	50		50
Woodchip[55]	350		350	324		324	433		433
Total input	1,340		1,340	1,276		1,276	1,407		1,407
Total output[56, 57]	736		736	704		704	739		739

43. Sawmill output data has been checked against industry estimates.
44. Hm: home market; Exp: export market: T: total
45. Sources: Forestry Commission (GB) & industry expert opinion.
46. SE: Square edged.
47. Source: Industry expert opinion.
48. Sources: Industry expert opinion and the Environmental Protection Agency (EPA).
49. Source: Industry expert opinion.
50. Source: Industry expert opinion.
51. This input is for the production of wood-based panels. This excludes boiler fuels. These are detailed overleaf.
52. In January 2011, Finsa Forest Products Ltd. ceased producing particleboard in Scariff, Co Clare.
53. Sources: EPA & industry expert opinion.
54. Source: Industry expert opinion.
55. Source: Forestry Commission (GB) & industry expert opinion.
56. Sources: Board mill survey & industry expert opinion.
57. All Ireland WBP output includes the output of the all WBP plants operating on the island of Ireland. These are Masonite Ireland, Medite Europe and SmartPly *Europe.*

A6: Feedstock for wood-biomass energy (WBE) & other uses.

Item	WBE 2011			WBE 2012			WBE 2013			Other uses 2011			Other uses 2012			Other uses 2013		
	ROI	NI	Total	ROI	NI	Total	ROI	NI	Total	ROI	NI	Total	ROI	NI	Total	ROI	NI	Total
	000 m³ OB																	
Pulpwood																		
Domestic/ industrial heating fuel[58,59,60]	41	25	66	30	25	55	100	25	125									
Bio energy[61]		75	75		50	50		50	50									
Other markets										53		53				50		50
Exported[62]										50	44	94	75	65	140	50	60	110
Total pulpwood	41	100	141	30	75	105	100	75	175	103	44	147	75	65	140	100	60	160
PCRW																		
CHP/WBP boiler fuel (BF)[63]	177	20	197	150	30	180	150	30	180									
Exported										3	40	43		30	30		30	30
Total PCRW	177	20	197	150	30	180	150	30	180	3	40	43		30	30		30	30
Bark																		
Sawmill bark used for biomass energy[64]	120	25	145	119	25	144	116	25	141									
WBP bark used for biomass energy[65]	82		82	73		73	77		77									
Bark mulch[66]										34	9	43	40	8	48	50	8	58
Total bark	202	25	227	192	25	217	193	25	218	34	9	43	40	8	48	50	8	58
Sawdust																		
Sander line sawdust used for WBP BF	33		33	31		31	33		33									
Sawdust used as BF by sawmills	40	5	45	56	21	77	86	21	107									
Other energy use					34	34	33		33									
Exported										63	15	78	26		26	25		25
Pellet manufacture[67]	62	22	84	60	20	80	70	20	90									
Total sawdust	135	27	162	181	41	222	222	41	263	63	15	78	26		26	25		25
Woodchip[68]																		
Woodchip used for CHP	80	60	140	118	30	148	129	30	159									
Woodchip exports										80	26	106	86	21	107	13		13
Pellet manufacture		60	60		90	90		111	111									
Other uses including animal bedding											16	16		16	16		16	16
Total woodchip	80	120	200	118	120	238	129	141	270	80	42	122	86	37	123	13	16	29
TOTAL	635	292	927	671	291	962	794	312	1,106	283	150	433	227	140	367	138	164	302

58. *Sources: SEAI survey (ROI), industry expert opinion.*
59. *Source: Industry expert opinion.*
60. *This includes pulp used for the manufacture of wood pellets.*
61. *Source: Forestry Commission (GB).*
62. *Source: Industry expert opinion.*
63. *Sources: EPA survey & industry expert opinion.*
64. *Sources: SEAI, Forestry Commission (GB).*
65. *Sources: Forestry Commission (GB) & industry expert opinion.*
66. *Sources: Industry expert opinion.*
67. *Source: Industry expert opinion.*
68. *Sources: Forestry Commission (GB) & industry expert opinion.*