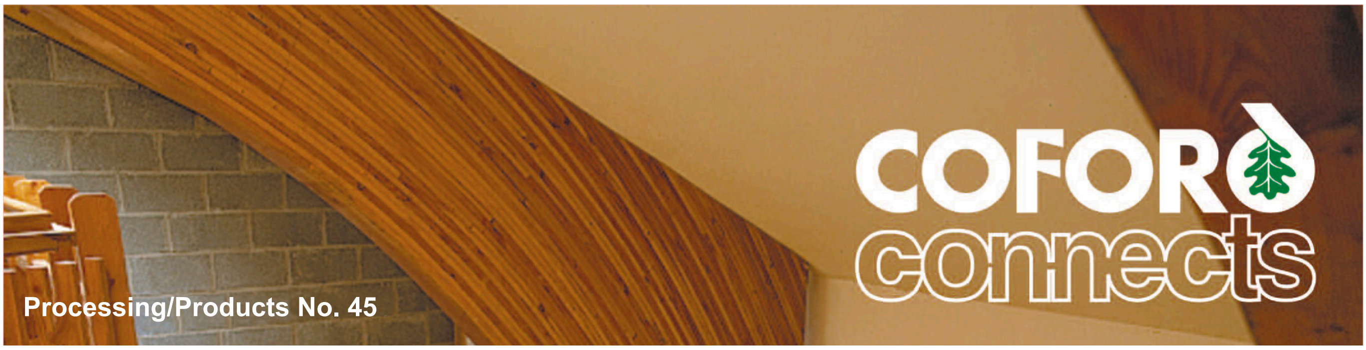

- *Roundwood harvest (including firewood) in the Republic of Ireland in 2015 was 3.25 million m^3, the highest level since records began.*
- *Softwood available for processing in 2015 was 3.07 million m^3.*
- *There was strong demand for wood fibre across all assortments.*
- *Product output in 2015 comprised 929,000 m^3 of sawn softwood, 154,000 m^3 of round stakes and 769,000 m^3 of wood-based panels.*
- *Exports of wood products reached €355 million, €190 million of wood-panels, €121 million of sawn timber and paper and €44 million of paper & paper-board products.*
- *Due to increased domestic demand, sawn timber exports declined by 2.4% in volume terms over 2014.*
- *Output of the forest-based biomass energy sector increased by 3% over 2014.*
- *In 2015, 35% of the roundwood available for use in the Republic of Ireland was used for energy purposes.*

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Woodflow and forest-based biomass energy use on the island of Ireland (2015)

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

Introduction

This COFORD Connects Note provides the 2015 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 which can be accessed at the FAOSTAT website[3,4].

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

In 2015, 3.25 million m^3 of roundwood was harvested in the Republic of Ireland (Table 1)[5]. This is the highest level since records began in 1961.

Table 1: Total roundwood harvest (including firewood) in the Republic of Ireland (2011-2015).

Harvest type	2011	2012	2013	2014	2015
			000 m^3 OB		
Coillte	2,492	2,485	2,588	2,517	2,470
Private	460	354	448	597	780
TOTAL	2,952	2,839	3,036	3,114	3,250

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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 1961-2015 can be found on the FAOSTAT website: http://faostat.fao.org/site/626/default.aspx#ancor*

In 2015, 3.07 million cubic metres of roundwood was available for processing in the Republic of Ireland[6], a 3.8% increase on 2014 (Table 2).

Table 2: Roundwood available for processing in the Republic of Ireland (2011-2015).

Item	2011	2012	2013	2014	2015
			000 m^3 OB		
Commercial softwood					
Imports less exports	55	-18	49	68	40
Coillte	2,299	2,269	2,474	2,434	2.377
Private sector	386	343	328	447	646
Commercial hardwood					
Imports less exports			-1		
Coillte	1	1	2	6	3
Private sector	1	1	1		
TOTAL	2,742	2,596	2,853	2,955	3,066

Wood fibre sources for the processing and wood energy sectors, and residue outturn are shown in Table 3; uses are in Table 4[7,8]. Wood residues are primarily used as a fuel for sawmill kilns and for process heat in the manufacture of wood-based panels (WBP).

Table 3: Sources of softwood fibre (2011-2015)[9].

Fibre source	2011	2012	2013	2014	2015
			000 m^3 OB RWE[10]		
Roundwood[11]	2,740	2,594	2,851	2,949	3,063
Sawmill residues[12]	829	853	897	925	949
Wood-based panel residues[13]	115	104	110	114	114
Residue imports			108	49	47
Harvest residues	40	30	30	60	60
Post-consumer recovered wood (PCRW)	270	250	250	300	300
TOTAL	3,994	3,882	4,246	4,397	4,533

Table 4: Uses of softwood fibre (2011-2015).

Fibre use	2011	2012	2013	2014	2015
			000 m^3 OB RWE		
Sawmilling	1,580	1,622	1,710	1,815	1,867
Round stake	116	131	117	147	169
Wood-based panels	1,340	1,276	1,407	1,377	1,370
Wood biomass energy use by the power generation and forest products sector[14]	572	611	704	760	796
Other uses					
Horticultural bark mulch	34	40	50	40	30
Wood chip for commercial biomass use[15]	41	30	100	100	114
Export of forest product residues	196	112	88	88	36
Other uses[16]	115	60	70	70	151
TOTAL	3,994	3,882	4,246	4,397	4,533

In 2015, 769,000 m^3 of wood-based panels (WBP) were produced from an intake of 1.37 million m^3 of wood fibre[17], virtually unchanged over 2014 (Table 5). A very high proportion (79%) of WBP manufacture was exported (610,000 m^3) to a value of €190 million (Table 6). WBP exports mainly comprised oriented strand board (OSB) and medium density fibreboard (MDF), manufactured by Masonite, Medite and SmartPly. Key export markets were the UK and the Benelux countries.

In 2015, sawmill roundwood intake was 1.87 million m^3, which was converted to 0.93 million m^3 of sawn timber[18] (Tables 4 & 5). This volume increased by 2.9% over 2014.

In 2015, an increased volume of home produced WBP and sawn timber was sold in the domestic marketplace. This was due to the partial recovery of the housing and construction market. This is also evident in the increase in the volumes of WBP (+2%) and sawn timber (+11%) imported in 2015 compared with 2014 (Table 6).

Table 5: Production of sawn timber and wood-based panels (2011-2015)[19,20].

Product	2011	2012	2013	2014	2015
			000 m^3		
Construction timber	289	297	313	478	491
Pallet/packaging	251	258	272	209	221
Square edge fencing	206	211	223	203	203
Other	15	15	16	17	16
TOTAL sawn wood	761	781	824	907	931
TOTAL wood-based panels	736	704	739	773	769

6. *Firewood is excluded.*
7. *UNECE Joint Wood Energy Enquiry (2012-2016) and EUROSTAT Joint Forest Sector Questionnaire (2012-2016).*
8. *Wood fibre that is reused is counted twice in this model.*
9. *UNECE Joint Wood Energy Enquiry (2012-2016) & EUROSTAT Joint Forest Sector Questionnaire (2012-2016).*
10. *RWE: roundwood equivalent*
11. *Data are from Table 1.*
12. *A breakdown of sawmill residues is shown in AnnexA4.*
13. *Includes bark (from the debarking lines at Medite & SmartPly) and sawdust from the sanding of wood-based panels. A breakdown of WBP residues is provided in Annex A4.*
14. *Wood biomass energy is used by the forest products sector for process drying, heating and for the generation of electricity. This includes the use of wood biomass energy for co-firing by Edenderry Power.*
15. *Primarily used for the production of space or production heat.*
16. *Other uses include 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 (2012-2016).*
20. *In 2015 and in 2016, sawmill output for 2014 and 2015 was estimated by a sawmill survey. This has provided a better estimate of products manufactured and the volume of output.*

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

In 2015, exports of forest products from the Republic of Ireland were €355 million, a 4% decline on 2014. Wood-based panels accounted for €190 million, the balance comprising paper and sawn timber exports (Table 6). Export volumes of WBP declined by 8% on 2014, while exports of sawn timber declined by 2.4% over 2014 (Table 6). The decline in the exports of sawn softwood is largely due to the increased use of domestically produced sawn softwood in the Irish market.

In 2015, 54% of the Irish market for sawn softwood timber was supplied by domestic production with the balance being imported. However, over the same period, only 3% of the Irish market for sawn hardwood was supplied domestically (Table 8).

In 2015, forest products to the value of €612 million were imported into Ireland. This trade is dominated by the importation of pulp, paper and paper-board products. In 2015, these imports represented 67% of forest product imports into Ireland.

Table 6: Timber and paper products trade, volume and value (2011-2015)[21].

Product	Imports									
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
	000 m³					€ million				
Sawn timber	201	145	134	205	227	64	54	51	74	88
Wood-based panels	195	204	194	235	240	68	75	78	98	112
	000 tonnes									
Pulp products	54	47	50	46	51	45	45	41	42	53
Paper and paper-board products	383	415	428	404	427	333	339	340	340	359
TOTAL						510	513	510	554	612
Product	**Exports**									
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
	000 m³					€ million				
Sawn timber[22]	619	534	601	718	701	83	73	81	122	121
Wood-based panels	616	630	665	662	610	179	173	179	199	190
	000 tonnes									
Pulp products										
Paper and paper-board products	59	68	81	67	86	52	51	59	50	44
TOTAL						308	303	339	370	355

Table 7: Overall balance of trade in the value of forest products (2011-2015)[23].

Product	2011	2012	2013	2014	2015
	€ million				
Sawn timber	19	19	30	48	33
Wood-based panels	105	104	121	101	78
Pulp products	-45	-45	-41	-42	-53
Paper and paper-board products	-281	-288	-281	-290	-315
TOTAL	-202	-210	-171	-183	-257

Table 8: Self-sufficiency in sawnwood (2011-2015)[24].

Item	Sawn softwood					Sawn hardwood				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
	000 m³ UB									
Domestic production	760	782	824	904	929	1	1	1	3	2
Exports	619	534	601	718	700	1	0	0	1	1
Imports	169	116	108	175	194	32	28	26	30	33
TOTAL consumption[25]	310	364	331	361	423	32	29	27	32	34
% of sawn timber market which is supplied by domestic production	45	68	67	52	54	3	3	4	6	3

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 (2012-2016). 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. *In 2013-2014, the value of sawn timber exports grew by 51%, while volume grew 20%. The difference between value and volume may be due to a combination of changes in the euro/Sterling exchange rate and increases in product prices.*

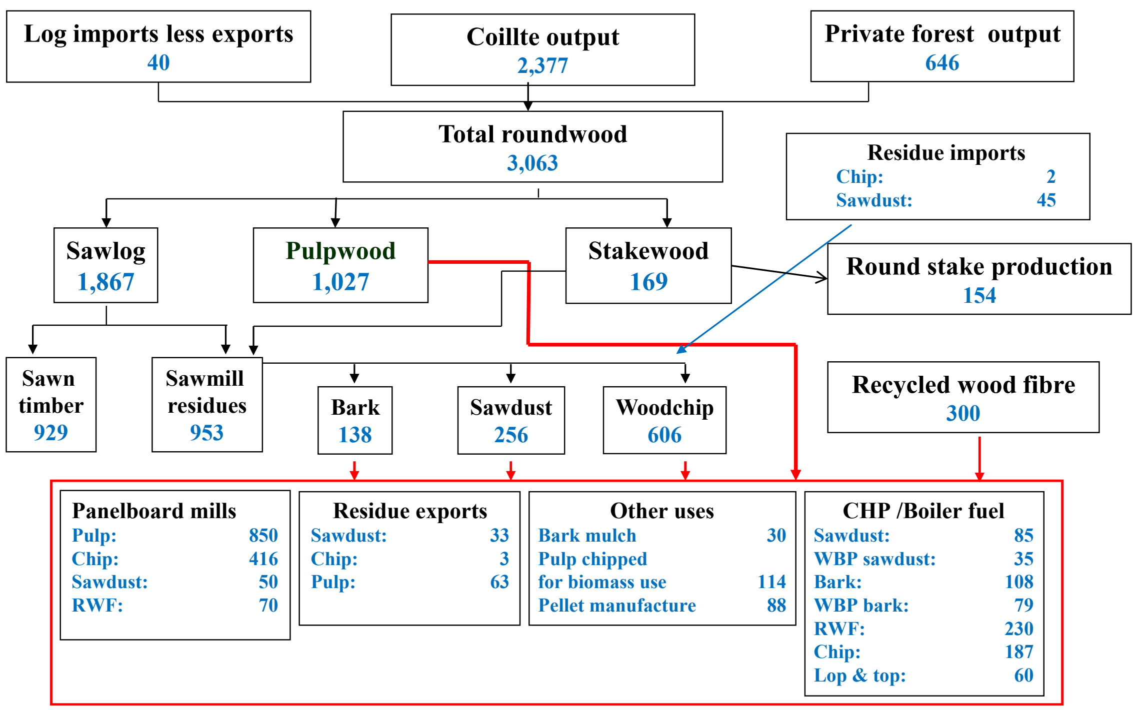
23. *Negative values show a surplus of imports over exports.*

24. *Central Statistics Office; www.cso.ie & EUROSTAT Joint Forest Sector Questionnaire (2012-2016).*

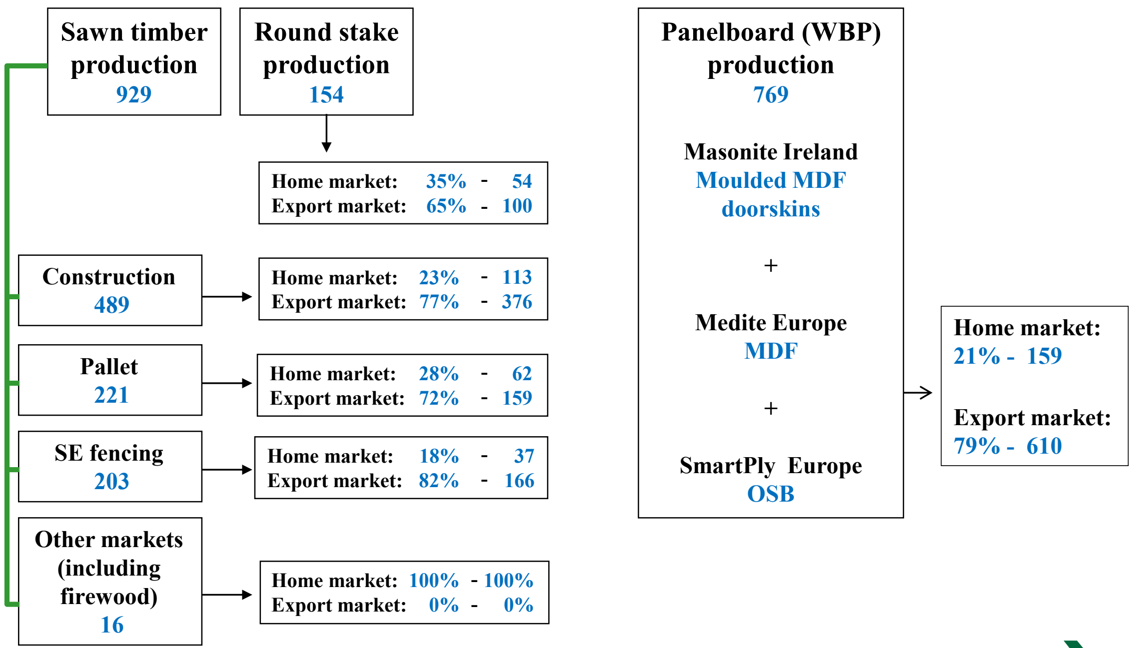
25. *Total consumption is calculated as: domestic production + (imports-exports).*

Woodflow for the Republic of Ireland in 2015

Figure 1: Woodflow for the Republic of Ireland for 2015 (000 m³) [overbark]



Breakdown of 2015 wood products (000 m³)



All island woodflow (2013-2015)

The all island woodflow for the period 2013-2015 is provided in Annex A. In 2015, the volume of roundwood processed on the island of Ireland was 3.67 million m^3, a 1.6 % increase over 2014 (A1). Over the same period the output of sawn timber increased by 0.4% (A2), while wood-based panel output declined by 0.5% over 2014 (A5).

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

In 2015, 35% of the roundwood used in the Republic of Ireland was used for energy generation, mainly within the forest products sector (Table 9). The use of wood biomass energy in Ireland results in greenhouse gas (GHG) emission savings from the displacement of fossil fuels. As shown in Table 10, the saving in 2013 is estimated as over 0.5 million tonnes of carbon dioxide (CO_2), which compares with total emissions of 57.8 million tonnes of carbon dioxide (CO_2) in the same year.

In 2015, the output of the forest-based biomass energy sector grew by 3% over 2014 (Table 10). However, demand for wood-biomass energy from Edenderry Power was reduced in 2015, caused by the outage of the power station to facilitate a boiler upgrade.

In 2015, 237,000 m^3 of firewood was used in the Republic of Ireland to a value of €34 million, showing that it is providing a steady and a growing market for first thinnings (Table 11). 8,000 m^3 of this demand was imported, with the balance being supplied domestically. In addition, firewood is also harvested by forest owners for their own use. Wood-biomass fuels used by the sector are shown in Table 9.

Ireland's progress towards meeting its renewable energy targets is detailed in Table 12[26].

Table 9: Use of forest-based biomass and as a proportion of total roundwood harvest (2011-2015)[27].

Item	2011	2012	2013	2014	2015
	000 m^3 OB RWE				
Wood-biomass use by the energy[28] and forest products industry	572	611	704	760	796
Roundwood chipped for primary energy use[29]	41	30	100	100	114
Domestic firewood use	214	225	230	235	237
Short rotation coppice (SRC)	5	5	5	5	5
Wood pellets and briquettes	129	144	161	150	154
Charcoal	5	2	1	1	1
TOTAL	966	1,017	1,201	1,251	1,307
Of which supplied from domestic resources	896	910	1,034	1,166	1,132
Roundwood available for processing	2,740	2,594	2,852	2,975	3,016
Firewood used	214	225	230	235	237
TOTAL roundwood use[30]	2,954	2,819	3,082	3,210	3,253
Wood-biomass use as a % of total roundwood used	30.3	32.3	33.5	36.3	34.8

Table 10: Output use of forest-based biomass and associated greenhouse gas emissions mitigation (2011-2015)[31].

Item	Unit	2011	2012	2013	2014	2015
		Output				
Heat	TJ	6,604	6,808	7,002	7,562	7,730
Electricity	TJ	378	477	491	530	446
TOTAL	TJ	6,982	7,285	7,493	8,092	8,176
CO_2 abated	000 tonnes	534	557	573	619	625

Table 11: Volume and value of the domestic firewood market in the Republic of Ireland (2011-2015)[32].

Year	000 m^3 OB	€ million
2011	214	30.97
2012	225	32.56
2013	230	33.33
2014	235	34.05
2015	237	34.34

Table 12: Renewable energy progress to targets[33].

Energy type	Progress towards targets by year					Targets	
	2010	2011	2012	2013	2014	2010	2020
RES-E (normalised)	14.5	17.3	19.5	20.8	22.7	15	40
RES-T	2.4	3.8	4.0	4.9	5.2	3	10
RES-H	4.5	4.9	5.1	5.5	6.6	5	12
Directive (2009/29/EC)	5.6	6.5	7.1	7.6	8.6		16

26. *At the time of writing, data for 2015 was not available.*
27. *UNECE Joint Wood Energy Enquiry (JWEE); 2012-2016*
28. *Includes co-firing of wood biomass at Edenderry Power; www.edenderrypower.ie*
29. *Primarily used for space and process heating*
30. *Roundwood use includes the use of domestically sourced and imported roundwood*
31. *UNECE Joint Wood Energy Enquiry (2012-2016)*
32. *drima market research study*
33. *At the time of writing, data for 2015 is not fully available.*

Data sources & data consistency

Data for Woodflow 2015 is taken from a number of sources. These are detailed below:

Roundwood harvest

The domestic roundwood harvest in the Republic of Ireland is provided by means of a survey[34] of the roundwood harvest by product for the forest management companies operating in the sector. This includes Coillte and associated 3rd parties, forest management companies, investment funds, producer groups and co-ops. A percentage is added to account for those who were not surveyed.

Imports less exports

Data on the importation and exportation of roundwood to/from Ireland is provided by survey. Those surveyed include forest management companies, Coillte, the Northern Ireland Forest Service (NIFS) and sawmills.

Sawmill output

Data on the output of the sawmill sector is provided by an annual sawmill survey.

WBP output

Data on the output of the wood-based panel (WBP) sector is provided by an annual survey of WBP manufacturers.

Trade in forest products

Data on the trade in forest products to/from Ireland is provided by the Central Statistics Office (CSO)[35].

Wood-biomass energy data

Wood-biomass energy data is taken from an annual energy survey undertaken by the Sustainable Energy Authority of Ireland (SEAI)[36]. Additional data is provided from the forestry surveys detailed above and by an annual survey undertaken by drima marketing for the production of the UNECE Joint Wood Energy Enquiry (JWEE).

Data consistency

Since 2015, to ensure data consistency and accuracy prior to its publication, the data contained in the COFORD Connects Woodflow is checked, discussed and agreed with a group of industry experts.

34. *Survey data remains confidential. For reasons of commercial sensitivity, data in the Woodflow series is only published in an amalgamated format.*
35. *www.cso.ie*
36. *www.seai.ie*

Abbreviations

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

Annex A: All island woodflow (2013-2015) and breakdown of use categories

A1: Softwood fibre processed[37].

Item	2013			2014			2015		
	ROI	NI	Total	ROI	NI	Total	ROI	NI	Total
	000 m^3 OB								
Roundwood source									
Imports less exports[38]	49	204	253	68	222	290	40	253	293
NIFS[39]		422	422		401	401		366	366
Coillte[40]	2,474		2,474	2,434		2,434	2,377		2,377
Private[41]	328	40	368	447	40	487	646	40	686
Roundwood processed	2,851	666	3,517	2,949	663	3,612	3,063	659	3,722
Sawlog	1,710	415	2,125	1,815	405	2,220	1,867	414	2,281
Stakewood	117	116	233	147	108	255	169	106	275
Pulpwood	1,024	135	1,159	987	150	1,137	1,027	139	1,166
Roundwood processed	2,851	666	3,517	2,949	663	3,612	3,063	659	3,722
PCRW[42, 43]	250	60	310	300	60	360	300	60	360
TOTAL fibre including PCRW	3,101	726	3,827	3,249	723	3,972	3,363	719	4,082

A2: Sawmill input/output.

Item	2013			2014			2015		
	ROI	NI	Total	ROI	NI	Total	ROI	NI	Total
	000 m^3 OB								
Input[44]									
Sawlog	1,710	415	2,125	1,815	405	2,220	1,867	414	2,281
Stakewood	117	111	228	147	108	255	169	106	275
TOTAL	1,827	526	2,353	1,962	513	2,475	2,036	520	2,556
Output[45, 46]									
Sawn timber	824	200	1,024	904	195	1,099	929	199	1,128
Round stakes	106	100	206	133	97	230	154	96	250
Sawmill residues	897	226	1,123	925	221	1,146	953	225	1,178
TOTAL	1,827	526	2,353	1,962	513	2,475	2,036	520	2,556

37. *Roundwood available for processing excludes both hardwood and firewood.*
38. *Sources: Coillte, NIFS, Forestry Commission (GB), trade estimates.*
39. *Source: Northern Ireland Forest Service (NIFS).*
40. *Source: Coillte.*
41. *Sources: Private forest management companies, Forestry Commission (GB).*
42. *Sources: EPA, Environment Service (NI), Trade Estimates, Joint wood Energy Enquiry (JWEE) [2012-2016], WRAP UK.*
43. *PCRW: Post consumer recovered wood.*
44. *Sources: Coillte, NIFS, private forest management companies, Forestry Commission (GB) and trade estimates.*
45. *Sawmill output data has been checked against industry estimates.*
46. *Sources: Forestry Commission (GB) sawmill survey and industry expert opinion.*

A3: Sawmill output by market/end use[47, 48, 49].

Product(s)	2013							2014							2015						
	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	78	235	313	36	37	73	386	100	377	477	36	35	71	548	113	376	489	38	39	77	566
Pallet/packaging	79	193	272	18	19	37	309	50	157	207	18	18	36	243	62	159	221	20	20	40	261
SE fencing[50]	50	173	223	43	43	86	309	19	184	203	43	41	84	287	37	166	203	41	41	82	285
Round stakes	50	56	106	40	60	100	206	60	73	133	40	57	97	230	54	100	154	40	56	96	250
Other markets	16	0	16	4	0	4	20	17	0	17	4	0	4	21	16	0	16		16	4	16
TOTAL			930			300	1,230			1,037			292	1,329			1,083			295	1,378

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

Item	2013			2014			2015		
	ROI	NI	Total	ROI	NI	Total	ROI	NI	Total
	000 m³ OB								
Pulpwood[51]	1,024	135	1,159	987	150	1,137	1,027	139	1,166
PCRW[52]	250	60	310	300	60	360	300	60	360
Sawmill residues[53]									
Woodchip imports	23	0	23	5	6	11	2	3	5
Sawdust imports	85	0	85	44	17	61	45	33	78
Bark	166	33	199	140	32	172	138	33	171
Sawdust	179	41	220	209	40	249	211	41	252
Woodchip	552	141	693	576	138	714	604	141	745
Woodchip from stakes	0	16	16	0	11	11	0	10	10
WBP residues[54]									
Bark	77	0	77	79	0	79	79	0	79
Sawdust	33	0	33	35	0	35	35	0	35
TOTAL	2,389	426	2,815	2,375	454	2,829	2,441	460	2,901

A5: WBP input/output[55, 56].

Item	2013			2014			2015		
	ROI	NI	Total	ROI	NI	Total	ROI	NI	Total
	000 m³ OB								
Pulpwood	824		824	822		822	850		850
PCRW[57]	100		100	79		79	70		70
Sawdust[58]	50		50	46		46	50		50
Woodchip[59]	433		433	430		430	416		416
TOTAL input	1,407		1,407	1,377		1,377	1,386		1,386
TOTAL output[60, 61]	739		739	773		773	769		769

47. *Sawmill output data has been checked against industry estimates.*
48. *Hm: home market; Exp: export market: T: total*
49. *Sources: Forestry Commission (GB) & industry expert opinion.*
50. *SE: Square edged.*
51. *Source: Industry expert opinion.*
52. *Sources: Industry expert opinion and the Environmental Protection Agency (EPA).*
53. *Source: Industry expert opinion.*
54. *Source: Industry expert opinion.*
55. *This input is for the production of wood-based panels. This excludes boiler fuels.*
56. *In January 2011, Finsa Forest Products Ltd. ceased producing particleboard in Scariff, Co Clare.*
57. *Sources: EPA & industry expert opinion.*
58. *Source: Industry expert opinion.*
59. *Source: Forestry Commission (GB) & industry expert opinion.*
60. *Sources: Board mill survey & industry expert opinion.*
61. *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 2013			WBE 2014			WBE 2015			Other uses 2013			Other uses 2014			Other uses 2015		
	ROI	NI	Total	ROI	NI	Total	ROI	NI	Total	ROI	NI	Total	ROI	NI	Total	ROI	NI	Total
	000 m^3 OB																	
Pulpwood																		
Domestic/ industrial heating fuel[62, 63, 64]	100	25	125	100	25	125	114	25	139									
Bio energy[65]		50	50		75	75		75	75									
Other markets										50		50		50	50		30	30
Exported[66]										50	60	110	65		65	63	9	72
TOTAL pulpwood	100	75	175	100	100	200	114	100	214	100	60	160	65	50	115	63	39	102
PCRW																		
CHP/WBP boiler fuel (BF)[67]	150	30	180	221	30	251	230	30	260									
Exported											30	30		30	30		30	30
TOTAL PCRW	150	30	180	221	30	251	230	30	260		30	30		30	30		30	30
Bark																		
Sawmill bark used for biomass energy[68]	116	25	141	100	25	125	108	23	131									
WBP bark used for biomass energy[69]	77		77	79		79	79		79									
Bark mulch[70]										50	8	58	40	7	47	30	10	40
TOTAL bark	193	25	218	179	25	204	187	23	210	50	8	58	40	7	47	30	10	40
Sawdust																		
Sander line sawdust used for WBP BF	33		33	35		35	35		35									
Sawdust used as BF by sawmills	86	21	107	90	25	115	45	19	64									
Other energy use	33		33	30		30	40		40									
Exported										25		25	17	7	24	33	45	78
Pellet manufacture[71]	70	20	90	70	25	95	88	10	98									
TOTAL sawdust	222	41	263	225	50	275	208	29	237	25		25	17	7	24	33	45	78
Woodchip[72]																		
Woodchip used for CHP	129	30	159	145	30	175	187	37	224									
Woodchip exports										13		13	6	5	11	3	2	5
Pellet manufacture		111	111		114	114		109	109									
Other uses including animal bedding											16	16		6	6		6	6
TOTAL woodchip	129	141	270	145	144	289	187	146	333	13	16	29	6	11	17	3	8	11
TOTAL	794	312	1,106	870	349	1,219	926	328	1,254	188	114	302	128	105	233	129	132	261

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