- *Roundwood harvest (including firewood) in the Republic of Ireland in 2014 was 3.11 million m^3, the highest level since records began.*
- *Softwood available for processing in 2014 was 2.96 million m^3.*
- *There was strong demand for wood fibre across all assortments.*
- *Product output in 2014 comprised 907,000 m^3 of sawn softwood, 133,000 m^3 of round stakes and 773,000 m^3 of wood-based panels.*
- *Exports of wood products reached €370 million, €198 million of wood-panels, €122 million of sawn timber and paper and €50 million of paper & paper-board products.*
- *In volume terms, sawn timber exports grew by 19% over 2013.*
- *Output of the forest-based biomass energy sector grew by 8% over 2013.*
- *In 2014, 36% 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 (2014)

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Introduction

This COFORD Connects Note provides the 2014 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 2014, 3.11 million m^3 of roundwood was harvested in the Republic of Ireland (Table 1) . This is the highest level since records began in 1961[5].

Table 1: Total roundwood harvest (including firewood) in the Republic of Ireland (2010-2014).

Harvest type	2010	2011	2012	2013	2014
			000 m^3 OB		
Coillte	2,517	2,492	2,485	2,588	2,517
Private	387	460	354	448	597
TOTAL	2,904	2,952	2,839	3,036	3,114

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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 1961-2014 can be found on the FAOSTAT website: http://faostat.fao.org/site/626/default.aspx#ancor

In 2014, 2.96 million cubic metres of roundwood was available for processing in the Republic of Ireland[6], a 4% increase on 2013 (Table 2).

Table 2: Roundwood available for processing in the Republic of Ireland (2010-2014).

Item	2010	2011	2012	2013	2014
	000 m³ OB				
Commercial softwood					
Imports less exports	28	55	-18	49	68
Coillte	2,217	2,299	2,269	2,474	2,434
Private sector	463	386	343	328	447
Commercial hardwood					
Imports less exports				-1	
Coillte		1	1	2	6
Private sector		1	1	1	
TOTAL	2,708	2,742	2,596	2,853	2,955

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 (2010-2014)[9].

Fibre source	2010	2011	2012	2013	2014
	000 m³ OB roundwood equivalent (RWE)[10]				
Roundwood[11]	2,708	2,740	2,594	2,851	2,949
Sawmill residues[12]	842	829	853	897	925
WBP residues[13]	101	115	104	110	114
Residue imports				108	49
Harvest residues		40	30	30	60
Post-consumer recovered wood (PCRW)	280	270	250	250	300
TOTAL	3,931	3,994	3,882	4,246	4,397

In 2014, 773,000 m³ of wood-based panels (WBP) were produced from an intake of 1.38 million m³ of wood fibre[14], an increase of 4.6 % increase over 2013 (Table 5). A very high proportion (86%) of WBP manufacture was exported (662,000 m³) to a value of €198 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 2014, sawmill roundwood intake was 1.82 million m³, which was converted to 0.90 million m³ of sawn timber[15] (Tables 4 & 5).

In 2014, 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 (+21%) and sawn timber (+53%) imported in 2014 compared with 2013 (Table 6).

Table 4: Uses of softwood fibre (2010-2014).

Fibre use	2010	2011	2012	2013	2014
	000 m³ OB RWE				
Sawmilling	1,603	1,580	1,622	1,710	1,815
Round stake	118	116	131	117	147
Wood-based panels	1,400	1,340	1,276	1,407	1,377
Wood biomass energy use by the power generation and forest products sector[16]	554	572	611	704	760
Other uses					
Horticultural bark mulch	27	34	40	50	40
Wood chip for commercial biomass use[17]	39	41	30	100	100
Export of forest product residues	58	196	112	88	88
Other uses[18]	132	115	60	70	70
TOTAL	3,931	3,994	3,882	4,246	4,397

Table 5: Production of sawn timber and wood-based panels (2010-2014)[19,20].

Product(s)	2010	2011	2012	2013	2014
	000 m³				
Construction timber	293	289	297	313	478
Pallet/packaging	255	251	258	272	209
Square edge fencing	209	206	211	223	203
Other	15	15	15	16	17
TOTAL sawn wood	772	761	781	824	907
TOTAL wood-based panels	758	736	704	739	773

6. *Firewood is excluded.*
7. *UNECE Joint Wood Energy Enquiry (2011-2015) and EUROSTAT Joint Forest Sector Questionnaire (2011-2015).*
8. *Wood fibre that is reused is counted twice in this model.*
9. *UNECE Joint Wood Energy Enquiry (2011-2015) & EUROSTAT Joint Forest Sector Questionnaire (2011-2015).*
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. *Includes pulpwood, wood chips, sawdust and post-consumer recovered wood (PCRW).*
15. *Includes the production of round stake.*
16. *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.*
17. *Primarily used for the production of space or production heat.*
18. *Other uses include the production of wood pellets.*
19. *EUROSTAT Joint Forest Sector Questionnaire (2011-2015).*
20. *In 2015, sawmill output for 2014 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 2014, exports of forest products from the Republic of Ireland reached €370 million, a 9% increase on 2013. Wood-based panels accounted for €198 million, the balance comprising paper and sawn timber exports (Table 6). Export volumes of WBP were relatively unchanged on 2013, while exports of sawn timber increased by 19.5% over 2013 (Table 6).

During 2014, consumption of sawn timber in the Republic of Ireland grew by 9%, driven by an improvement in construction markets. In 2014, 52% of the Irish market for sawn softwood timber was supplied by domestic production with the balance being imported. Over the same period, only 6% of the Irish market for sawn hardwood was supplied domestically (Table 8).

Table 6: Timber and paper products trade, volume and value (2010-2014)[21].

	Imports									
Product(s)	2010	2011	2012	2013	2014	2010	2011	2012	2013	2014
	000 m³					€ million				
Sawn timber	242	201	145	134	205	74	64	54	51	74
Wood-based panels	166	195	204	194	235	65	68	75	78	98
	000 tonnes									
Pulp products	41	54	47	50	46	31	45	45	41	42
Paper and paper-board products	370	383	415	428	404	313	333	339	340	340
TOTAL						483	510	513	510	554
	Exports									
Product(s)	2010	2011	2012	2013	2014	2010	2011	2012	2013	2014
	000 m³					€ million				
Sawn timber[22]	658	619	534	601	718	85	83	73	81	122
Wood-based panels	660	616	630	665	662	179	173	179	199	198
	000 tonnes									
Pulp products	1									
Paper and paper-board products	33	59	68	81	67	44	52	51	59	50
TOTAL						308	308	303	339	370

Table 7: Overall balance of trade in the value of timber products (2010-2014)[23].

Product(s)	2010	2011	2012	2013	2014
	€ million				
Sawn timber	11	19	19	30	48
Wood-based panels	114	105	104	121	100
Pulp products	-31	-45	-45	-41	-42
Paper and paper-board products	-269	-281	-288	-281	-290
TOTAL	-175	-202	-210	-171	-184

Table 8: Self-sufficiency in sawnwood (2010-2014)[24].

	Sawn softwood					Sawn hardwood				
Item	2010	2011	2012	2013	2014	2010	2011	2012	2013	2014
	000 m³ UB									
Domestic production	772	760	782	824	904		1	1	1	3
Exports	658	619	534	601	718	1	1			1
Imports	205	169	116	108	175	37	32	28	26	30
TOTAL consumption[25]	319	310	364	331	361	36	32	29	27	32
% of sawn timber market which is supplied by domestic production	36	45	68	67	52		3	3	4	6

[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 (2011-2015). 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.*

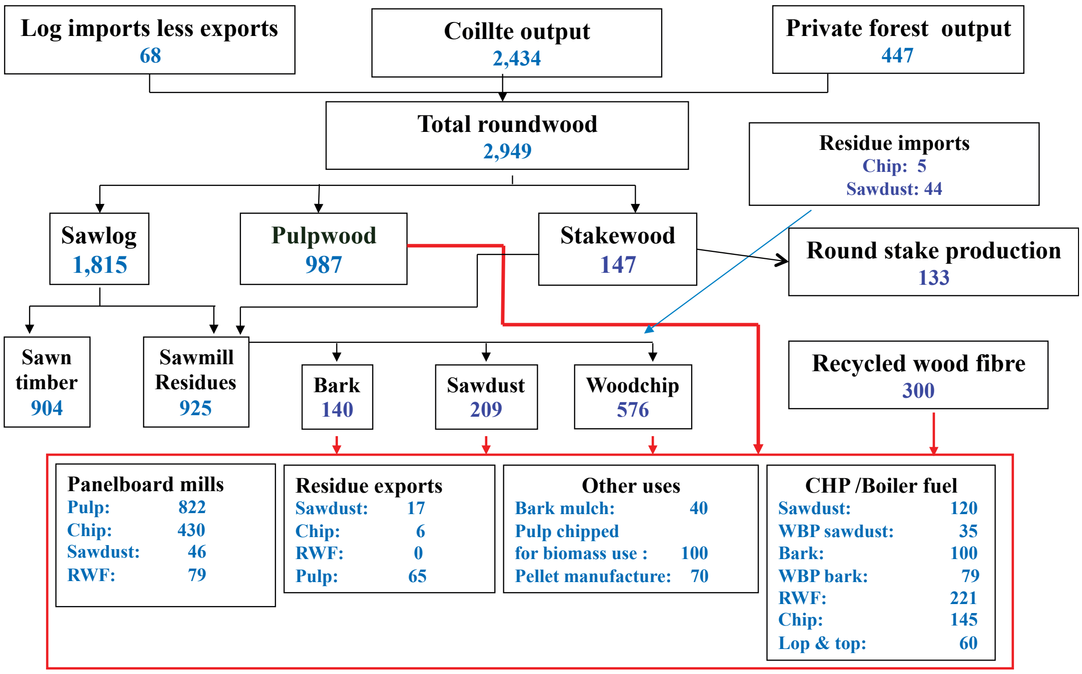
[23] *Negative values show a surplus of imports over exports.*

[24] *Central Statistics Office; www.cso.ie & EUROSTAT Joint Forest Sector Questionnaire (2011-2015).*

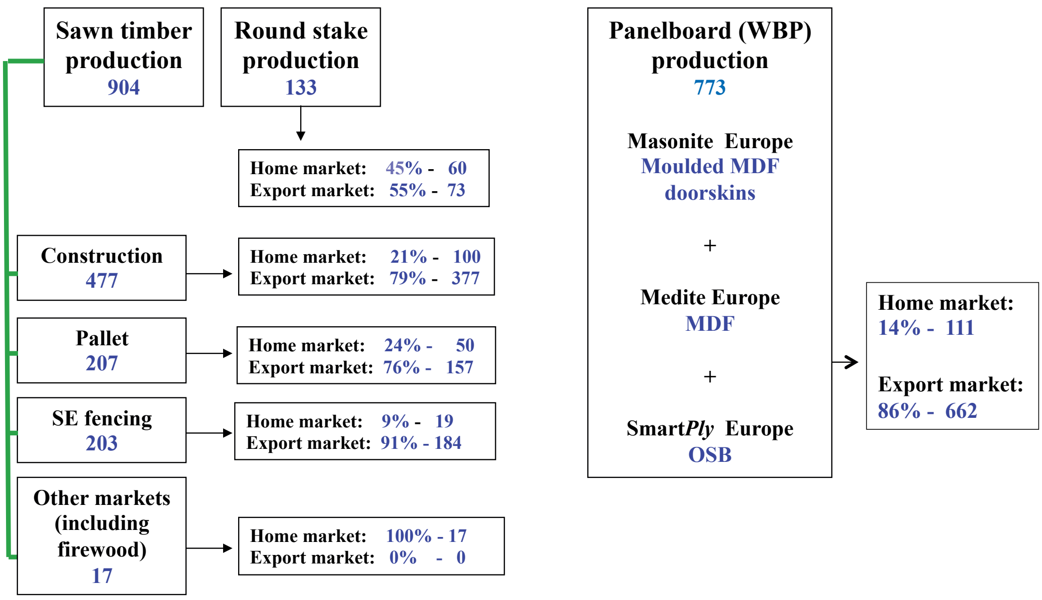
[25] *Total consumption is calculated as:domestic production + (imports-exports).*

Woodflow for the Republic of Ireland in 2014

Figure 1: Woodflow for the Republic of Ireland for 2014 (000 m³) [overbark]



Breakdown of 2014 wood products (000 m³)



All island woodflow (2012-2014)

The all island woodflow for the period 2012-2014 is provided in Annex A. In 2014, the volume of roundwood processed on the island of Ireland was 3.61 million m^3, a 2.7% increase over 2013 (A1). Over the same period the output of sawn timber increased by 7.3% (A2), while wood-based panel output increased by 4.6% over 2013 (A5).

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

In 2014, 36% 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 9, 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 2014, the output of the forest-based biomass energy sector grew by 8% over 2013 (Table 10). In 2014, 235,000 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). In addition, firewood is also harvested by forest owners for their own use. Wood-biomass fuels used by the sector are shown in Table 10

Table 9: Use of forest-based biomass and as a proportion of total roundwood harvest (2010-2014)[26].

Item	2010	2011	2012	2013	2014
	000 m^3 OB RWE				
Wood-biomass use by the energy[27] and forest products industry	554	572	611	660	760
Roundwood chipped for primary energy use[28]	39	41	30	100	100
Domestic firewood use	199	214	225	230	235
Short rotation coppice (SRC)	1	5	5	5	5
Wood pellets and briquettes	121	129	144	161	150
Charcoal	2	5	2	1	1
TOTAL	916	966	1,017	1,157	1,251
Of which supplied from domestic resources	841	896	910	1,034	1,166
Roundwood available for processing	2,708	2,740	2,594	2,852	2,975
Firewood used	199	214	225	230	235
Total roundwood use[29]	2,907	2,954	2,819	3,082	3,210
Wood-biomass use as a % of total roundwood used	28.9	30.3	32.3	33.5	36.3

Table 10: Output use of forest-based biomass and associated greenhouse gas emissions mitigation (2010-2014)[30].

Item	Unit	2010	2011	2012	2013	2014
		Output				
Heat	TJ	6,306	6,604	6,808	7,002	7,562
Electricity	TJ	372	378	477	491	530
TOTAL	TJ	6,678	6,982	7,285	7,493	8,092
CO_2 abated	000 tonnes	511	534	557	573	619

Table 11: Volume and value of the domestic firewood market in the Republic of Ireland (2010-2014)[31].

Year	000 m^3 OB	€ million
2010	199	28.80
2011	214	30.97
2012	225	32.56
2013	230	33.33
2014	235	34.05

26. *UNECE Joint Wood Energy Enquiry (JWEE); 2010-2015*
27. *Includes co-firing of wood biomass at Edenderry Power; www.edenderrypower.ie*
28. *Primarily used forspace and process heating*
29. *Roundwood use includes the use of domestically sourced and imported roundwood*
30. *UNECE Joint Wood Energy Enquiry (2011-2015)*
31. *drima market research study*

Contribution of renewables to heat and electricity demand

Renewable heat (RES-H)[32, 33]

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 the use of tallow from rendering plants for heat. Renewable heat share has doubled since 1990, now accounting for 5.7% of all thermal energy.

Over the period 2006-2013, the use of RES-H by the services sector grew strongly. This saw RES-E use by the sector grow by 388% to 442 gigawatt hours (GWh). This use of biomass was previously supported by the Renewable Energy Heat Deployment (ReHeat) grant scheme which supported wood chip and pellet boilers, solar thermal and heat pump installations. This scheme closed in 2011. One proposal contained in the Draft Bioenergy Plan[34] as published by the Department of Communications, Energy & Natural Resources in October 2014 is the introduction of a Renewable Heat Incentive scheme (RHI). A similar RHI scheme[35] is currently in use in the United Kingdom.

It is proposed, subject to State Aid clearance from the European Commission and further Government approval once the Irish RHI scheme is designed, that the Minister for Communications, Energy and Natural Resources will introduce from 2016 an Exchequer-funded incentive scheme for larger non-ETS industrial and commercial renewable heating installations. This scheme will be designed to reward users for each unit of renewable heat used from sustainable biomass and to deliver the additional heat required in the context of meeting 12% of heat demand from renewable sources by 2020. This scheme will be kept under review to assess its effectiveness[36].

Renewable electricity (RES-E)

Wind energy dominates this sector. Over the period 1990-2013, the output of the renewable energy has grown eight fold, from 697 GWh to 5,601 GWh (Table 12). Most of this increase has taken place since 2000[37].

Table 12: Generation of renewable electricity in Ireland (1990-2012) by source[38].

RE type	1990	2000	2005	2010	2011	2012	2013
				GWh			
Hydro	697	847	631	599	707	802	578
Wind		244	1,112	2,815	4,380	4,010	4,542
Biomass			8	111	137	248	299
Landfill gas		95	106	184	181	175	158
Biogas			16	22	21	21	24
TOTAL	697	1,186	1,873	3,731	5,426	5,256	5,601

32. *At the time of publication, data for 2014 was not available.*
33. *http://www.seai.ie/Publications/Statistics_Publications/Renewable_Energy_in_Ireland/Renewable-Energy-in-Ireland-2013-Update.pdf*
34. *http://www.dcenr.gov.ie/NR/rdonlyres/4B809564-5709-41C1-AB37-3CF772ECD693/0/BioenergyPlan.pdf*
35. *http://www.rhincentive.co.uk/*
36. *http://www.dcenr.gov.ie/NR/rdonlyres/4B809564-5709-41C1-AB37-3CF772ECD693/0/BioenergyPlan.pdf*
37. *At the time of publication, data for 2014 was not available.*
38. *http://www.seai.ie/Publications/Statistics_Publications/Renewable_Energy_in_Ireland/Renewable-Energy-in-Ireland-2013-Update.pdf*

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	Re-cycled 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 (2012-2014) and breakdown of use categories

A1: Softwood fibre processed[39].

Item	2012			2013			2014		
	ROI	NI	Total	ROI	NI	Total	ROI	NI	Total
				000 m³ OB					
Roundwood source									
Imports less exports[40]	-18	200	182	49	204	253	68	222	290
NIFS[41]		428	428		422	422		401	401
Coillte[42]	2,269		2,269	2,474		2,474	2,434		2,434
Private[43]	343	40	383	328	40	368	447	40	487
Roundwood processed	2,594	668	3,262	2,851	666	3,517	2,949	663	3,612
Sawlog	1,622	414	2,036	1,710	415	2,125	1,815	405	2,220
Stakewood	131	114	245	117	116	233	147	108	255
Pulpwood	841	140	981	1,024	135	1,159	987	150	1,137
Roundwood processed	2,594	668	3,262	2,851	666	3,517	2,949	663	3,612
PCRW[44, 45]	250	60	310	250	60	310	300	60	360
Fibre total including PCRW	2,844	728	3,572	3,101	726	3,827	3,249	723	3,972

A2: Sawmill input/output.

Item	2012			2013			2014		
	ROI	NI	Total	ROI	NI	Total	ROI	NI	Total
				000 m³ OB					
Input[46]									
Sawlog	1,622	414	2,036	1,710	415	2,125	1,815	405	2,220
Stakewood	131	114	245	117	111	228	147	108	255
TOTAL	1,753	528	2,281	1,827	526	2,353	1,962	513	2,475
Output[47, 48]									
Sawn timber	781	199	980	824	200	1,024	904	195	1,099
Round stakes	119	98	217	106	100	206	133	97	230
Sawmill residues	853	231	1,084	897	226	1,123	925	221	1,146
TOTAL	1,753	528	2,281	1,827	526	2,353	1,962	513	2,475

39. *Roundwood available for processing excludes both hardwood and firewood.*
40. *Sources: Coillte, NIFS, Forestry Commission (GB), trade estimates.*
41. *Source: Northern Ireland Forest Service (NIFS).*
42. *Source: Coillte.*
43. *Sources: Private forest management companies, Forestry Commission (GB).*
44. *Sources: EPA, Environment Service (NI), Trade Estimates, Joint wood Energy Enquiry (JWEE) [2011-2015], WRAP UK.*
45. *PCRW: Post consumer recovered wood.*
46. *Sources: Coillte, NIFS, private forest management companies, Forestry Commission (GB) and trade estimates.*
47. *Sawmill output data has been checked against industry estimates.*
48. *Sources: Forestry Commission (GB) sawmill survey and industry expert opinion.*

A3: Sawmill output by market/end use[49, 50, 51].

Product(s)	2012							2013							2014						
	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	80	217	297	34	34	68	365	78	235	313	36	37	73	386	100	377	477	36	35	71	548
Pallet/packaging	64	194	258	20	22	42	300	79	193	272	18	19	37	309	50	157	207	18	18	36	243
SE fencing[52]	89	122	211	42	43	85	296	50	173	223	43	43	86	309	19	184	203	43	41	84	287
Round stakes	48	71	119	38	60	98	217	50	56	106	40	60	100	206	60	73	133	40	57	97	230
Other markets	15		15	4		4	19	16		16	4		4	20	17		17	4		4	21
TOTAL			900			297	1,197			930			300	1,230			1,037			292	1,329

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

Item	2012			2013			2014		
	ROI	NI	Total	ROI	NI	Total	ROI	NI	Total
	000 m³ OB								
Pulpwood[53]	841	140	981	1,024	135	1,159	987	150	1,137
PCRW[54]	250	60	310	250	60	310	300	60	360
Sawmill residues[55]									
Woodchip imports	4		4	23		23	5	6	11
Sawdust imports	47		47	85		85	44	17	61
Bark	159	33	192	166	33	199	140	32	172
Sawdust	170	41	211	179	41	220	209	40	249
Woodchip	524	141	665	552	141	693	576	138	714
Woodchip from stakes		16	16		16	16		11	11
WBP residues[56]									
Bark	73		73	77		77	79		79
Sawdust	31		31	33		33	35		35
Woodchip									
TOTAL	2,099	431	2,530	2,389	426	2,815	2,375	454	2,829

A5: WBP input/output[57, 58].

Item	2012			2013			2014		
	ROI	NI	Total	ROI	NI	Total	ROI	NI	Total
	000 m³ OB								
Pulpwood	811		811	824		824	822		822
PCRW[59]	100		100	100		100	79		79
Sawdust[60]	41		41	50		50	46		46
Woodchip[61]	324		324	433		433	430		430
Total input	1,276		1,276	1,407		1,407	1,377		1,377
Total output[62, 63]	704		704	739		739	773		773

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

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

Item	WBE 2012			WBE 2013			WBE 2014			Other uses 2012			Other uses 2013			Other uses 2014		
	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[64, 65, 66]	30	25	55	100	25	125	100	25	125									
Bio energy[67]		50	50		50	50		75	75									
Other markets													50		50		50	50
Exported[68]										75	65	140	50	60	110	65		65
Total pulpwood	30	75	105	100	75	175	100	100	200	75	65	140	100	60	160	65	50	115
PCRW																		
CHP/WBP boiler fuel (BF)[69]	150	30	180	150	30	180	221	30	251									
Exported											30	30		30	30		30	30
Total PCRW	150	30	180	150	30	180	221	30	251		30	30		30	30		30	30
Bark																		
Sawmill bark used for biomass energy[70]	119	25	144	116	25	141	100	25	125									
WBP bark used for biomass energy[71]	73		73	77		77	79		79									
Bark mulch[72]										40	8	48	50	8	58	40	7	47
Total bark	192	25	217	193	25	218	179	25	204	40	8	48	50	8	58	40	7	47
Sawdust																		
Sander line sawdust used for WBP BF	31		31	33		33	35		35									
Sawdust used as BF by sawmills	56	21	77	86	21	107	90	25	115									
Other energy use		34	34	33		33	30		30									
Exported										26		26	25		25	17	7	24
Pellet manufacture[73]	60	20	80	70	20	90	70	25	95									
Total sawdust	181	41	222	222	41	263	225	50	275	26		26	25		25	17	7	24
Woodchip[74]																		
Woodchip used for CHP	118	30	148	129	30	159	145	30	175									
Woodchip exports										86	21	107	13		13	6	5	11
Pellet manufacture		90	90		111	111		114	114									
Other uses including animal bedding											16	16		16	16		6	6
Total woodchip	118	120	238	129	141	270	145	144	289	86	37	123	13	16	29	6	11	17
TOTAL	671	291	962	794	312	1,106	870	349	1,219	227	140	367	138	164	302	128	105	233

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