- *In 2009, roundwood harvest in the Republic of Ireland was 2.421 M m³, 3% down on the 2008 level.*
- *A reduction in demand for sawn timber and for wood-based panels was the main reason for the reduced harvest.*
- *Sawmill output was 774,000 m³.*
- *Wood-based panel output was 709,000 m³.*
- *In 2009, sawn timber and wood-based panel exports were worth €198 million.*
- *Over the period 2007-2009, the volume of sawn timber exports increased by 48%.*
- *Between 2005 and 2009, the domestic use of wood biomass grew by 18% per annum.*

COFORD
Dept. Agriculture, Food and the Marine
Kildare Street,
Dublin 2, Ireland
Telephone: +353 1 607 2487
Email: info@coford.ie
http://www.coford.ie

Woodflow and biomass use on the island of Ireland 2009

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

This COFORD Connects Note incorporates an analysis of woodflow for the island of Ireland, together with an analysis of wood biomass use. In previous years, these matters were dealt with in separate Notes.

Republic of Ireland

Table 1: Roundwood available for processing (2007-2009) [a].

	2007	2008	2009
		000 m³ OB	
Log imports less exports	57	106	-63
Coillte	2,556	2,279	2,354
Private	390	118	130
Roundwood processed	3,003	2,503	2,421
Of which			
Sawlog	1,934	1,619	1,602
Stakewood	180	80	88
Pulp	889	804	731

[a] *EUROSTAT Joint Forest Sector Questionnaire (2008-2010).*

Wood fibre sources for the processing and wood energy sectors are shown in Table 2, while the uses of wood fibre are shown in Table 3[3,4].

[1] *Forest products consultant (gordonknaggs@eircom.net)*
[2] *Consultant (eoin@drima.com)*
[3] *UNECE Joint Wood Energy Enquiry (JWEE) (2008-2010) & EUROSTAT Joint Forest Sector Questionnaire (JFSQ) (2008-2010).*
[4] *Wood fibre that is reused is counted twice in this model.*

Table 2: Sources of wood fibre (2007-2009)[a].

	2007	2008	2009
		000 m³ OB	
Roundwood[b]	3,003	2,503	2,421
Sawmill residues	966	846	838
Wood-based panel residues[c]	125	106	94
Post-consumer recovered wood	264	208	200
TOTAL	4,358	3,663	3,553

[a] *UNECE Joint Wood Energy Enquiry (2008-2010) & EUROSTAT Joint Forest Sector Questionnaire (2008-2010).*
[b] *Data are taken from Table 1.*
[c] *Includes bark (from debarking lines at Medite & SmartPly) and sawdust from the sanding of wood-based panels.*

Table 3: Uses of wood fibre (2007-2009).

	2007	2008	2009
		000 m³ OB	
Sawmilling	1,934	1,619	1,602
Wood-based panels	1,673	1,462	1,286
Round stakes	180	80	88
Wood biomass energy use by the forest products sector[a]	324	378	431
Other uses			
Horticultural bark mulch	132	44	54
Wood chip for commercial biomass use	20	30	55
Export of forest product residues	95	50	37
TOTAL	4,358	3,663	3,553

[a] *Wood biomass energy is used by the forest products sector for process drying, heating and for the generation of electricity.*

In 2009, imports of forest products were €464 million, mainly pulp and paper (71%), with sawn timber and wood-based panels (WBP) making up the remainder. The reduction in Irish construction led to a collapse in sawn timber and WBP imports in 2008 and 2009[5] (Table 4). In 2009, WBP and sawn timber exports were worth €198 million. Key export markets were Northern Ireland, GB and the Benelux countries.

Ireland remains a net importer of forest products (Table 5), particularly paper and paperboard. However, over the 3-year period (2007-2009) sawn timber exports and imports moved close to parity, while Ireland's position as a substantial net exporter of wood-based panel products was sustained, albeit at a declining level. These data need to be taken in the context of a decline of over 50% in the domestic market for forest products due to the collapse in housing construction over the 2007-2009 period.

Table 4: Timber trade (2007-2009)[a,b,c].

	Imports					
	2007	2008	2009	2007	2008	2009
	000 m³ UB			€ million		
Sawn timber	724	412	232	251	141	66
Wood-based panels	358	264	181	146	108	68
	000 tonnes					
Pulp products	31	29	32	22	20	22
Paper & paper-board products	546	526	379	467	520	308
TOTAL				886	789	464
	Exports					
	000 m³ UB			€ million		
Sawn timber	381	389	564	71	54	51
Wood-based panels	757	614	580	262	195	147
	000 tonnes					
Pulp products	0	2	0	0	0	0
Paper & paper-board products	85	77	45	92	69	45
TOTAL				425	318	243

[a] *Includes import/export figures for sawn timber, wood-based panels & pulp/paper products only. Data are taken from Ireland's EUROSTAT JFSQ returns (2008–2010). Roundwood, sawmill residues and secondary processed timber products are not included.*
[b] *Data based on Ireland's EUROSTAT JFSQ return for 2008-2010.*
[c] *Central Statistics Office (CSO): www.cso.ie*

Table 5: Balance of payments trade in the value of forest products (2007-2009).

	2007	2008	2009
		€ million	
Sawn timber	-180	-87	-15
Wood-based panels	116	87	79
Pulp products	-22	-20	-22
Paper & paper board products	-375	-451	-263
TOTAL	-461	-471	-221

In 2009 sawmills processed 1.7 million m³ of roundwood, generating 0.8 million m³ of sawn timber[6]. In line with the reduction in construction activity, the domestic sawn timber market declined by 67% over the period 2007-2009 (Table 6).

[5] *EUROSTAT JFSQ (2008-2010).*
[6] *Includes the production of round stake.*

Table 6: Sawn timber market (2007-2009)[a].

	2007	2008	2009
	000 m^3 UB		
Domestic production (softwood)	984	701	772
Domestic production (hardwood)	4	1	2
Exports	-381	-389	-564
Imports	724	412	232
TOTAL	1,331	725	442

[a] *Central Statistics Office; www.cso.ie & EUROSTAT JFSQ (2008-2010).*

The sawmilling sector produces mainly construction/structural timber, pallet/packaging timber and fencing products. In past years 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 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 facilities and in marketing and sales development in key export markets. In 2009, despite difficult market conditions, the exports of Irish sawn timber (in volume terms) increased by 45% over 2008 (Table 7). In recent years, structural/construction timber exports have increased significantly. These are largely sold in Northern Ireland and in the rest of the UK. Over the period 2000-2009, the volume of sawn softwood exported has increased by 205% (Table 7)[7].

Table 7: Exports of sawn softwood (2000-2009)[a,b].

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

[a] *Central Statistics Office; www.cso.ie*
[b] *Excludes hardwood figures included in Table 6.*

Wood residues are primarily used as feedstock for sawmill kilns and for the WBP sector. Post-consumer recovered wood (PCRW) is increasingly being used for wood energy and for the manufacture of particleboard. Over the period 2007-2009, the volume of wood residues declined by 23% (Table 8).

Table 8: Volume of wood residues (2007-2009)[a].

	2007	2008	2009
	000 m^3 RWE[b]		
Bark	271	203	215
Wood chip	687	470	517
Sawdust	229	152	200
Post-consumer recovered wood	279	208	200
TOTAL	1,466	1,033	1,132

[a] *UNECE JWEE (2008-2010).*
[b] *RWE: roundwood equivalent.*

In 2009, 709,000 m^3 of WBP was produced from 1.29 million m^3 of wood fibre[8]. This was a 9% decline over 2008 and a 23% reduction over 2007 (Table 9). 82% of the WBP manufactured in the Republic of Ireland were exported (580,000 m^3 to a value of €147 million; Table 4). Exports were dominated by Oriented Strand Board (OSB) and Medium Density Fibreboard (MDF), which are manufactured by Masonite, Medite and by Smart*Ply*. Key export markets for WBP are the UK and the Benelux countries. In 2009, 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[9].

Table 9: Production of wood-based panels (2007-2009)[a].

	2007	2008	2009
	000 m^3 UB		
Wood-based panels	918	779	709

[a] *EUROSTAT JFSQ (2008-2010).*

[7] *Central Statistics Office; www.cso.ie*
[8] *This includes pulpwood, wood chips, sawdust and post-consumer recovered wood.*
[9] *EUROSTAT; ec.europa.eu/Eurostat*

Woodflow for the Republic of Ireland (2009)

Woodflow for the Republic of Ireland (2009) is shown in Figure 1 overleaf.

All island woodflow (2007-2009)

The woodflow for the island of Ireland for the period 2007 to 2009 is shown in Annex A. Over this period, the volume of roundwood processed declined from 3.84 M m^3 in 2007 to 3.14 M m^3 in 2009 (A1).

Sawnwood output over the same period declined from 1.54 M m^3 in 2007 to 1.17 M m^3 in 2009 (A2). WBP output declined from 1.03 M m^3 in 2007 to 0.71 M m^3 in 2009 (A5). This was driven by a decline in construction markets and by the closure of the Spanboard chipboard plant in Coleraine, Co Derry.

Wood biomass energy use, policy drivers and markets (2007-2009)

The use of wood biomass energy is dominated by the forest products sector, where it is used for process drying and for energy purposes. Since 2007, the use of wood energy by commercial and domestic users has risen considerably (Table 10). Between 2005 and 2009, the domestic use of wood biomass grew by 18% per annum[10]. The output of the wood biomass energy sector is shown in Table 11.

Table 11: Output of the wood biomass energy sector (2007-2009)[a].

		2007	2008	2009
Heat	TJ	4,931	4,857	5,273
Electricity	TJ	51	112	240
TOTAL	TJ	4,982	4,969	5,513
Tonnes CO_2 abated	000 tonnes	381	380	422

[a] *UNECE JWEE (2008-2010).*

Four million tonnes of milled peat are harvested each year in Ireland from over 20,000 ha of peatland[11]. The main markets are power generation, briquette manufacture and horticultural products. Around 3 million tonnes are used at three peat-fired power plants[12], generate an annual electrical output of 378 MWe[13], providing 6% of Ireland's total primary energy requirement (TPER). This process emits 2.8 million tonnes of carbon dioxide ($C0_2$) per annum, accounting for 4.1% of Irish greenhouse gas (GHG) emissions[14]. Research has shown that co-firing of peat with wood biomass could reduce GHG emissions from peat burning power stations by up to 30%[15].

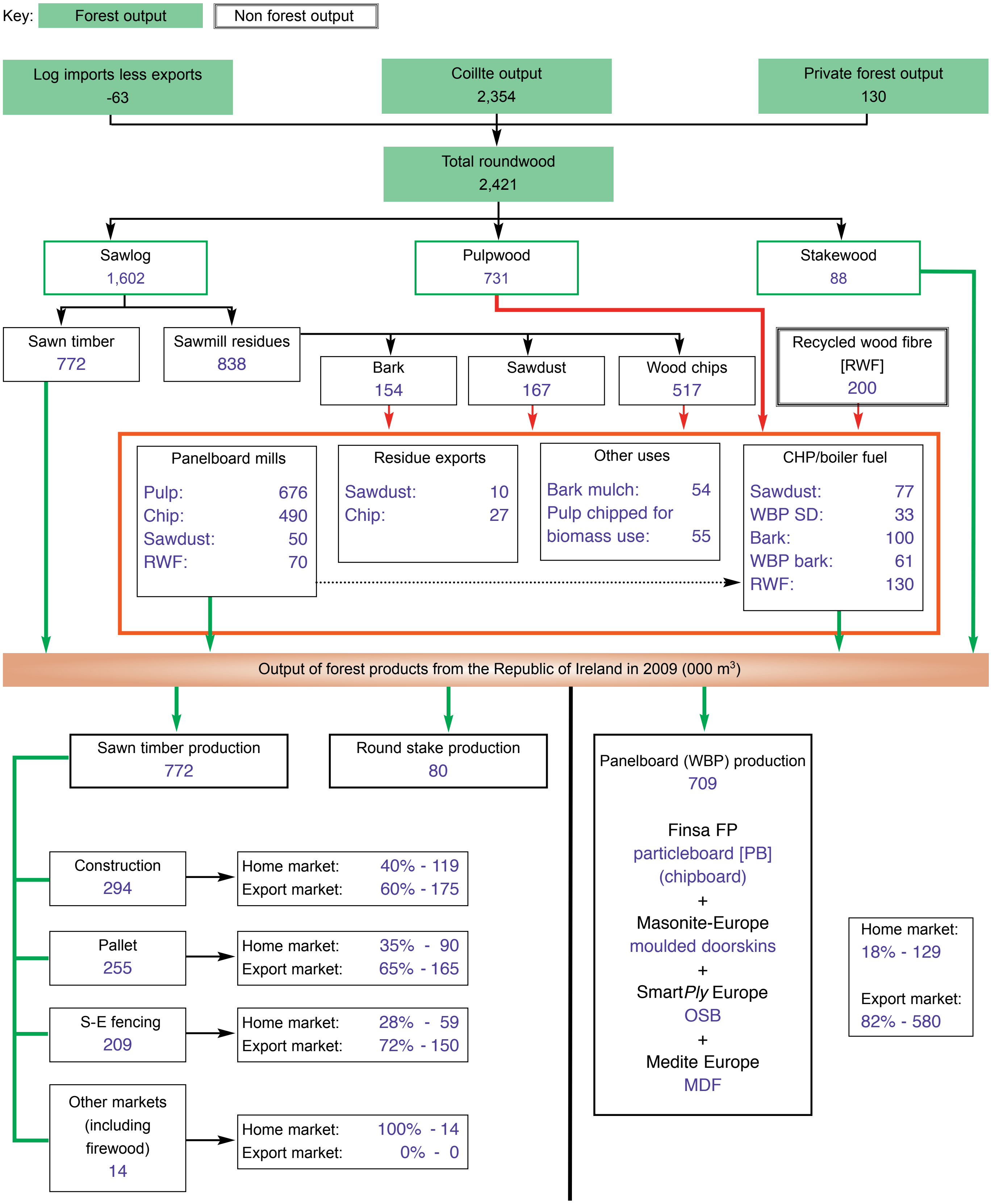
Table 10: Wood biomass energy use (2007-2009)[a].

	End use	2007	2008	2009
			000 m^3 OB	
Firewood	Domestic heating	44	54	87
Roundwood chipped in forest	Commercial heating	35	63	53
Short rotation coppice (SRC)	Commercial heating	1	1	4
Wood pellets & briquettes	Domestic & commercial heating	67	82	110
Charcoal	Domestic use	2	2	2
Wood biomass use for energy[b] generation and in the forest products industry	Process drying/heating/CHP	420	384	438
TOTAL		569	586	694
Percentage forest products industry use		74	66	63

[a] *UNECE JWEE (2008-2010).*
[b] *Includes co-firing with wood biomass at Edenderry Power. www.edenderrypower.ie*

[10] *http://www.seai.ie/Publications/Statistics_Publications/SEI_Renewable_Energy_2010_Update/RE_in_Ire_2010update.pdf*
[11] *http://www.sei.ie/uploadedfiles/RenewableEnergy/PeatuseforEnergyinIreland.ppt*
[12] *These plants are significantly more efficient than those they replaced.*
[13] *Edenderry Power (128 MWe) + Lough Ree Power (100 MWe) + West Offaly Power (100 MWe)*
[14] *http://www.epa.ie/downloads/pubs/air/airemissions/GHG_UN_2007_Final_150409.pdf*
[15] *Greenhouse gas benefits of co-firing biomass with peat for energy in Ireland; Sari Lappi & Kenneth A. Byrne; IEA Bio-energy Task 38; www.ieabioenergy-task38.org/projects/task38casestudies/ireland-brochure.pdf*

Figure 1: Woodflow for the Republic of Ireland for 2009 (000 m^3 OB).



Edenderry Power is increasing the level of co-firing of peat with biomass energy. By 2016, it is estimated that 310,000 tonnes of wood biomass will be used by Edenderry Power (Table 12).

Table 12: Co-firing of peat with wood biomass at Edenderry Power (2007-2016)[a].

	Wood biomass used
	000 wet tonnes
2007	na
2008	18
2009	66
2016 f	310

[a] *http://www.coford.ie/media/coford/content/eventspresentations/events2010/forestryconference/Wood%20energy%20-%20New%20markets%20for%20roundwood.pdf*

There are currently three commercial wood fuelled biomass combined heat and power (CHP) plants in operation: Balcas Fuel Ltd., Grainger Sawmills Ltd. and Munster Joinery Ltd. The heat and electricity capacities are shown in Table 13.

Table 13: Output of existing biomass fuelled CHP capacity on the island of Ireland (2009).

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

[a] *http://www.balcas.com/articles/chp.html*
[b] *http://www.graingersawmills.com/chp.htm*
[c] *http://www.sei.ie/Your_Business/Large_Industry_Energy_Network/Workshop_Presentations/John_Fingleton-_CHP_Projects.pdf*

In recent years, wood biomass energy systems have been promoted and developed for use in households and in medium-sized businesses by state agencies including COFORD (now part of the Department of Agriculture, Food and the Marine), the Forest Service, Teagasc and the Sustainable Energy Authority of Ireland (SEAI). These support schemes are outlined below.

Greener Homes Scheme (GHS)[16]

The GHS scheme allows householders to apply for grants to install renewable heat technologies including wood pellet stoves, biomass boilers, solar panels and geothermal heat pumps. By June 2010, 28,686 GHS applications had been approved. These have generated an energy saving of 265 GWh[17] and an annual GHG saving of 64,000 tonnes of CO_2[18].

Table 14: Uptake of the GHS (2009-2010)[a].

	4/2009	6/2010[b]
	% of total schemes	
Solar	54	59
Heat pump	23	20
Biomass	23	20
Wood gasification		0.4

[a] *Source: SEAI ; www.seai.ie*
[b] *Due to rounding, these numbers do not total 100%*

ReHeat Programme[19]

This grant support scheme enabled community groups, commercial sector, public sector and industrial sector organisations in the Republic of Ireland to obtain grants for the installation of wood chip and wood pellet boilers. Grant aid was up to 30% of overall cost. By June 2010, 163 biomass projects had been completed, with a total output of 67.6 megawatts. The average biomass boiler installed had a heat capacity of 415 kW[20].

In 2011, due to Government budget restrictions, the ReHeat programme was closed[21].

[16] *http://www.seai.ie/Grants/GreenerHomes*
[17] *GWh: Gigawatt hours.*
[18] *http://www.dcenr.gov.ie/NR/rdonlyres/FC3D76AF-7FF1-483F-81CD-52DCB0C73097/0/NEEAP_full_launch_report.pdf*
[19] *www.sei.ie/reheat/*
[20] *http://www.seai.ie/Grants/Renewable_Heat_Deployment_Programme/Organisations_supported.pdf*
[21] *http://www.seai.ie/Grants/Renewable_Heat_Deployment_Programme/*

Renewable Energy Feed-In Tariff (REFIT)[22]

The REFIT scheme provides support to renewable energy projects over a 15-year period. The new support mechanism differ from the previous programme in that it operates as a fixed feed-in tariff mechanism rather than as a competitive tendering process. Applicants to REFIT must have planning permission and a grid connection offer for their project.

In May 2010, a revised set of REFIT tariffs for biomass combustion, anaerobic digestion (AD) and biomass fuelled CHP were announced by the Department of Communications, Energy and Natural Resources (SEAI)[23]. These will provide price support to assist the deployment of CHP systems which are fuelled by biomass (Table 15).

Table 15: REFIT tariffs under the new SEAI CHP/AD CHP schemes[a].

	REFIT tariff
	€/MWh[b]
AD CHP ≤500 kW	150
AD CHP >500 kW	130
AD (non CHP) ≤500kW	110
AD (non CHP) >500kW	100
Biomass CHP ≤1500kW	140
Biomass CHP >1,500kW	120
Biomass combustion, using energy crops	95
Biomass combustion using all other biomass	85

[a] *http://www.seai.ie/Grants/Biomass_CHP_Anaerobic_Digestion_CHP_Call_for_Proposals/*
[b] *WWh: Megawatt hour*

Forest-based biomass and carbon emissions

Since 2006, the use of forest based biomass for energy generation in the Republic of Ireland has resulted in emissions savings of 1.54 million tonnes of carbon dioxide[24].

Meeting biomass energy targets

Over the period 1990-1995, renewable heat energy (RES-H) declined from 2.6% to 2.1%. Between 2000 and 2007 RES-H grew from 2.4% to 3.7% before falling back slightly in 2008 to 3.6%. The provisional RES-H figure for 2009 is 3.9%. The growth in renewable energy (dominated by biomass) is mostly due to increased capacity in the in the forest products and food sectors where it is mostly used. Recently there has also been growth in renewable energy use in the residential and services sectors with the introduction of grant support schemes. However, increases have been small in volume with respect to overall thermal renewable energy consumption. Against this backdrop, the short-term target of achieving a 5% renewable energy contribution to Ireland's thermal energy by 2010 is very challenging[25].

In 2009, the share of electricity which was generated from renewable energy sources (RES-E) was 14.4%[26]. This means that Ireland has surpassed the EU interim target of 13.2% RES-E by 2010. Table 16 shows that Ireland is on track to meet the 15% RES-E target by 2010. A significant milestone in 2009 was that wind energy accounted for over 10% of gross electricity generation[27].

Table 16: Renewable energy contribution to gross electricity consumption[a].

	1990	1995	2000	2005	2006	2007	2008	2009
	Renewables as a % of gross electricity consumption							
Hydro	4.9	4.1	3.6	2.3	2.5	2.3	3.3	3.2
Wind		0.1	1.0	4.0	5.6	6.7	8.1	10.5
Biomass			0.4	0.5	0.4	0.5	0.5	0.6
Total	4.9	4.2	5.0	6.8	8.5	9.5	11.9	14.3

[a] *SEAI; www.seai.ie and Eirgrid; www.eirgrid.com*

22 *ec.europa.eu/energy/energy_policy/doc/.../renewables_ie_en.pdf*
23 *http://www.dcenr.gov.ie/Energy/Sustainable+and+Renewable+Energy+Division/Electricity+from+Renewables+inc+REFIT+and+AER.htm*
24 *UNECE JWEE.*
25 *http://www.seai.ie/Publications/Statistics_Publications/SEI_Renewable_Energy_2010_Update/RE_in_Ire_2010update.pdf*
26 *2009 figures are provisional.*
27 *http://www.seai.ie/Publications/Statistics_Publications/SEI_Renewable_Energy_2010_Update/RE_in_Ire_2010update.pdf*

Over the period 2005-2009, the use of wood biomass energy has increased by 18% per annum. However, in 2009, wood biomass energy provided just 0.8% of Ireland's total primary energy requirement (TPER) (Table 17).

Table 17: Ireland's total primary energy requirement (TPER) by fuel type (1990-2009)[a]

	1990	2009
	%	
Fossil fuels		
Coal	22.0	8.2
Peat	14.5	5.8
Oil	46.6	52.0
Natural gas	15.2	29.0
Renewables		
Hydro	0.6	0.5
Wind	0.0	1.7
Biomass	1.1	1.3
Of which wood biomass	**0.7**	**0.8**
Other renewables	0.0	0.9
Non renewable (wastes)	0.0	0.1
Electricity imports	0.0	0.5
TOTAL	100.0	100.0

[a] *http://www.seai.ie/Publications/Statistics_Publications/Energy_in_Ireland/Energy_in_Ireland_1990-2009.pdf*

Abbreviations

The following abbreviations have been used in this COFORD Connects Note.

Abbreviation	Description
AD	Anaerobic digestion
BF	Boiler fuel
CHP	Combined heat & power
GHG	Green house gases
GHS	Greener homes scheme
GWh	Gigawatt hours
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
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
RWE	Roundwood equivalent
RWF	Recycled wood fibre
SE	Square edged
SEAI	Sustainable Energy Authority of Ireland
TJ	Terajoule
TPER	Total primary energy requirement
UB	Underbark
WBP	Wood-based panels
WBP SD	Sawdust produced during the sanding of wood-based panels

Annex A: Detailed woodflow data for the island of Ireland (2007-2009)

A1: Softwood fibre processed[a].

Item	2007			2008			2009		
	ROI	NI	Total	ROI	NI	Total	ROI	NI	Total
	000 m³ OB								
Roundwood source									
Imports less exports[b]	57	385	442	106	213	319	-63	255	192
NIFS[c]		423	423		430	430		437	437
Coillte[d]	2,556		2,556	2,279		2,279	2,354		2,354
Private[e]	390	33	423	118	27	145	130	30	160
Roundwood processed	**3,003**	**841**	**3,844**	**2,503**	**670**	**3,173**	**2,421**	**722**	**3,143**
Processed by category									
Sawlog	1,934	521	2,455	1,619	415	2,034	1,602	447	2,049
Stakewood	180	145	325	80	116	196	88	125	213
Pulpwood	889	175	1,064	804	139	943	731	150	881
TOTAL	**3,003**	**841**	**3,844**	**2,503**	**670**	**3,173**	**2,421**	**722**	**3,143**
PCRW[f,g]	264	81	345	208	69	277	200	60	260
TOTAL including PCRW	**3,267**	**922**	**4,189**	**2,711**	**739**	**3,450**	**2,621**	**782**	**3,403**

[a] *Roundwood available for processing excludes both hardwood and firewood*
[b] *Sources: Coillte, NIFS, Forestry Commission (GB), trade estimates*
[c] *Source: Northern Ireland Forest Service (NIFS)*
[d] *Source: Coillte*
[e] *Sources: Private forest management companies, Forestry Commission (GB)*
[f] *Sources: EPA, Environment Service (NI), Trade estimates, JWEE [2008-2010], WRAP UK*
[g] *PCRW: Post-consumer recovered wood*

A2: Sawmill input/output.

Item	2007			2008			2009		
	ROI	NI	Total	ROI	NI	Total	ROI	NI	Total
	000 m³ OB								
Input									
Sawlog	1,934	521	2,455	1,619	415	2,034	1,602	447	2,049
Stakewood	180	145	325	80	116	196	88	125	213
Total input	**2,114**	**666**	**2,780**	**1,699**	**531**	**2,230**	**1,690**	**572**	**2,262**
Output[a,b]									
Sawn timber	984	265	1,249	780	200	980	772	215	987
Round stakes	164	123	287	73	99	172	80	107	187
Sawmill residues	966	278	1,244	846	232	1,078	838	250	1,088
TOTAL	**2,114**	**666**	**2,780**	**1,699**	**531**	**2,230**	**1,690**	**572**	**2,262**

[a] *Sawmill output data checked against industry estimates*
[b] *Sources: Forestry Commission (GB) and industry expert opinion*

A3: Sawmill output by market/end use[a,b,c].

	2007							2008							2009						
	ROI			NI			Total	ROI			NI			Total	ROI			NI			Total
	000 m³ OB																				
	Hm	Exp	T	Hm	Exp	T		Hm	Exp	T	Hm	Exp	T		Hm	Exp	T	Hm	Exp	T	
Construction timber	318	56	374	25	60	85	459	200	97	297		40	65	362	119	175	294	42	28	70	364
Pallet timber	196	129	325	27	30	57	382	100	158	258		30	44	302	90	165	255	20	27	47	302
SE fencing[d]	156	110	266	60	52	112	378	108	103	211		45	85	296	59	150	209	45	47	92	301
Round stakes	82	82	164	66	60	126	290	37	36	73		49	99	172	20	60	80	47	60	107	187
Other markets	19	0	19	8	0	8	27	14	0	14		0	6	20	14	0	14	6	0	6	20
TOTAL			**1,148**			**388**	**1,536**			**853**			**299**	**1,152**			**852**			**322**	**1,174**

[a] *Sawmill output data has been checked against industry estimates*
[b] *Hm: home market; Exp: export market: T: total*
[c] *Sources: Forestry Commission (GB) & industry expert opinion*
[d] *SE: Square-edged*

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

	2007			2008			2009		
	ROI	NI	Total	ROI	NI	Total	ROI	NI	Total
					000 m³ OB				
Pulpwood[a]	889	175	1,064	804	139	943	731	150	881
PCRW[b]	264	81	345	208	69	277	200	60	260
Sawmill residues[c]									
Bark	192	52	244	154	37	191	154	41	195
Sawdust	229	62	291	169	44	213	167	47	214
Woodchip	529	142	671	523	134	657	517	144	661
Woodchip from stakes	16	22	38	0	17	17	0	18	18
WBP residues[d]									
Bark	79	0	79	67	0	67	61	0	61
Sawdust	45	7	52	39	7	46	33	0	33
Woodchip	0	0	0	0	0	0	0	0	0
TOTAL	**2,243**	**541**	**2,784**	**1,964**	**447**	**2,411**	**1,863**	**460**	**2,323**

[a] *Source: Industry expert opinion*
[b] *Sources: Industry expert opinion and the Environmental Protection Agency (EPA)*
[c] *Source: Industry expert opinion*
[d] *Source: Industry expert opinion*

A5: WBP input/output[a,b].

	2007			2008			2009		
	ROI	NI	Total	ROI	NI	Total	ROI	NI	Total
					000 m³ OB				
Pulpwood[c]	869	0	869	759	0	759	676		676
PCRW[d]	175	50	225	123	45	168	70		70
Sawdust[e]	129	7	136	82	0	82	50		50
Woodchip[f]	500	125	625	483	90	573	490		490
Total input	**1,673**	**182**	**1,855**	**1,447**	**135**	**1,582**	**1,286**		**1,286**
Total output[g,h]			**1,032**			**847**			**709**

[a] *Spanboard has ceased to produce chipboard at its Coleraine facility*
[b] *This input is for the production of wood-based panels, excludes boiler fuels (detailed overleaf)*
[c] *Source: Industry expert opinion*
[d] *Sources: EPA & industry expert opinion*
[e] *Source: Industry expert opinion*
[f] *Source: Forestry Commission (GB) & industry expert opinion*
[g] *Sources: Board mill survey & industry expert opinion*
[h] *All Ireland wood-based panel output includes the five wood-based panel plants operating on the island of Ireland. In March/April 2009, Spanboard ceased producing chipboard in Coleraine.*

A6: Feedstock for biomass energy & other uses.

	Biomass energy 2007			Biomass energy 2008			Biomass energy 2009			Other uses 2007			Other uses 2008			Other uses 2009		
	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[a,b,c]	20	15	35	45	20	65	55	25	80									
Bio energy[d]		135	135	0	94	94	0	75	75									
Exported[e]				0	0	0	0	0	0	0	25	25	0	25	25	0	50	50
TOTAL	20	150	170	45	114	159	55	100	155	0	25	25	0	25	25	0	50	50
PCRW																		
CHP/WBP boiler fuel[f]	89	31	120	85	24	109	130	20	150				0	0	0	0	0	0
Exported																	40	40
TOTAL	89	31	120	85	24	109	130	20	150							0	40	40
Bark																		
Sawmill bark used for biomass energy[g]	139	41	180	110	30	140	100	31	131									
WBP bark used for biomass energy[h]	45	7	52	67	0	67	61		61									
Bark mulch[i]				0	0	0	0	0	0	87	4	93	44	7	51	54	10	64
TOTAL	184	48	232	177	30	207	161	31	192	87	4	93	44	7	51	54	10	64
Sawdust																		
Sander line sawdust used for WBP BF	45	7	52	39	7	46	33		33									
Sawdust used as BF by sawmills	50	20	70	77	24	101	77	20	97									
Exported										50	0	50	10	0	10	10	0	10
Pellet manufacture[j]	0	35	35	0	20	20	30	27	57									
TOTAL	95	62	157	116	51	167	140	47	187	50	0	50	10	0	10	10		10
Woodchip[k]																		
Woodchip used for CHP	0	10	10	0	24	24	0	44	44									
Woodchip exports										29	0	29	40	0	40	27	20	47
Pellet manufacture	0	19	19	0	20	20	0	80	80									
Other uses including animal bedding				0	0	0	0	0	0	16	10	26	0	17	17	0	18	18
TOTAL	0	29	29	0	44	44	0	124	124	45	10	55	40	17	57	27	38	65
TOTAL	**388**	**320**	**708**	**423**	**263**	**686**	**486**	**322**	**808**	**182**	**39**	**223**	**94**	**49**	**143**	**91**	**138**	**229**

[a] *Sources: SEAI survey and industry expert opinion*
[b] *Source: Industry expert opinion*
[c] *This includes pulp used for the manufacture of wood pellets*
[d] *Source: Forestry Commission (GB)*
[e] *Source: Industry expert opinion*
[f] *Sources: EPA survey & industry expert opinion*
[g] *Sources: SEAI, Forestry Commission (GB)*
[h] *Sources: Forestry Commission (GB) & industry expert opinion*
[i] *Sources: Industry expert opinion*
[j] *Source: Industry expert opinion*
[k] *Sources: Forestry Commission (GB) & industry expert opinion*