



- Roundwood harvest in the Republic of Ireland in 2010, including firewood was 2.88 million cubic metres.
- Roundwood available for processing in 2010 was 2.708 million m<sup>3</sup>, (excluding firewood) 12% up on the 2009 level.
- Harvest in the private sector in 2010 was over 3 and half times the level in 2009, driven by strong demand across all assortments.
- Sawmill output for 2010 was 772,000 m<sup>3</sup>.
- Wood-based panel output was 758,000 m<sup>3</sup>.
- Sawn timber and wood-based panel exports in 2010 were worth €242 million.
- In 2010, 34% of roundwood harvest was used for the energy production.
- Between 2005 and 2009, the domestic use of wood biomass grew by 18% per annum.
- The Irish market for firewood has grown by 35% over the period 2006-2010.

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## Woodflow and forest-based biomass energy use on the island of Ireland (2010)

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This COFORD Connects Note incorporates an analysis of woodflow for the island of Ireland, together with an analysis of the use of forest-based biomass for energy production.

### Republic of Ireland

In 2010, 2.88 million m<sup>3</sup> of roundwood was harvested in the Republic of Ireland; 2.7 million m<sup>3</sup> of which was utilised by the processing sector (Table 1) with the balance of 199,000 m<sup>3</sup> being used for firewood (Table 11). Private forest harvest grew by 356% over 2009 driven by strong demand for across all assortments. 82% of the roundwood which was processed in the Republic of Ireland was supplied by Coillte with 17% provided by the private forest sector. The balance was supplied by imports (Table 1).

Table 1: Roundwood available for processing (2008-2010) 1<sup>a</sup>.

	2008	2009	2010
	000 m <sup>3</sup> OB		
Log imports less exports	106	-63	28
Coillte	2,279	2,354	2,217
Private	118	130	463
Roundwood processed	2,503	2,421	2,708
Of which			
Sawlog	1,619	1,602	1,603
Stakewood	80	88	118
Pulp	804	731	987

<sup>a</sup> EUROSTAT Joint Forest Sector Questionnaire (2009-2011).

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For information and a free on-line advisory service on the wood energy supply chain, the quality of wood fuels and internal handling visit [www.woodenergy.ie](http://www.woodenergy.ie)

The wood fibre sources for the processing and wood energy sectors in the Republic of Ireland are shown in Table 2, while the product output is in Table 3<sup>3,4</sup>.

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

Table 2: Sources of wood fibre (2008-2010)<sup>a</sup>.

	2008	2009	2010
	000 m <sup>3</sup> OB		
Roundwood <sup>b</sup>	2,503	2,421	2,708
Sawmill residues	846	838	842
Wood-based panel residues <sup>c</sup>	106	94	101
Post-consumer recovered wood	208	200	280
<b>TOTAL</b>	<b>3,663</b>	<b>3,553</b>	<b>3,931</b>

<sup>a</sup> UNECE Joint Wood Energy Enquiry (2009-2011) & EUROSTAT Joint Forest Sector Questionnaire (2009-2011).

<sup>b</sup> This data is taken from Table 1.

<sup>c</sup> Includes bark (from the debarking lines at Medite & SmartPly) and sawdust from the sanding of wood-based panels.

Table 3: Uses of wood fibre (2008-2010)<sup>a</sup>.

	2008	2009	2010
	000 m <sup>3</sup> OB		
Sawmilling	1,619	1,602	1,603
Wood-based panels	1,447	1,286	1,400
Round stakes	80	88	118
Wood biomass energy use by the energy and forest products sectors <sup>b</sup>	393	431	554
Other uses			
Horticultural bark mulch	44	54	27
Wood chip for commercial biomass use	30	55	39
Export of forest product residues	50	37	58
Other uses			132
<b>TOTAL</b>	<b>3,663</b>	<b>3,553</b>	<b>3,931</b>

<sup>a</sup> UNECE Joint Wood Energy Enquiry (2009-2011) & EUROSTAT Joint Forest Sector Questionnaire (2009-2011).

<sup>b</sup> Wood biomass energy is used by the forest products sector for process drying, heating and for the generation of electricity. This includes co-firing at Edenderry Power.

<sup>3</sup> UNECE Joint Wood Energy Enquiry (2009-2010) & EUROSTAT Joint Forest Sector Questionnaire (2009-2011).

<sup>4</sup> Wood fibre that is reused is counted twice in this model.

Table 4: Timber trade (2007-2010)<sup>a</sup>.

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

<sup>a</sup> Includes import/export figures for sawn timber, wood-based panels and pulp/paper products only. Data are taken from Ireland's EUROSTAT JFSQ returns (2008-2011). 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

Since 2007, the trend (in value terms) has been for Ireland to become a net exporter of sawn timber, largely due to the collapse of the domestic construction market and increased levels of exports to the UK. The value of wood-based panel exports (a net export category for some time) rose by over 40% in 2010 (Table 5).

Table 5: Balance of trade in the value of forest products (2007-2010).

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

In 2010, sawmills processed 1.7 million m<sup>3</sup> of roundwood, generating 0.8 million m<sup>3</sup> of sawn timber<sup>5</sup>. In line with the reduction in construction activity, the domestic sawn timber market declined by 46% over the period 2008-2010. Over the same period, sawn timber exports grew by 60% (Table 6).

The primary products of the sawmilling sector are construction/structural timber, pallets/packaging and fencing products. Until recently, Irish structural timber was largely sold on the home market, with pallet and fencing products making up the bulk of sawn timber exports. However, in recent years, Irish sawmillers have developed new products and export markets such as planed-all-over (PAO), eased-edge timber studding<sup>6</sup>, fencing products<sup>7</sup> and acoustic barriers<sup>8</sup>.

The development of new products has required considerable investment in both sawmill processing and in marketing and sales development in key export markets. In 2010, exports of Irish sawn timber (in volume terms) increased by 10% over 2009 (Table 7). However, in recent years, structural/construction timber exports have increased significantly. These are largely sold in Northern Ireland and in GB. Over the period 2000-2010, the volume of sawn softwood which has been exported by the sawmill sector has increased by 227% (Table 7)<sup>9</sup>.

Table 6: Share of domestic sawn timber market (2008-2010)<sup>a</sup>.

	2008	2009	2010
	000 m <sup>3</sup> UB		
Domestic production (softwood)	701	772	772
Domestic production (hardwood)	1	2	0
Exports	-389	-564	-621
Imports	412	232	242
TOTAL	725	442	393
% of 2008 market		61	54

<sup>a</sup> Central Statistics Office; [www.cso.ie](http://www.cso.ie)

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 2008-2010, the production of wood residues increased by 18% (Table 8).

Table 7: Exports of sawn softwood (2000-2010)<sup>a</sup>.

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

<sup>a</sup> Central Statistics Office; [www.cso.ie](http://www.cso.ie)

Table 8: Production of wood residues (2008-2010)<sup>a</sup>.

	2008	2009	2010
	000 m <sup>3</sup> RWE <sup>b</sup>		
Bark	203	215	222
Wood chip	470	517	517
Sawdust	152	200	204
Post-consumer recovered wood	208	200	280
TOTAL	1,033	1,132	1,223

<sup>a</sup> UNECE Joint Wood Energy Enquiry (2009-2011).

<sup>b</sup> RWE: Roundwood equivalent

In 2010, 758,000 m<sup>3</sup> of WBP was produced from 1.40 million m<sup>3</sup> of wood fibre<sup>10</sup>, a 7% increase over 2009 (Table 9). 87% of the WBP manufactured in the Republic of Ireland were exported (660,000 m<sup>3</sup>, to a value of €179 million (Table 4). Exports were dominated by Oriented Strand Board (OSB) and Medium Density Fibreboard (MDF), which are manufactured by Masonite, Medite and by SmartPly. Key export markets for WBP are the UK and the Benelux countries. In 2010, the Irish WBP sector was the second largest exporter of particleboard and OSB to the UK and the largest exporter of MDF to the UK<sup>11</sup>.

<sup>5</sup> Includes the production of round stake.

<sup>6</sup> [http://www.mtg.ie/construction\\_timber.html](http://www.mtg.ie/construction_timber.html)

<sup>7</sup> <http://www.glennonbrothers.ie/glenfence.html>

<sup>8</sup> <http://www.woodfabstructures.ie/acoustic.html>

<sup>9</sup> Central Statistics Office; [www.cso.ie](http://www.cso.ie)

<sup>10</sup> This includes pulpwood, wood chips, sawdust and post-consumer recovered wood.

<sup>11</sup> EUROSTAT; [ec.europa.eu/Eurostat](http://ec.europa.eu/Eurostat)

Table 9: Wood-based panel production (2008-2010)<sup>a</sup>.

	2008	2009	2010
	000 m <sup>3</sup> UB		
TOTAL production	779	709	758

<sup>a</sup> EUROSTAT Joint Forest Sector Questionnaire (2009-2011).

## Woodflow for the Republic of Ireland (2010)

The woodflow for the Republic of Ireland (2010) is shown in Figure 1.

### All island woodflow (2008-2010)

The woodflow for the island of Ireland for the period 2008 to 2010 is provided in Annex A. The volume of roundwood processed on the island of Ireland increased from 3.17 million m<sup>3</sup> in 2008 to 3.45 million m<sup>3</sup> in 2010 (A1). Over the same period the output of sawn timber has increased by 5% (A2). Wood-based panel output has declined from 0.85 M m<sup>3</sup> in 2008 to 0.76 M m<sup>3</sup> in 2010. This was driven by a decline in construction markets and by the closure of the Spanboard chipboard plant in Coleraine, Co Derry. However, WBP output grew by 7% over 2009(A5).

### Forest-based biomass for energy use, policy drivers and markets (2008-2010)

In 2010, 34% of the roundwood harvested in the Republic of Ireland was used for the production of biomass energy (Table 10). Since 2006, the use of wood biomass energy in Ireland has resulted in a total emissions saving of 2.03 million tonnes of carbon dioxide (CO<sub>2</sub>).

A recent study<sup>12</sup> has shown that the Irish market for firewood has grown by 35% over the period 2006-2010. In 2010, 199,000 m<sup>3</sup> of roundwood was sold in Ireland to a value of €28.80 million. The harvest level is significantly above that which had been estimated for previous years and shows that the Irish firewood market is providing a steady and a growing market for first thinnings.

Up to 2010, the volume of roundwood which has been harvested for firewood use has been estimated. A combination of survey data and industry expert opinion were used to estimate the volume of firewood harvested. In 2011, a new approach was taken. Every 5 years, the Irish Central Statistics Office (CSO) undertakes a Household Budget Survey (HBS)<sup>13</sup>. This estimates the expenditure by householders in the State on goods and services. The last completed survey was undertaken in 2004/5. This showed that the average expenditure on firewood was €0.26/household/week. Compound inflation rates were applied to ascertain the expenditure on firewood for the period 2007-2010.

The number of households in Ireland was taken from 2006 census<sup>14</sup> data and from preliminary data from the 2011 census<sup>15</sup>. The data was then combined with the HBS data to estimate the volume and value of the domestic firewood market in Ireland (Table 11).

Table 10: Use of forest-based biomass as a percentage of total roundwood harvest (2010).

Category	000 m <sup>3</sup> OB
Forest-based biomass used for electricity generation by Edenderry Power	79
Forest-based biomass used for energy production and process drying in sawmills and wood-based panel mills	475
Pulp chipped for biomass use by commercial users	39
Domestic use of firewood	199
Short rotation coppice	1
Wood pellets and briquettes	121
Charcoal	2
<b>TOTAL</b>	<b>916</b>
Pulpwood chipped for pellet production	38
Sawdust used for pellet production	30
<b>TOTAL</b>	<b>984</b>
Roundwood harvest	
Roundwood available for processing	2,708
Firewood harvest	199
<b>TOTAL</b>	<b>2,907</b>
Forest-based biomass use expressed as a % of total roundwood harvest	33.8%

<sup>12</sup> EUROSTAT Joint Forest Sector Questionnaire (JFSQ) as undertaken by drima marketing on behalf of the Department of Agriculture, Food and the Marine.

<sup>13</sup> [http://www.cso.ie/releasespublications/hbs\\_2004-2005final.htm](http://www.cso.ie/releasespublications/hbs_2004-2005final.htm)

<sup>14</sup> [http://www.cso.ie/census/census2006results/volume\\_3/volume\\_3.html](http://www.cso.ie/census/census2006results/volume_3/volume_3.html)

<sup>15</sup> <http://www.cso.ie/census/documents/Prelim%20complete.pdf>

Figure 1: Woodflow for the Republic of Ireland for 2010 (000 m<sup>3</sup> OB) [overbark]

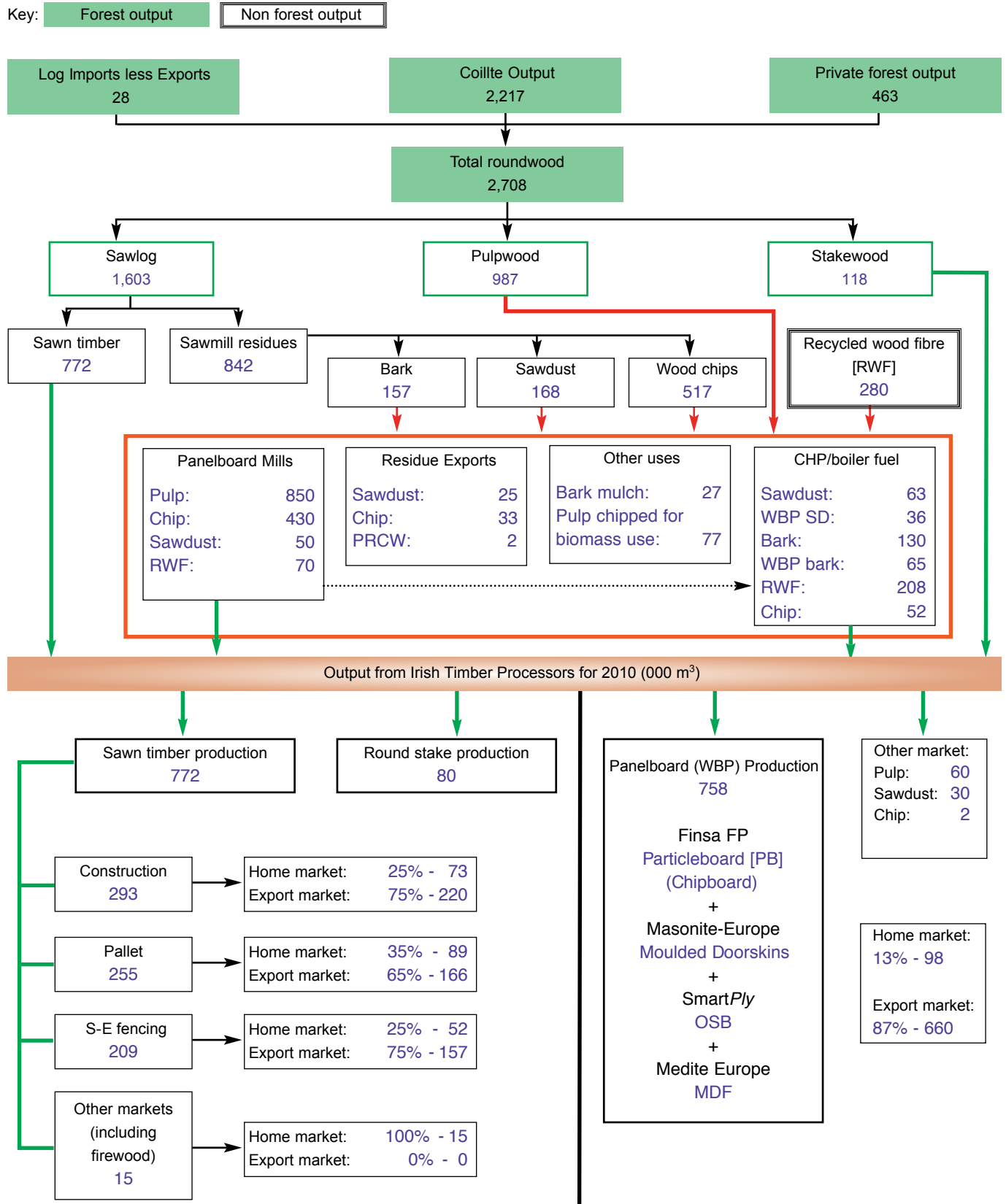


Table 11: Volume and value of the domestic firewood market in Ireland (2006-2010)<sup>a</sup>.

	000 m <sup>3</sup> OB	€ million
2006	147	21.35
2007	159	23.03
2008	171	24.83
2009	184	26.75
2010	199	28.80

<sup>a</sup> *Druma market research study*

Firewood harvest for 2011 will be estimated using new HBS data. Data is currently being processed and evaluated by the CSO and will be available in early 2012.

The use of forest-based biomass for energy production is dominated by the forest products sector, which uses it for process drying and for energy purposes. Since 2007, the use of forest-based biomass for energy production by commercial and domestic users has risen considerably (Table 12). Between 2005 and 2009, the domestic use of forest-based biomass for the production of energy grew by 18% per annum<sup>16</sup>. The output of the forest-based biomass energy sector is shown in Table 13.

Table 12: Use of forest-based biomass for energy production (2008-2010)<sup>a</sup>.

End use		2008	2009	2010
		000 m <sup>3</sup> OB		
Firewood	Domestic heating	171	184	199
Roundwood chipped in forest	Commercial heating	63	53	39
Short rotation coppice (SRC)	Commercial heating	1	4	1
Wood pellets & briquettes	Domestic / commercial heating	82	110	121
Charcoal	Domestic use	2	2	2
Wood biomass use for energy <sup>b</sup> generation and in the forest products industry	Process drying / heating / combined heat & power	393	431	554
<b>TOTAL</b>		<b>712</b>	<b>784</b>	<b>916</b>
Percentage forest products use		55	55	60

<sup>a</sup> *UNECE Joint Wood Energy Enquiry (2009-2011).*

<sup>b</sup> *Includes co-firing with wood biomass at Edenderry Power; www.edenderrypower.ie*

Table 13: Output of the forest-based biomass energy sector (2008-2010)<sup>a</sup>.

		2008	2009	2010
Unit		Output		
Heat	TJ	4,857	5,273	6,306
Electricity	TJ	112	240	372
TOTAL	TJ	4,969	5,513	6,678
Tonnes CO <sub>2</sub> abated	000 tonnes	380	422	511

<sup>a</sup> *Includes co-firing of wood biomass at Edenderry Power; www.edenderrypower.ie*

Four million tonnes of milled peat are harvested each year in Ireland from over 20,000 ha of peatland<sup>17</sup>. The main markets are power generation, briquette manufacture and horticultural products. Around 3.08 million tonnes are used at three peat-fired power plants<sup>18</sup>. These generate an annual electrical output of 378 MWe<sup>19</sup>, providing 6% of Ireland's total primary energy requirement (TPER)<sup>20</sup>. This process emits 2.8 million tonnes<sup>21</sup> of carbon dioxide per annum, accounting for 4.1% of Irish greenhouse gas (GHS) emissions<sup>22</sup>. Research has shown that co-firing of peat with wood biomass could reduce GHG emissions from peat burning power stations by up to 30%<sup>23</sup>.

<sup>16</sup> [http://www.seai.ie/Publications/Statistics\\_Publications/SEI\\_Renewable\\_Energy\\_2010\\_Update/RE\\_in\\_Ire\\_2010update.pdf](http://www.seai.ie/Publications/Statistics_Publications/SEI_Renewable_Energy_2010_Update/RE_in_Ire_2010update.pdf)

<sup>17</sup> <http://www.seai.ie/uploadedfiles/RenewableEnergy/PeatuseforEnergyinIreland.ppt>

<sup>18</sup> *These plants are significantly more efficient than those they replaced.*

<sup>19</sup> *Edenderry Power (128 MWe) + Lough Ree Power (100 MWe) + West Offaly Power (100 MWe)*

<sup>20</sup> [www.seai.ie](http://www.seai.ie)

<sup>21</sup> [www.epa.ie](http://www.epa.ie)

<sup>22</sup> [http://www.epa.ie/downloads/pubs/air/airemissions/GHG\\_UN\\_2007\\_Final\\_150409.pdf](http://www.epa.ie/downloads/pubs/air/airemissions/GHG_UN_2007_Final_150409.pdf)

<sup>23</sup> *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*

Edenderry Power<sup>23</sup>, a peat-burning power station operated by Bord Na Móna is increasing the use of biomass in co-firing with peat. By 2020, it is estimated that 500,000 tonnes of biomass<sup>24</sup> will be used by Edenderry Power (Table 14), supplied by local and imported biomass.

Table 14: Co-firing of biomass at Edenderry Power (2007-2020)<sup>a</sup>.

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

<sup>a</sup> <http://www.coford.ie/open24/pub/reilly.pdf.pdf>

The types and volume of biomass used by Edenderry Power over the period 2008-2010 are shown in Table 15.

Table 15: Biomass use at Edenderry Power by category and usage (2008-2010)<sup>a</sup>.

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

<sup>a</sup> *The co-firing experience at Edenderry Power Station, Charles Shier, Bord na Móna Power Gen, 11/2/2011*

There are three commercial combined heat and power (CHP) plants on island of Ireland which are fuelled using forest-based biomass; Balcas Fuel Ltd., Grainger Sawmills Ltd. and Munster Joinery Ltd. The heat and electricity capacities of these facilities are shown in Table 16.

Table 16: Output of forest-based biomass fuelled CHP plants on the island of Ireland (2010).

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

## Future roundwood demand

The overall demand for roundwood on the island of Ireland is forecast to increase from 4.295 M m<sup>3</sup> in 2011 to 6.038 M m<sup>3</sup> by 2020 (Table 17).

Table 17: Estimated roundwood demand on the island of Ireland in 2011 and 2020<sup>a</sup>.

	2011	2020	
		000 m <sup>3</sup> OB	
Conventional demand <sup>b</sup>	3,456	3,830	
Demand for forest-based biomass for energy production <sup>c</sup>	1,589	3,084	
Residues from conventional demand which are used to meet energy demand <sup>d,e</sup>	-750	-876	
<b>TOTAL</b>	<b>4,295</b>	<b>6,038</b>	

<sup>a</sup> [http://www.coford.ie/media/coford/content/publications/projectreports/roundwooddemand2011/COFORD\\_demand01Mar11.pdf](http://www.coford.ie/media/coford/content/publications/projectreports/roundwooddemand2011/COFORD_demand01Mar11.pdf)

<sup>b</sup> Conventional demand is roundwood used (for processing) by the sawmilling and by the boardmill sectors.

<sup>c</sup> The expected demand for forest-based biomass to 2020 is based on a scenario model which was developed by SEAI; [www.seai.ie](http://www.seai.ie). This is based on data available as of 2/11/2010.

<sup>d</sup> The use of post consumer recovered wood (PCRW) is excluded.

<sup>e</sup> A portion of sawmill and panel residues is used for process drying and for the production of energy. In 2011, it is estimated that 750,000 m<sup>3</sup> OB of such residues will be thus used on the island of Ireland. To avoid double counting, the demand for forest-based biomass (for energy production) is discounted by 750,000 m<sup>3</sup> OB. It is estimated that by 2020 the use of sawmill/panel residues for energy production will have increased to 876,000 m<sup>3</sup> OB.

<sup>23</sup> [www.edenderrypower.ie](http://www.edenderrypower.ie)

<sup>24</sup> Not all of this will be sourced from forest resources.

<sup>25</sup> This is based on data available as of 2/11/2010.

<sup>26</sup> This data are based on work which was undertaken by the COFORD Supply Group (2010).

Based on scenario modelling<sup>27</sup>, the Sustainable Energy Authority of Ireland (SEAI) forecast that by 2020, the demand for biomass for energy in the Republic of Ireland will be 53 M GJ. Forest-based biomass and waste resources could deliver about 9 M GJ each, with agricultural residues having the potential to supply a further 8 M GJ. The balance of supply is likely to comprise indigenous purpose-grown energy crops and imported biomass<sup>28</sup> (Table 18).

Table 18: Estimated supply streams which will be available to meet the biomass demand for energy production in the Republic of Ireland in 2020<sup>a</sup>.

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

<sup>a</sup> Data source: SEAI; [www.seai.ie](http://www.seai.ie)

<sup>b</sup> [http://www.teagasc.ie/forestry/docs/events/Roundwood\\_S\\_D\\_Eugene\\_Hendrick.pdf](http://www.teagasc.ie/forestry/docs/events/Roundwood_S_D_Eugene_Hendrick.pdf)

The demand for forest-based biomass for energy in 2011 and in 2020 is an aggregate of the demand for combined heat & power (CHP), heat only and co-firing. The expected demand for forest-based biomass in 2011 and 2020 is shown in Table 19. To meet the 2020 renewable energy target, the demand for forest-based biomass for energy production will need

Table 20: Renewable energy targets to 2020 by type<sup>a</sup>.

	2015	2016	2017	2018	2019	2020
	%					
Renewable heat (RES-H)	8	9	10	10	11	12
Renewable electricity (RES-E)	34	36	38	40	42	44
Renewable transport (RES-T)	7	7	9	9	10	11
<b>Overall RES</b>	<b>12</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>

<sup>a</sup> [http://www.mnag.ie/workshop\\_2010\\_7\\_2172276902.pdf](http://www.mnag.ie/workshop_2010_7_2172276902.pdf)

<sup>27</sup> This is based on data available as of 2/11/2010.

<sup>28</sup> This data are based on work which was undertaken by the COFORD Supply Group (2010).

to double over the period 2011 to 2020 (Table 19). This is a challenging target. However, experience in Scotland and in Austria has shown that biomass use can grow to meet challenging renewable energy targets. To meet the stated targets for renewable energy by 2020, the gross demand for forest-based biomass for energy production will increase 2-fold, from 1.589 M m<sup>3</sup> in 2011 to 3.084 M m<sup>3</sup> in 2020. Such a steep increase in wood biomass demand will require a significant investment in the sectoral supply chain, and will significantly increase the competition for wood fibre.

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

Table 19: Estimated demand for forest-based biomass for energy production on the island of Ireland in 2011 and 2020<sup>a</sup>.

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

<sup>a</sup> The expected demand for forest-based biomass to 2020 is based on a scenario model which was developed by SEAI; [www.seai.ie](http://www.seai.ie), which is based on data available as of 2/11/2010.

Ireland's national renewable energy targets are shown in Table 20. Ireland's progress towards meeting its biomass energy targets are discussed overleaf.



Table 21: Renewable energy as a percentage of gross electricity consumption<sup>a</sup>.

	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

<sup>a</sup> Source: SEAI; [www.seai.ie](http://www.seai.ie) and Eirgrid; [www.eirgrid.com](http://www.eirgrid.com)

## Renewable heat (RES-H)

In the early 1990's there was a decline in the contribution from renewable energy to thermal energy from 2.6% in 1990 to 2.1% in 1995. 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%. This growth in renewable energy (dominated by biomass) that has occurred is mostly due to increased activity in the industrial sub-sectors where the biomass is mostly used (i.e. in the forest products and food sectors). There has also been recent growth in renewable energy use in the residential and services sectors with the introduction of grant support schemes. However, the increases here have to date 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<sup>29</sup>.

## Renewable electricity (RES-E)

In 2009, the share of electricity which was generated from renewable energy sources (RES-E) was 14.3%<sup>30</sup>. This means that Ireland has surpassed the EU interim target of 13.2% RES-E by 2010. The data shown in table 9 suggests that Ireland is firmly on track to meet the Government target of 15% of all electricity generation to be from renewable energy sources by 2010. A significant milestone was achieved in 2009 was that wind energy accounted for over 10% of gross electricity generation (Table 21)<sup>31</sup>.

## Abbreviations

Abbreviation	Description
AD	Anaerobic digestion
BF	Boiler fuel
CHP	Combined heat & power
GHG	Green house gases
GHS	Greener homes scheme
kW	Kilowatt
m <sup>3</sup>	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
RES-E	Renewable electricity
RES-H	Renewable heat
RES-T	Renewable transport
RWE	Roundwood equivalent
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

<sup>29</sup> [http://www.seai.ie/Publications/Statistics\\_Publications/SEI\\_Renewable\\_Energy\\_2010\\_Update/RE\\_in\\_Ire\\_2010update.pdf](http://www.seai.ie/Publications/Statistics_Publications/SEI_Renewable_Energy_2010_Update/RE_in_Ire_2010update.pdf)

<sup>30</sup> 2009 figures are provisional

<sup>31</sup> [http://www.seai.ie/Publications/Statistics\\_Publications/SEI\\_Renewable\\_Energy\\_2010\\_Update/RE\\_in\\_Ire\\_2010update.pdf](http://www.seai.ie/Publications/Statistics_Publications/SEI_Renewable_Energy_2010_Update/RE_in_Ire_2010update.pdf)

## Annex A: Disaggregated woodflow (2008-2010)

### A1: Softwood fibre processed<sup>a</sup>.

Item	2008			2009			2010		
	ROI	NI	Total	ROI	NI	Total	ROI	NI	Total
<b>000 m<sup>3</sup> OB</b>									
<b>Roundwood source</b>									
Imports less exports <sup>b</sup>	106	213	319	-63	255	192	28	260	288
NIFS <sup>c</sup>		430	430		437	437		450	450
Coillte <sup>d</sup>	2,279		2,279	2,354		2,354	2,217		2,217
Private <sup>e</sup>	118	27	145	130	30	160	463	30	493
<b>Roundwood processed</b>	<b>2,503</b>	<b>670</b>	<b>3,173</b>	<b>2,421</b>	<b>722</b>	<b>3,143</b>	<b>2,708</b>	<b>740</b>	<b>3,448</b>
<b>Processed by category</b>									
Sawlog	1,619	415	2,034	1,602	447	2,049	1,603	458	2,061
Stakewood	80	116	196	88	125	213	118	128	246
Pulpwood	804	139	943	731	150	881	987	154	1,141
<b>Roundwood processed</b>	<b>2,503</b>	<b>670</b>	<b>3,173</b>	<b>2,421</b>	<b>722</b>	<b>3,143</b>	<b>2,708</b>	<b>740</b>	<b>3,448</b>
PCRW <sup>f,g</sup>	208	69	277	200	60	260	280	60	340
<b>Fibre total including PCRW</b>	<b>2,711</b>	<b>739</b>	<b>3,450</b>	<b>2,621</b>	<b>782</b>	<b>3,403</b>	<b>2,988</b>	<b>800</b>	<b>3,788</b>

<sup>a</sup> Roundwood available for processing excludes both hardwood and firewood.

<sup>b</sup> Sources: Coillte, NIFS, Forestry Commission (GB), trade estimates.

<sup>c</sup> Source: Northern Ireland Forest Service (NIFS).

<sup>d</sup> Source: Coillte.

<sup>e</sup> Sources: Private forest management companies, Forestry Commission (GB).

<sup>f</sup> Sources: EPA, Environment Service (NI), Trade estimates, Joint wood Energy Enquiry (JWEE) [2009-2011], WRAP UK.

<sup>g</sup> PCRW: Post consumer recovered wood.

## A2: Sawmill input/output.

Item	2008			2009			2010		
	ROI	NI	Total	ROI	NI	Total	ROI	NI	Total
<b>000 m<sup>3</sup> OB</b>									
<b>Input<sup>a</sup></b>									
Sawlog	1,619	415	2,034	1,602	447	2,049	1,603	458	2,061
Stakewood	80	116	196	88	125	213	118	128	246
<b>Total input</b>	<b>1,699</b>	<b>531</b>	<b>2,230</b>	<b>1,690</b>	<b>572</b>	<b>2,262</b>	<b>1,721</b>	<b>586</b>	<b>2,307</b>
<b>Output<sup>b,c</sup></b>									
Sawn timber	780	200	980	772	215	987	772	220	992
Round stakes	73	99	172	80	107	187	107	110	217
Sawmill residues	846	232	1,078	838	250	1,088	842	256	1,098
<b>TOTAL</b>	<b>1,699</b>	<b>531</b>	<b>2,230</b>	<b>1,690</b>	<b>572</b>	<b>2,262</b>	<b>1,721</b>	<b>586</b>	<b>2,307</b>

<sup>a</sup> Sources: Coillte, NIFS, private forest management companies, Forestry Commission (GB) and trade estimates.

<sup>a</sup> Sawmill output data checked against industry estimates

<sup>b</sup> Sources: Forestry Commission (GB) and industry expert opinion

### A3: Sawmill output by market/end use<sup>a,b,c</sup>.

	2008						2009						2010							
	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		
Construction timber	200	97	297	40	65	362	119	175	294	42	28	70	364	73	220	293	36	36	72	365
Pallet timber	100	158	258	30	44	302	90	165	255	20	27	47	302	89	166	255	20	28	48	303
SE fencing <sup>d</sup>	108	103	211	45	85	296	59	150	209	45	47	92	301	52	157	209	47	47	94	303
Round stakes	37	36	73	49	99	172	20	60	80	47	60	107	187	30	77	107	50	60	110	217
Other markets	14	0	14	0	6	20	14	0	14	6	0	6	20	15	0	15	6	0	6	21
<b>TOTAL</b>			<b>853</b>		<b>299</b>	<b>1,152</b>			<b>852</b>			<b>322</b>	<b>1,174</b>			<b>879</b>			<b>330</b>	<b>1,209</b>

000 m<sup>3</sup> OB

<sup>a</sup> Sawmill output data has been checked against industry estimates.

<sup>b</sup> Hm: home market; Exp: export market; T: total

<sup>c</sup> Sources: Forestry Commission (GB) & industry expert opinion.

<sup>d</sup> SE: Square-edged.

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

	2008			2009			2010		
	ROI	NI	Total	ROI	NI	Total	ROI	NI	Total
<b>000 m<sup>3</sup> OB</b>									
Pulpwood <sup>a</sup>	804	139	943	731	150	881	987	154	1,141
PCRW <sup>b</sup>	208	69	277	200	60	260	280	60	340
Sawmill residues <sup>c</sup>									
Bark	154	37	191	154	41	195	157	42	199
Sawdust	169	44	213	167	47	214	168	48	216
Woodchip	523	134	657	517	144	661	517	148	665
Woodchip from stakes	0	17	17	0	18	18	0	18	18
WBP residues <sup>d</sup>									
Bark	67	0	67	61	0	61	65	0	65
Sawdust	39	7	46	33	0	33	36	0	36
Woodchip	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>1,964</b>	<b>447</b>	<b>2,411</b>	<b>1,863</b>	<b>460</b>	<b>2,323</b>	<b>2,210</b>	<b>470</b>	<b>2,680</b>

<sup>a</sup> Source: Industry expert opinion.

<sup>b</sup> Sources: Industry expert opinion and the Environmental Protection Agency (EPA).

<sup>c</sup> Source: Industry expert opinion.

<sup>d</sup> Source: Industry expert opinion.

## A5: WBP input/output<sup>a,b</sup>

	2008			2009			2010		
	ROI	NI	Total	ROI	NI	Total	ROI	NI	Total
<b>000 m<sup>3</sup> OB</b>									
Pulpwood <sup>c</sup>	759	0	759	676		676	850		850
PCRW <sup>d</sup>	123	45	168	70		70	70		70
Sawdust <sup>e</sup>	82	0	82	50		50	50		50
Woodchip <sup>f</sup>	483	90	573	490		490	430		430
<b>Total input</b>	<b>1,447</b>	<b>135</b>	<b>1,582</b>	<b>1,286</b>		<b>1,286</b>	<b>1,400</b>		<b>1,400</b>
<b>Total output<sup>g,h</sup></b>			<b>847</b>			<b>709</b>			<b>758</b>

<sup>a</sup> In March/April 2009, Spanboard ceased producing chipboard in Coleraine, Co. Derry.

<sup>b</sup> This input is for the production of wood-based panels. This excludes boiler fuels. These are detailed overleaf.<sup>c</sup> Source: Industry expert opinion

<sup>c</sup> Source: Industry expert opinion

<sup>d</sup> Sources: EPA & industry expert opinion.

<sup>e</sup> Source: Industry expert opinion.

<sup>f</sup> Source: Forestry Commission (GB) & industry expert opinion.

<sup>g</sup> Sources: Board mill survey & industry expert opinion.

<sup>h</sup> All Ireland WBP output includes the five WBP plants operating on the island of Ireland. In March/April 2009, Sonae (NI) [Spanboard] ceased producing chipboard in Coleraine, Northern Ireland.

## A6: Feedstock for biomass energy & other uses.

	Biomass energy 2008			Biomass energy 2009			Biomass energy 2010			Other uses 2008			Other uses 2009			Other uses 2010		
	ROI	NI	Total	ROI	NI	Total	ROI	NI	Total	ROI	NI	Total	ROI	NI	Total	ROI	NI	Total
<b>Pulpwood</b>																		
Domestic/industrial heating fuel <sup>a,b,c</sup>	45	20	65	55	25	80	77	25	102									
Bio energy <sup>d</sup>	0	94	94	0	75	75	0	75	75	0	25	25	0	50	50	60	54	114
Exported <sup>e</sup>	0	0	0	0	0	0	0	0	0	0	25	25	0	50	50	60	54	114
Total pulpwood	45	114	159	55	100	155	77	100	177	0	25	25	0	50	50	60	54	114
<b>PCRW</b>																		
CHP/WBP boiler fuel (BF) <sup>f</sup>	85	24	109	130	20	150	208	20	228	0	0	0	0	0	0	2	40	42
Exported																		
Total PCRW	85	24	109	130	20	150	208	20	228	0	0	0	0	40	40	2	40	42
<b>Bark</b>																		
Sawmill bark used for biomass energy <sup>g</sup>	110	30	140	100	31	131	130	30	160									
WBP bark used for biomass energy <sup>h</sup>	67	0	67	61	61	61	65	0	65	44	7	51	54	10	64	27	12	39
Bark mulch <sup>i</sup>	0	0	0	0	0	0	0	0	0	44	7	51	54	10	64	27	12	39
Total Bark	177	30	207	161	31	192	195	30	225	44	7	51	54	10	64	27	12	39
<b>Sawdust</b>																		
Sander line sawdust used for WBP BF	39	7	46	33	33	33	36	0	36									
Sawdust used as BF by sawmills	77	24	101	77	20	97	54	13	67	10	0	10	10	0	10	25	15	40
Other energy use							9	9	9									
Exported																		
Pellet manufacture <sup>j</sup>	0	20	20	30	27	57	30	20	53									
Total sawdust	116	51	167	140	47	187	129	33	162	10	0	10	10	0	10	25	15	40
<b>Woodchip<sup>k</sup></b>																		
Woodchip used for CHP	0	24	24	0	44	44	52	65	117	40	0	40	27	20	47	33	27	60
Woodchip exports																		
Pellet manufacture	0	20	20	0	80	80	56	56	56	0	17	17	0	18	18	0	18	18
Other uses including animal bedding	0	0	0	0	0	0	2	2	2									
Total Woodchip	0	44	44	0	124	124	54	121	173	40	17	57	27	38	65	33	45	78
<b>TOTAL</b>	<b>423</b>	<b>263</b>	<b>686</b>	<b>486</b>	<b>322</b>	<b>808</b>	<b>643</b>	<b>304</b>	<b>947</b>	<b>94</b>	<b>49</b>	<b>143</b>	<b>91</b>	<b>138</b>	<b>229</b>	<b>167</b>	<b>166</b>	<b>333</b>

<sup>a</sup> Sources: SEAI survey (ROI), industry expert opinion.

<sup>b</sup> Source: Industry expert opinion.

<sup>c</sup> This includes pulp used for the manufacture of wood pellets.

<sup>d</sup> Source: Forestry Commission (GB).

<sup>e</sup> Source: Industry expert opinion.

<sup>f</sup> Sources: EPA survey & industry expert opinion.

<sup>g</sup> Sources: SEI, Forestry Commission (GB).

<sup>h</sup> Sources: Forestry Commission (GB) & industry expert opinion.

<sup>i</sup> Sources: Forestry expert opinion.

<sup>j</sup> Source: Industry expert opinion.

<sup>k</sup> Sources: Forestry Commission (GB) & industry expert opinion.

