

All Ireland Roundwood Demand Forecast 2011-2020

Authored by the COFORD Roundwood Demand Group



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Executive summary

This report by the COFORD Roundwood Demand Group (CDG) has been compiled by representatives of Coillte, the sawmilling sector, the Department of Agriculture, Fisheries and Food (DAFF), the Sustainable Energy Authority of Ireland (SEAI) and by Enterprise Ireland. The group's work was assisted by Eoin O'Driscoll of drima marketing.

The group's objectives were to:

- Determine the likely level of demand for roundwood, sawmill co-products and harvest residues on the island of Ireland from 2011 to 2020 and to
- Identify policy and market issues that are likely to impact on demand and seek ways to identify synergies between different demand streams.

Demand for roundwood is forecast to increase from 4.295 M m³ in 2011 to 6.038 M m³ by 2020 (Table 1).

Table 1: Estimated roundwood demand on the island of Ireland in 2011 and 2020.

Demand type	2011	2020
	000 m ³ overbark (OB)	
Conventional demand ¹	3,456	3,830
Demand for forest-based biomass for energy production	1,589	3,084
Residues from conventional demand which are used to meet energy demand ^{2,3}	-750	-876
TOTAL	4,295	6,038

Based on scenario modelling⁴, SEAI forecasts that by 2020, the demand for biomass for energy production 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 biomass⁵.

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 2. To meet the 2020 renewable energy target, the demand for forest-based biomass for energy production will need to double over the period 2011 to 2020 (Table 2). 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.

Table 2: Estimated demand for forest-based biomass for energy production on the island of Ireland in 2011 and 2020⁶.

End use type	2011	2020	2011	2020
	Estimated demand 000 m ³ 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
TOTAL	1,589	3,084	100	100

¹ Conventional demand is roundwood used (for processing) by the sawmilling and by the boardmill sectors.

² The use of post consumer recovered wood (PCRW) is excluded.

³ 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 m³ 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 m³ OB. It is estimated that by 2020 the use of sawmill/panel residues for energy production will have increased to 876,000 m³ OB.

⁴ This is based on data available as of 2/11/2010.

⁵ This supply data is based on the All-Ireland Roundwood Production Forecast (2011-2028).

⁶ The expected demand for forest-based biomass to 2020 is based on a scenario model which was developed by SEAI; www.seai.ie, which is based on data available as of 2/11/2010.

KEY ISSUES

To meet the stated targets for renewable energy by 2020, the gross demand for wood biomass will increase 2-fold, from 1.589 M m³ in 2011 to 3.084 M m³ in 2020. Such a steep increase in wood biomass demand will require a high level of 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 combined heat and power (CHP). Before becoming operational, such facilities have at least a 2-year lead-in period.

I would like to thank all of those who contributed to the production of this important report.

William Fitzgerald
Chairman, COFORD Demand Group

18 January 2011

Existing use of wood biomass (for energy production) in 2009

In 2009, the volume of wood biomass used to generate renewable energy on the island of Ireland was determined by survey to be 1 M m³ overbark (Table 3).

Table 3: Wood biomass use for energy production on the island of Ireland (2009)⁷.

Biomass type	ROI	NI	Total
	000 m³ OB		
Firewood (including imports)	87	17	104
Wood chip	53	25	78
Short rotation coppice (SRC)	4	30	34
Charcoal	2	1	3
Pellet and wood briquette	110	48	158
Forest-based biomass for drying & energy production by boardmills, sawmills, industrial use and co-firing	438	185	623
TOTAL	694	306	1,000

Biomass demand overview to 2020

By 2020, it is estimated that overall demand for biomass in the RoI will be 53 M GJ (Table 4), based on the following assumptions:

- bioenergy to contribute
 - 80% to the renewable heating and cooling (RES-H & C) target,
 - 14% to the renewable electricity (RES-E) target and
 - 92% to the renewable transport (RES-T) target.
- biomass CHP and anaerobic digestion (AD) CHP to reach installed capacities of 100 MWe and 50 MWe, respectively.

Of the 53 M GJ of biomass expected to be required by 2020, 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 would be made up of indigenous purpose-grown energy crops and imported biomass (Table 4)⁸.

Table 4: Estimated supply streams which will be available to meet the biomass demand for energy production in the Republic of Ireland in 2020⁹.

Biomass type	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
TOTAL	53	100

⁷ Sources: Joint Wood Energy Enquiry for the Republic of Ireland (2010) and a study of wood biomass use in Northern Ireland undertaken by drima marketing in 2009.

⁸ This supply data is based on the All-Ireland Roundwood Production Forecast (2011-2028).

⁹ Data source: SEAI; www.seai.ie

Roundwood for energy – demand to 2020

REPUBLIC OF IRELAND

Existing wood biomass use in the RoI was taken from the UN Economic Commission for Europe (UNECE) Joint Wood Energy Enquiry (JWEE) for Ireland (2010). Demand for wood biomass energy to 2020 was estimated by SEAI^{10,11} based on meeting the requirements set out in the Renewable Energy Directive (RED, 2009/28/EC)^{12,13}. The National Renewable Energy Action Plan (NREAP) sets out the strategic approach and measures to deliver Ireland's 16% target by 2020 under RED¹⁴, using the following assumptions:

- 30% of the fuel requirement at one of the three peat-burning power stations¹⁵ will be biomass (forest-based biomass¹⁶ may account for less than one-third of this amount). Actual fuel use by the three stations will depend on market prices and local supplies. The demand for electricity generated from co-firing of Renewable Energy Sources (RES-E) will increase up to 2015 to a maximum of 7,500 hours load time per annum, and will remain constant for the period 2015-2020,
- 1% co-firing will be undertaken at the Moneypoint power station¹⁷,
- 80% of renewable heat energy (RES-H) will be supplied by biomass, which will include forest-based biomass, agricultural residues and purpose-grown energy crops and
- biomass-fuelled CHP plants with a total installed capacity of 100 MW will be in operation in the Republic of Ireland, as outlined in the policy surrounding the new REFIT tariffs announced by the Department of Communications, Energy and Natural Resources in May 2010¹⁸. It is envisaged the plants will be mainly fuelled by forest-based biomass, agricultural residues and purpose-grown energy crops.

NORTHERN IRELAND

- existing wood energy use was taken from a survey carried out in 2009¹⁹,
- biomass energy targets to 2020 were provided by Action Renewables (Northern Ireland)²⁰ and by the UK Department of Energy and Climate Change (DECC)²¹,
- heat and power output is estimated to be 65% heat and 35% electrical,
- co-firing is not currently undertaken and is unlikely to take place up to 2020²².

¹⁰ www.seai.ie

¹¹ Formerly Sustainable Energy Ireland (SEI)

¹² www.r-e-a.net/policy/european.../renewable-energy-directive

¹³ Directive 2009/28/EC on the promotion of the use of energy from renewable sources establishes the basis for the achievement of the EU's 20% renewable energy target by 2020. Under the Directive, each Member State is set a binding renewable energy target, which will contribute to the achievement of the overall EU goal.

¹⁴ <http://www.dcenr.gov.ie/NR/rdonlyres/0E9749D9-BB72-49D6-B5BC-DC4EE41A6302/0/DraftNREAPv17June2010forwebsite.pdf>

¹⁵ Edenderry Power, Lough Ree Power and West Offaly Power

¹⁶ Roundwood, forest product residues and wood chipped in forest

¹⁷ <http://www.esb.ie/main/about-esb/moneypoint.jsp>

¹⁸ <http://www.dcenr.gov.ie/Energy/Sustainable+and+Renewable+Energy+Division/Electricity+from+Renewables+inc+REFIT+and+AER.htm>

¹⁹ Study undertaken by drima marketing in December 2009.

²⁰ www.actionrenewables.org

²¹ <http://www.decc.gov.uk/>

²² drima market research study (2009)

ALL-IRELAND FOREST-BASED BIOMASS DEMAND

The estimated demand for forest-based biomass for energy production on the island of Ireland to meet renewable energy targets in 2011 and 2020 is shown in Table 5.

Table 5: Demand for forest-based biomass to meet renewable energy targets on the island of Ireland in 2011 and 2020^{23,24}.

Item/year	2011	2020	2011	2020	2011	2020
	ROI		NI 000		TOTAL	
Combined heat & power (CHP)						
Required energy output (GJ ²⁵)	1,139	7,344	1,537	3,350	2,676	10,694
Roundwood demand (m³ OB)	165	1,064	223	486	388	1,550
Heat only						
Required energy output (GJ)	4,681	3,610	2,856	6,225	7,537	9,835
Roundwood demand (m³ OB)	678	523	414	902	1,092	1,425
Co-firing						
Required energy output (GJ)	750	750	0	0	750	750
Roundwood demand (m³ OB)	109	109	0	0	109	109
TOTAL						
Energy demand (GJ)	6,570	11,704	4,393	9,575	10,963	21,279
Roundwood demand (m³ OB)	952	1,696	637	1,388	1,589	3,084

Conventional roundwood demand to 2020

The demand for roundwood by the conventional forest products sector²⁶ on the island of Ireland was estimated by a survey²⁷ in late 2009 which was updated in June 2010. Roundwood requirements in 2011 and 2020 are shown in Table 6²⁸ based on the following assumptions:

- all sawmills and boardmills currently in operation on the island of Ireland will continue to upgrade their facilities to meet market demand,
- normal market conditions will return from 2015 onwards,
- conventional demand will grow on a linear basis from 2010 to 2015 and
- roundwood demand will remain constant over the period 2015 to 2020.

Table 6: Projected roundwood demand by the conventional forest products sector²⁹ on the island of Ireland in 2011 and 2020³⁰.

Demand type	2011		2020	
	Pulp	Stakewood & sawlog	Pulp	Stakewood & sawlog
	000 m ³ OB			
Sawmills	0	2,552	0	2,830
Boardmill demand	904	0	1,000	0
TOTAL	3,456		3,830	

²³ Energy demand data provided by SEAI; (www.seai.ie), as of 2 November 2010.

²⁴ Energy content per unit wood volume was taken as 6.9 GJ/m³

²⁵ A gigajoule (GJ) is an SI unit which is used for measuring energy; 1 GJ is equivalent to 277.8 kWh of electricity, 26.1 m³ of natural gas or 25.8 litres of heating oil

²⁶ Sawmills and boardmills in operation on the island of Ireland.

²⁷ COFORD/Enterprise Ireland survey of boardmills and sawmills (2009 & 2010).

²⁸ To avoid double counting, boardmill total excludes the use of sawmill residues.

²⁹ The conventional forest products sector is taken as the sawmilling and boardmill sectors in operation on the island of Ireland.

³⁰ Source: COFORD/Enterprise Ireland survey of boardmills and sawmills (2009 & 2010).

Conversion factors used and guidance on computations

- A conversion factor of 10.96 GJ/m³ was used for historic forest-based biomass use in the Republic of Ireland, over the period 2006-2008.
- A lower conversion factor, 6.90 GJ/m³ was used for forecast purposes, based on the assumption that over the period 2010–2020 a higher percentage of green woodchip will be used for energy generation.
- For Northern Ireland, existing wood biomass input/output is based on 2008 data, taken from a survey undertaken by drima marketing in December 2009.
- Energy generated from PCRW is excluded from this analysis. It is assumed that over the period 2010–2020 there will be no growth in its use on the island of Ireland. Current use of PCRW is taken from the all island woodflow (2009)³¹.
- Roundwood is expressed in cubic metres overbark (m³ OB).
- Energy production capacity is expressed in gigajoules (GJ).

Abbreviations

AD	Anaerobic digestion
CO ₂	Carbon dioxide
GJ	Gigajoule
JWEE	Joint Wood Energy Enquiry
m ³	Cubic metres
M	Million
MBM	Meat and bone meal
MGJ	Million gigajoules
MW	Megawatt
NI	Northern Ireland
NIFS	Northern Ireland Forest Service
NREAP	National Renewable Energy Action Plan
OB	Overbark volume
PCRW	Post consumer recovered wood
PJ	Petajoule
RES	Renewable energy source
RoI	Republic of Ireland
TD	Top diameter
UNECE	United Nations Economic Commission for Europe

³¹ Source: COFORD (2010); www.coford.ie

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