

# Realising the value of recovered wood

[back](#) | [forward](#) | [contents](#)

Consumption of wood and wood products	Wood waste arisings by sector	End markets for recovered wood	Gate fees and prices	Environmental benefits	Conclusions and challenges	Special Topic	Glossary	<b>Market Situation Report</b> page 1
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## Introduction

This report looks at the key factors influencing the market for recovered wood in the UK, including trends in supply and demand, legislation, incentives and prices for recovered wood and its substitutes. In addition, the special report investigates the growth in the biomass industry and its demand for recovered wood.

Key themes to emerge from the UK recovered wood sector are:

- Wood waste arisings have fallen substantially over the past three years due to reduced activity, particularly within the construction, furniture and joinery sectors.
- Demand for recovered wood from the panelboard sector has declined as construction and furniture output have waned. However, total recycling and recovery of wood waste has increased, because of growth in the use of recovered wood as animal bedding and by the biomass sector. Exports of recovered wood have also increased.
- Gate fees for recovered wood taken by UK wood recyclers have dropped significantly since early 2009, reflecting the combination of higher demand from biomass facilities and lower wood waste arisings.

# Contents

## Market Situation Report – Summer 2011

### Realising the value of recovered wood

<b>1.</b>	<b>Consumption of wood and wood products</b>	<b>4</b>
<b>2.</b>	<b>Wood waste arisings by sector</b>	<b>5</b>
2.1	Construction and demolition	6
2.2	Joinery and furniture manufacturing	6
2.3	Packaging	7
2.4	Municipal waste	7
2.5	Hazardous wood	7
2.6	Regional distribution of wood waste arisings	8
<b>3.</b>	<b>End markets for recovered wood</b>	<b>9</b>
<b>4.</b>	<b>Gate fees and prices</b>	<b>10</b>
<b>5.</b>	<b>Environmental benefits</b>	<b>11</b>
<b>6.</b>	<b>Conclusions and challenges going forward</b>	<b>11</b>
	<b>Special Topic: Use of recovered wood in biomass</b>	<b>12</b>
	<b>Glossary</b>	<b>14</b>



## 1. Consumption of wood and wood products

It is estimated that around 10 million tonnes of wood and wood products were consumed in the UK in 2010. This comprised wood used in the production of wood products (including timber frames, furniture and packaging manufacture) and imported furniture, joinery and other products.<sup>1</sup> Around 50% (about 5 million tonnes) is used by the construction sector, 3.1 million tonnes (31%) is used in furniture, joinery and moulding manufacture, and 0.9 million tonnes (9%) is used in packaging manufacture (Graph 1).

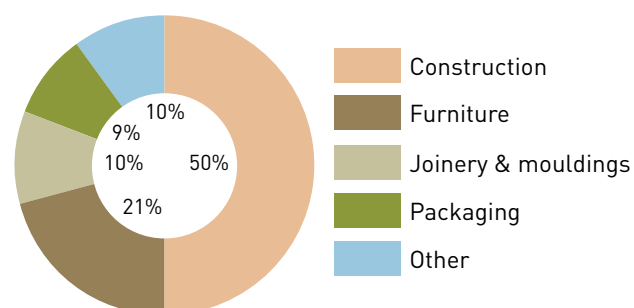
UK consumption of wood and wood products fell sharply between 2007 and 2009, declining by around 3 million tonnes (23%) over this period.<sup>2</sup> The key factors behind the decline were the contraction in the construction sector and households' reduced expenditure on home furnishings during the recession. More recent data suggest that construction output, furniture manufacturing output and domestic furniture demand have recovered somewhat. Accordingly, wood and wood product consumption is estimated to have increased between 2009 and 2010 by 380,000 tonnes (4%) to 10 million tonnes.

Between 2007 and 2010, wood consumption by the construction sector fell by 20%. UK construction sector output dropped 12% between 2007 and 2009 and, despite a rebound, output in 2010 remained around 7% below its 2007 peak. Private new housing activity – the component of construction that has the highest wood consumption – declined by around 40% between 2007 and 2009; 2010 output was 32% below 2007 levels.<sup>3</sup>

Wood consumption by the UK furniture manufacturing sector fell by 33% between 2007 and 2010. Domestic UK manufacturing is predominantly focused on mid to high-end furniture, expenditure on which was more severely affected by the recession than expenditure on lower-end furniture, which tends to be imported rather than produced domestically.

**Graph 1: Wood and wood product consumption by sector, 2010<sup>4</sup>**

**Total: 10 million tonnes**



**Source:** Pöyry

1. The estimates presented in this report were commissioned by WRAP from Pöyry.
2. WRAP (2009), 'Wood Waste Market in the UK'.
3. Source: ONS
4. 'Construction' refers to the consumption of wood and wood products in UK construction; 'furniture' and 'joinery & mouldings' include UK production, plus imported finished products; 'packaging' refers to domestic production of wood packaging; 'other' includes fencing and other miscellaneous uses.

## 2. Wood waste arisings by sector

Estimates of wood waste arisings vary, but the most recent estimates suggest that about 4.1 million tonnes of wood entered the UK waste stream in 2010.<sup>5</sup> Construction activities and demolition activities each accounted for around one quarter of wood waste (1-1.1 million tonnes apiece), with a further 1.1 million tonnes coming from packaging, 0.6 million tonnes from municipal sources and 0.4 million tonnes from joinery and furniture manufacture (Graph 2).

It is estimated that UK wood waste arisings declined by 0.4 million tonnes (10%) between 2007 and 2010 to 4.1 million tonnes.<sup>6</sup> The decline in wood waste arisings was less steep than that in wood consumption. However, there would not be expected to be a one-to-one relationship between consumption and arisings because much wood waste originates from wood used in buildings and furniture that have had lifetimes of many years. The joinery and furniture sectors saw the steepest decline in wood waste arisings, with combined arisings dropping by 100,000 tonnes (23%) to 360,000 tonnes. Wood waste arisings from the construction sector fell by 160,000 tonnes (13%) to 1.0 million tonnes.

5. Pöyry (2011), *ibid*.

6. The estimates of wood waste arisings presented in this report are based on an update of the top-down analysis presented in WRAP (2009), which linked tonnage of wood consumed by various industries with a wastage factor. The same waste factors were used in the two analyses, with the exception of that for construction, which was increased from 19% to 20% to reflect increased use of solid wood and higher use of wood products in indirect construction applications. Publicly available data for municipal and packaging arising were adjusted to reflect market developments.

7. For example, ERM (2006). 'Carbon balances and energy impacts of the management of UK wastes' and WRAP/MEL (2005). Reference document on the status of wood waste arisings and management in the UK.

The estimate of 4.1 million tonnes of UK wood waste arisings is substantially lower than some earlier estimates of wood waste arisings, for example, ERM's (2006) estimate of 7.5 million tonnes and WRAP/MEL's (2005) estimate of 10.6 million tonnes.<sup>7</sup> One of the main areas of uncertainty in estimating overall wood waste tonnages is the construction and joinery sectors. In part, the difficulty in generating robust estimates reflects the large number of small businesses that use wood and hence generate wood waste.

### Box 1: Recovered wood quality

The quality of the recovered wood in different waste streams varies considerably and the capacity of the various end markets to accept different grades depends on their technical and commercial capabilities. The Wood Recyclers Association's (WRA) grading structure aims to categorise various grades of recovered wood based on their quality and forms the starting point for the development of recovered wood standard specifications.

Grade A: "Clean" recycled wood - material produced from pallets.

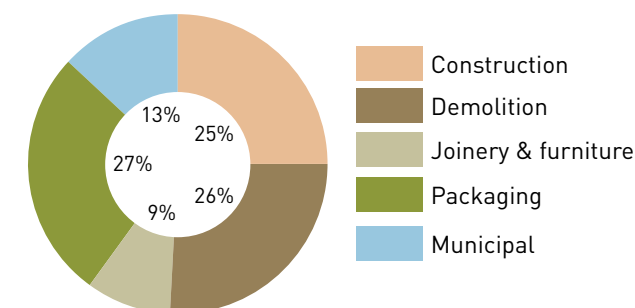
Grade B: Industrial feedstock grade - grade A material plus construction and demolition waste.

Grade C: Fuel grade - all of the above material plus that from municipal collections and civic amenity sites.

Grade D: Hazardous waste - all grades of wood including treated material such as fencing and track work.

Graph 2: Wood waste arisings by source, 2010

Total: 4.1 million tonnes



Source: Pöyry

## 2.1 Construction and demolition

The construction and demolition sectors are the largest sources of wood waste in the UK, accounting collectively for 2.1 million tonnes of wood waste in 2010.

More than half of construction sector wood waste arisings are solid wood (Graph 3). The next largest components are particleboard and imported structural elements (such as frames, beams and trusses).

Construction sector wood waste arisings are estimated to have declined by 160,000 tonnes (13%) between 2007 and 2010 to 1 million tonnes. Solid wood waste fell by 120,000 tonnes (17%) while particleboard arisings fell 50,000 tonnes (32%). Set against this, oriented strand board (OSB) waste rose by around 5,000 tonnes (15%) to 40,000 tonnes in 2010, which might be attributable to the increased use of this panel in timber frame applications.

Wood waste from the demolition sector is estimated to have declined by around 50,000 tonnes (5%) between 2007 and 2010. This compares with a 12% decline in repair and maintenance output during this period.<sup>8</sup>

Recent legislation and campaigns targeted at reducing wood waste may have had a further impact on wood waste arisings. For example, site waste management plans (SWMPs), introduced in April 2008, require construction companies to plan, monitor and measure the waste they generate on site. Meanwhile, industry commitments such as 'Halving Waste to Landfill' have provided further stimulus to the use of best practice in avoiding wood waste.<sup>9</sup>

## 2.2 Joinery and furniture manufacturing

The vast majority of industrial wood waste arisings come from the joinery and furniture manufacturing sectors. These sectors generated an estimated 0.4 million tonnes of wood waste in 2010. The main type of wood waste from the sector is solid wood (39%) followed by particleboard (34%, Graph 4).

Wood waste arisings from the industrial sector are estimated to have declined by 100,000 tonnes (23%) between 2007 and 2010. Particleboard waste arisings fell by 50,000 tonnes (30%) while solid wood waste fell 20,000 tonnes (13%). Industry commitments, such as resource efficiency action plans, may also have incentivised and supported the use of best practice in avoiding wood waste.

A 2009 survey from the British Woodworking Federation (BWF) provided an overview of how wood waste is managed within the sector. The main uses for this (predominantly clean) wood waste were in animal bedding or as a fuel for heat (either by the business itself or its employees).<sup>10</sup>

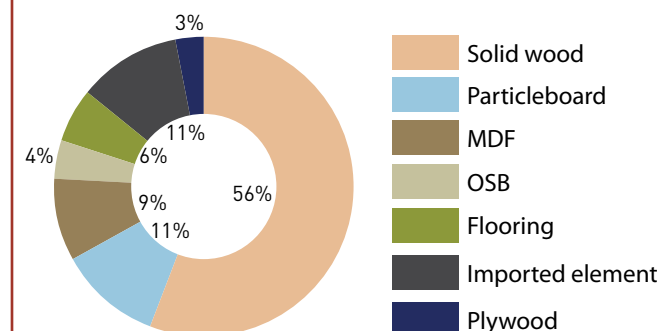
8. Source: ONS

9. See, for example, 'Halving Waste to Landfill'.

10. WRAP/BWF (2010) 'Joinery: A resource efficiency action plan'

**Graph 3: Composition of construction wood waste**

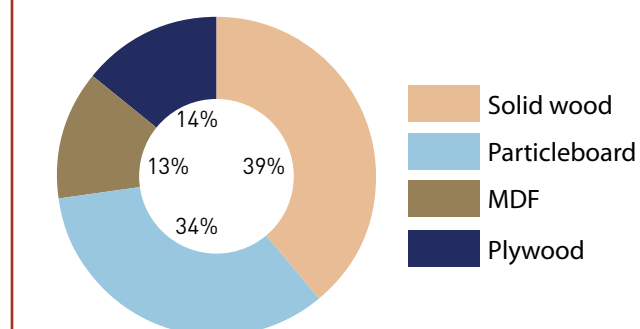
**Total: 1.0 million tonnes**



Source: Pöyry

**Graph 4: Composition of furniture and joinery waste**

**Total: 0.4 million tonnes**



Source: Pöyry

## 2.3 Packaging

Packaging (predominantly pallets) accounted for an estimated 1.1 million tonnes of wood waste in 2010, down from 1.2 million tonnes in 2007. Market contacts suggest that possible explanations for the decline include greater re-use of pallets and substitution away from wood packaging towards alternative materials such as plastic.

National Packaging Waste Database (NPWD) data suggest that the amount of packaging wood waste recovered for recycling fell to 770,000 tonnes in 2010, from 915,000 tonnes in 2007. However, this decline probably reflects reduced reporting of recycling, as low package recovery note (PRN) prices have reduced the incentive for wood reprocessors to seek accreditation with the Environment Agency (EA). Accordingly, the 70% recycling and recovery rate for wood packaging suggested by NPWD is likely to be an underestimate.

## 2.4 Municipal waste

Around 560,000 tonnes of wood waste is estimated to have arisen from the municipal waste stream in 2010, representing 13% of total UK wood waste arisings. Wood waste from municipal sources is estimated to have declined from 620,000 tonnes in 2007, potentially due to lower DIY activity during the recession.<sup>11</sup>

Wood waste from the municipal waste stream is typically of low quality as it includes all types of wood – sawn wood off-cuts, wood based panels, treated wood, painted wood, surfaced wood (eg foil or melamine-faced wood) – and is often co-mingled with furniture.

Furniture taken to civic amenity (CA) sites may be reused rather than recycled. Around 145,000 tonnes of domestic furniture is estimated to be reused per annum.<sup>12</sup> (An estimated 100,000 tonnes of office furniture is also reused per annum). Note that not all of these tonnages are wood, nor might all of these data be captured in estimates of wood waste arisings.

## 2.5 Hazardous wood

Hazardous wood waste typically includes all wood treated with varnish, preservatives or other chemicals and/or paint. Limited data on hazardous wood waste arising are available. Arisings from UK railway sleepers and utility poles are estimated to be approximately 60,000 tonnes per year, although previous studies suggest that little of this enters the waste stream. Data on cooling tower packing timber waste are considered commercially sensitive.<sup>13</sup> There are believed to be significant arisings (perhaps 45,000 tonnes per annum) of wood treated with chromated copper arsenate (CCA), which used to be used in buildings and fencing. CCA was withdrawn from the market in 2004, but CCA-treated wood waste arisings are forecast to continue to increase for the foreseeable future, and options to recycle or recover energy from them are currently limited.<sup>14</sup>

11. Source: Pöyry (2011) based on WasteDataFlow figures for 2010 Q1 and Q2 extrapolated and adjusted to reflect market developments. Note, however, that these data include only wood separately collected at CA sites, so they likely underestimate total municipal wood waste arisings.
12. WRAP estimates.
13. WRAP (2009)
14. Murphy, R. & Hillier, B (2004), 'Estimating service life for wood products and its use in evaluating resources and supplies of recovered wood'; arising estimates converted to tonnes assuming 600 kg per m<sup>3</sup>.

## 2.6 Regional distribution of wood waste arisings

Almost 40% of UK wood waste arisings are generated within three regions: London, South East England and North West England (Graph 5). These are areas with high population density and significant construction and manufacturing activities. Wood waste arisings declined in all regions except Northern Ireland between 2007 and 2010. The steepest fall was recorded in Yorkshire and Humber, which fell by 21%, driven by significant drops in construction and municipal wood waste arisings.

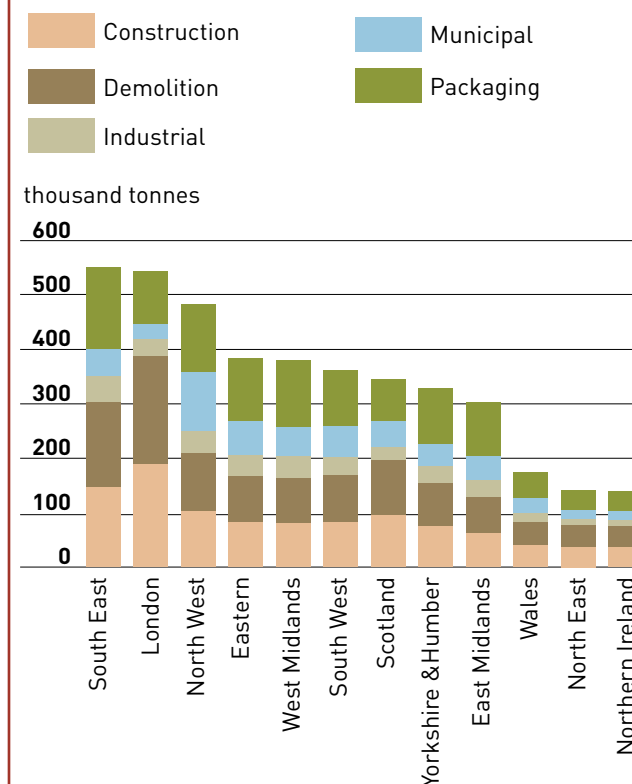
### Box 2: Recent legislative and regulatory developments

A draft Quality Protocol (QP) has been developed for recovered wood which defines the point at which recovered wood is no longer a waste and therefore no longer subject to waste legislation. This, in turn, should make it a more marketable product. The draft QP focuses on untreated recovered wood and covers the end markets of panelboard and landscaping products. Animal bedding and biomass uses are not currently included in the draft QP but additional work on animal bedding is being investigated to see if it is plausible to include in the future.

A Publicly Available Specification (PAS 111) is being developed to create more consistency in the way recovered wood is accepted, graded and processed by establishing a minimum specification for individuals and organisations recovering and processing such that potential customers will be assured they are procuring a material of consistent and verifiable quality.

In its Review of Waste Policy in England,<sup>15</sup> Defra announced an intention to consult on restricting the landfilling of wood waste in England. Waste wood is one of the materials under consideration by the Welsh Government for possible landfill bans or restrictions. The Scottish Government is considering its position on waste wood under its proposed Zero Waste Regulations, which were consulted on earlier this year.

Graph 5: Estimated wood waste arisings by region



Source: Pöyry

15. Defra (2011), [Review of Waste Policy in England](#)



### 3. End markets for recovered wood

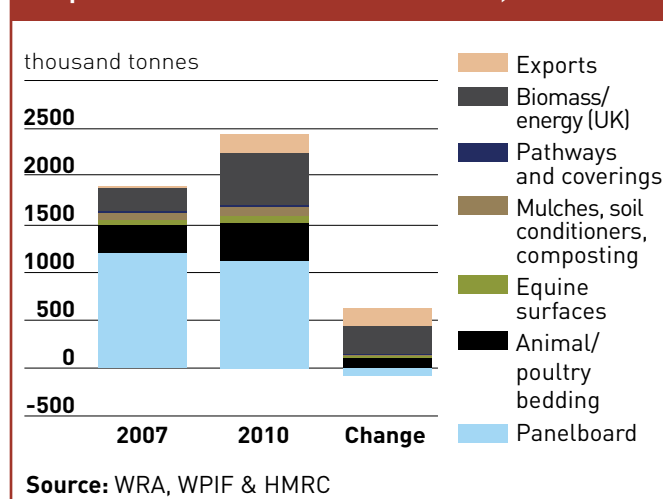
Almost 2.3 million tonnes of wood waste was recycled or used in energy recovery in the UK in 2010 (Table 1), over 50% of estimated UK wood waste arisings. A further 200,000 tonnes were exported for recycling or recovery. Of the remaining 1.7 million tonnes, it is believed that around 1.2 million tonnes was sent to landfill, with the remainder burned (primarily on-site) or used in land recovery.

The panelboard sector is the largest end market for recovered wood, consuming 1.1 million tonnes in 2010.<sup>16</sup> Total tonnages of recovered wood consumed by panelboard manufacturers fell between 2007 and 2010 (Graph 6) as their output contracted during the recession. However, recovered wood's share of panelboard manufacturers' total wood consumption rose, from 26% in 2007 to 33% in 2009, as panelboard manufacturers moved from more expensive virgin wood sources towards cheaper recovered wood.

Future growth in demand for recovered wood from the panelboard sector will depend to a large degree on the extent of any rebound in construction and furniture sector demand for panelboard. However, evidence from previous recessions suggests that panelboard output, and hence demand for recovered wood, could remain below its 2007 peak for some time.<sup>17</sup>

More than 0.4 million tonnes of recovered wood were used for animal/poultry bedding and equine surfaces in 2010. Usage of recovered wood in these markets increased by about 35% between 2007 and 2010 as wood recyclers sought to diversify from the panelboard sector and access higher value markets. Animal bedding and equine surfaces now account for around 20% of the UK's recovered wood consumption. Market contacts indicate that relatively high prices for substitutes, such as straw and hay, are likely to support demand for recovered wood for animal bedding in the near future.

**Graph 6: Recovered wood end markets, 2007-2010**



**Table 1: End Markets for Recovered Wood**

Thousand tonnes	2007	2008	2009	2010	07/08	08/09	09/10
Panelboard	1200	1126	1065	1119	-6%	-5%	5%
Animal/poultry bedding	290	350	360	391	21%	3%	9%
Equine surfaces/bedding	56	73	75	77	30%	3%	3%
Mulches, soil conditioners, composting	75	95	98	95	27%	3%	-3%
Pathways and coverings	15	17	18	17	13%	6%	-6%
Biomass/energy (UK)	250	370	495	551	48%	34%	11%
<b>Total recycled/recovered in UK</b>	<b>1886</b>	<b>2031</b>	<b>2111</b>	<b>2250</b>	<b>8%</b>	<b>4%</b>	<b>7%</b>
Exports	15	117	49	194	680%	-58%	296%
<b>Total recycled/recovered</b>	<b>1901</b>	<b>2148</b>	<b>2160</b>	<b>2444</b>	<b>13%</b>	<b>1%</b>	<b>13%</b>

Source: WRA, WPIF & HMRC

16. Panelboard manufacturing includes the production of wood chipboard, OSB and MDF.

17. WRAP (2009)

Around 100,000 tonnes per annum of recovered wood demand is used in horticulture in the production of mulches, soil conditioners and composts. Recovered wood is also used for pathways and coverings.

Consumption of recovered wood by UK biomass facilities is estimated to have more than doubled between 2007 and 2010 to become the second largest end market for recovered wood.<sup>18</sup> Growth in the biomass sector has been encouraged by government incentives to increase electricity generation from renewable resources. However, other users of recovered wood, the panelboard sector in particular, have expressed concern that such incentives impair their ability to compete for recovered wood. The development of the UK biomass industry and its impact on wood recycling in the UK are examined in more detail in the Special Topic.

Customs data indicate that the UK exported 195,000 tonnes of recovered wood in 2010,<sup>19</sup> compared with 15,000 tonnes in 2007. The main export destinations are Denmark and Belgium (Graph 7). Market anecdote suggests that recovered wood exports are primarily low quality material with no current end use in the UK. However, as more UK biomass capacity becomes operational (expected to be from 2012) exports of recovered wood may decline. The UK does not import significant quantities of recovered wood.

## 4. Gate fees and prices

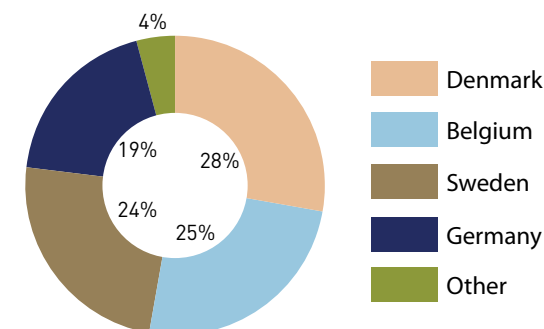
Actual gate fees may vary significantly depending on quality and region. However, indicative data suggest that gate fees for wood waste taken in by UK wood recyclers have fallen sharply since early 2009. High-grade gate fees fell from between £2 and £25 per tonne in January 2009 to between - £7 (ie wood recyclers pay collectors for the material) and £12 per tonne in early 2011 (Graph 8). Clean wood waste is reported to be attracting positive prices (ie negative gate fees) in Scotland at present. Market contacts also indicate that wood recyclers supplying the animal bedding market are often prepared to pay for exceptionally clean recovered wood. Average gate fees for low grade wood waste fell by £9 per tonne to between £7 and £35 per tonne over the same period.

Market contacts suggests that the decline in gate fees reflects increasing competition for recovered wood from UK biomass facilities, a fall in wood waste arisings due to the recession and the increase in exports of (in particular, grade C) recovered wood from southern England to biomass facilities on the continent. Indeed, many wood reprocessors feel that gate fees for clean wood may become a thing of the past.<sup>20</sup>

Market contacts also note increasing demand for recovered wood to be separated into different quality grades. They suggest that this may result in further declines in gate fees for clean wood, but also an increase in low-grade material fit only for the few biomass facilities currently able to handle the contaminants (Box 3).

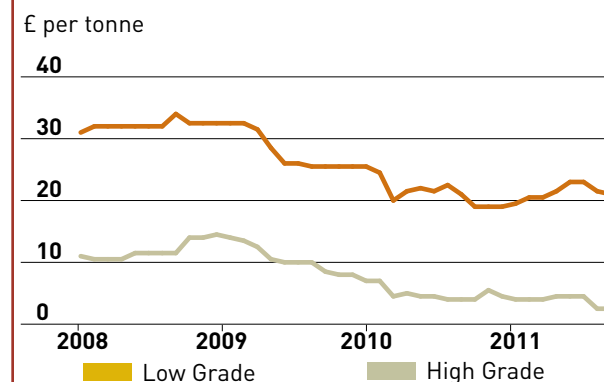
**Graph 7: Recovered wood export destinations, 2010**

**Total: 195,000 tonnes**



**Source: HMRC**

**Graph 8: Average gate fees**



**Source: Letsrecycle**

18. Total recovered wood demand from biomass may include an element of double counting due to recovered wood being transported to third parties before reaching biomass facilities.

19. Data from the WRA estimate a significantly higher level of recovered wood exports for 2010 at 540,000 tonnes, including 377,000 tonnes destined for biomass and 163,000 tonnes for panelboard.

20. AEA (2011), 'UK and Global Bioenergy Resource'.

## 5. Environmental benefits

When wood waste decomposes in landfill, it produces biogas, a mixture of carbon dioxide (CO<sub>2</sub>) and methane. Some of the biogas can be captured and used to generate heat or electricity. Nevertheless, wood waste (including wood waste in landfills that are now closed) is estimated to be responsible for around 5% of UK landfill gas emissions.<sup>21</sup> However, wood contains more lignin than food or green garden waste so it degrades much more slowly, which means that the biogas is released over a much longer period.

The evidence suggests that similar benefits are gained from both recycling and energy recovery of waste wood across a range of environmental impacts,<sup>22</sup> although the exact impact and relative benefit depends on the wood type and waste management technology used. For recycling, higher benefits can be attained if intensive manufacturing processes are avoided. Lower grades of wood are particularly suited to energy recovery, and these have been identified as an underutilised fuel source which could help fossil fuel use.<sup>23</sup>

## 6. Conclusions and challenges going forward

Wood waste arisings have fallen substantially over the last few years as reduced activity, particularly in the construction and joinery sectors, has led to lower wood consumption

Demand from the UK's traditional recovered wood user, the panelboard sector, has also declined as construction and furniture demand have waned. Wood recyclers have responded by targeting higher-value end markets, such as animal bedding, and the biomass sector. In addition, recovered wood is increasingly exported to continental Europe to supply biomass facilities.

Demand from the biomass sector has grown rapidly, encouraged by government incentives to increase the level of electricity generated from renewable resources. This has placed downward pressure on gate fees, which has led to concern by other users of recovered wood, the panelboard sector in particular, about their continued ability to compete for recovered wood.

While recovered wood arisings are likely to grow gradually as the economy recovers, demand for recovered wood from biomass facilities is expected to grow significantly faster, potentially putting further downward pressure on gate fees, particularly for clean waste wood.

### Box 3: Waste Incineration Directive

Biomass plants and co-fired plants that accept recovered wood as fuel must comply with the Waste Incineration Directive (WID). The WID aims to minimise the impact of negative environmental effects on the environment and human health resulting from emissions to air, soil, surface and ground water from the incineration and co-incineration of waste and specifies what biomass waste can be burned for energy. At present, clean recovered wood (free from halogenated organics and heavy metals) can be burnt outside the restrictions of the WID but wood that contains these contaminants can be burnt only inside a WID-compliant boiler.

21. Defra (2011), 'Inventory Improvement Project – [UK Landfill Methane Emissions Model](#)'.
22. See, for example, Defra (2011), '[Guidance on applying the waste hierarchy](#)'.
23. Defra (2008), '[Waste Wood as a Biomass Fuel, Market Information Report](#)'.

## Special Topic: Use of recovered wood in biomass

UK biomass facilities' demand for recovered wood more than doubled between 2007 and 2010 to reach 0.55 million tonnes, almost a quarter of total recovered wood demand.

The development of the UK biomass sector has been encouraged by government incentives aimed at increasing the proportion of electricity generated from renewable resources (see Box 4). The UK National Renewable Energy Action Plan (NREAP), formulated in 2009,<sup>24</sup> which outlines how the UK plans to meet its 2020 renewable energy targets, estimated solid biomass capacity to be 0.6 GW in 2010 and forecast it to increase to 3.1 GW by 2020. Another recent study suggests that approximately 6-7 GW of biomass capacity in the UK is currently at various stages of development.<sup>25</sup> Changes in relative fuel prices, access to finance, government legislation amongst other factors are likely to influence the pace at which biomass capacity is developed, so not all of the capacity identified may become operational or, if it does, not necessarily under the current planned timescales.

Biomass facilities typically can consume a range of feedstocks, one of those being recovered wood. There are a number of considerations in determining the blend of biomass feedstocks used and hence a plant's utilisation of recovered wood. Key amongst these are: calorific value/moisture content; security of supply; fuel cost; biomass content; and contaminants.

The energy output from wood is affected by moisture content. As recovered wood typically has a lower moisture content (18-25%) than forestry and biomass crops (~40%) by virtue of being less fresh, it may be preferred on that measure.<sup>26</sup>

Long-term contracts are more readily available for forestry and biomass crops, which can mean more predictable tonnage and material composition and hence greater security of supply. However, long-term contracts for recovered wood do exist and market anecdote suggests that over 1 million tonnes of recovered wood is currently contracted for five years or more.

Eligibility for ROCs – which can be fundamental to the financial viability of a biomass project – turns on biomass energy content. Whereas forestry and biomass crops have a biomass content close to 100%, low grades of recovered wood may have a biomass energy content as low as 80%, below the 90% threshold for ROCs eligibility. This can be addressed by using a blend of forestry, fuel crops and recovered wood to achieve the required biomass energy content. Note that biomass operators often don't secure finance for infrastructure on the basis of ROC's, because of the difficulty in proving the biomass energy content.

Finally, non-combustible contaminants, such as nails and grit, may cause additional wear to biomass facilities. Forestry wood is likely to contain lower levels of contaminants than recovered wood, but there exist pre-fuel processing processes to remove contaminants from recovered wood (metals can also be recovered for recycling post-combustion from the ash).

A recent study by John Clegg Consulting suggested that the demand for recovered wood from biomass plants could rise to over 4 million tonnes by 2015 (ie more than the UK's entire supply of waste wood).<sup>27</sup> Moreover, there are likely to be severe regional imbalances between supply and demand. For example, demand from Scottish biomass facilities is forecast to increase by approximately 1 million tonnes by 2015. But, as Graph 5 illustrated, current wood waste arisings in Scotland are estimated to be just 345,000 tonnes. Although it might be possible to overcome regional shortfalls by inter-regional movements of recovered wood, it does suggest that the market for recovered wood is likely to become much tighter.

24. DECC (2009), 'The UK National Renewable Energy Action Plan (NREAP)'

25. Hawkins Wright (2010), 'A strategic assessment of UK investments in biomass power'.

26. Defra (2008). Moisture content of forestry and biomass crops assumes a degree of seasoning.

27. John Clegg Consulting (2010), 'Wood fibre availability and demand in Britain 2007 to 2025'.

### Special Topic

[back](#) | [forward](#) | [contents](#)

Consumption  
of wood and  
wood products

Wood waste  
arisings by  
sector

End markets  
for recovered  
wood

Gate fees and  
prices

Environmental  
benefits

Conclusions  
and challenges

Glossary

**Market Situation Report**  
page 12



## Special Topic: Use of recovered wood in biomass cont.

### Box 4: Financial incentives

Since April 2002, electricity suppliers have been required to source a specified proportion of their electricity from renewable generators. Suppliers can meet this obligation by presenting evidence of sourcing from renewable generators, known as Renewable Obligation Certificates (ROCs).<sup>28</sup> The average price of a ROC in March 2011 was almost £50 per MWh. The ROC system was changed in 2009 by banding the value of a ROC according to the generation technology in order to foster the development of emerging renewable electricity technologies (Table 2).<sup>29</sup>

Although ROCs incentivise the use of renewable generation technology and hence stimulate demand for the associated feedstock, they provide an advantage to biomass facilities over other consumers of recovered wood whose operations do not receive the benefit of a ROC.

Further stimulus to demand for recovered wood may come from the introduction of the Renewable Heat Incentive (RHI) later in 2011.<sup>30</sup> The RHI is designed to increase the proportion of heat produced from renewable forms of heating from 1% in 2010 to 12% by 2020. The renewable technologies included are solid biomass (including wood pellets), thermal combustion (using municipal solid waste), biogas, heat pumps and others.

**Table 2: Recovered wood consuming generation technologies and associated ROC bands**

ROCs per MWh	Renewables electricity generation technology
0.5	Co-firing of biomass
1.0	Co-firing of biomass with CHP
1.0	Energy from waste with CHP
1.0	Standard gasification and pyrolysis
1.5	Dedicated biomass
2.0	Dedicated biomass with CHP
2.0	Advanced gasification and pyrolysis

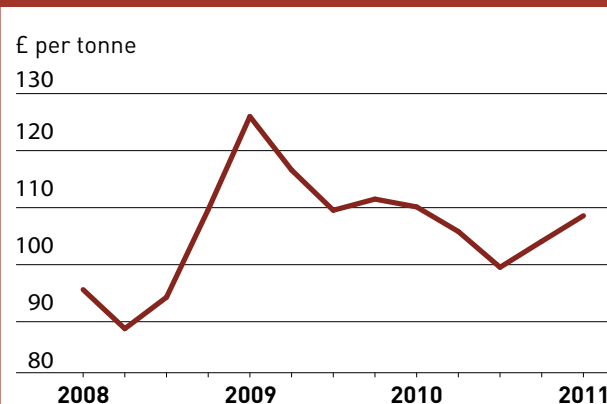
Source: DECC

28. Under the current RO, at least 90% of the energy content of a feedstock must be biomass-derived in order for it to be considered to be biomass.
29. DECC are currently reviewing the banding with new bands due to come into effect from 1st April 2013.
30. For more details, see [www.decc.gov.uk/rhi](http://www.decc.gov.uk/rhi)

Industrial wood pellets prices are the benchmark commodity price used by biomass plants. Industrial wood pellet prices averaged almost £110 per tonne in 2011Q1 and have been above £100 per tonne since the beginning of 2009 (Graph 9). The relatively stable profile for wood pellets (notwithstanding seasonal changes) stands in contrast to the increasing value of recovered wood during the same period. However, new capacity in the UK and elsewhere in Europe may put upward pressure on the prices of both industrial wood pellets and recovered wood.

The recovered wood market is becoming increasingly international, as is illustrated by the rapid increase in recovered wood exports to the rest of Europe. So demand for and prices of recovered wood are likely to be influenced by biomass developments in Germany, Sweden, Belgium and Denmark as well as the UK supply-demand imbalances described in this report. Exchange rate fluctuations and government support for biomass in other countries may also impact on the UK wood market.

**Graph 9: Industrial wood pellet prices**



**Source:** APX ENDEX, EEX (CIF Amsterdam, Rotterdam, Antwerp (ARA))

## Glossary

CA	Civic amenity
CCA	Chromated copper arsenate
CHP	Combined heat and power
CO <sub>2</sub>	Carbon dioxide
DECC	Department for Energy and Climate Change
Defra	Department for the Environment, Food and Rural Affairs
EA	Environment Agency
GW	Gigawatt
HMRC	HM Revenue & Customs
MDF	Medium density fibreboard
MWh	Megawatt hour
NPWD	National Packaging Waste Database
OSB	Oriented strand board
PAS	Publicly Available Specification
PB	Particleboard
PRN	Packaging Recovery Note
QP	Quality protocol
RHI	Renewable Heat Incentive
ROC	Renewable Obligation Certificate
WID	Waste Incineration Directive
WPIF	Wood Panel Industries Federation
WRA	Wood Recyclers Association