

REPORT 008

JOINERY: A Resource Efficiency Action Plan

September 2010

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A contribution to delivering the targets in the joint government and industry Strategy for Sustainable Construction



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JOINERY: A Resource Efficiency Action Plan Towards Sustainable Joinery Practices

This report is part of series of outputs aimed at supporting the delivery of the targets within the Strategy for Sustainable Construction, a joint industry and government strategy published in June 2008. www.bis.gov.uk/policies/business-sectors/construction/sustainable-construction

The project was initiated at the request of the British Woodworking Federation (BWF) which is the trade association for the woodworking and joinery manufacturing industry in the UK.

BWF has over 500 members drawn from manufacturers, distributors and installers of timber doors, windows, conservatories, staircases and all forms of architectural joinery. www.bwf.org.uk

Funding for the project to help develop the Action Plan was provided by a new joint partnership between WRAP and the BRE Trust.

WRAP (Waste & Resources Action Programme) is backed by government funding and aims to help businesses and individuals to reap the benefit of reducing waste, develop sustainable products and use resources in an efficient way. www.wrap.org.uk

The BRE Trust is a charitable company whose objectives are, through research and education, to advance knowledge, innovation and communication in all matters concerning the built environment for public benefit. The Trust commissions research from the BRE Group of companies. www.bre.co.uk

The research for this report was carried out by John Fletcher on behalf of the British Woodworking Federation: E-mail: john@fletcherconsulting.co.uk and Stuart Blofeld of the Building Research Establishment www.bre.co.uk

The report was structured and edited by Jane Thornback of the Construction Products Association. www.constructionproducts.org.uk

The "Delivering the Strategy Targets" series was initiated by Jane Thornback of the Construction Products Association. The Association is the umbrella body for construction product manufacturers and merchants. www.constructionproducts.org.uk

Foreword:

I am extremely pleased with the production of this Action Plan for the joinery sector. This represents a real step forward.

Not only did the industry identify this area of weakness itself but it then took responsibility and showed leadership in addressing the problem. What we now have within this Action Plan is a set of realistic actions that the industry across the supply chain can undertake to make practical improvements in the way we do business. This will not only benefit the environment but also the economics of our businesses as we improve the efficiency of our operations.

A handwritten signature in blue ink, appearing to read 'Ian Purkis', with a stylized flourish underneath.

Ian Purkis

President

British Woodworking Federation

EXECUTIVE SUMMARY

This Resource Efficiency Action Plan for the joinery sector has been developed to assist the industry to decrease the amount of wood waste it generates and to explore potential uses of any unavoidable waste. The Plan identifies the key challenges and actions that the joinery sector will need to take if improvements are to be achieved.

The Plan has been developed by the industry for the industry and has benefited from input from a stakeholder group made up of representatives from across the joinery supply chain and from government departments and the regulatory agencies, all of whom provided valuable input and direction. Research support was provided by BRE's resource efficiency team and funding for the project came from a new partnership of the WRAP (Waste & Resources Action Programme) and the BRE Trust. The work to develop the Plan was carried out between June 2009 and June 2010.

The project was initiated at the request of the British Woodworking Federation (BWF) which is the trade association for the woodworking and joinery manufacturing industry in the UK. BWF has over 500 members drawn from manufacturers, distributors and installers of timber doors, windows, conservatories, staircases and all forms of architectural joinery. Whilst the joinery, and timber industry as a whole, has focused hugely in recent years on responsible sourcing of its timber supplies, other aspects of sustainability have received less attention. The BWF realised that improvements on waste reduction needed to be made and in partnership with the Construction Products Association, the umbrella body for all construction products, sought support for this project. An initial scoping study was funded by the Defra supported Construction Resource and Waste Platform (now part of WRAP).

The joinery industry in the UK is estimated to use between 250-400,000 cubic metres (m³) of timber annually; this is only a small percentage of the annual UK wood consumption of 4 million (m³) used in construction, and 11 million m³ timber used overall in the UK including 'home grown' timber. Little information is available on the quantities of wood waste generated, the quantities reused or burnt or the amount that ends up in landfill. Research has shown, however, that yield rates from a section of timber can often be as low as 20% and are typically around 50%. This suggests significant amounts of wood waste are being generated and that there is perhaps considerable opportunity for improvement.

Waste disposal costs for wood vary considerably. A questionnaire of BWF members in 2009 gave a range from £200 to £7000 per year with an average of £2100 per year. Given the 50% yield rates, this works out as a waste disposal cost of £125 per cubic metre. Waste disposal therefore is costing the sector a considerable amount of money and is a potential major driver for change in the sector. If manufacturers can decrease these costs they not only benefit financially but also decrease the quantities of wood ending up in landfill.

The two most significant ways in which the joinery industry can reduce the amount of wood waste produced is to ensure it is not created in the first instance, and to find suitable outlets for any wood waste that is generated. To do this the sector must challenge traditional procurement practices, understand better the existing and emerging markets for wood waste, understand the principles for the establishment of economically and logistically viable wood waste collection schemes, and have a

good knowledge of the waste regulations that impact on the transport, disposal and burning of waste wood. All these challenges will require the industry along the entire supply chain to collaborate in ways not previously established.

Considerable benefit could be gained by changing procurement practices. The present wide range of timber section sizes could be reduced considerably and replaced by a reduced number of finished section sizes developed specifically to meet the specifications needed for the production of windows, doors and stairs. This is common practice in other parts of Europe. The project Procurement Task Group has developed a set of recommended finished section sizes for windows and doors which could greatly reduce the number of timber section sizes required, whilst at the same time still satisfying the needs of the majority of joinery manufacturers. This should result in much higher yield rates and less offcuts and machine waste.

The Task Group recommends that the joinery sector should adopt these new section sizes and work with merchants and sawmills to ensure it becomes common practice for the procurement of hardwood and softwood sections. Already agreement has been reached between representatives of some sawmill suppliers, merchants and manufacturer to work towards an 'Industry Accord'.

The second major challenge is to develop a more formal way of managing and collecting wood waste. This will require a better understanding of the markets for wood waste and their specifications, especially the fast-emerging bio-energy market. To this end, the establishment of a viable collection and management programme, targeted especially to help SMEs, is to be actioned.

The Joinery Resource Efficiency Action Plan will be taken forward by a new grouping called the Timber Resource Efficiency Partnership (TREP) which has evolved from the Action Plan project stakeholder group. This Partnership will act as custodian of the Action Plan and will promote its implementation throughout the industry.

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I. Introduction

- I.1 This Resource Efficiency Action Plan for the joinery industry is intended to assist the sector in reducing the amount of wood waste it generates, improve the efficiency of the wood materials used and identify end uses for any wood waste generated. The Action Plan identifies the key challenges and subsequent actions that must be addressed if the joinery sector is to achieve improvements in these areas.
- I.2 The work arose because of concerns by the British Woodworking Federation (BWF), the trade association for the joinery sector, that its industry produced considerable quantities of wood waste and that there was potentially much opportunity for improvement. The timber industry as a whole has paid great attention in recent years to the responsible sourcing of its timber supplies but less attention to other sustainability issues. The intention of this work has been to redress this imbalance.
- I.3 There is little information about the quantities of wood waste generated by the joinery sector but previous research has shown yield rates from a section of timber are typically 50% and can be as low as 20%, suggesting there is probably considerable opportunity for improvement. Wood waste is increasingly a cost to joinery manufacturers, as well as an issue in sustainability assessments of the industry. Understanding the amounts of wood waste generated as well as the opportunities for disposing of wood waste in new emerging markets could bring commercial benefits to the sector.
- I.4 The research work was funded by WRAP and the BRE Trust and was led by researchers from the British Woodworking Federation and the Building Research Establishment (BRE). The Construction Products Association facilitated the initiation of the project as part of its contribution to the delivery of targets within the joint government and industry Strategy for Sustainable Construction, published in June 2008.
- I.5 The Action Plan will be taken forward by a new grouping called the Timber Resource Efficiency Partnership (TREP) which has evolved from the Action Plan project stakeholder group. This Partnership will act as custodian of the Action Plan and will promote its implementation throughout the industry.
- I.6 This Joinery Action Plan is one of a series of waste reduction and resource efficiency action plans for construction materials. Others include flooring, plasterboard, windows and packaging. Together they form a wealth of new knowledge, practical recommendations and specific actions to be taken forward and implemented by industry in collaboration and partnership with government bodies and regulators. The programme is supported by WRAP, Defra and the BRE Trust.

2. How the Action Plan was developed

- 2.1 The Action Plan is the result of a research project carried out between June 2009 and June 2010 by researchers from industry and academia, assisted by input from a stakeholder group drawn from across the supply chain and from government departments and agencies (see Table 1 for membership). The project expands on an earlier short scoping study undertaken at the start of 2009.
- 2.2 In addition to the meetings of the stakeholder group, the development of the Action Plan was informed by a number of trials and case studies. These looked at:
- Procurement practices in the joinery sector
 - The issues involved in setting up collection schemes for wood waste from joinery manufacturers along the M62 transport corridor
 - The collection of clean wood waste by Somerset County Council and Bristol City Council for use in local schools for heating
 - The use of wood waste for poultry litter and its subsequent disposal for use as a fuel

Each trial benefitted from additional specific stakeholder input. The four trials are summarised in the annexes, and further detail is available in a full research report.

3. List of stakeholder and contributors

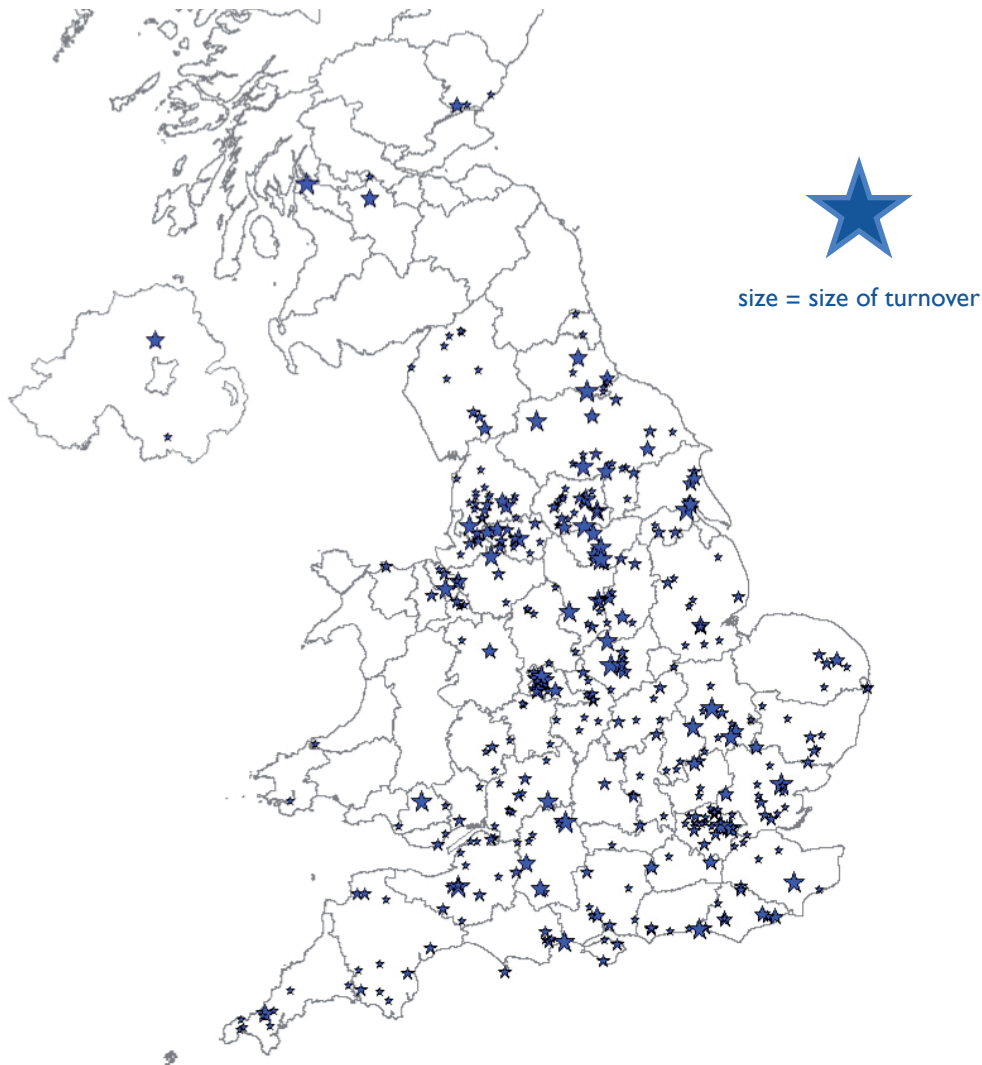
3.1 The following people gave generously of their time to participate in discussions and comment on the development of this Joinery Resource Efficiency Action Plan.

Name	Company
Katherine Adams	BRE (Building Research Establishment)
Stuart Blofeld	BRE
Richard Lambert	British Woodworking Federation
John Fletcher	John Fletcher Consulting Ltd on behalf of the British Woodworking Federation
Carole Green	Builders Merchants Federation
Jane Thornback (Chair)	Construction Products Association
Melville Haggard	Defra - Department of the Environment, Food, Rural Affairs
Mark Downham	Defra
Reuben Aitken	Defra
Lisa Oakes	Defra
Justin Dampney	Eco Sustainable Solutions
Martin Fodor	Environment Agency
Steve Millward	Saint Gobain Distribution UK
Rachel Butler	Timber Trade Federation
Graham Bruford	Timber Trade Federation
Justin Hayward	Timbmet
Andy Pitman	TRADA
Alastair Kerr	Wood Panel Industries Federation
Ian Rochester	Wood Panel Industries Federation
Chris Coggins	Wood Protection Association
Peter Butt	Wood Recyclers Association
Mark Collinson	WRAP – Waste & Resource Action Plan

4. The UK Joinery Industry

- 4.1 The UK has an estimated 3000 joinery companies; the majority of which are small or medium sized enterprises.
- 4.2 The British Woodworking Federation (BWF) is the trade association for the woodworking and joinery manufacturing industry in the UK. BWF has over 500 members drawn from manufacturers, distributors and installers of timber doors, windows, conservatories, staircases and all forms of architectural joinery. The majority are small companies. www.bwf.org.uk
- 4.3 Figure 1 shows the geographical spread of BWF members around the country. They tend to cluster along main transport arteries linking ports to manufacturing centres.

Figure 1: Location of BWF members



Wood consumption in the UK

- 4.4 The joinery industry in the UK is estimated to use between 250-400,000 cubic metres (m³) of timber annually; this is only a small percentage of the annual UK wood consumption of 4 million (m³) used in construction. Most is used in timber frame or other constructional timber applications and 40% is “appearance” timber used for mouldings, architrave, skirting, etc.
- 4.5 The UK consumes in total about 11 million m³ of sawn timber each year (approximately 6 million tonnes), of which 8 million m³ is imported and 3 million m³ is “home grown” (all figures are pre-recession). Over 95% of all sawn timber used is European softwood, of which half comes from Sweden; of the hardwood used, 60% is European.

The Joinery Industry - How companies process timber

- 4.6 Sawn softwood tends to be supplied in fixed lengths, whilst sawn hardwood is supplied in random lengths, due to the greater variation in tree height.

70% of sawn softwood supplied to the UK is less than 3.9m in length, typically between 2.7 and 3.9m, but can go up to 5.4m.

Engineered timber can be made available to specific dimensions. As the knots and other imperfections of the timber have been removed they produce less waste than normal softwood.

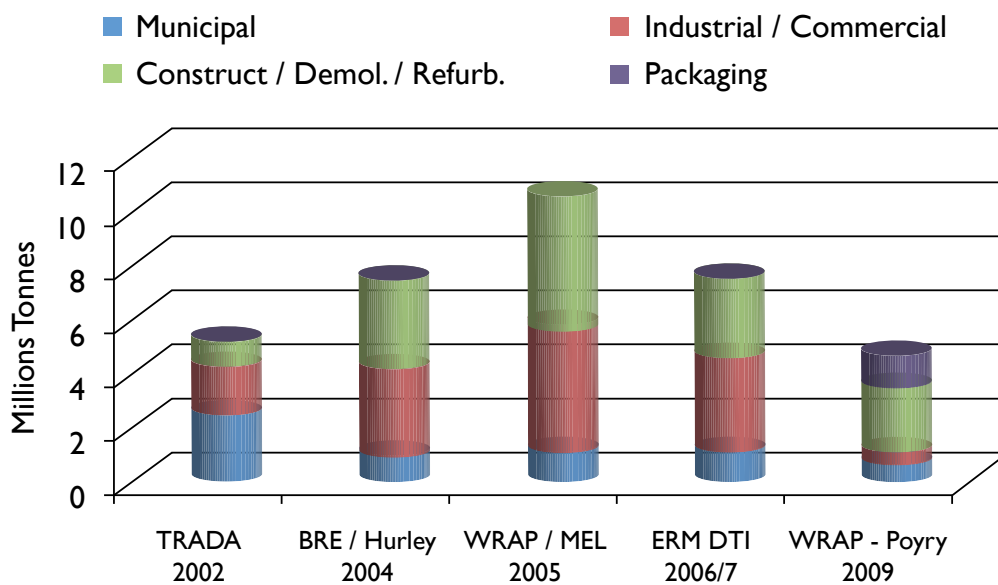
- 4.7 Larger companies tend to buy fixed length softwood and use more engineered components than small companies. For the small manufacturers the timber is bought according to the needs of the job and this can vary. As a result they often have to buy wood from merchants who do not supply the joinery industry exclusively and only carry a limited stock of fixed lengths. All this means that small companies tend to produce more waste, both in the form of off-cuts as they trim to length and machine waste from reducing the cross-section.

5. Wood waste quantities in the UK

- 5.1 Wood waste is generated at all stages of the lifecycle of a piece of timber, from harvesting and sawmilling, through trading (e.g. at timber merchants and DIY stores), whilst processing (e.g. by furniture and joinery manufacturers) and at end of life disposal (e.g. demolition and disposal of old wood items).
- 5.2 Information on the quantities of wood waste generated and levels of recycling in the UK are not readily available from government waste statistics because wood is not always separated out as a specific material. Also most landfill sites do not record wood waste figures separately.
- 5.3 A number of studies over the past decade have attempted to estimate wood waste quantities, the results exhibit considerable variability (see Figure 2). The most recent estimate is from WRAP at just over four million tonnes of wood waste produced annually.

Figure 2 :Wood waste estimates derived from studies since 2002

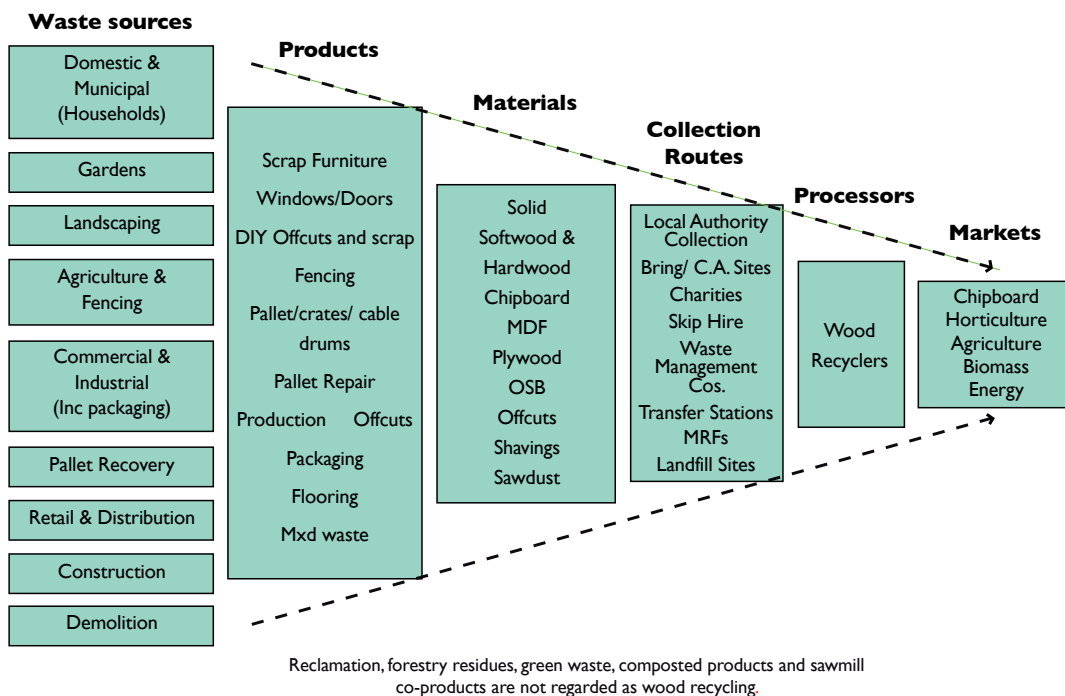
(Sources:WRAP 2009 and previous studies)



- 5.4 There is no information or estimates of the quantities of wood waste produced from the joinery sector; most of it takes the form of wood offcuts or machine waste.
- 5.5 The Wood Recyclers Association (WRA) which has 48 members currently handle approximately two million tonnes of wood waste annually; this is post consumer and demolition waste. The WRA estimate that six million tonnes of wood waste are generated annually in the UK. This figure does not include forestry residues, green waste, composted products and sawmill products.

Figure 3 :Waste Wood and its routes to market

(Source:Wood Recyclers Association)



The cost of wood waste disposal

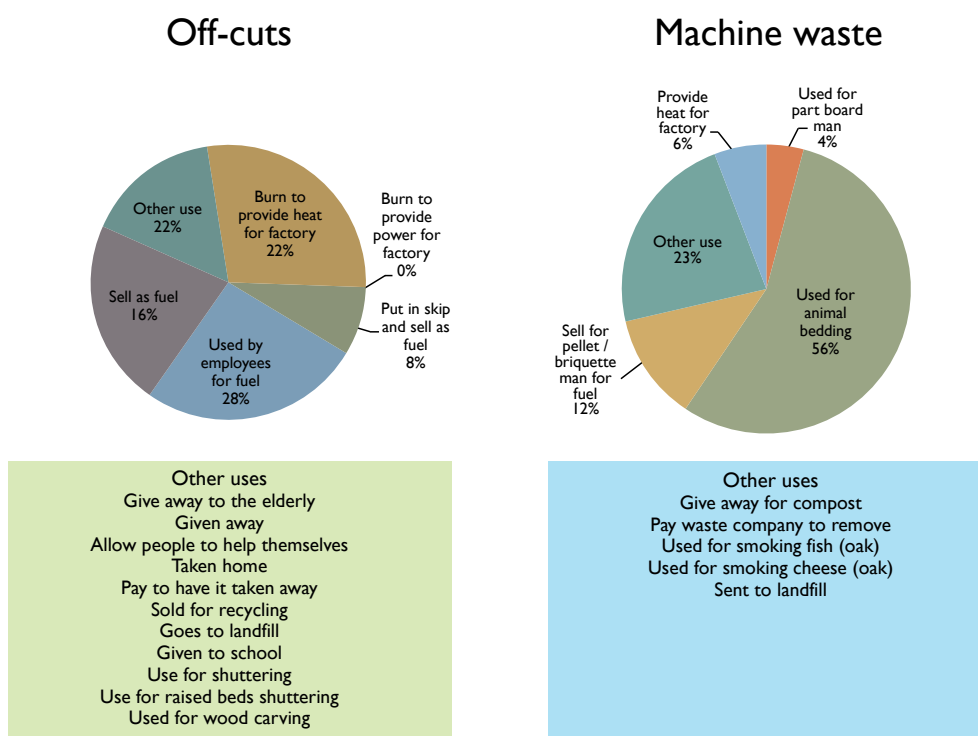
- 5.6 Waste disposal costs for wood vary considerably. A questionnaire of British Woodworking Federation (BWF) members in 2009 gave a range from £200 to £7000 per year with an average of £2100 per year. Previous research by the BWF has shown that yields in the joinery sector are typically around 50%, so this works out as a waste disposal cost of £125 per cubic metre. This highlights a potential major driver for change in the sector. Waste disposal is costing the sector a considerable amount, if manufacturers can decrease these costs they not only benefit financially but also decrease the quantities of wood ending up in landfill.

Uses and markets for wood waste

5.7 The 2009 questionnaire of members of the British Woodworking Federation (BWF) provided a good snapshot of the uses made of wood waste. Answers to the question of the disposal of wood offcuts included: giving away for free to employees, schools, the elderly; used for wood carving for craft classes; for making raised beds for allotments; or paid to have it taken away or sold for recycling. Uses made of machine waste included: giving away for free for composting; for animal bedding especially in rural areas; for smoking fish or cheese; paying to have it taken away; or sent to landfill.

Figures 4 and 5: Wood waste usage – Offcuts and machine waste

(Source: Survey of BWF Members 2009)

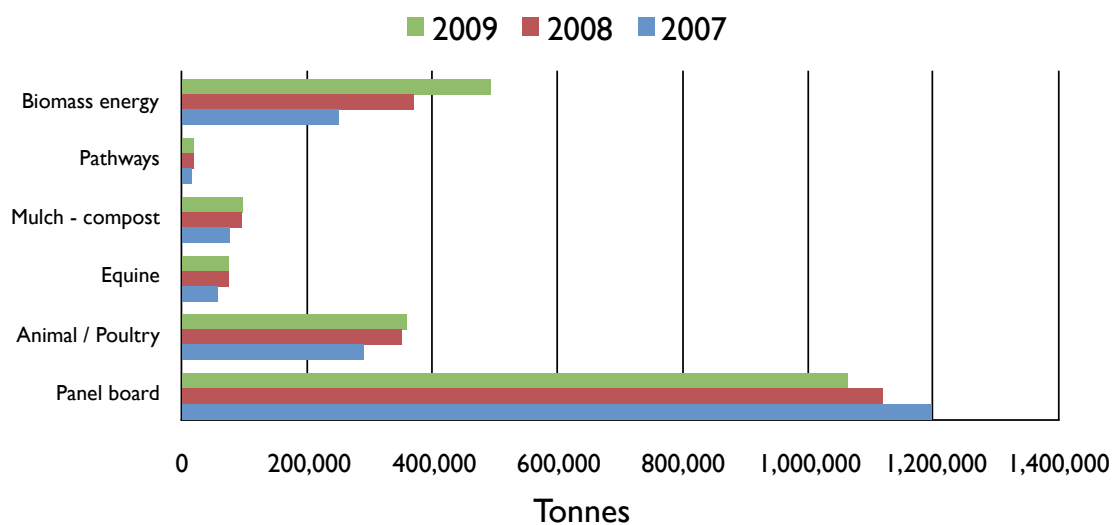


5.8 The largest commercial market in the UK for wood waste from any source is the wood panel industry (60%) where it is used to produce chipboard. This requires good quality A-grade wood waste of which there is currently a shortage; availability of this would most likely reduce wood recyclers costs and result in increased sell-on costs.

Figure 6: Markets for wood waste – 2007 / 08 / 09

(Source: UK Wood Recyclers Association)

**Total = 1.7 million tonnes processed by WRA members + 399,000 tonnes others
In addition, 83,000 tonnes exported**



5.9 In many rural areas, wood waste is often used to satisfy local needs. Off-cut wood waste may be used by local schools for example, in craft classes, by factory employees and other associates as fuel, whilst machine waste is used in animal or poultry bedding, sold as pellets or briquettes, recycled into chipboard or sent to landfill. In most cases, manufacturers cannot be exact when accounting for what happens to their waste nor the amount of waste disposed.

5.10 The relatively new biomass for energy market has doubled between 2007 and 2009 and is expected to grow further. This is a potential good commercial opportunity for the joinery sector though the challenges of wood collection schemes will have to be overcome.

5.11 There are perhaps increasing commercial opportunities for the joinery sector to deal with its waste wood. This will require the sector to have better information on the markets available and their requirements.

6. Policy and legislative framework

6.1 There are a variety of UK and European laws, policies and initiatives aimed at reducing the production of waste and avoiding waste to landfill; the key ones are listed below and apply to all materials.

- England Waste Strategy, 2007 and Review of Waste Strategy
- EU Waste Framework Directive, (Directive 2006/12/EC) and Revised Waste Framework Directive (Directive 2008/98/EC)
- Hazardous Waste Regulations (England and Wales) 2005
- EU Waste Incineration Directive (Directive 2000/76/EC)
- Environmental Protection Act 1990
- Environmental Permitting Regulations (England and Wales) 2010
- EU Landfill Directive (Directive 1999/31/EC)
- Renewables Order Obligation 2009
- Renewables Obligation Certificate (ROC)
- Joint Government and Industry Strategy for Sustainable Construction, 2008
- The Code for Sustainable Homes and BREEAM
- Waste Infrastructure Delivery Programme
- Developing the energy market for wood waste

7. Waste reduction: challenges facing the Joinery Industry

- 7.1 The case studies, project trials and stakeholder input to develop this Joinery Resource Efficiency Action Plan identified a series of major challenges that will need to be addressed by the industry and others if wood waste is to be reduced and wood used more efficiently.
- 7.2 The two most significant challenges for the joinery sector are to reduce the amount of wood waste produced in the first instance, and subsequently to find suitable outlets for any wood waste that is generated.
- 7.3 To do so, the sector must challenge traditional procurement practices, understand better the existing and emerging markets for wood waste, understand the principles for the establishment of economically and logistically viable wood waste collection schemes, and have a good knowledge of the waste regulations that impact on the transport, disposal and burning of waste wood. All these challenges will require the industry, along the entire supply chain, to collaborate in ways not previously established.
- 7.4 The following paragraphs summarise the principal challenges that this Action Plan seeks to address.

Little integration along the supply chain

- 7.5 Prior to the stakeholder dialogue established to develop this Action Plan there was little interaction between the different parts of the timber supply and waste chains. Improved resource efficiency will require collective action amongst many partners so it is essential that a mechanism exists to facilitate such collaboration.

Lack of data on quantities of wood waste and its disposal

- 7.6 There is a lack of information and data collection on the quantities of wood waste generated by joinery and wood products manufacturers. Such information is crucial if the industry is to better manage its wood resources and manage its waste disposal. Government statistics on waste do not separate out wood as a specific material, and most landfill sites do not record wood waste figures separately.
- 7.7 Information on costs, volumes and ease of segregation of wood is urgently required and a system for gathering such information is needed. The segregation of wood is particularly important because if timber has been chemically treated then there are far stricter regulations as to how this wood can be recycled. Such treated wood can contaminate other streams of wood waste, making it more difficult to recover.

Inefficient procurement practices

- 7.8 As a proportion of the amount of timber they buy, small and medium sized joinery enterprises produce relatively large amounts of waste. This is primarily because they buy whatever timber lengths are available from merchants and then trim it to the lengths they require. Yield levels are usually around 50%, and can be as low as 20%, which means that a lot of wood waste is generated.
- 7.9 A major challenge therefore for minimising wood waste is to eliminate its creation early on in the supply chain by establishing improved procurement practices. This will require timber merchants to develop and stock a simplified range of timber sections which will be sufficient to make up the majority of joinery components required for the manufacture of windows, stairs and door frames. The result will be less waste generated than by the current trimming of non-standardised sections to the required size.

Scant knowledge of markets for wood waste

- 7.10 Seemingly, there is little awareness amongst joinery manufacturers and other wood processors of the various markets and commercial opportunities for wood waste, their requirements, and how these might affect the disposal methods for wood waste. A good knowledge of the various existing and emerging markets for wood waste will impact on the types of wood waste collection schemes required and these are likely to vary in different regions.
- 7.11 There is no specific existing Market Information service providing good economic data to the joinery industry on wood recycling opportunities. The key questions for the supply chain are what are the markets for wood waste, how big are they, where are they, do different markets require different types and grades of wood waste? How commercial and profitable are these markets? Can such a market information service be set up commercially? WRAP commissioned a 2009 report on the wood waste market that sought to address some of these questions.¹

Lack of business models for wood waste collection schemes

- 7.12 The majority of joinery companies are micro businesses (a micro enterprise is defined as an enterprise which employs fewer than 10 persons and whose annual turnover and/or annual balance sheet total does not exceed EUR 2 million). They produce small quantities of wood waste in many different locations and probably with a variable production of waste. Even with the existence of commercial markets for wood waste, a major challenge is how to set up wood collection schemes that are viable both logistically and economically. Many examples of wood collections schemes have an element of philanthropy at their start with either a local council project or a local business sponsoring the start up costs. There remain few examples of commercially viable wood collection schemes. One possibility is to establish "collection hubs" at timber merchants from whom joinery manufacturers purchase their wood supplies on a regular basis.
- 7.13 There is also little readily available information and analysis on what criteria need to be in place to make wood collection schemes viable. Clearly, one criterion is for consistency in the amounts, continuity and quality of the wood waste supplied. For instance, in the Somerset

1. Available from www.wrap.org.uk

County Council/Bristol City Council case study (see Annexe 3), if schools are to rely solely on biomass energy generation for heating, then a key question is whether there is a sufficient and continuous supply of clean wood to meet demand, especially when this demand rises in the winter months.

Confusion over the legislative and regulatory framework surrounding the disposal, transport and use of wood waste

- 7.14 There is a strong regulatory framework in the UK surrounding the transport, recycling, recovery and disposal of any waste, including wood waste, and this needs to be fully understood to ensure compliance if a viable economic business is to be made out of disposing of wood waste.
- 7.15 **Contaminated wood.** A key issue for wood recyclers is that of the identification of wood treatments. The problem of defining what is, and what is not, classified as treated wood waste is often a major barrier to successful reuse and recycling of wood. It is known from previous research work that unless wood waste can be guaranteed or proven to be clean then the recycling industry must assume it is chemically treated. A better understanding of what is, and what is not, treated wood is highlighted as an urgent requirement by all stakeholders.
- 7.16 **Transport and storage.** If waste wood is to be collected and transported elsewhere then a waste carrier license will be required. This may not be known when wood waste collection schemes get started. Additionally, environmental permits or exemptions may be required for wood waste storage.
- 7.17 **Waste Incineration Directive (WID).** Currently, there is considerable confusion and lack of understanding within industry about the applicability of this Directive to the use of wood waste as a biofuel, and the types of waste material which can, or cannot, be used. Wood waste which is incinerated, and may contain halogenated organic compounds or heavy metals as a result of treatment with wood-preservatives or a coating, is subject to the provisions of the Waste Incineration Directive. There is no de minimis level of contamination specified in the Directive, and it is for the regulator to determine in each case if firstly the wood is waste and if so, secondly whether it may contain those materials. If the waste wood does not contain these materials then the Directive does not apply. Note that, with a few exceptions, where treatment imparts a distinctive colour, most types of wood preservative cannot be identified by visual means. Even with the current state of the art segregation techniques, it is not possible to identify and segregate all treated wood waste other than at source.
- 7.18 **Biosecurity restrictions.** When wood waste, especially wood shavings from rural-based joinery manufacturers, is used for poultry litter, then there are consequences in regard to biosecurity measures. These restrictions largely arose in response to the recent bird flu contamination of poultry flocks which was thought to have originated with wild birds. Commercial bedding has now been developed which meets these stringent specifications, whereas waste wood shavings may not. Joinery manufacturers will need to be aware of these restrictions if this avenue of wood waste disposal is to continue to be available to them.

8. A Resource Efficiency Action Plan for the Joinery sector

- 8.1 The following Resource Efficiency Action Plan for the joinery sector addresses the key challenges, recommendations, and practical actions that have been identified as essential if the sector is to improve its resource efficiency and decrease the quantity of waste it produces.
- 8.2 The following themes have been identified as the principal action areas for improvement by the sector. These are elaborated upon in the forthcoming pages.

A	Improve collaboration across the timber supply chain
B	Improve information on wood waste quantities
C	Improve timber procurement practices
D	Understand the markets for wood waste
E	Establish viable wood waste collection schemes
F	<p>Improve understanding of the legislative and regulatory framework surrounding the disposal, transport, and use of wood waste</p> <ol style="list-style-type: none"> What is considered contaminated wood waste, and what is not? The need for waste licensing for transporting wood waste The requirements surrounding the Waste Incineration Directive (WID) Implications of biosecurity regulations for the use of wood waste for animal bedding
G	Understand the appropriateness of the use of Wood Waste for Biofuel: The Waste Hierarchy

The Joinery Action Plan was informed by four pilot trials or case studies. A summary of each of these projects is provided in the annexes.

- Pilot Trial: Improved Procurement Practices.** This includes recommendations for the reduction of section sizing to reduce waste in joinery manufacture
- Pilot Trial: Wood Waste Collection on the M62 corridor.** This trial aimed to establish a collection system on the M62 corridor around the formation of local collection hubs, and cluster groups comprising joinery companies and other wood product processors
- Case Study: Wood Waste for Biofuel – Somerset County Council/ Bristol City Council.** In collaboration with Somerset County Council this study project examined a project by the Council to develop a wood waste collection model. This was based on the premise of acquiring clean wood waste for biofuel usage in support of the Building Schools for the Future programme
- Case Study: Energy from poultry litter – A rural case study.** This study looked into the use of waste wood for poultry litter and its subsequent use as a fuel for energy production

A. Improve collaboration across the timber supply chain

Overview

Improvements in wood waste management require collaboration between the different sectors in the timber supply chain. Prior to the dialogue instigated through the development of this Action Plan there was seemingly little such interaction. Improved resource efficiency will require collective action amongst many partners so it is essential that a mechanism continues to exist to facilitate such collaboration.

Challenges

- The good dialogue between the wood recycling industry and the timber industry that has developed during the development of this Action Plan needs to be maintained
- The industry needs to be convinced that collective action on waste management will provide benefits across the supply chain

Next Steps

	Action	Key Partners
1	<p>By end 2010, establish the Timber Resource Efficiency Partnership (TREP) as a new organisation to be the custodian of the Joinery Resource Efficiency Action Plan and oversee its implementation</p> <p>Agree a Constitution, Secretariat and Chair for TREP. Members to include trade bodies, organisations, key delivery bodies, Government departments etc</p> <p>TREP to meet at least twice a year to review progress in implementing the recommendations within the Joinery Action Plan</p> <p>Secure necessary funding for resources required to support the running of the TREP Secretariat</p>	<p>British Woodworking Federation (BWF)</p> <p>Wood Recyclers Association (WRA)</p> <p>Timber Trade Federation (TFF)</p> <p>Other timber industry bodies</p> <p>Defra and other government departments</p> <p>Environment Agency</p>
2	<p>Run an awareness campaign of the need for, and commercial opportunities available to manufacturers and suppliers for disposing of wood waste</p>	<p>BWF</p> <p>TTF</p> <p>WRA</p>
3	<p>Deliver a training programme for better wood waste management including improved timber procurement</p> <p>Training courses to start in late 2010 onwards</p>	<p>BWF</p> <p>Construction Skills</p>

B. Improve information on wood waste quantities

Overview

Little information is readily available on the quantities of wood waste generated in the joinery industry, the levels of recycling of wood waste, and the potential markets for wood waste (see later topic on markets). Such information is crucial if the industry is to better manage its wood resources and manage its waste disposal.

Challenges

- Lack of information and data collection on the quantities of waste wood generated by joinery and wood products manufacturers
- Government statistics on waste do not always separate out wood as a specific material, and most landfill sites do not record wood waste figures separately
- Little information is available on costs, volumes and ease of segregation of wood. This is particularly important because if timber has been treated by any chemicals then there are far stricter regulations as to how this wood can be recycled. It is possible for this treated wood to contaminate other streams of wood waste

Next Steps

	Action	Key Partners
1	Data Collection System to be designed by 2011 to collect annual data on the quantities of waste wood generated by joinery and wood product manufacturers and their timber suppliers This to include information on costs, volumes and ease of segregation of wood	British Woodworking Federation (BWF) Timber Trade Federation (TTF) Wood Recyclers Association (WRA) Building Research Establishment (BRE) WRAP
2	Annual surveys to be carried out by BWF and TTF of their members to gather data on the quantities of waste wood generated	BWF TTF
3	A simple guidance note to be produced for joinery manufacturers on waste management record keeping	BWF

C. Improve timber procurement practices

Overview

The main cause of the generation of wood waste in the joinery sector is procurement practices that result in poor yields. The majority of small to medium sized joinery manufacturers buy their sawn timber supplies from builders merchants or timber merchants from available stock. The timber may be of the wrong quality standard, or is supplied in varying sectional dimensions or lengths and may not be suited to the specification required by the manufacturer for the product being made - such as a window, door or stair components, resulting in a high amount of off-cut wood or machine waste.

Research by the British Woodworking Federation has shown that yields (i.e. the amount of wood utilised from sawn timber) can be as low as 20%, though are typically around 50%. Such wastage may add considerable cost to a business as well as to the product.

Case study information suggests that using more precise sectional dimensions and lengths, often in the form of defect-free laminated timber, can result in a reduction of waste, as well as other financial cost savings and, in addition, leads to improved product performance. Manufacturers who have been able to purchase in this way have not returned to their previous procurement practices. Improving yields by changing procurement practices therefore has the potential for making significant impact on the amount of waste generated by joinery manufacturers.

The Procurement Practices Task Group established during this Action Planning process believes that the present wide range of timber section sizes available for purchase in the UK could be reduced considerably, and has proposed the introduction of a simplified range of timber sizes, preferably made from laminated timber sections which are suited specifically for window, door and stair component manufacture (see Annexe 1 for details). In Scandinavia and other European countries, window manufacturers have produced windows in this way for a number of years, and there is extensive experience, knowledge and know-how to be gained from them and their suppliers. The material is used by an increasing number of medium to large manufacturers in the UK and can be regularly supplied by softwood and hardwood mills, either directly or by merchants.

The Task Group recommends that the joinery sector should adopt these new sizes and work with merchants and sawmills to ensure it becomes common practice for the procurement of hardwood and softwood sections. Already agreement has been reached between representatives of sawmill suppliers, merchants and manufacturer on the Stakeholder Group to work towards an 'Industry Accord', a copy of which is contained in Annexe 5.

Laminated and engineered timber products

An additional approach to reducing the inefficiencies within current procurement practices and joinery manufacture is a more widespread use of engineered or laminated timber products. These are man-made wood products manufactured by binding together the strips (lamels), particles, fibres or veneers of wood, together with adhesives, to form composite/laminate wood products in the final timber size required. They have the benefit of providing a component free from defects such as knots, splits or shakes inherent in the timber, thereby eliminating the need to waste large sections of timber during final product manufacture.

Advances in timber components designed and supplied in this way are such that the joinery manufacturer is now able to manufacture doors, windows and staircases which are stronger, more durable and have less propensity to distort, leading to a reduction in waste from product rejects either in manufacturing or during service. They also offer a further, more sustainable advantage of increased service life expectancy. Although there may be limitations for recycling at end of life.

As developments of these components continue, they are able to assist small manufacturers in meeting the increasing demands and costs of product testing to comply with regulatory requirements. For example, they can lead to the use of fully tested bespoke product 'systems' designed to manufacture doors and windows to conform to new energy regulations required by Approved Document L : 2010.

Different types of engineered timber exist (see Annexe I for details).

The following table indicates the savings in waste disposal costs, materials and labour that can be made through the use of engineered timber

Savings on Material / Waste	Savings on labour
Material supplied to correct dimensions – little or no cutting or re-sawing to size	Very little time spent cutting material
No defects in material. No rejection when selecting material for use	No time spent in treating knots and defects
No spend on defect or knot treatment materials	No time wasted re-manufacturing products that are rejected
No rejections during production - no warped or twisted material	No time wasted producing the same item as a replacement for the reject
No rejection of final product on site. Product is more stable and resilient to humidity changes	Fewer production stages. More products produced in a quicker time. No need for on-site remedial work

Challenges

- Traditional procurement practices are wasteful of wood and need to change
- Changing the established culture of an industry is not easy and there is likely to be considerable resistance to attempts to change procurement practices
- Agreed standard stock sizes are not currently widely available for the manufacture of specific joinery products such as windows, doors and staircases
- The supply chain will need to collaborate in order to supply the marketplace with standardized stock sizes

Next Steps – Procurement Practices

	Action	Key Partners
1	<p>Early in 2011, agree an "Industry Supply Accord", signed by representatives of timber suppliers, merchants and manufacturers, which establishes the intent to examine the ways in which standardised timber lengths might become commonplace in the UK marketplace</p> <p>By end 2010, launch the Timber Joinery Industry Supply Accord</p> <p>Disseminate the Accord widely to trade association members and non-members</p> <p>By Ecobuild in March 2011 to sign up 30% of the major suppliers, distributors and manufacturers</p>	<p>British Woodworking Federation (BWF)</p> <p>Builders Merchants</p> <p>Timber Trade Federation (TTF)</p> <p>TREP</p>
2	<p>By 2013, new agreed standardised sections sizes to be decided, adopted and available in the market place. This requires:</p> <ul style="list-style-type: none"> • By mid-2011, <u>finalise and agree</u> the standardised supply timber sections and sizes to be sold via timber and builders merchants for the manufacture of door, window and staircase components • By end 2011, <u>disseminate and communicate</u> the proposed recommended standard sizes to small and large builders merchants and initiate discussions on their adoption • By end 2011, merchants to have started <u>to develop and adopt</u> the range of standard material stock sizes inline with the recommended standard sizes • By end 2011, merchants and importers <u>to stock</u> the suggested range of standard sizes suitable for the manufacture of windows, doors and staircases • By 2015, uptake of new range of stock sizes to be 50% of the market share. This will require an initial base-line study in 2011 and annual surveys thereafter 	<p>TREP</p> <p>BWF</p> <p>TTF</p> <p>Builders Merchants Federation (BMF)</p> <p>Wood Windows Alliance</p>
3	<p>Introduce tested and accredited timber component system for window, door and staircase manufacture to aid compliance with regulations</p> <ul style="list-style-type: none"> • BWF & components suppliers to develop tested wood window system to help achieve to Part L compliance by 2011 	<p>BWF</p>

	Action	Key Partners
4	<p>By end 2011, develop a strategy and programme to effect behavioural change in procurement practices within the joinery sector:</p> <ul style="list-style-type: none"> • From 2010, deliver a BWF Training Course which will focus on waste management and improving procurement • By end of 2010/11, deliver an awareness campaign and procurement advice targeted at SMEs • Promote better understanding of the cost benefits gained in better procurement practices for solid and laminated components • Develop a portfolio of best practice case study information to persuade suppliers and manufacturers of the benefits of better waste management • Carry out regular surveys to understand the barriers to change • Devise training programmes and delivery systems designed to help small manufacturers • Further develop component systems which allow small manufacturers to meet legislation requirements and improve resource efficiency • Create monitoring systems to capture information demonstrating that industry is changing 	<p>Timber Resource Efficiency Partnership (TREP)</p> <p>BWF</p>
5	Promote the use and benefits of engineered / finger-jointed sections	BWF

D. Understand the markets for wood waste

Overview

Wood waste is often given away free by joinery manufacturers for use as fuel, for craft purposes, for animal bedding etc. This solves the problem of disposing of the waste and brings social benefits to the manufacturer. However there are existing and newly emerging commercial markets for wood waste that could bring economic benefits to the sector, especially in the renewable energy markets. Manufacturers and other wood processors need to be aware of the various markets for wood waste and their requirements.

The largest commercial market in the UK for wood waste from any source (60%) is the wood panel industry where it is used to produce chipboard. This requires good quality A-grade wood waste of which there is currently a shortage. Relatively little machine wood waste is used for panel manufacture.

The new biomass for energy market accounts for 12% of recycled wood, but is expected to grow considerably as government initiatives attempt to increase the amount of energy generated from renewable sources. This is a potentially good commercial opportunity for the joinery sector, though the challenges of wood collection schemes will have to be overcome, and the sustainability issue of burning wood waste rather than reusing or recycling it needs to be addressed.

Challenges

- Lack of awareness across the timber industry of the potential commercial markets for wood waste
- Lack of existing mechanisms to gain understanding of the markets for wood waste

Next Steps

	Action	Key Partners
1	<p>Markets for wood waste better understood through closer collaboration between the wood recycling industry, especially the Wood Recyclers Association, and the timber industry</p> <p>This could be through a Market Information Group established under TREP and meeting every six months to produce good market information for dissemination to the industry</p>	<p>Wood Recyclers Association (WRA)</p> <p>British Woodworking Federation (BWF)</p> <p>Timber Trade Federation (TTF)</p> <p>Wood Panel Industries Federation (WPIF)</p>
2	<p>In 2011, survey work to be undertaken of WRA members to determine the main markets for wood waste.</p> <p>This to be repeated on a regular basis</p>	<p>WRA</p>
3	<p>By mid-2011, a guidance paper to be prepared and published to increase awareness of wood waste markets across the timber/joinery industry</p>	<p>WRA</p> <p>BWF</p>

E. Establish viable wood waste collection schemes

Overview

Joinery manufacturers tend to be small or medium sized companies (SMEs) producing small amounts of wood waste in many different locations and probably with a variable production of waste.

The UK has no comprehensive collection systems for wood waste from joinery manufacturers. Although wood waste collection schemes sound simple to establish and there are many examples of attempts to do so, the majority fail because of logistical and economic limitations that prove too difficult to overcome.

Three project trials were looked at to inform the development of this Action Plan (see Annexes 2,3 and 4). These considered wood collection schemes in several different scenarios:

- Along the M62 corridor which is a major transport artery along which many joinery companies are located
- A clean wood waste collection scheme run by Somerset County Council (SCC) and Bristol City Council (BCC) for distribution to local schools and other amenities for burning for heat in biomass boilers
- In a rural area of East Anglia where wood waste is given away by joinery companies to local poultry farms. The used poultry litter was then later used for biomass energy production by four power stations.

Challenges

- The major challenge to the viability of wood waste collection schemes is how to collect small amounts of wood waste from many different locations in a financially and logistically viable way
- Continuity of supply is important to wood recyclers and market end-users who rely on it as a source of fuel, (especially power generators, schools etc); is there a sufficient and continuous supply of wood waste to meet the demands of a commercial collection scheme? As diverse a supply of wood waste as is possible is the best security to maintain a continuity of supply
- The ability to easily identify and segregate contaminated wood waste from clean wood waste is essential
- It is not yet clear that the business case can be made for setting up collection schemes. Often those schemes in the market place began with local authority or private sponsorship. The degree to which collection schemes might need regular/annual contributions of sponsorship is also unclear
- Waste collection regulations apply and can prove confusing
- The pilot wood collection scheme undertaken by SCC/BCC highlights the challenges in quantifying the amount of clean waste available from joinery manufacturers. Only a very small proportion of the manufacturers targeted by SCC/BCC (15%) responded to three separate mailings sent out to identify those interested in participating in the pilot collection scheme

Next Steps

	Action	Key Partners
1	By 2012, set up a sustainable collection system for wood waste derived from the manufacture of joinery products which can act as a model for other parts of the wood processing industry	British Woodworking Federation (BWF)
2	Develop guidance for joinery manufacturers on the need for segregation of wood waste at source (considered the only way to maintain knowledge of waste wood types, i.e. untreated, treated etc)	BWF
3	Continue working with Howarth Timber on the M62 pilot trial to gather information on costs, volumes of waste and ease of segregation, and the management systems required to make a collection hub work, and how this could be replicated by others in the timber industry.	BWF Howarth Timber
4	Continue dialogue with CO2Sense Yorkshire (funded by Yorkshire Forward) regarding possible partnership/funding of collection system for wood waste on M62 corridor	BWF CO2Sense Yorkshire Envirolink North West
5	Continue to learn lessons from the Somerset County Council/Bristol City Council wood waste recovery collection scheme	BWF Somerset County Council / Bristol City Council
6	Understand the implications of the Wood Waste Quality Protocol, once published, in regard to the further development and implementation of wood waste collection schemes	BWF TREP Wood Recyclers Association (WRA)

F. Improve understanding of the legislative and regulatory framework surrounding the disposal, transport and use of wood waste

Overview

There is a strong regulatory framework in the UK surrounding the transport, storage, recycling, recovery and disposal of wood waste, and this needs to be fully understood to ensure compliance, if a viable economic business is to be made out of dealing with waste wood. A number of key regulatory issues can impact significantly on the establishment of wood waste collection schemes. These are:

- a. What is considered contaminated wood waste, and what is not?
- b. The need for waste licensing for transporting, sorting, recycling and recovery of wood waste
- c. The requirements surrounding the Waste Incineration Directive (WID)
- d. Implications of biosecurity requirements for the use of wood waste for animal bedding

a. What is, or is not, contaminated wood waste?

Wood waste can be considered either untreated (clean), treated and some treated wood waste may be classed as hazardous with virtually no end markets. If there is doubt over the chemical treatment of timber, the recycling industry will assume the worst case scenario i.e. that it is hazardous waste, resulting in the timber product being sent either to an appropriate licenced incinerator or to landfill depending on the contamination. The problem of defining what is, and is not, classified as contaminated wood waste can be a major barrier to successful reuse and recycling of wood. A better understanding of what is, and what is not, treated wood is highlighted as an urgent requirement by all stakeholders. A Wood Waste Quality Protocol has been in preparation by the Environment Agency with the intention of clarifying legally when wood waste can be deemed to be no longer a waste and therefore no longer subject to waste legislation. This is in line with the revised Waste Framework Directive which is looking at defining end-of-waste criteria.

A further possibility could be in the creation of quality assurance, waste certification and audit trail mechanisms leading to improvements in environmental product profiling at industry and company levels.

b. Transporting and storage of wood waste

If waste wood is to be collected and transported elsewhere then a waste carrier license is required. This can be overlooked when wood waste collection schemes get started. Additionally, if wood waste is to be stored then it may require an environmental permit or an exemption.

c. The requirements of the Waste Incineration Directive (WID)

Any wood waste which is incinerated, and may contain halogenated organic compounds or heavy metals as a result of treatment with wood-preserved or a coating, is subject to the provisions of the Waste Incineration Directive. There is no de minimis level of contamination specified in the Directive and the Regulator should determine if the waste contains these materials.

With a few exceptions, most types of wood preservative cannot be identified by visual means. For mixed-source waste streams such as industry collections, demolition and civic amenity waste, even with the current state of the art segregation techniques, it is not possible to identify and segregate all treated wood waste other than at source.

If the regulator is satisfied that the wood does not contain these materials then the Directive does not apply. The government is currently assessing the risks associated with the incineration of mixed wood wastes. If key health and environmental criteria as specified in a Wood Waste Protocol can be satisfied, this material may be able to be incinerated in a broader range of energy plant.

Challenges

- Ensure there is a good understanding within the industry and amongst those seeking to run take back, recycling operations and collection for wood waste for combustion schemes that full compliance with waste legislation is required.

Next Steps

	Action	Key Partners
1	Trade Associations to better understand the legal implications of wood waste on behalf of their members and to communicate this to members on a regular basis	British Woodworking Federation (BWF) Timber Trade Federation (TTF) Wood Panel Industries Federation (WPIF) Wood Recyclers Association (WRA)
2	Industry to urge government to conclude the Wood Waste Quality Protocol	TREP
3	A guidance paper on the implications of the Wood Waste Quality Protocol (when concluded) to be prepared for joinery manufacturers (waste segregation) and wood recyclers (wood waste to biomass)	TREP Research consultancy
4	Findings of Defra's wood waste management study (WR1209) to be disseminated when concluded. This is expected to assist the timber industry on the separation, transportation, reprocessing and recycling/ reuse disposal of wood waste	TREP

d. Bio-security regulations in relation to the use of animal bedding

Overview

In rural areas, one of the difficulties of disposing of wood waste is the cost of transport in relation to the volume of waste produced, particularly when the waste is in the form of shavings which are light in weight and occupy a large volume. A common use of wood waste is therefore to give it to the agricultural sector for animal bedding, especially for use in poultry farms (see case study in Annexe 4).

However there are emerging challenges to this disposal of wood waste shavings. The recent destruction of poultry flocks by bird flu, due to cross-contamination from wild birds, has led to tighter controls on animal bedding to ensure it is disease-free. Although the specification for the bedding material is not demanding, commercial poultry bedding has now been developed which guarantees bio-security through rigorous testing. This commercial bedding may replace wood waste shavings if the latter cannot show it is similarly tested and audited.

Biosecure material can be achieved by providing material to the required specification or by working with wood waste processors to collect and utilise the waste material incurring further cost. The development of an audit trail to demonstrate how wood shavings are disposed of through the chain is achievable, but whether this offers any huge benefit to small joinery manufacturers is doubtful.

The specification for wood waste shavings used as poultry litter thus needs to be better understood by joinery and other wood product manufacturers. Guidance should be circulated through trade association channels.

The use of wood waste as animal bedding relieves the manufacturer of his waste, but moves the waste disposal issue down the chain so that the wood shavings, now in the form of poultry litter, still require disposal. This may be used for biofuel or as fertiliser. The Environment Agency is currently consulting with the farming industry on the use of poultry litter as a fertiliser and tighter controls on its use may be introduced.

Challenges

- Are the biosecurity regulatory requirements that may affect the use of wood waste for use as animal bedding known and fully understood by the joinery industry?
- Once known, how best to communicate the requirements to the joinery industry.
- The specification for wood waste shavings used as poultry litter should be better understood by joinery and other wood product manufacturers. This is especially so where bio-security measures to prevent contamination of poultry flocks is required. Guidance should be circulated through trade association channels.
- Joinery manufacturers may need to reconsider how best to dispose of wood shavings, if bio-secure litter material is demanded. The development of an audit trail to demonstrate how wood shavings are disposed of through the chain is achievable, but whether this offers any huge benefit to small manufacturers is doubtful.
- Waste management and disposal records could be included as part of a company's manufacturing procedures to help them and their customers understand how waste is disposed of.

Next Steps

	Action	Key Partners
1	By end 2011, initiate a further study into the requirements for bio-secure wood shavings when used in poultry litter and other animal bedding materials; to include consideration of the cost/benefits of providing guidance on the biosecure specification and the implementation of an audit trail system.	British Woodworking Federation (BWF)
2	Produce short guidance paper describing findings of above study targeting joinery manufacturers and wood waste collectors in rural areas	BWF

G. Clarify the use of Wood Waste as a Biofuel: The Waste Hierarchy

Overview

Potentially the growing markets for biofuel present an economic opportunity for producers of wood waste. The demand for sources of renewable energy is rapidly increasing. The UK government has a target of providing 20% of energy from renewable sources by 2020 as part of the EU Renewable Energy Directive² and a variety of incentives have been put in place to promote the generation of renewable energy, most notably the Renewables Obligation. Biofuel, the energy from natural materials including wood, is part of this renewable mix and therefore the demand for wood, whether virgin wood or waste wood, for use as a biofuel is rapidly increasing. This provides an economic opportunity for the joinery industry, but also some challenges.

Somerset County Council and Bristol City Council (see case study in the Annexe 3) has a wood collection project specifically aimed at collecting wood waste for burning in school biomass boilers. The quality of the wood being burnt needs consideration to avoid any concerns from residents and parents. The waste fuel should not include contamination from wood that could be described as hazardous. The question therefore arises for wood waste turned into fuel whether some type of certification or quality assurance scheme for quality needs to be developed (Austria and Germany already have a standard for wood pellets).

The Quality Protocol for Wood being developed by The Environment Agency in conjunction with WRAP, and the Wood Recyclers Association will be of relevance to wood collection by clarifying a grading system for wood waste, typical markets suited to each grade, and when waste wood can be considered no longer a waste, and therefore no longer subject to waste legislation. The time frame for this is at present uncertain.

Challenges

- Currently, there is considerable confusion and lack of understanding over the use of wood waste as a biofuel, and the types of waste material which can, or cannot, be used
- Improved communication mechanisms are required to advise the timber industry on wood waste legislation and its use in biomass energy
- There is an potential emerging inconsistency in the policies for producing renewable energy and the waste hierarchy principles which seek to reuse and recycle resources before burning them

Current Initiative

Defra has commissioned a study entitled *An Assessment of the Environmental Impact of Management Options for Waste Wood (WRI 209)* which is due for completion in March 2011. The findings from the research will be used as evidence for any future policy decisions. The study intends to identify the most sustainable methods of managing waste wood, addressing the whole waste hierarchy and other policy drivers, though the research report will not constitute a regulatory guidance note on waste wood management.

2. http://ec.europa.eu/energy/renewables/index_en.htm

Next Steps

	Action	Key Partners
1	Industry to urge government to resolve the potential inconsistency between producing renewable energy and waste hierarchy principles	Timber Resource Efficiency Partnership (TREP)
2	Trade Associations to better understand the legalities surrounding the burning of wood waste for biofuel and to communicate this to members on a regular basis	British Woodworking Federation (BWF) Timber Trade Federation (TTF) Wood Recyclers Association (WRA)
3	Industry to disseminate and widely publicise the Wood Waste Quality Protocol when it is concluded	TREP
4	Findings of Defra's wood waste management study "An Assessment of the Environmental Impact of Management Options for Waste Wood (WR1209)" due for completion March 2011 to be disseminated when concluded.	TREP Trade Associations

Annexes: Pilot trials and case study summaries

- 1 Pilot trial: Joinery procurement practices**

- 2. Pilot trial: Wood waste collection on the M62 corridor**

- 3. Case study: Wood waste for biofuel
– Somerset County Council/Bristol City Council**

- 4. Case study: Energy from poultry litter
– A rural case study**

- 5. Timber Supply Chain Accord**

Annexe I: Joinery procurement practices

Introduction

1. Research by the British Woodworking Federation has shown that yields in the timber industry (including the joinery sector) can be as low as 20%, though are typically around 50%. Several practices in the procurement of timber lead to such poor yields, and the consequent high amounts of wood waste produced. This inefficiency may add considerable cost to a business and to the product.

Project aims

2. A pilot project was initiated during the preparation of the Joinery Resource Efficiency Action Plan to examine the opportunities for improving procurement practices. The aims of the project were to:
 - Explore better use of wood purchasing to minimise waste, for both softwood and hardwood
 - Investigate the use of more appropriate lengths and section sizes for sale via merchants
 - Understand any barriers to change
 - Promote the use of engineered / finger-jointed sections
 - Develop business cases for better procurement, and hence reduce waste
 - Develop a portfolio of best practice systems currently in use by some joinery companies and their suppliers

Procurement Practices Task Group

3. To achieve these project aims, a Procurement Practices Task Group was formed from representatives of different parts of the joinery and timber industries:
 - Three Scandinavian timber sawmill companies (Finforest, SCA, Stora Enso)
 - Two hardwood importers/ timber merchants (Timbmet / International Timber)
 - Two British Woodworking Federation manufacturing members (Littlethorpes of Leicester / George Barnsdale Ltd)
 - A representative of the Timber Trade Federation (representing supply and merchant sectors), and BRE (Building Research Establishment)

Project findings

4. The study identified the following:
 - The majority of small to medium sized joinery manufacturers buy their sawn timber supplies from builders or timber merchants from available stock. There can be a mismatch in the section size between what the merchant has available for purchase and what the manufacturer may require to make the components for the end product, resulting in a high amount of off-cut material or machine waste
 - The timber may be of the wrong quality standard for joinery or is supplied in varying sectional lengths and may not be suited to the measurements required for the window, door or stair components, resulting in greater offcuts or machine waste
 - The timber may be of lower quality than that required and may contain defects such as knots, splits or shakes which must be manually sorted and removed prior to machining

Project conclusions and recommendation

5. The Task Group felt there was much opportunity for the sector to identify ways to utilise wood more efficiently through changed procurement practices. This would require the concerted effort of different parts of the supply chain.
6. Case study information from other projects already suggests that by using more precise sectional dimensions and lengths, often in the form of defect-free laminated timber, can result in a reduction of waste, as well as other financial cost savings and, in addition, can lead to improved product performance. Indeed, manufacturers who have made such a switch have continued with this improved strategy and not returned to their previous procurement practices.
7. The Task Group proposed therefore the introduction of a simplified range of timber sections sizes, preferably made from laminated timber sections, specifically suited for window, door and stair component manufacture. In Scandinavia and other European countries, window manufacturers have produced windows in this way for a number of years, and there are huge amounts of experience, knowledge and know-how to be gained from them and their suppliers. The material is used by an increasing number of medium to large manufacturers in the UK and can be regularly supplied by softwood and hardwood mills, either directly or by merchants.
8. As well as manufacturers, the suppliers and merchants also recognise the need to achieve a more efficient timber supply which brings benefits to the supply chain. As a result of this project work an agreement has been reached between representatives of a number of sawmill suppliers, merchants and manufacturer to work towards the introduction of standardised timber sections. This agreement is captured in an 'Industry Accord', a copy of which is contained in Annexe 5.

Standardised section sizes

9. The Task Group identified the distribution of the most common timber section sizes (see Table 1). These represent the top selling dimensions used in the manufacture of doors, windows and staircases. There is a wide range of sections sizes, many of which the Task Group considered unnecessary to meet the requirements of joinery manufacturers.

**Table 1: Existing finished sizes for a range of door, window and stair components
(data from 5 suppliers)**

Window Sizes (mm)	Sash / mullion	Frame / jambs / head / cill	Door sizes (mm)	Stile / muntin / top rail	Mid / bottom rail	Stair String	Stair tread
	63 × 63	93 × 63 87 × 63		48 × 95 48 × 100	44 × 200	27 × 275	
	63 × 75	100 × 63		44 × 100 48 × 120	48 × 200	32 × 225 32 × 275	32 × 275
	63 × 95 63 × 122			63 × 95 63 × 100		33 × 350	
	72 × 63	92 × 75 96 × 75		63 × 120 63 × 115 63 × 122 63 × 125	63 × 200 63 × 197 63 × 220		
	72 × 75	75 × 75		72 × 95			
	72 × 86 72 × 95	75 × 86 75 × 100		72 × 120	72 × 200		
		100 × 100					

10. The Task Group felt the present wide range of timber section sizes could be reduced considerably and that a reduced number of finished section sizes could be proposed to address specifically the requirements for the production of windows, doors and stairs.

11. Table 2 presents a matrix of recommended finished section sizes for windows and doors, developed by the Task Group. These greatly reduce the number of section sizes required, whilst at the same time are thought to still satisfy the needs of joinery manufacturers. The Task Group recommends that the joinery sector should adopt these new sizes and work with merchants and sawmills to ensure the proposals become common practice for the procurement of hardwood and softwood sections.

Table 2: Summary of finished sizes – highlighting common door and window components

	63mm	72mm	86mm	95mm	120 mm	200mm	220mm
44mm				D			
48mm				D	D		
63mm	W	W	W	W/D	W/D	D	D
72mm	W	W	W	W/D	D	D	
100mm				W			

D = Door section W = Window section

12. The Task Group also recommends additional sizes: 56mm X 56mm, 150mm X 65mm, 150mm X 75mm, for use in vertical sliding sash windows on a 'to order' basis.
13. Table 3 presents recommended finished section sizes for the manufacture of staircase components as developed by the Task Group.

Table3: Finished section sizes proposed for manufacture of staircase components

	225mm	230mm	275mm	350mm
27mm		S		
32mm	S		S	S

Standardised lengths

14. The Task Group recommends standardised timber lengths for use in door and window production:
 - 3.3– 5.4 metres for solid timber sections (with a resultant 3% - 6% offcut waste)
 - 5.9 – 6.0 metres finger-jointed / laminated timber sections (with a resultant 1%-2% waste)
15. In door and stair production, standard heights and widths for door rails and stair treads and risers are typical. Thus, engineered sections can be supplied in ready-cut component sizes for use as and when required.

Laminated and engineered timber products

16. An additional approach to reducing the inefficiencies within current procurement practices and joinery manufacture is to increase the use of engineered or laminated timber products. Engineered timber is a man-made wood product manufactured by binding together the strips (lamels), particles, fibres or veneers of wood, together with adhesives, to form composite/laminate wood products in the final timber size required. They have the benefit of providing a component free from defects such as knots, splits or shakes inherent in the timber, thereby eliminating the need to waste large sections of timber during final product manufacture.
17. Different types of engineered or laminated timber include:
 - 'Clear' engineered sections produced by removing defects (such as knots) at the sawmill and gluing together 'clear' material
 - Thicker sections of timber can be produced from laminating thinner battens together to make the required thickness
 - Small lengths of clear timber can be finger jointed to form longer length boards
 - Outer faces may be made from more durable timber sections increasing product durability
18. Advances in timber components designed and supplied in this way are such that the joinery manufacturer is now able to manufacture doors, windows and staircases which are stronger, more durable and have less propensity to distort, leading to a reduction in waste from product rejects either in manufacturing or during service. They also offer a further, more sustainable advantage of increased service life expectancy.
19. As developments of these components continue, they are able to assist small manufacturers in meeting the increasing demands and costs of product testing to comply with regulatory requirements. For example, they can lead to the use of fully tested bespoke product 'systems' designed to manufacture doors and windows to conform to new energy requirements included in the Building Regulations (Approved Document L : 2010).

20. Table 4 indicates the savings in waste disposal costs, materials and labour that can be made through the use of engineered timber:

Table 4: Savings from use of engineered timber stock

Savings on Material / Waste	Savings on labour
Material supplied to correct dimensions – little or no cutting or re-sawing to size	Very little time spent cutting material
No defects in material. No rejection when selecting material for use	No time spent in treating knots and defects
No spend on defect or knot treatment materials	No time wasted re-manufacturing products that are rejected
No rejections during production - no warped or twisted material	No time wasted producing the same item as a replacement for the reject
No rejection of final product on site. Product is more stable and resilient to humidity changes	Fewer production stages. More products produced in a quicker time. No need for on-site remedial work

Key recommendations

The Task Group recommended the establishment of industry-wide groups to tackle each of the key challenges identified below in order to drive the industry forward:

- Changing the established culture of an industry is not easy and there is likely to be considerable resistance to attempts to change procurement practices. To drive change, the proposed Industry Accord, will be promoted across the supply and manufacturing sectors
- Agreed standard stock sizes specific to the manufacture of joinery items such as windows, doors and staircases need to be agreed and to become widely available
- Monitoring systems to capture information demonstrating the industry is changing need to be established
- Case study information highlighting the benefits of improved procurement practices need to be developed to help persuade suppliers and manufacturers to change behaviour
- Training programmes and delivery systems designed to help small manufacturers need to become widely available
- Component systems, which allow small manufacturers to meet legislative requirements and improve resource efficiency, need developing.

Annexe 2: Wood waste collection on the M62 corridor

Introduction

1. More efficient waste management and disposal mechanisms need to be developed to assist manufacturers reduce their waste costs and avoid unnecessary waste being sent to landfill.
2. The study indicated that emerging markets for wood waste could bring commercial benefits for the wood working sector by achieving a better understanding of waste management, and that a formal plan for the sector would help focus on how this could be achieved.
3. The small volumes of wood produced by individual SMEs (small and medium sized companies) are not commercially attractive for collection by wood recyclers, however, a more viable solution is to amass larger volumes at suitable locally 'collection hubs'.
4. The study proposed:
 - Pilot trials should be set up to examine collection systems around the formation of local collection hubs
 - Cluster groups should be formed comprising joinery companies and other wood product processors in regional areas
 - Greater awareness and understanding of the markets for wood waste should be promoted by the industry to demonstrate how businesses would benefit from taking a more responsible approach

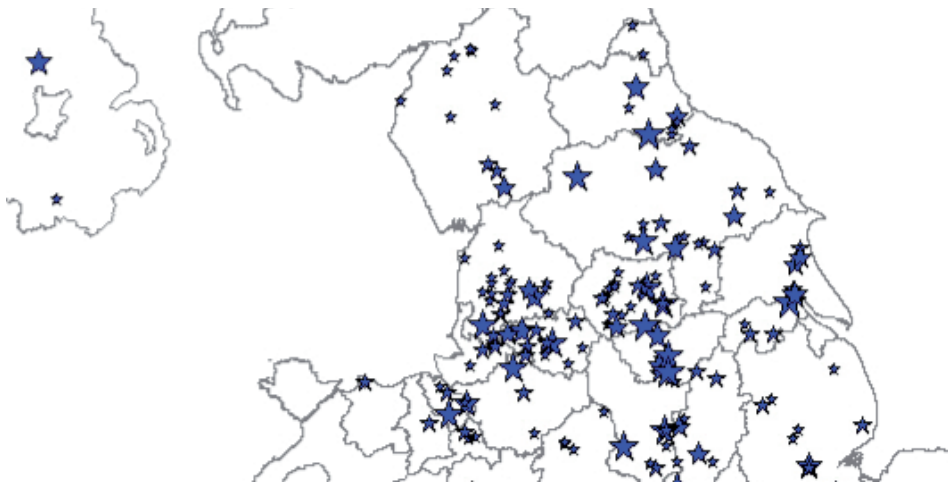
Project aims

5. The pilot project set out to:
 - Explore the idea of a frequent collection system centred around a collection hub, and where hubs should be located
 - Measure the volume, type and form of waste to be collected from each processor (i.e. offcuts, shavings, dust, panel products, contamination)
 - Determine the likely cost and frequency of collection
 - Identify the type of container suitable for different types of locations
6. To achieve these project aims, a Task Group was formed comprising:
 - Howarth Timber – a manufacturing and merchanting company
 - Timberpak – a wood waste recycler (part of the EGGER group)
 - Dalkia – an energy services company
 - Duffield Timber – a hardwood merchant
 - CO2Sense Yorkshire (funded by Yorkshire Forward)

Project findings

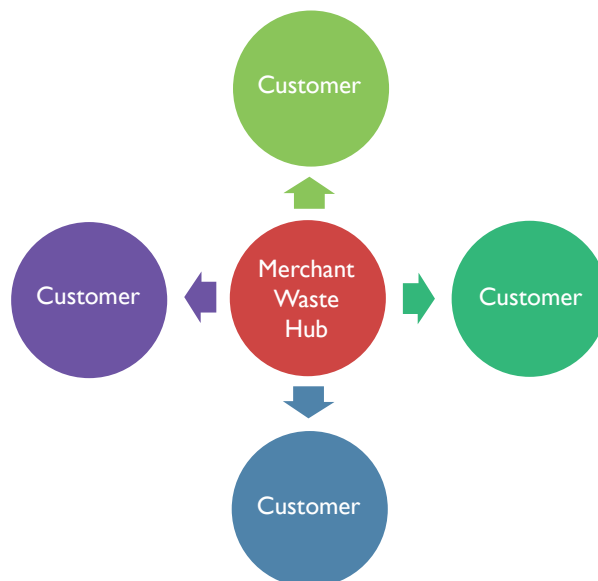
- The preliminary study identified a large concentration of joinery and wood processing industries situated along an East-West corridor linked by the M62 Motorway. Post code mapping of members and non members of the British Woodworking Federation revealed high concentrations of joinery manufacturers (see Figure 1), producing varying quantities of clean wood waste, situated along its borders. The closeness of several major cities provided the possibility of additional high quantities of demolition and post consumer wood waste.

Figure 1: BWF member locations around the East-West corridor



- The project sought to utilise Howarth Timber branches, positioned on either side of the M62, as wood waste collection hubs. Howarth delivery vehicles would collect wood waste from their small joinery customers on their return journeys, and bring it back to the 'home' branch for later collection by the wood recycler, as illustrated in Figure 2.

Figure2: Collection hub principle



9. To develop this concept further, two recyclers proposed to carry out feasibility surveys of some of the Howarth branches. These surveys would consider location, vehicle access, safe loading and unloading areas and suitable storage areas for waste. They would also make recommendations on the potential for each location. This would then help in planning the trial by identifying each branch's customer base and determining the wood waste potential for each location.
10. Unfortunately this work proved difficult to complete within the project timescales. However a lot has been learnt from the setting up of this trial. To develop the principle of a collection hub further, a number of company-wide and individual branch activities need to be considered and obstacles overcome before a collection scheme can be established:
11. **Company-wide** activities that require attention include:
 - Appoint a senior management 'champion' to develop the idea and make things happen
 - A full assessment of each branch, identifying a suitable area where segregated waste can be stored. Provide adequate facilities where required
 - An assessment of the customer base of each branch to identify the customers most likely to benefit from the scheme. Develop a league table of timber purchasers to assess initial potential
 - Trials on suitable containers in which to carry waste which can be managed safely and efficiently by the delivery vehicle and operator. Containers suited to overall potential volumes
 - A waste carriers license obtained for Howarth Timber
 - A full cost appraisal of the system once trialled, (probably on a weekly management reporting basis) with fine tuning recommendations, where appropriate
12. **Branch activities** that require attention include:
 - Overall management of the waste collection area at the branch and correct segregation of any waste
 - A questionnaire mailed to each customer, usually using monthly statement mailings, to assess:
 - Interest in taking part
 - How they currently dispose of waste
 - Type and volume of waste produced
 - Whether or not they think they would benefit from the new system
 - This exercise would also be followed up by telephone to chase up late returns
 - Provide information to customers to educate and ensure correct waste segregation is made at their premises (developed from a corporate template)
 - Accurate and strict delivery and collection route planning for each customer
 - Apply for an exemption from the Environment Agency under the Environmental Permitting Regulations - Storage of waste (S2) to allow the storage of waste in a secure place for recovery elsewhere³

3. There are various requirements and conditions in order to comply with this exemption. Refer to www.netregs.gov.uk for more information

Project Conclusion and recommendations

13. This project had a wide vision, with the aim of setting up collection hubs, and systems with suitable collection routes with a wide range of partners to help achieve it. Over time, this has narrowed considerably to focus on one company, Howarth Timber, and a suitable waste recycling partner. The support of the Howarth Timber board of directors has now been secured and some work on waste measurement within the group is being undertaken. A project 'champion' has also been appointed.
14. It has become clear that the joinery industry and other wood processors require a better understanding of the markets for wood waste, the market influences and the opportunity introduced through better waste management. The market for wood waste also appears to be very fluid, with demand for securing large volumes of wood waste for renewable energy beginning to make an impact.
15. Setting up a successful collection trial requires a focus from all partners; commitment, time and resources to make it happen. This is difficult given the pressures of everyday issues such as production demands, shortage of orders and reducing overall waste processing costs.
16. Due to waste arisings from small manufacturers being difficult to predict, since the volumes generated by small manufacturers vary, weekly management of waste volumes will be required. There is also the danger of mixing waste streams from other materials such as plastic packaging, nails and treated wood.

Key recommendations

17. The following recommendations are made:
 - Continue to work with Howarth Timber to gather information on costs, volumes of waste and ease of segregation, and the management systems required to make a collection hub work, and how this can be replicated by others in the timber industry
 - Closer cooperation with the Wood Recyclers Association (WRA) to gain a better understanding of the markets for wood waste which could benefit the timber industry. This could be through a joint working group with the WRA, meeting every six months, to establish good dissemination of information to its members and across sectors of the timber industry
 - Establish a mechanism to collect data on the quantity of waste wood generated by joinery and wood product manufacturers and their timber suppliers each year. This will lead to better understanding of the markets, challenges and issues faced across the wood waste recycling industry, and could, if initiated, lead to more detailed and accurate market information as the timber sectors seek to improve waste management
 - A further outcome could be in the creation of quality assurance, waste certification and audit trail mechanisms leading to improvements in environmental product profiling at industry and company levels
 - Deliver a training programme for wood waste management and better timber procurement. This programme led by the British Woodworking Federation (BWF), and funded under the Construction Skills programme is intended to include non-BWF members and other timber sector partners

Annexe 3: Wood waste for biomass heating – Somerset County Council and Bristol City Council wood collection scheme

Introduction

1. This case study, in collaboration with Somerset County Council (SCC) and Bristol City Council (BCC), sought to explore the issues and challenges faced by a local authority when trying to establish a collection scheme for clean wood waste for burning in biomass boilers in schools and other amenities. The scheme sought to partner with wood product manufacturers in the local area.
2. A number of general principles emerged from the experience which could assist other local authorities wishing to initiate similar wood collection schemes.

Project aims

3. This case study provided the opportunity to:
 - Work alongside / support Somerset County Council/ Bristol City Council in lesson learning from an actual wood collection scheme trying to get established
 - Investigate the communication process required to identify and acquire 'clean wood waste' for biomass usage (at the time for the Building Schools for the Future (BSF) Programme)
 - Explore ways of engaging with local joinery manufacturers
 - Develop a wood collection model for other local authorities to consider
 - Examine financial, social and environmental cost benefits. Can a business model be made for wood collection schemes?

Key findings

4. The case study highlighted some of the many issues that a local authority will need to consider when seeking to utilise wood waste generated across a region. These include:
 - The difficulty in engaging with, and then collecting, wood waste from small joinery manufacturers
 - Addressing the waste hierarchy model by aiming to recycle clean wood waste before considering using it as a fuel
 - The requirements of waste legislation in regard to transport, segregation, storage and use of wood waste biomass boilers
 - Addressing and fully understanding the issues surrounding the use of the Waste Incineration Directive (WID) and non-WID compliant biomass boilers
 - Ensuring an adequate and continuous supply of wood waste is available for biomass heating and/or power generation
 - Ensuring that the correct grades of wood waste are segregated and any quality mechanisms are in place to ensure compliance with the forthcoming Environment Agency Wood Quality Protocol

- Analysing the financing required to get the collection scheme started and any ongoing costs. Will the local authority need to provide/find start up funds. How quickly can the collection scheme become self-financing. Costs will include any manual and machinery costs required for quality control, collection systems and transport to biomass boiler installations around the county
- Collaborating closely with trade associations such as the Wood Recyclers Association to achieve a good and up-to-date understanding of wood waste markets

Project conclusions and recommendations

Reaching small and medium sized manufacturers (SMEs)

5. SCC and BCC experienced considerable challenges in quantifying the amount of clean wood waste available in their region. Only a very small proportion of the manufacturers targeted by SCC (15%) responded to three separate mailings sent out to identify those interested in participating in the pilot collection scheme.
6. This is an issue for the joinery sector; since SMEs are likely to be the companies most likely to benefit financially from a simple and formal waste collection system. Engagement with manufacturers can be increased by follow-up telephone calls, during which waste volumes can be assessed and collection arrangements made. A county-wide collection system could be considered using timber merchants, who are in contact with small companies on a regular basis.

Waste hierarchy

7. The scheme focused on clean wood waste collection for use in biomass boilers in schools and other amenities. The waste hierarchy, which favours in order of preference waste prevention, reuse, recycle, energy recovery and finally disposal to landfill, means that one should seek to recycle waste wood in the first instance (e.g. for panel manufacture) before choosing to burn it.
8. The logistics of wood collection and the carbon cost of that transportation also need careful thought. SCC/BCC are aware of these issues and are currently undertaking a further exercise to investigate.

Waste licensing - transport

9. From the experience obtained from Bristol City Council, the principle of using a 'backload' collection system, employing empty returning delivery vehicles highlighted the need to ensure that all waste is transported and managed under appropriate licensing regulations.

The continuity of wood supply

10. If schools and other amenities are to rely solely on biomass energy generation for heating, the question arises whether there is sufficient and continuous supply of clean wood to meet demand especially in the winter. Feedstock should be as diverse as possible so as not to rely on only a few sources.

Funding and 'free' issue wood waste

11. The need for start up funds and possibly annual funding must be given consideration. A stand alone and economically viable operation must also be considered by councils wishing to consider this type of approach to wood waste usage. If local sponsorship money is considered, then this should be on a long term view to keep the system going. Predicted demands for clean wood waste already suggests that market forces will dictate where the best price for clean wood will lie, and that the present concept of donating wood waste for use in schools may not continue to be a viable option to manufacturers.

Quality of clean wood waste

12. The SCC/BCC project is specifically aimed at collecting wood waste for burning in school biomass boilers and other amenities, and the quality of the wood needs some consideration to avoid any concerns from residents and parents. The waste fuel should be 'guaranteed' to not include contamination from wood and as such the requirements of the Waste Framework Directive do not apply. The question therefore arises for wood waste turned into fuel whether some type of certification or quality assurance scheme needs to be developed to ensure that concerns are alleviated. (Austria and Germany already have a standard for wood pellets).
13. The Quality Protocol for Wood (being developed by The Environment Agency in conjunction with WRAP, and the Wood Recyclers Association) is likely to define what wood waste is suitable for particular end uses and as such it can be considered no longer a waste, and therefore no longer subject to waste legislation. A wood grading system may be used.

Wood waste incineration

14. Any wood waste which is incinerated, and contains halogenated organic compounds or heavy metals as a result of treatment with wood-preservatives or a coating, is subject to the provisions of the Waste Incineration Directive. There is no de minimis level of contamination specified in the Directive although there are emission limit maximums specified and as such this has consequences for the incineration of such wood waste, including for energy recovery.
15. With a few exceptions where treatment imparts a distinctive colour e.g. transmission poles, railway sleepers (typically creosote treated) and wooden fencing products (typically treated with creosote or chromate copper arsenate or other copper-containing preservative that imparts a pale green colour), most types of wood preservative cannot be identified by visual means.

16. For mixed-source waste streams such as industry collections, demolition and civic amenity waste, even with the current state of the art segregation techniques, it is not possible to identify and segregate all treated wood waste other than at source. Studies undertaken by the wood preservation industry suggest that the actual loadings of treatment chemical in mixed wood waste are extremely low. This is because of (intended) limited preservative penetration, the presence of dense heartwood resistant to penetration, and dilution with untreated timber in the waste stream.
17. The absence of a de minimis means that at present, both treated wood waste and mixed wood wastes should be incinerated in a combustion system that meets the provisions of the Waste Incineration Directive. This requirement would exclude the majority of smaller capacity incinerators. Government is currently assessing the risks associated with the incineration of mixed wood wastes. If key health and environmental criteria as specified in a Wood Waste Protocol can be satisfied, this material may be able to be incinerated in a broader range of energy plants.

Key recommendations

18. The following key recommendations are made:
 - Consider the setting up of collecting hubs around the county to collect small amounts of waste from SMEs
 - Create ways of encouraging / incentivising SMEs to manage and segregate waste
 - Examine ways of ensuring consistent and continuous supply of clean material by setting up a Quality Protocol
 - Ensure that manufacturers, waste collectors and collection centres have adequate records for the disposal of waste, even if waste is 'donated' to charitable causes
 - Consider the introduction of a quality assurance and / or certification scheme (e.g. FSC / PEFC) which will provide a chain-of-custody trail from cradle to grave
 - Measurement and ensuring good quality of clean wood waste – especially when wood waste biomass is used in schools
 - Consider how funding the collection, recycling and provision of 'free clean waste' for schools and other public amenity or charity-based projects is viable as demand for wood waste biomass grows and price pressures change
19. Other local authorities may have similar aims to Somerset County Council/Bristol City Council in the use of locally produced and collected wood waste for its schools and other local amenities. This case study has highlighted some of the issues, and the amount of careful and considered planning which may be required. To help in this, the following suggestions should also be considered:
 - Work should commence with an in-depth wood waste survey to provide information on potential volumes of clean waste in a region
 - Communication with local wood recyclers and waste partners is essential in ensuring an adequate understanding of waste wood flow streams is achieved
 - Contact with micro enterprises and SMEs can be difficult and time consuming; need to consider telephone interviews in addition to postal surveys
 - Give detailed consideration to how small volumes of waste wood can be collected and stored before transport to the final receiving station

- Ensure wood processors undertake wood segregation into the appropriate grades according to the EA Quality Protocol
- Ensure that the receiving station is adequate and fully equipped for storage of raw and chipped material. The station must be adequately manned to enable manual sorting of material
- Consider transport costs from chipping station to amenity user
- Consider the financial viability of the overall operation from collection to final fuel use

Annexe 4: Energy from poultry litter – A rural case study

Introduction

1. In many rural areas, wood waste is often used to satisfy local needs. Off-cut wood waste may be used by local schools for example in craft classes, by factory employees and other associates as fuel, whilst machine waste is used in animal or poultry bedding, sold as pellets or briquettes, recycled into chipboard or sent to landfill. In most cases, manufacturers cannot be exact when accounting for what happens to their waste nor the amount of waste disposed.
2. Figures 3 and Figure 4 below illustrate the different uses for wood off-cuts and shavings described above.

Figure 3: Different uses for wood offcuts

(Source: Survey of BWF members 2009)

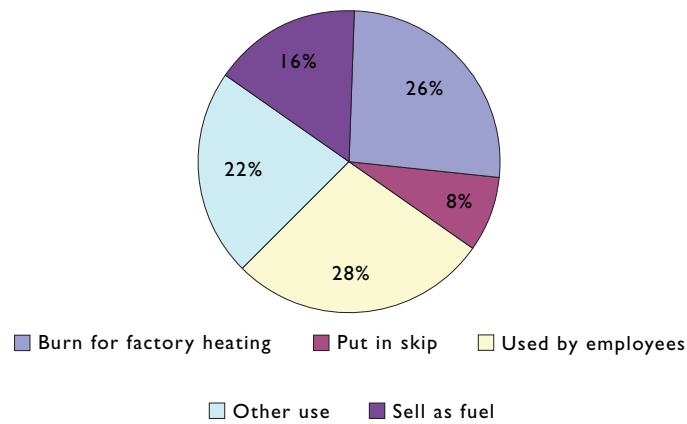
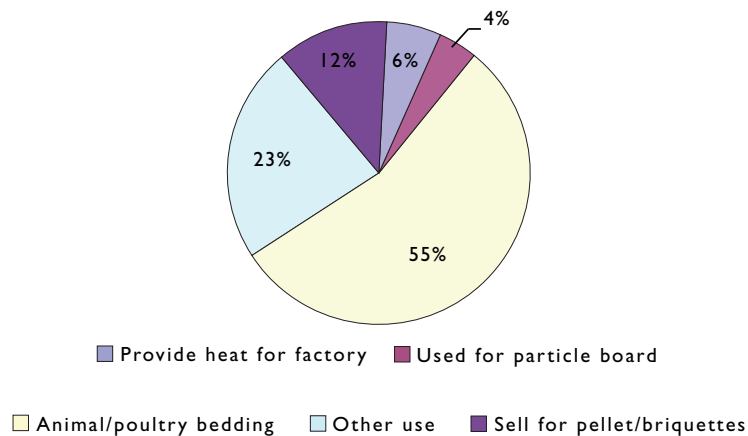


Figure 4: Different uses for wood shavings



3. One of the difficulties in disposing of waste in rural areas is the cost of transport in relation to the volume of waste produced, particularly when waste is in the form of shavings which are light in weight and occupy a large volume. A simple and accepted solution is to use shavings as poultry or animal bedding, allowing the local farmer to benefit from material that is soft and absorbent. This solution relieves the manufacturer of his waste, but moves the waste disposal issue down the chain so that the wood shavings, now in the form of poultry litter, still require disposal.
4. In the UK, about three quarters of poultry litter waste is used as fuel for biomass energy, the remainder being used as fertiliser. Poultry litter has a calorific value of about 50% that of coal, depending on the moisture content. Four small to medium-sized power generating plants (10 to 40MW output) now operate using this material.

Project Aims

5. This case study in rural East Anglia was chosen to examine:
 - How wood shavings for poultry bedding are subsequently used for biomass energy
 - What specification of wood shavings is required for animal and poultry bedding
 - Whether the waste supplied in this chain can be accounted for in a formal audit trail
 - To learn lessons that can assist the joinery industry in understanding more about waste disposal in rural areas

Key findings

6. The supply of wood shavings for use as poultry litter is a simple and convenient way of waste disposal, prevailing particularly where poultry farming exists in highly concentrated areas (such as Norfolk, Suffolk, and Cambridgeshire) and where waste is otherwise difficult and costly to collect. Local arrangements between farmer and wood processor are often mutually commercially beneficial; the manufacturer disposes of waste at low cost, and the farmer receives an efficient, low-cost bedding material. The subsequent use of waste litter as biomass fuel for energy is a beneficial solution to end of life disposal.
7. However there are emerging challenges to the disposal of wood shavings for animal bedding:
 - Although the specification for bedding material is not demanding, tighter controls have now come into force to ensure disease-free bedding because of recent destruction of poultry flocks by bird flu via cross-contamination from wild birds. Commercial poultry bedding has now been developed which guarantees bio-security through rigorous testing, whereas wood shavings may not meet these standards
 - The downturn in construction has led to some shortages of wood shavings from wood processors such as joinery manufacturers, and in order to balance demand, wood shavings produced directly from the log or straw have been used as substitutes
 - The British Woodworking Federation believes that the use of waste poultry litter for biomass energy production is a good end-of-life consideration, and more favourable than an alternative use as a land fertiliser. The Environment Agency is currently consulting with the farming industry on the use of poultry litter as a fertiliser and tighter controls on its use may be introduced

- Power generators have a broad mix of fuel specification which includes wood waste, straw, feathers and horse bedding. A consistent supply of material from poultry farmers is essential, although generators may, within certain limitations, vary the material mix to ensure this occurs. Joinery wood waste may not be in constant supply where business downturn is experienced, or where wood waste fails to meet the new strict bio-security standards

Recommendations

8. A number of issues affecting the use of wood shavings used in poultry litter could affect future disposal. The following considerations may assist small manufacturers who dispose of shavings in this way:
 - Joinery manufacturers and other wood processors should be aware of the various markets for wood waste, their requirements, and how these affect the different types of wood waste disposal methods for manufacturers situated in rural areas
 - The specification for wood waste shavings used as poultry litter should be better understood by joinery and other wood product manufacturers. This is especially so where bio-security measures to prevent contamination of poultry flocks is required. Guidance should be circulated through trade associations
 - Joinery manufacturers may need to reconsider how best to dispose of wood shavings, if bio-secure litter material is demanded. This can be achieved by providing material to the required specification or by working with wood waste processors to collect and utilise the waste material incurring further cost
 - The development of an audit trail to demonstrate how wood shavings are disposed of through the chain is achievable, but whether this offers any huge benefit to small manufacturers is doubtful
 - Waste management and disposal records could be included as part of a company's manufacturing procedures to help them and their customers understand how their wood waste is disposed

Annexe 5: Timber Supply Chain Accord

We, the undersigned, representing different parts of the timber joinery supply chain and manufacturers

Recognising that opportunities exist to decrease wastage rates which can be as high as 25-50% of the original purchased wood during manufacture;

Recognising the need to improve the resource efficiency of softwood and hardwood timber use in the joinery industry and to reduce the amount of discarded wood;

Agree to work together in partnership to promote more efficient procurement practices throughout the supply chain; especially we will:

- Explore the viability of adopting standardised timber sections for use in the manufacturing of windows, stairs and doors;
- Promote the use of engineered timber;
- Develop the business case for more efficient procurement and waste reduction;
- Promote through awareness campaigns the take up of length optimisation, standardised sections and other best practice procurement methods.

We will progress our ideas and activities to achieve these objectives through six monthly meetings of the newly formed Timber Resource Efficiency Partnership (TREP).

REPORT 008

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