

An introduction to wood waste in the UK

Dr Georgina Magin



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Great Eastern House, Tenison Road
Cambridge CB1 2TT, UK
publications@fauna-flora.org

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1.1 A global forest crisis

Forests perform a wide range of functions, including watershed protection, soil conservation, provision of timber and non-timber forest products, climate stabilisation and carbon storage. They are home to human communities as well as providing the habitats for a huge proportion of the world's plant and animal species. They are thus vital to the health of our planet.

According to the United Nations Food and Agricultural Organisation (FAO), natural forest in developing countries decreased by 13.7 million ha a year between 1990 and 1995 (FAO, 1999). In addition to this deforestation, forest degradation—a decrease in the ecological quality of forests—is occurring on an equally large scale. While the causes of forest loss and degradation are numerous, logging for the timber industry is undoubtedly a significant factor in many areas (Dudley *et al.*, 1995).

The decrease in forest quantity and quality has also resulted in many tree species showing drastic declines, and a total of 8,753 tree species are listed as globally threatened (Oldfield *et al.*, 1998). Logging is a factor threatening at least 1,000 of them. The majority of threatened trees are from tropical forests, where species diversity is high and individual species may occur at low densities (unlike the relatively uniform northern forests, which are generally dominated by widespread species).

A wide variety of threatened timbers are used in the

UK, including Meranti / Lauan (*Shorea spp.*), Ramin (*Gonystylus spp.*) and Keruing (*Dipterocarpus spp.*) from the Far East (Malaysia, Indonesia, Philippines); Sapele (*Entandrophragma cylindricum*), Utile (*Entandrophragma utile*) and African Mahogany (*Khaya spp.*) from West/Central Africa; and Brazilian Mahogany (*Swietenia macrophylla*) from Brazil.

Sustainable management of forests used for timber production is vitally important to the future of forest ecosystems as a whole, and for the individual species harvested. Promotion of sustainable forest management has received considerable attention over the years; one significant outcome has been the development of certification schemes such as the Forest Stewardship Council (FSC), which label wood products originating from forests certified as well-managed.

Using wood carefully, with minimum waste, is also a vital component of sustainable timber use, but one that has been less of a focus to date. The FAO predicts that global consumption of industrial forest products (including paper) will increase by 25% between 1996 and 2010 (FAO, 1999), and many are concerned about the additional pressure this will put on the world's forests. Reducing waste and increasing re-use and recycling of timber could help meet the increasing demand for wood without further impacting on the world's forests and tree species.

1.2 The UK waste crisis

Alongside the global forest crisis, there is also a waste

crisis in the UK. In 1997/8, the UK produced 27 million tonnes of municipal (household) waste, over 85% of which was landfilled, with just 8% recycled. Industrial and commercial waste is estimated at a further 70–100 million tonnes, 50% of which goes to landfill (*DETR, 1999a*). The UK has one of the worst recycling records in the developed world: for example, paper recycling rates in Britain in 1999 were just 37.4% compared with 90.9% in Austria, 80.8% in Sweden and 57.7% in Germany (*Confederation of European Paper Industries, 2000*).

Landfilling waste uses valuable land, can cause pollution, and does not maximise use of the primary resource. Biodegradable waste (including wood and paper) in landfill emits methane as it rots, a greenhouse gas many times more potent than carbon dioxide.

Waste has been high on the agenda for many environmental groups for decades and, as an issue with high public resonance, it has received considerable popular support. Some political effort, both at the national and European level, has gone into reducing the amount of waste generated, increasing re-use and recycling and decreasing the amount sent to landfill. The Landfill Tax, the Landfill Directive and the Packaging Directive (*see section 5*) are initiatives now in place that are forcing local authorities and the private sector to develop alternative ways to use or dispose of waste.

1.3 Purpose of this study

Using wood efficiently is thus important from both the forest and waste perspectives. While paper recycling is well-established, timber and timber products have been less in the spotlight so far, yet large quantities are ending up in landfills. This study set out to examine the current status of timber waste, and to identify opportunities for, and constraints to, increasing timber re-use and recycling in the UK.

The work forms part of Fauna & Flora International's Global Trees Campaign, which is run in collaboration with the UNEP-World Conservation Monitoring Centre. The campaign is working on reducing the threats to the world's most threatened tree species and the ecosystems in which they occur.

The waste hierarchy of “reduce, re-use, recycle” indicates the most environmentally beneficial ways of dealing with wastes or residues. Reducing waste involves issues such as product design, material specification and production processes, and is not covered in this report. Re-use means the item continues to perform the function for which it was originally designed; recycling is use of the material for a different purpose or for reprocessing into a different form.

Timber waste generation and disposal in the UK—current status

2.1 Timber use in the UK

The UK is one of the highest consumers of “industrial” wood in the world, using 47.2 million m³ in 1998 (*Forestry Commission, 1999*). Approximately half the wood used in the UK is consumed as timber or panel products and half as paper and paperboard (see *Table 1*). Within the timber sector, sawn softwood is the largest product group; the major users of sawn timber are shown in *Table 2*. Consumption of wood-

PRODUCT	% OF UK WOOD RAW MATERIAL EQUIVALENT
Coniferous sawnwood (softwood)	31%
Non-coniferous sawnwood (hardwood)	4%
Wood-based panels (including plywood)	16%
Other industrial wood	0.5%
Paper and paperboard	48%

Table 1.

Relative proportions of wood used in the UK by product type (from Friends of the Earth, 1995).

based panels has increased in recent years and is expected to continue to grow, with materials such as Medium Density Fibreboard (MDF) increasingly replacing sawn timber, particularly in the furniture and joinery sectors.

2.2 Information on timber waste

Residue or waste is generated at all stages of the life of a piece of timber, from harvesting and sawmilling, through trading (e.g. timber merchants, DIY stores), secondary processing (e.g. furniture and joinery manufacture), to end of life disposal (e.g. demolition, disposal of old wood items). Comprehensive, reliable data for amounts of wood waste generated, levels of recycling etc. are not readily available. Government figures on waste do not separate wood as a specific component, most landfill sites do not record wood waste figures and no trade body for wood recyclers exists. Obtaining information on the species of timber occurring in the waste stream, or even making the distinction between hardwood and softwood, is generally not possible.

TRADA, the timber industry research body, conducted a study of wood residues generated in the timber processing industry, with the aim of identifying types, grades, locations and uses for residues (*Riddiough, 1999*). Information was obtained by telephone from 161 companies involved in a whole range of activities from sawmilling to merchants, manufacturers, and residue traders; their study did not include post-consumer wood waste, however (from construction and demolition, for example).

SECTOR	% OF SAWN TIMBER CONSUMPTION (SOFTWOOD & HARDWOOD)
Construction	39%
Joinery	11%
Packaging / pallets	11%
Fencing	6%
Furniture	7%
Transport	-
DIY	16%
Other	11%

Table 2.

Consumption of sawn timber by end use sector (from Friends of the Earth, 1995, based on studies in the early 1990s).

TRADA confirmed that quantitative data on wood waste was also not available at the company level. Many companies consulted did not collect figures on the amount of residues they generated, and many estimates available were in non-standard units (e.g. bags, bins, skips). In terms of type of waste generated or handled, sawdust was the most common (91% of respondents), with offcuts (78% of respondents), shavings (74% of respondents) and woodchips (57% of respondents) being the other most frequent categories. Over half the respondents (53%) disposed of at least some of their wastes to wood residue traders, while over a quarter of the companies (26%) sent at least some to landfill, 20% used wood waste to generate their own power and 19% passed some on for animal or equestrian uses. External power generation, horticultural products and panel mills were other significant disposal routes.

Although the report does not give a break-down of disposal route by sector or by size of company,

discussion with the researcher involved revealed that, in his view, it was the small to medium sized companies where wood waste was most under-utilised. While many large producers of waste do some sort of re-use or recycling, the smaller producers, which may produce 10–20 tonnes of waste a month, are inhibited by the costs of separating waste and storing it until they have accumulated a sufficient quantity for collection by a recycling company.

2.3 Timber waste generation

The following section outlines the generation and treatment of wood waste by sector. Information was obtained from available literature and trade bodies, by telephone interviews with a small number of companies, and via two site visits. It therefore provides an indication of patterns within a sample of the industry and should not be regarded as a comprehensive survey.

2.3.1 Harvesting

Significant waste can be generated in the harvesting of trees. An ITTO study showed that, in tropical forests, the extracted log represents an average of 54% of the volume of wood over 20 cm diameter from the tree (leaving smaller dimension wood in the forest is desirable for environmental reasons and it was therefore excluded from the study). The remaining 46% was accounted for by the wood in the tree crown (approximately 26%), stem offcuts (10%), stump (5%) and buttress (5%) (Noack, 1995).

The Forest Stewardship Council (FSC) requires the minimisation of harvesting waste in forests that it certifies as well-managed, stating in its Principles and Criteria: “Forest management should minimise waste associated with harvesting and on-site processing operations and avoid damage to other forest resources” (FSC, 2000).

While the development of better use of forest residues may be desirable, a balance is needed between subsistence use / local cottage industries, and use for the commercial timber industry, particularly in tropical areas.

This study focused on timber waste that could end up in the UK's landfill sites, and ways to re-use or recycle it. The commercial utilisation of harvesting residues is therefore not discussed further.

2.3.2 Primary processing

The yield of main product at a sawmill may be as low as 20% of the log, although more typically it is around 40-50%, even up to 70% in some cases (Noack, 1995; Table 3). The proportion of residues depends on factors such as the quality of the input log, the machinery used, the qualification, experience and motivation of the personnel involved, and the specifications of the main products (e.g. smaller dimensional timbers require more cutting, thus producing more sawdust). In Britain, the Forestry Commission estimates that there were 365 sawmills processing home-grown timber in 1998 and 19 mills processing imported roundwood (the number that do both is not given); yield of softwood sawn timber in British mills is estimated at 56% of the log input (Forestry Commission, 2000).

The by-products, solid residues and sawdust (generally 40-60% of the log volume) are normally used as feedstock for the paper and wood-based panel industries in Europe and North America; such residues are regarded as "co-products" rather than recycled waste. In 1998, 1,748,000 green tonnes of softwood co-products were produced by British sawmills; of this, 83% was sold to wood processing industries, 4% to other industries, 11% was sold as bark and 2% burnt for heat or disposed of. Hardwood co-products from British mills amounted to 33,000 green tonnes

Table 3.

Product output from round logs (from Riddiough, 1999).

PRODUCT TYPE	PRODUCT OUTPUT	RESIDUE
Sawn / planed softwood	50%	50%
Sawn / planed hardwood	40%	60%
Veneer, <6 mm thick	29%	71%

in 1998, of which around 79% was sold to wood processing industries (Forestry Commission, 2000). In tropical sawmills, solid residues may be used locally for furniture, joinery, mouldings or as fuel, but there is often no commercial use for sawdust (6-14% of log input) (Noack, 1995).

2.3.3 Sawn timber trade

2.3.3.1 Timber merchants

The majority of timber merchants' business comes from selling on ready-sawn timber, a process that does not generate significant waste. Many do have a machining operation, however, to further process timber or cut specific sizes to order. Merchants vary in their waste disposal, some chipping softwood offcuts for sale to wood-based panel manufacturers. Hardwood offcuts appear more difficult to use, either being burnt or sent to landfill.

2.3.3.2 DIY stores

Timber waste at DIY stores arises from used pallets, offcuts (for those with timber cutting services), damaged goods etc. As retailers with a major interface with the public, DIY chainstores have been frequent targets for environmental lobbying and several now have environmental policies and programmes in place. The major chains have joined the World Wide Fund for Nature's 95+ Group, for example, and are committed to selling only timber products from independently certified sources (primarily those certified by the Forest Stewardship Council).

Policies to deal with timber waste vary. B&Q appear to be leading the way, donating all usable scrap timber to Scrap Stores (see section 3.3) and "back-hauling" non-reusable wood waste to their central depot

where it is chipped for use in panel manufacture.

B&Q

B&Q is the UK's largest DIY retail chain, with 303 stores, over 25,000 employees, a market share of 11.3% and a turnover in 1999/2000 of £2.3 billion. It also operates internationally, with stores or joint ventures in France, Poland, Taiwan and China.

In 1997, B&Q sold 360,000m³ of wood as finished products (including paper products such as wallpaper), equating to 550,000 m³ of unprocessed timber. It also uses 250,000 pallets a year, of which 100,000–150,000 are not reusable.

Wood waste is generated by offcuts from in-store timber cutting services, from damaged timbers or products and un-reusable pallets. Many stores have an arrangement with a local community group or Scrap Store who take the usable waste wood. The remainder is taken back to the central warehouse for recycling. This is part of B&Q's overall system to "back-haul" all types of waste from stores: the lorries that deliver goods to stores, rather than returning empty, take the waste back to the central depot, where it is recycled. At the central depot, timber is made into woodchips which are sold to a wood-based panel manufacturer; 2,640 tonnes of woodchips were produced in 1999. Overall, the back-hauling system for all types of waste saved the company £750,000 in 1999.

2.3.4 Secondary processing / use

2.3.4.1 Furniture manufacture

Waste is a very significant issue for furniture manufacturers: rough estimates for converting sawn timber to furniture are 40–50% waste for hardwoods, 30% waste for softwoods, and 10–15% waste for panel products. This is in addition to the waste at the sawmill stage.

The furniture manufacturing industry in the UK consists of around 8,000 companies, characteristically fairly small (fewer than 20 employees). A few larger companies have recycling systems in place, some

companies have wood burning stoves that provide power to their factory, many allow staff to take offcuts for firewood, but many dispose of at least some wood waste to landfill. The Furniture Industry Research Association (FIRA) has conducted research into waste within its industry: the results are yet to be published, but initial conclusions show that it is the small and medium-sized furniture companies where wood waste is least likely to be utilised. Constraints to recycling include a lack of information amongst manufacturers on wood recycling and the potential uses of waste wood, geographic location of wood recycling companies, and the relatively low volumes of wood waste produced by the average small or medium-sized company. Ultimately, the deciding factor on disposal route for most companies is cost, although a few have taken on recycling as a marketing tool or to satisfy their customers (retail outlets) (*Craig Bartlett, FIRA, pers. comm.*).

2.3.4.2 Joinery

Similar levels of waste are generated by the joinery industry (25% with softwoods, 35–60% with hardwoods). The fate of wood waste also seems to be similar to the furniture industry, with larger companies recycling offcuts where possible (for panel manufacture, for example), while medium-sized and smaller companies often dispose of offcuts to landfill (via a waste management company), or use them as firewood.

2.3.4.3 Construction

The minimisation and disposal of waste is recognised as an important issue within the construction industry, driven chiefly by the increasing costs of landfill, but also by large clients requesting sound waste management systems, and by government pressure. A recent series of government initiatives has focused on sustainability (including waste) within the construction sector, and a document entitled *Building a better quality of life: a strategy for more sustainable construction* was published in April 2000 (*DETR, 2000*). The Building Research Establishment has a Centre for Waste and Recycling, looking at ways to promote waste minimisation and better waste policies and practices amongst builders.

Wood waste on building sites is generated by offcuts from structural or joinery timber, used shuttering and formwork, temporary site or supporting structures etc. Currently, a lot of timber waste is sent to landfill, although some companies are in the process of examining alternatives. Again, it seems that the bigger companies working on large-scale projects are more likely both to have thought about a waste management policy at company level, and to be generating a sufficient volume of waste on each site to make separation of different waste streams worthwhile.

Issues raised included the extra space required to separate waste on site, education and awareness of employees and subcontractors, where the responsibility for waste management lies in a big project with many subcontractors, and contamination from chemicals or metals of the timber waste generated.

2.3.5 Post-consumer timber

True post-consumer wood waste is generated from the disposal of old items such as furniture and pallets, and from demolition.

2.3.5.1 Demolition

Timber from the demolition of old buildings or refurbishment projects is one of the major sources of wood in landfill sites, and represents an enormous potential resource. According to the Construction Industry Research and Information Association (CIRIA), an estimated 2.5 million tonnes of timber waste is generated by demolition and construction together in Britain each year (CIRIA, 1999). In 1998, it was estimated that approximately 1.5 million tonnes of reclaimable or salvageable timber is generated by demolition each year, of which approximately 0.75 million tonnes is reclaimed and 0.75 million tonnes is thrown away or burnt. Around 10% of the discarded or burnt timber is estimated to be tropical hardwood (equivalent to approximately 300 tonnes of tropical hardwood every working day). Much of it is extremely high quality, coming from ancient or first-growth forests (Salvo, 1998; Thornton Kay, Salvo, *pers. comm.*).

Although only utilising a fraction of the available

resource, there is a healthy industry involving around 2,500 businesses and employing 42,000 people reclaiming, salvaging and selling on building materials including timber, stone, tiles etc. As well as these specialists, many demolition firms will undertake some timber reclamation themselves when it is worthwhile, particularly for floorboards. The main constraint identified is the extra time involved, customers generally wanting sites cleared very quickly. Demolition is also a non-labour intensive business, often conducted with heavy machinery bought at high capital cost. Reclamation or salvage of materials is more labour intensive and inevitably slower.

Timber not suitable for reclamation (use in its original form) could, in theory, be recycled for panel manufacture or other purposes. Although timber is estimated to make up approximately 50% of the “strip-out” waste from demolition, almost no recycling currently takes place. Constraints include the presence of relatively substantial metal joins in timber frames (larger than the nails used in pallets or other wood items that can be removed mechanically), or other contaminants. A few demolition plants produce a low quality woodchip that is burnt for energy generation; this happens to a much greater extent in the USA and on the continent.

Brighton and Hove Wood Recycling Project

The Brighton and Hove Wood Recycling Project is a self-financing initiative that collects wood waste from within a 15 mile radius of Brighton, largely from construction and demolition sites. The wood is taken to the project depot and sorted manually: the highest quality timber is sold for re-use in the project's Wood Store (generally 10–15% of the waste), the remainder is processed and sold as firewood in winter, or chipped and composted. Approximately 30% residue is returned to the waste stream for landfill or incineration. The project employs four people, processes approximately 10 tonnes of wood a week and takes approximately £1,000 a week on wood sales in the Wood Store. The charge levied for collecting timber waste from building sites is highly competitive and the project has more requests for its services than it can fulfil.

2.3.5.2 Pallets

Wooden pallets, cases and crates are widely used for packing and transportation of goods. Approximately 1.5 million tonnes of wood packaging is produced each year (Davidson, 1999).

Pallet re-use by the supplier or carrier is widespread: an estimated 94% of companies re-use their pallets, and pallet “pool” schemes lease new or reconditioned pallets to customers. On average, pallets are used nine times during their life (Davidson, 1999). Damaged or end-of-life pallets nonetheless represent a significant amount of timber for disposal: an estimated 1.3 million tonnes of wood packaging waste is produced each year, making up 13% of the packaging waste stream.

A limited number of specialist companies exist that repair or recondition pallets, the timber that is too damaged to be re-used being chipped for wood-based panel manufacture or mulch. Pallet timber may also be recycled by some general wood recyclers. Currently, it is estimated that 170,000 tonnes of wood packaging waste is used in panel manufacture, 15,000 tonnes is shredded for mulch or compost and 5,000 tonnes is burnt in energy-generating plants (Davidson, 1999).

In January 2000, wood was included in the Packaging Directive regulations (see section 5.3). Although there is no material-specific target for wood (specifying the percentage that must be recycled or recovered), the Timber Packaging and Pallet Confederation estimates that around 650,000 tonnes will need to be recovered each year to meet the regulations (Davidson, 1999).

West Midland Pallet Supplies, Birmingham

The company employs 22 people. Pallets are either collected from users or delivered to the company's site. Five people are involved in repairing damaged pallets for re-use, processing 500–600 pallets a day; those that are beyond repair are broken down and the timber used to reconstruct new pallets. Timber that is beyond re-use is transferred to a neighbouring company that chips it for use in wood-based panel manufacture.

2.3.5.3 Furniture

Unwanted furniture, of which a significant amount is wood, is generated by households and offices. For household furniture, there are over 360 re-use schemes throughout the UK co-ordinated through a network called SOFA. The schemes collect old furniture free of charge and sell it on at nominal cost to those on low incomes. SOFA maintains a directory of the schemes, which is available via the internet (see section 8). Charity or second-hand shops may accept furniture for re-sale, and some second-hand office furniture dealers exist.

2.3.5.4 Other household timber waste

Other timber waste from households arises from items such as fences, garden sheds, window frames, doors or miscellaneous wood from DIY projects. This is generally taken to a Civic Amenity site provided by the local authority. The fate of timber waste taken to Civic Amenity sites varies, some sites offering recycling but many sending it to landfill (see section 4.1).

Uses of reclaimed and recycled timber

This work is motivated by concern for forests and threatened tree species as well as waste disposal, and thus focuses on uses of reclaimed and recycled wood that reduce the demand for new timber. Some uses of wood waste (e.g. fuel and horticultural products), while diverting the waste away from landfill, would have no impact on the need for virgin timber.

Areas with the potential to reduce the need for new timber

3.1 Reclaimed timber in building

Reclaimed timber and timber items can be used in new buildings, renovations or alterations, and current fashion means that demand for good quality items is high. An estimated 2,500 businesses exist reclaiming and selling building materials of all sorts, including timber items such as flooring, beams, doors, staircases, and ornamental woodwork such as carved wood, fire surrounds, panelling etc. The total turnover of the whole reclamation industry is £450 million a year; no figures for the timber reclamation business are available, although ornamental woodwork is alone worth £36 million a year (*Salvo, 1998*).

A small independent organisation called Salvo is dedicated to promoting the reclamation and re-use of building materials. There is also some interest at the building industry body level. The Construction Industry Research and Information Association (CIRIA) has produced a handbook on the use of reclaimed and recycled construction materials (*CIRIA, 1999*) and a “Timber Dwelling Project” has been developed by TRADA, which involves

(amongst other initiatives) “best practice” demonstration sites featuring the use of recycled materials or those from sustainable sources, and the re-use or recycling of waste created in the construction process. The Building Research Establishment (BRE) has set up a Materials Information Exchange service on the internet (*see section 8*), where suppliers and users of reclaimed materials can post information. BRE is hoping to make a thorough study of re-use and recycling in the construction industry, possibly leading to the establishment of a specific industry trade body.

Despite this interest at the research level, a survey by Salvo showed that between 50% and 80% of reclaimed and antique materials are bought by “private” customers, rather than by professional builders or architects. Interestingly, around 80% of the buyers of reclaimed material are women (*Salvo, 1998*). Constraints to the use of reclaimed timber include strict and comprehensive building regulations that require certain manufacturing or performance standards in the materials used. These standards are often difficult to prove for reclaimed timber. Contamination with toxic chemicals that may have been acceptable for use in the past is another potential issue, although there are no reported instances of

this actually presenting a problem. Supply and demand for materials can also be a constraint: the availability at a certain point in time of reclaimed materials of the right size, type and specification to fit a pre-agreed design cannot be guaranteed.

Solopark, near Cambridge

Solopark is one of the largest suppliers of reclaimed building materials in the country, dealing in a range of materials including timber, stone, bricks and tiles, as well as assembled items such as doors, fireplaces, staircases etc. The company works in partnership with demolition firms and takes away all the materials from suitable demolition sites. Materials are sorted, cleaned, and restored if necessary, before being put on display on its six acre site. Timber of insufficient quality to be sold at Solopark is used for making pallets, or passed on to an associated company, R. Larkinson, for sale as scrap.

Approximately 70% of the turnover in the timber section is softwood, mostly pine, and 30% is hardwood. The highest volume of sales is in pine sawn timber; other popular products include flooring, especially Oak and Iroko (which is a threatened species), and beams. The company handles 2,000–3,000 railway sleepers a year, 50% of which are estimated to be tropical hardwood, 50% Oak. Sleepers are sold mainly as fireplace beams or for structural timber.

Solopark attributes its success to the size and scale of the company. It has facilities to de-nail, strip paint and plane timber, as well as to undertake more detailed restoration work. This enables almost all timber received to be processed for sale. It does not identify contamination of the timber as a major constraint, and ensuring materials meet the relevant building specifications is the responsibility of the purchasers.

3.2 Finger-jointed timber offcuts

Offcuts or small dimension timber can be finger-jointed into solid lengths, which can be used in place of virgin timber in a variety of functions. While the economics of this process are marginal for softwood

offcuts, for the more expensive hardwoods (which may cost £600–800 per m³, for example), it is an economically viable option that can massively reduce wastage. “Waste” timbers currently being finger-jointed in the UK include Oak and Utile (listed as a threatened species), for use as building timbers and in joinery, respectively. Finger-jointing offcuts is much more widely established in other parts of Europe; the main constraint identified to expansion in the UK is awareness amongst secondary processors. While the dispersed nature of the resource may be an issue, for expensive hardwoods the value that can be given to what is otherwise a waste product means that even with collection and transport costs it may be economically worthwhile.

3.3 Scrap timber

Scrap timber suitable for a range of uses can be sold at some scrap yards. The timber may be low-grade material from demolition sites or surplus wood that is unsuitable for use in building or larger-scale projects. While the supply is obviously unreliable, such outlets can provide a source of timber that is quite adequate for a variety of jobs.

Scrap Stores or Resource Centres are organisations that collect surplus or waste materials from various sources and distribute or sell them to youth or community groups. While the smaller stores may take materials from individuals, the majority are supplied by business or industry, where the volumes available are sufficient to merit collection. Attempts to establish a national network of Scrap Stores failed, but it is estimated that there are approximately 100 such stores around the country. There are also a number of unofficial, *ad hoc* relationships between scrap timber producers and community projects.

Manchester Scrap Store

The Manchester Scrap Store provides materials for young people’s centres and activities. It is a retailer for standard new items, but also collects and distributes waste, scrap or surplus materials from industry. It collects approximately 20,000 tonnes of waste a year which is sold on at a nominal fee; the revenue from scrap and waste sales accounts for

approximately 10% of its income. Scrap wood is collected from furniture makers in the area, and is always a popular item with its customers.

3.4 Reclaimed timber in new product manufacture

Products such as doors, flooring and furniture can be manufactured from reclaimed or salvaged timber, either through re-planing of the timber (for flooring) or through complete manufacture. Salvo reports that around 1,200 people are employed making new products from salvaged wood (*Salvo, 1998*). Reclaimed pine furniture is available in some high-street pine stores and is considered fashionable.

3.5 Wood-based panel manufacture

Good quality recycled woodchips and sawdust can be used in the manufacture of some wood-based panels such as chipboard/particleboard. Wood-based panels are increasingly replacing solid timber in the UK market in a range of applications including furniture, flooring, shelving, etc. UK consumption of particleboard, Oriental Strandboard and Medium Density Fibreboard in 1999 is estimated at just over 4 million m³. In 1999, UK manufacturers produced almost 3 million m³ of these products, a small amount of which (324,000 m³) was exported (*A. F. Kerr, Wood Panel Industries Federation, pers. comm.*); UK production will have increased markedly with the opening in January 2000 of a new wood-based panel factory near Liverpool.

In 1997, particleboard manufacture in the UK used approximately 2.7 million tonnes of woodchips, around 375,000 tonnes (14%) of which were recycled (not including sawmill residues) (*Davidson, 1999*). An advantage of post-consumer recycled woodchips is that they do not need drying (as virgin woodchips do). Panel manufacturers in the UK that were contacted during this study were using a maximum of 54% recycled woodchips in any one product. There is believed to be considerable capacity to increase the quantity of recycled woodchips used, perhaps to as much as 2.2 million tonnes (*Davidson, 1999*). Some panel manufacturers had doubts over the quality of products containing very

high proportions of recycled material. However, at least one manufacturer in the USA, CanFibre, makes MDF from 100% post-consumer recycled wood that it claims is suitable for a range of applications including panelling and furniture. The product, called Allgreen, is also made without the use of urea formaldehyde resin, which has potentially negative health impacts (*see below*).

Another constraint to increasing the percentage of recycled wood in panel products raised by manufacturers was the need to maintain a certain percentage of virgin fibre content in order to get the FSC label, a high priority for them since it gives them access to key markets. This is discussed further in section 6.10.

Woodchips for wood-based panel manufacture must be of the highest quality (i.e. preferably not a mixture of hardwood and softwood, and low on contamination with metals, paint or chemicals). Equipment to remove nails from waste wood does exist, but the quality requirement could restrict the use of certain sources of waste wood.

While panel products from recycled wood have significant potential for reducing the demand for new timber, other issues may need to be considered before they are wholeheartedly promoted. For example, formaldehyde (believed to be carcinogenic at high levels) or other chemicals with negative health impacts may be used in panel manufacture, and it has been observed that the manufacture of panels uses large amounts of energy (although it is not known how this compares with the energy required for harvesting, transporting and processing virgin timber). For a true comparison a whole host of other issues such as pollution, water use, land use etc. should also be considered, which would only be possible through a full life-cycle analysis for each product. It is also worth noting that, because of the bonding resins they contain, some wood-based panel products are unrecyclable.

3.6 Plastic lumber

Plastic lumber is a wood substitute that is made from recycled plastic and sometimes includes wood fibre. It can be used for functions such as fencing, signs,

sea or water defences. Plastic lumber is relatively uncommon and not currently a major user of waste wood.

Areas that do not reduce the need for new timber

3.7 Fuel

Wood waste, both solid timbers and sawdust compacted into briquettes, can be used as a fuel, although restrictions apply to preservative-treated wood that may produce poisonous emissions when burnt. Some timber processors (e.g. furniture makers) have wood-burning stoves that provide power and /or heat to their premises; in other instances wood offcuts are taken by employees or local residents for use at home. The development of pilot biomass power stations that could use waste wood as fuel is underway in the UK. Wood waste can also be burnt in general waste-to-energy incinerators.

Burning of wood waste for energy happens to a much greater extent in other parts of Europe and in the USA. In the Netherlands, for example, the disposal of combustible waste in landfill is prohibited by law and a high proportion of post-consumer wood is burnt.

Burning wood waste to generate energy removes it from landfill and may offer environmental benefits

for waste management as well as for the energy sector (especially where it is burnt on-site, avoiding energy use in transport). However, it has no impact on the demand for new timber. Furthermore, an argument used against incineration of general waste is that the need to generate a sufficient quantity of waste to keep what are usually large-scale incinerators running can actually work against waste reduction, re-use and recycling initiatives. The same argument could be used with respect to wood waste if its use as a fuel were to become widespread.

3.8 Animal bedding

Good quality shavings or sawdust are commonly used as animal bedding or on racetracks and gallops.

3.9 Horticultural products

Approximately 1 million tonnes of bark from the sawmilling industry, and an unknown quantity of post-consumer shredded wood (including 15,000 tonnes a year from packaging), are used for mulch manufacture or other horticultural products and agricultural uses (*FICGB, 1998; Davidson, 1999*). Wood-derived products can be used in place of peat compost, the extraction of which is a major threat to the survival of the UK's peat bogs.

Timber re-use and recycling facilities and services

This section reviews the facilities currently provided to the public to recycle old timber products, and the services available to industry to recycle wood waste. Since many local authorities contract their waste management to the private sector, there are close links between the services available in both.

4.1 Facilities for public timber recycling

Timber is estimated to make up 7–10% of waste at Civic Amenity sites (*John Gilford, Bedford County Council, pers.comm.; Waste Watch, 2000*). A questionnaire about timber recycling sent to 203 local authorities resulted in 109 responses, a response rate of 54% (*see Appendix 1 for questionnaire; the section on green wood recycling is not analysed here*). The questionnaire revealed that 37 of the 109 responding authorities (34 % of respondents) collect timber separately at their Civic Amenity sites. This figure should not be taken as representing the proportion for local

authorities as a whole, however, since it can be assumed that authorities that collect timber are more likely to respond to the questionnaire than authorities that do not.

Details of the respondents that collect timber at Civic Amenity sites are given in Appendix 2. The

Table 4.

Uses of timber collected by local authorities at Civic Amenity sites, according to FFI's survey.

**Several respondents identified more than one use.*

USE	NUMBER OF POSITIVE RESPONDENTS *	% OF POSITIVE RESPONDENTS (TOTAL 37)
Chipboard manufacture	14	38%
Re-use	11	30%
Composted	10	27%
Waste to energy incineration	7	19%
Firewood - public use	3	8%
Road surfaces	1	3%
Animal bedding / surfaces	1	3%

most common use for this timber is for wood-based panel manufacture, with re-use by the public, compost and waste to energy incineration also frequent (Table 4). In most cases where timber is recycled for panel manufacture, an intermediary processing company is used (10 out of 14 authorities).

Estimates of the amount of timber collected vary from 30 tonnes a year to almost 3,000 tonnes a year. Of course, the number of people served by a local authority, the number of CA sites they run and the number of sites at which they separate timber also varies widely. The minimum reported amount collected by an authority that recycles timber for panel manufacture is 90 tonnes a year.

Seventy two of the responding authorities did not recycle timber. Respondents were asked to identify constraints or reasons why they did not: the answers are summarised in Table 5. The lack of local outlets for the material (processors or end users) is the reason most often cited; this is borne out by the locations of authorities that do recycle wood, at least 8 of which are in the vicinity of a chipboard plant, with another three (London Borough of Sutton, Buckinghamshire County Council and Thurrock Council) close to a significant wood waste processing company. Space at the Civic Amenity sites is another commonly cited constraint, along with costs/resources and contamination. Four authorities mentioned lack of information on local processors

(this may be because there aren't any!). Surprisingly, none mentioned that the volume of timber brought to their sites was too low to warrant recycling, although this clearly has an impact on costs and feasibility (low volumes may be a factor contributing to economic unfeasibility).

The Landfill Directive (*see section 5.2*) may mean there is more interest from local authorities in diverting timber from the municipal waste stream in the coming years.

4.2 Timber recycling for business and industry

A number of private enterprises offer timber recycling for businesses and industry. These may be either specialist wood recyclers or general waste management companies operating transfer stations or landfill sites. No accurate total of the number of enterprises involved could be located but it may be of the order of 200-300 (*Gilli Hobbs, Building Research Establishment, pers. comm.*), most of which have started recycling wood in the last 5 years as the cost

Table 5.

Constraints to timber recycling identified by local authorities.

** Many respondents identified more than one constraint.*

† Nine respondents did not provide information.

CONSTRAINTS TO TIMBER RECYCLING	NUMBER OF RESPONDENTS *	% OF RESPONDENTS (TOTAL 63) †
Lack of local outlet for material	39	62%
Lack of resources (financial, staff)	24	38%
Lack of space at sites	23	37%
Contamination / quality of material	15	24%
Lack of awareness / information availability	4	6%
Logistics / infrastructure	2	3%
Commitment to existing contracts / tendering process	2	3%
Lack of political will	1	2%
New authority	1	2%
Would attract commercial users	1	2%

of landfill has increased. Those involved mostly chip waste wood for the wood-based panel industry.

Hadfield Wood Recyclers, Manchester

Hadfield Wood Recyclers is the largest specialised wood recycling company in the UK, with 19 employees. Its main sources of wood waste are demolition, pallets and furniture manufacturers. The timber is turned into woodchips for panel manufacture; 1,000 tonnes of woodchips are produced a week. Almost any type of timber is accepted, with a few exceptions (e.g. creosoted timber such as telegraph poles and sleepers, and green waste); contamination from paint and metal objects such as nails are removed mechanically. For large waste producers, the company provides containers which are left on site and collected when filled. Smaller or less regular producers can deliver waste to the recycling facility.

Crucial to Hadfield's success is the quality of the woodchip produced, which is vital to the panel manufacturers. Hadfield is dedicated to wood recycling and has invested heavily in the machinery to make it a success. Whilst it believes there is a market for more recycled woodchips, producing chips of consistently high quality is the challenge that smaller recycling operations may not be able to meet. The current policies (directives, landfill tax) mean that more companies are likely to be looking for alternatives to landfilling wood waste, although significant quantities are already burnt on bonfires and this may increase. Awareness amongst wood waste producers of the recycling potential and economics are seen as being the main constraints to increased recycling.

There are also a number of companies, both small operators and larger national contractors, that recycle shavings and sawdust. As well as feeding the panel and paper industries, shavings and sawdust may be used for animal bedding and horse gallops, or compacted into briquettes for use as fuel.

Twelve of the largest general waste management companies in the UK (according to a list provided by WasteWatch) were contacted to find out if they were doing any timber recycling, and to ascertain their views on the opportunities and constraints in the

sector. Those currently doing timber recycling or planning to start in the near future are listed in Table 6. Some of those listed separate timber waste but pass it to a specialist wood waste processor for chipping.

Table 6.

Involvement in timber recycling by the UK's major waste management companies contacted during the study.

Biffa Waste Services

Recycles pallets and C&D waste, at six to eight transfer stations.

Cleanaway Ltd

Recycles timber, mostly pallets, at two landfill sites and one transfer station.

Onyx

Recycles timber from industrial and municipal waste at several sites.

Shanks Waste Services

Recycles timber from industrial waste at three sites.

Lancashire Waste Services (part of United Waste Services)

Recycles timber from municipal and industrial waste at several sites.

RMC Environmental Services Ltd (sister company to Hales Waste Control Ltd)

Recycles timber at two recycling centres. A further four centres are planned within the next 12 months.

Viridor Waste Management

Recycles timber from industrial waste at two transfer stations. Considering expansion.

PLANNING / CONSIDERING TIMBER RECYCLING

Greater Manchester Waste

SITA

Constraints to wood recycling mentioned by the companies contacted are summarised below (Table 7). These are discussed further in section 6.

CONSTRAINT	NUMBER OF RESPONDENTS IDENTIFYING THE ISSUE*
Contamination in timber, lack of sorting by waste producers, cost of sorting	10
Price of recycled chips	3
Charges from specialist processors / collectors	2
Information / data on wood waste resource and market	2
Lack of market for recycled timber	2
Space at sites, bulky product	2
Capital cost of chipper	1
Quantities of timber at Civic Amenity sites (from company specialising in municipal waste)	1

Table 7.

Constraints to timber recycling identified by major waste management companies.

**Most companies identified more than one constraint.*

Forces driving timber re-use and recycling

Several national policies exist that can be expected to drive an increase in timber re-use and recycling. There are also a number of opportunities and initiatives that may help the development of the sector.

5.1 The Landfill Tax

In an effort to reduce the amount of waste sent to landfill and increase re-use and recycling rates, the UK Government introduced a tax on landfill in October 1996. Taxes are charged per tonne of waste, the rate depending on whether the material is biodegradable (charged at a higher rate) or inert. The rate of tax has been steadily increasing since its introduction; biodegradable waste, which includes timber, was charged at £11 per tonne during 2000. The rate will increase by £1 per tonne each year until 2004, when it will be reviewed.

The Landfill Tax must be paid in addition to the actual cost of tipping, meaning that the total cost of landfill may be around £20–£30 per tonne, depending on location. The rising cost of landfill is probably the major force increasing recycling efforts in the UK.

5.2 The Landfill Directive

The EC Landfill Directive came into force in the EU on 16 July 1999, and needs to be transposed into UK law no later than 16 July 2001. The Directive requires the UK to reduce the municipal biodegradable waste (which would include timber taken to Civic

Amenity sites) that is sent to landfill to 35% of 1995 levels by 2016 (this deadline may be extended to 2020). Authorities are currently working out how they will implement this requirement but it may mean that alternative disposal options for timber from households will need to be developed.

5.3 The Packaging Directive

The EC Packaging Directive aims to cut down the amount of packaging waste going to landfill by setting targets for recycling and recovery. The legal framework for implementing this directive in the UK is set out in the Packaging Regulations of 1997, which include a target that at least 50% of the UK's packaging waste must be recycled or recovered by 2001, with a minimum of 15% of each of the major packaging materials being recycled. Responsibility for dealing with the waste has been passed to the producers or users of packaging, different parts of the packaging chain having different levels of obligation. All businesses with an annual turnover of £2 million or more that handle above 50 tonnes of packaging or packaging materials a year must comply.

Initially, wood packaging was not included in the regulations. However, in January 2000 it was added, although there is still no material-specific require-

ment for the percentage that must be recycled. The interest in recovering pallets and other timber packaging can therefore be expected to increase significantly in the near future.

5.4 Climate change agreements

Wood in landfill sites emits methane as it rots, a very powerful greenhouse gas. The international commitment to reduce greenhouse gas emissions is another factor driving initiatives to divert biodegradable waste such as timber from landfill sites.

5.5 Sustainable development initiatives

In May 1999, the government published *A better quality of life—a strategy for sustainable development for the United Kingdom (DETR, 1999b)*. This is underpinned by a national set of indicators to measure sustainable development, one of which is the amount of construction waste going to landfill. The document *Building a better quality of life—a strategy for more sustainable construction (DETR, 2000)* emphasises the need to reduce waste generation, decrease the amount sent to landfill, and increase the recycling of construction waste and the use of recycled materials.

5.6 Increased demand for wood-based panel products

The growth in demand for wood-based panels

(which can use recycled wood as a raw material) is predicted to continue, with panel products replacing sawn timber in a range of applications. The market for woodchips can therefore be expected to increase, offering an outlet for recycled wood. The recent opening of a new panel factory near Liverpool is likely to have increased the current demand for woodchips in the UK (see section 3.5).

5.7 Funding availability

Part of the revenue generated by the landfill tax is being channelled into funding environmental projects relating to waste management. The money, managed through ENTRUST, could help fund timber re-use or recycling schemes. The government Department for the Environment, Transport and the Regions and the Department of Trade and Industry have also launched a fund to help projects that will develop markets for recycled materials.

5.8 Biomass power stations

Initiatives are underway to build sample biomass power stations in the UK. These could in theory burn at least some types of wood waste, as well as coppiced timber specifically grown for the purpose. Wood waste can also be burnt in waste-to-energy plants (see section 3.7).

Constraints to increasing timber re-use and recycling

6

A number of constraints that may limit the re-use and recycling of timber were identified during the course of this study.

6.1 Building regulations and material specifications

The construction industry is very tightly regulated and specifications exist for most materials, especially those that will be used in structural and load-bearing functions. These specifications, usually proved at the sawmilling or manufacturing stage for new timbers, can be hard to meet for reclaimed materials and may limit their use.

6.2 Supply and demand in reclaimed timber

Supplies of reclaimed materials are by their nature sporadic and the availability of the right material at the right time in the right place for a specific construction or renovation project cannot be guaranteed. Salvo recommends that people wishing to use reclaimed materials should establish what materials are available to them before they proceed to detailed design and planning.

6.3 Mechanisation and efficiency in demolition

Most demolition is now done with the use of large, expensive machinery which needs to be optimally employed to be economically viable. In addition,

most demolition contracts require completion in very short time scales. Reclamation of materials almost inevitably requires more time and personnel.

6.4 Contamination

The constraint to wood recycling most commonly cited by large waste management companies was contamination in the waste wood supply (*see Table 7*). Panel manufacturers require clean woodchips uncontaminated by preservatives, glues, metals, or other substances including old wood-based panels, which are unsuitable for recycling because of the bonding resins they contain. While the technology to remove nails and paint from post-consumer wood exists, other materials can still pose a problem. A small amount of contaminant may render a whole consignment of waste wood unusable. Meticulous sorting by waste producers could minimise this problem.

6.5 Dispersed waste sources/space

Many of the sources of waste wood that might be appropriate for re-use or recycling are relatively small and dispersed, making the economics of waste collection by recycling companies marginal. Storing waste until a sufficient quantity for collection or delivery to a recycler has accumulated may not be

possible in businesses with small premises, especially if mixed waste products are produced, each of which would have to be collected and stored separately. Similarly, space at Civic Amenity sites may limit the separation of timber from the municipal waste stream for re-use or recycling.

6.6 Large size of recycled wood users

Conversely, wood-based panel manufacturers (one of the major markets for recycled woodchips) are typically large-scale, with just a small number of sites in the country. The financial and environmental costs of transporting recycled woodchips for panel manufacture from some areas could be significant.

6.7 Capital investment

The equipment required for wood recycling (principally a chipper) is expensive to purchase. It is therefore only viable where a large, uncontaminated, reliable supply of recyclable timber and a market for the woodchips are both assured.

6.8 Volatility in woodchip price

Large fluctuations in the price for woodchips, as seen in the recycled paper market in recent years, would make managing wood recycling businesses difficult.

6.9 Awareness of wood recycling

Wood re-use and recycling is still in its infancy. Many companies, especially smaller businesses, are unaware of the options for waste wood. Within companies, employee awareness and commitment to separating and sorting wood waste meticulously is also a key issue. Public awareness of wood waste, transmitted to the timber industry via retailers, could prove an important driver in decreasing waste levels and increasing re-use and recycling (in the same way that awareness of forest issues led to the development of timber certification and labelling initiatives). Public concerns and prejudices over the quality and cleanliness of recycled materials may be a barrier to the sale of recycled timber products.

6.10 Product labelling

Perversely, the success of forest product labelling initiatives, principally the Forest Stewardship Council (FSC), and the lack of an equivalent for recycled products may be working against wood recycling (although this may be more of a perceived than an actual constraint). Many large retailers are committed to stocking only timber products (including wood-based panels) that have been certified. UK panel manufacturers are thus working to get the FSC label on their products to allow them access to these markets. The FSC policy currently allows recycled or other “certification neutral” materials to make up 82.5% of a product, which is well above the percentage used by most panel manufacturers in the UK. However, several manufacturers cited it as a reason why their use of recycled woodchip as a raw material would be limited.

Part of the driving force that led to the establishment of the FSC was the desire to avoid misleading or uncontrolled labelling of products. There is currently no system that controls the labelling of recycled items. It is therefore possible that a product made from recycled wood, even if labelled, would be discriminated against by retailers committed to the FSC, because the label was not independently verified. Some FSC supporters are calling for the organisation to expand its remit to include certification of recycled wood sources; the FSC is currently considering whether it should investigate this option.

6.11 Preservative treated wood

Certain types of preservatives applied to some timber, especially items for external use such as railway sleepers and telegraph poles, render wood unsuitable for recycling for panel manufacture, or for burning (the preservatives generate toxic emissions when burnt). Careful sorting is needed to exclude them from the general wood waste stream, and an alternative method of disposal is needed.

Discussion and conclusions

Waste timber is a valuable resource and there is considerable potential to expand re-use or recycling. As well as providing environmental benefits for both waste management and forest and timber resources, diverting wood waste from landfill can be financially beneficial to waste producers. Indeed, for any waste disposal option to be taken up, it must be economically competitive.

While the Landfill Directive's requirements for biodegradable materials are currently applicable exclusively to municipal (household) waste, it is likely that industrial waste will receive increasing government attention in the coming years, to meet climate change, waste and sustainable development targets. Wood packaging has already been tackled with the inclusion of timber in the Packaging Directive. This is resulting in a considerable increase in interest in wood recycling, with several large waste management companies now offering some limited timber recovery.

In considering options for wood waste, the waste hierarchy (which favours re-use over recycling) must always be borne in mind. One of the major sources of wood waste is timber from the demolition of old buildings. Far more of this could be reclaimed, and there appears to be a healthy demand for used and reclaimed timber and timber items of various sorts. Industry research into the practicalities of more mainstream use of reclaimed materials is a very welcome sign. Attractive, good quality floorboards, beams, and worked items can usually be sold via specialist dealers, but schemes such as the Brighton

and Hove Wood Recycling Project demonstrate that the extraction and sale of even more mundane timber from demolition waste can be economically viable. The establishment of a network of similar timber recovery projects is highly desirable, and funding should be directed to support their development. Similarly, several local authorities successfully separate re-usable timber at Civic Amenity sites and allow the public to help themselves. Space permitting, this could be introduced by other local authorities, to great benefit.

The government and research body focus on waste in the construction industry is a positive development: as the largest user of sawn timber, the building sector is an obvious target for improvement. Waste minimisation must of course be the primary goal but, especially for clean uncontaminated offcuts, the potential for re-use and recycling should be high. Waste from small to medium-sized joinery and furniture makers is also identified as currently under-utilised. Here also the waste is pre-consumer and hence (assuming rigorous sorting by producers) uncontaminated; there is thus a prime opportunity for re-use or recycling. Finger-jointing might be worth considering for high-value hardwood offcuts; other good sawn timber may be appreciated by youth or community groups locally. Finding location of a suitable re-use scheme, offcuts from construction and secondary processing offer a good clean source of woodchips for panel manufacture.

The expansion of wood-based panel manufacturing capacity in the UK potentially offers an increased

market for recycled wood. The predicted continuation of growth in demand for wood-based panels suggests the market for woodchips should be steady in volume or even expand further in the future, although price fluctuations might be anticipated. Although proximity to a panel manufacturer might be expected to limit geographically this option for waste timber producers, there are wood recycling companies located several hundred miles from panel factories that presumably find the business economically viable despite the distance.

While there appears to be demand from panel manufacturers for recycled woodchip, shortage of wood waste processors may be a key limiting factor. Availability of local outlets was certainly the most common constraint to timber recycling identified by local authorities. The feasibility of recycling the relatively low volumes of waste produced by smaller manufacturers would also increase if more wood waste processors existed locally.

Several commentators specifically identified both the lack of general awareness and the lack of data on timber waste. Lack of data particularly affects the waste management industry, who have difficulty assessing the potential resource for recycling and hence the economic viability of a proposed scheme. The compilation of reliable, comprehensive statistics on wood waste would be a valuable stimulus to wood recycling.

Increasing awareness could also contribute in several ways. Service industries such as waste disposal should, in theory, respond to client demand, assuming the required services are economically viable. Awareness of wood recycling possibilities by waste producers or handlers and enquiries to the waste management industry should therefore encourage

the spread of wood recycling schemes. Requests for wood recycling from local authorities may be especially effective in this regard, since authorities often have waste management contracts of significant size on offer, which the private sector are keen to win.

Awareness of the possibilities for wood waste would also stimulate wider participation in recycling schemes by all types of waste wood producers (i.e. construction companies, secondary processors such as furniture and joinery companies, post-consumer waste handlers such as local authorities or pallet users). Obtaining a sufficient volume of high-quality waste timber from a relatively small area is crucial to the success of any wood recycling scheme, and broad participation from all sectors is key.

The constraint to wood recycling most commonly identified by the waste management industry is contamination in the waste timber supply. Increased participation and rigour in sorting wood wastes at source is required, which would be an expected result of increased general awareness of, and company commitment to, wood recycling. Stability in the price of woodchips is another key factor for success, which is hard to control.

Increasing markets for recycled timber would also undoubtedly contribute to development of the sector. Innovative products may appear in the coming years; labelling and positive marketing of wood-based panel products made from recycled wood, perhaps through the FSC, could help.

Uses such as wood-burning power stations, mulch or compost may develop further in the future; while removing waste from landfill, these uses will not reduce the demand for new timber and the pressure on forests.

Organisations and information sources

8

The following is a list of organisations involved in timber waste, re-use and recycling in some way, and sources of published and unpublished information. It is not intended to be exhaustive.

Brighton and Hove Wood Recycling Project

7-8 Regent Street, Brighton BN1 1UL
Tel: 01273 570500
www.pavilion.co.uk/woodrecycling/

Independent initiative reclaiming and selling timber from construction and demolition waste.

Building Research Establishment (BRE)

Garston, Watford, Herts WD2 7JR
Tel: 01923 664000
www.bre.co.uk

Building industry research body; has a 6-person centre for waste and recycling. Runs the Materials Information Exchange website for reclaimed building materials (www.bre.co.uk/waste).

Community Recycling Network (CRN)

Trelawny House, Surrey Street,
Bristol BS2 8PS
Tel: 0117 942 0142
www.crn.org.uk

Umbrella organisation with over 300 members, largely community-based recycling schemes. Provides support

and services for local groups and a national voice for community recyclers.

Construction Industry Research and Information Association (CIRIA)

6 Storey's Gate, Westminster,
London SW1P 3AU
Tel: 020 7222 8891
www.ciria.org.uk

Building industry research body. Published 'The reclaimed and recycled construction materials handbook' (CIRIA, 1999).

Department of the Environment, Transport and the Regions (DETR)

Eland House, Bressenden Place,
London SW1E 5DU
Tel: 020 7890 3000
www.detr.gov.uk

UK government department responsible for waste and environment issues.

ENTRUST

Acre House, 2 Town Square, Sale,
Cheshire M33 7WZ

Tel: 0161 972 0044
www.entrust.org.uk

Body that manages the funds channelled through the Landfill Tax Credit Scheme.

Friends of the Earth

26-28 Underwood Street,
London N1 7JQ
Tel: 0207 490 1555
www.foe.co.uk

Environmental non-government organisation. Published 'Out of the Woods: reducing wood consumption to save the world's forests' (FOE, 1995), a study of how the UK's timber and paper consumption could be reduced, and 'The Good Wood Guide' (FOE, 1996), a consumer guide to buying timber that includes information on reclaimed wood and wood products.

Furniture Industry Research Association (FIRA)

Maxwell Road, Stevenage,
Hertfordshire SG1 2EW
Tel: 01438 777700
www.fira.org.uk

Furniture industry research body; recently conducted a study on timber waste, as yet unpublished.

Local Authority Recycling Advisory Committee (LARAC)

Contact Penny Spirling
Tel: 020 8770 6248
www.greenchannel.com/larac/

Committee of local authority officers addressing municipal waste recycling issues.

Materials Recycling Weekly

19th Floor, Leon House, 233 High Street,
Croydon CR0 9XT
Tel: 020 8277 5540
e-mail: recycling@maclaren.emap.co.uk

Weekly magazine dedicated to recycling. Also publishes the 'Materials Recycling Handbook', which lists some companies that are involved in wood recycling.

National Recycling Forum

National Recycling Forum/Waste Watch,
Ground Floor, Europa, 13-17 Ironmonger
Row, London EC1V 3QN
Tel: 020 7253 6266
www.nrf.org.uk

An independent forum managed by Waste Watch bringing together industry, manufacturers, retailers, local authorities, private and public sector institutions, and the voluntary sector to promote the principles of waste reduction, re-use and recycling.

SALVO

Ford Village, Berwick Upon Tweed,
Northumberland TD15 2QG
Tel: 01890 820333
www.salvo.co.uk

Organisation dedicated to the promotion of reclaimed building materials. Publishes series of Salvo Packs with lists of dealers in reclaimed materials, and a newsletter Salvo NEWS. Conducted a study (called the BigRec survey) of the reclaimed building material trade—summary is published on their web site.

SOFA - THE FURNITURE RECYCLING NETWORK

Unit 3, Pilot House, King Street,
Leicester LE1 6RN
Tel: 0116 2337007
www.btinternet.com/~frn/FRN

Network of organisations taking second-hand furniture to be passed on to low-income households.

The Urban Timber Initiative (UTI)

Andy Urquhart, Academic Enterprise,
The University of Salford, Salford,
Greater Manchester M5 4WT
Tel: 0161 295 4459

Project based at the University of Salford promoting sustainable utilisation of local woodlands and recycled timber in the Manchester area.

The Environment Council

212 High Holborn, London WC1V 7VW

Tel: 020 7836 2626
www.the-environment-council.org.uk

Charity dedicated to enhancing and protecting Britain's environment through building awareness, dialogue and effective solutions. Publishes a series of Stakeholder Guides: the 'Sustainable Waste Management' guide has a section on timber waste.

Timber Research and Development Association (TRADA)

Stocking Lane, Hughenden Valley,
High Wycombe,
Buckinghamshire HP14 4ND
Tel: 01494 563091
www.tradatechnology.co.uk

Research and development body covering all timber uses. Published 'Wood residue: waste or resource?' (Riddiough, 1999).

Waste Watch

Europa House, Ground Floor, 13-17
Ironmonger Row, London, EC1V 3QG
Tel: 020 7253 6266
www.wastewatch.org.uk

Non-government organisation dedicated to the promotion of sustainable waste management.

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R

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Waste Watch (2000). [Online] www.wastewatch.org.uk

FFI questionnaire on tree and timber recycling

A1

SECTION A: GENERAL INFORMATION

Name of authority:

Area of responsibility:

Approximate number of inhabitants:

Your name:

Your job title:

Is the authority responsible for the provision of Civic Amenity Sites?:

If yes, how many are you responsible for?:

Who runs the Civic Amenity sites — yourselves, or a contracted company?

Please give name of company

SECTION B: TIMBER WASTE

(old wooden items such as fencing, doors, window frames, furniture, DIY offcuts etc.)

Is timber collected for recycling at any of your Civic Amenity sites?

If yes, at how many sites?

Please give the names of these sites:

Who processes the recycled timber (Civic Amenity site managers themselves or a separate company)?

What is the recycled timber used for (product, uses, who uses it)?

How much timber is collected (volume or weight collected in given time unit) ?

AND/OR

How much product (e.g. woodchip) is produced from the recycled timber (volume or weight in given time unit)?

If you DO recycle timber, what were the forces that encouraged you to do it?

If you DON'T recycle timber, have you considered doing so?

What are the constraints / reasons that prevent you doing so?

What changes would encourage you to start timber recycling?

SECTION C: TREE WASTE

(wood cut from street, park or garden trees, public and private)

Are you responsible for maintaining any trees in public places (parks, roadsides etc.) ?

If yes, what do you do with any wood resulting from their maintenance?

Do you offer tree waste recycling for public use at any of your Civic Amenity sites?

If yes, at how many sites?

Please give the names of these sites:

What is the recycled tree waste used for? (product, uses, who uses it)

How much tree waste is collected (volume or weight collected in given time unit)?

AND/OR

How much product (e.g. mulch, chippings) is produced from the recycled tree waste (volume or weight in given time unit)?

If you DO recycle tree waste, what were the forces that encouraged you to do it?

If you DON'T recycle tree waste, have you considered doing so?

What are the constraints / reasons that prevent you doing so?

What changes would encourage you to start tree waste recycling?

Any other relevant information or comments you would like to make:

THANK YOU VERY MUCH FOR COMPLETING THIS QUESTIONNAIRE.

*Please return it to: Georgina Magin, Global Trees Campaign, Fauna & Flora International,
Great Eastern House, Tenison Road, Cambridge CB1 2TT Tel. (01223) 571 000.*

Local Authorities that recover timber at Civic Amenity sites

A2

(from questionnaire responses)

AUTHORITY & CONTACT	NO. OF CIVIC AMENITY SITES WITH TIMBER RECOVERY	USES OF RECOVERED TIMBER
Angus Council Iain Webster	5 recycling sites	Panel manufacture (<i>processed by separate company</i>)
Armagh City and District Council Irene Kempton	2 sites	Panel manufacture, composted, burnt for power (<i>Processed by Natural World Products</i>)
Ballymena Borough Council Jack Quigley	1 site	Composted
Blackburn with Darwen S. N. Hammond	1 site (George St West)	Panel manufacture (<i>processed by Armstrongs</i>)
Borough of Poole Louise Lowans	1 site	Composted by separate company
Buckinghamshire County Council Barbara Watts	4 sites	Panel manufacture (<i>processed by Wood Waste Services</i>)
Conwy County Borough Council Anthony T. Sykes	2 sites	Composted by council
Devon County Council Christine Littlejohn	19 sites	Firewood
Doncaster Metropolitan Borough Sue Daynes	2 sites	Panel manufacture, used for garden furniture, plant pots etc.
Dundee City Council Gillian Lee	?	Burnt in energy from waste plant
Durham County Council John Wade	?	Panel manufacture (<i>processed by site managers</i>)
East Renfrewshire Council Anne Higgins	1 site	Panel manufacture (<i>processed by WH Tracey</i>)

AUTHORITY & CONTACT	NO. OF CIVIC AMENITY SITES WITH TIMBER RECOVERY	USES OF RECOVERED TIMBER
East Sussex County Council Gill Wheeler	11 sites	Public re-use
Fermanagh District Council Paul Slowey	At one landfill site	Used as boiler fuel
Fife Council D. Hendry	1 site	Public re-use
Glasgow City Council Rolf Matthews	1 site as trial	Panel manufacture (<i>processed by WH Tracey</i>)
Hampshire County Council Michael Senior	23 sites	Doors for re-use; other wood for firewood Trialing chipping for equestrian centres at 2 sites
Jersey, States of Paul Every	1 site	Demolition timber is used for compost and mulch
Lancashire County Council Carole Taylor	7 sites	Panel manufacture (<i>processed by Armstrongs</i>)
Leicestershire County Council Jonathan Surridge	14 sites	Public re-use
London Borough of Sutton Penny Spirling	1 site	Panel manufacture (<i>processed by site managers</i>)
Luton Borough Council Roger Seed	1 site	Shredded for compost and mulch
Moray Council Steven Williamson	?	Sorted by community project for re-use
Northamptonshire County Council Sheridan Hornsby (Ms)	?	Public re-use
North Yorkshire County Council Tracey Bednell	1 site	Panel manufacture (<i>processed by Armstrongs</i>)
Omagh District Council Kevin O'Gara	1 site	Composted
Portsmouth City Council Karen Jones	1 site	Public re-use
Shetland Island Council Mary Lisk	1 site	Fuel for waste to energy plant
Southampton City Council	1 site	Public re-use; untreated wood composted
Stoke on Trent City Council. Andrew Hargreaves	1 site	Incinerated at waste to energy plant
Swindon Borough Council Amelia Craighill	1 site	Composted for parks and gardens, chipped for landfill site roads
Thurrock Council Pat Benning	1 site	Panel manufacture (<i>processed by Wood Waste Ltd</i>)
Torbay Council Mr A Dumont	1 site	Panel manufacture
Wakefield Metropolitan D. C. Robert Wilkinson	1 site	Used for waste to energy, garden centre, panel manufacture, furniture recycled
Warwickshire County Council Jack Lindsay	1 site	Firewood, bird tables, sold to public
West Berkshire Council Andrew Deacon	At recycling centre	Shredded and composted for soil improver
Wolverhampton Metropolitan Borough Council / Melvyn Lilley	2 sites	Burnt in waste to energy plant

