



Waste Wood Reuse and Recycling in Essex & Cambridgeshire

WasteWISE Overview Report 3 JUNE 2003

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We are keen to share research and discuss joint projects on this opportunity.

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Executive Summary

- Waste wood is considered a major opportunity for focused new social enterprises.
- It is estimated that over 1.7 million tonnes of domestic wood waste are produced annually in the UK, of which only about 40,000 tonnes (2.3%) are currently recycled.
- 2.5 million tonnes of construction and demolition wood waste are also produced annually, of which 1.2 million tonnes is estimated to be reclaimable but only *ca.* 39% of this is reused, recycled or burnt.
- Major opportunities for social enterprises include timber sales and furniture reuse, with commercial sources and partnerships with councils, re bulky collections, offering the best early opportunities.
- A number of other significant opportunities exist, including pallet reuse and reprocessing for particle board manufacture, fuel, and as biomass, including reprocessing of wood already diverted by CA and other sites.
- Over 24,000 tonnes of waste timber and 11,000 tonnes of waste furniture are estimated to be available annually in Essex and Cambridgeshire for such projects.
- It is estimated by WasteWISE that new social enterprises could create 90 jobs in Essex and Cambridgeshire for a 10% increase in the recycling rate of timber and a 20% increase for furniture reuse.
- Wood is a versatile, high availability waste stream. This enables projects to combine a wide variety of options which are explored and summarised here as a preliminary guide.

1. Background

There have been some valuable recent developments regarding waste wood - for example the Waste Resources Action Programme (WRAP) has recently introduced an interactive site (www.wrap.org.uk/RecycleWood) which together with letsrecycle (www.letsrecycle.com) provides good marketing opportunities.



It is estimated (WRAP 2002) that the UK annually produces around 1.76 million tonnes of domestic wood waste. 242,000 tonnes of this arises from normal household collections, 40,000 tonnes from bulky household collections and the clear majority from civic amenity (CA) sites. This constitutes *ca.* 7% of the total domestic waste stream. Virtually no collected household wood waste and only 2.7% of civic amenity waste nationally is recycled. In addition, it is estimated that *ca.* 0.67 million tonnes of wood packaging waste was produced in 2001, of which 44% was recycled and *ca.* 2.5 million tonnes of commercial and demolition (C&D) waste are produced every year, of which 32% is reused as wood or wood products, 6% is burnt to produce energy and 1% is recycled. APU is currently researching ways to reduce the levels of C&D waste within the TREE (Timber Recycling For Essex Environment) project.

For the purposes of this report, wood is used as a general term to encompass timber, timber products such as furniture and woody waste such as branches.

A survey of 203 local authorities conducted in 2001 by Flora and Fauna International revealed that the major constraint to timber recycling was the lack of a local outlet for material (62% of respondents), followed by lack of resources (38%), lack of space (37%), contamination/quality of material (24%) and lack of awareness/information availability (6%).

The current cost of segregating and processing waste wood from CA sites is estimated to be between £19 and £47 per tonne. This cost could probably be reduced if skips for various categories of wood waste shown in Tables 2 and 3 were provided.

Current uses for wood waste include:

1. Re-use/recycling of timber, furniture and pallets
2. Chipboard and MDF manufacture
3. As a bulking material and carbon source for compost
4. Conversion to mulch for horticultural use
5. As a fuel source or feedstock for charcoal manufacture
6. As animal bedding
7. As a pulp for the manufacture of corrugating medium and brown paper
8. As a fibre source for wood-plastic and fibre-cement composite materials

Future opportunities include use as biomass for conversion to transport fuels such as ethanol or methanol, which can be used as fuel extenders for petrol



and diesel or for bio-diesel manufacture. These are discussed in more detail in the Appendices. Appendix 1 discusses wood products opportunities, skills needs and business angles. Appendix 2 assesses opportunities in by looking at successful recycling social enterprises elsewhere in Britain.

Appendix 6 lists local wood recyclers. These are rather few and far between as they are more traditionally found in the North. Letsrecycle (www.letsrecycle.com) have a national listing.

2. Estimated Quantities Available for Recycling

The quantity and type of wood waste available varies shows seasonal fluctuations and variances such as varying levels of trade waste, local policies and overall lack of measurement contribute to the level of uncertainty. However, the following tables probably represent the best available estimates. Table 1 shows estimated annual quantities of wood available for recycling in Essex, Cambridgeshire and the Eastern Region.

The household values include normal domestic collections and CA waste and are calculated from '00 – '01 data (Eastern Region) and '01 – '02 data (Essex). Appendices 3 and 4 provide more details. National average values of 1.2 % for the percentage of wood in collected household waste and 22.5% for the percentage of wood in civic amenity waste are used (WRAP averages from a survey of 450 local authorities '01-'02). The figure of 1.2% for household waste is within 10% of the average figure of 1.1% reported from an analysis of Cambridgeshire waste conducted in '02.

A recycling rate of 0% is assumed for household collections and an average Essex '01 – '02 CA recycling rate of 4.7% is assumed for all CA sites. This rate is *ca.* 2% above the national average and assumes that all the recorded CA waste is recycled, which may not be the case. However, this means that the values provided are likely to be an under rather than an over estimate. In addition to these figures, bulky household collections of wood, an unknown percentage of which are currently recycled, probably total 1,000 tonnes for Essex, 400 tonnes for Cambridge and 3,400 tonnes for the Eastern Region.

The estimated figure for business waste is for wood packaging and is calculated on a population basis using a figure of 670,000 tonnes for the UK total (DETR 2000). The estimated figure for C&D waste is derived similarly



using an estimated UK total of 0.71 million tonnes of unrecycled but reclaimable C&D wood waste (WRAP '02) and includes the substantial waste imports into Essex where noted.

Table 1

Estimated Wood Available for Recycling In Cambridge and the East of England (Tonnes)

	Household Collections	Household CA Sites	Business	C&D	Total
Essex	6,300	37,300	9,200	18,000 + 36,000*	70,800 106,800**
Cambridge	2,400	13,500	3,700	7,400	27,000
E & C	8,700	50,800	12,900	25,400 + 36,000*	97,800 133,800**
Eastern Region	22,400	89,000	31,400	61,600 + 36,000*	204,400 240,000**

*Estimated additional contribution from imports (T. Bomber, TREE bid , APU 2002)

**Total including estimated imported waste

Table 2 shows estimates of quantities of various categories of CA wood waste available for recycling in Essex, Cambridgeshire and the Eastern Region using national average percentages of 10.5% for timber, 5% for furniture and 6.5% for branches (WRAP survey).

Table 2

Categorised Estimates of CA Wood Waste Available for Recycling In Essex, Cambridgeshire and the Eastern Region (Tonnes)

	Timber	Furniture	Branches
Essex	17,400	8,300	10,800
Cambridge	6,300	3,000	3,900
E & C	23,700	11,300	14,700
Eastern Region	41,500	19,800	25,700



Table 3 shows an estimated breakdown of the timber element of CA waste for Essex, Cambridgeshire and the Eastern Region derived proportionately using data from an analysis of CA sites in Brighton and Hove conducted by the Wood Energy and Research Group in '01 (WRAP '02). This analysis found that timber constituted 20.2% of CA waste, almost twice that of the national average of 10.5%. This may reflect the inclusion of some furniture within this category in the Brighton study, although this would not be expected to account for such a large difference. The data does at least give some broad guidance as to the amounts of wood that may be available within these categories.

Table 3

Breakdown of Timber Element of CA Wood Available for Recycling In Essex, Cambridgeshire and the Eastern Region (Tonnes)

	Chip Board	Fibre Board	Untreated Solid	Treated Solid	Painted Solid	Solid Furniture	Block Board	Virgin Timber
E	5,400	2,700	1,900	2,100	2,000	1,700	1,100	340
C	2,000	1,000	700	800	700	600	400	130
EC	7,500	3,700	2,600	2,900	2,700	2,400	1,500	530
ER	13,000	6,400	4,500	4,900	4,700	4,100	2,700	800

3. Financial Overview

Government has created new start-up funding for effective community recycling projects. Although it is recognised that grants may be essential at the beginning, the aim is to create sustainable businesses that no longer need them. WasteWISE will assist organisations to win funding for projects in the two counties, including in Thurrock, Southend and Peterborough. There is plenty to bid for, including: New Opportunities Funding: The CRED scheme, SEED funding, Fair Share projects, the new Government £100 million/year sustainable waste funding package managed by WRAP and others and the DTI Clear Skies funding package.



4. Social Employment Opportunities

It is difficult to calculate the precise economics of social enterprises reusing or recycling wood waste ahead of undertaking detailed business planning, which WasteWISE would be keen to assist groups with as a next stage. One initial approach is to consider specific schemes which already operate in some parts of the UK and apply the information available to the quantities of waste estimated to be available in Essex and the Regions. The following three examples of (A) timber, (B) furniture and (C) pallets are used to provide estimates of social employment opportunities for further discussion. It is assumed that WasteWISE furniture schemes would collect from homes and businesses before the waste was deposited at CA sites, so the reference to CA waste is largely academic and is used only as a means of deriving estimated quantities. Timber schemes may also benefit from some degree of prior collection, in addition to some assistance from local authorities with improved pre-sorting at CA sites. There may also be room for a fair amount of overlap between all three scenarios. Future research, including visits to the various projects outlined will provide more financial and operational information on this.

Skills and training involved would include driving, valuation, furniture restoration, sales, carpentry, machine skills, creative design, chipping and grinding. A listing of possible skills and markets associated with various categories of wood waste is assessed in the summary analysis of the cascade of opportunities for creating value from wood and wood products presented in Appendix 1.

Successful projects are likely to combine a range of reuse and reprocessing options. Reuse plus back-up is one strategy. Projects need to define a main income product range but also have an outlet/opportunity for the residue, perhaps using one or other of the options described here.

A. Timber

Up to 10 enterprises similar to the 4-man Wood Recycling Project in Brighton and Hove could be set up locally to achieve a 10% increase in the C&D wood re-use/recycling rate in Essex. A more detailed analysis is presented in Appendix 2. The C&D wood waste in Cambridge could support 6 people at the 10% rate, creating employment for *ca.* 46 people for the combined counties.



Timber from CA sites in Essex should be able to provide work for another 3 enterprises for a 10% increase in the re-use/recycling rate. Timber from CA sites in Cambridge should be sufficient for at least one enterprise, providing *ca.* 16 jobs in total for timber derived from CA sites and *ca.* 62 jobs using C&D and CA timber in the two counties combined.

B. Furniture

For an increase in the recycling rate of 20%, the estimated waste furniture available at CA sites in Essex could produce employment for *ca.* 20 people along the lines of Bulky Bob's in Liverpool. An analysis is provided in Appendices 2 and 6. This would probably be best divided up into 4 schemes distributed over the county. For Cambridge, the figures indicate that employment for *ca.* 8 people should be possible for the 10% recycling rate, making a total of 28 jobs for the two counties combined. The estimated 1,400 tonnes of bulky household waste in Essex and Cambridge would provide additional resources.

C. Pallets

Estimates of the number of pallets available in Essex and Cambridge (see Appendix 1C) show that these could be worth up to £42,000 and could be sufficient to provide employment for *ca.* 3 people in Essex and 1 person in Cambridge.

Other Opportunities

Tables 1-3 show there is plenty of wood waste available in other categories and a number of other possibilities for social employment using these are outlined in Appendix 2. It is difficult to estimate the financial aspects of these due to the current lack of information but this is being continuously updated and possible WasteWISE projects will be assessed on an individual basis if requested.

5. Environmental Issues

Land-filled wood produces methane – a greenhouse effect gas - when it rots, so this should be avoided if possible. Treated wood can also contain tributyl tin oxide and copper and tributyl tin naphthenate which can contaminate



surface water. It has been commonly been thought that items such as furniture decayed in around 25 years in landfill and items containing preservative around 50 years, however preliminary findings from recent research (www.forest.nsw.gov.au/bush/feb02/stories/21.asp) have shown that many products may take a hundred years or more to decay.

Decisions concerning wood reuse and recycling will assist councils to achieve landfill directive targets to divert biodegradable municipal waste (BMW). These are required to fall to 75% of 1995 levels by 2010 and 50% of 1995 levels by 2013. Councils have failed to analyse wood as an issue as they have only analysed dustbin composition regularly, not civic amenity waste.

Use as a fuel for either domestic heating or conversion to electrical energy in commercial units is effectively carbon neutral but toxic emissions are produced when wood treated with preservatives is burnt. Items for external use such as railway sleepers and telegraph poles are particularly bad in this respect. Railway sleepers contain creosote which incorporates benzopyrenes and may be carcinogenic. Telegraph poles contain pentachlorophenol and pressure treated wood contains chromated copper arsenate. Use as biomass for road fuels such as ethanol or methanol, which can be used to extend petrol and diesel without engine modifications, would reduce CO₂ and other emissions.

Chipboard manufacture raises environmental issues because of the possibly carcinogenic formaldehyde based glues used and the large amounts of energy and water consumed. No proper life-cycle analysis has been conducted for this in the UK, although a Dutch study has recently reported that recycling to produce chipboard leads to a greater reduction in CO₂ emissions than burning the wood to produce electrical energy. The new Fibresolve process being developed by TRADA appears to dispense with formaldehyde based glues and allow particleboard itself to be recycled.

6. Potential Partner Organisations

- WasteWISE and WISE - WISE provides detailed development and management training for recycling/other social enterprise managers in Essex, Cambridgeshire and neighbouring areas.
- Recycling social enterprises and community/environment groups



- Essex and Cambs county councils, district and unitary councils, and joint waste strategy and recycling initiatives. Councils may donate timber and furniture to reuse and recycling schemes as in Liverpool with Bulky Bob's.
- Essex ReMaDe, and other initiatives/umbrella organisations.
- TREE, also at APU, provides research on C&D waste within Essex
- External partners, e.g. TRADA and wood recovery companies listed at www.letsrecycle.com.
- Local construction sites and DIY stores such as B&Q etc.
- Local recycling, waste, and other businesses.
- New entrepreneurs/venture capital funders

7. Next Steps

Our standard two stage approach at WasteWISE is, with partners, to

- a Consult on discussion drafts like this, then improve and publish a final 'overview report'
- b To then undertake a detailed feasibility study and financial analysis with partners on a real potential scheme covering a defined catchment area that is projected to deliver economic and successful recycling. This will normally cover at least three council districts in Essex and/or Cambs, and the study will be overseen by the creation of a 'task and finish' project group including key partners.

8. Detailed Financial Analysis

In the case of wood, the issues to be costed in detail include:

A **FIXED COSTS** (** costs reduced by partnerships/links)

Capital investment

- recycling skips appropriate to various categories of wood
- collection vehicles
- ** premises for sorting/refurbishing/chipping/external storage
- ** Retail outlets

** Operating costs

- business rates, phones etc
- promotion/media



B VARIABLE COSTS

Staff costs

- Wood collection
- Sorting/refurbishing/selling/craft design
- Delivery/transport to market

Operating costs

- Fuel/premises/refurbishing materials

C INCOME

Price per item of timber/furniture or kg fuel/woodchips sold

Recycling credit per tonne (or landfill saving from commercial wood sources)

Packaging recovery notes

Potential financial support from local authority for trial

Staffing contribution re: placing people with learning disability/training support

Potential one off assistance from industry/packaging compliance schemes

Local partners interested in reprocessing outputs

Potential grant aid and start up funding (WasteWISE has further analysis on these)

9. Further Contacts and Sources

Tony Bomber, TREE Project, Anglia Environmental, APU, Bishop Hall Lane, Chelmsford. CM1 1SQ. t.bomber@apu.ac.uk, 01223 363271.

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Richard Mehmed, Project Director, National Community Wood Recycling Project, Municipal Market, Circus Street, Brighton. BN2 9QF.
Info@communitywoodrecycling.org.uk, 01273 696900.

Neil Thomson, Project Manager, Remade Essex, tel: 01245 259351,
neil.thomson@eepartnership.co.uk.



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www.associationhq.org.uk/ae/ourclients/showclient2.asp?UniRef=8

www.communitywoodrecycling.org.uk