

## APPENDIX 14 – MARKET DEVELOPMENT

### 14.1 MARKET DEVELOPMENT

#### 14.1.1 Introduction

The following Section of this report examines issues linked to development of markets for recycle and compost (or biologically treated/stabilised organic wastes). All waste management options, incorporating increased recycling and composting performance, will generate additional quantities of recycle and compost. Success in meeting the WAG recycling and composting targets will depend on being able to secure, and maintain, sufficient reprocessing capacity for the recycle generated and markets for the compost. The following sub-sections of this report examine the likely quantities of material that will be generated and provides a market analysis for each material type together with options for developing markets and securing the necessary reprocessing capacity.

#### 14.1.2 Total Recycle Tonnages

Based on the preferred waste management option (BPEO) estimates of recyclable material tonnages in 2003/4, 2006/7 and 2009/10 have been made. (see Table A14.1 below).

	2003/04	2006/07	2009/10
<b>Paper</b>	1,091	3,085	5,636
<b>Glass</b>	527	884	1,616
<b>Steel</b>	191	320	584
<b>Aluminium</b>	68	115	210
<b>Plastic</b>	582	976	1,783
<b>Textiles</b>	232	390	712

**Table A14.1 Predicted Recycle Tonnages for target years**

It should be noted that the estimates provided in Tables A14.1 are based on current municipal waste compositional data and do not take into consideration likely changes in packaging material preferences or effects of waste minimisation schemes and material take back schemes over the period of the strategy.

### **14.1.3 DISCUSSION**

#### **14.1.3.1 Glass**

The glass tonnages are based on mixed coloured glass. Colour separation of glass is preferred as different glass colours cannot be mixed in the glass manufacturing process. Clear glass is particularly sensitive such that the green and amber content in clear cullet must be less than 2%. Additional glass tonnages could be collected by targeting commercial glass generators such as pubs, clubs and restaurants.

Whilst the above estimates are concerned with container glass only, recycling of plate glass (for example window glass) and spent fluorescent tubes, offers further opportunities to increase glass collection tonnages.

#### **14.1.3.2 Plastics**

At present there are limited market opportunities for mixed plastics not just in North Wales, but across the UK as a whole. However, many Local Authorities do not sort plastic bottles into individual polymer types choosing instead to bale mixed plastic bottles and take advantage of a buoyant export market for this material. The UK plastic bottle recycling sector is set up to reprocess pre-segregated bottles (HDPE & PET) only and cannot process mixed bottles economically - unless they have little or no contamination and are baled to a low density. Polyethylene terephthalate (PET) and high density polyethylene (HDPE) represent approximately 25% by weight of total plastic waste in the municipal waste stream. The remaining 75% of the plastic waste stream, made up of PVC, low-density polyethylene, polypropylene, polystyrene and resin composites is not generally suitable for recycling due to the range of polymer types and higher levels of contamination. However, this material could have value as a feedstock to mixed plastic processing facility.

A range of alternative, and innovative, uses for mixed plastic waste are currently being researched in the UK which may in the future offer further market opportunities for mixed plastic waste.

#### **14.1.3.3 Timber**

No detailed estimate has been made of the potential quantity of timber that could be generated for each of the options, however it is clear that timber is present in the municipal waste stream and that it could be recovered for recycling. A number of wood recyclers already operate in Wales reprocessing wood into a range of products including compost, recreational coverings, chipboard and furniture. Only certain wood types are acceptable as feed stocks to these reprocessors and most exclude treated and/or painted wood.

Timber will enter the municipal waste stream as unwanted furniture either through HWRC sites or from dedicated bulky household waste collections. In many areas of the UK furniture recycling projects have been set up to recover good quality furniture for renovation and repair

prior to resale to the domestic market (often low-income householders). These schemes also offer opportunity for refurbishment and reuse of large electrical appliances.

## 14.2.0 MARKETS CONSIDERATIONS

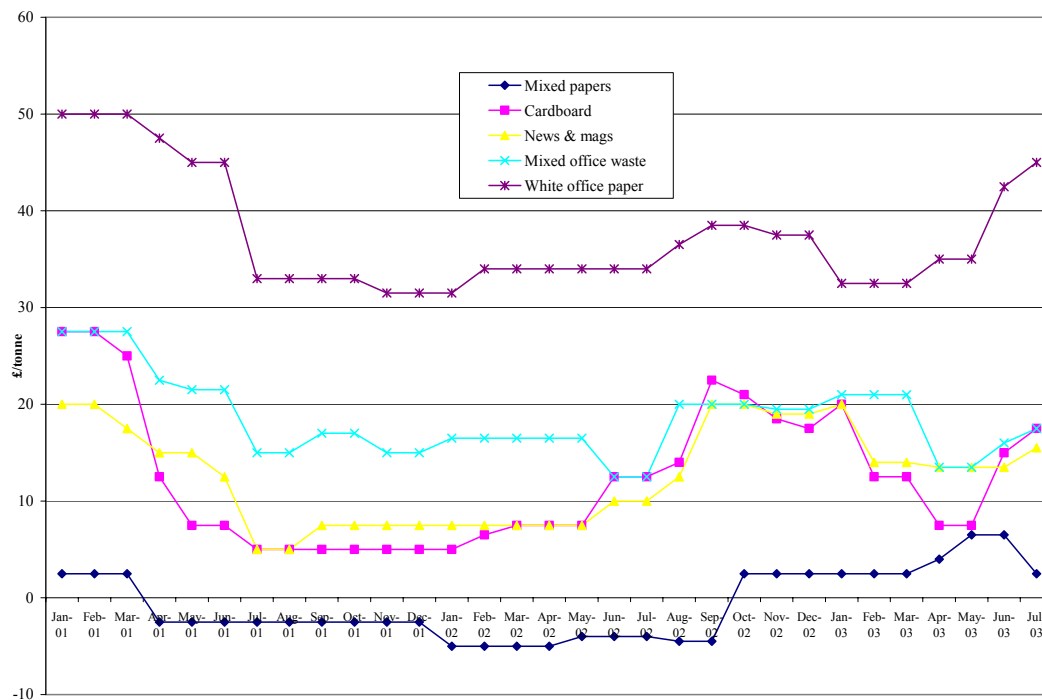
### 14.2.1 Introduction

The prices paid for waste materials (recyclate) are directly related to the demand for these materials from a range of industries. Thus, in order to understand the markets for waste materials, it is important to understand the wider market context. Prices quoted for materials have been taken from the 'Lets Recycle' web page ([www.letsrecycle.com](http://www.letsrecycle.com)).

### 14.2.2 Paper

Waste paper is used primarily in the manufacture of new paper products, although the amount of waste paper used by paper mills varies according to the products manufactured. Like glass cullet and scrap metal, waste paper is an internationally traded commodity and markets for waste paper and finished paper products fluctuate accordingly. The majority of paper waste collected by Local Authorities in the UK is in the form of 'newsprint and pamphlets', which are subsequently used in domestic paper production or exported.

Average prices paid for 5 different grades of waste paper (delivered to merchant) over the past two years are shown in Figure A14.1. This graph illustrates the price fluctuations discussed above.



**Figure A14.1: Average prices paid for waste paper delivered to merchant (Jan 01 – July 03)**

Lowest prices are paid for mixed paper; however mixed paper offers the greatest opportunity for maximising collection tonnages. Newsprint and magazines (pamphlets) command significantly higher prices compared to mixed paper. Highest prices are paid for office paper, which would suggest that opportunities for separate collection of office paper from commercial premises and the public sector should be considered.

It is generally accepted that significantly greater use of secondary fibre in the UK can only be achieved as a result of a major expansion in UK paper and board manufacturing capacity and that this expansion is unlikely to occur without UK Government support. Any new capacity additions will result from decisions taken by multi-national corporate owners.

An alternative use for paper is shredded as animal bedding as an alternative to straw. A good example of success in this area is Western Isles Council who have been so successful at recycling paper into animal bedding that they are now beginning to export to other areas. Anecdotal evidence suggests that animals actually prefer waste paper to straw.

### **14.2.3 Glass Cullet**

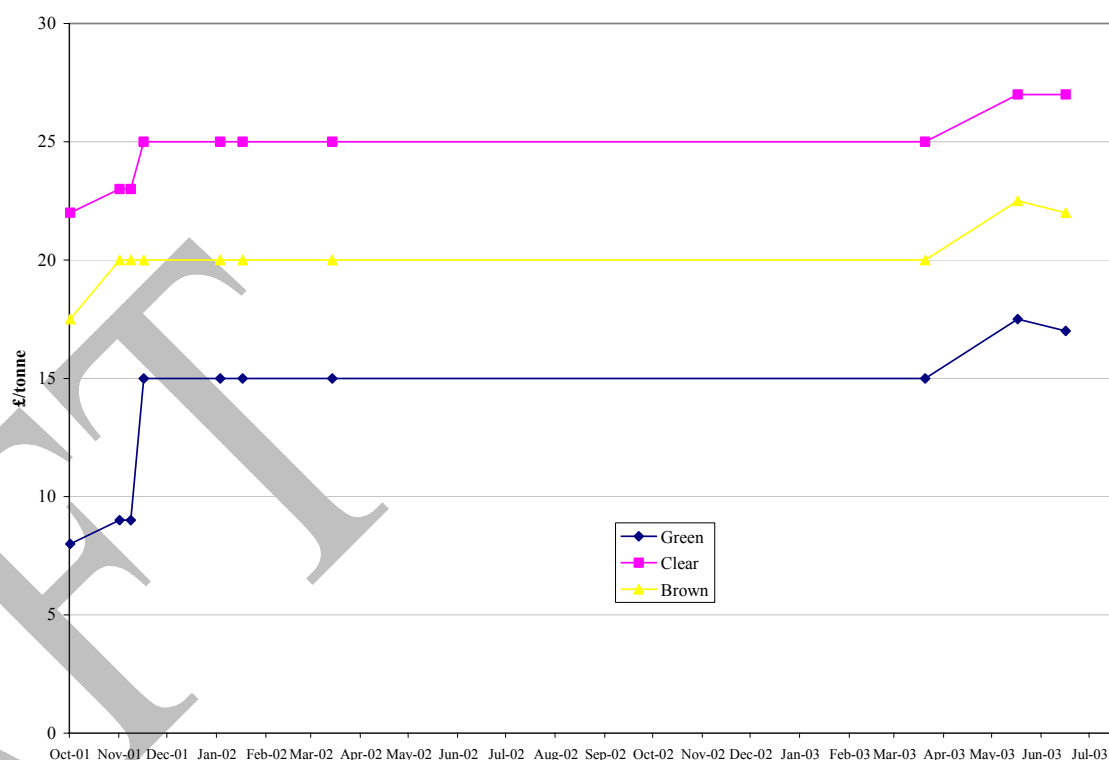
The majority of waste glass collected in the UK is in the form of waste bottles and containers. Waste glass is primarily used in the manufacture of new glass containers. A major barrier to the UK increasing the domestic recycling rate is the colour imbalance between waste glass arisings and the feedstock requirements of the UK glass producers. In the UK, the glass container industry primarily serves the UK food and drink sector, which is predominately a user of clear, rather than green, glass. Around 50% of UK collected glass is green.

Average prices paid for cullet over the past two years are shown in Figure A14.2. Cullet prices are relatively stable in comparison to waste paper and scrap metal prices, although prices do fluctuate depending on the output from UK glass manufacturing and demand from overseas markets.

The composition of waste glass by individual colour is estimated to be as follows; Green (50%), Amber (15%), Clear (35%).

Clearly, green glass is present in the greatest quantity, which has lead to a market surplus of green glass, due to the imbalance of UK production and consumption. Development of alternative glass markets which are less colour sensitive such as aggregates, shot blast abrasives, decorative applications and fibre glass production is helping to redress the colour imbalance.

A notable success is again Western Isles Council, Scotland who are milling collected glass as an alternative to aggregate in low-tech constructional uses for example drainage.



**Figure A14.2: Average price paid for glass cullet (Oct 01 – July 03)**

#### 14.2.4 Aluminium Cans and foil

There is a reliable demand for waste aluminium cans, however the main barrier to increasing recycling is the cost of collection, which is borne by the Local Authority. As aluminium cans are recycled into new beverage cans, the price of waste aluminium is affected by the market share of aluminium in the can market. Average prices paid for aluminium cans and aluminium foil are given in Figure A14.3. Prices for aluminium have gradually increased over the past two years due mainly to the growth in beverage sales, put at 4.1% for non-alcoholic beverages in 2002.<sup>26</sup>

#### 14.2.5 Ferrous Metal

The UK market for scrap steel is significantly influenced by foreign markets, as large volumes are imported and exported each year. Steel cans collected by Local Authorities are readily accepted by the scrap industry as feedstock material for the UK steel industry or overseas markets. However, the barrier to increasing the recycling rate of steel scrap is the cost of collection, which is borne by the Local Authority. Average prices paid for ferrous scrap over the past two years are given in Figure A14.4. These figures show the wide variations that are a consequence of the influence of foreign markets.

<sup>26</sup> The UK Food & Drinks Report 2003, leatherhead Food International.

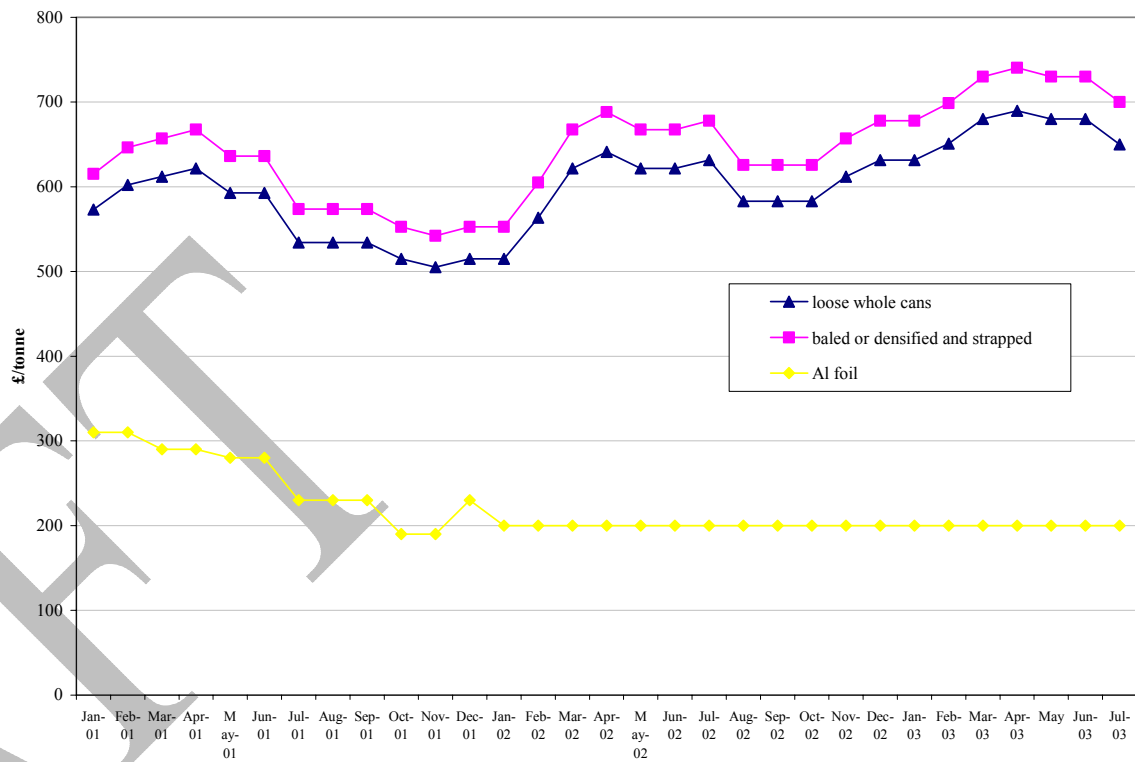


Figure A14.3: Average price paid for aluminium cans and foil (Jan 01 – July 03)

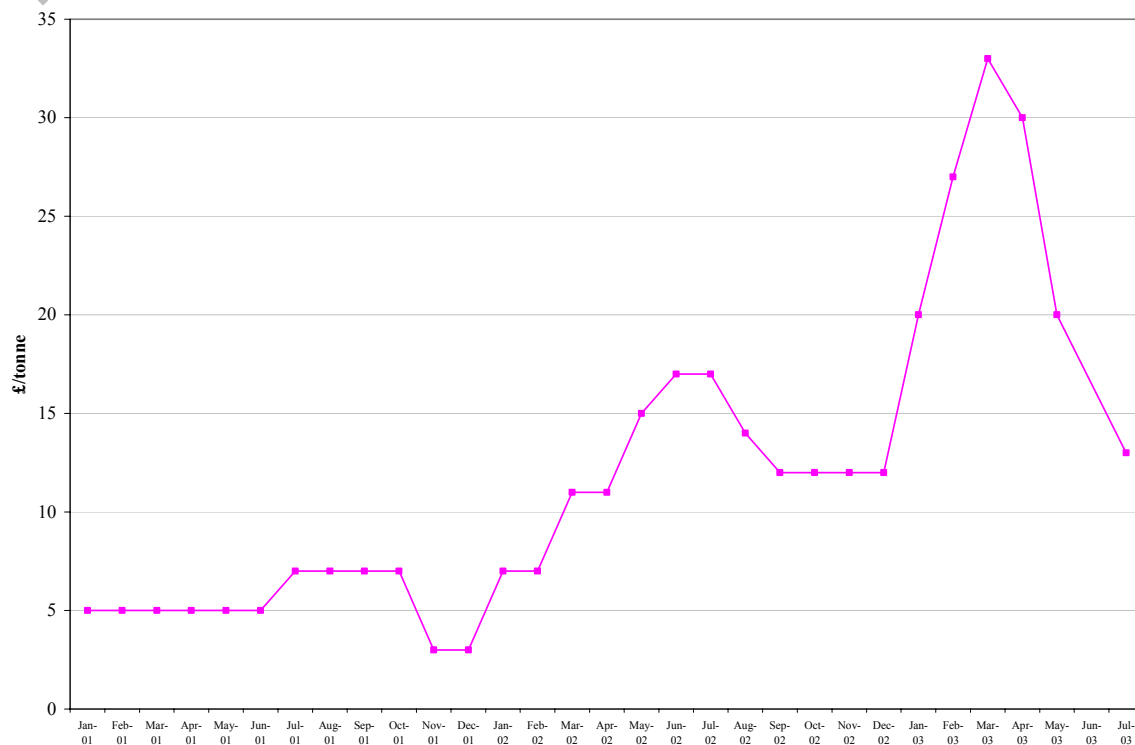


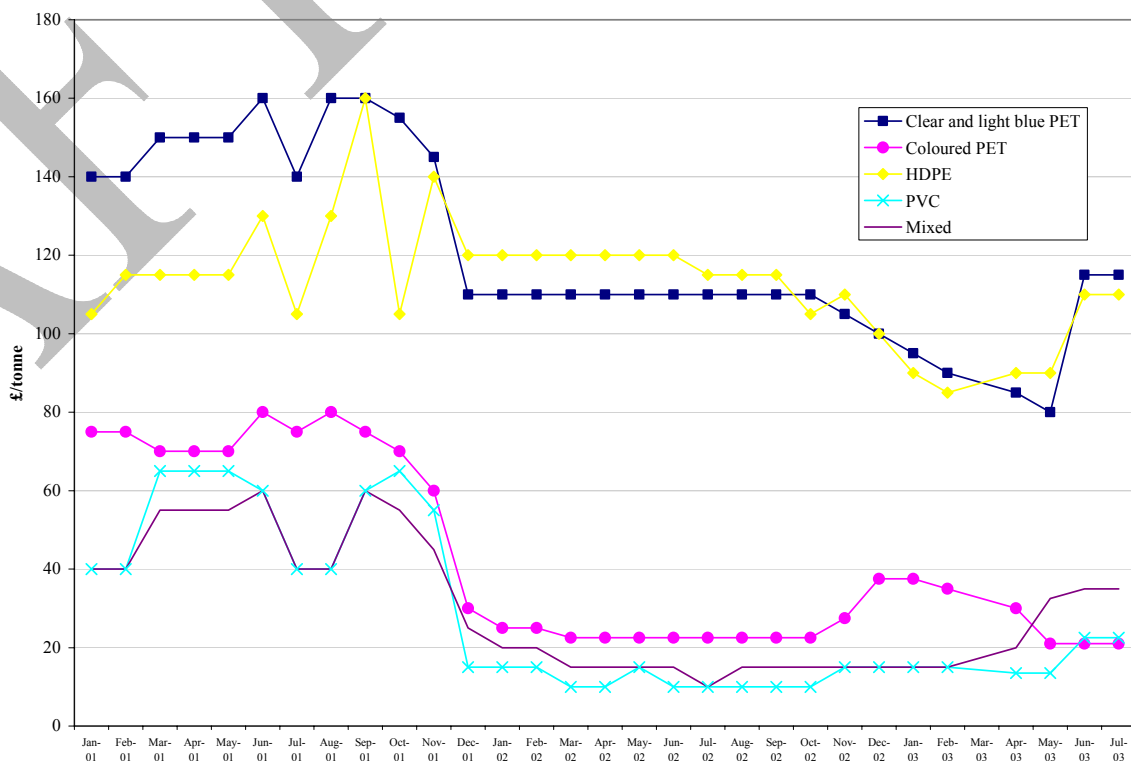
Figure A14.4: Average price paid for ferrous metal (Jan 01 – July 03)

### 14.2.6 Plastics

The plastics recycling industry tends to be more diverse and fragmented than the other main recycling industries such as paper and glass. There are a number of barriers to increasing the volumes of plastic recycling in the UK, including:

- high prices of recycled versus virgin polymers, with the market frequently not allowing recycled polymer to compete with virgin polymers;
- the reluctance of plastic product producers to use recycled polymers in their production process; and
- a lack of reprocessing technologies for waste plastics.

Average prices paid for different rigid plastic types are given in Figure A14.5



**Figure A14.5: Average prices paid for waste plastic (Oct 00 – July 03)**

Figure A14.5 indicates that highest prices are paid for PET and HDPE, whilst mixed plastics command a much lower price due to the limited markets for this type of material. This reinforces the need to separate plastic into individual types. Recycled plastic must compete against virgin material and hence prices paid for waste plastic(s) will depend on market conditions. Throughout 2002 there has been a gradual fall in the prices for virgin material, and hence a fall in waste plastic prices, brought about by over-production and competition in the world market.

CWMre are currently developing a number of initiatives in respect of plastics reprocessing in Wales, including:

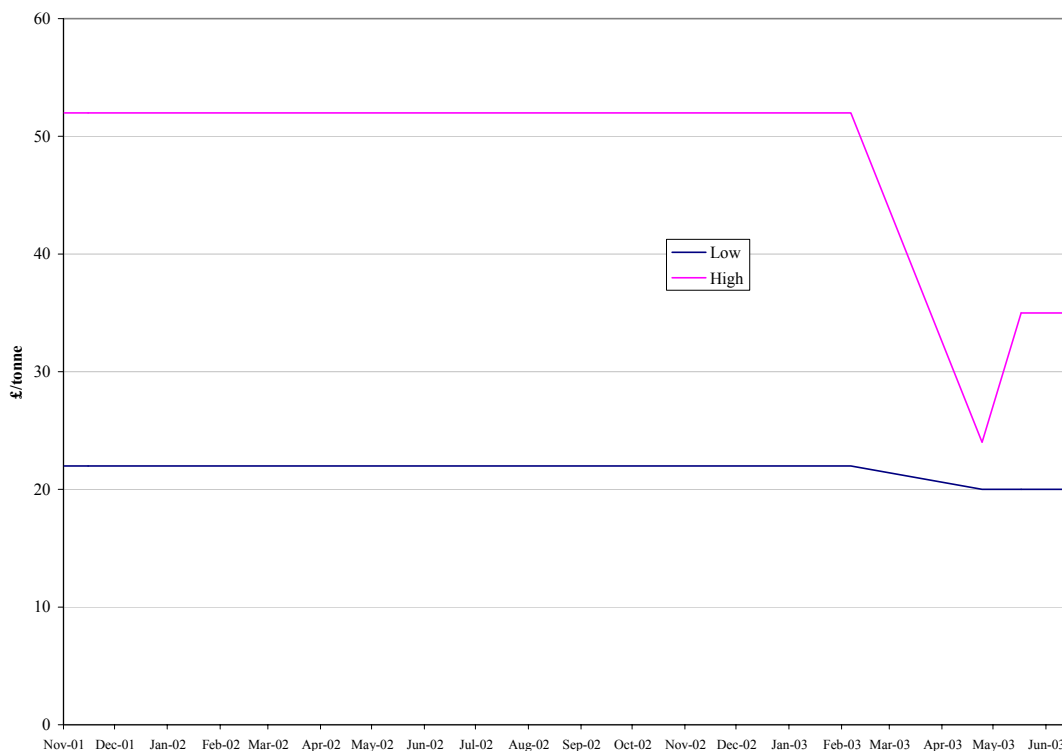
- Provision of support for indigenous Welsh plastics reprocessors to assist in development of a plastics processing plant in South Wales.
- Establishment of a Plastics Manufacturing and Recycling Facility (PRMF) incorporating a plastics auto-sorter and possible rough extrusion process
- Establishment of a production facility to make plastic pallets
- Establishment of a network of Commercial Amenity Sites for collection of commercial material including processing of plastic packaging waste.

Other plastics projects currently based in Wales include:

- ‘Second Life Plastics Wales’, based in Llandeilo, Carmarthenshire which collects agricultural waste plastic film from 7,000 farms
- Cae Post, which is a community based plastics recycling and sorting scheme based in Powys

### 14.2.7 Textiles

Average prices paid for textiles from Local Authority clothing and textile banks over the past two years are shown in Figure A14.6. This shows a dramatic recent dip in prices, linked to poor trading conditions in the UK fibre sector and a subsequent lack of confidence in all associated markets.

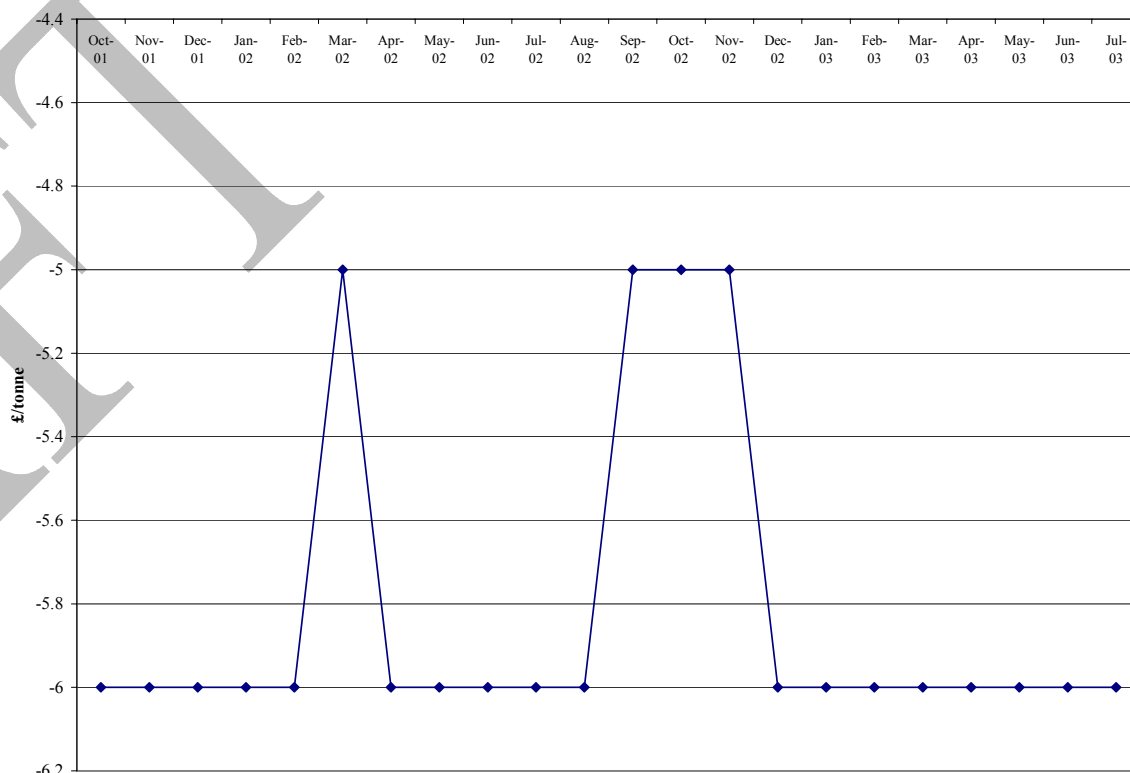


**Figure A14.6: Average prices paid for textiles (Nov 01 – June 03)**



### 14.2.8 Wood

Figure A14.7 indicates average prices paid by a wood waste recycling business for mixed wood waste (not the figure paid by a board maker for processed and graded material) over the past two years. The volume, quality and cleanliness of material will influence the rate paid. Currently, in most instances, this figure should be seen as a wood disposal cost as it is likely to be a negative figure to allow for a sufficient margin to cover processing and transport costs to a board maker or other wood waste user.



*Figure A14.7 Prices paid for mixed wood*

### 14.2.9 Compost

Potential markets for waste derived compost, or bio-stabilised organic waste include:

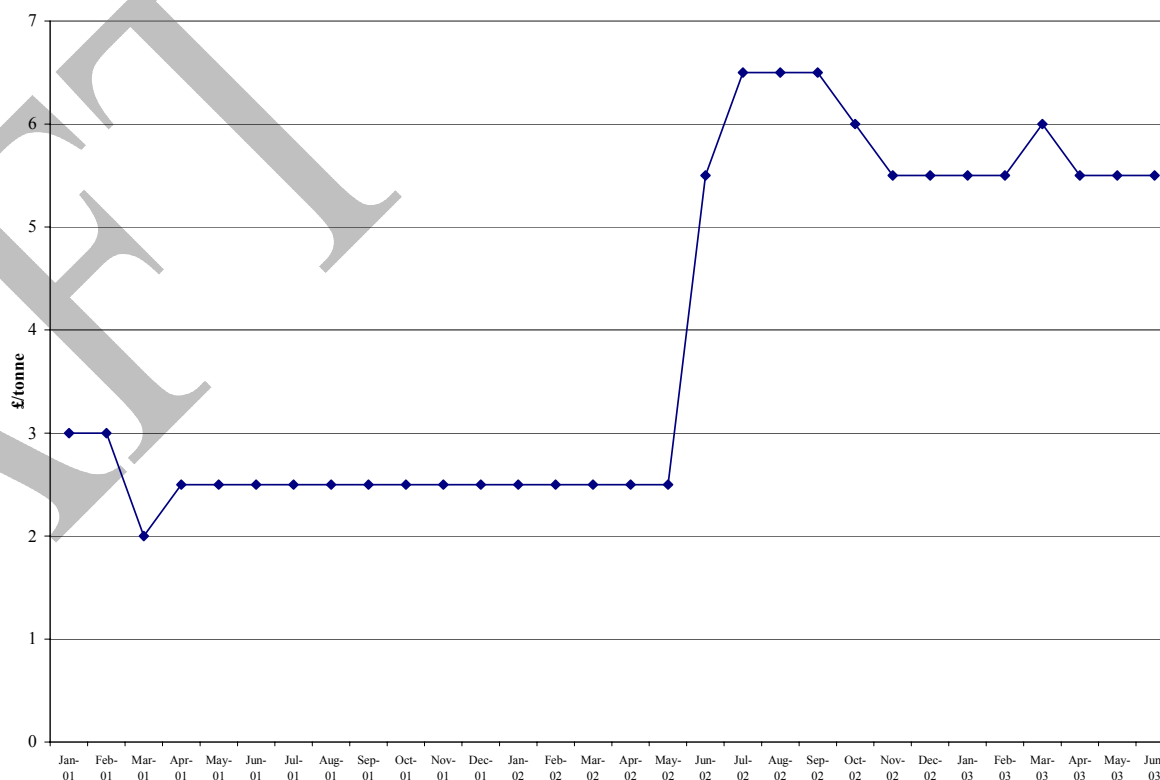
- Agriculture
- Forestry
- Horticulture
- Land Restoration
- Landfill Cover

Gaining access to these markets will depend on the ability to guarantee quantities and quality of the product, quality being of critical importance for the horticulture market. However, in all cases the main determining factor will be cost. For the agricultural, forestry and land

restoration markets the price that end-users would be willing to pay for compost as a soil improver is expected to be in the order of £0-4/tonne and for horticulture markets, £5-10/tonne<sup>27</sup>. Average prices paid for graded, clean and contaminant free compost over the past two years are given in Figure 15.8.

Other small volume niche markets that may be suitable for compost include:

- Livestock bedding
- Bio-filtration
- Topsoil



**Figure A14.8 Prices paid for graded, clean and contaminant-free compost  
 (Jan 00 – June 03)**

<sup>27</sup> Cost information taken from “RESEARCH ANALYSIS OF THE MARKET POTENTIAL FOR LOWER GRADE COMPOSTED MATERIALS IN THE UK”, WRAP, 2002

### 14.3 Projected Recyclate Revenue

Estimates of potential recyclate revenue are shown in Table 16.1. These have been calculated from the material unit prices presented in Table 16.2 applied to the diversion tonnages for each option (Table 14.1).

	2003/4	2006/7	2009/10
High Estimate (£/annum)	149,463	236,542	438,572
Low Estimate (£/annum)	69,407	111,389	208,516
Difference (£/annum)	80,057	125,154	230,056

**Table A14.2 Estimated annual recyclate revenue for target years**

These figures are based on the estimates for material unit prices as shown in Table A14.3

Material	Price (Low) £/tonne	Price (high) £/tonne
Paper	5	20
Ferrous Metal	3	33
Plastic (Mixed)	10	31
Non-Ferrous	542	740
Textiles	22	37
Glass (Green)	8	17.5
Glass (Brown)	18	22.5
Glass (clear)	22	27

**Table A14.3 Estimates for material unit prices**

These unit prices are based on the following assumptions:

Price (low) – lowest price over the past 2 years (taken from Figures A14.1 to A14.6)

Price (high) – average price over the past 2 years (taken from Figures A14.1 to A14.6)

The low estimate is typical for the rates that Local Authorities may obtain when negotiating material contracts on an individual basis with reprocessors, whereby commercial risk to the reprocessing company is minimised. The high estimate reflects the position that could be attained if Local Authorities act in ‘partnership’ thereby enabling them to command higher contract prices for individual materials, based on the ability to deliver guaranteed quantities and quality of materials. These Contracts incorporate a degree of risk-sharing between the Local Authority ‘consortium’ and reprocessor and often include a profit sharing element should the market price for a material rise above the agreed Contract price.

The figures presented in the above tables are only indicative, based on our understanding of current recyclate markets, however they do show the potential economic benefit associated with a partnership approach. It should be noted that these predicted costs do not take into consideration costs associated with collection, sorting and transportation of recyclate to reprocessors. Recycling partnerships are discussed in more detail in Section 4.

## 14.4 INITIATIVES FOR MARKET DEVELOPMENT

### 14.4.1 Recycling Consortia or Partnerships

Recyclate markets are notoriously unpredictable and can suffer wide fluctuations in price often to the financial detriment of effective Local Authority recycling schemes. One effective solution to this problem is to create a 'Recycling Consortium' or 'Recycling Marketing Partnership' whereby a group of Local Authorities act together to negotiate recycling Contracts with material reprocessors. The potential benefits of a consortium or partnership approach are:

- Ability to command a long term guaranteed outlet for materials
- Ability to command higher prices and/or fixed prices over a longer time period
- Ability to withstand market fluctuations
- Potential for the reprocessor to invest in collection/ reprocessing infrastructure locally (i.e. within the geographic area covered by the Local Authorities)
- Ability to enter into profit sharing arrangements
- Sharing of risks

Examples of Recycling Consortia operate in Buckinghamshire for glass and Hampshire (Project Integra) for a range of materials. Recently the 'Midlands Recycling Consortium' has been established to allow local authorities and other public sector organisations based in the Midlands to collectively tender contracts for the sale of collected recyclable material and for the collection of such material from bring banks

Recycling Consortia could be introduced into North Wales potentially for glass, paper and compostables, however success will depend on buy-in from all or most of the Local Authorities. The principal elements of a successful partnership will include:

- Development of a 'Memorandum of Understanding' identifying the remit of the Consortium and its extent of powers
- Lead Authority (agreed by all partners) to act as negotiator and Contract Administrator
- Issuing 'Expressions of Interest' to reprocessors
- Negotiating with potential reprocessors (contract term, price, infrastructure provision, etc)
- Development of final contract specification and documents
- Each Authority to agree to minimum guaranteed tonnages and minimum quality standards
- Potential profit sharing element with reprocessors

Considerable effort and time will need to be invested by the Lead Authority, particularly in the early stages of Contract negotiation, although this could be undertaken by a third party acting on behalf of the Consortium.

### 14.4.2 Purchasing Consortia

Many public body purchasing consortia now operate throughout the UK, offering the opportunity for Members to develop and coordinate their green procurement strategies towards increasing sustainable procurement, and enhancing the purchase and use of recycled content products.

By promoting “buy recycled”, purchasing consortia can help to:

- Stimulate markets for recycled products, including local recycled goods
- Offer competitive price advantages
- Close the recycling loop, whereby recycled products are bought from reprocessors dealing with the collected recycle.

Opportunities for partnership working, facilitated by a purchasing consortium include:

- Waste derived compost for grounds and highway landscaping
- Wood/Bark chippings for recreational areas
- Road & building aggregate containing glass recycle
- Recycled paper products
- Recycled IT supplies
- Fibre glass insulation, for example as special offers to householders as part of HECA and energy efficiency programmes

As with recycling consortia, a ‘Memorandum of Understanding’ should be established between all partners.

### 14.4.3 Establishment of Local Reprocessing Capacity

The ‘proximity principle’ applied to waste indicates that waste should be dealt with as close to its point of origin in order to maximise the environmental benefits associated with recycling. This goal can be achieved by developing local recycling and reprocessing infrastructure. One of the key constraints to development of local reprocessing capacity is the availability and quantities of recycle and the size/maturity of the local market for reprocessed materials or goods. Possible local markets, which would also benefit from a partnership approach, include:

- Shredded cardboard/paper for animal bedding
- Wood/ Bark Chippings for landscaping and horticultural uses
- Waste glass as road aggregate or other construction use
- Waste glass for decorative uses
- Mixed plastic products, e.g. outdoor furniture, fencing posts, drainage products, etc

#### 14.4.4 Composting

Within the Authority and the Region, compost will be generated from two main sources:

- Green Waste Composting at Household Waste Recycling Sites, or other open windrow type facilities
- In-vessel derived compost

There is likely to be little economic or environmental benefit gained from processing of green waste through a centralised Regional facility, consequently green waste separated at HWRCs or through kerbside collection is most effectively managed by individual Authorities at localised facilities.

However, markets for higher value green compost could be encouraged through provision of a shared access compost 'finishing' plant to remove contaminants, blend materials with municipal solid waste derived compost and manufacture and package 'value added' compost products.

Other putrescible waste, together with some paper and cardboard, will need to be treated via in-vessel composting plants. Here, economies of scale may be gained from operating one large Regional (or possibly 2 or 3, sub-Regional) facility/ies rather than small individual facilities sited within each Authority.

It is therefore strongly recommended that the Authorities within North Wales investigate a partnership approach.