

Getting to Zero Waste:

A Citizens' Resource Recovery Strategy
For Anyshire County Council



October 2001

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INTRODUCTION

A waste crisis looms in the UK. Every year we create nearly 30 million tonnes of municipal waste.¹ Currently we recycle, on average, only 11%. The majority we bury in landfills. However, many local authorities are looking at incineration as an option. We are wasting valuable resources because, traditionally, planners have viewed burying or burning rubbish as our only options.

Incinerators pose serious health and environmental problems because they merely reduce waste to ashes of varying toxicity and distribute chemical pollution over wide areas through airborne emissions. Incineration of mixed municipal waste inevitably leads to the creation and discharge of highly toxic substances, including carcinogenic dioxins and a wide array of dangerous heavy metals. Even "state of the art" incinerators legally discharge hundreds of thousands of tonnes of carbon dioxide and other greenhouse gases annually and thousands of tonnes of fine dust which can lodge deeply in people's lungs and result in major respiratory problems.

The way in which we presently use landfills to dispose of both biodegradable and other mixed waste poses environmental and health problems because liquids released during the decomposition of organic waste can cause chemicals (from products such as batteries, electrical equipment, PVC plastic, household pesticides and pharmaceuticals) to leach into the surrounding environment. The decomposition of food and other organic materials in landfills also accounts for a substantial portion of the methane emitted in the UK and is, therefore, a significant contributor to global warming.

Two sets of targets are driving local authorities to devise new strategies for dealing with their waste. First, the UK Government has set targets for local authorities to double their recycling rates by 2003 and for the country as a whole to reach 25% by 2005, 30% by 2010 and 33% by 2015. Second, the UK is bound by a European Union directive under which it is required to reduce the amount of biodegradable waste going to landfills by 25% by 2010, 50% by 2013 and 65% by 2020.

Some officials at all levels of government are now claiming these targets cannot be met without incineration in some form or other². This is an unnecessary route which not only creates a dependency on a dirty technology, but also limits opportunities and flexibility to adapt for 25 years or more.

Incineration is not the answer.

Experience in the UK and elsewhere has shown that both landfill and recycling targets can be met or bettered without recourse to incineration. The first step to success in these communities was a change in attitude. They stopped thinking in terms of waste disposal and began thinking in terms of resource recovery. Once that leap was made, the door was opened to myriad options for innovation.

The steps outlined in this Resource Recovery Strategy show that it is perfectly feasible for Anyshire County Council and every other local authority in this country to meet their targets and rapidly move towards overall waste reduction figures of 70% or more. Not only can we do it, we must do it.

¹ Municipal waste is here defined as the total amount of waste from household dustbins, civic amenity sites and trade waste (i.e. offices, shops and restaurants) collected by councils or their contractors.

² For the purpose of this document, "incineration" and "incinerator" will be used as a generic term covering all thermal treatment of mixed waste, including energy from waste, mass burn or small scale incinerators, gasification and pyrolysis.

Only by setting ourselves goals, as communities in North America and Australasia have done, to ultimately achieve Zero Waste can we end the many kinds of pollution caused by current waste disposal methods. Adopting Zero Waste goals would also contribute to conserving resources, rebuilding depleted soils through composting, and cutting down carbon dioxide emissions by displacing energy intensive primary material production with low energy recovered material reprocessing.

What's in our bins?

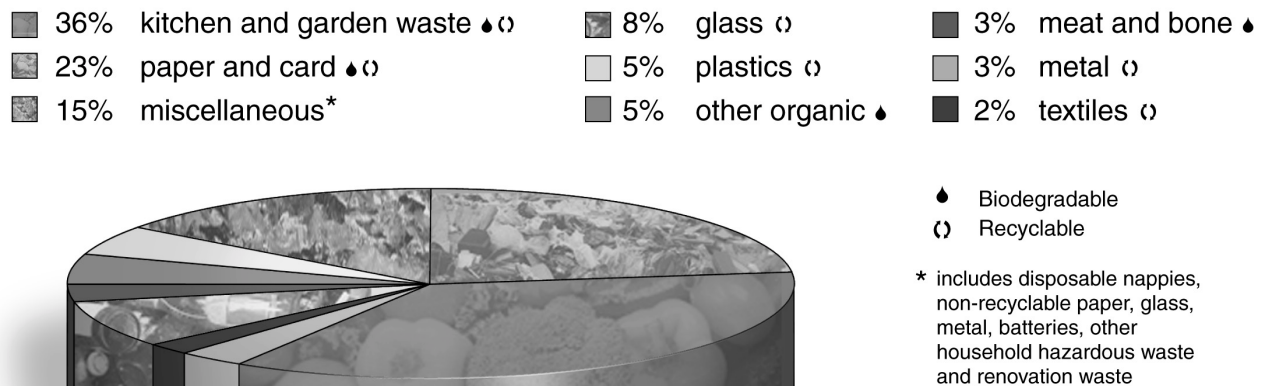


Figure 1 These estimates are derived from a model of dustbin waste based on analyses of weighed local authority tonnages together with 25 waste composition studies undertaken at different times of year from a sample of low rise and high rise housing, in urban and rural areas. Samples of waste from each authority were hand sorted into 38 categories, then adjusted for materials collected through recycling, estimated home composting and at civic amenity sites.³

As the above chart shows, source separated collection and a combination of recycling paper and composting kitchen and garden waste has the potential to divert more than 60% of the waste stream from landfills. Separate collection for recycling of glass, metals, plastics and textiles could potentially eliminate nearly 20% more, for a possible total of 80% diversion. No incinerator could achieve better reduction than that, because 30% of rubbish going into incinerators will always remain as ash which must then go to a landfill.

While there will be small regional variations for the figures above, the principle remains the same nationally.

Of course, 80% diversion will not be achieved overnight. However, following the steps outlined in this Resource Recovery Strategy will ensure that landfill and recycling targets are met and that Anyshire County Council is well on track to ultimately achieving Zero Waste.

³ Source: *Creating Wealth from Waste*, Robin Murray, Demos, 1999. Pages 52-53.

1. OVERVIEW

Anyshire County Council has a population of 500,000, in 250,000 households, 55% of which are located in urban areas.

Currently 83% of our municipal waste is landfilled and 17% is recycled.

Our recycling rate compares somewhat favourably with the national average of 11%. However, a great deal more can and must be done, given that some UK communities are now achieving rates of 50% or more (for example, Mersea Island in Essex, Uckfield and Polegate in East Sussex, and Wye in Kent) and whole counties are now up to 25%–35%, with Essex aiming for 60% by 2007.

With some leadership and imagination we could be achieving diversion rates of 60–80% for all municipal waste without incineration, as has been done in leading municipalities overseas, more than meeting the EU targets for diverting biodegradable waste from landfills and the Government's recycling and recovery targets.

2. KEYS TO SUCCESS

The two most important elements of a successful Resource Recovery Strategy are (1) kerbside collection of householder separated waste and (2) strong emphasis on public engagement.

2.1 KERBSIDE COLLECTION

The most successful waste reduction strategies around the world and in the UK always involve kerbside collection of waste which has been separated at source by householders. The more items collected from people's homes, the higher the success rate. Bottle banks and other receptacles for newsprint, metal and textiles can only ever achieve limited results, as they are much less convenient and not everyone has access to them. Therefore, it is essential to introduce separate collection of biodegradable waste, dry recyclables and residual waste.

2.1.1 Kitchen and garden waste

The most important aspect of any truly sustainable Resource Recovery Strategy is to ensure that organic materials are separated at source from dry waste. Implementing steps to assure source separation of these materials will immediately place Anyshire County Council on track for meeting targets set out in the EU landfill directive and Government targets for recycling and recovery.

As noted earlier, organics represent about 40% of the average household's waste. There are two components: food waste which is high density and garden waste which is low density.

Vegetable food waste and garden trimmings can best be composted at home. Many local authorities have distributed home composting bins at cost or free. The most successful programmes internationally have also provided substantial advisory support from what the Canadians refer to as 'compost doctors'.

However, for a variety of reasons, most households will require a separated kerbside collection of organic waste. A number of UK schemes have successfully introduced this service, providing regular

collection of householder separated kitchen waste, and often collection of garden waste⁴, too. The collected organics are then taken to either open windrow sites suitable for composting garden waste in rural areas or closed vessel compost systems suitable for composting kitchen and garden waste in urban areas. If organic material has not been contaminated in the mixed waste stream, high quality compost can be produced.

Municipal composting does not have to be an operation run by Anyshire County Council. It can, as is the case on the Isle of Wight, be undertaken in partnership with a private contractor or, as happened in Bury St. Edmunds, a private enterprise which was established by farmers wishing to diversify. A number of options already exist from very large scale to small, flexible enclosed units which can serve a village, a block of streets or a high rise block economically.

2.1.2 Paper and card

Anyshire County Council currently has a limited collection service for newsprint. This is in line with the majority of local authorities which have now introduced kerbside collection for recycling newspapers. However, this kerbside collection must be provided to all households and must also move beyond newsprint to include separate bags/containers for mixed paper and cardboard.

Anyshire County Council should explore the possibility of establishing long term contracts with a floor or fixed price which reflects the value of the paper collected. This is often best done through establishing consortia of a number of authorities which are able to employ specialist marketing expertise, and achieve economies of bulking and transport, as well as developing reserve outlets such as composting for any non-contracted paper collected.

Efforts are required by government, industry and consumers to secure and stabilise markets for recycled paper products. The current lack of stability (caused by a lack of paper mills, resulting in the need to import recycled paper from the US) is often cited as an excuse for the lack of paper recycling programmes. However, this is no excuse as paper and card are biodegradable materials some of which could be composted if necessary.

Separate kerbside collection is essential.

2.1.3 Textiles

Although textiles and shoes are a small component (2%) of the average household waste stream, they are a prime target material because their collection reduces the biodegradable content of landfill and because their value means they are an important source of income for recycling schemes. They are simple to attach to multi-material kerbside schemes which can be complemented with local donation receptacles, and can also be successfully supplemented by Anyshire County Council organising 'special promotion' collection days – in spring and autumn, for example – when householders are encouraged to clear out their clothes.

With effective kerbside collection of organics, paper and textiles, the biodegradable fraction of residual waste can be reduced by the long term EU target of 65% within a relatively short timeframe.

⁴ In order to ensure equitable costs to all households and to encourage home composting of garden waste where feasible, a small charge should be made for collection of garden waste.

This has been borne out by the experience in South Woodham Ferrers, a town of 18,000 people in Essex, which has reached a rate of 40% diversion of all dustbin waste in *only five months*, thanks to the separate collection of organics, cardboard and small animal bedding, and of dry recyclables, including textiles.

2.1.4 Glass

The waste hierarchy of reduce, reuse, recycle dictates that the best option for a glass drinks container should be reuse. Milk delivery proves that bottles can be collected and reused. It will, however, take some time and involve measures identified in Section 5 to maximise public preference for reusable glass drinks containers.

As a second best, glass can be economically recycled. Glass bottle makers are being forced by the packaging regulations to raise their recycled content from the inexcusably low 27% to the best continental levels of 70% and above.

2.1.5 Metals

Aluminium and steel are easily recycled by processors who are short of recycled input, and can also contribute to the revenue of Anyshire County Council's recycling schemes. The main aluminium can producer, Alcan in Warrington, is still having to import large quantities of cans because of a shortage of material from UK sources, and there is also surplus capacity at the UK's main can de-tinning plants.

Kerbside collection is essential.

2.2 PUBLIC ENGAGEMENT

No resource recovery strategy can succeed without maximising public participation. Whilst waste may not be at the top of the list of concerns for the average person, it is not difficult to explain both the need to and benefits of changing our methods of dealing with waste. It has also been shown repeatedly, here and around the world, that most people are willing to do the right thing if it is made convenient for them to do so. Before, during and after the launch of a three-stream kerbside collection programme, a number of steps must be taken.

2.2.1 Education

In order to communicate the urgency of the waste crisis and the need to alter our behaviour to protect our health and environment, Anyshire County Council must begin with a public education campaign. Experience in other jurisdictions has shown that the most successful public education campaigns include:

- Radio and print advertisement designed to be engaging and easily understood.
- Ongoing leafleting by collectors on their rounds alerting every household to the coming changes in collection and disposal of rubbish

- Appointment of at least one, preferably two, recycling officers (this can be a change of job description for existing staff members) by the council with a remit to do full time public outreach by means of school talks programmes and delivering talks to various community, faith and other groups. (Recycling officers should work in conjunction with professional education agencies in the government and voluntary sector in order to maximise local benefit.)

2.2.2 Feedback

Feedback is essential for effective recycling. Feedback cards are a powerful method of increasing waste diversion and recycling. They can be used by recycling officers, trained collection staff or young people trained to manage the feedback system. Householders or trade clients can fill in the cards and leave them in the boxes. Recycling officers or support staff can then:

- respond to people who complain that they have too much residual waste for their containers,
- show people, by sorting through the supposedly residual waste, that much of it (such as cardboard, bottles or garden waste) can go in other bins, and
- provide advice on composting.

There are always special circumstances in both in regular waste collection and in recycling/composting. Once identified, special arrangements can be worked out for householders who are truly unable to comply with the new system. This – combined with the personal visits above – can minimise complaints during programme and service shifts.

2.2.3 Householder Incentives

Many communities abroad have introduced user charges ('pay as you throw') as part of a move to increase consumer responsibility for waste. In the UK local authorities are currently required by law to provide a free waste collection service but there are many ways in which authorities can introduce both carrots and sticks to encourage recycling:

Anyshire County Council could:

- Offer households a year-end rebate based on full participation and reduction in costs for current disposal options.
- Work with local media outlets to devise a community challenge to regularly identify the street/area with the highest participation rates.
- Provide composting and recycling containers free to every household, but charge for the provision of sacks or other containers for residual waste. (In North America householders are often charged different annual rates according to the residual bin size that they agree to use. A similar effect can be achieved by using the instruments legally open to UK local authorities, which may not charge for removal of waste, but can establish what containers are permitted and set charges for the provision of these.)
- Reduce the size of the permitted residual container when other recycling containers are provided

- Educate and eventually require householders to use particular types of container, such as a blue box for recyclables and a plastic bin for food waste. (This has been important to the success of the organic scheme in Bury St Edmunds: the collectors explain that they will not pick up organic bins contaminated with non-organics and this has led to rapidly improved quality of set outs.)
- Schedule waste collections that are weekly for recycling and fortnightly for residuals. (Careful monitoring of dry recyclable and organic put outs will encourage householders to recycle.)
- Recycling efforts would also be aided by encouraging retailers – especially of food – to move to recycled paper based packaging and collection bags.

2.3 DIVERSION OF OTHER MUNICIPAL WASTE

2.3.1 Bulky goods

Consumer durables, old building materials and other bulky goods which do not go into our dustbins make up a quarter of the total household waste stream. Most of them have traditionally been deposited for disposal at civic amenity sites, or, for those without cars, have been separately collected. In both rural and urban areas they are also often dumped illegally. Disposal of these types of goods – particularly electrical and electronic goods, tyres and old oil – is both dangerous (particularly through incineration) and a waste of recyclable material.

Things are beginning to change. Producer responsibility will force manufacturers to take end-of-life responsibility for their products and for designing goods that are easy to recycle and reuse. Rapid progress is being made in increasing recycling of electrical and electronic goods, and of building materials.

In recognition of these trends, some Anyshire County Council civic amenity sites have been transformed from disposal sites into reuse and recycling centres, as has already been done in many areas. More staff and well designed incentive systems will allow householders (and traders) to deposit separated waste in the appropriate containers or sections. Some civic amenity sites are already moving towards the successful North American model of reuse centres, with householders coming to the facilities as they would to a car boot sale. They can be developed as educational centres, centres for information on salvaged and second hand goods, and repair workshops. The bulky goods collection systems need to be integrated with the civic amenity sites, and made regular and more systematic. The best civic amenity sites in the UK are now achieving recycling rates of 70%–80%, and should be seen as one of the priority spearheads of new high diversion programmes.

2.3.2 Trade waste

Trade waste tends to be more homogeneous than household waste and is more straightforward to recycle. In offices and many institutions the primary material is paper. With shops it is predominantly paper and cardboard. For hotels, restaurants, and open markets it will be a mixture of organics, glass and paper. Unlike households, LAs are required to charge traders for collection, with the result that charges can be geared to encourage recycling. Some trade waste can be picked up on the specialist rounds of organics and dry recyclables, and use the same sorting and processing facilities as household

waste. There is considerable scope for expanding the recycling facilities offered at civic amenity sites, with heavy discounts for source separated recyclables. With trade waste comprising 10%–20% of municipal waste in many authorities, (in some cases more as trade waste is smuggled into the household stream because of rising disposal costs) it is important that it is integrated more fully into the main three-stream systems for household waste.

2.3.3 Non-recyclable hazardous waste

To clean the residual waste stream it is also important to make householders aware of the toxicity of many household materials in daily use, and provide a convenient service for collecting them. Some (such as batteries, aerosols) can be easily added on to a multi-material kerbside collection service. For others (such as acids, anti freeze, oils, paints, car batteries, propane tanks, pesticides and herbicides) Anyshire County Council may need a 'campaign' to establish semi-annual collection days, and/or special facilities at the civic amenity site.

3. WHAT ANYSHIRE COUNTY COUNCIL NEEDS TO DO

3.1 Separate, separate, separate

To achieve the first milestone of 60% diversion, Anyshire County Council needs to establish a three-stream system for dustbin and trade waste, comprising:

- organic waste (distinguishing food waste and green waste),
- dry recyclables, and
- residual waste with capacity built in to separate hazardous items.

In designing the relevant collection systems for dustbin waste, there are four main variables:

- **The regularity of collection** Some three-stream dustbin systems have moved to alternative fortnightly collections of organic and residual waste, with weekly collection of dry recyclables. Others have weekly collection of residuals and fortnightly collection of dry recyclables and organics. Green waste can be collected fortnightly or monthly. One general principle is that participation and capture rates tend to be higher the more often collections are made.
- **The type of containers** Wheeled bins are designed for mixed waste. They increase tonnages collected and in many places are inconvenient and unsightly to store. Ultimately, wheeled bins should be replaced with two smaller bins, one for kitchen waste, the other for residuals. (The most successful schemes also provide householders with small lidded bins to store kitchen waste indoors and reduce trips to the green waste collection bin.) Garden waste can be put in sacks or tied bundles. Dry recyclables are often best in blue or green reusable bags or boxes.
- **The type of vehicle** In general the smaller, simpler and more flexible the better. Pedestrian controlled electric carts have been very successful in dense inner cities in the UK. Small cheap trucks with a lift for wheeled bins have been used economically in Italy. Co-collection vehicles with compaction may be suitable for dispersed rural areas. It is important to monitor the weight moved per vehicle day to optimise round efficiency and fuel emissions.
- **The extent of sorting** Kerbside sorting into multi-compartment vehicles reduces the need for large central sorting and bulking stations or Materials Reclamation Facilities (MRFs). Some types of sorting can be undertaken in local mini-MRFs with a magnetic separator. One thing which should be avoided is the construction of "dirty" MRFs in which mixed waste is sorted, often by hand in unhygienic conditions, to produce a low rate of recovered (and generally contaminated) recyclables.

The main principles to keep in mind in choosing the appropriate mix are:

- householder convenience,
- health and safety for collectors and sorters, and
- keeping the systems micro, avoiding large capital investment until the systems themselves are well established.

3.2 Tailored systems

Systems also need to be designed around the specific types of housing served:

- In dense inner city housing, small pedestrian controlled vehicles and organic pick ups may be the most efficient.
- On high rise estates, some authorities have been successful in using a small trolley for doorstep collection of mixed recyclables which are then sorted at ground level, and there is a similar opportunity for doorstep collection of organics for on site in vessel processing.
- In lower density urban and suburban areas, multi compartment caged vehicles which include provision for food waste collection have been successfully employed.
- In dispersed rural areas co-collection of mixed recyclables and residuals, with smaller food waste vehicles and home composting may be the most appropriate mix.

The most important thing Anyshire County Council must do initially is to invest in the human parts of the system: in training collectors, in providing advice for householders, in regular newsletters and feedback; and in good information which allows the collectors and managers to analyse how the system is working. A minimum of £1 per household per annum should be included in the financial estimates for publicity and education.

3.3 Residuals: MBTs and landfill

Public education and promotion of the advantages of the three-stream collection system will maximise diversion of residual waste from landfill. To further neutralise and reduce residual waste streams, Anyshire County Council should establish modular mechanical-biological treatment (MBTs) facilities, initially for 40% of residual waste, which can:

- extract any residual organic material for closed vessel composting to use as embankment and landscaping material or landfill cover,
- sort any recoverable metal and oversized material for reuse and recycling,
- identify materials which have been difficult to capture through recycling, for targeting by recycling schemes and/or for putting pressure on manufacturers to substitute them with recyclable materials and products, and
- reduce residual waste in the process by a further 10%–50%, thus reducing existing demand for landfill space by up to 80%.

The small amount of remaining neutralised and relatively inert material can be sent to landfill.

4. ADVANTAGES

4.1 Employment potential

When the above plan is implemented, there is the potential to provide considerably more employment in Anyshire. Recycling and composting are major creators of private sector enterprise and employment.

4.1.1 Collection and recycling

Experience in other communities has shown that there are four jobs in collection for every recycling service provided to 10,000 households (allowing for one collector to pass 2,500 households per week) and at least one further job in sorting, bulking and transporting.⁵ Organics collection and local composting are similar. Introducing a three-stream service for organics, dry recyclables and residuals would create an additional 10 jobs, minus two saved on the normal refuse round, or a net creation of eight jobs in all.

For a town or borough of 100,000 this will mean 80 extra jobs. For a county of 250,000 households like Anyshire it will mean expanding employment by 200. The private sector employment potential is borne out by the community recyclers ECT⁶ which now have more than 200 employees providing a dry recycling service to half a million households in London, a figure which would double if they added a separated organics collection.

4.1.2 Processing

A number of opportunities for increased employment exist in processing if Anyshire County Council made an effort to attract new enterprises (which would have the added advantage of reducing journey distance for delivery to reuse and recycling facilities).⁷

For example, a local paper mill would provide a major boost to employment. A large (280,000 tonnes per annum) recycled newsprint mill would create an estimated 850 direct jobs, a further 600 jobs in the investment sector and 2,800 jobs through the income multiplier. Smaller mills are more labour intensive per 10,000 tonnes of output.

Another good job provider is textiles. A town of 100,000 households should recycle at least 1,000 tonnes of textiles per annum which would create 150 jobs.

Electronics and electrical disassembly will become important new local industries within five years with the introduction of new producer responsibility legislation. The same potentially applies to tyres and end of life vehicles.

The conversion of Anyshire County Council civic amenity sites into reuse and recycling centres should see average employment on the sites rising from two or three to 20, as reuse and repair services are added to the front line recycling advisers.

⁵ R. Murray, *Re-Inventing Waste*, Ecologica, 1998, Chapter 15.

⁶ ECT Recycling, 97 Bollo Lane, Acton, London W3 8QN Tel: 0208 9936293 E-mail: abond@ectgroup.co.uk

⁷ *Re-Inventing Waste*, Chapters 13 and 14. See also R. Murray, *Creating Wealth from Waste*, Demos, 1999, Chapters 4 and 5.

Cities in the US have found that recycling generates local manufacturing activity well in excess of the jobs created in collection and sorting.⁸ In the UK, a ratio of at least two manufacturing and service jobs for every one created in collection, sorting, bulking and transporting of materials could be expected.

4.2 Long term savings

In the long run, three-stream systems will save Anyshire County Council money. There will be immediate economic benefits from reduced landfill fees. (If a an incineration fee proposed by the Environment Select Committee is adopted by the Government, the savings will be even greater.⁹) There is, however, a significant start up cost. Investment is needed for the five year transition period during which the systems are established, participation rates increase, collection contracts are synthesised, and material prices strengthen. One industry estimate for recycling is a cost of £10 per household per annum. For a three-stream system over five years this would equate to an incremental cost (including organics collections) of £20 per year per household, or £10 million per year across the population of Anyshire. A detailed financial analysis of the cost of a 60% diversion scheme for Essex collection authorities confirmed this order of magnitude.

Much of this cost can be recouped. Some will be recoverable through sales of recyclate once the system is established. Money for capital cost is available through Private Financial Initiative and other schemes (see Section 5).

For example, a collection regime based on weekly collection of separated kitchen waste and dry recyclables, fortnightly collection of residual waste and a small charge for collection of garden waste would result in costs and income roughly as follows:

Activity	40% composting	30% dry recyclables	30% residual
Logistical/Collection Cost	£10-25/household ¹ (weekly collection)	£10/household for kerbside collection ²	£12.50/household (fortnightly collection)
Disposal Cost	Nil	Nil	£25/tonne (£13 gate fee + £12 landfill tax ³ /tonne)
Recycling Cost	£20/tonne	Dependent on ruling market prices	Nil
Recycling Income	Quality dependent. Up to £80/tonne + £25/tonne garden waste collection charge	Dependent on ruling market prices	Nil

¹ Logistical costs dependent on preferred option. Providing home composting units to interested householders should involve a one off cost of £10-15 per household, but should also include financial investment in education to avoid leachate and methane production from improper use. Kerbside collection of kitchen waste should be weekly to avoid health issues arising from life cycle of fly, with costs of £25 per household.

² This is an incremental cost above current average collection costs of £25/household

³ Current landfill tax of £12/tonne expected to increase substantially

⁸ *Creating Wealth from Waste*, page 73.

⁹ Para. 124 *Delivering Sustainable Waste Management*, House of Commons Environment, Transport and Regional Affairs Committee, March 2001

The important points to keep in mind when estimating the start up costs are the following:

In adding kerbside recycling and organics collection, collection costs will not treble. Studies undertaken for the Essex Consortiums three-stream plans suggest the increase can be kept to a ratio of 1.2 to 1.8 of current refuse collection costs. This is mirrored by experience on the Isle of Wight which shows that the cost of multi-stream collection is approximately £80 per tonne (inclusive of capital costs) compared to £50 per tonne for mixed waste collection (£25 per household) and disposal (£25 per tonne, landfill tax inclusive).

The key to keeping this ratio low is to use existing assets imaginatively, cut down on the need for back up vehicles through efficient maintenance, adjust the balance between crews and vehicles according to material picked up, and reorganise logistics to minimise down time between the collection round and drop off.

A major economy comes from reducing residual collection. If there is already a weekly recycling collection, and organics and residual waste are collected on alternative weeks there will be little if any extra cost. Most three-stream collection schemes in the UK have been introduced on this basis.

High rise estates such as those in central Anytown pose a specific challenge. This is by no means insurmountable. Officials in Hounslow found there was minimal extra cost in a doorstep recycling service because the work has been included in the job descriptions of estate cleaners, and the service reduces the costs of rubbish clear up by the cleaners resulting from existing waste problems on high rise estates.

Another key economy comes from high capture rates. If a service that passes all households captures 20% of recyclable material from 20% of the households, it will achieve a recycling rate of only 4%. If it raises these (at a low incremental cost) to 80% and 80%, it will capture 64% of the material, and dramatically reduce costs per tonne.

Most of the cost estimates of recycling in the UK focus on the start up years of recycling schemes, and yield figures of £110–£150 a tonne. These will reduce to gross costs of £50 a tonne as the scheme matures, less the cost of materials and savings on residual collection costs.¹⁰

Many of those opposing recycling argue that there are no markets. This is demonstrably not the case for materials such as cans, textiles, and metals. The problems come from the price fluctuations of paper and green glass. For paper there are always outlets: the issue is price. For green glass, glass which cannot be sold at one time can be stored until demand recovers. The development of new uses for glass has ensured that established schemes elsewhere are no longer dependent on a small number of monopoly buyers of recycled container glass.

With paper, the long term trend has been to expand the use of recycled paper relative to virgin pulp. The UK is recognised as the major untapped source for recycled paper in Europe. This is why Anyshire County Council needs paper marketing expertise to ensure receipt of adequate prices for paper collected (as for packaging).¹¹

¹⁰ R. Murray, *Re-Inventing Waste*, Ecologika, 1998, Chapter 11.

¹¹ R. Murray, *Re-Inventing Waste*, Ecologika, 1998, pages 150-156.

A weighted average conducted recently for the Essex Consortium indicated that, at the current time, the value of a basket of dry recyclables could be expected to vary from between £16 a tonne and £36 a tonne, according to the point of the material cycles.

5. FINANCE

A perceived lack of available finance is often cited by local authorities as an argument against intensive recycling. Finance does, in fact, exist. Once Anyshire County Council has produced a costed business plan showing the finance needed, appropriate sources can be identified. This is of two kinds:

- **Capital funding.** Most capital costs of intensive recycling schemes can be side stepped by leasing.
- **Revenue funding.** It is critical to have sufficient working capital to fund the transition costs and 'human capital investment' which are necessary for successful schemes.

5.1 Potential funding

Of the many potential sources of funds for what is in effect an investment in long term sustainability, Anyshire County Council can consider the following:

- The £140 million earmarked for recycling by the Government for 2002/3 and 2003/4.
- The £50 million New Opportunities funding for community schemes in recycling and composting
- An allocation from the £1.1 billion announced last year for local councils to spend on environmental and cultural programmes through an allowance on the Standard Spending Assessment
- New Deal funds for employment under which it is possible to put up projects for training and employing unemployed workers on recycling schemes
- Single Regeneration Budget (SRB) which can be used to promote recycling due to employment and new enterprise creation
- Allocations as part of a Performance Service Agreement with respect to ambitious waste diversion programmes
- A Private Finance Initiative bid from the £220 million PFI fund. The Government has insisted that this is not to be seen as a source of finance for incinerator led programmes, but priority to recycling.
- Rising recycling credits from the disposal authorities
- Landfill tax funding
- Finance from the sale of Packaging Recycling Notes (PRNs), for example, through long term supply agreements with packaging schemes such as Valpak¹²
- Long term materials sales agreements, which can be used as security for loan finance
- Investment funds through non profit financial intermediaries established to promote recycling
- Private and third sector investment in providing and running particular parts of the system (composters, MRFs, collection vehicles)
- Investment through equity or loans by Local Authority Waste Disposal Authority Companies (LAWDACs) and Disposal Authorities, which have substantial funds and assets and could invest in recycling operations

¹² PRNs are issued by processors to show they have taken recycled material. Producers responsible for increasing recycling of packaging or reducing quantities then have to produce PRNs of the amount required of them, according to calculations by the Environment Agency. Retailers must earn PRNs, based on their sales per annum, either by taking their own packaging to a processor and receiving PRNs in return, or by buying them through an intermediary body, the largest of which is Valpak. (Valpak Ltd, Savannah House, 11-12 Charles II Street, London SW1Y 4QU Email: info@valpak.co.uk Tel: 020 7321 3500 Fax : 020 7321 3599

- Equipment and vehicle leasing
- Rural regeneration funds to promote on farm diversification (through organics collection and composting for example)

6. CONCLUSION

The term "Waste Management" is increasingly viewed as anachronistic: if we've created waste, we haven't managed very well. It's time to move past the throwaway waste mentality and think in terms of Resource Recovery.

The steps outlined in previous pages of this Resource Recovery Strategy are all perfectly feasible and can be implemented with existing technologies. This document provides a blueprint for a truly sustainable waste minimisation programme which will allow Anyshire County Council to meet and better all existing landfill and recycling targets without recourse to incineration or other, unproven, thermal treatment facilities.

It cannot, however, be adopted in a piecemeal fashion as "add ons" to our current collection and disposal system. Experience in the UK and abroad has shown that Waste Prevention Strategies only succeed when an integrated plan is introduced, following substantial public engagement efforts, as a new and complete system.

In order to maximise resource recovery, Anyshire County Council should, as its primary goals:

- Move immediately to implement source separated kerbside collection of kitchen and garden waste and other biodegradable materials (paper, card, textiles and wood), and hazardous household goods. Simultaneously (or as soon as possible afterwards), kerbside collection of non-organic recyclable materials such as glass and metal should be introduced.
- Establish a monitoring unit at landfills to analyse all incoming waste streams. Landfills should become a laboratory for the new recycling economy, not a dump for residual problems.
- Establish modular mechanical-biological treatment facilities, initially for 40% of residual waste, which can, after treatment and further reduction be sent to landfill.
- Ensure there is disposal flexibility, capable of accommodating declining quantities of residuals according to the progress of diversion. This means that Anyshire County Council needs to have a form of disposal which does not require guaranteed streams of waste for its viability.
- Establish a process for benchmarking progress and performance with similar authorities in terms of size, demography and physical characteristics.

FURTHER ACTION: WHO NEEDS TO DO WHAT

Getting as close to Zero Waste as possible, the goal of many communities around the world, will take a considerable effort by many sectors, not least the general public who need to reject the current throwaway mentality which has led to the current waste crisis. Education will play a pivotal role in this.

Manufacturers must accept responsibility for designing products with minimal non-biodegradable packaging which can be reused or easily recycled. Current producer responsibility initiatives are moving us in that direction, but further legal measures may be required to speed up the process.

The goal of diverting up to 70% of waste from landfill and incineration is realistic. However, efforts to go beyond this point will be stymied unless central and local governments have the vision to accept this challenge. The following measures are essential.

Local government

Anyshire County Council (and other local authority) internal management can:

- Ensure that Anyshire County Council purchasing policy is used to promote use of clean, recycled, remanufactured, and repaired products and materials.
- Consider how Social Services, in conjunction with refurbishment projects, could convert discarded furniture and other bulk items for secondary use.
- Implement intensive recycling and composting in all Anyshire County Council buildings, parks, leisure centres, schools, police and other institutions.
- Review an inventory of all property assets to consider which would support the decentralised dropping off, storage and processing points necessary for an efficient Zero Waste service.
- Produce an internal plan for waste reduction with the goal of achieving Zero Waste.
- Draw up a list of hazardous and environmentally damaging materials and products which should be banned from landfills in the local authority area as part of the planning process.
- Increase public confidence in the decision making process by ensuring full transparency in any private contract negotiations, including public access – with comment period – to all proposals.

Central government

The UK Government has an important role in resolving our waste crisis and moving to Zero Waste. It must lead by example and implement numerous changes in waste legislation and regulations, both to ensure a uniform approach and to ease the burden on local government.

At a minimum, and as soon as possible, it should end hidden subsidies to incineration and replace the current landfill tax with a 'disposal' tax which includes incineration.

Other measures which would encourage increased resource recovery and therefore lessen the adverse health effects from waste disposal should include:

- The phase out of all forms of incineration by 2020, including municipal waste incineration.
- Financial and legal mechanisms to increase re-use of packaging (e.g. bottles, containers) and products such as computer housings and electronic components.
- Financial mechanisms including the 'disposal' tax used directly to set up the necessary infrastructure for effective recycling.
- Stimulating markets for recycled materials by legal requirements for packaging and products, where appropriate, to contain minimum amounts of recycled materials.
- Materials that cannot be safely recycled or composted at the end of their useful life (for example PVC plastic) must be phased out and replaced with more sustainable materials.
- In the short term, materials and products that add to the generation of hazardous substances in incinerators must be prevented from entering the waste stream at the cost of the producer. Such products would include electronic equipment, metals and products containing metals, such as batteries and florescent lighting, and PVC plastics (vinyl flooring, PVC electrical cabling, PVC packaging, PVC-*u* window frames etc) and other products containing hazardous substances.

and more generally:

- Further the development of clean production technologies which are more efficient in terms of material and energy usage, produce cleaner products with less wastes and which ultimately can operate in a “closed loop” configurations to serve the needs of society in a more equitable and sustainable manner;
- Implement fully the Precautionary Principle, such that, in the future, problems are avoided before they occur. The continuation and further development of scientific research has a fundamental role to play in identification of potential problems and solutions, but we must be ready to take effective precautionary action to prevent environmental contamination and degradation even in the face of considerable and often irreducible uncertainties.