

# Zero Waste: Useful Target or Dangerous Delusion? <sup>1</sup>

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## Summary

Opinions on Zero Waste (ZW) are polarized. Some think the concept has to be one of the fundamental principles of any conceivable sustainable future. Others think it is hopelessly unrealistic, unattainable within the timescales over which modern societies plan their activities, if ever, and thus liable to be dangerously misleading. Attitudes in some quarters are entrenched and there has been little meeting of minds.

Consequently, the appearance of ZW as a topic in plenary session at the 2004 Annual Conference of CIWM is a welcome advance. I hope to show that co-operation will do more than confrontation to advance us towards ZW.

I believe the fundamental principles of ZW are sound but that the Zero Waste movement gravely underestimates both the volume of residual waste and the barriers to reducing it quickly. I suggest that the necessary reforms require a scheme of Universal Producer Responsibility, in which all manufacturers would be responsible for the ultimate fate of their products and all retailers for packaging.

Such a scheme could not be implemented by expecting customers to return their discards to the shop. I see new opportunities for resource management companies in providing unified kerbside collection services. These would co-ordinate the return of discards and the repayment of scrappage taxes to the householder. What we now call the Waste Management Industry (WMI) might then evolve into true Resource Management. There would be no shortage of new business opportunities but the main customers would be industry and local authorities. Natural benefits to the image of the industry and of the profession would follow.

## Introduction

Many in the WMI dismiss ZW as belonging in a parallel universe, inhabited by unrealistic idealists. Meanwhile, some environmentalists see the WMI as ruthless capitalists, willing to destroy the planet for profit. Communications between these camps tend to be poor, with little meeting of minds. I hope to help bridge the gap.

Despite all the talk about ZW, definitions are elusive. I have found it hard to find good information, even as a Chartered Waste Manager and an academic researcher with a genuine interest in ZW. As the websites set up by enthusiasts rarely offer any critical analysis, I first tried attending a conference on ZW last autumn. I was bemused to find that no definition was offered -- and that any discussion of one was ruled out of order! I then turned to the literature. I could recall no articles on ZW in the professional journals on waste or recycling. Enquiries to some editors early in 2004 confirmed the void. I next looked for a book on ZW, first in the university and city libraries in Limerick and then on Amazon -- but all in vain.

However word of mouth did lead to one useful book (Murray, 2002). The present paper is based on a synthesis of my own ideas with others gleaned from Murray and from selected websites. If I have treated the ZW concept unfairly, there might be lessons for the enthusiasts regarding their communications strategy.

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<sup>1</sup> Talk given at The Chartered Institution of Wastes Management Annual Conference, Torbay, England, 15 June 2004.

### **What does Zero Waste mean?**

Sensitivities on the subject of a definition might largely arise from the contentious question of how near zero we can get. Enthusiasts deal with this important reservation by adding a rider: “Zero Waste -- or darn close”. To my mind, this is unhelpful, since it ducks a crucial question: “How close?” Moreover, it leads to a blinkered mindset. A focus on waste minimization can obscure the important question of what to do with the residue, however small it might be. Anyone who refuses to discuss these two questions will not be taken seriously in the WMI.

Despite undefined nature of ZW, there is a general consensus on an underlying principle is that all materials are resources and that none should ever be seen as a waste. There is much good sense in this, often expressed in such slogans as “Waste is just matter in the wrong place”, (Murray, 2002, p18) Simplistic, yes, but a useful spur to action.

This is commonly interpreted, both by the general public and by politicians, as meaning that all wastes should be reused or recycled. The philosophers of ZW do stress such additional concepts as waste minimization and Extended Producer Responsibility (Snow & Dickinson, 2004). However, these get little attention in the public image of ZW, which I believe to be a major weakness.

Thus, I believe the very term Zero Waste is a major obstacle to the implementation of the sound ideas behind it. I shall suggest an alternative title later.

### **What’s right with Zero Waste?**

Many agree that business-as-usual in the so-called developed world cannot go on much longer. Whether we consider resource depletion, energy usage, global warming, pollution or conventional waste disposal, it seems very likely that some such factor will in due course limit economic growth or even throw it into reverse, perhaps very soon. ZW addresses many of these factors to some extent.

The more far-sighted ZW advocates also propose better solutions than universal recycling. The alternatives to recycling include:

- a) consuming less (the simplest solution, which rarely gets much attention);
- b) designing products for longer life, for repair and for disassembly;
- c) the provision of services or functions rather than products (e.g. leasing a machine instead of selling it).

A major theme in the latter two concepts is that of Producer Responsibility. The slogan “The Polluter Pays” is used by governments everywhere to justify dumping much of the cost of waste management on the householder. Yet the real polluter is often the retailer or manufacturer. The householder has little real choice when commercial pressures have forced convergent design of both product and packaging.

Producer Responsibility might be implemented by means of leasing or by deposits and scrappage taxes. The latter would increase purchase prices but would reduce domestic waste collection charges. The long-term result would be environmentally beneficial and perhaps economically neutral. There is no obvious reason why industry should make less profit from producing a smaller volume of higher-value products.

I believe such ZW approaches to be urgent and essential for future waste management. However, the ZW banner may not be the best flag to campaign under.

### **What's wrong with Zero Waste?**

I see a number of problem areas. The first weakness is the title itself. I have never seen an estimate of the size of “darn close” but my instinct is that the residual waste stream will be large in any foreseeable scenario. Many others share my view, which simply discredits the term Zero Waste. Enthusiasts consider this scepticism to be a cynical excuse for inaction; I beg to disagree.

The term Zero Waste falsely suggests that waste disposal can be eliminated from the economy. This is a dangerous delusion, which distracts people and governments from the real need to plan well ahead for waste disposal. Even more worrying is the apparent belief of the enthusiasts that the elimination of waste would be easy, if only we would set our minds to it, and also invariably beneficial. Certainly, there are inspiring examples of what can be done to recover, reuse and recycle particular components of the waste stream. These examples could be widely emulated. However, such “cherry-picking” does not come close to eliminating all waste.

The ZW terminology is an adaptation from such industrial concepts as Zero Accidents or Zero Defects, which can indeed be closely approached in many contexts. The principle is simply assumed to be transferable but zero might in fact be unattainable in other contexts. For example, a political campaign for Zero Crime might be credible but Zero Illness would be seen as a sham. Yes, it might effect major improvements in the well-being of the population -- but we would still need hospitals. I believe ZW suffers from a similar credibility gap.

The second weakness is a simplistic belief that setting demanding but crude numerical targets and deadlines will ensure rapid progress (Snow & Dickinson, 2003a). This is a dubious approach in politics, since governments have proven ability to manipulate data to show the desired outcome. It is especially dubious when we do not exactly what we need to do, only what we want to stop. After all, it was such a scenario that turned the EU Landfill Directive into a virtual Incineration Directive.

The third weakness is the emphasis in practice on reuse and recycling, at the expense of less palatable or convenient options, such as consuming less or shopping more selectively (Snow & Dickinson, 2003a). Recycling has, of course, the great advantage of remoteness. We can ‘bank’ our bottles and cans, then carry on as usual, clearing our consciences of any question as to whether they will in fact be recycled or whether it would be beneficial to do so.

The simple truth is that the complexity of many modern products, as they are now designed, renders recycling impracticable. We could certainly recycle far more than we do. However, many claims of high recycling rates are based on optimistic interpretations of poor data or on unjustified definitions of all beneficial disposal methods as recycling. Murray (2002, p.31) reports over 50% recycling in California but such claims mean little without rigorous analysis. Any meaningful definition of recycling must involve the production of a material fit for manufacture of the same product and thus the possibility of indefinite repetition. As Murray says (p.54) “waste data is notoriously unreliable.” However, like many authors, he seems to fall into the trap of believing any data that supports his argument.

In many cases, recycling rates are greatly exaggerated by inaccurate assumptions, such as the following.

- a) Reductions in waste arisings reported as increases in recycling. (The real cause might be wiser shopping -- but it might also be fly-tipping, backyard incineration or the home landfill - simple stockpiling.)
- b) Bring banks signposted as recycling centres. (Nothing is recycled there. This does matter!)
- c) Describing all composting as recycling. (Very little MSW compost is applied to productive land. Landscaping might be a beneficial use -- and might also save peat -- but this is not recycling.)

d) Claims of high recycling rates in construction and demolition, (Murray, 2002, p. 31, reports 90% recycling in Denmark but in fact very little CDW is used to make new building materials, anywhere. Again, it might be beneficial to found a new building on crushed CDW - and might save quarrying -- but this is not recycling.)

Of course, most products and materials can be recycled, in principle. However, there are exceptions: even a simple, traditional, process can be irreversible. Consider the firing of china, for example. Can a plate be decomposed and used as raw material for a new plate?

However, complexity is a more general problem than irreversibility. The few products that are now recycled extensively fall into three classes: (a) low-value materials commonly used in almost pure or easily separable form (e.g. glass or plastic bottles, aluminium or tinned- steel cans, paper); (b) high-value materials (e.g. silver, lead); (c) large metal products (e.g. cars; domestic appliances). Class (a) products are simple. More complex products may be worth separating because the material they contain is expensive (class b) or because there is a worthwhile mass of it in each product (class c). However, many everyday products fit none of these categories.

The difficulties are not only economic. Recycling processes often require machinery, create their own wastes and consume energy, reagents or solvents. These generally have their own adverse effects, so the net effect of recycling may not be beneficial. A full Environmental Impact Assessment (EIA) is therefore needed for every proposed recycling process. Few such studies have been done but one for paper has shown that recycling may not be preferable to incineration.

Thus, the slogan “Waste is just matter in the wrong place” is in fact a gross simplification. Most wastes are not only in the wrong place but also in the wrong condition. This is usually much more important. Reprocessing and purification may take far more resources (not just money) than collection and transport. However, financial barriers are also common. Where the recycling process itself is cheap or the recovered material is valuable, as for (a-c) above, transport costs may be dominant. However, for many materials, the processing costs are much greater.

The difficulty is compounded by ever-rising demands for the performance of materials. Modern product design often requires tightly-specified raw materials that can be hard to make from recycle. Perversely, the trend towards higher quality is driven, in part, by the principle of ‘dematerialization’ (making more with less). This is partly motivated by a desire for less waste when the product is finally discarded. However, if virgin materials must be used to reach this goal, the net effect might be detrimental.

We also demand high standards, as customers, and will return a product because of a minor blemish. Consumer protection and safety legislation tends to compound this quality problem. These trends combine to place major barriers in the way of recycling.

This leads to what I see as a fourth and grave weakness of ZW: a tendency to underestimate the difficulty of changing the way the manufacturing and retail sectors work. Few companies can afford to risk litigation or to make major policy changes that will erode short-term competitiveness, however persuasive the long-term case might be. Business-as-usual with incremental change is the safer bet. Economic pressures, including customer demand, may in due course force more radical decisions. However, these tend to affect the whole sector. In the absence of such pressures, few companies will initiate radical changes unless driven by legislation.

In today’s world, such legislation can rarely be effective at national level. However, action at EU level would be effective, especially if the USA were persuaded to co-operate. Many

multi-nationals will protest, as will such organizations as the WTO. They are bound to be wary of radical change -- especially if we keep dealing them the "Get out of jail free" card of recycling. However, some companies are more far-sighted and we should work actively with them.

Why is this weakness grave? Because the well-meant emphasis on recycling as the main practical route to ZW supports the business-as-usual principle. The message it sends is "Carry on making and retailing products as you do now. Your customers will work with the Waste Management Industry (WMI) to clear up after you -- and will happily pick up the bill."

In my view, the public are far from happy with paying. Governments may rush into PAYT for reasons of political expediency and will produce reams of data to show that it works. However, I have argued elsewhere that it does not (Martin 2004 a,b). I do not believe it will ever work in these islands, or at least not in the foreseeable future. Notably, the case for PAYT rarely includes data on fly-tipping, backyard burning or other unlawful disposal methods. Bulky waste is commonly excluded too. Yet these are major problem areas.

I accept that many environmentalists have a sincere belief in the efficacy of PAYT. However, I consider this to be naive. I also believe the major attractions of PAYT to the cynical political mind are the illusion of action and the benefit of a transfer to the householder of costs and responsibility -- not to mention the future blame for policy failure.

Nor should the WMI be happy with this business-as-usual message. We have no Philosopher's Stone: we cannot transmute base metals into gold, at any cost, let alone the sort of sums people think are a fair price to pay for waste collection and disposal. Miracles are not on the menu. If we accept this implicit remit, we set ourselves up for failure and for further erosion of our reputation. Perhaps it is time the WMI started to protest too?

### **Beyond Zero Waste**

The manufacturing and retail industries will not make the necessary changes quickly without legislative support. One company may initiate voluntary change but, as Kelly (2003) observes, such efforts tend to peter out. The progressive company is commonly undermined by an unholy alliance of cheaper competitors and cost-conscious customers. Thus, the UK has made very little progress towards sustainability to date (SDC, 2004). Parallels might be drawn with pollution controls or car safety, which advanced slowly until the pace (and a level playing field) was forced by legislation. ZW enthusiasts who have been directing their fire at the WMI might have done better to send the necessary messages to manufacturers and retailers. And to government.

Nevertheless, I believe the ZW concept could provide the foundation for a more effective new movement. What might it entail?

1. Building a collaboration between the WMI and the ZW movement, to develop an equally radical but more realistic waste minimization policy. The presence of ZW on the agenda for a mainstream WMI conference augurs well for such a development. Perhaps CIWM should form a ZW group?
2. Applying Producer Responsibility to most manufactured goods. Householders frequently have little real choice when they buy, so it is inequitable and ineffective to justify dumping the cost of disposal on them by misapplying the slogan "The Polluter Pays".

Rather than confining scrappage taxes to a few high-profile high-value sectors, I would make them the eventual norm, applied to most products apart from food and drink. Perhaps the current moves on cars and electrical goods are the thin end of such a wedge but I believe

progress must be accelerated. You cannot now sell a car, a pill, a toy or a table-lamp unless it has passed rigorous safety tests. I suggest that similar environmental tests should be applied. Manufacturers should be required to prove that their product can be reused, repaired or, at least, effectively disassembled for recycling. Where none of these is feasible, they must take full responsibility for its recovery and safe disposal. Ephemeral products, such as newspapers, and disposables, such as nappies, should be included. Similarly, solid fuel suppliers should be required to collect ashes. Producers must also set up robust arrangements for ensuring that the preferred route is actually utilized, for example by charging a substantial scrappage levy. The levy would be determined by a new regulatory body. This could also cover the functions of Dickinson & Snow's 'Zero Waste Agency' (2003b, p.36) and Murray's 'Design for the Environment Commission' (2002, p184). Higher levies would, of course, be applied to products with a greater environmental impact. If this doubles the cost of a pair of flashing trainers, so be it.

Of course such changes would have to be phased in. However, that is no reason for not starting. Larger or more costly items would come first: cars, appliances, furniture or electronic goods. However, in due course I would expect an EIA to favour treating almost every non-consumable purchase in the same way.

In the meantime, we could quickly halve the volume of wastes from the manufacture of many products (including packaging and final disposal) by simply doubling the design life of products. This is not rocket science. In many cases, it would be much easier than making extensive use of recycled materials. Smaller manufacturers may already make such high-quality long-lasting products, so can show us how. Their prices are usually higher but the long-term cost may not be. Expanding re-use by facilitating second-hand markets and other such exchange mechanisms would complement such developments and would have an even quicker impact.

3. Making retailers directly responsible for all packaging, along similar principles. A great deal of packaging is wholly or largely determined by and designed to suit the retailer, so Producer Responsibility should apply. Return to the shop is not essential; other return/disposal mechanisms could be used. Customers should be encouraged to use their own containers where possible and substantial deposits should be charged on all other containers, whether reusable or not. Designs should be standardized to facilitate reuse and a unified refund system should be set up.

4. Building on recent plans to develop long-term relationships with farmers, to ensure that they are given the necessary support for use of MSW composts and digestates on productive land. Combine this with moves towards greater localization of food supplies. (Space does not allow elaboration of the many reasons for this but it does help create outlets for composts and digestates: the smaller the cycle, the more we trust the recycled material.) Separate collection of kitchen and garden wastes would, of course, be an essential element of such a programme. Producer Responsibility should apply to this unavoidable waste. There is no question that the householder produces it and should pay for collection and treatment. However, I believe simple PAYT is not the best mechanism. Collection should be free at the point of use, with a rebate off local taxes or service charges for low usage.

5. Reviewing all relevant legislation, with a view to removing barriers to the reuse and repair of products. A better balance is needed between the rights of the individual consumer and the needs of society and the environment.

6. Devising a more accurate title than ZW for this extensive waste minimization programme, perhaps Universal Producer Responsibility.

Most of these changes can be summed up in the revised waste hierarchy shown in Figure 2.

The original version (Figure 1) is often treated as Holy Writ, whereas it is no more than a first draft of a working guide to priorities. Experience shows that its vague terms fudge too many issues. Moreover, its very orientation suggests exactly the wrong priorities: its proportions shows that we expect to do a bit of Waste Prevention but a lot of Disposal.

Figure 2 deliberately uses more direct language. Inversion of the triangle corrects the apparent priorities, turning the Waste Pyramid into more of a Waste Filter. The other major changes are the addition of new tiers for Producer Responsibility, to make clear who has to take the prime responsibility for Waste Prevention, and for Downgrading, to cover beneficial uses that cannot qualify as recycling.

### **Where would that leave the WMI?**

This Universal Producer Responsibility scheme, with kerbside collection of organic waste only (and, perhaps, a little residual waste), might seem to leave many CIWM members out of a job. However, the WMI could find a new role, handling the whole flow of discards to be returned for re-use, remanufacture, recycling or disposal.

Most proposals for product return schemes to date have focused on electronic goods and have placed the responsibility on the retailer. However, there are numerous practical objections to such schemes.

- a) In full operation, the volume of returned goods would match the volume sold. This would be genuinely difficult to reconcile with any retail business, even when the returned goods are clean and non-hazardous. Would every shop need a 'shadow' shop round the back to accept returns?
- b) Customers must travel to make the return, for the small(?) reward of their deposits. This might require a long journey they might not otherwise make.
- c) Houses must have enough space to store discards (consider furniture and appliances!) until their next trip to the store.
- d) Householders must have or hire suitable transport. (They might have had transport at the time of purchase but it does not follow that they still have.)
- e) Householders must be fit enough to make the journey.
- f) Householders might have moved a long way from the retailer, perhaps abroad.
- g) The retailer might have closed or moved far away.
- h) The householder might have lost the sales receipt, during an interval of what might be decades.
- i) The goods might have been inherited, gifted, bought second-hand or acquired under other circumstances liable to 'lose' paperwork (e.g. divorce).
- j) The manufacturer might have gone out of business, leaving the retailer with no outlet for the returned goods.

Would such a scheme work, even for high-value, lightweight goods with a typically short working life? Should we not consider a centrally managed service, for *all* manufactured goods. All returnable items could be collected from the doorstep by one vehicle, running a regular, frequent, service. An integrated system like this could be set up to deal with a few selected 'target' items but could readily be expanded later to cover as wide a range of products and materials as we wish, including household hazardous wastes.

All products could be bar-coded in manufacture to show where they should be returned to and what scrappage tax would be paid. The rebate might decline with time, to discourage hoarding of unused products, but a substantial residual value would be essential. This would necessitate index-linking, but this could be financed by investing the tax paid.

The household could be issued with a 'till slip' to record what was collected. The cumulative total could be credited to its local tax bill or waste collection fee (depending on the prevailing

funding system). Reverse logistics could play a part but collection would be from a regional depot, rather than individual stores. A government agency would act as banker and would deal with goods whose makers have disappeared. Yes, it would be an expensive scheme -- but it would be fully financed by the customer at the time of purchase. This is both equitable and practicable.

The foregoing is simply the first draft of an idea. It would require a great deal of work to develop a proposal worthy of serious consideration. It would also require decisive, far-sighted, government support. However, it is the logical and, I believe, necessary development of the ZW principle.

### **Where would that leave the Zero Waste Movement?**

There would still be waste; zero would not be reached. However, all the difficult wastes would now be dealt with by the manufacturers or successor bodies. There can be little doubt that most future products would be more durable and more recyclable. Commercial pressures, including high disposal charges for industrial wastes, would ensure this.

However, grass-roots activists would still have valuable roles to play in community composting and product reuse schemes and in the collection of smaller discards, such as food packaging. Most have earning potential. Householders could contract into the first for a fee, as a cheaper alternative to commercial collection services. The last would bring in deposit refunds, since deposits could be set high enough to allow a mark-up for the collector, as well as a refund to the householder. Such activities would also help maintain environmental awareness.

### **Conclusion**

Zero Waste is undoubtedly a useful target and one that we should work swiftly towards. However, I believe it is a dangerous delusion to consider it as easy to reach. It will not be closely approached by action at community level or in local government, helpful though these are. Legislation at national and supranational level will be needed if we are to effect the business revolution that I envisage as necessary.

I therefore urge CIWM to take the initiative in developing a Universal Producer Responsibility scheme and to do so without delay.

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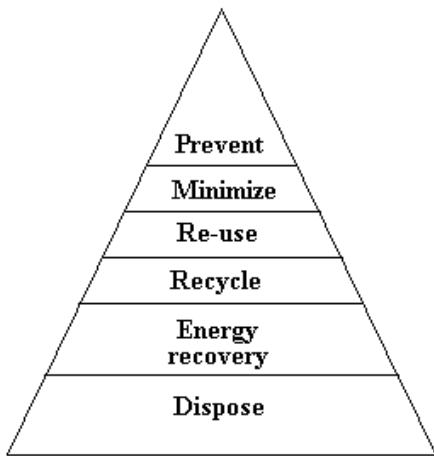


FIGURE 1  
THE OLD WASTE PYRAMID

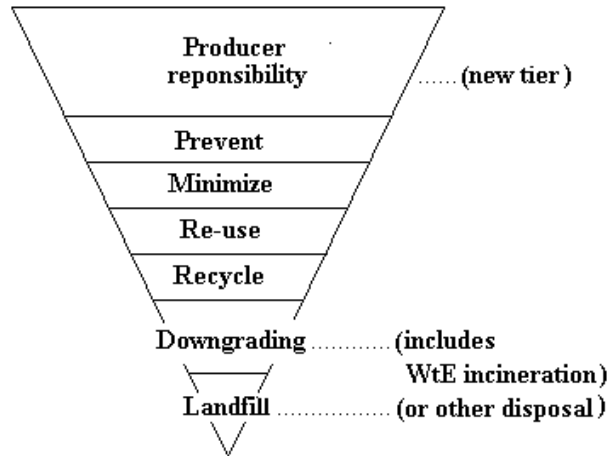


FIGURE 2  
PROPOSED WASTE PYRAMID