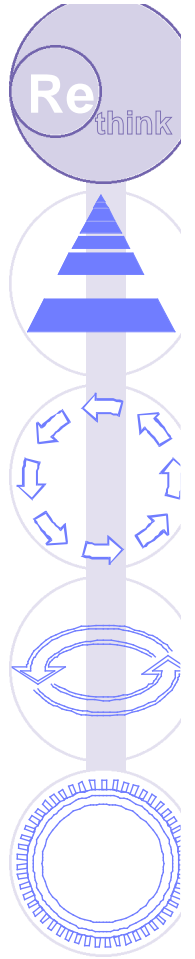


# 1

## Waste Management in Ireland

A throw-away society  
Ireland now has a pivotal opportunity to turn away from end-of-pipe disposal  
cannot be sustained  
mechanisms to sustainable methods of dealing with waste, which will achieve the  
on a finite planet  
revolution in resource use necessary for sustainable development.



# Re

# think

Waste management in Ireland is currently at a crossroads. Ireland now faces what is frequently referred to as ‘waste crisis’. The roots of this ‘crisis’ lie in the traditional over reliance on landfill as the primary method of waste management. Historically, landfills have been generally small in size and operation, and have often been badly operated and maintained. Many of these landfills are now reaching full capacity. The cost of landfilling has been relatively low and this has inhibited the development of alternatives. At this juncture, decision makers face a choice that will have consequences reaching far into the future. They can either perpetuate an environmentally unsound approach, or move towards a long-term sustainable solution. Rather than viewing the situation that Ireland now faces as a crisis, it can be seen as a pivotal opportunity to turn away from end-of pipe disposal mechanisms to sustainable methods which will achieve the revolution in resource use necessary for sustainable development.

## 1.1 Sustainable Waste Management: The Way Forward

### Sustainability

Sustainable development is most commonly described as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Sustainable development thus aims to improve the quality of human life whilst living within our ecological means.

#### Sustainability – Misuse of the term

In accordance with Agenda 21, sustainability should be a key goal of our society. However, the term has become something of a catch phrase, and its misuse will devalue its importance. For example, incinerators and landfills have been termed ‘sustainable’, which suggests that the concept of sustainability is being misunderstood. Landfill is unsustainable as it entombs potentially recoverable resources and leaves a potentially environmentally detrimental legacy to be dealt with by future generations. Incineration, with or without energy recovery, is inherently unsustainable as it simply sends these resources ‘up in smoke’ and therefore wastes valuable materials.

### What is Sustainable ‘Waste’ Management?

Sustainable waste management is a system whereby waste is not viewed a ‘useless rubbish’, but as a valuable resource for which another use can be found. It means recognising that many ‘wastes’ are useful, either for the material that they

contain and/or for the potential product they represent. Our ‘wastes’ still contain much of the original material we desired when we purchased them; i.e. they still contain useful resources. It is for this reason that waste is often referred to as simply a ‘**resource heading in the wrong direction**’.

#### Inefficient Use of Global Resources

In the UK, it has been calculated that for every tonne of product made, ten tonnes of materials have been used to manufacture it.<sup>1</sup> Therefore, although domestic waste, for example, accounts for a relatively small proportion of overall waste arisings, a great deal of other waste is produced as a result of the manufacturing process for consumer products.

**From the viewpoint of sustainable development waste generation and its associated problems cannot be decoupled from resource depletion.** This is clarified by consideration of our current system of resource use, which follows a predominately linear pattern.

i.e. Resources ▶ Product ▶ Disposal

Resources are extracted, used to manufacture a product that is bought by a consumer and subsequently thrown away. On the right-hand side of this equation the rapidly increasing amounts of waste generated have reached critical levels. In fact, industrial development and its associated waste products has accelerated at a rate far surpassing the adaptive

capacity of natural systems, and if wastes continue to be produced at current or increased volumes, then any 'management' system will eventually become overwhelmed.

On the other side of the equation, the rapid depletion of the Earth's natural resources is endangering their supply for future generations. Global calculations show that humans are consuming over one third more than nature can reproduce. The rate for industrialised countries is even higher. The current consumption levels of the industrialised world, along with the energy required, and the greenhouse gases produced as a result, are unsustainable.

### Inequitable Use of Global Resources

*'At present 20% of the world's population use 80% of the world's resources: the other 80% - the population of the developing world - uses only 20% of these resources. Such inequity cannot continue. Traditionally it has been believed that as the less developed world developed, it would use more and more resources and that the world's supply of resources would expand to accommodate that; any shortage of raw materials would either stimulate the search for new supplies or encourage the use of alternatives. Now, we are having to face the fact that such a level of resource use would push the world way beyond what is sustainable; so that either the developing world has to be held back or the developed world has to find ways to sustain current standards of living while using far fewer resources; maybe as little as 10% of the resources we use now.*

***Such a revolution in resource use, and possible reuse is the real driving force behind today's needs for the developed world to take waste minimisation and sustainable development seriously.'***

**UK House of Commons Environment, Transport and Regional Affairs Committee (1998), Report on Sustainable Waste Management.**

### Closing the Material Loop

When waste management is considered in the context of sustainable development, it is apparent that a change in attitude towards waste is necessary. A shift from waste **management** (i.e. what are we going to do with our rubbish) to **resource conservation** (i.e. how are we going to prevent wastage and conserve natural resources) is essential.

### Unsustainable Production and Consumption Patterns

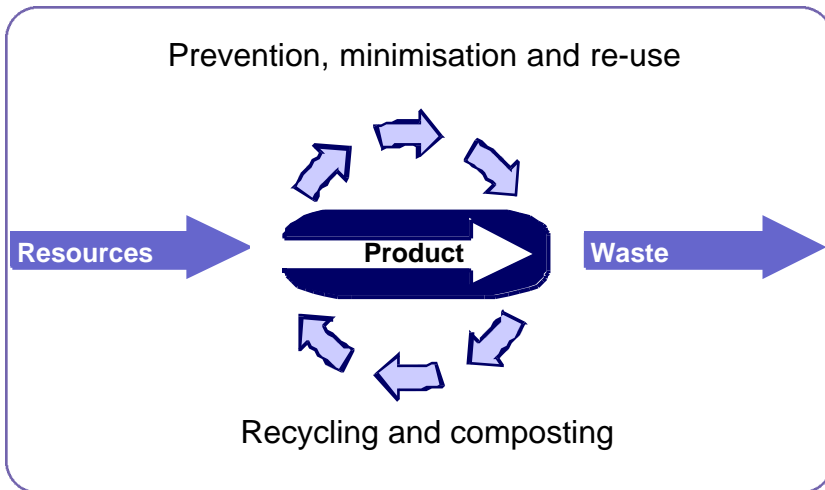
There is an imbalance between our current development patterns and the natural capacity of the Earth's systems to adapt to the over consumption of resources and to absorb waste at its current rate of production.

- ◆ Researchers in the Netherlands found that the country would have to be 14 times larger to supply all the water, energy and other resources used by Dutch consumers and absorb all the waste produced by Dutch citizens.<sup>2</sup>
- ◆ Research has shown that if all the world were to live as a North American or Canadian, two more planet Earths would be needed to sustain everyone, three more still if population should double, and twelve Earths altogether if worldwide standards of living should double over the next 40 years.<sup>3</sup>
- ◆ Studies conducted in the US show that for every 100 pounds of product manufactured, at least 3,200 pounds of waste is created. Only 6% of the materials extracted each year become durable goods; the other 94% is converted into waste within a few months of being extracted.<sup>4</sup>

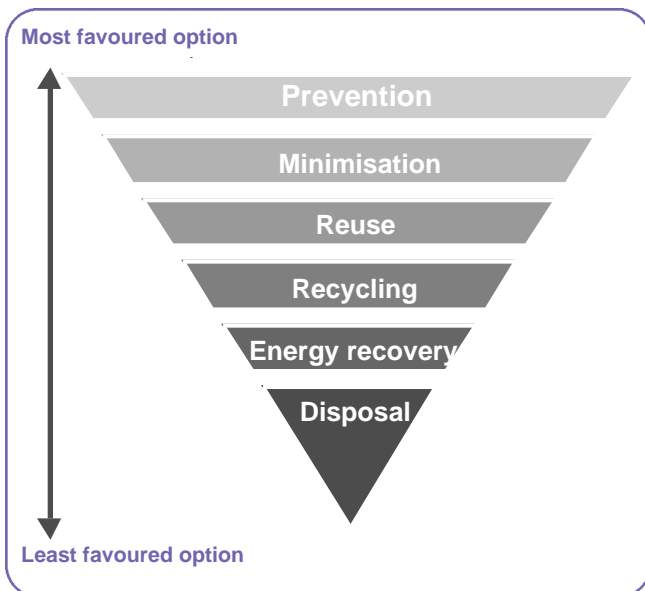
Traditionally, the primary focus has been on what to do with waste after it has been produced i.e. end of pipe solutions. For sustainable development, the '**closing of the material loop**' must be achieved, i.e. turning our present linear use of resources into a cyclical process. To close the material loop, there needs to be an incremental reduction in the amount of virgin resources feeding into the production chain, coupled with a continuous decrease in waste produced. This is shown diagrammatically in Figure 1.

The EU Waste Management Hierarchy (see Figure 2), which lists waste management options in order of preference, aims to promote sustainable waste systems. According to this hierarchy, prevention and minimisation of waste are the most favourable option. Anything that cannot be prevented or minimised should be reused, repaired, recycled or composted. Energy recovery and landfill are the least favourable options.

Sustainable waste-resource programs focus on the upper and middle parts of this hierarchy. Such an approach furthers the development of cyclical production and consumption patterns and consequently, the advancement of closed loop processes. Unlike options such as landfill or incineration,



**Figure 1: 'Closing the Material Loop'- The sustainable approach to waste - resource management**



**Figure 2: The EU Waste Management Hierarchy**

only recover the energy contained within the actual material, and, of course, this can only be recovered once. The energy used in the extraction of resources, in transport etc. cannot be recovered. Conversely, this energy can be saved by methods such as reuse and recycling.

For many substances, recycling cannot occur indefinitely (for example, due to shortening of fibers in newsprint recycling), but usually recycling can take place more than once. Therefore, there is an element of circularity in the recycling process that is absent in the case of incineration with energy recovery. Also, sustainable development requires a reduction in raw **material** usage. Incineration effectively results in these materials 'going up in smoke'. Landfill entombs these materials in the ground. It is for these reasons that both landfill and incineration are referred to as linear waste management options. (This publication, uses the term "recovery" to denote 'material recovery mechanisms' and does not refer to energy recovery, unless otherwise stated).

**'No such thing as waste - only wasted resources'.**  
Western Sydney Waste Board, Australia.



recycling and reuse result in material being returned to the production process where it can be made into the same or similar product from which the material arose, or it can be fashioned into something entirely different. This means that for the economy as a whole there is a reduced need for primary extraction; hence resources are saved and there is a reduction in the environmental effects from the production, processing and transport of the raw material, which also results in considerable economic savings. Recovery of energy from waste may appear to have a similar effect, yet on closer examination it becomes evident that this is not the case. Recovering energy from waste by incineration (thermal treatment, waste-to-energy or any of its other synonyms) can

**Waste as a Resource**

The City of Canberra in Australia has a policy of 'No Waste by 2010'. It is developing an infrastructure to meet this policy and is breaking its 'waste stream' down into 'resource streams': including building and demolition materials, paper and cardboard, organic materials and garden wastes, hard and soft plastic, glass and textiles. **These resources are then publicised to attract and develop new industries. To date, Canberra has reached a 66% diversion of domestic waste from landfill.**

## Zero Waste

At the forefront of sustainable waste management are those regions developing Zero Waste policies. Canberra, the Capital of Australia, twenty-five territorial local authorities in New Zealand and Alameda County, California are among those with such a zero waste to disposal goal. Such policies aim to turn all waste (or discarded materials) back into resources. Zero Waste is a 'whole system' approach to resource management that maximises recycling, minimises waste, reduces consumption and ensures that products are made to be reused, repaired or recycled back into nature or the marketplace. It is a goal based on the premise that significant environmental and economic benefits accrue through sustainable and more efficient materials use and conservation, as opposed to disposal.

### Zero Waste - Idealistic Dream?

*'The concept of Zero Waste is achievable - the goal is unambiguous and clear. We feel that setting targets such as a 50% reduction in waste by a certain time creates confusion. The No Waste option is the only option, the percentages are clear - it is a 100% solution. With a refinement of collection systems, the advancement of reprocessing technologies, the development of markets and by clearly articulating why less waste is a good thing, a 100% solution is realistic'.*

**Michael Wightman, Project Officer, No Waste By 2010, Australian Capital Territory (ACT).**

At a conference launching the Zero Waste New Zealand project, Warren Snow, from the Zero Waste New Zealand Trust, stated that, "councils can see that reducing waste to zero is no longer a theoretical exercise. Most of the processes already exist and we have more than enough case studies of community based recycling and waste reduction projects achieving dramatic results".<sup>5</sup>

Zero Waste requires the need for dual responsibility. Firstly, the community has to maximise reuse, repair, recycling and composting. Secondly, industry has to redesign the objects that the community cannot reuse, repair, recycle or compost. Both industry and the community need to reduce wasteful practices such as overpackaging and overconsumption. Many businesses are acknowledging that waste equals inefficiency, are committed to zero waste and sustainable prod-

ucts and are reaping the financial benefits. For example, the 98% recyclable car will soon be on the market, and one manufacturer already claims to have designed a 99% recyclable television set. The goal of the Xerox corporation is to produce sustainable products by 2005. They have produced a photocopier of which over 90% of its components can be recycled. In 1998, they prevented more than 145 million pounds of material from entering landfills, through equipment remanufacture and parts reuse and recycling.<sup>6</sup>

### Further benefits of a Sustainable Approach

A sustainable approach to waste management ensures inter-generational equity and a more equitable sharing of resources for the present generation. Case studies presented throughout this handbook will illustrate that high waste reduction levels can be obtained in a sustainable manner. Communities around the world are achieving ever-increasing diversion levels from landfill and incineration, through waste prevention, reuse and recycling.

### Waste: A source of innovation

There is a growing awareness that improved resource use can bring economic and employment benefits as well as environmental improvement. The development of a **secondary materials economy** offers opportunities to stimulate innovation and to create new sources of wealth and jobs. The province of Nova Scotia in Canada increased its diversion from disposal rates from 7% to 51%, between the years 1995 to 2000. In the process, approximately 3,000 jobs were created from their sustainable waste-resource strategy alone.

### Reduction in Greenhouse Gas Emissions

Materials consumption contributes indirectly to climate change because it requires energy to mine, extract, harvest, process, and transport raw materials. More energy is then required to manufacture, transport and, after use, dispose of products. Reducing material use through waste prevention and increasing material efficiency through product redesign have the greatest beneficial impact on climate change. Recycling adds further to greenhouse gas savings by reducing the need for energy-intensive resource extraction. Manufacturing using recycled rather than virgin material saves substantial energy in virtually every case.<sup>7</sup>

**The US Environmental Protection Agency estimated that a 1% increase in recycling in the US would reduce carbon dioxide emissions by an amount equivalent to taking 1.2 million cars off the road.<sup>8</sup>**

## 1.2 National Waste Management Policy

Ireland has traditionally relied on landfill as the principal method of dealing with its 'waste'. In 1998, over 90% of the municipal waste stream was consigned to landfill. This one-dimensional approach is clearly unsustainable and is contrary to European policy and practice. A recent evolution in Irish legislation and policy has seen developments such as the 1996 Waste Management Act and the release of the policy statements *Changing our Ways* and *Sustainable Development: A Strategy for Ireland*.

### The Waste Management Act, 1996

This Act provides a comprehensive statutory framework for the management of waste. It provides for new and redefined roles for the Minister and the EPA, as well as for local authorities. It also places obligations on agricultural, commercial and industrial operators to *'take all such reasonable steps as are necessary for the purposes of such prevention and minimisation (including, where appropriate, steps as respects the design of any product)* (Section 28 (2) (a)). This includes steps to be taken at the design stage of a product. Regulations can also be introduced requiring products to be designed, manufactured or constructed in a specified manner.

The Minister may also introduce regulations:-

- ◆ for the purpose of preventing, minimising or limiting the production of waste or a specified class or classes of waste;
- ◆ to include provisions for the imposition of producer responsibility obligations on producers of products;
- ◆ prohibiting, limiting or controlling
  - (i) the production or use, in a production process or otherwise, of any substance, material or thing,
  - (ii) the composition, production, importation, distribution, supply, sale, disposal or advertising of any product or substance, or
  - (iii) the production of any waste.

This Act prohibits the holding, transport or recovery of wastes in a manner that causes, or is likely to cause environmental pollution. It also defines the role of, and empowers local authorities with regard to waste (See Chapter 2.2: Local Authorities and the 1996 Waste Management Act).

### Waste Management: *Changing our Ways*

This policy statement sets targets for the future aimed at stabilisation of waste generation, reduced dependence on landfill and increased recycling and composting rates. It provides a framework for the adoption and implementation of waste plans. This policy statement is addressed chiefly to Local Authorities and focuses the need to give practical expression to the Waste Hierarchy by developing solutions that are sustainable and progressive. It also emphasises the need to be ambitious in relation to meeting and surpassing targets set by National and EU policy.

*Changing our Ways* endorses:-

- ▶ a reduction in reliance on landfill;
- ▶ a more effective and equitable system of waste charging which provides incentives for waste reduction;
- ▶ strategic planning on a regional basis to facilitate economies of scale; and
- ▶ greater utilisation of legislative instruments, particularly with regard to producer responsibility.

The targets laid out in this policy statement, to be achieved over a 15 year period, in relation to **municipal waste** are:-

- ◆ diversion of 50% of overall household waste away from landfill;
- ◆ a minimum 65% reduction in biodegradable wastes consigned to landfill; and
- ◆ materials recycling of 35% of municipal waste.

These targets also provide for stipulations required by the EU Landfill Directive. This directive requires a 65% reduction, over fifteen years, in the amount of biodegradable waste landfilled using 1995 levels as the baseline.

### Sustainable Development: *A Strategy for Ireland*

This policy document emphasises the need to move towards sustainable practices in relation to waste. One major objective is that all sectors of society take appropriate responsibility on a shared basis for their waste generation. Other objectives include:-

- ▶ The stabilisation and reversal of the growth of waste production. It requires that in the short term, to 1999, municipal waste arisings should be stabilised at 350 kg/year per

capita. The long term goal, to 2010, is to reduce these wastes by 20%;

- ▶ Development of the use of economic instruments to reduce waste and to promote reuse and recycling; and
- ▶ The intensification of reuse and recycling activity. This document highlights producer responsibility obligations, and measured actions by public authorities as methods to achieve this goal.

### 1.3 Municipal Waste

In 1998, over 2 million tonnes of municipal waste were generated in Ireland, of which, over 90% was disposed of at landfill. As waste quantities can be seen as a measure of the resource efficiency or inefficiency of a society, this represents a **huge resource loss** through the disposal of municipal waste alone.

#### Compositional Analysis

The cornerstone of successful waste-resource management planning is reliable information about the quantity and type of material being generated. The quantities of material that can be prevented or captured can then be estimated. Decisions about equipment and space needs, facilities, markets and personnel cannot be reliably made without clear knowledge of the quantities that can be expected. Such analyses identify large weight and volume items to target for source reduction and recycling programs. Compositional data also provides a baseline to assess whether goals were achieved. If data is inac-

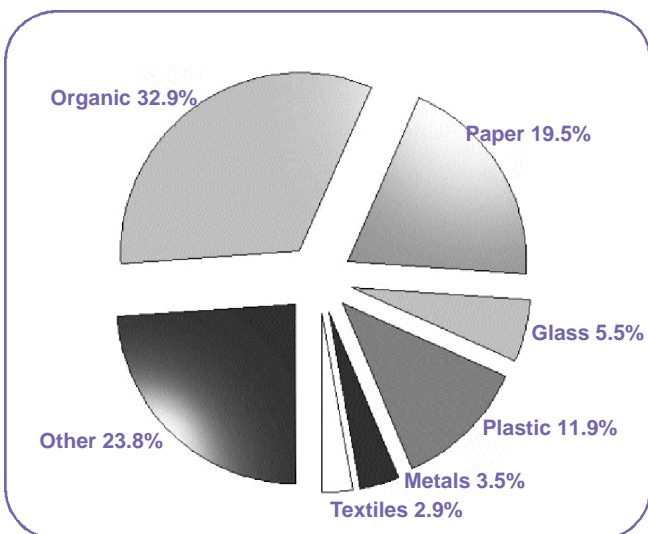
curate or unreliable, perspectives on the right direction for future activity will be based on conjecture rather than fact.

Some efforts have been made by local authorities in recent years to establish the composition of household waste generated in their functional areas; however, more work still needs to be done in this area. There is also an urgent need for detailed compositional analyses of commercial wastes. Commercial waste streams are by nature more diverse than household waste streams. Also, the composition of municipal wastes arising in urban and rural areas may differ significantly. Typically, commercial waste streams may account for a far lower percentage of overall municipal waste arisings in rural areas, as opposed to urban areas.

#### Composition and Trends

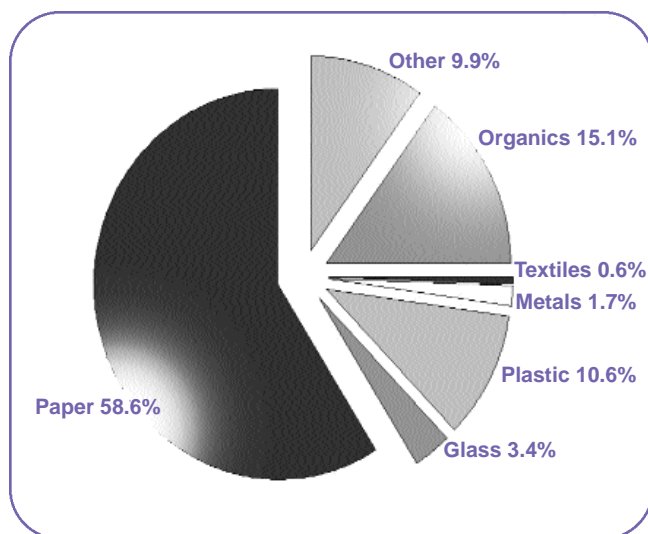
A comparison of waste collected by, or on behalf of local authorities between 1984 and 1998 indicated an increase of over 100% in 14 years.<sup>9</sup> Although this increase may be partly due to better reporting, it still illustrates the rapid rate of increase in waste generation and in resource loss in Ireland.

Municipal Solid Waste (MSW) is defined as household, as well as commercial and other waste, which, because of its nature and composition is similar to household waste. Of the estimated 2,056,652 million tonnes of MSW generated in Ireland in 1998, household waste consisted of 59%, commercial 37% and street cleaning waste accounted for 4%. The estimated composition of household and commercial waste landfilled is shown in Figures 3 and 4 respectively.



**Figure 3: Estimated Composition of Household Waste Landfilled**

Source: National Waste Database (1998), EPA, Ireland.



**Figure 4: Estimated Composition of Commercial Waste Landfilled**

Source: National Waste Database (1998), EPA, Ireland.



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