

Environmental RTDI Programme 2000–2006

**Assessment and Development of a Waste
Prevention Framework for Ireland
(2001-WM-DS-1)**

Synthesis Report

Prepared for the Environmental Protection Agency

by

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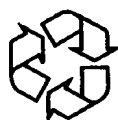
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Executive Summary

Ireland currently faces a major challenge regarding its use of materials and energy and its management of waste. The problems relating to solid waste in particular are well documented and have been quantified in several studies. The increase in waste arisings in Ireland during the decade 1990–2000, no doubt influenced by the economic growth during that period, is of particular concern.

A radical, urgent and comprehensive response to the problem of waste and materials is therefore required at all levels in society and utilising a wide spread of instruments and initiatives. This response must be focused on prevention – to decouple waste creation from economic growth and reverse current trends. One such approach involves the development and implementation of a waste prevention strategy and such a strategy is strongly recommended in this study.

An inadequate approach to waste management, inefficient use of materials, a dependency on landfill, a resistance to change and an unacceptable level of illegal dumping are some of the inevitable manifestations of the challenging situation consequent from the growing level of waste creation that pertains to this country.

Annual increases in waste arisings (almost 10% per annum from 1995 to 2000) confirm that Ireland has not yet succeeded in decoupling waste generation from economic growth (as measured by Gross Domestic Product – GDP). This is in contrast to the relative stabilisation of waste arisings in some other regions where practical measures have been implemented that have been designed to arrest and reverse the growth in waste production.

In order to meet this and other challenges, in recent years Ireland has adopted a number of important policies in relation to resource use, waste management, sustainability and the abatement of greenhouse gas emissions. Specific policy documents include:

- A National Policy Statement entitled *Waste Management – Changing Our Ways* (DoELG, 1998).

- A Supplementary Policy Statement *Preventing and Recycling Waste – Delivering Change*, dedicated to the higher priority waste management practices of Prevention, Re-Use and Recycling (DoELG, 2002a).
- A *National Hazardous Waste Management Plan*, designed to prevent and manage hazardous waste, adopted in July 2001 (EPA 2001b).
- A National Sustainable Development Strategy *Sustainable Development: A Strategy for Ireland* (DoE, 1997) and supplemented by *Making Ireland's Development Sustainable: Review, Assessment and Future Action* (DoELG, 2002b).
- A *National Climate Change Strategy* (DoELG, 2000) and supplemented by a *Progress Report on the Implementation of the National Climate Change Strategy* (DoELG, 2002c).

Other important steps have also been taken to stem the growth of waste. The legislative framework has been strengthened by the Environmental Protection Agency Act (1992), the Waste Management Acts (1996 and 2001), the Protection of the Environment Act (2003) as well as several Regulations. Economic instruments have been applied, including the landfill levy, the plastic bags levy and the setting up of the Environment Fund. Awareness levels are rising through the ENFO *It's Easy to Make a Difference* campaign and locally by Environmental Education Officers, the Green Flag Programme, etc.

However, despite the effective efforts of the many people involved in these developments, it is clear that a much more extensive and integrated approach is still required if Ireland is to attain the level of success that is apparent in some other countries.

With regard to prevention, an implementation of the recommendations of the *Preventing and Recycling Waste – Delivering Change* policy document (DoELG, 2002a) would be especially worthwhile, including the setting up of a Core Prevention Team (CPT) within the

Environmental Protection Agency (EPA) to develop a national strategy.

Much of Ireland's current approach to the development of a modern waste management system is based upon the initiatives contained in the 11 local and regional waste management plans that have now been adopted. However, while these plans acknowledge that prevention of waste is the priority, there is a lack of detail relating to specific measures that will be taken to ensure that progress is attained in stabilising and reversing the trend of waste growth. This is not the case in terms of future waste disposal and recycling arrangements, which are described in detail in the plans and are, in many cases, substantial, ambitious and quite specific. It seems clear that the science of waste prevention is still developing in Ireland, especially at local level, and it is also important to point out that some major elements of any prevention programme, such as regulation and producer responsibility agreements, require implementation at a national level.

It is vital, however, that companies and local authorities do make firm arrangements to ensure that waste prevention will be achieved in practice. Many local authorities have by this stage appointed Environmental Education Officers who, it is expected, will oversee the development of some practical experience and knowledge of the techniques of waste prevention over time. The Department of the Environment and Local Government (DoELG) have published *Preventing and Recycling Waste – Delivering Change*, a Supplementary Policy Statement dedicated exclusively to Prevention, Re-use and Recycling of waste (DoELG, 2002a). It is also hoped that the publication of this present study will add considerably to the body of knowledge available within Ireland on waste prevention. The establishment of the CPT in the EPA and the initiation of the National Prevention Programme should also ensure that a large impetus is provided for the practice of waste prevention. Given the above and other future initiatives, local authorities should be much better placed when the time comes to review their Waste Management Plans and to incorporate appropriate prevention initiatives within local- and regional-level action.

The quality of waste data and the underestimation of waste trends in some Waste Management Plans are also a cause for concern. While it is accepted that the information provided was the best available at that time, there is a need to make every reasonable effort to ensure that the data can be more reliable in the future. Companies and local authorities must realise the importance of accurate data returns in making provision for future waste planning and must make every effort to ensure that the information provided is the very best available. In addition, the growth rates chosen for waste generation projections ought reasonably to reflect the level of effort that is actually going to be made in the attempt to stabilise and reverse the previous trends which indicated a significant increase. The increased use of weighbridges and the establishment of the licensing/permitting regime should improve the situation and it is anticipated that the *National Waste Database 2001* will provide the most reliable waste statistics ever compiled in Ireland. Further and more detailed quantification studies are also required at local and national levels.

The *Preventing and Recycling Waste – Delivering Change* statement announced that, where appropriate and on the basis of advice from the CPT, it is the intention to introduce mandatory waste audits and waste reduction programmes for those companies that fall below the thresholds for IPC licensing (DoELG, 2002a). It also advised of the intention to develop a Public Service Waste Management Programme, with particular emphasis on optimal prevention practices. These initiatives should have a great impact on waste prevention in both the private and the public sectors, especially if they focus on green procurement policies and practices, and are highly desirable.

Apart from any regulatory requirements, some sectors of industry and commerce, such as hotels and construction, are already beginning to develop voluntary codes of best practice in waste management. Other sectors are encouraged to adopt similar guidelines for member companies, with a special emphasis on waste prevention and efficient resource utilisation.

Several barriers to waste prevention are identified in this report and these constitute a major obstacle to change, but Ireland's poor performance is due in no small measure to

a lack of prioritisation of waste in Irish society and the lack of specific dedicated resources being allocated to prevention. Furthermore, the administrative structure to manage waste prevention, while greatly improved in recent years, remains underdeveloped and a dedicated body or team is required to deliver substantial progress. In companies and local authorities, there is a particular need to provide adequate resources and training in order to allow an effective programme of waste prevention measures to be developed and implemented. There is also a need to ensure that waste prevention initiatives are given a real priority over disposal and recycling activities when developing the resource management systems for implementation.

A series of instruments and tools have been applied in some other countries to ensure successful resource management and a decoupling of economic growth and waste. Four regions were analysed in detail during this study. The Netherlands, Denmark, Austria and Flanders have developed waste prevention frameworks based upon a solid foundation of information/communication, economic and regulatory initiatives. Ten such instruments are identified and described herein, and in more detail in the Main Report, which also have the potential to be applied and developed in Ireland.

In order to initiate a waste preventive framework for Ireland, it is first necessary to define prevention. The recommended definition (which builds upon that used in the *Preventing and Recycling Waste – Delivering Change* document – DoELG, 2002a) for waste prevention is the:

elimination or reduction at source of material and energy consumption, waste arisings (solid, gaseous, heat and liquid) and harmful substances.

It is important that this definition is officially recognised and promoted so that all those involved in waste matters are aware of what prevention entails (which is not currently the case). However, it should also be noted that, when focusing on prevention, waste is not the only concern and the consumption of raw materials and energy are of critical importance. Solid waste should also not be considered in isolation: the liquid and gaseous phases as well as waste heat, etc. also require attention.

Any waste prevention framework will also require certain essential elements. As a first step, commitment and leadership are required in all sectors of society to achieve success in relation to waste. Adequate resources must be allocated to any waste strategy as a demonstration of such commitment. As regards the level of funding required for the development of a national waste prevention strategy, it was recommended in the *National Hazardous Waste Management Plan* (EPA, 2001b) that the prevention element be allocated IR £43.5 (€55.2) million. It is recommended that at least the same level of resources would be required for the prevention of non-hazardous waste.

Other framework elements include high-quality data relating to waste and resources, the ability to measure prevention, the setting of realistic and effective targets, a solid foundation of instruments, a material management focus, the consideration of energy and equity issues, taking a full product life-cycle approach, linking and synergising with other national strategies, and a consideration of qualitative as well as quantitative prevention.

As stated above, there are ten main sets of tools and instruments required to develop a waste prevention strategy. These are:

1. Awareness Raising Programmes
2. Technical Support and Training
3. Research
4. Green Public Procurement
5. Environmental Taxes and Charges
6. Extended Producer Responsibility
7. Economic Supports and Grants
8. Restrictions and Bans
9. Agreements and Covenants
10. Industrial Permits and Licenses.

However, a framework foundation and a series of tools and instruments are not sufficient to bring about real

change. What is needed most of all is action. This study identifies nine stakeholder groups that have a role to play in any strategy and a responsibility to improve Ireland's management of resources and waste. These are the CPT (within the EPA), all other elements within the EPA, Local Authorities, Government Departments and State Agencies, Environmental Non-Governmental Organisations, Environmental Experts, Compliance Schemes, the General Public, and Industry/Commerce.

If any national waste strategy is to succeed, 75 specific actions by these stakeholder groups are recommended. These actions are listed in the main body of this report. However, as a matter of priority, the following ten measures are urgently required to accelerate the implementation of the prevention process, decouple waste arisings from economic growth and reverse current trends:

1. Prioritisation of waste generation and material consumption issues in national government, local government, industry/commerce and among the general public.
2. Allocation of resources for an adequate response to the current persistent increases in the quantity and harmfulness of waste arisings.
3. Immediate setting up of a CPT within the EPA, with support from a Prevention Programme Steering Group, and adequate resources to develop and implement a comprehensive and effective strategy.
4. Development of a waste prevention strategy for Ireland, incorporating the framework elements, instruments and actions outlined in this study.
5. Development of criteria for a waste prevention audit and waste reduction plan to be a requirement of Irish business and state agencies through regulation. Such regulation to be developed and implemented in the near future, incorporating green procurement.
6. Immediate setting up of a system of differentiated charges based on volume/weight for separately collected and treated waste, supported by the adoption of regulations and a well-resourced dedicated enforcement regime.
7. Setting up a technical support service designed to provide information regarding waste prevention to Irish businesses, develop sectoral and other guidelines, carry out research, and implement training programmes for businesses and state agencies.
8. Local authorities to take account of the preventive knowledge and experience accumulated by the Environmental Education Officers, the Government Policy Statement *Preventing and Recycling Waste – Delivering Change* (DoELG, 2002a), the recommendations contained within this study, the National Waste Database Reports, the outputs from the National Waste Prevention Programme and any other initiatives when the time comes to review their Waste Management Plans and thereby incorporate appropriate prevention initiatives within local/regional level action.
9. Implementation of a series of environmental charges and levies (building upon the plastic bag and landfill levies) on products and waste, implementing the 'polluter pays principle', and generating resources to co-fund the strategy in the longer term.
10. Development of a long-term and well-resourced research programme regarding materials and waste data acquisition, as well as several other critical issues.

These ten priority actions are required to ensure the accelerated implementation of a prevention strategy and to provide early successes and results. However, in the medium to long term, all framework elements, instruments and actions described in this study should be considered in order to ensure that Ireland develops in a sustainable manner, providing a healthy environment and a strong economy for future generations.

1 Introduction

Ireland currently faces a major challenge regarding its use of materials and energy and its management of waste. The problems relating to solid waste management, in particular, are well documented and have been quantified in several studies (DoELG, 1998, 2002a; EPA, 1998, 2000, 2001a,b, 2002; Forfás, 2001; Peter Bacon and Associates, 2002). The increase in waste arisings in Ireland during the decade 1990–2000, no doubt influenced by the economic growth during that period, is of particular concern.

This study was carried out with a view to developing a framework for waste prevention in Ireland as a response to these pressures and to aid the formulation of a national strategy. The objectives of the study were to examine matters relating to resource management and waste prevention, in Ireland and elsewhere, so that some framework elements, instruments and actions might be identified and discussed.

Between the period March 2002 and January 2003 this study examined the main issues relating to waste prevention in Ireland. This Synthesis Report and the Main Report are based upon:

- A study of materials and waste in Ireland, focusing on waste prevention and current measures in place.
- An examination of the barriers to waste prevention.
- An analysis of four regions where a level of successful waste management has been achieved.
- A description of the most suitable instruments for waste prevention for Ireland along with a potentially applicable set of framework elements.
- A recommended set of actions by the responsible stakeholder groups in order to successfully implement a waste prevention strategy.

2 Waste Arisings and Trends

An annual increase of almost 10% in commercial and domestic waste collected occurred in Ireland from 1995 to 2000. This is shown in Fig. 2.1.

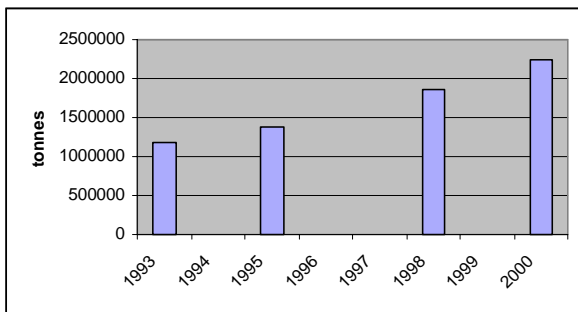


Figure 2.1. Household and Commercial Waste Collected in Ireland (EPA, 2002).

These increases are linked to economic and population growth as well as social change. Figure 2.2 shows the relationship between some environmental pressures and Gross Domestic Product (GDP), with waste arisings closely coupled to GDP. Furthermore, the management of this waste leaves a lot to be desired, with landfill rates of up to 90% in Ireland – an unacceptable dependency on disposal and waste of valuable materials.

The problems resulting from such volumes cannot be tackled by waste recovery alone. There is a need in Ireland to move further up the waste management hierarchy, from disposal and recycling to prevention, as shown in Fig. 2.3.

A decoupling of economic growth and waste, and a reversal of current trends are necessary in order to:

1. Reduce dependency on landfill, and its potential for environmental damage and climate change.
2. Minimise future requirements for waste incineration.
3. Reduce unnecessary usage of raw materials.
4. Reduce energy usage in the processing of raw materials and/or recovered waste materials.
5. Reduce Ireland's dependency on exporting our waste products for recycling in other countries.
6. Reduce costs associated with unnecessary resource acquisition, transport, recycling, treatment and disposal.
7. Ensure maintenance of Ireland's image as a clean, green environment.

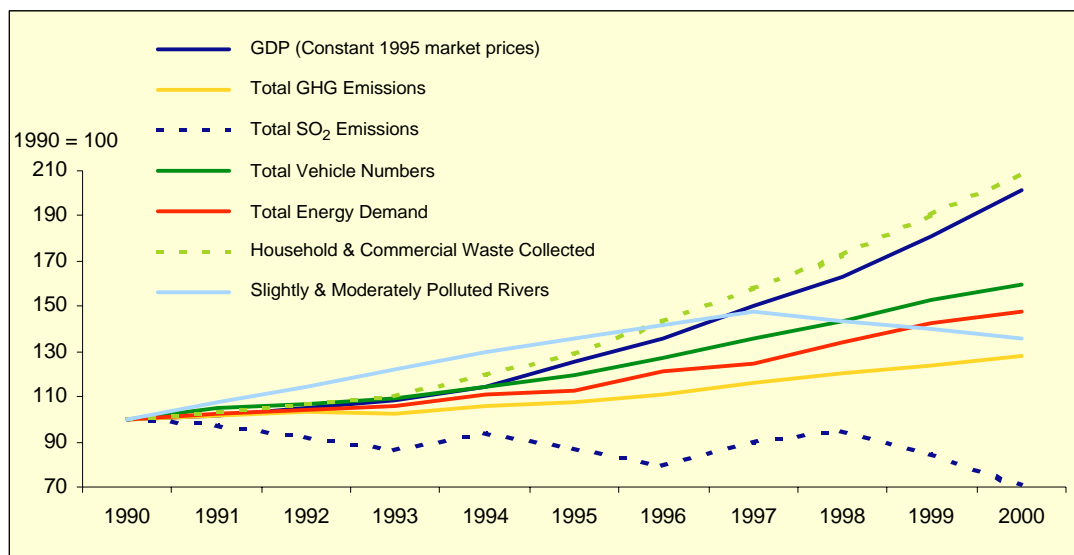


Figure 2.2. GDP and environmental pressures in Ireland (EPA, 2002).

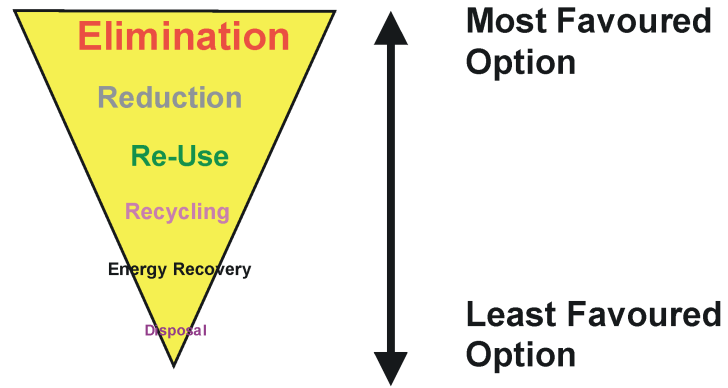


Figure 2.3. Waste management hierarchy.

3 Waste Prevention in Ireland

While past performance may have left much to be desired, it is also now clear that there are a number of instruments and tools coming on stream with potential to impact on current waste trends. Some of these instruments are listed in [Table 3.1](#).

The policy document from the DoELG: *Preventing and Recycling Waste – Delivering Change* (DoELG, 2002a) is a major breakthrough in these efforts, in particular through the proposed implementation of the National Waste Prevention Plan by a Core Prevention Team (CPT) within the EPA. With full and timely implementation, such a plan, with support from adequately focused and resourced instruments, could have an effect for greater resource efficiency and the dematerialisation of Irish society in the move

towards more service-oriented and less resource-dependent lifestyles.

The 1996 and 2001 Waste Management Acts and their associated Regulations provide a valuable and potentially effective legal basis upon which progressive and sustainable actions can be taken by regulators, waste producers and consumers, as does the Protection of the Environment Act 2003. At a local level, other legislation, such as commercial and waste stream bans in landfill sites, will immediately lead to waste recovery and eventually to waste reduction.

However, it appears that not all of this legislation is being applied fully and there seems to still be an unacceptable level of illegal dumping and non-enforcement of the 1997 and 1998 Packaging Regulations. Future EU-based

Table 3.1. Instruments with potential for waste prevention being applied in Ireland.

Basis	Instrument
Policy	Preventing and Recycling Waste – Delivering Change National Waste Prevention Programme Local/Regional Waste Management Plans
Legislation	Waste Management Acts, 1996, 2001 Environmental Protection Agency Act, 1992 Waste Management (Packaging) Regulations, 1997 Waste Management (Packaging) (Amendment) Regulations, 1998 Protection of the Environment Act, 2003 Waste Permitting and Licensing Current and Future EU Legislation Local Authority Landfill Bans
Economic	Plastic Shopping Bags Levy Landfill Levy Landfill Charges Use-Related Waste Charges EPA and Enterprise Ireland Grant Programmes (e.g. CGPP, ESP)
Awareness	It's Easy to Make a Difference Education Officer Programmes ENGO Local Programmes ENFO
Information	ERDTI Programme DoELG Reports on LA21, etc. EPA Reports and Documents CTC Reports and Documents Forfás Report, etc.

legislation is also pending that will create further pressure for waste producers and will lead to a more 'polluter pays principle' approach and extended producer responsibility (EPR).

There is also great potential for the extension of economic levies beyond the existing plastic shopping bags levy and the landfill levy. The plastic shopping bag levy appears to have been a major success and engendered a 'feel-good' factor among the general public that could result in general acceptance by the public of further fiscal disincentives. Landfill charges are being increased widely and use-related waste charges are also now appearing in some local authority regions for domestic as well as commercial waste producers. Again, these should lead to waste reductions, in time. Since the monies from these charges go into an Environment Fund, they can also create potential future investment in prevention measures. Supportive economic mechanisms, such as those implemented by the EPA (e.g. Cleaner Greener Production Programme – CGPP) and Enterprise Ireland (e.g. Environmentally Superior Products – ESP), can also have a beneficial effect. These can also add to the awareness and information tools available to companies to increase their implementation of cleaner production and eco-design.

Awareness levels may also be rising and the *It's Easy to Make a Difference* campaign has achieved relatively high levels of recognition. Education Officers have been appointed in most local authorities, but their

responsibilities need to be more widespread and focused solely on education and awareness raising. The DoELG and local authority support for the awareness raising activities of many small-scale ENGOs is also on the increase.

Environmental research levels are also increasing in Ireland through EC-based programmes, EPA ERDTI programmes and Enterprise Ireland support. The information and support materials produced from this pure and applied research should aid the efforts of policy makers, programme planners and those implementing plans and initiatives.

Despite these initial moves, however, further and better work is required on the ground. Local authorities and companies must take a more preventive approach towards the problem of increased waste generation that many of them face and the current waste management plans are not explicit enough in that regard. Local authority engagement with commercial and industrial waste producers, in particular, requires serious attention. A detailed assessment of the current Regional and Local Authority Waste Management Plans is desirable and would help ensure that local authorities will be much better placed when the time comes to review their plans and to incorporate appropriate prevention initiatives within local- and regional-level action. **The forthcoming reviews of individual plans should focus, in particular, on their preventive elements and their approaches to waste reduction for all sectors.**

4 Barriers to Waste Prevention

This study identified 19 barriers to waste prevention. These will require major driving forces to overcome. They are described in detail in the Main Report. The two most important barriers have been identified as:

1. The lack of priority and resources allocated to tackle the problems of raw materials management and waste prevention.
2. The underdeveloped status of the administrative systems required to accelerate the implementation of any process of change.

Only when these two obstacles are overcome in Ireland can the other social, economic and information-based barriers be tackled in earnest.

Some other countries have already overcome these barriers. The four regions discussed in [Section 5](#), as a starting point, adequately prioritised the issues of resource management and waste prevention and made available the funds and personnel required to meet the challenge. They have also developed sophisticated, integrated and well-resourced administrative systems dedicated to prevention. Those decisions ensured their success.

In Ireland, some of the other barriers to prevention, such as the development of throwaway and convenience tendencies in society as well as demographic changes, are general social trends. These are also apparent in other regions, especially where recent economic growth has taken place, and, while they may not be easily overcome, their effects can possibly be ameliorated by the instruments recommended in this study.

Other obstacles, such as the lack of sufficiently detailed materials and waste data, are information based, which is not surprising since prevention is a relatively new topic, especially in Ireland, and society has just begun to find ways of dealing with the issue. Such information is particularly important to promote prevention, which is more complex and innovative than, for example, recycling. However, these information deficits have been

overcome in other regions and Ireland can and should also extend the current data gathering and dissemination infrastructure, especially with the high performance information technologies now available.

A relatively low level of knowledge and awareness with regard to materials, products and waste is prevalent in society in general, and this is a barrier to change. However, neither is enough information being made available to people in their jobs. Some of this know-how may be general and practical in nature, but other, more technical and more sophisticated training and guidance may also be required, depending on the workforce, products and processes concerned. This may, for example, incorporate eco-design issues and life-cycle approaches – currently not prevalent in Ireland. It also appears to be the case that not enough research has been carried out in order to generate sufficiently focused preventive-based knowledge and information.

Legislative barriers are also in place, with regard to planning issues, as well as commercial and domestic practices. Legislative requirements for widespread segregation, separate collection and recovery that are apparent in other regions are only now beginning in Ireland, though some progress has been made. While a very strong regulatory basis is in place for some companies, under the Integrated Pollution Control (IPC) licensing system, the requirements for other companies with regard to materials, energy and water are not as effective. Furthermore, the enforcement of such legislation needs to be improved, and local authorities in particular require greater resources and powers.

The lack of green procurement policies and practices in commercial and public agencies and bodies is another barrier to progress. It is estimated that public procurement purchases are valued at over €1,000 billion every year across the EU (14% of EU GDP) (CEC, 2001a). In Ireland, the GDP for 1999 was IR £69 billion, 14% of which is IR £9.7 billion (€12.3 billion) (CSO, 2002) – considerable spending power.

In comparison to other countries, Ireland has not put into place sufficient economic incentives and disincentives with regard to raw material, water and energy consumption and subsequent waste. Some levies with regard to landfill and plastic bags have been implemented successfully, but others are required for different material and waste streams and they should be preventive based.

Extended producer responsibility means that the responsibility of producers for their products is extended to the pre-manufacturing and post-consumer stages and includes the full environmental impact of the life cycle of the product or packaging. While some companies take responsibility for the environmental impact at the

production stage (e.g. through IPC Licensing, environmental management systems, etc.) and regarding recovery (e.g. through REPAK), they are not tackling the problems related to the resource acquisition, sales, transportation and usage of their products. Furthermore, while the compliance scheme being implemented through REPAK has made an impact on EPR regarding the recycling of some packaging products, this has not yet been extended to other non-packaging products. Nor is the REPAK scheme primarily preventive based.

Table 4.1 lists the 19 barriers to prevention identified, which are further discussed in the Main Report.

Table 4.1. Barriers to waste prevention in Ireland.

Lack of Priority and Resources	Lack of Administrative System	The Convenience Society
The Throwaway Society	Infrastructural Deficiencies	Social/Demographic Changes
Cheap and Easy Disposal	Lack of Materials Flow Data	Lack of Research
Low Awareness Levels	Lack of Economic Instruments	Lack of Information Provision, Education & Training
Lack of Waste Data	Lack of EPR	Legislation Deficiencies
Lack of Green Public Procurement	Lack of Business Champions	Design for Disposal
Lack of Enforcement		

5 Waste Prevention Measures Worldwide

Several waste prevention policies, plans, strategies and programmes have been initiated worldwide at national, regional and local levels. Such actions are considered a prerequisite for sustainable development in those regions. While it is fair to say that in many regions attempts at prevention (if taken at all) have generally been unsuccessful, in others some success has been achieved. From all the regions examined, four were selected for a detailed analysis, due to geographic, demographic and economic similarities to Ireland and their relative success regarding resource usage and waste prevention. These were the Netherlands, Austria, Denmark and Belgium (Flanders). For some time, a wide and varied mix of instruments has been applied to good effect in these four regions.

In the case of the Netherlands, for example, annual overall volumes of waste arisings grew between 1985 and 2000 from 46 million tonnes to 57 million tonnes, an increase of 24%. However, during that period the GDP of the Netherlands rose by 54%. Thus, Dutch policies and programmes achieved a decoupling of waste arisings and GDP over those 15 years. If arisings had matched GDP (54%), an extra 14 million tonnes or 71 million tonnes in all would have arisen in the year 2000. Therefore, it could be calculated that a prevention rate of 14 divided by 71 or

19% was achieved (Ministry of Housing, Spatial Planning and the Environment, the Netherlands 2001a,b,c, 2002).

In the case of Flanders, during the period 1991–1998, the residual waste fraction decreased from 318 kg to 217 kg/inhabitant/year, while selective collection of recyclables increased from 74 kg to 310 kg/inhabitant/year. As Fig. 5.1 shows, waste arisings both from municipal and other sectors have been almost static between 1992 and 1999. And for the waste that has arisen, dependency on landfill has decreased from 43% in 1991 to 16% in 1999, use of incineration has decreased from 36% in 1991 to 22% in 1999, and recycling rates have grown from 21% in 1991 to 62% in 1999. Thus, Flanders is moving up the waste management hierarchy towards prevention. The recycling targets of 51% for the year 2001 and 57% for the year 2006 were both met in 1998. A waste reduction target of 10% has been set for 2006 (OVAM, 1999a,b, 2001a,b, 2002).

The tools and instruments that have been successfully applied in these regions can be broadly categorised as being based upon a communication/information, economic and/or regulatory basis, though some overlap does occur.

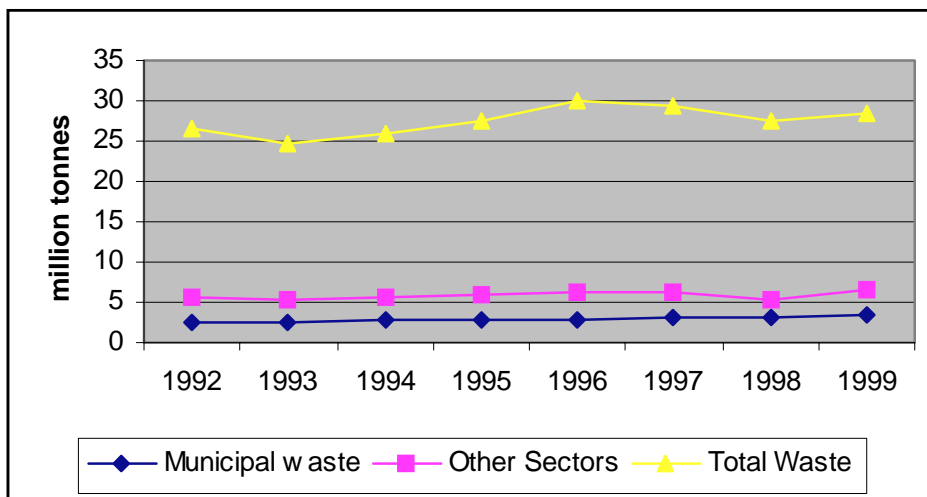


Figure 5.1. Waste arisings in Flanders from 1992 to 1999 (OVAM, 2001a).

Ten such instruments were identified in this study as being:

- a. The most influential and effective when applied for prevention in the four regions considered.
- b. To have the most potential for adaptation to and widespread application in Ireland.

Several strategic waste management and prevention strategies and plans have been in place for some time in the four regions considered. These plans have been supported by specific and focused administrative structures and dedicated agencies, for example OVAM was set up in Flanders in 1981. Thus, the successes apparent in those regions have taken considerable time, resources and effort.

General-public related information campaigns have been prevalent, involving the most effective agencies and media. Technical information is being generated by well-resourced and innovative research programmes, and detailed material usage and waste data are generated and analysed to make programmes more focused and effective. A wide range of economic disincentives to waste disposal are in place in each region – in the case of Denmark, the whole taxation system was adjusted to incorporate environmental issues and priorities. Economic supports are also widely used, especially to aid waste producers, when legislative or other pressures are applied. Such economic grants and subsidies are effectively targeted and very focused on the priorities and programmes being implemented. Regulatory instruments have also been widely applied, not only to large industry, but also to smaller companies and the general public. These are supported by information provision, consultation and inclusion.

Table 5.1 shows that the Netherlands, Denmark, Austria and Flanders have all applied instruments from each framework element, but the mixture or emphasis tends to vary from region to region. For example, there is an emphasis in the Netherlands and Flanders on covenants and agreements, but Denmark has used economic instruments, especially taxes, more widely. The importance of information and communication in Austria can be seen from the number of consultants employed

and the amount of training being carried out, and company-based legislation is also prominent in that country. Also in Austria a crucial core connection is made between wastes and raw materials. Its National Environmental Plan states that “wastes and raw materials are interconnected via the production and consumption process and cannot be viewed independently: waste and resource problems must be solved jointly” (Austrian Federal Ministry of Environment, Youth and Family Affairs, 1996).

Some of these instruments are also now being applied in Ireland, but to a lesser extent and only quite recently. For example, the local and national awareness campaigns are less extensive in Ireland, the range of economic instruments is not as wide, nor is the legislation being implemented to the same extent as elsewhere.

Of the many tools and instruments described in detail in the Main Report of this study, the following ten appear to be the most influential and effective in the four regions described, and to have the most potential for adaptation to and widespread application in Ireland.

Communication/Information

1. *Awareness Raising Programmes*: these are apparent in each region, both at local and regional levels. The focus is often on the implementation of new programmes or policies so that the general public is aware of them. Such awareness raising has been a feature of some regions, especially the Netherlands, Denmark and Austria for some time.
2. *Technical Support and Training*: again each region has provided resources and expertise to commercial enterprises and public bodies, so that these potentially large sources of waste can reduce their outputs. This information-based support comes from the public bodies themselves, private consultants or agencies or centres set up and funded by public and public-private sources. The Danish EPA, for example, has produced 50 sets of environmental guidelines for purchasers and specifiers to aid green public procurement.
3. *Research*: research is widespread in all regions, and major resources have been made available to

Table 5.1. Main instruments and tools being used in the four regions considered.

Regions	Instruments		
	Communication/Information	Economic	Regulatory
The Netherlands	<ul style="list-style-type: none"> • Awareness raising programmes, especially for consumers and SMEs • Programmes to create a knowledge base and also to support injunctions, regulations, bans, collection schemes, etc. • Technical support schemes for industry • Market development programmes for recyclable materials • Green public procurement 	<ul style="list-style-type: none"> • Environmental-based taxes • Producer responsibility • Rate-differentiated domestic waste charges • Landfill and incineration taxes • Producer responsibility programmes • Financial supports and grants for infrastructural improvements • Economic rewards for good behaviour – exemption from taxes, etc. 	<ul style="list-style-type: none"> • Injunctions and bans • Self-regulation – covenants and voluntary agreements
Denmark	<ul style="list-style-type: none"> • Research • Information provision on the objectives of the Waste Management Plan • Training of key stakeholders • Life-cycle assessment tools • Green accounts, guidelines & manuals • Eco-labels and product declarations • Green guides (environmental consultants in communities) • Green public & private procurement policies 	<ul style="list-style-type: none"> • Green taxes and charges including <ul style="list-style-type: none"> – Product taxes and charges, tax differentiation, effluent taxes and charges, user fees, administration charges • Subsidies <ul style="list-style-type: none"> – Grants, soft loans, tax allowances • Deposit–refund schemes <ul style="list-style-type: none"> – Reusable items, disposals 	<ul style="list-style-type: none"> • Regulating products (e.g. chemicals in products) • Industrial permits, etc. • Enforced segregation • Deconstruction of buildings (not demolition) • Landfill bans
Austria	<ul style="list-style-type: none"> • Sector-specific guidelines • Information and public awareness campaigns • Training of and actions by eco-consultants and waste consultants • Green public procurement • Research 	<ul style="list-style-type: none"> • Environmental grants and subsidies • Economic supports for research 	<ul style="list-style-type: none"> • Legislative support for green public procurement • Requirement of companies to appoint waste officers and develop waste management plans • EMAS regulation • Voluntary agreements for old tyres, PVC products, packaging and ELVs • Regulations on demolition waste and excavated soil, packaging, WEEE, biogenous waste
Flanders	<ul style="list-style-type: none"> • Widespread series of research campaigns • Advice and consultancy centres for business and government • Series of guideline documents for industry • Local authority campaigns to support measures • Eco-teams • Campaigns in schools 	<ul style="list-style-type: none"> • Differential charging for household waste • Landfill charges and taxes • Incineration charges and taxes • National government subsidies to local government • Grant schemes to business organisations • Grants to individual companies 	<ul style="list-style-type: none"> • Mandatory separation of household and commercial waste – collection by authorities • Take-back or duty of acceptance for certain waste streams – agreements • Environmental covenants between central government and municipalities • Landfill bans for specific streams • Stricter incineration standards

increase knowledge bases, and to properly inform and direct policies and programmes. Before information-based support can be made available, the correct information needs to be identified and accumulated. Research is the first step in building competence at regional or sectoral levels.

4. *Green Public Procurement*: this tool (which may also qualify as regulatory and economic) has been recognised in each region, and has been especially emphasised in Austria, which has developed supporting legislation and guidance. In the Netherlands, the Waste Management Plan 2002–2012 has set a target for government offices to reduce their paper consumption by 35%. This instrument is seen as vital for three reasons. Firstly, since public agencies are major consumers and waste producers, their activities can have a great effect and impact on business suppliers. Secondly, since the local and national governments are implementing policies and legislation, they must be seen to be providing exemplary actions. Thirdly, the experiences of public agencies in green procurement can provide better guidance, and prove to private consumers that such policies can work and be effective.

Economic

5. *Environmental Taxes and Charges*: Denmark, in particular, has used taxes in a wide variety of areas, not just waste, to great effect in changing how consumers behave. The emphasis in the Netherlands and Flanders is more on charges, whereby domestic waste charges are weight or volume related and high costs for incineration and landfill are a deterrent, etc.
6. *Extended Producer Responsibility*: the responsibility of those who manufacture products, using raw materials and producing waste, is recognised in the four regions considered. In Austria, for example, the waste packaging compliance programme has had a major effect on recovery levels.
7. *Economic Supports and Grants*: in the regions

considered, it now appears that such grant aid is most effective if applied as part of new policies or programmes, to support businesses and authorities to adapt their structures, develop case studies, initiate pilot projects, enter into public–private partnerships and meet stiffer economic or legislative requirements.

Regulatory

8. *Restrictions and Bans*: product or disposal bans are apparent in all four regions considered. The banning of the disposal of certain recyclable and commercial waste streams is widespread and the phasing out of certain substances has been under way for some time. Further, the required standards for disposal methods such as landfilling and incineration have greatly increased, providing a deterrent to those options. In Flanders and Denmark, the segregation of domestic household waste is also mandatory – otherwise it will not be collected for disposal or recycling.
9. *Agreements and Covenants*: these are especially prevalent in Flanders and the Netherlands where there is a long history of good co-operation between authorities and industry. They are used in particular to implement producer responsibility, though an innovative system of agreement between local authorities and national government is also in place in Flanders.
10. *Industrial Permits and Licenses*: the IPPC licensing system is widespread in Europe, and has also been implemented well in Ireland since 1996. However, the legislation for smaller, non-IPPC companies seems to be much stronger in other regions than in Ireland – the waste requirements for companies in Austria seem particularly strong.

For any framework of waste prevention to be effective in Ireland, these ten instruments and tools should be considered for application in an integrated manner, by the responsible and best-placed stakeholder groups. They are listed in [Table 5.2](#) below and their application in Ireland is discussed in further detail in [Section 7](#).

Table 5.2. Tools and instruments to support waste prevention.

Framework element	Tools and instruments
Communication/Information	Awareness Raising Programmes Technical Support and Training Research Green Public Procurement
Economic	Environmental Taxes and Charges Producer Responsibility Economic Supports and Grants
Regulatory	Restrictions and Bans Agreements and Covenants Industrial Permits and Licenses

6 Waste Prevention Strategy Elements

6.1 Definition of Prevention

One of the initial steps for a Waste Prevention Strategy for Ireland is to put into print and action an accepted and understood definition of the term ‘prevention’. This study recommends a definition of waste prevention as the:

elimination or reduction at source of material and energy consumption, waste arisings (solid, gaseous, heat and liquid) and harmful substances.

It is important that this definition is officially recognised, entered into legislation and promoted, so that all those involved in waste matters are aware of what prevention entails (which is not currently the case). However, it should also be noted that when focusing on prevention, waste is not the only concern and the consumption of raw materials is of primary importance, since any material that enters our economic system may have potential to damage the environment in its acquisition, processing, transport, usage, recovery and disposal. Nor should issues regarding energy be ignored. Furthermore, on the output side, prevention encompasses more than just waste (where waste is traditionally taken as solid). Gaseous and liquid wastes, waste heat, etc. are also included. Issues regarding equity and global responsibility are also important when considering prevention – this is discussed further below.

As regards what such a definition would mean in practice, it is worthwhile to look at the standard waste management hierarchy options and to suggest which of them should be included in ‘prevention’ as suggested in Fig. 6.1.

6.2 Framework Elements

In order for a waste prevention strategy to function effectively, it is necessary to put a framework into place to make prevention possible. Any worthwhile framework, such as those in more successful regions, requires certain core elements or components. Without these foundations, the policies and subsequent tools and instruments necessary for waste prevention cannot be properly applied. The following are ten core building blocks considered as prerequisite for any such framework:

1. *Commitment, Resources and Structure*: all the four regions described in Section 5 have developed clear and preventive policies that show their knowledge of the issue. They have then shown their commitment to these policies by allocating the necessary resources and putting in place the required administrative structures. In Flanders, as far back as 1981, a dedicated waste agency, OVAM, was set up to reduce waste. Such decisions showed the kind of commitment and leadership that is required – *as a critical starting point* – to achieve success in

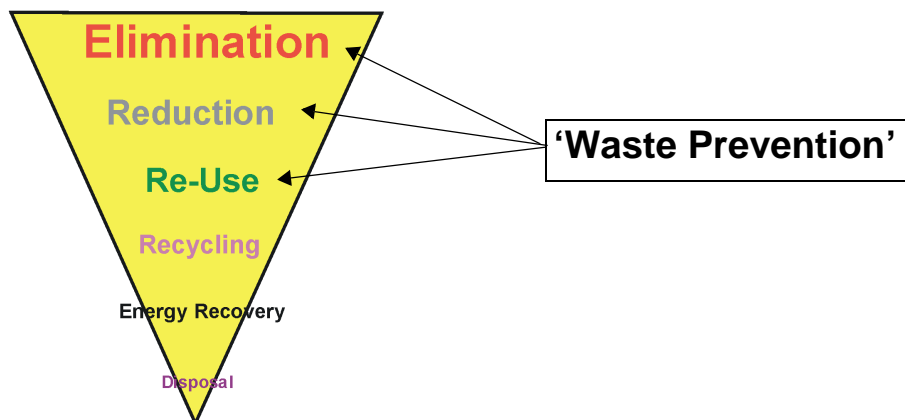


Figure 6.1. Waste management options included in ‘Waste Prevention’.

relation to materials and waste. The waste prevention policy statement, *Preventing and Recycling Waste – Delivering Change*, issued by the Irish Government in March 2002 (DoELG, 2002a), was a welcome step, but the recommendations in that report must be implemented in the short term. In particular, the establishment of a National Waste Prevention Programme is urgently required. As regards the level of funding required for the development of such a strategy, it should be noted that in the National Hazardous Waste Management Plan (EPA, 2001b), the prevention element was allocated IR £43.5 (€55.2) million. It is recommended that at least the same amount of resources for the prevention of non-hazardous waste would be required. On a local level, however, unlike the national policy statement, most regional and local waste management plans do not clearly indicate the kinds of measures and actions required to reduce waste arising in those regions. The insufficiently developed data and trends prevalent in some plans, and the lack of concrete preventive-based measures outlined, indicate the likelihood that waste reduction in those regions will not be achieved in the short to medium term. Those factors, combined with the general lack of knowledge and understanding of prevention in some plans, and the emphasis on recycling and waste disposal therein, indicate that further efforts regarding prevention are required. Greater leadership and commitment must be shown in local authorities with regard to prevention, especially at the highest levels, in order for any improvement regarding raw material usage and waste in Ireland.

2. *Data Requirements*: any strategy for waste prevention cannot function without a high-quality and focused data collection system for raw materials and wastes. It is not enough to generate general data on waste arisings and their means of disposal – this is just a starting point. For preventive-based policies and tools to be successful, it is necessary to identify how and why specific materials are entering the economy and material flow analyses are required for several streams. Policy makers and those charged with implementing local and national waste prevention plans must have a good knowledge of what is happening to the material at each stage of its life cycle. Adequate resources and structures should be put in place at local and national levels to acquire and analyse such data so that the CPT can utilise them to develop and implement effective measures for waste prevention.
3. *Measurement of Prevention*: in order to ensure effective actions, it is necessary to regularly measure their success and failure. In the case of waste prevention, it is often stated that it is difficult to measure what is not there. Nevertheless, the measurement of prevention is essential in order to evaluate the success of any programme and also to provide a basis for refinement of elements of the strategy – such as goals and targets, selection of instruments, etc. The entire process should be dynamic and evolutionary, and effective monitoring will assist this. Criteria for measuring prevention should be developed first. In order to measure prevention, it is necessary to measure waste produced, materials consumed (renewable and non-renewable) and energy consumed (renewable and non-renewable). It should be understood that waste produced is different from waste disposed of or treated. Prevention figures, therefore, include materials internally recycled in companies but exclude materials externally recycled. It is also necessary to decide on which basis the measured waste is presented. This can be a simple numerical value (such as tonnes of waste produced), or can be related to some other indicator, such as population or GDP. The latter methods help overcome any fluctuations brought about by variations in economic activity, etc. Since an overall objective of sustainable development is the decoupling of environmental and economic performance, it may be suggested that a basic starting indicator will incorporate GDP.
4. *Targets*: targets are necessary for any waste prevention strategy or plan to be successful, in particular to measure progress. Targets for hazardous waste prevention were developed for the *National Hazardous Waste Management Plan*

(EPA, 2001b). Ireland has also set itself targets regarding recycling in the past and has current targets regarding the recycling of specific waste streams, such as packaging waste. But recovery is not enough. The countries and regions that have begun to effectively grasp the issue of waste prevention, such as the Netherlands and Flanders, have also set themselves specific and ambitious waste *prevention* targets. Irish targets should be developed by the CPT in consultation with the relevant social groups and taking into account the measures being implemented. They should also reflect issues such as economic and population growths and, if sufficient data are available, specifically target certain societal sectors, trade groups and individual waste streams. Furthermore, such targets should also be set at local and regional levels, in conjunction with local or regional waste management plans.

5. *Communication/Information, Economics, Legislation:* the range of tools and instruments applied in the Netherlands, Denmark, Flanders and Austria encompassed these three main areas, as can be seen from [Table 5.1](#). These three areas should also form the foundation framework for an Irish waste prevention strategy. As a starting point, the CPT requires information in order to begin to formulate a strategy as well as to decide which tools and instruments should be applied and by whom. A series of discussions with national and international experts would be required, especially those who have developed such strategies in other regions. Since economic factors greatly influence behaviour at all levels of society, several measures will require persuasive and dissuasive financial incentives. The current Irish legislation in place will need to be supplemented by further and more preventive-focused regulations geared at large-scale and domestic waste producers.
6. *Material Management Focus:* one of the defining elements of waste prevention is that it provides a fundamental shift of attention away from the traditional area of the end-of-pipe or the product end-of-life cycle, which have been the focus of most consideration. Prevention, by its nature, must target materials at all stages of their flow through economic and production systems, and in particular at the early stages of this flow, where it can have most beneficial environmental effect. In Austria, this emphasis has been recognised and is now the cornerstone of the *National Federal Waste Management Plan 2001* (Austrian Federal Ministry of Agriculture and Forestry Environment and Water Management, 2001). The main focus of any Irish National Waste Prevention Strategy should not be on waste per se, rather it should be on the whole issue of material management – at all stages of the material flow through the life cycle.
7. *Energy and Equity:* taking materials and energy alone into account is the normal response of governments and agencies when considering sustainable development, since they are easily identified as both measurable and substantive factors. However, a third factor (equity) must constantly be borne in mind. While it is outside the remit of this study to consider issues in detail, such as human rights, social equity, poverty, intra- or inter-generational equity, etc., these are inherent elements of sustainability and must not be ignored. The links between equity and sustainable development were explicitly expressed in the Report of the World Summit on Sustainable Development from Johannesburg in 2002 (United Nations, 2002). Further study of these issues in relation to Irish production policies, import/export issues, shipping of waste products to developing countries for recycling, etc. is required. It is important that Ireland does not “import sustainability” while indirectly damaging other regions’ environments.
8. *Full Life-Cycle Approach:* the environmental impact of a product is sometimes only considered at the end of its life cycle, when it enters the waste stream and, as a result, policies or programmes are focused on that stage alone. However, the effect of some products is far greater during an earlier stage of their life cycle. For motor vehicles and washing machines, for example, this is in its usage stage. It is therefore important for any strategy on waste

prevention that life-cycle thinking be incorporated so that better instruments can be applied to products at the most effective stage of their life cycle.

9. *Links to other Strategies:* any prevention strategy should also consider and become consistent with other related national strategies. These include The National Climate Change Strategy (NCCS) and The National Sustainable Development Strategy. Other, more waste-related strategies and programmes should also be integrated, including those relating to specific streams. The CPT should undertake the development of such synergies in cooperation with relevant groups and government departments. This would require an initial study of where such overlap could occur.
10. *Qualitative Issues:* qualitative as well as quantitative issues are relevant to waste prevention. Qualitative waste prevention in strictly management terms currently relates to the harmfulness of the waste under conventional waste legislation. In general, this should still apply under a waste prevention strategy. However, other initiatives, which go beyond current legislation, should also be considered. Already a National Hazardous Waste Prevention Programme has been laid out since July 2001 (EPA, 2001b). Any waste prevention strategy should consider specific awareness raising programmes related to the harmfulness of certain products and materials and the potential usage of

safer alternatives in the application of the precautionary principle. An initial study of the prevalence and usage of hazardous materials in Ireland should be undertaken whereby safer alternatives can also be identified. An analysis of how other countries with highly developed programmes regarding hazardous waste have improved their qualitative waste prevention performance should also be carried out by the CPT. The development of a Chemical Products Register for Ireland should also be considered. Such registers are already in place in some EU Member States and this subject has already been discussed in a study by the Clean Technology Centre (Duffy *et al.*, 2000). This initial work should be further developed so that a feasibility study of such a register for Ireland can be undertaken. In February 2001, the European Commission adopted a White Paper (CEC, 2001b) setting out a strategy for a future Community Policy for Chemicals. It advocates setting up a new system for the Registration, Evaluation and Authorisation of Chemicals (REACH), which may also have some potential for qualitative prevention. REACH, if implemented, may subsume a National Chemical Products Register. Nevertheless, as a starting point, before hazardous substances can be managed and prevented in Ireland, it must be first known which materials are present, and to what extent, and how they are being used.

7 Potential Instruments and Tools

In order to build upon the core framework elements described above, it is necessary to implement specific tools and instruments. A wide range of measures have been applied in other countries to develop the communication/information, economic and regulatory framework necessary for waste prevention. Of these, ten specific measures were identified and an overview of their implementation in those regions is provided above (further information is given in Section 5 and Appendix II of the Main Report). More details as to how they can be put into place in Ireland most effectively are as follows:

1. *Awareness Raising Programmes*: local and national awareness raising campaigns are required in Ireland on an ongoing basis and with long-term commitment. These campaigns should inform the public on general issues related to the environment and also promote specific new initiatives, campaigns, and measures being applied. Awareness raising programmes are best done at a local level, using the correct agencies or bodies to affect specific Irish target groups. In the long term, the involvement of the Irish educational system in developing sustainable practices among the population is essential and has been proven to succeed, over time, in other regions.
2. *Technical Support and Training*: as well as awareness of the problems relating to waste prevention, Irish people, especially in their work, require technical support and training in order to improve their performance. The setting up of a well-resourced and expert waste prevention information agency or agencies, with free-phone lines, a website, e-mail access, etc. is urgently required in Ireland. This should be put in place on a permanent basis, and not for ad hoc issues, with guaranteed funding and support. These agencies or units could also coordinate, with direction from the CPT, effective training programmes, again with general information or geared to specific industrial groups, regional groups, for the support of new initiatives, etc. Specific and up-to-date sectoral guidelines, focused on Irish conditions, should be produced by this agency or unit and made freely available on the Internet (or on paper for a nominal cost) to support the waste audit and waste reduction programmes required. The funding for such initiatives should be derived from revenue earned through the application of disincentives, as well as contributions from savings made as a direct result of the success of waste prevention initiatives.
3. *Research*: some research programmes, such as the ERTDI Research Programme, in Ireland have involved waste-related research, but further and more preventive-focused studies are required in order to fill the Irish knowledge gap which is currently apparent. Such programmes should be ongoing and long-term funding must be made available and ensured. Resources are not just required on an ad hoc basis, when new legislation or pressures appear. The barriers relating to a lack of Irish waste and materials flow data, in particular, need to be tackled. While the EU *Regulation on Waste Statistics* (EU, 2002) may improve the quality of some waste data across the Union, further and detailed information is required in Ireland on specific industries, domestic material usage, regional material flows, etc. Such research is required locally as well as nationally.
4. *Green Public Procurement*: while this tool could be enforced in Ireland by regulation in the short term, it must be supported by the provision of useful information to the public officials who will implement it. One of the problems associated with improved performance in Irish public bodies and local authorities is the lack of integration among different departments, especially in large organisations. High-level commitment is necessary, within each organisation, to promote this important instrument. One of the initial actions required in Ireland to develop such procurement policies is an audit of the organisations to estimate the amounts

and types of materials consumed, where and why they are purchased and the subsequent wastes they produce. Green procurement can have a major knock-on effect; for example, public agencies can demand that private companies who supply them have, at the very least, responsible environmental policies and programmes in place. Green procurement policies and practices must, of course, be consistent with EU procurement rules.

5. *Environmental Taxes and Charges*: charges can be applied in several ways in Ireland, for example on products and/or their packaging, based upon the types of raw materials being used, their harmfulness to the environment, recyclability, usefulness or importance to society, difficulty of disposal, etc. Thus, any such taxation system should be differentiated, with different levels applied to different materials and products – especially those of most concern in Ireland. Due to the success of the plastic bags and landfill levies, the feasibility of additional levies and charges for other material or product streams should be investigated further and implemented. Examples of such high-priority Irish streams could include plastic packaging, aggregate and other building materials, newsprint, electrical and electronic equipment, vehicles, tyres, certain hazardous materials, etc.
6. *Extended Producer Responsibility*: currently, one major EPR programme is the compliance scheme being implemented by REPAK to meet Ireland's packaging waste targets under EU Directive 94/62/EC on Packaging and Packaging Waste (EU, 1994). Other Irish voluntary programmes are also in place for farm plastics, C&D waste, etc. But, while these producer responsibility initiatives are welcome, they are mostly focused on recycling and do not, for the most part, consider ways and means to prevent the waste that is occurring from their products. Other priority material streams in Ireland should also be considered for EPR and the *Preventing and Recycling Waste – Delivering Change* (DoELG, 2002a) recommendation for the setting up of a Producer Responsibility Unit within the EPA would be a good beginning in this regard. Such a unit should be initiated as a matter of urgency with appropriate resources and powers to implement and enforce such initiatives.
7. *Economic Supports and Grants*: since waste prevention is a relatively new subject in Ireland, persuasive economic stimuli are also required for change. Some economic grant aid has been applied by the EPA (e.g. Cleaner Greener Production Programme, CGPP) and Enterprise Ireland (e.g. Environmentally Superior Products, ESP), and, while being beneficial, this has, as yet, achieved only modest success in stimulating a widespread uptake of environmental management systems, eco-design, and cleaner production. Irish local authorities should also be eligible for government grant aid for preventive-based programmes and initiatives in their regions. However, such aid should be performance-related and should conform to the policies and programmes of the National Waste Prevention Plan. It should also be used to aid Irish companies to meet new legislative requirements and to defer some of the economic dissuasive charges and levies required. It could be used, for example, to initiate pilot projects, public–private partnerships, to support innovative practices, etc.
8. *Restrictions and Bans*: regulatory instruments are a major element of any waste prevention strategy and are widely applied in regions seeking to reduce landfill dependency and increase recycling levels. Restrictions and bans can also stimulate quantitative prevention through reuse, elimination and reduction and, if material-specific bans are in place, qualitative prevention will be supported through material substitution. Material stream bans from landfill and enforced segregation of waste is required on a wide scale in Ireland if higher levels of recycling and, eventually, prevention are to be achieved from domestic sources. This is especially true of the growing number of regions where kerbside and bring site facilities allow for alternatives. Mandatory segregation of commercial wastes – not just packaging waste – is also required in Ireland, again to increase recycling levels, but also to improve waste awareness and to aid companies that are implementing waste reduction programmes in-house.

9. *Agreements and Covenants*: a major feature of other countries' waste prevention strategies is the use of agreements and covenants – this is especially the case in the Netherlands and Flanders. These would be most effective in Ireland if they are legally binding and are based upon legislative provisions, should the agreed targets and timescales not be met. In the event of non-compliance, the relevant Irish regulatory measures (usually based upon an EU Directive, such as the Packaging Directive) are then applied to the industry or material stream in question. Agreements and covenants between Irish businesses and authorities, or between national and local governments, are attractive for both sides, but are most effective when performance driven with specific targets and timescales.
10. *Permits and Licenses*: several regulatory instruments are in place in Ireland that may have already had some preventive effect, such as the EPA Act 1992 and the Waste Management Acts 1996 and 2001. However, IPC licensing affects only about 500–600 companies and thus has not had an extensive impact regarding industrial environmental performance. The recommendation in *Preventing and Recycling Waste – Delivering Change* (DoELG, 2002a) that waste audits and waste reduction programmes be required of non-IPC businesses should receive high priority since it could produce early, significant and widespread results in the business community – similar to those achieved by IPC licensing in those sectors affected. **A major study is required to develop audit criteria and a suitable format for a waste prevention programme. Irish public organisations should not be exempt from carrying out such audits and waste reduction programmes.** However, such new

legislation will not be effective unless it is properly enforced. An immediate study should be carried out as to the cost and expertise requirement of enforcing such a major regulatory programme. Consideration should also be given to integrate these audits and waste reduction programmes with other media, such as noise, air and water emissions. The current Irish legislation regarding air and water control for non-IPC licensed companies requires a review to consider how it can be made more preventive in nature.

7.1 Instruments and the Barriers they Overcome

Table 7.1 overleaf indicates the ten main instruments recommended for Ireland and which of the barriers identified they could overcome. As can be seen, some instruments can have an effect on more than one barrier. For example, research can influence 11 of the 19 barriers identified – all those that require a development of the knowledge base in order to implement change. Conversely, some barriers require more than one instrument to overcome them. For example, infrastructural deficiencies require information through research, along with economic assistance as well as regulatory support. In the case of green public procurement, obviously the required instrument matches the barrier exactly, but it would also require research and information provision to be implemented properly.

The main barriers to waste prevention are lack of priority and resources and lack of an adequate administrative system. These are not affected so much by individual instruments, rather by the framework element: *Commitment, Resources and Structure* described in Section 6.2.

8 Roles, Responsibilities and Actions

The effective operation of any strategy will necessitate development of the foundation elements described in Section 6 and the application of the tools and instruments recommended in Section 7 above. This is achieved by series of interlinked and integrated actions carried out by the most appropriate stakeholder groups. Nine stakeholder groups are identified as having such a role and these are shown in Fig. 8.1.

Each stakeholder group has a major responsibility in the creation of a prevention culture in Ireland, whether as a waste producer, consumer, or in a role of policy maker, regulator, educator, etc. Any successful strategy must be inclusive, fully integrated with economic and social practices and incorporate all sectors of society. This means that a wide range of social groups and actors must be actively involved. Specific actions required from each stakeholder group are outlined in more detail below.

In all, 75 specific actions are recommended in order to develop the framework for a waste prevention strategy in Ireland, in order to implement the instruments outlined, and to overcome the barriers in place. The actions required are as follows:

Core Prevention Team (CPT)

As a matter of urgency, the following actions should be seriously considered for implementation:

1. Develop, implement and widely communicate a waste prevention strategy for Ireland. The strategy should take account of the instruments and framework elements outlined in this study.
2. Develop audit procedures and waste reduction plan requirements for legislative implementation of a new licensing system in industry/commerce.
3. Set up and adequately resource a prevention-focused technical support agency for Ireland.
4. Develop and implement, in conjunction with other relevant organisations, a training programme for business and public bodies.
5. Set up and adequately resource a long-term and major waste prevention research programme incorporating subjects such as those recommended in this study.
6. Build upon the detailed information collected by the National Waste Database scheme by co-ordinating with other EPA departments, the DoELG, local authorities and business in order to compile an accurate data collection programme for Ireland regarding material flow and waste.
7. Advise and liaise with the DoELG and other relevant departments regarding prevention elements

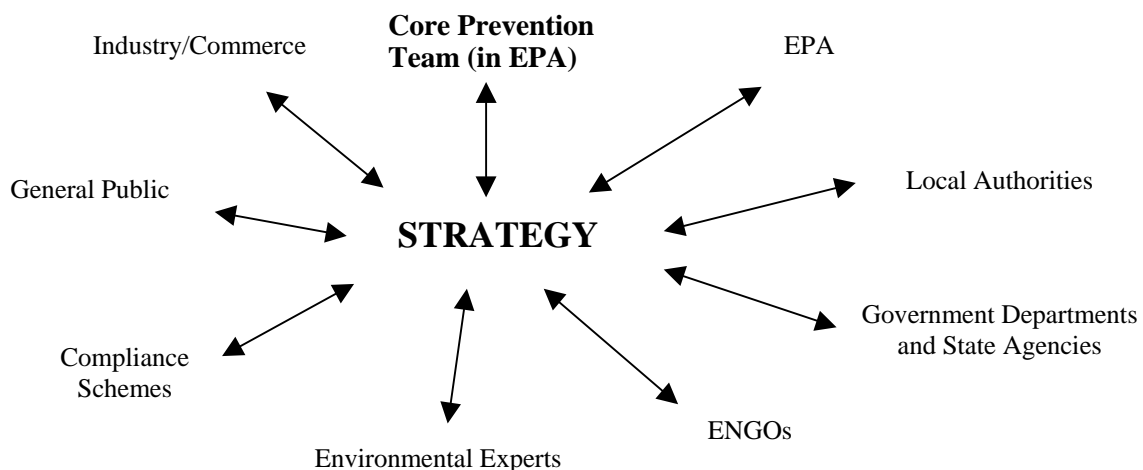


Figure 8.1. Main actors in waste prevention strategy.

of green procurement procedures, economic taxes and charges, producer responsibility programmes, economic support systems, compliance schemes, and regulatory issues.

8. Develop a comprehensive waste prevention awareness campaign, in co-operation with other programmes by the DoELG and others.
9. In co-operation with the DoELG, develop environmental grant programmes to support new innovations and better performance.
10. Assess the waste prevention strategy on an annual basis with full overall reviews every 5 years.

EPA

As well as its involvement through the CPT, the EPA should also seriously consider for implementation:

11. Continued enforcement of IPC licensing, waste permits, landfills, etc. to a high standard.
12. Continued monitoring of the environmental situation in Ireland.
13. Setting up and developing an enforcement system for new auditing and waste prevention plan legislation.
14. Liaison between other EPA departments and the CPT.

Local Authorities

Local authorities should seriously consider the following actions, developing further those that have already been initiated:

15. Prioritise environmental issues, waste prevention in particular, in the functioning of local authorities.
16. Allocate increased and adequate resources to environment departments within authorities, including training and education programmes.
17. Develop new local/regional waste management plans with greater emphasis on waste prevention than on recycling and disposal, involving a high level of public participation.
18. Train and educate local authority staff regarding

waste prevention and other environmental issues.

19. Develop and implement green procurement policies including consideration of the environmental behaviour of suppliers.
20. Full waste prevention audit and waste prevention plans to be put in place in all local authorities.
21. Develop a high level of engagement with local business and support for local business to reduce waste.
22. Develop better and more prevention-focused awareness raising programmes for domestic and business consumers in regions, with dedicated and well-trained staff.
23. Implement enforced waste separation systems for domestic and commercial waste in their regions.
24. Implement separate waste collection programmes in their regions.
25. Implement volume/weight-related domestic charges.
26. Maintain landfill charges at their current punitive levels in their regions.
27. Undertake public-private partnerships with appropriate business interests in order to develop a waste management infrastructure.
28. Implement current and future waste-related legislation, in particular the Waste Management Act 1996, Waste Management (Amendment) Act 2001, Waste Management (Packaging) Regulations 1997 and Waste Management (Packaging) (Amendment) Regulations 1998.
29. Investigate new and innovative waste prevention activities in society through pilot programmes and engagement with environmental experts.

ENGOS

ENGOS are a major stakeholder group regarding environmental protection and should seriously consider the following actions to support waste prevention:

30. Become involved in waste prevention related

actions at a local level.

31. Actively support and take a role in the implementation of the waste prevention strategy.
32. Increase interaction with local authorities and in the development of local/waste management plans.
33. Increase public awareness regarding waste prevention through campaigns and other activities.
34. Continue to vigorously campaign for better policies and behaviour in other stakeholders, highlighting the potential for future improvements.

Government Departments and State Agencies

National government should seriously consider the following actions to protect the environment and support a waste prevention strategy:

35. Prioritise environmental issues and waste prevention to the highest level.
36. Allocate to the DoELG the resources and personnel required to meet Irish international obligations and develop policies and programmes to protect the Irish environment.
37. Immediately set up and adequately fund the CPT within the EPA in order to develop a national waste prevention strategy.
38. In co-operation with the CPT, implement legislation required to develop auditing and waste prevention plans in industry/commerce as well as government bodies and agencies.
39. In co-operation with the CPT, develop and set up further environmental taxes and charges on products and waste.
40. In co-operation with the CPT, develop and implement environmental grant programmes to support innovative solutions and waste prevention projects.
41. In co-operation with the CPT and relevant groups (such as REPAK), extend current compliance programmes to include prevention requirements.
42. In co-operation with the CPT and relevant groups,

develop and implement new producer responsibility programmes, agreements and compliance schemes, with a focus on reducing unnecessary raw material consumption and higher levels of prevention, for streams such as plastic packaging, newsprint, office paper, hazardous materials, etc.

43. Further develop ENFO's *It's Easy to Make a Difference* awareness raising campaign incorporating some of the elements described in this study.
44. In co-operation with the CPT, develop and implement further waste prevention related legislation, such as product bans or restrictions.
45. All government departments, agencies and public bodies to carry out internal audits and set up waste prevention programmes.
46. All government departments, agencies and public bodies to develop and implement green procurement policies, including issues relating to environmental performance of suppliers.
47. The DoELG, in co-operation with the CPT, to develop and distribute guidelines regarding green procurement policies for public agencies.
48. The Department of Education and Science, in co-operation with the DoELG, to develop sustainable development related curricula for primary, post-primary and tertiary school systems.
49. All public servants to receive relevant environment and waste prevention related training and information.
50. Streamline planning legislation with a view to developing a waste prevention and recovery-based infrastructure.

Environmental Experts

Environmental experts should be facilitated to undertake the following actions:

51. Carry out waste prevention related research and widely disseminate results.
52. Develop training programmes for business and other

stakeholders.

53. Develop best-practice guidelines to support waste prevention activities for the public, business and public bodies.
54. Support and advise the CPT in the development and implementation of a waste prevention strategy.
55. Advise and assist local authorities in the development of local/regional waste management plans, public-private partnerships, and pilot projects.
56. Co-operate with other stakeholders to increase the knowledge base.

Compliance Schemes

Compliance schemes (involving suitable business interests) should ensure that participants seriously consider the following actions:

57. Engage with the CPT and the DoELG in order to create schemes to reduce waste.
58. Engage with environmental experts to develop new and innovative methods of reducing material intensity per service (MIPS) and thus reduce waste.
59. Through engagement with suppliers and distributors of products and the general public, devise deposit, bring-back and reuse schemes to prevent waste.
60. Facilitate training programmes for relevant sectors to reduce waste.
61. Raise waste awareness in client companies and clients along the product chain.
62. Carry out research and best practice on production/distribution/warehousing operations.
63. Disseminate results of research on best practice to the relevant sectoral groups.

General Public

The general public must play its role and seriously consider the following actions:

64. Reduce its environmental impact by minimising its consumption of raw materials and preventing waste, maximising recycling and responsibly disposing of residual waste.
65. Inform itself as to the best options regarding prevention and become aware of the main environmental issues of concern.
66. Become involved in local or national ENGOs and other groups and campaign for more responsible behaviour in other stakeholders.

Industry/Commerce

The following actions should be seriously considered by business and industrial organisations:

67. Carry out a waste prevention audit and implement a suitable waste prevention programme.
68. Develop green procurement policies whereby suppliers are also required to behave responsibly regarding the environment.
69. Accept and become active in producer responsibility programmes and relevant compliance schemes.
70. Engage with local authorities and, when appropriate, the EPA to ensure legal compliance and best practice.
71. Engage with the environmental technical information agency to ensure awareness of best-practice guidelines and relevant information.
72. Train and educate staff regarding environmental performance.
73. Engage with environmental experts to develop new and innovative methods of waste prevention.
74. Inform and raise awareness in customers and consumers about best practice and most appropriate consumer options.
75. Engage with local communities and other relevant stakeholders to develop a more participatory approach.

9 Priority Tasks

While all the above actions are necessary as part of a long-term and effective strategy, as a matter of priority, the following ten measures are urgently required to accelerate change, begin the process of decoupling waste from economic growth and reverse current trends. These are:

1. Prioritisation of waste generation and material consumption issues in national government, local government, industry/commerce and among the general public.
2. Allocation of resources for an adequate response to the current persistent increases in the quantity and harmfulness of waste arisings.
3. Immediate setting up of a Core Prevention Team within the EPA, with support from a Prevention Programme Steering Group, and adequate resources to develop and implement a comprehensive and effective strategy.
4. Development of a waste prevention strategy for Ireland, incorporating the framework elements, instruments and actions outlined in this study.
5. Development of criteria for a waste prevention audit and waste reduction plan to be a requirement of Irish business and state agencies through regulation. Such regulation to be developed and implemented in the near future, incorporating green procurement.
6. Immediate setting up of a system of differentiated charges based on volume/weight for separately collected and treated waste, supported by the adoption of implementing regulations and a well-resourced dedicated enforcement regime.
7. Setting up a technical support service designed to provide information regarding waste prevention to Irish businesses, develop sectoral and other guidelines, carry out research, and implement training programmes for businesses and state agencies.
8. Local authorities to take account of the preventive knowledge and experience accumulated by the Environmental Education Officers, the Government Policy Statement *Preventing and Recycling Waste – Delivering Change*, the recommendations contained within this study, the National Waste Database Reports, the outputs from the National Waste Prevention Programme and any other initiatives when the time comes to review their Waste Management Plans, and thereby incorporate appropriate prevention initiatives within local/regional-level action.
9. Implementation of a series of environmental charges and levies (building upon the plastic bag and landfill levies) on products and waste, implementing the ‘polluter pays principle’, and generating resources to co-fund the strategy in the longer term.
10. Development of a long-term and well-resourced research programme regarding materials and waste data acquisition, as well as several other critical issues.

These ten priority actions are required to ensure the accelerated implementation of a prevention strategy and to provide early successes and results. However, in the medium to long-term, all framework elements, instruments and actions described in this study should be considered in order to ensure that Ireland develops in a sustainable manner, providing a healthy environment and a strong economy for future generations.

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