

SUMMARY

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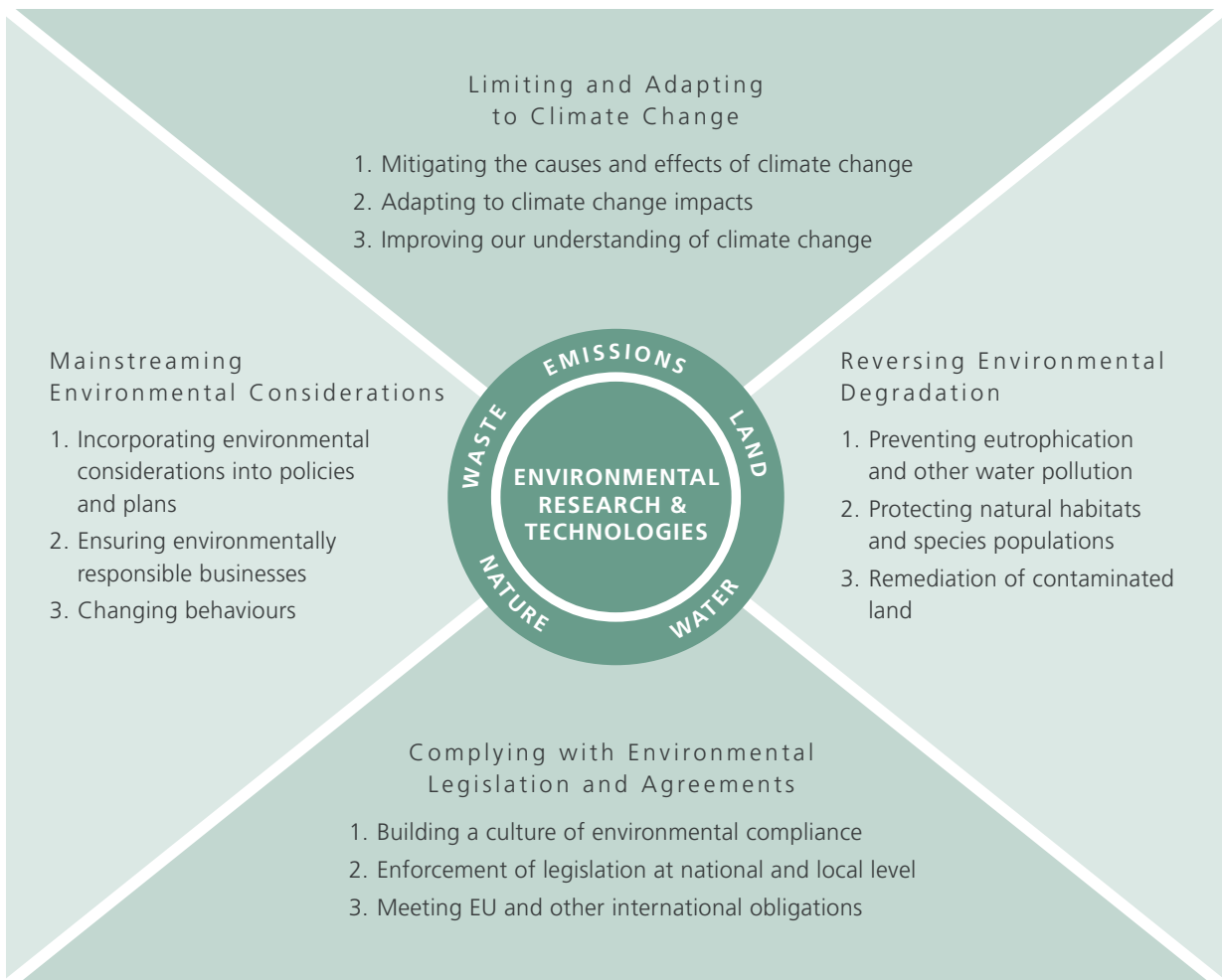
Ireland's Environment 2008, the Environmental Protection Agency's fourth state of the environment report, provides an overall assessment of Ireland's environment. It reviews the quality of all aspects of the natural environment, identifies environmental pressures, and provides an assessment of the impacts and potential responses. The overall conclusion of the report is that the quality of Ireland's environment is relatively good but that there are some key environmental challenges facing Ireland resulting from the major economic, social and demographic changes that have occurred in

recent years. In addition, analysis of likely future developments across all sectors of the economy suggests that pressure on environmental quality will continue to build over the next two decades.

Main Challenges

There are four priority challenges for the environment: limiting and adapting to climate change; reversing environmental degradation; mainstreaming environmental considerations; and complying with environmental legislation and agreements. These four challenges, illustrated in Figure 1, are outlined below.

Figure 1 Main Environmental Challenges



Limiting and Adapting to Climate Change

Climate change is recognised as the greatest threat to the planet and the greatest challenge facing humanity. The challenges for Ireland are similar to elsewhere. The first challenge is to achieve significant reductions in emissions of greenhouse gases in the period up to 2020 and beyond. The second is to minimise the impacts of climate change in Ireland. Finally, to achieve an improved understanding of climate change, the challenges it poses for this country and how these can be met.

Ireland faces a significant challenge to meet its targets both under the Kyoto Protocol in the period 2008–2012 and under the EU burden-sharing target for 2020 and beyond. Current projections show that even if all anticipated reductions from existing and planned policies and measures are delivered, Ireland will still exceed its Kyoto Protocol limit. Ireland needs to reduce its dependence on fossil fuels and at the same time ensure that significant increases are made both in energy efficiency and in the use of alternative energy sources such as wind, ocean and biomass. To achieve the 2020 target will require radical changes to current practices in all economic sectors, particularly those in energy and transport.

The nature of climate change means that even if greenhouse gas levels were reduced now, some climate change impacts are unavoidable. Responding to the impacts of climate change will require a concerted series of adaptation measures. A greater frequency of flooding events and drought periods is among the anticipated impacts of climate change. Future investment decisions at national, regional and local levels must incorporate adaptation measures, addressing flood prevention and control as well as greater management of water resources (e.g. for drinking water supplies).

Underpinning the country's ability to implement measures to limit and adapt to climate change effectively is an improved understanding of climate change. Continued research is required to understand better how Ireland's climate will change, its impact on business (e.g. agriculture) and society generally, developing innovative technologies for reducing emissions and in particular, producing energy from low emission sources as well as devising climate-proofed planning and public policy measures.

Reversing Environmental Degradation

On balance environmental quality in Ireland is relatively good, but there are two primary areas where unsatisfactory conditions are extensive – eutrophication and other water pollution; and the unsatisfactory conservation status of natural habitats and species. Remediation of contaminated land is also an important issue.

Almost 29 per cent of surveyed river channel has unsatisfactory water quality. Some 11 per cent is moderately or seriously polluted. A number of major estuaries, predominantly in the south-east and south of the country, persistently display symptoms of nutrient enrichment. Water quality in 66 lakes, or 15 per cent of lakes assessed, is also unsatisfactory. In addition, there are elevated nitrate concentrations in groundwater in the east and south-east of the country and elevated phosphate concentrations in the west of the country. Most of the pollution is characterised by eutrophication and attributed to a number of causes including municipal, agricultural and other sources (industry, forestry, etc). To enable these water bodies to achieve a satisfactory quality status, as required by the EU Water Framework Directive, more focused efforts are now required and water must be managed as a key resource. For instance, environmental quality standards, which set limits on pollutants in the aquatic environment, must be fully complied with. Discharges to water must be controlled and incidences of pollution accurately tracked back to their source and tackled. The Nitrates Action Plan must be fully implemented to tackle pollution from diffuse agricultural sources, while development planning must be closely linked with appropriate provision of sewage treatment facilities and of safe drinking water.

Many of Ireland's most important habitats afforded protection under the EU Habitats Directive have recently been assessed as having bad conservation status, including dune systems, raised and blanket bogs, natural grasslands and woodlands. Certain species, particularly those of wetland and aquatic environments, such as the Atlantic salmon, the otter and freshwater pearl mussel, are considered to be of poor conservation status. Furthermore, many commercially important salt-water fish species are heavily exploited, to the extent that it is estimated that as

much as 75 per cent of stocks are being harvested beyond safe biological limits. Biodiversity loss is a serious threat to the quality of Ireland's environment because habitat degradation and loss of species are often irreversible. Among the key threats to biodiversity are direct habitat damage, water pollution, unsustainable exploitation, and recreational pressure. Proactive management and protection of important habitat sites is required to redress poor conservation status assessments. The designation of an adequate number of protected sites must be finalised and site management plans with clear conservation targets implemented as a matter of urgency. Improved coherence is also required at national level between various plans and programmes affecting biodiversity (e.g. forestry, agriculture, climate change, fisheries), and decision-making at regional and local levels must be consistent with high-level commitments for biodiversity. Much remains to be done to raise both the awareness and the importance of Ireland's biodiversity, including the provision of baseline and current information on the distribution and abundance of species and habitats.

Contaminated sites in Ireland include disused landfills, abandoned mines and sites of old industrial activities such as steel or gas works. The EPA has estimated that there are between 1,980 and 2,300 sites where there is the potential for soil and/or groundwater contamination, but the actual number is unknown as there is currently no national inventory. While two national initiatives are under way to establish inventories for historic mines and unregulated waste disposal sites, there is no overall policy framework for the identification, management and remediation of contaminated land in Ireland. National legislation dealing specifically with soil contamination needs to be developed, including a mechanism for remediation of sites.

Mainstreaming Environmental Considerations

Within the context of sustainable development, economic well-being is intrinsically linked to a clean and protected environment. While there has been much progress in integrating environmental issues into economic and social policy areas, much remains to be done. Policies and plans relating to a wide range of issues (industrial development, housing, planning, agriculture, fisheries, energy, transport,

etc.) have the potential to impact the environment either directly or indirectly, and accordingly, all policies and plans should be appropriately proofed for their impact on the environment. The EU Strategic Environmental Assessment (SEA) Directive is aimed at assessing the environmental effects of plans and programmes in sectors such as forestry, fisheries, transport, energy, tourism, and land-use planning. While many of the sectors are now beginning to address the requirements of the SEA Directive, some have yet to engage fully. It is notable that no enforcement powers are assigned to the statutory environmental authorities to require plan/programme makers to undertake an SEA. Furthermore, the provision and maintenance of sufficient infrastructure in the areas of sustainable transport, renewable energy, wastewater treatment, waste management, and flood prevention and control is critical for sustainable development.

Businesses, and their representative bodies, must also take greater responsibility for their environmental performance. While individual businesses are increasingly becoming aware that good environmental practice is financially and competitively advantageous, there is less awareness that the economic vibrancy of several sectors of the economy is closely intertwined with Ireland's clean and green image (e.g. tourism, food sectors), and furthermore, that the cumulative impact of small, medium and large enterprises' environmental performance on environmental quality is very substantial. Business representative bodies have an important leadership role to play in increasing awareness of economic benefits of good environmental performance, including encouraging participation in several initiatives currently under way to help businesses produce goods and services in more environmentally friendly ways (e.g. the EPA's Green Business Initiative and Cleaner Greener Production Programme).

Responsibility for environmental issues is not the preserve of governmental bodies; it is a responsibility shared with every member of society. Everyday decisions by individuals can contribute either to environmental degradation (biodiversity loss, pollution, waste, etc) or to its protection and enhancement. Current levels of resource use, in particular energy and water, are at unsustainable levels, and the volume of waste being generated is continuing to escalate. Individual behaviours must change if a more sustainable style of living is to be attained. Some progress has been achieved,

for example in waste recycling, but there is still considerable scope for improvement with regard to energy use, for transport and heating, in the conservation of water, and in waste prevention and management.

Complying with Environmental Legislation and Agreements

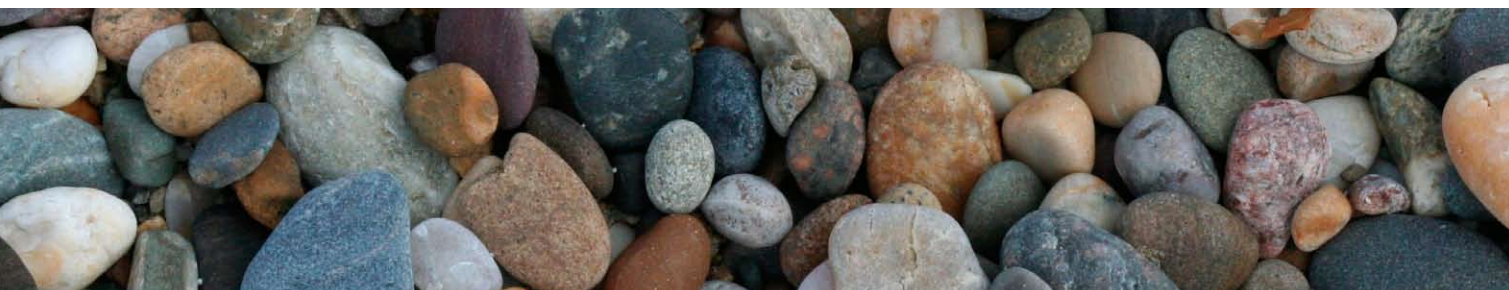
Ireland needs to develop a strong culture of compliance with environmental legislation. Environmental licensing and enforcement and the achievement of good environmental status are often viewed as an unnecessary regulatory burden. However, such regulation is necessary to ensure a high-quality environment. While state bodies and local authorities must be proactive guardians and stewards of the environment, all of the business representative organisations also need to encourage an increased culture of environmental compliance. Likewise, all of Ireland's citizens need to become more environmentally conscious and compliant with environmental laws, as there is still a substantial minority taking part in illegal activities such as littering, fly-tipping and backyard burning of household waste.

There is also a continuing need for a higher and more consistent standard of enforcement of all environmental legislation at national and local levels to ensure that the 'polluter pays' principle applies and that those who flout environmental laws are made to pay for their actions. Liabilities for enforcement and pollution remediation costs, which can run into millions of euro, are also an increasing deterrent to would-be polluters.

Ireland faces a difficult challenge in meeting many of its environmental protection obligations under both European legislation and other internationally binding legal agreements. Failure to deliver on our international environmental obligations in itself is an indication of a lack of commitment to the environment and may impinge on Ireland's image as a country with a high-

quality environment. Financial penalties are a potential consequence of failing to meet our environmental protection commitments, which would directly limit our ability to pay for environmental protection and other productive measures and place Ireland in the undesirable position of being one of only a few EU countries penalised with environmental fines. Environmental policy obligations include commitments on waste, nature, water and air emissions, and those that pose the most substantial challenges include the following.

- To prevent the deterioration of water quality in any water body and to achieve 'good' status or higher for all water bodies by 2015 under the Water Framework Directive.
- Under the Kyoto Protocol to the UNFCCC, to reduce greenhouse gas emissions to 13 per cent over 1990 levels over the period 2008–2012, corresponding to average limit of 62.8 Mt CO₂e annually.
- Under the European Commission's 'Climate Action and Renewable Energy Package', to reduce greenhouse gas emissions by 20 per cent in 2020 relative to 2005 levels (equivalent to a target of 37.9 Mt CO₂e total emissions). If an international agreement is achieved, further reductions, up to 30 per cent, will be required.
- Under the Habitats and Birds Directives, to fulfil Ireland's obligations on the designation, classification, management and protection of sites.
- Under the National Emissions Ceiling Directive, to achieve the emissions reductions targets for transboundary gases, particularly with respect to nitrogen oxides (NO_x) emissions.
- Under the EU Landfill Directive, progressively to reduce biodegradable municipal waste disposed in landfill to achieve a maximum of 451,000 tonnes landfilled by 2016.



Environmental Quality and Recent Trends

Detailed assessments of all the environmental media were undertaken and specific challenges for each environmental issue are discussed in the individual chapters. The four main environmental challenges for Ireland, as discussed above, are based on a wide-ranging evidence-based assessment of the quality of the Irish environment, the identification of the pressures being exerted on it and the responses that are considered necessary. A brief synopsis of environmental quality and of some further issues is outlined below.

Air Quality

Air quality in Ireland is generally of a high standard across the country. Due to the prevailing Atlantic air flows, the relatively few large cities, and the lack of widespread heavy industry, Ireland is one of the few countries in the EU to have no exceedances of any ambient air quality limit values in recent years. However, there is no room for complacency. Within urban areas the main threat to air quality is emissions of particulate matter and nitrogen oxides arising primarily from vehicles. Cleaner vehicle emissions technology has curbed individual transport emissions in recent years, but the growth in the number and size of vehicles has offset any cumulative benefits for air quality. The control of transport air emissions, against a strong upward trend in vehicle numbers in Ireland, will continue to be a key issue for Ireland.

Air Emissions

Ireland's performance on air emissions compared to EU emission targets is mixed. For example, reductions in emissions of sulphur dioxide, volatile organic compounds and ammonia – all transboundary air pollutants known as acidifying gases – are expected to achieve prescribed targets. The improved emissions performance is due to the combination of environmental policy and technological improvements (e.g. catalyst controls in transport emissions, flue gas desulphurisation in power generation). European agricultural policy reform has also contributed to air emissions performance, as the reduction in ammonia emissions is directly linked to the decline in cattle numbers rather than any specific measure to control

emissions. The performance with NO_x, as noted above, is less encouraging as emissions are anticipated to remain considerably above the 2010 National Emissions Ceiling Directive target level. The principal sources of NO_x emissions are power generation plants and motor vehicles, both areas with strong recent growth and limited large-scale alternatives in the short term.

Noteworthy progress has been made in decoupling greenhouse gas emissions from economic activity, with emissions per unit value of gross output currently half its 1990 level. However, as noted earlier reducing greenhouse gas emissions is a significant environmental challenge in the context of limiting and adapting to climate change.

Water

As noted earlier, remediation of unsatisfactory quality in groundwater, rivers, lakes and estuaries, is one of the main environmental challenges.

The Water Framework Directive (WFD) marks a new approach for the protection and improvement of water resources. Commencing in 2009, a six-year cycle of river basin management plans will be implemented for the purpose of protecting and enhancing all waters – groundwater, rivers, lakes, transitional waters (estuaries) and coastal waters – including protection for related terrestrial ecosystems and wetlands.

Waste and Resource Use

Waste generation and resource use have increased considerably in recent years and are at unsustainably high levels. The increased use of materials (for consumer goods, packaging, etc.) inevitably leads to the increased generation of waste. For example, the growth in municipal waste generation in recent years closely matches growth in GDP and personal consumption. The EPA's National Waste Prevention Programme has developed a number of initiatives to prevent waste occurring both within the home and in business. An extensive network of civic amenity and bring-bank sites have facilitated greater levels of recycling. Over 2 million tonnes of material was sent for recycling either in Ireland or abroad during 2006. The improved recycling performance has moved Ireland

away from a position of almost total reliance on landfill for managing waste. Nevertheless, landfill remains the primary option used for municipal waste management. By 2016 Ireland is required to reduce its landfill of biodegradable municipal waste to 35 per cent of the amount produced in 1995. With the latest data for 2006 showing almost 68 per cent of such waste being sent to landfill, this target is a considerable challenge for Ireland.

Anticipated growth rates for waste generation are very high. It is expected that municipal waste will double within 20 years, driven by a growing population, more households and greater levels of consumption. Municipal waste per person is anticipated to increase from 840 kg in 2006 to approximately 1,300 kg by 2025. Average annual growth rates of up to 4 per cent per annum in a range of waste streams will create significant pressures on waste management infrastructures, especially in relation to hazardous waste and biodegradable waste, where major infrastructure deficiencies already exist.

Land Use

Ireland has experienced a relatively high rate of land use change by European standards since the early 1990s. For example, the area under forestry has increased by a quarter to 10 per cent of national land cover since 2000, and the area of artificial surfaces (pavement, buildings, etc.) increased by approximately one-fifth between 2000 and 2006. Housing development on the peripheries of urban areas is associated with increases in commuting distances, travel times and emissions of pollutants to air. Similarly, rural areas have experienced widespread construction of single rural dwellings and the suburbanisation of villages close to towns and cities without full infrastructure requirements being developed for waste, wastewater, drinking water, and transport. Over 60 per cent of the land in Ireland is devoted to agricultural activities, which are predominantly extensive and grass-based. The most notable trends in agricultural land use are the increase in land devoted to silage production and, since 2004, the more than doubling of land devoted to biofuel crop production.

Soil

Our maritime climate, predominance of permanent grassland, sustainable land management practices and lack of historic industrialisation have contributed to the maintenance and protection of soil quality across the country. The general consensus is that soil quality in Ireland is good but there is limited information on which to confirm this assessment. Though there were relatively few pressures on soils historically, there is a range of pressures threatening contamination of soils today. As noted earlier, upwards of 2,300 commercial sites are estimated to have the potential for soil and/or groundwater contamination, such as sites used for petroleum storage, gas works, tanneries, and timber treatment.

Diffuse contamination of soil potentially arises from a range of land-based activities including fertiliser, pesticide and sewage sludge application, or from atmospheric deposition from industry, transport, households and agriculture, all requiring careful management. For instance, based on available information approximately 15 per cent of Irish soils exceed threshold levels for cadmium and 23 per cent for nickel, therefore the application of sewage sludge to land, which is potentially one of the prime sources of heavy metal inputs into soil, must be carefully managed. The contamination of soil threatens its functionality, which includes its use as a growing medium, its ability to regulate and control water flows, its ability to filter and assimilate certain potential pollutants, as well as the storage of nutrients.

To ensure that soil is adequately protected, the following actions are necessary: to develop a comprehensive national soil map with associated physical and chemical data; to undertake a critical assessment of the state of Irish soils; to develop a soil monitoring network; and to develop a management framework for remediation of contaminated soils. Soils need to be afforded the same level of protection as air and water, to which they are intrinsically connected.

Chemicals and Radiation in the Environment

An area of growing concern is the presence of chemicals in the environment. A range of chemical substances, such as persistent organic pollutants (POPs), polychlorinated biphenyls (PCBs), endocrine-disrupting chemicals (EDCs), dioxins, furans, and pesticides has the potential to cause damage to human health and the environment when released. Monitoring surveys for dioxins, for example, have demonstrated their ubiquitous presence in the environment but concentrations are low by comparison with those in other European countries. Monitoring in the vicinity of industrial facilities, in particular those that may have the potential to release dioxins, show levels to be generally very low and well within limits. A number of internationally binding legal instruments govern the management of these chemicals, whereas REACH, the new EU chemicals regulation, aims to streamline and improve the chemicals legislative framework.

Radioactivity in the Irish environment is very low, with most of it occurring naturally – for example, from radon gas that originates from the decay of uranium in rocks and soils. The consumption of fish and shellfish from the Irish Sea is the dominant pathway by which man-made radioactive contamination results in radiation exposure of the Irish population, but the exposure is very small compared to naturally occurring radiation in seafood.

In Conclusion

Ireland's environment remains of generally good quality, though it is subject to potentially damaging pressures from a range of activities. As a result of continued economic development and changing consumer patterns these pressures have grown significantly over the past decade, often at a rate that exceeds that observed in other EU countries. As a result there are a number of key environmental challenges facing Ireland in the coming years: limiting and adapting to climate change; reversing environmental degradation; mainstreaming environmental considerations; and complying with environmental legislation and agreements.

Developments in science, research and innovation can play an important role in rising to the environmental protection challenges. Quality research provides the foundation for credible decision-making, while technology and innovation provide solutions to environmental problems. In addition to ongoing research in the environmental sciences more research is required to understand better the socio-economic context of environment issues, including behavioural responses, as well as developing environmental scenarios and projections, which will better inform the development of solutions to environmental problems. Due to the complexity of environmental issues, effective environmental policies and solutions must be underpinned by a good knowledge of the science, which is best delivered through a systematic programme of environmental research. The continued strong investment in environmental research is crucial, as today's environmental research will become tomorrow's environmental protection.

The natural environment is a critical national asset and its protection and enhancement benefit both economy and society, now and in the future. Within the context of sustainable development, it is important that the environmental conditions fundamental to the economic and social well-being of future generations not be exhausted or degraded. It is vital that environmental considerations be placed at the heart of policy and decision-making across all economic sectors.