National Audit Office

BRIEFING FOR THE HOUSE OF COMMONS ENVIRONMENTAL AUDIT COMMITTEE

JULY 2010

Environmental protection

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The National Audit Office has prepared this briefing on environmental protection for the new members of the Environmental Audit Committee.

Contents

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Summary

1 The National Audit Office has prepared this briefing on environmental protection for the new members of the Environmental Audit Committee. This document summarises the key environmental protection issues facing the UK. We have prepared a separate briefing for the Committee covering sustainable development issues more broadly.

2 The environment is a complex ecosystem of inter-related parts including air, water and soil. This briefing addresses 10 areas: atmospheric pollution and climate change; air pollution; biodiversity; forestry; soil; flooding and coastal protection; waste; the freshwater environment; water availability; and the marine environment. The chosen areas are interrelated. For example, atmospheric pollution is thought to lead to climate change, and drier summers and wetter winters, which in turn may lead to more soil erosion and river pollution due to soil deposited in watercourses. Increased river pollution potentially reduces the amount of clean fresh water available for natural habitats and makes it harder for freshwater fish to thrive.

3 We have summarised below the key issues within the 10 environmental protection areas addressed in the brief:

- Scientists consider **climate change** to be under way and caused by increased levels of man-made carbon dioxide and other greenhouse gases (including methane and nitrous oxide) in the atmosphere. The UK is on course to meet its international greenhouse gas emission reduction obligations.
- **Air pollution** has been improving across the UK for a number of years, but the UK has been unable to comply with all the concentration limits and emission targets for particulate matter and nitrogen oxides within the deadlines set by the European Union (EU). The EU did not accept the UK's original request for an extension to the deadline for complying with particulate matter targets, but is reconsidering the request following receipt of further information.
- Following widespread declines in key wildlife groups in the last 30 years, some measures of **biodiversity** are now improving. For example, important improvements have been made to the condition of the UK's Sites of Special Scientific Interest. However, some priority species and habitats continue to decline, and the UK has been unable to meet its original international commitment to arrest biodiversity decline by 2010.

- Key national and international **forestry** objectives are to increase land in England dedicated to forestry, combat diseases suffered by trees, and tackle imports of illegally felled timber into the EU. Forest cover in England is increasing year on year, but the rate of increase is falling.
- The UK needs to maintain and in some cases improve **soil** quality, to ensure that soil continues to provide the food needed and store some 10 billion tonnes of carbon, which if mismanaged, could be lost as carbon dioxide emissions. Threats to soil quality include erosion, compaction, loss of organic matter and historic contamination, which can pose a significant risk to people or the environment.
- Some 5.2 million properties are at risk from **flooding** in England and Wales. The Environment Agency focuses its resources on areas of highest risk, but still estimates the average level of flood damage to properties to be some £1 billion a year.
- Nearly half of all **waste** is sent to landfill. The amount of domestic waste sent to landfill per person has been greater in the UK than many other EU countries. As well as being an inefficient use of resources, landfill is harmful to the environment, especially in terms of greenhouse gas emissions.
- **The freshwater environment** in England has improved over the last 20 years. However, there are still problems with high levels of nitrates, phosphates, sediment and pesticides from agricultural sources and sewage effluents entering rivers and a number of species of fish (such as salmon and eels) are under threat. Some 27 per cent of rivers have a 'good' ecological status, but not all rivers are expected to meet EU Directive quality standards by 2015.
- A number of areas in England and Wales face pressure on **water availability**. Increasing problems are forecast with a warmer climate and increases in the population.

- Climate change and over-fishing are having an adverse impact on **the marine environment**. Increased water temperatures are inducing fish to migrate north of the UK into colder waters, and ocean acidity levels have risen to their highest levels in the last 200 years, making it harder for fish to thrive. Only 50 per cent of the different fish stocks living in UK waters are fished sustainably.

4 There are two broad ways in which the Committee might choose to address environmental protection issues:

- An enquiry could focus on one of the environmental protection areas listed above. The Committee has covered some of these issues before, such as air quality, biodiversity, forestry, or climate change. In these cases, the Committee may wish to follow up its previous coverage to assess the current position. Other areas have not been covered to the same extent, such as water related issues, over-fishing or soil. An enquiry focusing on a particular issue could cover links with other related areas of environmental protection.

- Alternatively an enquiry could focus on a particular type of approach to the protection of the environment. The Committee may wish to continue its previous interest in the Government's success in increasing environmental taxes' contribution to the tax base whilst making polluters pay. It may wish to focus on other types of measures, including consideration of regulations and their compliance and enforcement costs and delivery of intended benefits. A number of initiatives are currently under way that aim to understand and shape the way the Government and society respond to the challenge of environmental protection in terms of climate change, financial constraints, and increasing demand for natural resources. Current initiatives include the National Ecosystem Assessment, the proposed Natural Environment White Paper, and new biodiversity targets. The Committee could build on this work to identify key areas that should receive priority and define its focus.

Part One

Introduction

1.1 The National Audit Office has prepared this briefing on environmental protection for the new members of the Environmental Audit Committee. The document summarises the key environmental protection issues and government performance in addressing them. This part of the briefing sets out the broad environmental protection aims of government.

What are the Government's environmental protection aims?

1.2 Environmental protection refers to the practice of maintaining, or restoring, the range of natural resources – such as plants, animals and fish, water, soil and the air – by preventing degradation and preserving diversity.

1.3 The approaches to environmental protection in England are determined, in part, by agreements and conventions at a global level, in part by European legislation and ultimately by UK law. For example, in relation to climate change, the Kyoto Protocol was adopted in 1997 under the UN Framework Convention on Climate Change and set binding targets to reduce greenhouse gas emissions. In 2002, the European Council approved the Kyoto Protocol and in 2004 the EU established a mechanism for monitoring community greenhouse gas emissions and for implementing the Kyoto Protocol. This led to relevant UK legislation, including the Climate Change Act in 2008, which established the world's first long term legally binding framework to tackle climate change.

1.4 Environmental protection is a key part of the Government's drive for sustainable development. Sustainable development seeks to balance economic and social needs with those of the environment, for the benefit of current and future generations. Achieving sustainable development requires balancing the competing demands of the environment, the economy and society. The UK's 2005 Sustainable Development Strategy sought to focus more explicitly than previous UK Sustainable Development Strategies on living within environmental limits. In particular, the Strategy stated that the key issues were: the need for better understanding of environmental limits; the need for environmental enhancement where the environment is most degraded to ensure a decent environment for everyone; and the need for a more integrated policy framework to deliver this.[1]

1 UK Government, *Securing the future: delivering the UK Sustainable Development Strategy*, March 2005.

1.5 Environmental protection can support progress towards sustainable development through: minimisation of the depletion of natural resources; conserving biodiversity; preventing pollution; and ensuring that services that the earth's ecosystems provide (such as raw materials or water purification) are protected (or enhanced). Although environmental protection and conservation are necessary for achieving sustainable development they are not sufficient, since a healthy environment does not necessarily mean a prosperous society or a healthy economy. This briefing on environmental protection accompanies a separate document for the Environmental Audit Committee covering sustainable development issues more broadly.

1.6 In England, the Department for Environment, Food and Rural Affairs (the Department) is responsible for environmental protection. The Department led on the delivery of Public Service Agreement (PSA) 28 over the spending review period 2008-11, working in partnership with other government departments, such as the Department for Communities and Local Government and the Department for Transport. This PSA sought to secure a diverse, healthy and resilient natural environment (providing the basis for everyone's well-being, health and prosperity now and in the future) where the value of the services provided by the natural environment is reflected in decision-making. The main indicators for PSA 28 are shown in **Figure 1**.

1.7 The new Government announced in June 2010 that it would end the system of Public Service Agreements and consider the best structures for ensuring departments' accountability.[2] These will include the publication of departmental business plans, the resources for each department, key statistics and data. This information is intended to allow departments to be held to account for spending money efficiently and effectively. It is not yet clear how environmental protection will be considered in any new system for holding departments to account.

Figure 1
Indicators for Public Service Agreement 28 on the natural environment

Water quality is measured by the Water Framework Directive in terms of water body status indicators.

Biodiversity is indicated by changes in wild breeding bird populations in England, as a proxy for the health of wider biodiversity.

Air quality is judged by meeting the Air Quality Strategy objectives for eight air pollutants, illustrated by trends in measurements of two of the more important pollutants which affect public health and covered by the Strategy: particulate matter and nitrogen dioxide.

Marine health is considered in terms of clean, healthy, safe, productive and biologically diverse oceans and seas as indicated by proxy measurements of fish stocks, sea pollution and plankton status.

Land management is considered in terms of its contribution to the natural environment as measured by the positive and negative impacts of farming.

Source: Department for Environment, Food and Rural Affairs, *PSA Delivery Agreement 28: secure a healthy natural environment for today and the future*

2 HM Treasury, *The Spending Review Framework*, June 2010.

1.8 A number of other departments and agencies also play an important part in environmental protection. **Figure 2** sets out the main responsibilities for environmental protection across central government in England. Responsibilities in Scotland, Wales and Northern Ireland rest with the relevant devolved administrations.

Figure 2

Key government bodies responsible for delivering environmental protection in England

Key English public sector delivery bodies	Main areas of activity in environmental protection
Department for Environment, Food and Rural Affairs	• Working to adapt to the effects of climate change; • improving air quality; • protecting wildlife; • sustainable management of trees; • protecting soil; • protecting against flooding and coastal erosion; • reducing waste; • improving freshwater availability and quality; • improving the freshwater environment; and • improving the marine environment.
Environment Agency	• Managing energy efficiency and carbon emission reduction schemes; • regulating emissions of pollutants from large industrial installations; • implementing the Water Framework Directive; • constructing and maintaining flood defences; • managing flood and coastal erosion risk; • assessing emergency responses to flood risk; • implementing waste and landfill regulations; • managing and protecting freshwater and migratory fish species in inland waters and up to six nautical miles offshore; and • issuing water abstraction licences.
Natural England	• Protecting biodiversity, soil and water quality (for example, through Sites of Special Scientific Interest and agri-environment schemes).
Forestry Commission	• Leading on domestic forestry policy; • regulating woodland; • maintaining forest and woodland health; and • woodland creation and management.
Marine Management Organisation	• Leading on marine fishing regulation; • planning, licensing, nature conservation; and • protecting the marine environment.
Department for Transport	• Improving air quality through vehicle and fuel standards.

Figure 2 Continued
Key government bodies responsible for delivering environmental protection in England

Key English public sector delivery bodies	Main areas of activity in environmental protection
Department of Energy and Climate Change	• Leading on international commitments for reducing greenhouse gas emissions; • leading UK initiatives for reducing emissions; and • meeting UK Carbon Budgets.
Department for Communities and Local Government	• Dealing with risks to the environment (e.g. climate change, floods and biodiversity loss) through housing standards and planning regulations.
Department of Health	• Protecting health and well-being; and • working alongside other government departments to promote environmental health.
Health Protection Agency	• Seeking to protect the health of the population; and • protecting the population from hazardous materials and chemicals.
HM Treasury	• Setting environmental taxes.

Source: National Audit Office

1.9 The Government recognises that the environment is an interconnected ecosystem in which a change to one part can impact elsewhere. The environment therefore needs to be protected in a holistic way that recognises those interrelationships.[3] For example, atmospheric pollution is thought to lead to climate change, which makes air quality worse as summers get drier and hotter and dry soil is taken up as dust in air. A fall in atmospheric moisture could dry out soil, making it more susceptible to erosion, increasing the risk of flooding. Greater levels of soil runoff increase the chance of contamination of rivers and freshwater supplies which in turn make it harder for freshwater fish to thrive. Warmer summers lead to greater demands for fresh water supplies from populated areas and may reduce the amount of freshwater available for habitats and biodiversity, if those sources are unable to replenish their water levels fast enough.

1.10 During the last two years the Department has sought to encourage group entities (such as the Environment Agency, Natural England and Forestry Commission) to work together and evaluate key priorities using a holistic approach in areas such as water quality, forestry, the marine environment and climate change adaptation. For example, the water availability strategy (Future Water) outlines an integrated approach to sustainable management of water resources by considering together abstraction, drainage, sewage and discharge back to the environment. The Department, with partners, is completing a UK National Ecosystem Assessment, to analyse the natural environment in terms of the benefits it provides to UK society and future economic prosperity, in order to raise awareness of the importance of ecosystems and the services they provide.

3 Department for Environment, Food and Rural Affairs, *Securing a healthy natural environment: An action plan for embedding an ecosystems approach*, November 2007.

1.11 The Department for Environment, Food and Rural Affairs has also worked with other government departments in order to achieve a more holistic approach for cross-departmental policy development with impacts on the environment. It has worked with the Department for Communities and Local Government on eco-town policy (including minimum requirements for biodiversity, green infrastructure and ecosystems mangement) and with the Department for Transport (on incorporating a landscape valuation into its appraisal tools in transport schemes).[4] The new Government announced in June 2010 that it is to produce a White Paper with the aim of taking an integrated approach to the Natural Environment.[5]

1.12 As Figure 2 shows, the various environmental protection bodies in England have interrelated responsibilities and they should, therefore, seek to work together effectively. For example, the Department develops environmental policies, such as for land use and agricultural practices. The Environment Agency (the Agency) regulates pollution in a number of environmental areas, including soil. Natural England's responsibilities include conserving England's woodland biodiversity, whilst the Forestry Commission's work includes protecting Britain's forests, woodlands and wildlife habitats.

Scope and structure of the report

1.13 This brief covers key issues for 10 environmental protection areas entitled: Atmospheric pollution and climate change; Air pollution; Biodiversity; Forestry; Soil; Flooding and coastal protection; Waste; The freshwater environment; Water availability; and The marine environment. Our briefing is structured as follows:

- Part Two provides a high level summary for each main area of environmental protection setting out the main problems and how the UK is performing. A separate Appendix details key parts of the regulatory framework, strategy, targets, performance, stakeholders, policy instruments and future issues.
- Part Three explains government approaches to protecting the environment.

4 Department for Environment, Food and Rural Affairs, *Delivering a healthy natural environment: An update to Securing a healthy natural environment*, February 2010.
5 Hansard written answers, *Commons debates, Richard Benyon MP*, June 2010.

Part Two

Key issues facing the main areas of environmental protection

2.1 This part of the briefing summarises the key issues facing England in relation to environmental protection. The ten areas are entitled:

- Atmospheric pollution and climate change;
- Air pollution;
- Biodiversity;
- Forestry;
- Soil;
- Flooding and coastal protection;
- Waste;
- The freshwater environment;
- Water availability; and
- The marine environment.

Atmospheric pollution and climate change

2.2 **Problem:** The 2009 UK Low Carbon Transition Plan states that if the world continues emitting greenhouse gases such as carbon dioxide at current levels then average global temperatures could rise by up to 6° Celsius by 2100. Climate change may affect the UK by making extreme weather events, like heat-waves, floods and droughts more frequent, harming the economy, society and the environment.[6]

2.3 **Performance:** The UN Framework Convention on Climate Change in 1992 led to the 1997 UN Kyoto Protocol, which set binding targets for 37 industrialised countries, including the UK, to reduce greenhouse gas emissions. The UK's target was to reduce greenhouse gas emissions by 12.5 per cent over the period 2008 to 2012 compared to 1990 levels. An agreement beyond the Protocol is still under negotiation.

2.4 The Climate Change Act 2008 made the UK the first country in the world to set a national legally binding framework to tackle climate change. It established a target to reduce greenhouse gas emissions in 2050 by at least 80 per cent below 1990 levels, with carbon budgets setting the trajectory. The first three carbon budgets were set in May 2009 (**Figure 3**) and the Low Carbon Transition Plan set out how they would be met.

2.5 The European Union (EU) has set up an Emissions Trading System to reduce carbon emissions from electricity generators and large scale industrial emitters. It has set Member States renewable energy targets under which the UK must generate 15 per cent of its energy from renewable sources by 2020. The UK has also established the Carbon Reduction Commitment Energy Efficiency Scheme and a range of energy efficiency measures. The new Government will support an increase in the EU emission reduction target to 30 per cent by 2020. The latest figures from the Department of Energy and Climate Change show UK emissions for 2009 were 8.6 per cent lower than the previous year. In 2009, UK emissions were provisionally estimated to be 26 per cent lower than 1990. In October 2009, the Committee on Climate Change commented that a step change in policy was needed to deliver the UK's future statutory emissions targets.[7]

Figure 3
UK Carbon Emission Budgets (2008 to 2022)

	Budget 1 (2008-2012)	Budget 2 (2013-2017)	Budget 3 (2018-2022)
Budget level ($MtCO_2e$)[1]	3,018	2,782	2,544
Percentage reduction below 1990 levels	22%	28%	34%

NOTE

1 Budgets are in units of metric tonnes of carbon dioxide equivalent ($MtCO_2e$).

Source: HM Government, The Low Carbon Transition Plan, July 2009

6 Department of Energy and Climate Change, *The UK Low Carbon Transition Plan*, July 2009.
7 Committee on Climate Change, *Meeting Carbon Budgets: ensuring a low-carbon economy*, June 2010.

Air pollution

2.6 **Problem:** Airborne pollutants can be harmful to human health and the environment, as the Environmental Audit Committee noted in its 2010 report on air quality.[8] A recent UK Government report estimates that poor air quality reduces life expectancy by around six months averaged over the whole population.[9] The Department leads on improving air quality. It estimated in 2008 that air pollution imposed a cost on society of between £8 billion and £17 billion a year. Pollutants, such as sulphur dioxide and nitrous oxides, also lead to acid rain which can harm biodiversity.

2.7 **Performance:** Since the 1970s, UK air quality has improved as UK and Northern European industrial output and trans-boundary emissions have fallen, and as successive UK and European governments have implemented increasingly tough limits to meet air quality standards and to control road transport emissions.

2.8 The UK is meeting EU limits and UK objectives for benzene, carbon monoxide, lead and 1,3-butadiene. The UK is meeting all EU limits and UK objectives for sulphur dioxide except for one UK objective that is stricter than European limits. The UK is meeting EU limits and UK objectives for particulate matter except in London. The UK is also on track to meet EU limits on total national emissions for volatile organic compounds and ammonia by 2010. The UK is not on track to meet national emission limits for nitrogen oxides by 2010, though the projected breach is small. Nor is it expecting to meet EU targets and UK objectives for ozone and polycyclic aromatic hydrocarbons.

2.9 Road vehicles are the key source of air pollutants (such as nitrogen oxides and particulate matter) in urban areas and responsibility for delivering reductions in emissions from transport lies with the Department for Transport. Measures to tackle both this and climate change together include vehicle fuel emission standards and low-emission zones.

2.10 The air quality challenge presented in Greater London differs considerably from that faced by the rest of the UK. London is a large, densely populated urban area, where the exposure to air pollutants is high due to the sheer size of the city and the significant road traffic congestion. Outside London, the challenge is characterised by small pockets of air pollution, for example along main roads in busy town centres. The EU did not accept the initial UK request for an extension to the timetable for complying with air quality standards for particulate matter in the Greater London area, but the Department reapplied with further evidence in May 2010.

8 Environmental Audit Committee, *Air quality*, March 2010.
9 Department for Environment, Food and Rural Affairs and Devolved Administrations, *Air Pollution: Action in a Changing Climate*, March 2010.

Biodiversity

2.11 **Problem:** Biodiversity is the variety of plant and animal life found on Earth. High levels of biodiversity are linked with human well-being. Biodiversity has been in decline throughout the world in recent years. The main pressures on biodiversity are habitat loss and degradation (primarily from agricultural intensification), inappropriate or inadequate land management, pollution, climate change and invasive non native species. The UK is a party to the 1992 UN Convention on Biological Diversity which aims to reduce the rate of biodiversity loss and a new target is due to be agreed at the 2010 conference for the Convention on Biological Diversity in Nagoya. The EU has already agreed to defer a 2010 target to halt biodiversity loss to 2020.

2.12 **Performance:** The Department seeks to protect UK biodiversity through its Biodiversity Action Plan, the England Biodiversity Strategy, compliance with the Habitats and Water Directives and compliance with domestic nature conservation legislation. UK work is coordinated with the devolved administrations. The Department assesses the state of biodiversity in the UK through 18 indicators, covering 34 component measures, selected from the 390 species and risk areas covered in the Biodiversity Action Plan. Data for 2010 suggest that, across the 34 measures, 15 have improved since 2000; nine have not changed; seven have deteriorated; and three have not been assessed due to a lack of data. Selected measures are illustrated in **Figure 4** for the short term (from 2000 to 2010) and for the long term (earliest available data to 2010).

Figure 4
Selected UK biodiversity performance measures

Indicator	Change since 2000	Long term change
Population of farmland birds	Deteriorating	Deteriorating
Population of water and wetland birds	Little or no change	Deteriorating
Population of seabirds	Deteriorating	Improving
Arable and horticultural land plant diversity	Improving	Improving
Woodland and grassland plant diversity	Deteriorating	Deteriorating
Protected sites	Improving	Improving

Source: Department for Environment, Food and Rural Affairs, *UK Biodiversity Indicators in your pocket,* May 2010

2.13 Key measures to protect biodiversity include basic environmental requirements in subsidy payments to farmers, agri-environment schemes and protection for designated Sites of Special Scientific Interest. A 2008 NAO report, found Natural England had realistic plans in place to meet the target of getting 95 per cent of the land covered by Sites of Special Scientific Interest into favourable or recovering condition by 2010.[10] In 2009, the NAO noted British beekeepers reporting unusually high bee losses in recent years, which could adversely affect pollination of crops.[11]

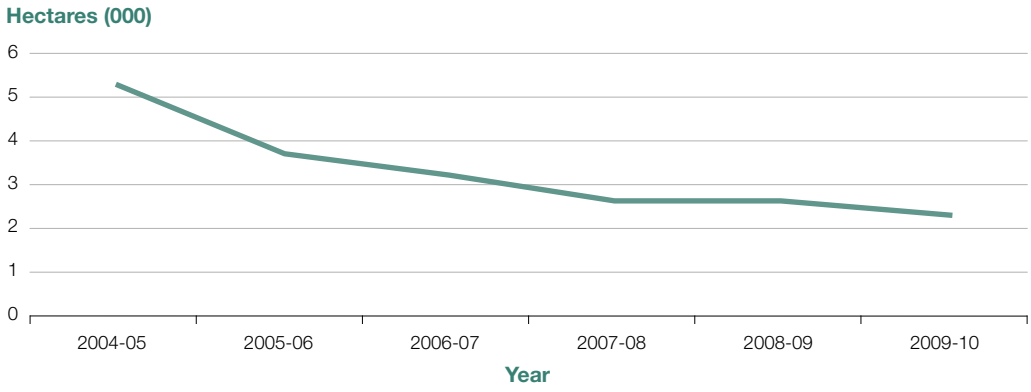
10 National Audit Office, *Natural England's role in Improving Sites of Special Scientific Interest*, November 2008.
11 National Audit Office, *The health of livestock and honeybees in England*, March 2009.

Forestry

2.14 Problem: Woodland covers almost nine per cent of England's land area, just over 1 million hectares with around 1.3 billion trees. Woodland contributes to the economy and people's health and well-being. It also acts as a "sink" to reduce carbon dioxide emissions and their impact on the climate. The Department's 2007 strategy for England's trees stated that woodland management and associated business contributed £2.1 billion to Gross Domestic Product and employed 64,000 people.[12] Recently, England's trees have faced a growing threat from a number of new diseases.[13]

2.15 The Low Carbon Transition Plan suggests an additional 10,000 hectares of woodland a year could remove 50 million tonnes of carbon by 2050. The Forestry Commission (Commission) has set up the Woodland Carbon Task Force to deliver these carbon savings. However, the Commission noted a fall in the amount of English woodland created during 2009-10 to 2,300 hectares (**Figure 5**). The National Forest Company has secured private sector funding for woodland creation.

Figure 5
Tree planting in England from 2004-05 to 2009-10



Source: Forestry Commission and the National Audit Office

2.16 Performance: The Commission and the Department work to promote sustainable forest management internationally. The UK is the world's fifth largest importer of crude wood products and the third largest importer of paper products. In June 2009, the Environmental Audit Committee pressed for international agreement on capacity building and effective governance in rainforest nations; developing countries' growth; development plans to address deforestation; and a ban on imports of illegally felled timber into the EU.[14] In May 2010, a voluntary partnership agreement was reached between developed and developing countries to use $4 billion over the next three years in projects to reduce emissions of carbon dioxide associated with forestry practices in developing countries. The new Government plans to make the import or possession of illegal timber a criminal offence.

12 Department for Environment, Food and Rural Affairs, *A Strategy for England's Trees, Woods and Forests*, June 2007.
13 Examples of new tree diseases are acute oak decline and *P.ramorum* infection on Japanese larch.
14 Environmental Audit Committee, *Reducing greenhouse gas emissions from deforestation: No hope without forests*, June 2009.

Soil

2.17 **Problem:** Maintaining good soil quality is essential for achieving agricultural output. Soils need to retain their ability to store, supply and recycle nutrients; as well as process and store fresh water (reducing run off, diffuse pollution and the risk of flooding). This in turn supports biodiversity and mitigates climate change by helping to reduce the amount of carbon dioxide emissions released into the atmosphere from degraded soils. UK soils store some 10 billion tonnes of carbon.

2.18 Key features of soil degradation are erosion by wind and rain, compaction (by livestock and heavy machinery) and loss of organic matter and the carbon it stores. The Agency estimates that 2.2 million tonnes of top soil are eroded every year in the UK, where soil has degraded in recent years because of intensive farming, atmospheric pollution and development. The Department estimates the cost to the UK of soil degradation, from erosion, cultivation losses, flooding and sedimentation to be around £200 million to £300 million a year.

2.19 **Performance:** Farmers, foresters and other land managers have made progress in preventing soil degradation on agricultural soils through government measures such as the Common Agricultural Policy, the Environmental Stewardship Scheme, the England Catchment Sensitive Farming Delivery Initiative and the new code of Good Agricultural Practice.

2.20 In relation to contaminated land, successive governments have taken a primarily market-based approach to address problems and hold regulatory intervention in reserve. Private redevelopment, regeneration schemes and companies dealing with their own legacies of land contamination (prompted by new legislation since 1995) have cleaned up some tens of thousands of hectares of land, with the contaminated land sector reportedly turning over some £1 billion per year.

2.21 The European Commission is negotiating a Soil Framework Directive with Member States, covering contaminated land, soil degradation and land use planning. Proposals require Member States to identify all contaminated sites within 25 years, and ensure they are remedied. Local Government estimates that the cost to the UK of implementing these provisions could be as high as €23 billion, depending on the final approach taken. These costs consist of: investigation costs of between €3.4 billion and €5.3 billion spread over 25 years; and remediation costs of between €3.75 billion and €18 billion spread over 30 years. During negotiations, the UK has called for a more flexible approach whereby costs are proportionate to the socio-economic and environmental benefits.

Flooding and coastal protection

2.22 Problem: Approximately 5.2 million properties in England are at risk from flooding (comprising 2.4 million properties that are at risk from rivers or the sea, 1 million of which are also at risk from surface water flooding and a further 2.8 million properties susceptible to surface water flooding alone). Flooding events are likely to rise in future if the predictions of wetter winters, drier summers and higher sea levels from climate change are realised. The annual average cost of flood damage is some £1 billion in 2010, but this could rise to some £27 billion by 2080 in the worst case scenario. The impact of a flood can be environmental, financial and social. Large volumes of flood water cause erosion and contaminate fresh water sources from transported pollutants. Social impacts include loss of life, personal distress from damage to private property and disruption to daily life (**Case study 1**).

Case study 1
The severe floods of 2007

The Met Office recorded unprecedented levels of rainfall between May and July 2007. Thirteen people died in the subsequent flooding, which affected many parts of England. Altogether, some 48,000 households and nearly 7,300 businesses were affected by the floods leading to economic damage estimated at some £3.2 billion, averaging about £30,000 a household in the affected regions. The Pitt Review later found that an overwhelmed drainage system caused the flooding in most of the properties affected.[1] The previous government accepted the Review's recommendation that local authorities should lead the management of local flood risk and surface water management.[2]

NOTES

1 Sir Michael Pitt, Learning Lessons from the 2007 floods, June 2008.

2 Department for Environment, Food and Rural Affairs, The Government's response to Sir Michael Pitt's Review of the summer 2007 floods, December 2008.

2.23 Performance: The Agency is responsible for some 24,000 miles of flood defences and 46,000 flood defence structures. The Agency's recent inspections suggest 97 per cent of defences are currently at the desired condition whilst three per cent were neither 'fair' nor better than 'fair'. The Agency's funding from the Department for flood defences has risen recently, and is budgeted to spend £629 million in 2010-11. The Agency seeks to protect the areas of greatest need, based on an assessment of risks, costs and benefits and reprioritises funding as risk changes.

2.24 Following the 2007 floods, the Pitt Review recommended a more coordinated approach to clarify responsibilities between stakeholders including: the Department (flood defence policy); the Agency (strategic overview of flood risk and building flood defences on designated 'main' rivers and the coast); local authorities (local flood risk management and coast protection); and other bodies representing local interests (such as Regional Flood Defence Committees).

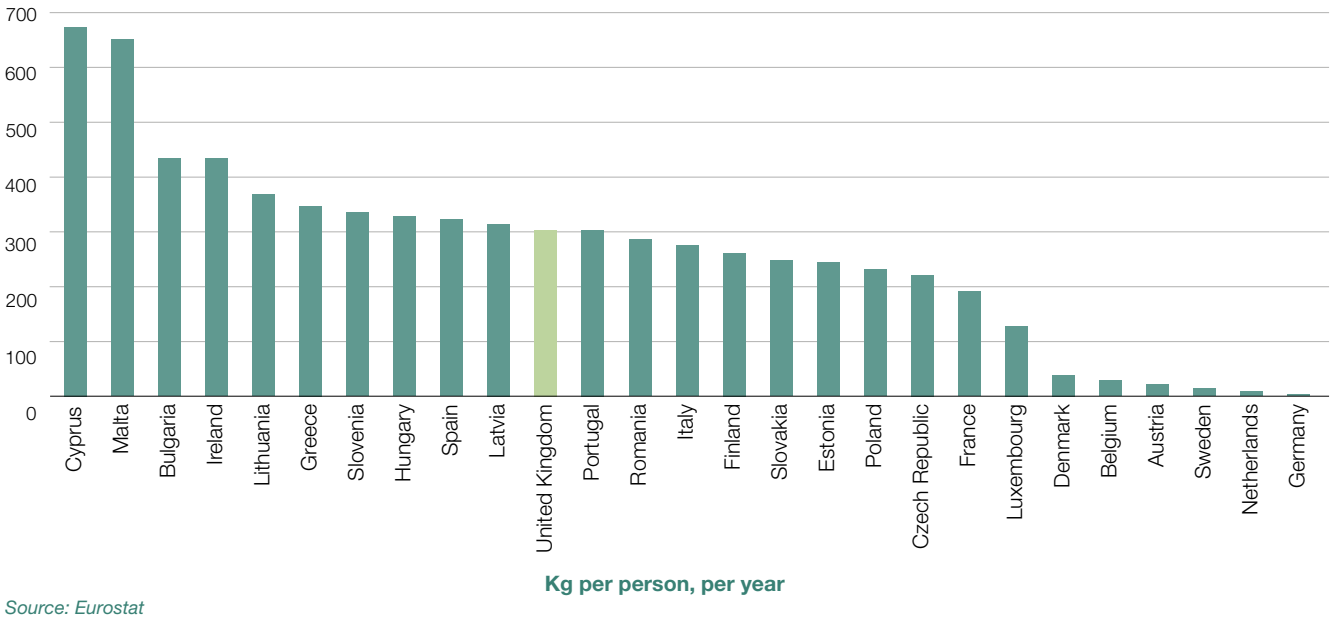
Waste

2.25 Problem: The NAO recently reported that over 280 million tonnes of waste was produced in England in 2006.[15] Nearly half of it was sent to landfill sites. As well as being an inefficient use of resources, landfill sites produced 40 per cent of the UK's emissions of methane and 3 per cent of all the UK's greenhouse gas emissions in 2008. Some 90 per cent of waste comes from industry, the rest comes from households. The direct costs of managing household waste are £2.5 billion a year.

2.26 Performance: The amount of domestic waste sent to landfill per person has been greater in the UK than many other EU countries (**Figure 6**), but the proportion of total waste sent to landfill has fallen by nearly a quarter in recent years. The latest data on domestic waste, from 2009, suggest the Department is on track to meet the Landfill Directive 2010 target to reduce the amount of land-filled biodegradable municipal waste. Household waste recycling has risen from 14 per cent in 2000-01 to 38 per cent in 2008-09. At the same time, the amount of household waste produced has fallen by 3 per cent.

2.27 To meet the Landfill Directive targets and increase the resources recovered from waste, local authorities and the waste management sector need to secure more investment in waste treatment infrastructure. A 2009 NAO report found that, since 2006, the Department had achieved a faster flow of new and larger PFI contracts for waste treatment infrastructure but, to meet the 2013 landfill reduction targets, it would need to reduce the time taken to procure projects and bring them into operation.[16] The new Government plans to minimise waste and litter by paying people to recycle and to generate more energy from waste through anaerobic digestion.[17]

Figure 6
Municipal waste sent to landfill per person per year in Europe (2008)



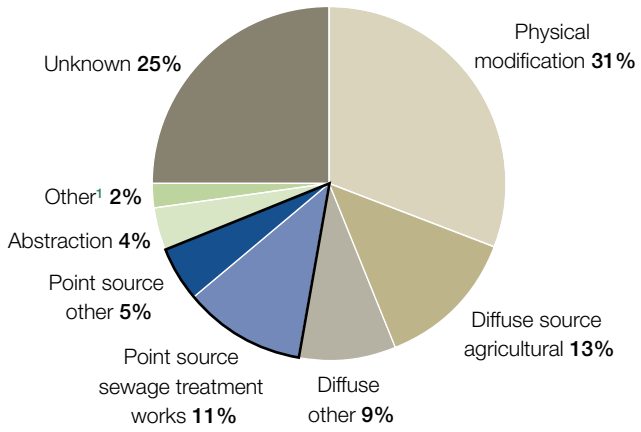
Source: Eurostat

15 National Audit Office, *Reducing the impact of business waste through the Business Resource Efficiency and Waste programme*, March 2010.
16 National Audit Office, *Managing the waste PFI programme*, January 2009.
17 HM Government, *The Coalition: our programme for government*, May 2010.

The freshwater environment

2.28 Problem: Some 27 per cent of all assessed surface water bodies (including rivers, lakes, transitional estuaries and coastal waters to one nautical mile) in England and Wales are considered to be at 'good' ecological status as defined by the measures in the EU Water Framework Directive (WFD). Rivers are the most significant by volume and the Agency has found that the main reasons why rivers fail to meet the Directive targets are: physical modifications or alterations; pollution from agriculture; sewage effluent (including nitrates and phosphates); and pollution from urban, transport and construction activities (**Figure 7**). Some 33 per cent of English rivers have high concentrations of nitrates, whilst some 50 per cent of rivers and 65 per cent of lakes exceed the new UK WFD standards for phosphates. High levels of river pollution increase the financial and environmental costs of purification. A number of species of fish (such as salmon and eels) are under threat.

Figure 7
Reasons for failing to meet Water Framework Directive targets in 2009



NOTE
1 Other includes biomanipulations, acidification and ecological recovery time.

Source: Environment Agency

2.29 Performance: The biological and chemical conditions of some 2,500 km of English rivers have improved over the last 20 years. Improvements are mainly due to water companies' investment in sewage treatment to comply with European Union Directives on water quality. The Agency, which is responsible for improving water quality in England, has published River Basin Management Plans, across the whole of England and Wales, which set out the reasons why water bodies are failing environmental targets and the measures that will be implemented to improve them. The Agency does not expect all English rivers to meet Directive standards by 2015, and will work towards increasing the number of rivers that comply with standards in subsequent river basin planning cycles.

Water availability

2.30 Problem: By 2008, the Agency had assessed 119 areas in England and Wales for water availability (**Figure 8**). In 32 per cent, water was available for abstraction. In 35 per cent, no water was available at low flows for abstraction. Existing licences, fully exploited in 18 per cent of areas would lead to environmental damage, whilst in 15 per cent of areas existing abstraction was damaging the environment.

Figure 8
Map of water availability for abstraction in England and Wales in 2008

Source: Environment Agency

2.31 The Agency has noted that biodiversity can be put at risk in areas where water companies are using water resources at a rate greater than that at which they are replenished. The Agency expects future pressure on water resources to grow due to climate change and increasing population density. It encourages a sustainable approach to water use by reducing the level of leaks and by using water more efficiently. It recognises that water availability is important to support economic growth.

2.32 Performance: Domestic water consumption has not changed significantly from 1995 to 2008. Average household water consumption in un-metered households between 2000-01 and 2008-09 increased to 150 litres per day, from 149, whilst metered household consumption over the same period fell to 127 litres per day, from 132. Total water abstracted has fallen since 1990. The Agency is setting time limits to all new abstraction licences giving it flexibility to respond to future water availability pressures. Ofwat has concluded that water companies have reached their 'Economic Level of Leakage' and that greater investment to tackle leakages in the short term would represent poor value for money.[18] The Agency and Ofwat believe that compulsory water metering and a sound water efficiency policy in areas of serious water stress would lead to a more sustainable use of water and help secure water supplies, by helping reduce demand.

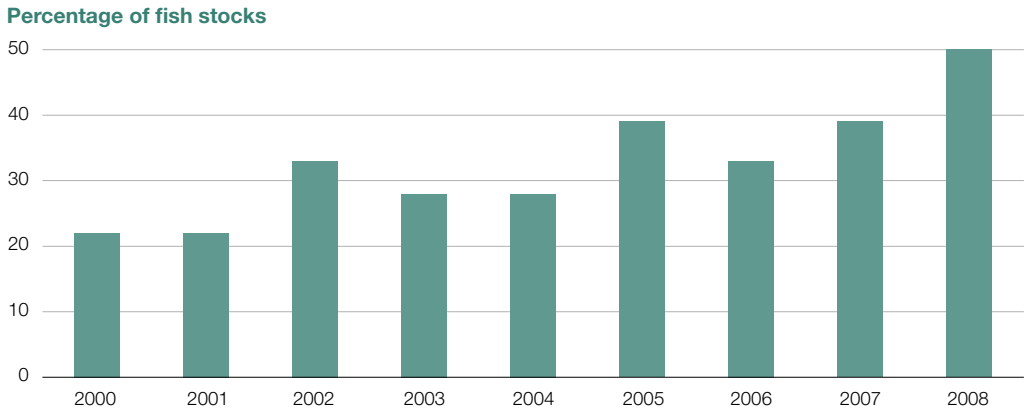
18 Ofwat, *Future water and sewerage charges 2010-15: Final determinations*, November 2009.

The marine environment

2.33 Problem: The current rate of ocean acidification is many times faster than at any time in the past 65 million years. Acidic sea waters harm the ability of many ocean animals and plants to thrive; removing primary food sources from the marine food chain, and undermining their ability to adapt to climate change. Despite recent improvements, fish stocks around the UK remain under pressure through over-fishing and the changes in the acidity and temperature of the water. This raises the prospect of depleted fish stocks around UK waters which are unable to recover and a further decline of the fishing industry. Member State Fisheries' Ministers jointly agree catch quotas and quotas are divided using national apportionments. Ministers regularly agree a higher quota than scientists recommend leading to over-fishing.

2.34 Performance: The International Council for the Exploration of the Sea estimates that the proportion of English fish stocks that are being fished sustainably has risen to 50 per cent in 2008 from 22 per cent in 2000 (**Figure 9**).

Figure 9
Proportion of English fish stocks fished sustainably from 2000 to 2008



NOTE

1 The data for this figure is based on assessment reports on 18 stocks for which accurate time series data are available. Each fish stock refers to a population of a species in a defined sea area.

Source: International Council for the Exploration of the Sea, Centre for Environment, Fisheries and Aquaculture Science

2.35 The 2008 EU Marine Strategy Framework Directive suggests Member States should maintain or achieve *'Good Environmental Status'* of their marine environments by 2020.[19] The Department, working with the Marine Management Organisation, transposed the Directive into UK law in July 2010, and is to assess the status of marine waters by July 2012, establish a monitoring programme by July 2014, develop measures to achieve *Good Environmental Status* by 2015 and implement them by 2016. The European Common Fisheries Policy is due for reform in 2012 to address over-fishing and the quota system. The new draft Policy is currently under consultation with Member States.

19 The Directive defines 'good' environmental status to be where waters are ecologically diverse, oceans and seas are clean, healthy and productive within their intrinsic conditions and the use of the marine environment is at a level that is sustainable.

Part Three

The Government's approach to environmental protection in England

3.1 The Government uses a number of approaches to achieve its objectives for environmental protection. These include taxation; regulation; market traded instruments; government expenditure; informing choices; and voluntary agreements. The type or combination of approach used varies depending on particular circumstances and the nature of the problem.

3.2 The Sustainable Development Strategy requires the Government to take sustainable development into account when selecting and designing policies. The Strategy suggests taking decisions on whether and how to tackle environmental protection issues. It sets out the principle that polluters should pay for the pollution they cause. The Treasury Green Book provides guidance on appraisals of policy, projects and programmes. For any specific initiative, departments are required to publish Impact Assessments. Impact Assessments help policymakers compare various options for achieving an objective by assessing the likely costs, benefits and impacts of each option. The difficulties associated with appraisal of environmental impacts and developments to the process are covered in the separate briefing for the Environmental Audit Committee on sustainable development. This part of this briefing addresses the types of measures governments use to achieve their environmental protection objectives and the challenges arising from their use.

Taxation

3.3 Historically, businesses have not had to take full account of all the environmental consequences of their actions, and the prices paid for goods and services in the market have typically therefore not included all the costs associated with environmental damage. Taxation can provide a way of addressing this market failure by adding to the cost of the product or activity. In 1997, the Government embarked on a programme of environmental tax reform, with the objective of ensuring that the 'polluter pays' the full costs of his actions, and shifting the burden of taxation from 'goods' (such as labour) to 'bads' such as the consumption of environmentally damaging resources (such as petrol).

3.4 Economic theory suggests an environmental tax should be set at a level which makes the polluter pay the full economic cost. However, because there is no identifiable market value for the environmental costs, alternative approaches must be adopted, for example when seeking to value irreplaceable natural resources or when calculating costs which fall on future generations. An alternative is to set the tax at a rate expected to change behaviour. For example, the Landfill Tax was initially introduced at a rate intended to represent the full economic costs associated with landfill (including environmental costs). However, in subsequent years governments progressively increased the rate of tax and level of disincentive.

3.5 If an environmental tax is effective in altering behavioural response and in discouraging the polluting activity, the revenue from it might be expected to diminish over time. However, environmental taxes can raise substantial revenues. This does not necessarily mean the tax is ineffective. Increases in the price of petrol, for example, have relatively little short-term impact on car use but, together with high and increasing levels of duty over several decades, may have constrained increases in demand that would have happened otherwise and contributed to the sale of more efficient vehicles (**Case study 2**).

Case study 2
Fuel duty on diesel

The price paid at the pump for a litre of petrol is currently around £1.20. Of this, fuel duty and Value Added Tax account for nearly 70 pence. While not originally introduced as an environmental tax, high rates of duty on fuel have constrained increases in demand and contributed to the development and purchase of smaller and more efficient vehicles. Differential rates of taxation between different fuels have also been used to achieve environmental objectives – as, for example, in incentivising the shift to lead-free and ultra low sulphur fuels from 1990 to 2007. However, the appropriate differential between diesel and petrol is difficult to determine. While diesel is a more efficient fuel than petrol and contributes less to global warming, it produces more particulate matter and therefore worsens air quality. The same rate of duty is currently applied to sulphur free petrol and diesel.

3.6 In June 2010, the Office for National Statistics reported that revenues from environmental taxes during 2009 amounted to £39.5 billion.[20] Taxes and duties on road vehicles (including fuel duties, Value Added Tax on fuel, and Vehicle Excise Duty) constituted a little more than 90 per cent of all environmental tax revenues. The remaining 10 per cent of environmental tax revenues came from other taxes, including those on energy (the Climate Change Levy), on travel (Air Passenger Duty), on landfill (landfill tax) and on quarrying (the Aggregates Levy).

20 Office for National Statistics, *Environmental Accounts*, June 2010.

3.7 The Environmental Audit Committee has regularly examined progress on environmental taxation since it was first established in 1997, and its March 2009 Pre-Budget Report concluded that little progress had been made against the original commitment to environmental tax reform.[21] The new Government plans to increase the proportion of revenue accounted for by environmental taxes.[22]

Regulation

3.8 The European Union and the UK Government commonly use regulations to deliver environmental protection. This may be by setting a maximum allowable level of pollutant in the air, water or soil; setting maximum levels of a pollutant that industry can emit over a given time; or licensing potentially harmful activities such as landfill and fishing. Regulation can be relatively simple to enact, but to be efficient it must be well targeted and compliance costs must be proportionate.

3.9 Regulation of maximum allowable levels of pollutants tends to be applied where there are serious and immediate threats to human health and the environment. Such areas include drinking water quality, air quality, and the treatment of hazardous wastes. Quality standards are often set on the basis of scientific evidence, though it may not always be easy to determine appropriate standards where there is scientific uncertainty about the degree of risk. Such regulations are straight-forward to specify and monitor, but it can be difficult to determine the appropriate measures to take to deliver the required outcome efficiently, particularly where there are diffuse or complex sources of the pollution. For example, ozone concentration, which affects human health, vegetation and ecosystems, has been steadily falling in urban areas due to reductions in nitrogen oxides. Ozone concentration is, however, also affected by the weather and pollution from other regions or countries. It is therefore difficult to determine national measures to reduce the risk of exceeding regulatory limits.

3.10 In contrast, where regulations apply to individual installations and processes or where there are obvious point sources of pollution, specific steps can generally be taken to ensure compliance. Industrial sites, for example, are closely monitored by the Agency and by local authorities under the Environmental Permitting Regulations and companies can generally ensure compliance by implementing best practice in relation to their industrial plant and the way it is operated.

21 Environmental Audit Committee, *Pre-Budget Report 2008: Green Fiscal Policy in a recession*, March 2009.
22 HM Government, *The Coalition: our programme for government*, May 2010.

3.11 Regulation may impose significant costs on industry and on consumers, and the Impact Assessment process was established to ensure that these costs are calculated and taken into account in the design of regulations and result in an appropriate cost falling on polluters. In general, there is limited information available on the costs incurred in complying with regulations and there are examples of where the costs do not fall on the polluters. For example, in relation to freshwater pollution the water companies, and ultimately consumers, bear substantial costs to comply with drinking water regulations addressing the impact of pollution largely caused by the agricultural sector.[23] Conversely, regulations provide more clarity and greater certainty over the action that is needed to prevent environmental damage whilst ensuring a level playing field for businesses.

3.12 Non-compliance with regulations can attract penalties and fines, the scale of which can range substantially depending on the nature of the infringement and the entity involved. At a national level, the EU can impose fines on Member States. The EU has recently indicated that it may pursue legal action against the UK for non-compliance with air quality regulations.

3.13 At a corporate level, the Environmental Audit Committee found in 2004 that most penalties or fines were imposed on water and waste companies.[24] The concern remains that the scale of fines is insufficient to ensure future compliance (**Case study 3**). In 2008, for example, the Agency prosecuted 250 companies and 470 individuals, who were fined a total of £5.3 million. From 2010, the Agency has been granted new powers to impose civil penalties. The Agency considers that this may make it easier and more cost effective to ensure that individuals and businesses operate within environmental laws.

Case study 3

Fines imposed for non-compliance with environmental regulations

In 2007, Thames Water accidentally discharged a large quantity of chlorine into the River Wandle in southwest London. The chlorine had a serious effect on local wildlife and it took the Agency three days to remove two tonnes of dead fish from the river. The Agency subsequently prosecuted the company in 2009. Thames Water was fined £125,000 for the incident and ordered to pay £21,335 in clean-up and investigation costs. The company subsequently appealed. The Appeal Court acknowledged that a fine in the order of £250,000 to £300,000 would have been appropriate in view of the severity of the offence. But it reduced the fine to £50,000 in view of the amount of money Thames Water had pledged for local restoration and remedial projects.

23 Environmental Audit Committee, *Pre-Budget report 1999: Pesticides, Aggregates and the Climate Change Levy*, February 2000.
24 Environmental Audit Committee, *Environmental crime and the courts*, May 2004.

Market traded instruments

3.14 Emissions Trading Systems are a distinct form of regulation whereby polluters may trade or compete with each other within a tightly controlled system designed to meet a specific environmental objective. The European Union Emissions Trading System (EU ETS) represents the best example of such a policy instrument (**Case study 4**). Other forms of market based instruments may operate in slightly different ways to the EU ETS but nevertheless aim to create a traded market in an environmental resource. They include, for example, the Renewables Obligation, under which certificates from the generation of electricity from renewable sources have a market value.

Case study 4
The European Union Emissions Trading System

The European Union Emissions Trading System is a 'cap and trade' system. Its primary purpose is to reduce greenhouse gas emissions in the most cost-effective and economically efficient manner. It does so by setting a limit or 'cap' on the maximum level of greenhouse gases which EU industrial sites will be allowed to emit over a given period, and issuing allowances equivalent to this level of emissions. These allowances, each equal to one tonne of carbon dioxide equivalent, can be auctioned or distributed free by the regulatory authorities. Once issued, they have an economic value and can be traded by companies participating in the System. At the end of the compliance period, each company has to present sufficient permits to cover its emissions or else pay a prohibitively large fine. If the cap is sufficiently tight, companies may be forced to reduce output if it is not cost-effective for them to achieve emission reductions in any other way or if they cannot afford to buy sufficient allowances.

In its February 2010 report on carbon markets, the Environmental Audit Committee concluded that the EU ETS had not been particularly effective in reducing emissions and that significant tightening of the cap would be necessary for it to achieve any impact.[1] The new Government plans to support a floor for the price of carbon and to move to full auctioning of EU ETS carbon allowances.

NOTE

1 Environmental Audit Committee, *The role of carbon markets in preventing dangerous climate change*, January 2010.

3.15 Market-traded instruments operate in a significantly different way to environmental taxes. Environmental taxes provide certainty over the price of environmentally damaging activities, but cannot determine environmental outcomes as companies may simply choose to maintain the same level of activity and pay the tax. In contrast, market-traded instruments theoretically provide certainty over environmental outcomes, and allow the price of meeting those outcomes to be determined by the market.[25]

25 The degree to which market based instruments provide such certainty will depend on their detailed design – in particular, the level of penalties for non-compliance.

Government expenditure

3.16 Government and EU expenditure in the form of grants, guarantees, loans and equity investments can be used to support particular activities for protecting the environment and moving towards a more sustainable future. All forms of public funding to companies have to comply with stringent EU rules on State Aid designed to eliminate unfair competition between companies and Member States. Grants and other forms of subsidy need to be set at levels which provide sufficient incentive to deliver the intended outcome efficiently, without paying for activities that would have occurred anyway.

3.17 For historical reasons, the EU has provided extensive subsidies to the agricultural sector. Until 2000, these were generally related to production such that farmers gained more financial support the more they produced. There have been significant concerns about the environmental impacts of these subsidies, and over the last decade there have been initiatives to shift the basis of agricultural support away from production subsidies and to reward farmers more for environmental protection (**Case study 5**).

Case study 5
Agri-environment schemes in England

The Government set up the agri-environment scheme in England following reforms to the Common Agricultural Policy implemented in the UK in 2005-06. The purpose of the scheme is to pay farmers to implement and maintain environmental land management measures (such as hedgerow management, low fertilizer treatment for grassland, tree conservation and woodland management). The Government has allocated some £3.987 billion of UK and EU monies to fund the scheme from 2007 until 2013.[1] A 2010 NAO report on the agri-environment scheme found that organic farming helped support biodiversity, but found insufficient evidence on wider benefits.[2]

NOTES

1 Department for Environment, Food and Rural Affairs, *Rural Development programme budget* 2007-2013.

2 National Audit Office, *Defra's organic agri-environment scheme*, March 2010.

3.18 The latest available data from the Office for National Statistics show that UK public expenditure on environmental protection amounted to £5.9 billion in 2004. Of this, some £3.5 billion related to waste management and £0.7 billion to the protection of biodiversity. The figures exclude expenditure on flood defence.

Informing choices

3.19 Governments generally seek to promote behavioural change indirectly by using other kinds of policy instruments such as taxation and regulation. However, they also promote change directly in areas they consider important. For example, the previous government mounted public awareness campaigns to promote energy efficiency and recycling. The effectiveness of such campaigns is difficult to assess (**Case study 6**).

Case study 6
Energy efficiency in homes

A 2008 NAO report found that UK households spent £20 billion on energy a year.[1] Typically a household could save roughly 30 per cent of its energy bills if it adopted all the energy efficient measures available to it. However, the report found that there was a significant gap between householder awareness of energy efficiency and behaviour. It also should not be assumed that take-up of energy saving measures would necessarily result in lower energy consumption. For example, homeowners who have installed better insulation might respond by keeping their homes warmer rather than using less electricity.

NOTE

1 The National Audit Office, *Programmes to reduce household energy consumption*, November 2008.

3.20 Governments can also influence consumer choice in other ways. These include requirements on manufacturers to provide more detailed labelling information, such as energy efficiency ratings for appliances. Such approaches can be effective in influencing consumer choice, particularly if reinforced through media coverage. The Environmental Audit Committee concluded in 2009 that environmental labelling can be one of the most powerful ways to bring about social and environmental change and that the Government needed to promote better environmental labelling and place greater priority on setting the standards and parameters for labelling schemes.[26]

3.21 Significant behaviour change may also depend on the provision of appropriate facilities and infrastructure. Increases in recycling and reductions in landfill, for example, have been largely dependent on efforts by local authorities to require householders to sort waste into different streams. But it can be difficult for some householders to comply with such requirements, particularly if they live in multi-occupancy dwellings in urban environments.

26 Environmental Audit Committee, *Environmental Labelling*, March 2009.

3.22 A package of mutually reinforcing measures can be more effective in changing behaviour than tools used on their own. For example, the previous government sought to reduce water demand per person from current levels of 150 litres per day to 130 litres per day using a range of policy instruments. Performance standards for new buildings aimed for water demand to be no greater than 125 litres per day per person. Standards within the plumbing industry increased the minimum water efficiency standards for new fittings (such as toilets, urinals and taps). Meanwhile the water regulator set leakage and infrastructure investment targets for water companies and incentivised companies to roll out household water meters.

Voluntary agreements

3.23 Voluntary agreements have been used with varying degrees of success to achieve environmental policy objectives. At an EU level, for example, the European Car Makers Association concluded a voluntary agreement with the European Commission in July 1998 to reduce the average carbon emissions of new cars to 140 grams of carbon per kilometre (gC/km) by 2008 and to 120 gC/km by 2012. The 2008 target was not achieved, however, and the agreement has now been abandoned and replaced by regulation. Within the UK, voluntary agreements have been used in the agricultural sector to try to reduce the use of pesticides and more recently in the commercial sector to reduce the use of plastic bags (**Case study 7**).

Case study 7
Plastic bags

On 18 December 2008, Asda, Co-op, Marks & Spencer, Sainsbury's, Somerfield, Waitrose and Tesco signed a voluntary agreement with the Department to halve the number of single-use carrier bags handed out each year compared with 2006 levels by spring 2009. The participants reported that they had reduced the number of single use carrier bags they were handing out by 48 per cent to 452 million by May 2009 compared with 870 million in May 2006.

The introduction of the voluntary agreement was partly influenced by the highly successful introduction in Ireland in 2002 of a tax on plastic bags and by a UK statutory provision imposing charges on single use carrier bags, should the voluntary approach not succeed.

Appendix One

Atmospheric pollution and climate change

We have set out below the key components of: the regulatory framework; strategy; targets & performance; stakeholders; and future issues.

Regulatory framework

World-wide

Copenhagen Accord (2009): called for a global agreement to limit global temperature rises to no more than 2° Celsius.

The Kyoto Protocol to the UNFCCC (adopted 1997, came into force 2005): set binding targets for 37 industrialised countries and the European Community to reduce greenhouse gas emissions by an average of five per cent compared with 1990 levels over the five-year period 2008-2012.

UN Framework Convention on Climate Change (1992): aimed to stabilise greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. It committed the 194 parties to the Convention to common principles and commitments to monitor and report on emissions and develop plans to address them.

European

Directive on the promotion of the use of energy from renewable sources (2009): set targets such that 20 per cent of energy and 10 per cent of transport fuels should come from renewable sources by 2020.

Emissions Trading System Directive (2003): established a system for greenhouse gas emissions allowance trading within the Community (and was formally known as the Emissions Trading Scheme).

National

Energy Act (2010): included measures on carbon capture and storage, social price support, and fairness in energy markets.

Energy Act (2008): provided new or amended existing initiatives to reduce carbon emissions, including those relating to carbon capture and storage and the Renewables Obligation.

Climate Change Act (2008): provided the world's first legally binding framework to tackle climate change. It proposed an 80 per cent cut in greenhouse gas emissions by 2050, to be achieved through five-year carbon budgets. These cuts are to be met by action in the UK, from credits under the EU ETS, and credits for emission reductions abroad.

Planning and Energy Act (2008): enabled planning authorities to set targets for energy use and energy efficiency in local developments.

Strategy

The Low Carbon Transition Plan (2009): set out how the UK will meet international and national targets for carbon emission reductions. The plan addressed energy efficiency and low carbon technologies: clean coal, nuclear and renewables. It also included plans for homes and communities, workplaces, jobs, transport, farming, land and waste.

Targets and performance

Targets: the EU target for renewable energy requires 15 per cent of the UK's energy to come from renewable sources by 2020. Under the Climate Change Act 2008 (Section 5), the previous government set a target for a 34 per cent reduction in greenhouse gas emissions by 2020 compared with 1990.

Performance: for all greenhouse gases (including net emissions or removals from Land Use Change & Forestry) emissions for 2008 were provisionally 574.6 metric tonnes of carbon dioxide equivalent ($MtCO_2e$), a fall of 26 per cent compared to the 1990 baseline.

Stakeholders and policy instruments

Department of Energy and Climate Change: seeks to secure global commitments which prevent dangerous climate change and aims to reduce greenhouse gas emissions in the UK. The Department of Energy and Climate Change (DECC) is working to protect the public from immediate risks from climate change and is seeking to build a low carbon economy in the UK. In particular, it has policy responsibility for the Renewables Obligation and the Carbon Reduction Commitment Energy Efficiency Scheme which requires mandatory emissions trading of carbon emissions from large public sector and commercial organisations and which will apply an emissions cap from 2013. It has started to use Feed-In-Tariffs to incentivise micro-generation from April 2010. It is responsible for the UK application of the EU Emissions Trading System to cap carbon emissions throughout Europe. It is responsible for the Climate Change Levy which charges large carbon emitters for their emissions. It negotiated climate change agreements with energy intensive industries that can obtain an 80 per cent discount from the climate change levy (and a 65 per cent discount from 2011), providing they meet demanding targets to improve energy efficiency and reduce carbon emissions. It is responsible for capital grants programmes, and it administers the Environmental Transformation Fund jointly with the Department for International Development.

Department for Environment, Food and Rural Affairs: supports the development of climate change mitigation and is responsible for adaptation policy. Its policy responsibilities include reduction of biodegradable waste sent to landfill sites, sustainable use of timber nationally and internationally, and soil preservation.

Department for Business Innovation and Skills: part-funds the Climate Change Projects' Office, which assists UK businesses pursue opportunities arising from the Kyoto Protocol. It provides 50 per cent funding for the Energy Technology Institute, which develops new low carbon technologies and funds the Engineering and Physical Science Research Council, which invests in early stage research on, amongst other sectors, low-carbon energy technology.

Department for Communities and Local Government: develops policy to improve energy efficiency in buildings including a national standard (or code) for the sustainable design and construction of new homes.

Department for Transport: seeks to reduce carbon emissions in the transport sector. It is supporting biofuels through the development of the Renewable Transport Fuel Obligation, which requires fuel suppliers to ensure that a given proportion of road transport fuel comes from renewable sources.

Foreign & Commonwealth Office: seeks to build the necessary political conditions to influence the major emitters in working towards reducing their greenhouse gas emissions.

Department for International Development: funds the Environmental Transformation Fund (a joint fund with DECC to tackle poverty through environmental protection) and helps developing countries respond to climate change.

Environment Agency: administers registration under the EU Emissions Trading System and the Carbon Reduction Commitment Energy Efficiency Scheme.

Future issues

Copenhagen 2009: was an international Accord that was reached in December 2009 in Copenhagen that suggested the need for sufficient carbon emission reductions to limit future temperature rises by 2° Celsius. By April 2010, 122 parties signed or made pledges to endorse the Accord, including all Member States of the European Union, a further 15 developed countries and 37 developing countries. Countries intend to meet again in December 2010 in Mexico to agree greenhouse gas emission targets.

Renewable Heat Incentive: aims to incentivise renewable heat technologies and will start from April 2011.

The new Government's programme includes commitments to:

- establish a smart grid and smart meters;
- establish a renewable energy Feed-In-Tariff system alongside a system of banded Renewables Obligation Certificates;
- support measures to encourage marine energy; and
- establish an emissions performance standard that will prevent coal-fired power stations being built unless they are equipped with sufficient mitigation facilities such as Carbon Capture and Storage.

Appendix Two

Air pollution

We have set out below the key components of: the regulatory framework; strategy; targets & performance; stakeholders; and future issues.

Regulatory framework

World-wide

World Health Organisation (2000): provided guidance on reducing the health impacts of air pollution.

UNECE Convention on Long Range Trans-boundary Air Pollution (1979): was the first legally binding international agreement to address trans-boundary air pollution, using international cooperation founded on research to develop policies to combat pollution. Several protocols have been developed under the Convention including the Heavy Metals Protocol (1998) and the Gothenburg Protocol (1999) that limit emissions of various pollutants.

European

Ambient Air Quality Directive (2008): set targets for improving human health and environmental quality up to 2020.

Integrated Pollution and Prevention Control Directive (2008): merged extant legislation on industrial pollution control into one Directive and regulated emissions from industrial installations over a certain size.

Paints Directive (2004): set maximum limits for Volatile Organic Compounds (VOC) concentrations in paints.

National Emission Ceilings Directive (2001): set pollutant-specific Member State emission ceilings for sulphur dioxide, nitrogen oxides (NO_x), non-methane VOCs and ammonia.

Large Combustion Plant Directive (2001): required operators to meet deadlines for emissions limits of sulphur dioxide, oxides of nitrogen, and particulates from large combustion plants.

Solvent Emissions Directive (1999) and the Petrol Vapour Recovery Directive (1994): required installations to show how they were to reduce their VOC use.

Sulphur Content of Liquid Fuels Directive (1999): limited sulphur emissions from burning fuel oil.

National

Pollution Prevention Control Act (1999): established the framework for the integrated pollution prevention control system and local authority industrial pollution control.

Environment Act (1995): established the framework for local air quality management in the UK and set national objectives regarding benzene, butadiene, carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter, polycyclic aromatic hydrocarbons, and sulphur dioxide.

Clean Air Act (1993): banned emissions of dark smoke from chimneys and furnaces, set minimum chimney heights, and created smoke control zones.

Strategy

The air quality strategy for England, Scotland, Wales and Northern Ireland (2007): set air quality objectives and policy options to further improve air quality in the UK and set national objectives regarding benzene, butadiene, carbon monoxide, lead, nitrogen oxides, ozone, particulate matter, polycyclic aromatic hydrocarbons and sulphur dioxide.

Stakeholders & policy instruments

Department for Environment, Food and Rural Affairs: is responsible, together with devolved administrations, for overseeing the management of air quality across the UK; for work carried out by local authorities to manage local air quality; and for overseeing local authority industrial pollution control.

Department for Transport (DfT): aims to promote a healthy natural environment, by reducing pollution from transport. DfT administers standards that define acceptable levels of pollutants for fuel. European standards define limits for exhaust emissions of NO_X, carbon monoxide, hydrocarbons and PM_{10} from new vehicles in Member States. General emission standards are enforced by MOT testing. DfT has policy responsibility for cleaner fuels and electric cars. It uses initiatives like congestion zones and incentives for low emission cars. DfT encourages sustainable travel and use of public transport and is responsible for reducing congestion from road improvements and for establishing route management strategies.

Department of Energy and Climate Change: is responsible for building a low carbon economy for the UK that will benefit air quality in the longer term.

Department of Health: funds research on the health impacts of air quality. It also provides policy advice on the effects of air pollution on health.

Department for Communities and Local Government: issues planning policy statements and building regulations to ensure the planning system takes account of the impact of construction on air quality.

Health Protection Agency: advises on the health impacts of air pollution.

Environment Agency: regulates emissions of pollutants from larger industrial installations in England and Wales and provides advice to local authorities on the impacts of major industrial installations on the national Air Quality Strategy.

Highways Agency: operates and maintains the strategic road network and works with regional and local authorities to deliver the Air Quality Strategy.

Government Offices: promote consideration of air quality in regional strategy development.

Local authorities: monitor local air quality against UK objectives, prepare and implement local actions to improve air quality and regulate some 19,000 mainly industrial installations.

Future issues

The Government plans to mandate a national recharging network for electric and hybrid vehicles and to work towards full compliance with EU air quality limits.

Targets and performance

	Air quality targets	National Emission Ceiling	Performance in 2007	Projection for 2010
Ammonia	Not applicable	297 k tonnes by 2010	295 k tonnes	289 k tonnes
Carbon Monoxide	10mg/m^3 by 1.1.2005 (maximum daily 8 hour mean)	Not applicable	Met	Expected to meet
Lead	0.25µg/m^3 by 31.12.2008	Not applicable	Met	Expected to meet
Nitrogen Dioxide (NO_2)	Annual mean 40µg/m^3 by 2010	Not applicable	41 zones exceeded the limit value	Not available
	1 hour limit 200µg/m^3 by 2010	Not applicable	2 zones exceeded the limit value	Not available
Oxides of Nitrogen (other than NO_2)	Not applicable	1,167 k tonnes by 2010	1,486 k tonnes	1,210 k tonnes
Ozone	120µg/m^3 not to be exceeded on any day	Not applicable	41 zones exceeded target	Not available
	6000µg/m^3 hours in a single year	Not applicable	3 zones exceeded target	Not available
Particulate Matter (PM10)	Annual mean 40µg/m^3 by 1.1.2005	Not applicable	1 zone exceeded target (Greater London Area)	Not available
	Daily mean 50µg/m^3 by 1.1.2005 not to be exceeded more than 35 times a year	Not applicable	6 zones exceeded target (3 measured and 3 modelled)	Not available
Polycyclic Aromatic Hydrocarbons	0.25ng/m^3 by 31.12.2010 (For Benzo[a]pyrene)	Not applicable	1 zone exceeded target (Yorks. & Humberside)	Not available
Sulphur Dioxide	585 k tonnes by 2010	Not applicable	591 k tonnes	411 k tonnes
Benzene	Annual mean 5µg/m^3 by 1.1.2010	Not applicable	Met	Expected to meet
Butadiene	Annual mean 2.25µg/m^3 by 31.12.2003	Not applicable	Met	Expected to meet

Source: The National Audit Office and the Department for Environment, Food and Rural Affairs

Appendix Three

Biodiversity

We have set out below the key components of: the regulatory framework; strategy; targets & performance; stakeholders; and future issues.

Regulatory framework

World-wide

Convention on Biological Diversity (1992): committed parties to reduce significantly the rate of biodiversity loss at the global, regional and national level by 2010.

Convention for the Protection of the Marine Environment of the North-East Atlantic (1992): sought to protect the marine environment of the North-East Atlantic.

Convention on the Conservation of European Wildlife and Natural Habitats (1979): aimed to ensure conservation and protection of listed wild plant and animal species in their natural habitats.

Convention on Migratory Species (1979): sought to operate through regional agreements to conserve terrestrial, marine and avian migratory species throughout their range.

Convention on International Trade in Endangered Species of Wild Fauna and Flora (1973): sought to prevent threats to the survival of wild animals and plants caused by international trade.

European

Birds Directive (1979 revised 2009): aimed to protect wild birds and their most important habitats.

Marine Strategy Framework Directive (2008): established a framework for community action in the field of marine environmental policy.

Environmental Liability Directive (2004): established the polluter pays principle whereby land should be decontaminated until it poses no significant risk to human health, and water bodies and habitats should be restored to their position prior to contamination.

Water Framework Directive (2000): sought to protect biodiversity by: 1) improving inland and coastal waters through better land management and protection from diffuse pollution; 2) using water more sustainably; 3) creating better water borne wildlife habitats; and 4) creating a better quality of life for everyone.

Habitats Directive (1992): aimed to protect listed species of plants and animals and sought to protect habitats by establishing a network of protected areas (known as Natura 2000).

National

The Conservation of Habitats and Species Regulations (2010): consolidated previous regulations including implementation of the Habitats Directive (see above) by establishing Special Areas of Conservation alongside a system of strict protection for listed plants and animals.

Marine and Coastal Access Act (2009): introduced Marine Conservation Zones, consisting of a system of protected marine areas.

Offshore Marine Conservation Regulations (2007): implemented the Birds Directive and the Habitats Directive in relation to marine areas where the UK had jurisdiction beyond its territorial 12 mile limit.

Natural Environment and Rural Communities Act (2006): introduced a duty for all public bodies to have regard to biodiversity in the exercise of their functions.

Wildlife & Countryside Act (1981): aimed to protect listed species of plants and animals and strengthened the level of protection for Sites of Special Scientific Interest.

Strategy

UK Marine Monitoring and Assessment Strategy (2008): included national indicators of local government performance (on management of conservation sites).

The Invasive Non Native Species Framework Strategy for Great Britain (2008): sought to minimise the risk posed, and to reduce the negative impacts caused by invasive non-native species in Great Britain.

Securing a healthy natural environment (2007): suggested promoting joined-up working within the Department, developing ways of valuing ecosystem services including valuing the benefits of the UK Biodiversity Action Plan.

Conserving biodiversity – the UK approach (2007): re-cast the UK Biodiversity Action Plan in light of devolution.

Working with the grain of nature: A Biodiversity Strategy for England (2002): promoted biodiversity in woodland and agricultural land, aimed for sustainable management of coasts and promoted biodiversity as part of sustainable communities.

Targets and performance

The Environmental Audit Committee reported in 2008 that halting biodiversity loss by 2010 was not realistically achievable in its entirety.[27] The new EU target set in 2010 aimed to halt biodiversity loss by 2020. Key performance data from the 2008 UK Biodiversity Action Plan showed 18 per cent of priority habitats and 11 per cent of priority species were increasing or probably increasing. Some 20 per cent of priority habitats and 39 per cent of priority species were stable or probably stable. Some 13 per cent of habitats and 8 per cent of species were declining, whilst for another 20 per cent of habitats and 8 per cent of species trends were declining but the decline was slowing. Some 9 per cent of habitats and 8 per cent of species were fluctuating (but probably declining) and for some 20 per cent of habitats and 21 per cent of species the trend was either unknown or unclear. In addition a further five per cent of species had been lost since records began.[28]

27 Environmental Audit Committee, *Halting biodiversity loss*, October 2008.
28 Habitats are measured in terms of extent and condition, whilst species are measured in terms of population size and range.

The data showed the UK was on track to achieve the commitment to increase the proportion of Sites of Special Scientific Interest (SSSIs) in favourable or recovering condition to 95 per cent by 2010.

In recent years, specialist rather than generalist bird species have declined. Many of the birds that were subject to intensive conservation are doing well.

Three quarters of butterfly species have declined in distribution over the last 25 years. Moth numbers have fallen by one third since 1968 and only 6 of 25 British species of social bumblebees are now common.

Protection of mammals has helped reduce the long term decline of mammals over the last 20 years. The Tracking Mammals Partnership reported trends for 35 terrestrial mammals, suggesting that 14 species had increasing populations (e.g. otters and bats); 12 species were stable or did not show a statistically significant trend; 7 species were declining; and for 2 species the trends were unclear.

Stakeholders and policy instruments

Department for Environment, Food and Rural Affairs: works in partnership with others to protect the best sites for wildlife. It sponsors agri-environment schemes which aims to maintain and enhance biodiversity. The European Commission matches the Government's funds to the agri-schemes from the European Agricultural Fund for Rural Development.

Natural England: leads on the English Biodiversity Strategy, and seeks to conserve the natural environment including biodiversity, conservation of soils and natural resources. It advises the Government and industry on marine conservation, administers agri-environment schemes, collaborates with the Forestry Commission to conserve biodiversity in English woodlands, administers Environmental Stewardship Schemes and promotes biodiversity in English waters.

Joint Nature Conservation Committee: provides scientific advice and knowledge on nature conservation. It coordinates the input of the statutory nature conservation agencies nationally and internationally and oversees monitoring standards and research.

Environment Agency: is the lead authority for implementation of the Water Framework Directive in England and Wales, which seeks to protect and improve the water environment for people and wildlife. The Agency is also a key contributor to achieving objectives for SSSIs and European protected areas.

Forestry Commission: leads in taking forward the Native Woodland Habitat Action Plans.

Sea Fisheries Committees: seek to ensure sustainability of the marine environment by managing, regulating, developing and protecting the fisheries within six nautical miles from shore.

Future issues

The Department has commissioned a review of England's wildlife and ecological network and it is to report by summer 2010.

The Government is planning a White Paper on an integrated approach to the natural environment.

Appendix Four

Forestry

We have set out below the key components of: the regulatory framework; strategy; targets & performance; stakeholders; and future issues.

Regulatory framework

World-wide

UN programme on Reducing Emissions from Deforestation and Forest Degradation in developing countries (REDD-2008): aimed to establish a collaborative framework to reduce emissions from deforestation and forest degradation.

UN General Assembly (2007): aimed to reverse the loss of forest cover worldwide by reforestation and forest management; to increase forest protection; and to increase support for forest management.

UN Millennium Development Goals (2000): aimed to reduce emissions from deforestation and forest degradation in developing countries.

European

The Forest Law Enforcement, Governance and Trade Portal (FLEGT) Action Plan (2003): sought to improve governance and tackle the market demand for illegal timber. The plan promoted trade in legal timber, ethical public procurement policies and corporate social responsibility. It also safeguarded financing and investment, and addressed the problem of timber sourced from conflict zones.

European Community plant health regime (2002): aimed to defend Member States against the introduction and spread of organisms that harm plants.

National

Plant Health (Forestry) Order (2005): established measures to prevent the introduction and spread of harmful forestry pests and diseases in the UK, and to prevent their spread elsewhere in the EU.

Forestry Acts (1967, 1979 to 1988): provided responsibilities and powers to Forestry Commissioners.

Trees Act (1970): provided powers for making tree preservation orders and for granting felling licences.

Plant Health Act (1967): provided for the Forestry Commission to be the Competent Authority for protecting the nation's forest trees from pests and disease.

Strategy

Timber procurement policy (2009): was the previous government's timber procurement policy and required central government departments, their executive agencies and non-departmental public bodies to procure timber and wood-derived products originating only from either legal and sustainable, FLEGT licensed, or equivalent sources.

England Trees, Woods and Forests Strategy (2007): included the guiding principle of "the right tree in the right place".

A Woodfuel Strategy for England (2007): set out how to provide the market an additional two million tonnes of wood fuel per year.

Targets and performance

Transport bio-fuels: The Renewable Energy Directive contains a target for the UK to source 10 per cent of its transport energy from renewable sources by 2020 together with mandatory sustainability criteria for all bio-fuels. The UK is on course to meet the Directive targets. By 2009, the proportion of bio-fuels from renewable sources meeting the Directive's environmental sustainability standards was 20 per cent.

Sites of Special Scientific Interest: Some 98.3 per cent of sites in the Forestry Commission's public forest estate were in target condition in February 2010.

Woodland Sites of Special Scientific Interest: Some 92.8 per cent were in target condition in February 2010.

Standards of sustainable forest management certification: In 2008, certification schemes covered all state forests (comprising 0.82 million hectares belonging to the Forestry Commission and the Forest Service), some 22 per cent of other forests (comprising 0.45 million hectares); and about 45 per cent of UK woodland (including some 30 per cent of English woodland). Although certification accounts for only 23 per cent of the woodland area which is not state owned, it amounts to some 68 per cent of the total timber production from these forests, and some 80 per cent of total UK timber production.

The UK Low Carbon Transition Plan: suggested that planting some 10,000 hectares of new woodland in England per year for 15 years would remove 50 million tonnes of CO_2 from the atmosphere by 2050.

The Open Habitats Policy: sought to remove trees planted in the wrong place to increase the level of biodiversity in habitats. Targets aim to remove 1,000 hectares of trees planted inappropriately, a year.

Stakeholders and policy instruments

Department for Environment, Food and Rural Affairs: is responsible for policy to maintain a network of sustainably managed forestry and woodland.

Forestry Commission England: is responsible for regulation, implementation and policy making on domestic forestry. It issues licences (such as for felling trees) and provides grants (such as for woodland creation and management). The Commission administers a number of schemes including the English Woodland Grants Scheme, which seeks to increase public benefits from England's woodlands. To facilitate private investment in woodland and support the delivery of the Government's carbon dioxide (equivalent) emissions targets the Commission created the Woodland Carbon Task Force.

Forestry Commission GB: shares responsibility for UK interests in international forest policy. It undertakes research in forestry and seeks to establish conditions for significant private sector investment in woodland creation. For example, it established the UK Forestry Standard, which seeks to promote sustainable forest management and which covers environmental issues relevant to UK forests and supports the UK's international approach to them. It has also recently developed a code of good practice to encourage investment in forestry projects that contribute to a move towards a low carbon economy.

Department for International Development: seeks to improve forest governance in developing countries and seeks to provide support to rainforest nations under the FLEGT Programme and the Forest Governance and Trade Programme (a five-year, £24 million programme, which supports the European Union's FLEGT programme).

Department of Energy and Climate Change: leads on negotiations to address climate change which include carbon emissions from deforestation.

Regional Development Agencies: deliver Regional Economic Strategies and give grants towards infrastructure in the wood-fuel supply chain.

Natural England: collaborates with the Forestry Commission England to conserve woodland.

Local authorities: develop and implement a responsible timber procurement policy through the Central Point of Expertise on Timber (CPET).

Future issues

The European Commission has rejected the use of forest credits in the EU ETS before 2020 and will then permit their use only if forest credits can be demonstrated to be effective. More recently the European Parliament's Environment Committee proposed that 12.5 per cent of auction revenues for Phase 3 of the EU ETS be spent on forest protection.

The European Commission agreed to review land-use change by 2010 and review by 2014 whether the 2020 target for 10 per cent of bio-fuels from sustainable sources can be met.

The UK Government is contributing to negotiations for a successor to the UN Framework Convention on Climate Change (UNFCCC) to reduce emissions from deforestation and forest degradation. A conference on this is due in Mexico in December 2010.

The EU should finalise a new due diligence regulation in 2010 aimed at tackling the sale of timber from illegal sources in the EU. This will require anyone who places timber on the EU market for the first time to ensure the timber is legally sourced. In addition, an amendment looks likely that will make it an offence to possess or sell timber from illegal sources.

Appendix Five

Soil

We have set out below the key components of: the regulatory framework; strategy; targets & performance; stakeholders; and future issues.

Regulatory framework

European

Environmental Liability Directive (2004): established the polluter pays principle whereby polluted land should be decontaminated by the polluter until it poses no significant risk to human health, whilst water bodies and habitats should be restored to their position prior to contamination.

Common Agricultural Policy (mid term review) – cross compliance (2003): required farmers to comply with: 1) Member State regulations on soil protection; and 2) statutory management standards for protection of the environment, animal and plant health and animal welfare.

Large Combustion Plant Directive (2001): required new and existing combustion plants to reduce sulphur emissions and acid rain and so reduce their consequential contamination of the soil.

Nitrates Directive (1991): required governments to identify surface or ground waters that were or could be high in nitrates from agricultural sources (often applied to land rather than contaminated soil). Once identified all the land draining into that water should be designated a Nitrate Vulnerable Zone. Within such Zones farmers should restrict the timing and application of fertilisers and manure.

Sludge (Use in Agriculture) Directive (1986): sought to protect soil when sewage sludge is used on agricultural land by imposing maximum concentration limits.

National

The Environmental Damage (Prevention and Remediation) Regulations (2009): implemented the Environmental Liability Directive (2004) on the prevention and remedy of environmental damage.

The Nitrate Pollution Prevention Regulations (2008): provided a legal basis for Nitrate Vulnerable Zones.

The Common Agricultural Policy Single Payment and support Scheme (cross-compliance) (England) Regulations (2005): enacted the cross-compliance regulations.

Sludge (Use in Agriculture) Regulations (1989 & 1990): enacted the Sewage Sludge Directive.

Part 2A of the Environmental Protection Act (1990): required local authorities to identify land which posed a risk to health or to the environment and secured remediation where such risks could not be reduced by other means.

Strategy

Soil Strategy for England: Safeguarding our soils (2009): was published by the previous government. The strategy sought to manage soils sustainably and tackle threats to degradation by focussing on protecting and enhancing stores of soil carbon. It sought to build the resilience of soils to a changing climate, prevent soil pollution, maintain effective soil protection during construction and development, deal with our legacy of contaminated soil and continue monitoring and research.

Targets and performance

Soils managed sustainably:

Indicator 1: soil status (chemical and physical) is an outcome-based indicator reported over 7-15 year cycles, as data become available. The latest data from the Countryside Survey, published on 22 January 2010, show that there have been small but significant decreases in soil nitrogen concentrations, phosphorus concentrations and soil pH, and an increase in soil invertebrate numbers in all habitats.

Indicator 2: Cross-compliance and agri-environment criteria for Good Agricultural and Environmental Conditions (GAEC) are process-based indicators looking at take-up of key soil protection measures.

Inspection statistics for cross-compliance for 2009 are published by the Rural Payments Agency and show that the majority of farmers are complying with standards relating to soil protection (GAEC 1-4). There has been a slight increase in overall inspection failures, although this figure remains well below 0.1 per cent of all recipients receiving payments under the Single Payment Scheme.

Target to halt decline in soil organic matter caused by agricultural practices in vulnerable soils by 2025: The latest Countryside Survey results show no overall change in the average carbon concentrations in soils in Great Britain since 1978, contrasting with a previous study in England and Wales. These differences are currently being investigated.

Previous target under the Biodiversity Action Plan for the UK market for soil improvers and growing media to be 90 per cent peat free by 2010: Data for sales during 2007 showed the market was then 54 per cent peat free.

Annual cost of soil degradation: in the UK is some £206 million to £315 million. This comprises: soil erosion (£45 million); loss of carbon from cultivation (£82 million); flooding due to structural damage to soil (£29 million to £128 million); and sediment in urban drainage systems (£50 million to £60 million).

Contaminated land: Since 2006, the Environment Agency has helped bring over 4,750 hectares of land affected by contamination into beneficial use.

Stakeholders and policy instruments

Department for Environment, Food and Rural Affairs: is responsible for overseeing and implementing the strategy for soil protection and contaminated land in the UK. The Department is responsible for codes of designation, promoting good practice and action programmes.

Natural England: administers applications for the Environmental Stewardship Scheme and approves payments. The Scheme includes opportunities for farmers to reduce soil erosion from wind and water.

Rural Payments Agency: is responsible for making cross-compliance inspections and payments under the Single Payment Scheme. Anyone in receipt of support under the Single Payment Scheme or certain other schemes, such as Environmental Stewardship, must meet the GAEC standards for soil management and protection set out in the Cross Compliance Handbook for England (2010 edition).

Environment Agency: is the Competent Authority for the Nitrates Directive. One of the objectives of the Nitrates Directive is to reduce nitrate pollution from contaminated soil interacting with freshwater. The Agency is a joint regulator for Part 2A of the Environmental Protection Act with local authorities.

Forestry Commission: is responsible for the UK Forestry Standard and for identifying best practice in forest management including maintenance of soil quality.

Local authorities: should ensure their areas are inspected for contaminated land. Where they identify contamination, they should ensure remediation, should make the polluter pay where possible and should transfer special sites to the Environment Agency. They are joint regulators for Part 2A of the Environmental Protection Act with the Environment Agency.

Future issues

Draft Soil Framework Directive: The Soil Framework Directive is currently being negotiated, and the UK has had serious concerns about the high and disproportionate costs (in relation to benefits) and the prescriptive nature of the measures, which offer little flexibility for Member States, like the UK, who already have soil protection regimes in place. Stakeholders, notably the Confederation of British Industry, National Farmers Union and Local Government Association have shared UK concerns.

Appendix Six

Flooding and coastal protection

We have set out below the key components of: the regulatory framework; strategy; targets & performance; stakeholders; and future issues.

Regulatory framework

European

Floods Directive (2007): required Member States to identify river basins and associated coastal areas at risk of flooding and to establish plans focused on prevention, protection and preparedness by 2015.

EU Water Framework Directive (2000): sought to mitigate the effect of drought and floods by reducing the level of soil contamination from agriculture and by increasing the ability of soil to retain water.

National

Flood and Water Management Act (2010): required the Agency to compile a National Flood and Coastal Erosion Risk Management Strategy and to report on progress against this strategy to the Government. Lead Local Flood Authorities were required to produce Local Flood Risk Management Strategies. The Act required all new developments or re-developments that may have an impact on surface water drainage, to obtain approval (in line with National Standards) from the Sustainable Drainage System Approving Body before construction work could commence.

Flood Risk Regulations (2009): transposed the requirements of the Flood Directive into UK law.

Water Framework Directive (WFD) Regulations (2003): enacted the Water Framework Directive.

Strategy

Future Water (2008): focused on the supply of water and also considered how surface water could be better managed.

Making Space for Water (2005): was a cross-government strategy for flood and coastal erosion risk management in England.

Targets and performance

Indicator	Performance 2009-10 (rounded)	Target for 2009-10 (rounded)
Ratio of whole life present value benefits to whole life present value costs	11:1	5:1
Total number of households reallocated from one of the four flood probability categories to a lower one	67,400	67,600
The number of households reallocated from the 'very significant' flood risk probability category to either the 'moderate' or 'low' risk categories	12,900	subset of the above
The number of hectares (ha) of Sites of Special Scientific Interest on which the Agency has commenced all Flood Risk Management remedies for which the Agency is responsible	500ha	200ha

Source: Environment Agency

Stakeholders and policy instruments

Department for Environment, Food and Rural Affairs: has national responsibility for flood defence policy and coastal erosion risk management including land use planning policy. It provides funding through grants to the Environment Agency.

Environment Agency: is responsible for risk assessment, advice, warnings and emergency response. It builds and maintains flood defences and provides grants for capital projects to local authorities and Internal Drainage Boards. It creates Catchment Flood Management Plans which are flood risk management plans for the 68 main catchment areas in England and Flood Maps and Flood Risk Assessments which indicate areas at risk. It also creates Shoreline Management Plans, setting out coastal flooding and erosion risks, which are produced with local authorities and coastal groups.

Local authorities: lead in local emergency planning and recovery from flooding. They are responsible for managing smaller water courses and managing risks from building on flood plains and increasingly managing surface water flooding.

Internal Drainage Boards: are responsible for land drainage in areas at particular risk of flooding (generally low-lying areas).

Regional Flood Defence Committees: are responsible for helping make decisions on improvement and maintenance work on flood defences, that fall within the Environment Agency's annual plans.

Local Resilience Forums: coordinate the emergency services and all other organisations with some responsibility for flood defence and response.

Future issues

Responsibility for flood risk management and response has been split across a number of bodies. In future the Environment Agency will take the strategic lead to improve the overall approach to flooding and generate better value for money by reducing duplication or by closing potential gaps in responsibility.

Appendix Seven

Waste

We have set out below the key components of: the regulatory framework; strategy; targets & performance; stakeholders; and future issues.

Regulatory framework

World-wide

The Stockholm convention on persistent organic pollutants (2001): sought to protect human health and the environment from persistent and toxic chemical substances prone to long-range environmental transport.

The Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste management (1997): applied to civilian nuclear reactors and to military or defence programmes if and when such materials are to be transferred permanently to and managed within exclusively civilian programmes.

The Basel Convention (1989): introduced a system to control the export, import and disposal of hazardous waste and reduced amounts moved so as to protect human health and the environment.

European

Waste Framework Directive (2006 revised 2008): The 2006 Directive applied principles of self sufficiency and proximity to waste disposal and advocated that polluters should pay for the waste they incur. It introduced permits for the recovery and disposal of waste and registration of waste carriers and brokers. The revised Directive (2008) incorporated the measures from an earlier Hazardous Waste Directive, emphasised a waste hierarchy which suggested Member States should aim to prevent and minimise waste, reuse resources, recycle, recover energy and only then dispose of waste. It set recycling rates of 50 per cent for household and similar waste and 70 per cent for construction and demolition waste to be achieved by Member States by 2020. It obliged Member States to develop national waste prevention programmes by December 2013.

Packaging and Packaging Waste Directive (1994 revised 2004): sought to prevent the impact of packaging and packaging waste on the environment and set recovery and recycling targets.

Waste Electrical & Electronic Equipment Directive (2002): aimed to prevent waste from electronic and electrical equipment and promoted collection by setting targets for re-use and recycling of electrical equipment. The Directive made manufacturers responsible for the disposal of electrical and electronic equipment waste.

Restriction of Hazardous Substances Directive (2002): restricted the use of certain hazardous substances in new electrical and electronic equipment.

Waste Incineration Directive (2000): included measures to prevent or reduce, air, water and soil pollution caused by the incineration of waste, and mitigate the resulting risk to human health.

Landfill Directive (1999): imposed common technical standards over the design, operation, monitoring, completion and aftercare of landfill sites.

National

Environmental Permitting (England and Wales) Regulations (2007 revised 2010): the 2007 regulations established a unified system of permits required under various EU Directives including permits for those who carry out waste management activities. The 2010 regulations clarified the circumstances in which operators could undertake waste recovery activities with minimal environmental risk and hence without needing a permit.

Climate Change Act (2008): provided for waste reduction schemes and provided financial incentives to produce less domestic waste and recycle more.

Waste and Emissions Trading Act (2003): sought to help the UK meet its European obligations under the Landfill Directive.

Strategy

Low Carbon Transition Plan (2009): proposed to cut waste emissions by 13 per cent on 2008 levels, by increasing the use of anaerobic digestion and better capturing of landfill emissions.

Waste strategy for England (2007): emphasised waste prevention and re-use. It proposed to exceed the Landfill Directive targets for biodegradable municipal waste by setting higher targets for recycling and composting of household waste. It sought to reduce landfill, increase recycling and increase production of energy from residual waste.

The strategy aimed to reduce the target amount of household waste not re-used, recycled or composted from 22.2 million tonnes during 2000-01 to 15.2 million tonnes by 2008-09.

Targets and performance

UK targets	2010 (%)	2013 (%)	2020 (%)
Landfill Directive: to reduce UK Biodegradable Municipal Waste (BMW) to X% (by weight) of that produced in 1995	75	50	35
English targets	**2010 (%)**	**2015 (%)**	**2020 (%)**
Household waste recycling	40	45	50
Municipal waste recovery	53	67	75
Commercial and industrial waste land-filled: reduction compared to 2004 (expected rather than target)	20	None noted	None noted
Re-use and recycling for non hazardous construction	None noted	None noted	70

The Department's data indicate England is on track to meet the Waste Strategy 2007 target to recycle 40 per cent of household waste by 2010. The amount of UK waste recycled and composted has increased, and accounted for 37 per cent of household waste during 2008-09, a significant increase from 7.5 per cent during 1996-97. Composting has increased from 1 per cent during 1996-97 to 15 per cent during 2008-09, and dry recycling has increased from six per cent during 1996-97 to 23 per cent during 2008-09. There has been a year-on-year decrease in the amount of non-recycled waste per person over the last six years, and it is now at its lowest level since 1983-84.

Statistics for commercial and industrial waste are pending subject to the completion of a survey during 2010.

Stakeholders and policy instruments

Department for Environment, Food and Rural Affairs: is responsible for policy on waste and sponsors the Waste and Resources Action Programme (WRAP), which helps businesses and individuals benefit from reducing waste, developing sustainable products and using resources more efficiently.

Environment Agency: regulates the waste management sector and some waste producers through a system of permits and registrations. It provides advice to regulated businesses, tackles the unintended consequences of regulation such as waste-crime and illegal waste exports. It works with WRAP to encourage recovery of waste materials by establishing a system of waste protocols that help define when materials need no longer be regarded as waste.

Regional Development Agencies: coordinate waste recycling projects at the regional level and fund regionally specific waste projects.

Royal Society of Wildlife Trusts: administer the Business Reuse Funds for community groups to bid for resources to deliver local business waste projects.

Future issues

The Government announced a review of waste policy on 15 June 2010. It intends to publish preliminary findings in spring 2011. The Department is currently consulting on how the UK should meet the European Union Landfill Directive targets to reduce the amount of biodegradable municipal waste sent to landfill.

Member States are required to bring into force by 12 December 2010 the laws, regulations and administrative provisions necessary to comply with the revised Waste Framework Directive. The Department is currently in consultation to deliver to the required timetable.

Appendix Eight

The freshwater environment

We have set out below the key components of: the regulatory framework; strategy; targets & performance; stakeholders; and future issues.

Regulatory framework

European

Freshwater Fish Directive (2006): set water quality objectives to protect freshwaters suitable for sustaining fish populations.

Water Framework Directive (2000): sought to achieve and maintain good ecological and good surface water chemical status in water bodies by 2015. The Directive required Member States to develop a programme of measures for each River Basin District.

Urban Waste Water Treatment Directive (1991): regulated the collection and treatment of waste water from our homes and from industry.

Nitrates Directive (1991): aimed to reduce water pollution from agricultural nitrates and to prevent such pollution occurring in the future. The Directive required governments to identify surface or ground waters that were or could be high in nitrates from agricultural sources. Once identified, all the land draining into that water was to be designated as a Nitrate Vulnerable Zone. Within such Zones farmers had to restrict the timing and application of fertilisers and manure.

Sewage Sludge (Use in Agriculture) Directive (1986): regulated sludge spreading to prevent harmful effects on soil, vegetation, animals and man.

National

The Nitrate Pollution Prevention Regulations (2008 revised 2009): provided a legal basis for Nitrate Vulnerable Zones.

Water Framework Directive (WFD) Regulations (2003): enacted the Water Framework Directive.

Salmon and Freshwater Fisheries Act (1975 revised 2003): regulated fishing to protect freshwater and migratory fish and fisheries.

Urban Waste Water Treatment Regulations (1994): enacted the Waste Water Treatment Directive.

Water Resources Act (1991): set out legislation for Water Protection Zones (WPZs). (Water Protection Zones are regulatory mechanisms to address diffuse water pollution. A Zone is a defined geographical area in which the Environment Agency has additional powers to use measures to manage or prohibit activities which cause or could cause damage or pollution of water).

Sludge (Use in Agriculture) Regulations (1989 & 1990): enacted the Sewage Sludge Directive.

Strategy

Creating a better place (2010): sought to analyse the characteristics of the 11 River Basin Districts in England and Wales; assess the impact of activities on each water body; and monitor the status of rivers (and other freshwater bodies) against set objectives.

Water resources action plans for England and Wales (2010): implemented the National Strategies and individual Regional Action Plans for each of the seven regions.

Future water (2008): promoted the Codes of Good Agricultural Practice (a practical environmental protection guide for farmers including advice on water quality); encouraged Catchment Sensitive Farming (or tackling diffuse water pollution by management of soil, manure, livestock and nutrients); implemented the EU Nitrates Directive; aimed to increase uptake of Sustainable Drainage Systems; and implemented Water Protection Zones.

Targets and performance

Under the measures of the Water Framework Directive: 26 per cent of rivers, 36 per cent of lakes and reservoirs and 26 per cent of estuaries and coasts in England and Wales are at good or better ecological status. The Department aims to achieve good ecological status in 31 per cent of surface water bodies by 2015 and 60 per cent by 2021.

Some 22 per cent of rivers that fail Water Framework Directive objectives do so because of diffuse pollution. Almost a third of rivers in England show high levels of nitrates. Some 49 per cent of nitrates in English waters come from agriculture, with a further 10 per cent from woodland and rough grazing. Some 62 per cent of England is currently designated a Nitrate Vulnerable Zone.

River phosphate levels have fallen steadily over the past 20 years, but they remain high in much of England with concentrations along as much as 50 per cent of the length of rivers exceeding the new Water Framework Directive concentration limits for phosphates. Sewage effluent is the largest source of pollution nationally.

Stakeholders and policy instruments

Department for Environment, Food and Rural Affairs: is responsible for policy and regulation over freshwater quality, although enforcement is delegated to the Environment Agency.

Environment Agency: is responsible for producing River Basin Management Plans to improve freshwater quality. The Agency analyses the impact of activities in river basin areas and monitors the status of water bodies against the objectives set for them. It draws up and carries out a programme to prevent deterioration in water bodies for each River Basin. It also acts to maintain, improve and develop freshwater and migratory fisheries.

Ofwat: sets water companies targets for dealing with diffuse pollution. It monitors and compares the services the companies provide, scrutinises the water companies' costs and investments and encourages competition where this benefits consumers.

Natural England: ensures that the natural environment is conserved, enhanced and managed for the benefit of present and future generations, thereby contributing to sustainable development.

Department of Communities and Local Government: is responsible for the urban and rural planning process and promoting greater usage and uptake of sustainable drainage systems.

Future issues

The UK may be subject to a penalty should it neither be able to raise the standard of all English rivers to 'good' by 2015, nor successfully apply for an extension to the deadline on grounds of technical feasibility or disproportionate cost, as required by the Water Framework Directive.

Appendix Nine

Water availability

We have set out below the key components of: the regulatory framework; strategy; targets & performance; stakeholders; and future issues.

Regulatory framework

European

Water Framework Directive (2000): required Member States to promote the sustainable use of water and water demand management measures.

National

Floods and Water Management Act (2010): included provisions to restrict the use of water if water companies thought that there might be water shortages as a result of an activity (for example, watering a garden or plants using a hosepipe; cleaning a car; filling a swimming pool; or filling an ornamental fountain).

Water Industry Act (1991 revised 1999): contained regulations to prevent waste and promote efficiency in water companies. The Act gave water companies responsibility to include water conservation in their operations and to prepare, consult upon, and publish 25 year water resources management plans.

Water Resources Act (1991): contained regulations for water resources management, abstraction and impounding. It gave the Agency the power to propose that a water company apply to the Water Services Regulation Authority (Ofwat) for a bulk supply from another water company and gave the power to cancel a water company's abstraction licence and re-allocate that resource to another water company.

Strategy

Water for people and the environment, Water Resources Strategy for England and Wales (2009): set out how the Environment Agency believed water resources should be managed so that water could be abstracted and used sustainably. It aimed to provide a secure water supply and to safeguard the environment.

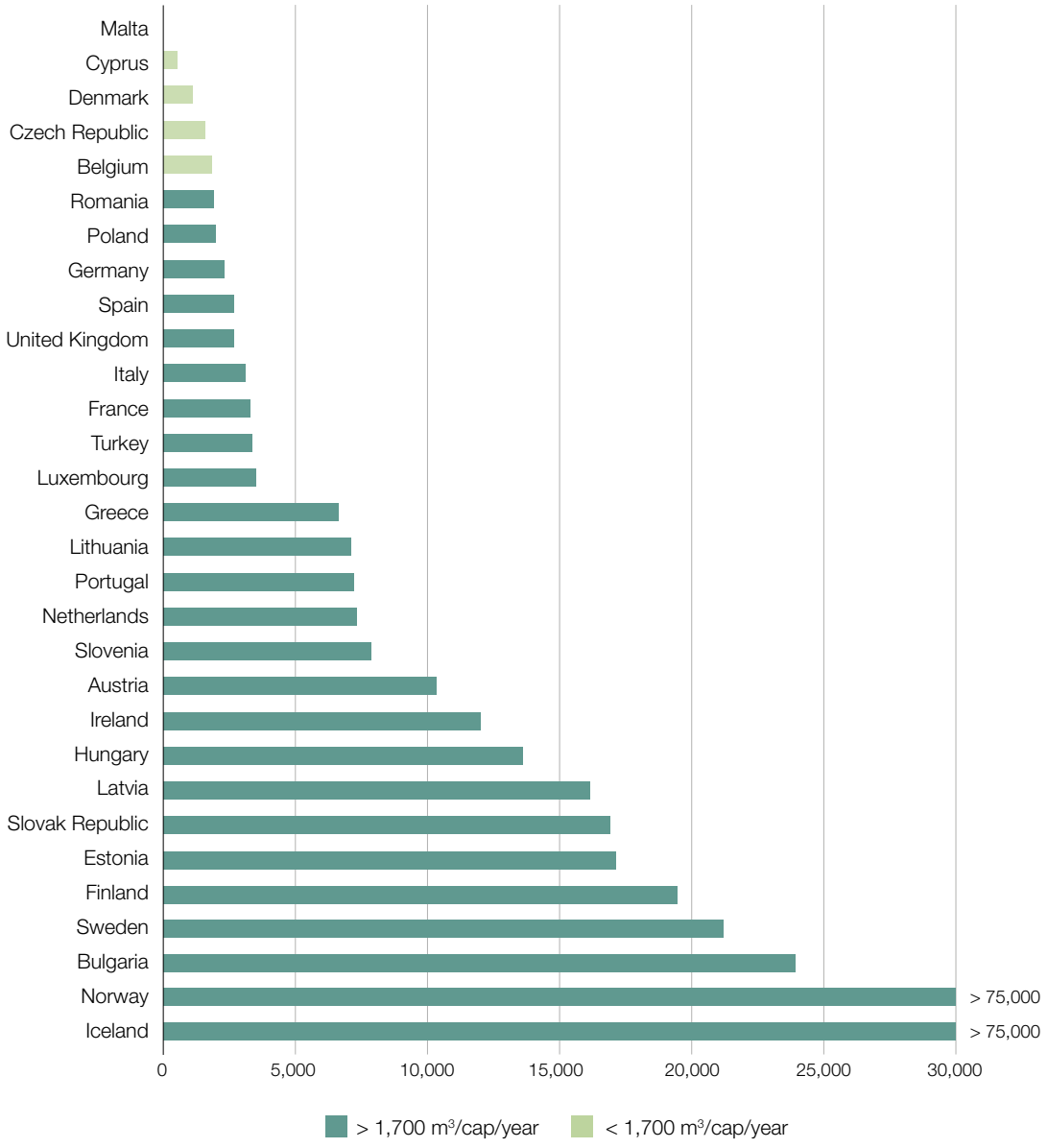
Catchment abstraction management strategies (2008 onwards): sought reviews of all licences, including those which are time-limited, to ensure abstractions are sustainable.

Future water: the Government's water strategy for England (2008): established minimum water efficiency standards for all new homes, a Code for Sustainable Homes and better product labelling. The Strategy encouraged water companies, Ofwat and the Environment Agency to reduce water consumption by encouraging consumers to buy more water efficient products and to send out stronger and more consistent water saving messages.

Targets and performance

Water availability is more restricted in England than in many countries in Europe. Metering is the usual method of charging for water in most other European countries.

Annual water availablilty per capita by country for 2001



Source: European Environment Agency, *Sustainable use and management of natural resources,* 2005

Ofwat set water companies targets for both leakage and water efficiency (in million of litres per day). Ofwat expects companies to aim for a slight reduction in leakage rates, whilst ensuring, at a minimum, that rates have not increased.

The Department for Communities and Local Government and the Department for Environment, Food and Rural Affairs have developed water efficiency targets which include a building performance standard (from April 2010) for new homes of 125 litres per person per day. The targets also set new performance standards for key fittings such as toilets, urinals and taps.

The Government aspires to reduce individual water use in England to 130 litres per person per day by 2030, but relies on various parts of society (such as manufacturing industry, water companies and consumers) to work together to achieve these goals.

Water supply and demand balance

Environment Agency figures state that during 2008-09 there were 12.7 million people living in areas of supply deficit, who could suffer water restrictions in times of low rainfall (against the target of 6.5 million). The number of areas of supply deficit fell from 18 areas to 9 areas during 2008-09, but most of the 9 areas no longer so categorised have smaller populations.

National Indicators

There are three sustainable development indicators for water availability:

Water resource use relating to total abstractions from non-tidal surface and ground water and leakage losses show a lower level of abstraction since 1990, and a falling level of leakage loss since 1990.

Domestic water consumption showed no significant change from 1995 to 2008.

There are four status categories describing the availability of water for licensed abstraction: 1) water available – water likely to be available at all flows including low flows; 2) no water available – no water is available for further licensing at low flows; 3) over licensed – unacceptable environmental damage could arise if licences were used to full allocation; and 4) over abstracted – existing abstraction is causing unacceptable damage to the environment at low flows.

Some 33 per cent of areas in England and Wales are either over licensed or over abstracted.

Stakeholders and policy instruments

Department for Environment, Food and Rural Affairs: has overall responsibility for setting the policy framework for water resources in England and Wales. It has overall policy responsibility for water efficiency and demand use including promotion of water demand management technologies and oversight of supply side management.

Environment Agency: manages water resources, monitors the condition of freshwater bodies, assesses sources and impacts of pollution, and produces River Basin Management Plans to improve freshwater quality in England. It compiles Water Resources Strategy Regional Action Plans showing how the objectives within the Water Resources Strategy for England will be delivered at a regional level. The Agency investigates where over-abstraction has occurred and works with abstractors (particularly water companies) and local people to restore sustainable supplies, within the Restoring Sustainable Water Abstraction programme.

Ofwat: is responsible for ensuring that water companies promote water efficiency, and reduce leakage (to the extent it is economically viable). They promote water metering and scrutinise water companies' Water Resource Management Plans to understand how water companies intend to meet forecast water demand while protecting the environment for the next 25 years. They also scrutinise water companies' forward planning and contingency plans against drought.

Future issues

The Department will prepare the Water Supply National Policy Statement and the Department is expecting to release it for consultation in late 2010. Some proposed regulatory changes are currently under consultation. The Department has undertaken two consultation exercises for proposals on: time limiting water abstraction licences and implementing the abstraction elements of the Water Act 2003.

Appendix Ten

The marine environment

We have set out below the key components of: the regulatory framework; strategy; targets & performance; stakeholders; and future issues.

Regulatory framework

Worldwide

World Summit on Sustainable Development (2002): sought to conserve natural resources (including marine) and to achieve commitments on fisheries' management.

Convention on Biological Diversity (1992): sought to arrest the world-wide decline in biodiversity.

OSPAR Convention (1992): provided a legal basis for international cooperation on the protection of the marine environment of the North-East Atlantic. The UK is one of 16 parties to the Convention.

United Nations Convention of the Law of the Sea (1982): was an agreement for all States to adopt measures to manage and conserve living resources.

European

Marine Strategy Framework Directive (2008): required Member States to assess the status of their seas and take measures to maintain or achieve good environmental status by 2020. For example, it encouraged the fishing sector to adopt sustainable fishing practices by discouraging the release of waste waters into the marine environment.

Illegal, Unreported and Unregulated (IUU) Fishing Regulation (2008): sought to prevent, deter and eliminate illegal fishing, by introducing a catch certificate scheme to ensure full traceability of marine fish products traded within the European Union.

Revised Bathing Waters Directive (2006): sought to protect public health by aiming for all bathing waters to be classed as "sufficient" by 2015 (where the classifications are defined as "poor", "sufficient", "good", and "excellent", and classified according to microbial concentrations in the water).

Common Fisheries Policy (2002): sought to establish rational and sustainable exploitation of fish stocks through conservation and management policies, by setting limits on catch numbers and controls on fishing activity as agreed with all Member States.

Water Framework Directive (2000): sought to prevent any deterioration in the status of water bodies and to achieve good ecological status and good surface water chemical status of water bodies (including estuary waters and coastal waters up to 1 nautical mile from shore) by 2015.

Directive on the Conservation of Wild Birds (1979): aimed for the protection of birds in the marine environment by prohibiting the killing of or capture of bird species covered by the Directive, and by prohibiting damaging, collecting or destroying nests and eggs.

National

Conservation of Habitats and Species Regulations (2010): sought to promote conservation in the marine environment. The regulations required Member States to protect species; undertake surveillance of habitats and species and produce a report every six years on implementation of the EU Habitats Directive.

Marine and Coastal Access Act (2009): established the Marine Management Organisation to provide better protection for our marine environment by taking a consistent decision making approach to planning, licensing and enforcement.

Offshore Marine Conservation Regulations (2007): enacted the Birds and the Habitats Directives by requiring Special Areas of Conservation and Special Protection Areas to be identified and protected in the offshore marine area.

The Registration of Fish Buyers and Sellers and Designation of Fish Auction Sites Regulations (2005): fulfilled EU obligations to improve the monitoring and control of fish and shellfish landed in the UK.

Water Framework Directive (WFD) Regulations (2003): enacted the Water Framework Directive.

Strategy

Our Seas – A Shared Resource (2009): set out UK marine objectives in 2009 including those for achieving a sustainable marine economy.

A strategy for promoting an integrated approach to the management of coastal areas in England (2008): set objectives and presented actions to achieve its vision for effective coastal management.

Fisheries 2027 – a long term vision for sustainable fisheries (2007): aimed to explain the changes in fisheries and fisheries' management over the past 30 years, and suggested how to achieve long-term sustainability by encouraging the fishing sector to adopt more appropriate fishing practices.

Targets and performance

The Government is developing a framework for measuring performance. Relevant performance measures are likely to build on information published in Charting Progress 2 (a 2010 assessment of the state of the UK marine environment). Previous indicators measured the status of fish stocks, abundance of plankton and the level of marine pollution.

Stakeholders and instruments

Department for Environment, Food and Rural Affairs: aims to establish productive and biologically diverse oceans and seas. The Department has responsibility for the UK Quota and Quota Management System (the system ensures that the Common Fisheries Policy quotas are shared fairly amongst the UK fishing industry and quotas are not exceeded) and the 'Days At Sea' scheme (which seeks to improve the sustainability of cod and sole stocks by limiting the amount of time vessels can spend away from port).

Environment Agency: is responsible for management of migratory fish (to 6 nautical miles offshore) and water quality (to 3 nautical miles offshore). The Agency is the Competent Authority for the Water Framework Directive (to 1 nautical mile offshore) and has the strategic overview of flood and coastal erosion risk management.

Natural England: is responsible for promoting nature conservation and protecting biodiversity in English waters (up to 12 nautical miles from shore).

Centre for Environment, Fisheries & Aquaculture Science (CEFAS): provides monitoring, assessment and advice to the Department and other marine managers. It also carries out an annual commercial fisheries stock take.

International Council for the Exploration of the Sea (ICES): assesses the risk that spawning stock biomass could fall below the level required to produce sufficient young fish to support a fishery and maintain it for sustainable, commercial harvesting. Data, provided by CEFAS in the UK, are used as the basis for setting annual EU catch limits.

Marine Management Organisation: implements a new marine planning system designed to integrate the social requirements, economic potential and environmental imperatives of our seas. It implements a new licensing regime; manages UK fisheries quotas; and works with Natural England and the Joint Nature Conservation Committee to manage a network of marine protected areas (marine conservation zones and European marine sites) designed to preserve vulnerable habitats and species in UK waters.

Joint Nature Conservation Committee: provides advice to the Government on the identification of Marine Protected Areas in UK offshore waters.

Sea Fisheries Committees: seek to ensure sustainability of the marine environment by managing, regulating, developing and protecting fisheries (up to six nautical miles from shore).

Future issues

Reform of the Common Fisheries Policy is currently subject to EU-wide consultation and it is planned that a new Policy will be in place from the start of 2013. The last European Union Fisheries Council meeting was on 29 June 2010 and gauged Member State's reactions to a Commission 'options' paper. Formal proposals are not expected until spring 2011.

The most comprehensive and up to date assessment of the UK marine environment is due in July 2010. The next steps under the Marine and Coastal Access Act are to develop Marine Protection Areas and for the Marine Management Organisation to complete Marine Plans for each region. Natural England and the Joint Nature Conservation Committee are to advise the Government by autumn 2011 on sites identified as possible marine conservation zones.

Sea litter and how to deal with it is an emerging issue and the next OSPAR (Oslo and Paris Conventions for the protection of the marine environment of the North-East Atlantic) ministerial meeting is planned to take place in September 2010.

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