August 2001

Environmental Action Plan

Foreword

Ofgem is principally an economic regulator. Within this framework we aim to be sensitive to environmental concerns, and to the environmental effects of our work. This requires us to think carefully about what is the correct balance between economic, social and environmental objectives; to identify what is appropriate for Ofgem to do, and what is appropriate for Government departments and other statutory bodies to do, particularly the Environment Agency (EA) and the Scottish Environment Protection Agency (SEPA) as the environmental regulators; and to define our approach so that it is understood by all those with whom we deal. This document sets out how the Gas and Electricity Markets Authority (the Authority) intends to address these issues.

2. The impact of the gas and – particularly – the electricity industries on the environment is large. Ofgem's duties include the responsibility to protect the interests of consumers (including future consumers) wherever appropriate through effective competition; to carry out our functions in a way which secures a diverse and viable long-term energy supply; the need to have regard to the effect on the environment of activities connected with the generation, transmission, distribution or supply of electricity, and the conveyance of gas through pipes; and the need to have regard to the guidance on social and environmental issues which the Secretary of State will issue in due course. Much of our policy work has wide environmental implications, for example, the structure of price controls for regulated companies, the system for trading wholesale electricity and gas and the creation of locational signals for electricity generation. We have in addition important executive responsibilities, where the policy is made elsewhere: the administration of aspects of the Government's Climate Change Levy and the Renewables Obligation are examples of this.

3. We are conscious that the issues raised by environmental questions can be large and difficult: they often involve decisions on the transfer of wealth between generations, sometimes on a substantial scale. They may also involve trade-offs between economic, social and environmental objectives. The value judgements required go beyond the statutory duties which define Ofgem's responsibilities. We therefore welcome the Government's view, first set out in the White Paper "A Fair Deal for Consumers" and later repeated in the draft guidance on social and environmental questions, that "where the Government wishes to implement social or environmental measures which would

have significant financial implications...these will be implemented by specific legal provision".

4. This document, Ofgem's Environmental Action Plan, sets out how we intend to meet our statutory duties, within the context set out above. It explains our approach to our environmental duties, in terms both of those things we consider it proper for Ofgem to do and of those we do not. It describes these in terms of policy and in terms of execution, and it also describes how Ofgem will itself seek to act in an environmentally responsible way in administering its own affairs.

5. The policy principles which Ofgem has adopted in relation to our environmental responsibilities are as follows:

(i) Environmental sensitivity

Ofgem, while principally an economic regulator, is sensitive to the environmental effects of its actions and of the industries that it regulates.

(ii) Coherence

Ofgem will treat environmental issues coherently across the range of its decision-making. Its policies will seek to maximise synergy between its economic, environmental and social objectives, and to ensure that its activities do not cause unintended environmental harm.

(iii) Role of Ministers and environmental regulators

Ofgem will look to Ministers and other government bodies with direct environmental responsibilities to take the lead on environmental policies where action would have significant financial implications. When called on to do so, and where it is compatible with its statutory duties, Ofgem will implement these policies in the most efficient manner.

(iv) Market imperfections

Ofgem will seek to identify market imperfections that cause environmental harm. It will work to reduce or eliminate those that lie within its sphere of influence, and alert those responsible for environmental regulation to those issues that fall outside Ofgem's scope.

6. In accordance with these principles, and in view of the work currently being undertaken by Ofgem, the following priorities for action have been identified:

- further work on the price controls of transmission and distribution systems to see whether additional incentives are justified to reduce gas and electricity losses

- a review of the treatment of embedded generation, where Ofgem needs to ensure that the system costs to be met by embedded generators are appropriate; and that system integrity is maintained if there is a substantial increase in embedded generators

- an investigation of whether, within the structure of efficient energy trading which the New Electricity Trading Arrangements (NETA) promotes, there is a case for further facilitation of renewables or Combined Heat and Power (CHP), and if so what are the most effective mechanisms to achieve this, and

- further encouragement of a system of NO_x emissions trading, as an efficient means of encouraging compliance with environmental standards.

7. Also in line with these principles, Ofgem will continue to carry out its executive functions relating to the environment, including:

- the administration of the exemption for renewables from the Government's Climate Change Levy and the administration of the Government's Renewables Obligation

- the administration of the Energy Efficiency Commitment, where the overall framework will be set by Government, and

- the continuing survey of the CHP generating sector, to assist Government in its policy of promoting CHP.

Callum McCarthy
Chairman of the Gas and Electricity Markets Authority,
Chief Executive of Ofgem

August 2001

Executive summary

This document represents the culmination of Ofgem's work to establish an Environmental Action Plan. The first step in this process was the discussion document, published in July 2000, in which we set out our initial thoughts on our approach to the environment. We received many responses to the document which we have taken into account in developing the final version of the Plan (a summary of responses is contained in Appendix 1).

In the meantime, with the continuing implementation of the Utilities Act, our secondary duties in relation to the environment have been strengthened. The Government has now issued a draft of the social and environmental guidance to which Ofgem will have to 'have regard' in carrying out its functions in the future. In the draft the Government has set out the environmental policies it considers to be most relevant to Ofgem's work, including targets for the reduction of greenhouse gases; for increasing the percentage of electricity generated from renewable sources; and for increasing the amount of installed CHP.

The Environmental Action Plan should be seen in light of these developments. It sets out the four main principles Ofgem will adopt in regard to its environmental responsibilities, and explains the general policy direction that we shall follow as a result. Throughout the process of developing the Plan we have taken careful account of the basis of Ofgem's role in relation to the environment, and the way we interact with other organisations which also have a role to play. The Plan also sets out certain priorities for action, identified in light of the principles described above, and taking into account Ofgem's current work programme, including our executive functions which relate to the environment.

The first part of the Plan (chapters 1–3) sets out the general context for Ofgem's work in relation to the environment. Chapter 2 looks specifically at Ofgem's principal objective and secondary duties. It then explains the ways in which Ofgem will interpret these duties, in particular where our secondary duties relating to the environment might appear to conflict with our principal objective. In light of this discussion, the chapter then sets out the four key principles that Ofgem will adopt in relation to our environmental responsibilities.

Chapters 4–6 look at the environmental aspects of specific areas of Ofgem's work: generation; transmission and distribution; and supply. The chapters explain the basis for applying the environmental principles to these areas of work, and set out the next steps to which we are committing ourselves.

Chapter 7 considers the issue of environmental reporting, and discusses the ways in which Ofgem might encourage best practice in this area. Chapter 8 describes Ofgem's own environmental policy, and sets out the actions we are taking to increase transparency and to improve our links with a wide range of interested parties. It also explains the mechanisms by which we shall take into account the environmental implications of our policy decisions. The final two chapters summarise the specific actions set out in the Plan, and explain how we intend to monitor and measure our progress against them.

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1. Introduction

Purpose of this document

1.1 This document:

- assesses the extent and nature of Ofgem's role in contributing to the Government's environmental agenda, and
- proposes specific actions which Ofgem intends to carry out in fulfilment of that role.

Background to this document

1.2 Following consultation over the Plan and Budget for 2000/2001 Ofgem decided to initiate a process which would result in an Environmental Action Plan. A discussion document was issued at the end of July last year, which was the first step in this process. This decision document has been delayed to allow a further draft of the Secretary of State's social and environmental guidance to be published in May this year.

1.3 By October we had received 65 responses to the discussion document, from a wide range of interested parties; and between November and January we held 30 bilateral meetings to explore in more depth the comments we had received. In March we hosted two workshops, one for representatives of gas and electricity companies and another for representatives of non-governmental organisations (NGOs) and other interested parties. (For a full list of respondents and attendees see Appendices 2 and 3).

1.4 This document is the culmination of that consultation process. It also reflects the results of various workstreams set in motion to gain a better understanding of some of the issues raised in the initial discussion document. This is not the end of the process as the document commits Ofgem to taking forward a range of initiatives beneficial to the environment. Some of these will require further discussion and consultation before they are finalised.

1.5 Ofgem is committed to linking closely its work on social and environmental issues, which form one of the priority areas of activity in Ofgem's Plan and Budget for 2001/2002.

Ofgem's duties

1.6 Ofgem's principal objective is to protect the interests of present and future consumers, wherever appropriate by promoting competition. A number of secondary duties are potentially relevant to the environment. These include a duty to promote efficiency and economy; a requirement to protect the public from dangers associated with the generation, transmission, distribution or supply of electricity, and the conveyance of gas through pipes; a duty to have regard to the effect of these activities on the environment; and a duty to secure a diverse and long term energy supply.

1.7 Ofgem also has a statutory responsibility for implementing a number of important Government environmental policies in the areas of domestic energy efficiency, renewable energy and combined heat and power (CHP). These are executive functions.

1.8 In addition the Secretary of State will finalise guidance to Ofgem on social and environmental issues over the coming months. A draft of this guidance was issued for consultation in May. It will detail the Government's social and environmental policies considered to be relevant to Ofgem's work. Ofgem will have to 'have regard to' these policies in carrying out its functions. The draft makes it clear that where the Government wishes to implement social or environmental measures which would have significant financial implications for consumers, or for the regulated companies, these will be implemented by means of specific legal provision.

1.9 Ofgem recognises that the use of gas and electricity, whilst fundamental to the health and economic wellbeing of this country, has significant environmental impact, not least through the emission of greenhouse gases to the atmosphere. This document sets out the ways in which Ofgem intends to take into account its principal objective and secondary duties in relation to the environment in carrying out its functions. It also sets out the ways in which Ofgem will seek to

resolve any conflicts which might arise in meeting its economic, social and environmental objectives.

1.10 The development of this Environmental Action Plan should therefore be seen as part of the process in which Ofgem defines the scope and establishes the basis for its role in taking into account environmental considerations in the decision-making process, and in making its contribution towards delivering the Government's environmental targets.

Ofgem's role in environmental issues

1.11 Ofgem's role in environmental issues is defined in statute including the Utilities Act 2000. First, Ofgem has an obligation to carry out its functions in accordance with its principal objective and secondary duties, set out in the preceding section, and to decide how to proceed where these might conflict. Second, we must act within the bounds of the coexisting, and sometimes overlapping, responsibilities of other bodies, whether they be Government departments, the devolved administrations or other regulators and agencies. Some of these have much more substantial statutory duties than Ofgem in relation to the environment.

1.12 Nonetheless, it is clear that Ofgem, together with the gas and electricity companies, will have an important role to play in helping to deliver the Government's environmental targets, and in contributing to sustainable development.

1.13 Ofgem also has a further important role in acting as a catalyst for gas and electricity companies wishing to come forward with innovative and creative ideas for promoting and protecting the environment. There are already many good examples of companies who have come up with interesting ideas. Ofgem hopes that the Environmental Action Plan process will stimulate many others, in much the same way as the Social Action Plan has done.

Structure of the document

1.14 The first part of the Plan (Chapters 1–3) sets out the general context for Ofgem's work in relation to the environment. Chapter 2 looks specifically at Ofgem's

principal objective and secondary duties. It then explains the ways in which Ofgem will interpret these duties, in particular where our secondary duties relating to the environment might conflict with our principal objective. In the light of this discussion, the chapter then sets out the four key principles that Ofgem will adopt in relation to our environmental responsibilities.

1.15 Chapters 4–6 look at the environmental aspects of specific areas of Ofgem's work: generation; transmission and distribution; and supply. The chapters explain the basis for applying the environmental principles to these areas of work, and set out the next steps to which we are committing ourselves.

1.16 Chapter 7 considers the issue of environmental reporting, and discusses the ways in which Ofgem might encourage best practice in this area. Chapter 8 describes Ofgem's own environmental policy, and sets out the actions we are taking to increase transparency and to improve our links with a wide range of interested parties. It also explains the mechanisms by which we shall take into account the environmental implications of our policy decisions. The final two chapters summarise the specific actions set out in the plan, and explain how we intend to monitor and measure our progress against these.

1.17 A summary of the responses to the July discussion document is contained in Appendix 1, followed by a full list of respondents in Appendix 2. A list of attendees at Ofgem's workshops appears in Appendix 3. Appendix 4 contains information on the diversity and viability of the UK fuel mix. Finally, Appendix 5 provides a glossary of terms. Throughout the document specific actions for Ofgem are identified in bold.

1.18 A section of Ofgem's website is now dedicated to the Environmental Action Plan. It contains lists of key contacts and relevant background documents. For example, more details are available on climate change, sustainable development, power station consents, on the role of other organisations in the environment, and on environmental reporting. Ofgem's website can be found at: www.ofgem.gov.uk

Next steps

1.19 Ofgem will start to implement the proposals in the Plan immediately. Many of the initiatives are already underway. Others will require further consultation, as we have indicated, and we shall be seeking views on these from interested parties during the year. The document lists the timescales to which Ofgem is working, and against which we shall report on progress by the end of March 2002.

2. Legislative context

2.1 This chapter sets out the legislative framework within which Ofgem works, recently reformed by the Utilities Act 2000 (the "Act"). The environmental responsibilities established under this legislation are outlined, and Ofgem's views of the complex relationships between these responsibilities and the principal objective are elaborated. Based on this analysis, four policy principles regarding Ofgem's environmental responsibilities are proposed.

Ofgem's statutory duties

2.2 The Utilities Act 2000 made changes to the Gas Act 1986 (the "Gas Act") and the Electricity Act 1989 (the "Electricity Act"). It created the Gas and Electricity Markets Authority (the "Authority") transferring to it the functions of the Director General of Gas Supply and the Director General of Electricity Supply.

2.3 The Act introduced a new principal objective and new duties into the Gas and Electricity Acts. Ofgem's duty is to carry out its functions in the manner best calculated to further the principal objective, which is to protect the interests of consumers, including future consumers, wherever appropriate by promoting effective competition.

2.4 In carrying out this objective Ofgem must also have regard to:

- the need to ensure that all reasonable demands for electricity are met and, so far as is economical, all reasonable demands for gas are met;
- the need to secure that licence holders are able to finance their obligations;
- the interests of individuals who are disabled or chronically sick, pensionable age, living on low incomes, and individuals residing in rural areas; and
- the interests of consumers in relation to gas (under the Electricity Act) or electricity (under the Gas Act) and any interests of consumers in relation to telecommunications, water or sewerage services which may be affected by the carrying out of Ofgem's functions.

2.5 At the next level in its hierarchy of duties, Ofgem is also required to carry out its functions in the manner which it considers best calculated to:

- promote efficiency and economy
- protect the public from dangers, and
- secure a diverse and viable long term energy supply.

2.6 In carrying out these functions Ofgem must have regard to the effect on the environment of activities connected with the generation, transmission, distribution or supply of electricity, and the conveyance of gas through pipes.

2.7 Finally, Ofgem is required to have regard to social and environmental guidance to be issued from time to time by the Secretary of State. The Secretary of State is required under the legislation to consult with Ofgem concerning this guidance. A draft of the first guidance was issued in May 2001 for consultation and is expected to be finalised later in this year. Details of the draft guidance are included in the box on page 15.

2.8 Ofgem also has duties under other legislation relating to the environment. For example, the National Parks and Access to the Countryside Act 1949 (as amended by the Environment Act 1995) require Ofgem, when performing functions in relation to, or so as to affect, land in any National Park, to have regard to certain criteria set out in that Act.

Ofgem's executive functions

2.9 Under the Electricity and Gas Acts Ofgem also has a range of executive functions in respect to the environment. The Acts provide the legal basis for the Energy Efficiency Standards of Performance (EESoP) schemes which promote energy efficiency in the domestic environment. The Electricity Act also provides for the Non Fossil Fuel Obligation (NFFO) and the Fossil Fuel Levy which have been used to promote the development of renewable energy technologies. It also makes provisions for Combined Heat and Power (CHP), requiring Ofgem to collect information about the generation of electricity, particularly the development of generation using CHP.

2.10 The Utilities Act introduced new powers for the Secretary of State to make regulations to promote energy efficiency and the generation of electricity from renewable sources. The Finance Act 2000 provides for electricity from renewable sources to be exempt from the Climate Change Levy. Ofgem is required to administer these policies.

Statutory social and environmental guidance

An initial draft of the guidance was issued in February 2000[1]. The Secretary of State has recently issued a further version of the guidance for consultation[2]. Comments are requested by 24 August 2001.

The aim of the guidance is to ensure that Ofgem takes into account the Government's wider social and environmental goals in its decision-making process:

"In this way, the Authority can make a contribution, appropriate to its functions and duties, towards the wider social and environmental objectives of the Government, without compromising the principle of arm's length regulation."

The guidance does not issue specific instructions to Ofgem. It is designed to remain current for the next five years or so.

Although Ofgem has a responsibility to have regard to the Government's wider policy goals, the draft guidance makes it clear that:

"*where the Government wishes to implement social or environmental measures which would have significant financial implications for consumers or for the regulated companies, these would be implemented by means of a specific legal provision*".

The environmental policies specifically referred to include energy efficiency, sustainable development and the particular targets for emissions reductions, renewables and CHP that are described in the UK's Climate Change Programme.

[1] Draft Statutory Social and Environmental Guidance to the Gas and Electricity Markets Authority: A consultation document from the Department of Trade and Industry. February 2000
[2] Draft Statutory Social and Environmental Guidance to the Gas and Electricity Markets Authority: A consultation document from the Department of Trade and Industry. May 2001

The document cites the Environmental Action Plan as an opportunity for Ofgem to encourage innovation and be creative in the way that it treats environmental issues. The Government welcomes Ofgem's intention to flag environmental concerns at the earliest stages of policy and decision-making. They also suggest that Ofgem has a role in the quantification of the environmental effects of any proposed regulatory action.

The Government has asked Ofgem to assess the impact of NETA on CHP and renewables, and to be aware of the desirability of reducing gas and electricity losses through increased embedded generation and other means.

The guidance also points to Ofgem's duty to promote competition in generation. As part of its work to achieve this, the Government suggests that Ofgem should consider as desirable the removal of barriers to embedded generation. The Government also points to the desirability of growth in domestic generation as an embedded generation issue for Ofgem to consider.

The Government suggests Ofgem should focus on the potential impact of energy efficiency at all points in the supply chain. This includes electricity generation, gas transportation, electricity transmission and distribution and energy efficiency for commercial and domestic consumers, including the potential impact of metering systems. The Government notes that Ofgem will have to administer the Energy Efficiency Commitment from 2002 – 5 and urges it to take account of this when making other regulatory decisions. The Government supports the development of energy services and calls on Ofgem to have due regard for their potential.

The Government hopes to see Ofgem report annually on its Environmental Action Plan. Ofgem is currently engaged in work in many of the areas mentioned in the guidance. This work is described in the appropriate sections in chapters 4 – 6.

Regulation and the environment

2.11 Taken together, the changes to the regulatory framework outlined above make it appropriate for Ofgem to place greater emphasis on the consideration of the environmental effects of its activities. This is within the overall context of the principal objective of protecting the interests of consumers. The July 2000 discussion document identified that there can be conflicts between these responsibilities. Therefore Ofgem considers that the clarification of its role in

relation to the environment will assist its internal policy development. It will also assist the industry in understanding Ofgem's role and those of other relevant organisations.

Conflicts between objectives

2.12 While there is potential for conflict between meeting Ofgem's principal objective and meeting its environmental responsibilities, Ofgem suggests that the promotion of competition and use of targeted regulation can be complementary to a coherent environmental policy, as long as there is clarity of responsibility for environmental issues.

2.13 For many of Ofgem's activities all of the relevant objectives and responsibilities will be complementary, and no trade-offs will need to be made. In these situations, successful fulfilment of Ofgem's principal objective should simultaneously ensure that the secondary duties are fulfilled. The adoption of cost effective energy efficiency measures by domestic customers is an example of this. Measures to promote energy efficiency are in the long term interests of both consumers and the environment if the additional costs are more than offset by savings in energy costs from decreased consumption over a reasonable term.

2.14 Where there are potential tensions between objectives, Ofgem will make decisions based on an assessment of the positive and negative economic, social and environmental effects within the context of the hierarchy of objectives and duties set out in the legislation. We will seek to do this as explicitly as possible.

Lower energy costs and environmental externalities

2.15 A frequently cited example of conflicting interests is that of low energy prices resulting in high consumption and decreased incentives for energy efficiency measures.

2.16 The achievement of lower prices through market reforms is the result of increased operating efficiency. This may bring positive benefits for the environment by, for example, reducing energy losses or more efficient use of fuels. Conversely, higher operating costs and margins imply inefficiency and a potential waste of resources. The existence of inefficient plant and monopoly

profits does not benefit the environment, since wasted resources could be redeployed to activities that have more positive environmental effects.

2.17 If lower prices lead to increased consumption, this may have an environmental impact. Consumers may not recognise the full environmental impact of their energy consumption where they are not paying the full environmental cost of the energy that they use. This occurs when the full cost of pollution is not paid; that is, there are environmental externalities. The existence of environmental externalities is not unique to energy industries, being present to a degree in all sectors of the economy. In some, transport for example, the externalities are very large indeed.

2.18 Given that there is great contention over charges to customers reflecting such externalities, and given the framework of our statutory duties, Ofgem looks to elected Ministers to take a lead by setting, where appropriate, overall environmental goals and targets which take into account specific externalities. Ministers may then make the policy choices when these involve charging regimes reflecting externalities through emissions trading schemes, setting levies or the raising of taxes or other fiscal instruments that may apply more broadly than to the gas and electricity industries. It may then become Ofgem's responsibility to administer such instruments where this is considered appropriate.

The new duties

2.19 The Act has resulted in two changes to the Authority's duties which require Ofgem to take a longer term view in its activities. These are:

- the principal objective to protect the interests of consumers, *including future consumers,* wherever appropriate by promoting effective competition*;* and
- the secondary duty to secure a diverse and viable long term energy supply.

The interests of future consumers

2.20 The gas and electricity industries are characterised by the importance of investment in assets, such as pipelines and power stations, that have useful lives of a generation or more. Consequently balancing the needs of the present and the future is central to the operation and regulation of these industries. These factors are routinely taken into account by Ofgem in undertaking its regulatory activities, especially in areas where there is no effective competition.

2.21 Balancing the needs of current and future consumers also has an environmental dimension. Investment decisions made today can impose environmental costs on future generations or may result in limiting their options for development by the early depletion of scarce resources or the locking in of particular technologies.

2.22 A market which is functioning efficiently will take into account the interests of future consumers as assessment of the conditions and risks participants will face will be incorporated into current decision-making processes especially in the case of long term capital investment. However, a number of factors can affect whether these market signals are effectively delivered, not least the existence of environmental externalities.

2.23 Ofgem is reviewing the incentives for providers of monopoly services with a view to enhancing their capacities to meet longer term requirements.

A diverse and viable long term energy supply

2.24 Ofgem's new duty, to carry out its functions in a manner which it considers is best calculated to secure a diverse and viable long term energy supply, also requires consideration of issues of the conservation of scarce resources and the needs of future generations. It is, therefore, relevant to the Environmental Action Plan. The new duty requires Ofgem to give due attention to issues surrounding risks to energy supplies when discharging its principal duty.

2.25 The tendency for centralised decision-making to produce lesser degrees of diversity than competitive markets is borne out by historical experience. Centrally managed electricity systems, for example, have in the past relied heavily on particular generation technologies, for example, coal in the UK and

nuclear in France. The liberalisation of energy markets and the development of competition in the UK has been associated with significantly increased diversity in the fuel mix used for electricity generation (see Appendix 4 for more information).

2.26 Based on available evidence, Ofgem considers that the most effective guarantor of the diversity and viability of energy supplies in the long term is effective competition. Therefore the new duty gives added weight to the presumption that the promotion of such competition is the best means of protecting the interests of all consumers. More specifically, it emphasises the importance that Ofgem attaches to ensuring there are no substantial barriers to entry into the relevant markets. As a result Ofgem's new duty in relation to diversity and viability is implicitly encompassed in its principal duty and any significant conflict between the two is unlikely.

2.27 The new duty reinforces Ofgem's established view that the suspension of effective competition, even when it may lead to short-term benefits for consumers, can be expected to be contrary to consumer interests more generally, because of its likely long term consequences. Government intervention in markets in order to secure future supply is not cost free as it may blunt market signals. For example intervening to reduce price shocks discourages market participants acting to minimise them.

2.28 There are, however, possible sources of market failure that might compromise Ofgem’s new duty. Specifically a range of environmental externalities associated with the production, transmission and distribution of electricity and gas could potentially affect the evolution of the fuel mix in ways that are not, in the long term, efficient. If the prices paid for certain fuels do not reflect their full cost, including environmental costs, then the market will be biased in their favour and will result in an inefficient fuel mix in the longer term.

2.29 As with other externality issues, where diversity and viability problems are not currently being addressed adequately, the appropriate response is for the bodies primarily responsible to develop policies to resolve the difficulties. Consistent with the policies outlined above, it would not be for Ofgem to take a lead role in resolving such market failures. Attempting to do so would usurp the

responsibilities of Government departments and other statutory bodies, leading to regulatory confusion and poor policy implementation. However Ofgem will endeavour actively to implement any policy decisions in this area within the framework of a competitive market.

2.30 In competitive markets users of electricity and gas networks can be expected to factor risk assessments into their decisions. However where effective competition is not currently feasible, such as in the transmission and distribution of electricity and gas, Ofgem should seek to ensure that new investment, and access to existing networks, do not bias the development of energy sources and lead to inappropriate future risks associated with the resulting lack of diversity. Therefore, when making decisions concerning non-competitive activities, Ofgem should act to ensure that long term network development, access and operation appropriately reflect the needs of network users, and that network capacity is made available on a non-discriminatory basis.

2.31 In discharging its duties in relation to diversity and viability, when issues relating to externalities arise, Ofgem should not seek to substitute its own actions for those of other public bodies or agencies directly entrusted with the responsibility of addressing those problems. However, Ofgem should alert other agencies to any likely or significant effects of their decisions and potential decisions on the diversity and viability of energy supplies in the long term.

2.32 The DTI and Ofgem have agreed to set up a working group to monitor aspects of security of supply issues. The group will:

- assess the available data relevant to security of supply, to identify the gaps in that data and develop appropriate indicators
- monitor at a strategic level, over a timescale of at least 7 years ahead:

  (a) the availability of supplies of gas
  (b) the availability of supplies of electricity and fuels used for electricity for generation
  (c) the adequacy of generating capacity, and
  (d) the adequacy of the UK's gas and electricity infrastructure

- assess whether appropriate market-based mechanisms are bringing forward timely investment to address any weaknesses in the supply chain that are anticipated
- identify relevant policy issues and consider implications, and
- report twice yearly to the Secretary of State and the Gas and Electricity Markets Authority.

Conclusion

2.33 **In the light of the above analysis, Ofgem intends to adopt the following policy principles in regard to its environmental responsibilities**:

(i) Environmental sensitivity

Ofgem, while principally an economic regulator, is sensitive to the environmental effects of its actions and of the industries that it regulates.

(ii) Coherence

Ofgem will treat environmental issues coherently across the range of its decision-making. Its policies will seek to maximise synergy between its economic, environmental and social objectives, and to ensure that its activities do not cause unintended environmental harm.

(iii) Role of Ministers and environmental regulators

Ofgem will look to Ministers and other government bodies with direct environmental responsibilities to take the lead on environmental policies where action would have significant financial implications. When called on to do so, and where it is compatible with its statutory duties, Ofgem will implement these policies in the most efficient manner.

(iv) Market imperfections

Ofgem will seek to identify market imperfections that cause environmental harm. It will work to reduce or eliminate those that lie within its sphere of influence, and alert those responsible for environmental regulation to those issues that fall outside Ofgem's scope.

3. Policy context

3.1 This chapter summarises developments in energy and environment policy at the international, European and national level. This is the context within which Ofgem intends to apply the four principles set out in Chapter 2. The main focus of the current chapter is on climate change policy, as a key element of sustainable development. The chapter also summarises other developments in air quality policy.

3.2 Energy and environmental policy is dynamic and changing. New policy initiatives and drivers can have an impact on energy consumption and production patterns and, indirectly, on Ofgem's environmental and broader executive responsibilities.

Sustainable development

3.3 The 1992 United Nations Conference on Environment and Development (UNCED) (the "Earth Summit") marked the beginnings of international efforts to achieve sustainable development. All 180 delegate countries agreed to produce their own national sustainable development strategies, indicating the ways in which social, environmental and economic considerations would be integrated into national growth and development. The UK was one of the first countries, in early 1994, to do so. In May 1999, the Government published the third version of the strategy, *A better quality of life - a strategy for sustainable development in the United King*dom, which, amongst other actions, established the Sustainable Development Commission.

3.4 The European Union (EU) is also addressing issues of sustainability. The European Commission has now published its draft sustainable development strategy called *Quality of Life*. This is expected to be adopted by Ministers in preparation for the 'Rio + 10' meeting, to be held in South Africa in 2002. It is likely that an update in the international approach to sustainable development will be agreed at that meeting.

3.5 Climate change, green energy and fossil fuel consumption are central issues in the debate on sustainability, making recent developments highly relevant to the

utilities sector. General definitions of sustainable development and more details of the European and UK strategies are available on Ofgem's website.

Climate change

The United Nations Framework Convention on Climate Change

3.6 Agreement that an international response to climate change was necessary proved to be a major driver for the development of national climate change policy initiatives. The 1992 United Nations Framework Convention on Climate Change (UNFCCC) is the international instrument that set in motion the process to combat climate change. Signed by over 160 countries, the UNFCCC set up a framework for combating climate change that was fleshed out by the Kyoto Protocol to the Convention, agreed in December 1997.

3.7 The Kyoto Protocol sets quantitative targets for developed nations in terms of cuts in greenhouse gas emissions to be met over the period 2008 – 2012. The second phase will run from 2013 – 2017. The Kyoto Protocol will become law when ratified by 55 countries, representing at least 55 per cent of 1990 developed world emissions.

3.8 The United States, responsible for approximately 25 per cent of 1990 CO_2 emissions in the developed world, withdrew its support for the Protocol in March 2001. However many other developed nations, meeting in Bonn in July 2001, reached agreement on modifications to the Protocol which will allow them to proceed with the ratification process. Since, together, they account for 75 per cent of 1990 developed world emissions, this should be sufficient for the Kyoto Protocol to become law without the support of the US. Further details on the implementation of the Kyoto Protocol will be considered in Marrakesh in November 2001.

Climate change in the EU

3.9 The EU's target of 8 per cent has been apportioned among the Member States, with each having agreed to individual targets according to national circumstances. In parallel, the European Commission has launched the European Climate Change Programme (ECCP) aimed at identifying additional policies and measures that will be necessary if the EU is to meet its climate change targets.

Several of these are already well developed, including a Directive aimed at encouraging renewable sources of energy, proposals for a CHP strategy, an energy efficiency action plan and initial proposals for the development of a European-wide greenhouse gas emissions trading scheme.

Climate change initiatives in the UK

3.10 The UK has agreed to reduce its greenhouse gas emissions by 12.5 per cent on 1990 levels by 2010 – its contribution to the overall EU target of an 8 per cent reduction. The UK has also set a domestic goal to cut emissions of CO_2, the most abundant greenhouse gas, by 20 per cent on 1990 levels by 2010. In parallel, the UK launched a detailed *Climate Change Programme*[3] in November 2000. It includes a wide range of measures to contribute to meeting both targets. One of these measures is the Climate Change Levy, introduced on 1 April 2001, which taxes non-domestic customers on the basis of their energy use.

3.11 The Programme measures apply to all relevant sectors from forestry to agriculture, transport to energy and include all sections of the population. In the area of transport, for example, the Government is running programmes to increase penetration of next generation fuel-efficient technologies and vehicles and is introducing various taxation schemes such as an emissions differentiated vehicle tax.

3.12 The US position on the Kyoto Protocol will be an important factor in determining greenhouse gas emission reduction targets beyond 2012. The UK does not intend to set longer term targets for emissions in advance of international discussions on future targets, due to start in 2005.

Royal Commission report

3.13 The UK's Royal Commission on Environmental Pollution (RCEP) report, *Energy – The Changing Climate*[4], focuses on the uncertainties evident in the long term, predicting that the UK is likely to see an increase in CO_2 emissions after 2012, reaching a 2 per cent rise on 1990 levels by 2020. The DTI's middle-of-the-road scenario, outlined in the *Energy Paper 68* (December 2000), is slightly more

[3] Climate Change – The UK Programme, DETR, November 2000.
[4] *Energy – The Changing Climate* (Royal Commission on Environmental Pollution), 22nd Report June 2000

optimistic, forecasting a 2.6 per cent decrease on 1990 levels of CO_2 emissions by 2020.

3.14 The RCEP suggests that the UK should go much further than existing reductions and cut CO_2 by 60 per cent on 1990 levels in order to keep the atmospheric concentration of CO_2 below 550 ppmv (parts per million by volume) (twice the pre-industrial level) by 2050. Such a large reduction would require emissions cuts at the rate of 4.4 per cent of 1990 levels/year from 2010, outstripping the rate expected in 2000-2010 of 2.9 per cent/year and greater than the historic trend of 3.0 per cent/year between 1970 and 2000.

UK energy policy review

3.15 In June 2001 the Prime Minister announced that the Government's Performance and Innovation Unit (PIU) will undertake a review of the long term, strategic issues surrounding energy policy. The review will look at how the UK can contribute to meeting the challenge of global warming, while ensuring reliable and competitive energy supplies. The PIU will prepare a report by the end of 2001.

3.16 The PIU has identified that current patterns and future projections of global and UK energy consumption raise three key challenges:

- managing potential conflict with environmental objectives
- ensuring continued security and diversity of energy supplies over the long term, and
- managing potentially conflicting policy goals for energy prices and balancing environmental goals with fuel poverty targets and industrial competitiveness objectives.

3.17 The project will look at energy policy up to 2050. The main aim of the project will be to set out the objectives of energy policy and to develop a strategy that ensures current policy commitments are consistent with long term goals. The project will also analyse the implications on fuel poverty of possible policy changes. The Prime Minister has explained that competitive markets will continue to be central to energy policy.

3.18 The results of the review will inform future policy on security and diversity of energy supply and on climate change, including the Government's response to the RCEP report outlined above. The review will incorporate the PIU's current work on resource productivity, which is examining the scope for reducing the proportion of raw materials in manufacturing and other output.

Future energy use and power generation

3.19 Clearly energy policy will be a major factor in determining future climate change policies in the UK and elsewhere. The *World Energy Outlook (WEO) 2000*[5] forecasts a steady rise in world energy use and carbon dioxide emissions between now and 2010, in the absence of any new policy measures. By 2010 forecasts suggest that the power sector will contribute 21 per cent more greenhouse gas emissions than in 1997, and by 2020 it will contribute 33 per cent more. (By contrast, total greenhouse gas emissions are only expected to rise 16 per cent and 25 per cent respectively over the same time periods).

EU policy on renewable energy

3.20 The EU Directive on the promotion of electricity produced from renewable energy sources, part of the Climate Change Programme, was agreed in July 2001. It sets out an 'indicative' target of 12% for renewables to be achieved by 2010. The Directive calls on Member States to report on the achievement of their targets, and on the effectiveness of national support measures used to promote renewables. The Directive also requires Member States to ensure that transmission and distribution systems are accessible for renewables, and this could include granting them priority access to the systems.

3.21 Many other EU initiatives aim to encourage the use of renewable sources of energy. For example, the Framework Programmes for Research and Development have provided funding for several important renewable energy projects in Europe. Crucially, the Commission's guidelines on State Aids in Environment Policy allow Member States to support the development of renewable energy.

[5] *World Energy Outlook 2000*, Second Edition published February 2001 by International Energy Agency, Paris.

UK policy on renewable energy

3.22 The UK Government has supported the development of renewable energy for many years. Since 1990 the Non-Fossil Fuel Obligation (NFFO) has provided support worth around £700 million. A wide range of support measures designed to accelerate the development of renewable energy has now superseded NFFO. These include:

- the Renewables Obligation on suppliers, estimated to cost consumers £780 million a year by 2010
- exemption from the Climate Change Levy for electricity from renewable sources (as well as for 'good quality' CHP, see footnote below)
- capital grants available for renewable energy schemes over the next three years, worth £100 million
- support for the planting of energy crops over the next six years, worth £29 million
- support for research, development, demonstration and dissemination for renewable technologies over the next three years, worth £55 million
- additional funding of £100 million to supplement these support mechanisms.

Market mechanisms

3.23 The principal elements of the Government's support programme are the two market-based mechanisms designed to encourage the uptake of new and renewable energy:

- electricity generated from qualifying renewable sources, and 'good quality'[6] CHP, is exempt from the Climate Change Levy, set at 0.43p/kWh

[6] 'Good quality' is based on a DEFRA definition

- the Renewables Obligation puts electricity suppliers under an obligation to supply 3 per cent of their electricity from qualifying renewable sources of energy from January 2002; the aim is to increase the percentage annually so that the UK is in a position to meet its target of 10 per cent of electricity generated from renewable sources by 2010; those suppliers who do not meet their obligation will be permitted to 'buy out' at a cost of 3p/kWh of unmet obligation.

Capital grants

3.24 The Government recognises that the Renewables Obligation is unlikely to be sufficient to provide support for all qualifying renewable energy technologies, and is providing additional support for those which it considers less well-developed. These include offshore wind, photovoltaic (PV) cells, energy crops and small scale biomass heat. This support which totals approximately £129 million over the next 3 - 5 years is being made available through the DTI, through the New Opportunities Fund and through the DEFRA Planting Fund.

3.25 Those technologies considered likely to be immediately viable with the Government's assistance include waste, biomass, landfill gas, onshore wind, hydro and passive solar with stand-alone photovoltaic (PV) cells. The Government considers that these technologies will prove attractive as exports. Wood fuel, such as short rotation coppice, is considered to be a promising energy crop in the longer term.

Embedded generation

3.26 The Government has also recognised the need for initiatives downstream of research and development. The Working Group on Embedded Generation, in its report in June 2001, warned that the Government would miss its targets for renewables and CHP if commercial barriers in the electricity network to embedded generators were not addressed. The Working Group has suggested a range of initiatives to address the regulatory framework, financial incentives and network technical design approaches that could create a more favourable commercial and technical setting for embedded generators to contribute significantly to the UK's electricity consumption. (See page 44 for more details.)

Trading CO_2 emissions

3.27 The Government plans to launch a voluntary national scheme for trading CO_2 emissions in April 2002. This scheme will put a value on emissions reductions and is designed to help industry reduce emissions according to market signals, in a cost-effective way. In parallel, such a system should increase the value of the more modern, and environmentally sound, technologies. (It is not clear yet how the UK scheme will interact with the EU's proposed scheme.)

Other new technologies

3.28 Under the auspices of the UK Climate Change Programme, cleaner coal technologies are still being developed, although mostly with a view to export to developing nations. Combined Heat and Power is also subject to a new quality assurance scheme and with a new support CHP Club set up in May 2000. The Government is expected to publish a CHP strategy during 2001. The potential to capture and store carbon is also being researched as an alternative means of combating climate change.

Air quality

3.29 In addition to the climate change driven strategies outlined above, international, European and national policy-makers are continuing to update policies to improve air quality. These policies have significant impacts on the electricity and gas industries.

EU policy on clean air

3.30 Current European legislation sets long term limits and targets for certain pollutants in the air and makes restrictions on emissions to the air from a wide range of industrial processes.

3.31 The EU's Clean Air for Europe (CAFE) programme was launched in May 2001. It focuses on the need to pull together existing air quality legislation and initiatives into a co-ordinated framework, with a review in 2004. One key element will be a review of the Directives on large combustion plant and emissions ceilings, as well as the Directives on oxides of nitrogen and sulphur dioxide.

3.32 Although the process is in its early stages, the Commission has already identified particles and ground-level ozone as the two pollutants on which its strategy will concentrate. The review will be followed up by detailed research and the development of new and revised Directives. (More details on the existing European strategy on air pollution can be found on the Department for Environment, Food and Rural Affairs (DEFRA) website - www.defra.gov.uk)

3.33 The Integrated Pollution Prevention & Control (IPPC) Directive is designed to combat air pollution in an integrated manner. In force since October 1999, it focuses on using 'permitting' procedures to prevent pollution at source. Under the IPPC the EU investigates the environmental impact of a plant or activity and draws up a best available technique reference document to help industrial operators eliminate pollution. The IPPC is more comprehensive than previous legislation because it now includes noise, vibrations, safety and energy efficiency.

UK policy on clean air

3.34 In 1997, after wide consultation, a *National Strategy for Air Quality*[7] was published, which maps out the future of ambient air quality policy in the UK at least until the year 2005. The Strategy sets out a framework of standards and objectives for the pollutants of most concern which will lead to reductions in the number and extent of episodes of air pollution, both in summer and winter. (More details on the details of this strategy can be found on the DEFRA website.)

[7] Department of the Environment, Welsh Office, Scottish Office (1997). *The United Kingdom Air Quality Strategy* (1997).

4. Generation issues

4.1 Ofgem has responsibility for ensuring competition in generation. It also issues licences for generators who are not exempted by the relevant statutory instrument (currently those with an output of over 100 MW). The licences set out the operational framework for these generators. Chapter 4 of the July 2000 discussion document described in detail Ofgem's range of activities in relation to generation.

4.2 The combustion of fossil fuels is a major cause of emissions of pollutants such as sulphur dioxide and oxides of nitrogen and other greenhouse gases, principally CO_2. The Environment Agency (EA) regulates the emissions resulting from generation. The Government is keen to encourage the development of electricity generated from renewable sources which emit no greenhouse gases.

4.3 This chapter sets out Ofgem's present work in relation to generation, and explains how environmental considerations are being taken into account. It also sets out the nature of Ofgem's executive functions to administer the Government's policies on renewables and CHP.

4.4 Generation, transmission and distribution issues interact. These issues include barriers to entry, locational signals, and Ofgem's work on embedded generation. These interactions are dealt with in the next chapter.

New Electricity Trading Arrangements

4.5 The New Electricity Trading Arrangements (NETA) came into effect on 27 March 2001. The primary purpose of the new arrangements is to promote efficiency and lower prices through encouraging competition in the electricity market. Under the new arrangements the Pool was abolished and a bi-lateral trading market now operates between generators, suppliers, traders and customers. The new arrangements are specified in the Balancing and Settlement Code (BSC) to which all licence holders are required to be a party and to which others may also accede.

4.6 BSC parties enter into contracts for the sale and purchase of electricity and can notify those contracts under the BSC at any time up to three and a half hours

before the half hour to which the contract refers. Parties will also (in accordance with the Grid Code) declare to the National Grid Company (NGC), the system operator, the output that they intend to produce or demand that they intend to take for each half hour period. After the three and a half hour "gate closure" the balancing mechanism functions. The system operator accepts "offers" to increase output or decrease demand from their declared position or "bids" to reduce output or increase demand from Parties in order to maintain a stable electricity supply. This arrangement is known as the Balancing Mechanism.

4.7 In the same way that generators can offer to increase generation, large electricity consumers (through their suppliers) can offer to reduce demand in the Balancing Mechanism if they can reduce their electricity consumption at relatively short notice (less than 3½ hours). Parties who produce less or use more electricity in any half hour than they had contracted for (described as being "short") are required to buy the shortfall at System Buy Price (SBP). Similarly, parties who are "long" (produce extra or use less) sell the excess at System Sell Price (SSP). SSP and SBP are known as the imbalance prices, and can be volatile.

4.8 One of the fundamental principles of NETA is that generators and suppliers are incentivised to balance their expected generation and demand with contracts for the sale and purchase of energy respectively.

4.9 CHP and renewable generators have expressed concern that the NETA arrangements are potentially disadvantageous to them. In particular, the requirement to balance generation output with contracts for the sale of this output, or face the effect of the imbalance prices, is problematic for small generators and CHP or renewable plants which have uncertain output. These generators argue that they are more likely to be exposed to imbalance prices and that they are particularly disadvantaged by the new arrangements.

4.10 In February, the Minister of State for Energy and Competitiveness in Europe asked Ofgem to undertake a review of the impact of NETA on smaller generators after two months of operation. Smaller generators are taken to be those that are licence-exempt or licence-exemptable. This will include, but not be limited to, CHP installations which export power to the grid, CHP which relies on imports for top up, renewable generators with predictable output and renewable

generators with unpredictable output. The complete terms of reference were published in May 2001[8].

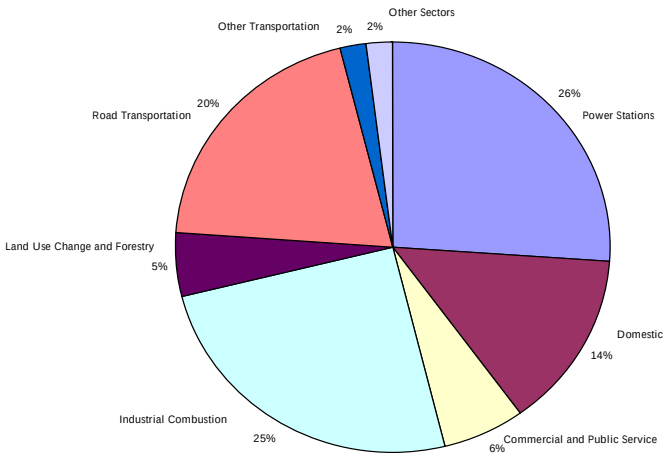
4.11 **The review will consider the operation of NETA over the period up to the end of May 2001, and it is planned that an initial report will be published in August 2001.**

Emissions

Carbon dioxide

4.12 In 1998 power stations alone accounted for 26 per cent of the UK's total carbon dioxide (CO_2) emissions, responsible for emissions equivalent to 41 million tonnes of carbon that year. Nonetheless, over the past 10 years, CO_2 emissions from power stations have decreased, partly due to the increased use of nuclear and gas as fuels for generation, and to the reduction in coal fired plant. By way of illustration, natural gas emits less than half the amount of CO_2 per unit of energy as coal; and nuclear generated electricity emits no CO_2 at all at the point of generation. CO_2 emissions have also been reduced due to newer power stations generally being more energy efficient. Some reduction in CO_2 emissions

Figure 1 - UK 1998 CO_2 emissions by source



Source: DTI Digest of Energy Statistics, based on IPCC definitions

[8] Review of the initial impact of NETA on smaller generators, Conclusions report on Terms of Reference May 2001

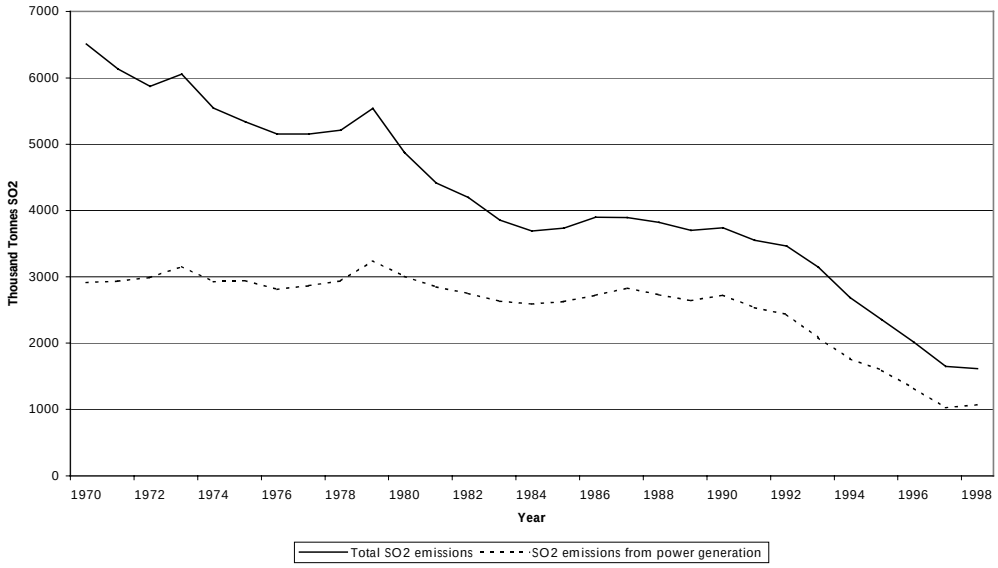
has been offset by increased consumption of electricity, which rose from 284.4 TWh to 324.3 TWh between 1990 and 1999.

Sulphur dioxide

4.13 Emissions of sulphur dioxide (SO_2) from power stations have reduced considerably since 1990 (see figure 2 below). In that year, 2.7 million tonnes of SO_2 was emitted from power stations as a result of coal and oil being burned. By 1997 this had reduced to approximately one million tonnes, accounting for some 60 per cent of the current national emissions of SO_2.

4.14 As in the case of CO_2 emissions, the reduction in SO_2 has been largely due to a reduction in coal-fired generation and an increase in generation from gas and nuclear sources both of which emit no SO_2. Since 1990, SO_2 emissions have been further reduced by the introduction of flue gas desulphurisation (FGD) equipment at two coal fired power stations and increased reliance on lower sulphur content imported coal.

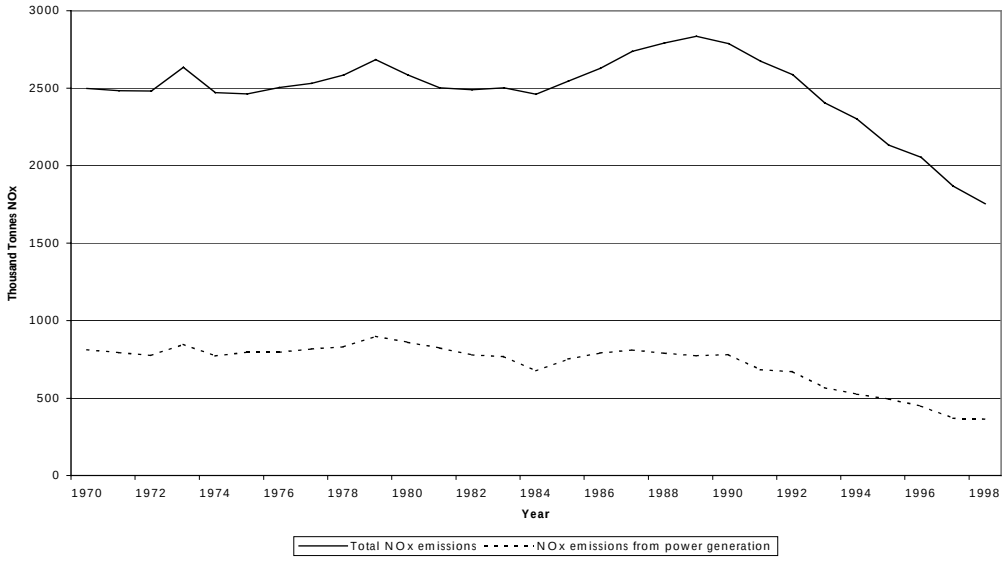
Figure 2 - UK sulphur dioxide (SO_2) emissions



Oxides of nitrogen

4.15 Emissions of oxides of nitrogen (NO_X) from power stations have also reduced, from approximately 777,000 tonnes in 1990 to approximately 350,000 tonnes in 1997 (see figure 3 below). This is mainly due to the reduction in the use of coal and the installation of low NO_X burners on coal fired power stations.

Figure 3 - UK oxides of nitrogen (NOx) emissions



4.16 The Environment Agency (EA) intends to set up a trading scheme for NO_X emissions from power stations and has recently commissioned a feasibility study. Ofgem strongly supports the market-oriented approach which the EA, together with DEFRA, is now taking to air quality emissions**.** This fits in directly with Ofgem's view of how Government environmental goals can best be met using the market mechanism.

4.17 **Ofgem will continue to contribute to the development of the EA's NO_X scheme, which is still at a relatively early stage, but which should be completed by the end of this year**. **Ofgem will also be discussing with EA whether an emissions trading approach could later be extended to SO_2 emissions**.

Renewables

4.18 Ofgem has an executive function to administer certain mechanisms of the Government's policy on renewable sources of energy which produce significantly lower levels of environmental pollutants than fossil fuels. Chapter 4 of the July 2000 discussion document outlined the position relating to renewables in more detail.

4.19 In particular, renewable sources of energy emit no greenhouse gases or are neutral over their life-cycle. For example, energy crops produce CO_2 when they are burned, but the new crop growth absorbs an equivalent amount of CO_2 from the atmosphere, making the process carbon neutral. Some types of waste, such as household waste or landfill gas, can be used to avoid using fossil fuels and to reduce greenhouse gases in the atmosphere by burning methane, a potent greenhouse gas.

4.20 The Government has a target for 10 per cent of electricity to be supplied from renewable sources by 2010 as part of the broader Climate Change Programme, subject to the costs to consumers being acceptable (see chapter 3). The Government has also highlighted renewables technologies as an important sector for future growth and has allocated £200 million from central funds for their promotion. This is in addition to the extra funds that will be available as a result of the Renewables Obligation.

Climate Change Levy

4.21 As part of the Climate Change Programme the Government has introduced the Climate Change Levy on non-domestic electricity users. Suppliers can qualify for an exemption from the Climate Change Levy if they contract with a generator to purchase qualifying renewable energy[9] and to supply it to non-domestic customers. The Finance Act 2000 makes Ofgem responsible for accrediting the generation and supply of electricity coming from the qualifying renewable sources.

[9] Qualifying renewable sources are defined in Statutory Instrument 2001/838, The Climate Change Levy (General) Regulations 2001

4.22 Ofgem has designed a new system and set of procedures to accredit the generators from 1 April 2001 onwards, and to issue Levy Exemption Certificates (LECs) to accredited generators for their qualifying output. **Ofgem will continue to accredit new generators and issue LECs for qualifying renewable sources.**

Renewables Obligation

4.23 In order to achieve the renewables target the Government has also introduced the Renewables Obligation on suppliers to supply a percentage of electricity generated from qualifying renewable sources. This is due to come into force on 1 January 2002. A supplier will be able to meet the obligation either by supplying electricity generated from renewable sources, by purchasing 'green' certificates or by 'buying out'. The actual electricity and its 'green' value will be able to be separated notionally. In this way, a supplier who supplies more renewable electricity than he is required to, would be able to sell the 'green' value of this extra electricity, in the form of a certificate, to a supplier who has not supplied enough. The electricity itself will not be a part of this exchange. It is Ofgem's view that, if the market is established correctly, trading will ensure the most economically efficient way of achieving the targets.

4.24 **Ofgem will be responsible for monitoring and ensuring compliance with the Renewables Obligation, and has designed a new IT system which is capable of issuing Renewables Obligation Certificates (ROCs) as well as LECs, taking account of the similarities and differences between the two regimes**.

4.25 It is envisaged that any supplier failing to meet the obligation will be required to make a payment – likely to be 3p per kWh shortfall[10]. This is referred to as the buy-out price. Ofgem is responsible for collecting the proceeds of the buy-out price and recycling it to suppliers. The DTI have estimated that the Renewables Obligation will cost consumers around £780m in total per year on consumers' bills by 2010. **To offset the impact of this increase on the fuel poor, Ofgem recommended that the Government should consider whether it could direct some of the proceeds from the Buy-Out Fund to mitigate the impact of these measures on low income consumers, for example through energy efficiency measures.**

[10] The Renewables Obligation Preliminary Consultation DTI October 2000

Combined Heat and Power

4.26 Combined Heat and Power (CHP), or cogeneration, is the simultaneous generation of electricity and usable heat from the same plant. Such stations achieve higher energy efficiency compared with conventional power stations, through the recovery of otherwise wasted heat. CHP provides environmental benefits due to this improved efficiency and lower overall fuel consumption. Every 1,000 MWe of CHP can reduce carbon emissions by 1 million tonnes, depending on the fuel used.

4.27 The Government strongly supports the development of CHP as a key contribution to sustainable development, and promotes its use wherever economic. The Government has set a revised target for 10,000 MWe of CHP capacity to be installed by 2010. DEFRA is working on a strategy which will set out how this target is to be achieved. The Government recently issued guidelines which oblige any developer of a power station to consider seriously the use of CHP technology.

4.28 **Ofgem will continue to carry out its statutory duty to collect information about the generation of electricity using Combined Heat and Power (CHP). Ofgem intends to increase the visibility of this database, and to analyse the data contained in it more actively. Ofgem will consult on this later in the year.**

5. Transmission and distribution issues

5.1 This chapter looks at Ofgem's work in relation to transmission and distribution, and at the impact this has on the environment. It outlines the specific actions Ofgem is proposing, and explains the rationale. Chapter 5 of the July discussion document looked at these issues in more detail.

5.2 Ofgem's price controls on companies operating electricity distribution and transmission networks and the major gas network company are designed to protect the interests of consumers. In setting price controls Ofgem has to consider the appropriate balance between factors such as cost reduction, quality of supply and energy efficiency.

5.3 Transmission and distribution activities have direct effects on the environment through gas and electricity losses. In the case of gas, losses are a potentially significant pollutant. In the case of electricity the emissions related to the generation of power needed to replace losses may have direct environmental effects. In either case they represent an inefficient use of resources. The existing price control regime includes financial incentives to encourage reductions in transmission and distribution losses.

5.4 In addition, price control regulation can have indirect effects on the environment. In considering the projections of operating and capital costs at a price control review Ofgem takes into account the advantages of an approach to network development based on minimising the total costs of distribution and transmission and providing incentives to address quality of supply issues. The total costs include capital, operations and losses. Ofgem's approach to price controls is based on making sure that companies are given the appropriate incentives to ensure the efficient and economical development of the system.

5.5 This approach to setting the level and structure of prices means that regulation can have an effect on investment in transmission and distribution networks. This may influence the rate at which networks are expanded or the enhancement of interconnections between different parts of the networks. This in turn can influence choices such as the choice between fuels, location for generators and

consumers, the choice between large and small generators and the extent to which renewables and CHP are economically viable.

5.6 Most price controls link a company's allowed revenues, in part, to volumes transported or distributed, but also to other factors. The nature of the revenue driver may incentivise the behaviour of the regulated company.

5.7 Consequently, the choices made in the design of price regulation can have wide ranging environmental impacts and unless care is taken, these may include unintended effects.

Electricity

5.8 **Over the coming two years, Ofgem will focus on developing the framework of price controls in preparation for the next distribution price control review which is expected to begin in 2003/4. This will include changes that may be appropriate to reflect revised legislation and the implementation of the Social and Environmental Action Plans.**

5.9 As far as electricity distribution is concerned, the areas set out below are all substantial areas of work and will require an ongoing commitment of resources from the distribution businesses and Ofgem. Undertaking this work prior to the next price control review will help ensure that:

- the distribution businesses are provided with clearer long term incentives and
- the price control review process will be more transparent and predictable and consequently less of a burden on both the companies and Ofgem.

Electrical losses

5.10 There are two main categories of electrical losses in power transmission:

- fixed losses: this is the power required to energise transmission and distribution plant. For example, the energy requirement of a transformer that has been switched on, but is not yet carrying any load, and

- load dependent losses: these are mostly due to the resistance of conductors to the passage of current, and manifest themselves as heating of the conductors. These are more significant.

5.11 Total losses on the NGC transmission system are around 2 per cent, and on a typical distribution system around 7 per cent, making total losses around 9 per cent (although the figure for total losses also includes undetected theft).

5.12 Where electricity production is from fossil fuels, a proportion of the greenhouse gases produced can be attributed to these losses. A reduction in losses could result in a reduction in power station demand and a reduction in greenhouse gas production.

Ofgem's treatment of losses

5.13 The price control arrangements include an incentive mechanism designed to encourage distribution businesses to reduce losses. Prior to 1995, a 1 GWh reduction in losses would enable distribution businesses to earn an additional £15,000 for the year that the reduction was achieved. In 1995, the financial benefits retained by distribution businesses was doubled to provide greater incentive to reduce losses.

5.14 Where transmission losses are concerned, there is an incentive mechanism within the existing price control arrangements designed to encourage the reduction of the total cost of transmission losses. Under NGC's current incentive arrangements, which are implemented as part of the System Operator incentive scheme under NETA, NGC is incentivised to manage, and where possible, reduce the volume of transmission losses.

5.15 Ofgem is currently reviewing the arrangements for charging transmission losses to participants. Under the current arrangements, all participants (i.e. generators and suppliers) are exposed to the costs of national, actual losses. In May 2001, Ofgem published a consultation document that outlined a "possible approach" to future arrangements for the charging of transmission losses.[11]

[11] *Transmission access and losses arrangements under NETA*, Ofgem, May 2001.

Future actions on losses

5.16 **As part of the review process outlined in paragraphs 5.8 and 5.9, Ofgem will review the incentives relating to distribution system losses**. At present, distribution losses are factored into distribution charges only to the extent of the additional capacity required at each voltage level to accommodate demand. Distribution losses are paid for by grossing up suppliers metered demands and the scheduling of additional generation as part of trading arrangements.

5.17 Transmission and distribution charges and electricity trading arrangements should ideally provide for a fully cost reflective treatment of losses. This would be helped by location-specific transmission loss factors being applied in the derivation of transmission charges and in calculating wholesale energy costs. In the future it may be possible to introduce more cost reflective arrangements for charging for transmission losses. These arrangements could strengthen incentives on generators and suppliers to take actions that will reduce transmission losses.

5.18 Further reductions in distribution losses could be achieved through measures to optimise distribution system design and operation, and provide better signals on the location of generation. Nevertheless, in considering these matters it will be important to bear in mind Ofgem's statutory duties to take account of the interests of customers in rural areas and the need to ensure that actions result in a net benefit.

5.19 Power factor correction (PFC) is a well-established technique that reduces the current drawn from distribution networks to supply electric motors and other 'inductive' loads. This reduces losses and enables better utilisation of network capacity. There are a number of considerations that have to be taken into account to determine whether PFC is economic and practical in any given situation.

5.20 **Ofgem is currently considering a project to examine the drivers of losses on distribution networks with a view to modifying the incentives for the next distribution price control review**.

Embedded generation

5.21 Embedded generation is plant connected to the electricity distribution networks rather than the high voltage transmission networks. Embedded generators are generally small stations based on industrial sites, CHP plant, renewable stations or micro generation at a domestic level, though other types of generator can be connected to distribution systems. In addition to the environmental benefits of CHP and renewable generation, local embedded generation can also reduce transmission and distribution losses and may help to avoid the need for network reinforcements.

5.22 If Government targets for CHP and renewables are to be met, the amount of embedded generation must increase over the next ten years. In recognition of the need for distribution networks to accommodate more embedded generation and to identify any barriers to it, in November 1999 DTI issued a consultation paper on Network Management Issues[12]. The paper looked at network access, management and charging, with a view to identifying any changes needed to level the playing field for embedded generation access to distribution networks.

5.23 Following this report, the DTI decided to establish the Embedded Generation Working Group (EGWG), composing of representatives of all interested parties, including DTI, DEFRA and the distribution network operators. It was chaired by Ofgem. The group met throughout last year, had in six specialist sub-groups and issued its report in June 2001.

5.24 The first of EGWG's two main recommendations was that Ofgem should review the structure of regulatory incentives on distribution network operators (DNOs) in light of the new statutory duty on DNOs to facilitate competition. In response, and considering particularly the distribution price control and connection charges, Ofgem intends to identify:

- how the overall regulatory framework should operate in relation to electricity distribution, ensuring that there is no discrimination against embedded generation

[12] *Consultative Document – Electricity Network Management Issues*. DTI. November 1999

- the implications of the growth of embedded generation, and of associated changes to the regulatory framework for distribution company costs, charges and incentives

- which changes to price control mechanisms to defer until the next price control review, whether any might sensibly be implemented sooner, and what processes would be required to effect and manage those changes and to suggest

- whether the possibility of domestic and other micro-scale generation raises any additional questions not properly addressed by the foregoing.

5.25 Ofgem's present intention is to issue a consultation paper on price control and connection charge issues in August 2001, requesting responses by the beginning of November. **Ofgem intends to publish a decision document in late December and will seek to implement any necessary changes from April 2002**.

5.26 EGWG's other main recommendation was that a group should be established, under Government leadership, to co-ordinate and take forward the implementation of the EGWG's recommendations for the longer term. Ofgem and DTI will jointly chair this group.

Locational signals

5.27 Losses from transmission and distribution systems are related to the distances between supply and demand points on those networks. Greater use of pricing signals in network charging that reflect the costs of these potential losses will provide greater incentives for supply and demand to be located close to each other.

5.28 **As part of the review of the structure of distribution charges Ofgem will consider the effect of locational price signals on encouraging efficiency and on different groups of customers.**

Sulphur hexafluoride

5.29 Sulphur hexafluoride (SF_6) is one of the most potent of the greenhouse gases, with each molecule of SF_6 that is released into the atmosphere having a global

warming potential (GWP) some 20,000 times as great as a molecule of CO_2. SF_6 is a particularly effective electrical insulant and is used widely in transmission and distribution equipment, enabling efficient and compact equipment design.

5.30 Discontinuing use of SF_6 would result in significant additional costs to distribution and transmission operators. However best practise management for monitoring and controlling losses would minimise environmental harm without entailing excessive cost. Loss of SF_6 gas to the atmosphere through leakage, maintenance practices or equipment failure is currently not reported on a consistent basis, nor is good practice incentivised. **Ofgem will discuss with NGC and distribution companies their policies in relation to investing to promote the efficient operation of SF_6 equipment, as part of Ofgem's scrutiny of capital expenditure programmes.**

Gas

Transportation losses

5.31 Natural gas consists mainly of methane, which is a potent greenhouse gas when released into the atmosphere. The atmospheric concentration of methane has more than doubled over the past 200 years, mostly as a result of human activities. Methane is thought to contribute about one fifth of the effect of greenhouse emissions. Around 28 per cent of methane emissions are thought to be associated with fossil fuel extraction through leakage from coal mines, gas pipelines and oil wells.

5.32 In the Local Distribution Zones (LDZs) leakage represents 0.8 per cent of the throughput. In 1995 Transco voluntarily undertook to reduce leakage from the low pressure distribution system and reduced leakage by 8.7 per cent between 1991 and 1999.

5.33 Ofgem has estimated that, in 1999/2000, Transco's LDZ networks produced emissions of around 380,000 tonnes of methane. Ofgem has commissioned research to place a value on the environmental costs created by methane emissions[13]**.** Such estimates are sensitive to a number of assumptions, but this

[13] Hope, C. 2001 *'The benefits of reducing methane emissions'*, paper prepared for Ofgem, Clare Hall, University of Cambridge.

work suggests that the environmental costs of methane leakage might be £20 to £180 per tonne of methane released into the atmosphere, with a central estimate of around £80 per tonne. These costs imply that the environmental cost from emissions from Transco's LDZ networks might be £8 million to £70 million per year, with a central estimate of £30 million per year.

5.34 Transco and the Health and Safety Executive (HSE) are in the process of agreeing a revised programme to replace cast-iron mains with safer, modern materials which will improve safety and reduce emissions.

5.35 **As part of the current Transco price control process, Ofgem is proposing that in future Transco should collect and report information on certain outputs and report on the medium-term performance of its networks.** This is with a view to creating stronger incentives on Transco to deliver an appropriate level of service to its customers and ensuring that Transco does not focus on short-term performance at the expense of the medium-term performance, Ofgem would expect Transco to report on levels of methane leakage as part of the reports. These proposals will be finalised in time to be incorporated into the price control which is due to come into force from 1 April 2002.

Access to gas

5.36 At present approximately 80 per cent of households in Great Britain have a mains gas supply. Most of the premises that are not connected to the gas network are some distance from a gas main and may require the installation of a significant length of new pipeline and other connection assets (eg. pressure reduction station).

5.37 From the social perspective, rural consumers could benefit from access to gas as it would increase the choice of fuel type and thus provide access to cheaper tariffs and more efficient appliances. This is of particular importance to the fuel poor. In general there may also be benefits to the environment as a result of further extensions to the gas network. Gas is much less carbon intensive than other fuels, such as coal, and so extensions of the gas network could encourage customers to switch fuels, thereby reducing CO_2 emissions.

5.38 **Ofgem will shortly issue a consultation document proposing a review of the Gas Connections Regulations (which are used to derive charges for network extensions to rural areas with existing premises); and proposing modifications that should make such projects more viable.**

5.39 The provisions of the Gas Connections Regulations mean that a gas transporter has a maximum of 5 years in which to recover the cost of extending a gas main. Extending this period of time should provide the gas transporter with a longer period within which to recover the cost of mains extension, thereby making it more attractive as an investment.

Government working group on access to gas

5.40 Ofgem recognises that, even by extending the period of time the gas transporter has to recover his costs, it will still not be economic to connect some areas of the country to the gas network. To achieve any large-scale extension of the gas network additional funding would be required, for example from central government, from local authorities, from the European Union or from a combination of these sources.

5.41 Recognising the potential social and environmental benefits that might accrue from increasing access to gas, the Government, as part of its fuel poverty strategy, has recently announced its intention to set up a group that will look into different options for extending the gas network to non-gas areas.

5.42 **Ofgem is participating in the group, which also includes representatives of all relevant Government departments, industry and other stakeholders. An initial report will be produced by October 2001**.

Domestic site reconciliation

5.43 Prior to the introduction of domestic competition, Transco discussed with shippers and suppliers the costs of developing systems and processes required to support competition.

5.44 Industrial and commercial (I&C) competition in gas supply is supported by reconciliation based on meter reading from individual sites. The industry considered this approach to be necessary for charging shippers/suppliers. During

the first phase of domestic competition, domestic sites were subject to site by site reconciliation. However, the industry decided not to proceed with this approach and instead adopted the RbD (Reconciliation by Difference) principle. Under RbD, Transco is required to make an estimate of the demand attributable to both domestic and non-domestic premises. However, it does not routinely correct its initial estimate on the basis of individual reads for each of the 20 million sites in the domestic market. The industry adopted RbD because the management and design of systems to implement individual reconciliation for 20 million sites was viewed to be too expensive and would have forced industry players to incur large IT and administration costs.

5.45 Ofgem recognises that the current gas settlement systems may not deliver price signals that encourage more efficient use of gas. However the environmental and efficiency gains must be weighed against the cost. **Ofgem intends to seek further information and to monitor the performance of RbD on an ongoing basis**.

6. Supply issues

6.1 The gas and electricity supply markets are now fully open to competition and all customers are able to choose their supplier. Competition adds to the downward pressure on prices, and therefore the need for price controls has diminished. Chapter 6 of the July discussion document set out at greater length Ofgem's policies in relation to the supply market. This chapter deals specifically with supply issues which have an impact on the environment, and sets out the arrangements for Ofgem's executive function in relation to domestic energy efficiency.

Energy efficiency

6.2 One quarter of the UK's CO_2 emissions is caused by the domestic use of energy. (Figure 1 (page 34) demonstrates the relative sources of CO_2 emissions.) In view of this, successive governments have worked to reduce emissions from domestic sources, in particular by encouraging greater take-up of energy efficiency measures. Chapter 6 of the July discussion document described Ofgem's (and previously Offer's) involvement with domestic energy efficiency programmes.

6.3 The installation of simple measures can dramatically reduce domestic fuel bills. For example, cavity wall insulation can reduce heat loss through the wall by up to 60 per cent; solid wall insulation, though more expensive, can also have good results. Loft insulation to a depth of at least 200 mm can save an average domestic customer up to 20 per cent of their heating costs[14]. In addition, upgrading heating controls for rooms and hot water, insulating water tanks and changing to energy efficient household appliances and energy saving lightbulbs can dramatically reduce domestic fuel bills.

Standards of Performance

6.4 Ofgem has a statutory responsibility to set and administer Energy Efficiency Standards of Performance, known by their acronym EESoP. The Standards, first set in 1994, imposed obligations on Public Electricity Suppliers (PESs) to achieve

[14] Energy Saving Trust (EST), based on figures from the Building Research Establishment (BRE).

specified energy savings for domestic and small business customers. Funding was granted through a special revenue allowance in the Price Control.

6.5 The National Audit Office carried out a detailed independent value for money examination of EESoP 1 in 1998 and concluded that the programme achieved a net present value of £250m with a further £80m worth of comfort savings, in terms of warmer homes and better lighting. The Energy Saving Trust has estimated the lifetime CO_2 savings from EESoP 1 and EESoP 2 combined at 10 million tonnes.

6.6 EESoP 3 has an aggregate domestic energy savings target of 11,000GWh. This current programme, which runs from 2000 – 2002, has been extended to include designated second tier electricity and domestic gas suppliers. Through the programme, energy suppliers are spending approximately £110 million in domestic energy efficiency measures over two years. Local authorities, agencies and consumers are contributing a further £40 million, for example by means of matched funding and other partnership arrangements. It is estimated that the programme will result in savings of 7 million tonnes of CO_2 emissions and total energy benefits worth £500 million. The majority of the funds, and the energy benefits, are being directed to disadvantaged customers.

Energy Efficiency Commitment

6.7 As a result of the Utilities Act, DEFRA will for the first time have the responsibility for setting the next energy efficiency programme, to be known as the Energy Efficiency Commitment (EEC). It will run for three years from 1 April 2002. Ofgem will monitor and evaluate companies' compliance with the programme. The target for carbon savings in the new programme is likely to be much higher, with the indicative level of funding required to meet the target three times more than under the current programme – some £165 million a year.

6.8 **DEFRA intends to consult on the framework for the future programme in August 2001. In conjunction with this, Ofgem intends to set out its proposed arrangements for administering the programme in September 2001**.

Working with local authorities and other partners

6.9 In order to maximise the energy benefits resulting from domestic energy efficiency expenditure, Ofgem has consistently stressed the need for supply companies to co-ordinate their efforts with the Government's other energy efficiency programmes; and to work with local authorities and other social housing providers. In the current programme there are incentives for these partnerships, and many companies have taken advantage of them.

6.10 **Ofgem will work to ensure that incentives for supply companies, to form partnerships with local authorities, housing associations and registered social landlords to deliver their targets, are maintained and strengthened in the future programme**.

Working with local authorities on energy efficiency

In order to promote greater co-operation, earlier this year Ofgem sponsored a joint conference with the Local Government Association entitled 'Tackling Fuel Poverty – Delivering Decent Homes'. This looked at the role which energy companies, Government and agencies can play by working together to deliver warm, decent and healthy homes.

Representatives from two local authorities told the conference how their authorities had designed and delivered successful 'affordable warmth' strategies. This involved drawing together a broad-based partnership with all active and relevant agencies in their area; identifying the fuel poor, where are they and what needs to be done; and raising the profile of energy awareness by training front-line staff and promoting energy efficiency.

A number of areas for improvement were identified. In particular, it was agreed that a multiplicity of often overlapping schemes and poor marketing material cause unnecessary confusion about what assistance with energy efficiency is available.

Warm Zones

6.11 With a view to promoting greater co-operation between the various energy efficiency programmes and managers, the Government has announced the 'Warm Zone' initiative which is part of its Fuel Poverty Strategy. This is a pilot programme which draws together local partnerships involving energy

companies, local authorities, health authorities, local businesses and community and voluntary organisations in a co-ordinated effort to tackle fuel poverty in specific localities.

6.12 The aim is to halve fuel poverty in each of the five pilot areas within 3 years, using an area, rather than a referral, based mechanism. 'Warm Zone' teams will aim to survey all households in a particular area, identify those in fuel poverty and provide energy efficiency measures through the grant schemes available in that location. All zones will work to national performance, delivery, and best value targets and receive central co-ordination and oversight.

6.13 The zones will raise awareness of related health and energy efficiency issues; encourage community support and care for the elderly and disabled relatives and neighbours and create practical links with community finance and banking.

6.14 **Ofgem has offered its support to the Warm Zone pilot scheme as an interesting alternative method for delivering energy efficiency. Ofgem will be reviewing with DEFRA, the Energy Saving Trust (EST) and the energy supply companies how the concept of Warm Zones can best be incorporated into the framework for the Energy Efficiency Commitment**.

Energy efficiency advice

6.15 Electricity and gas supply companies are currently obliged by their licences to provide energy efficiency advice to their customers. As well as sending out leaflets, suppliers are required to have a telephone helpline, and to refer customers to independent sources of energy efficiency advice, such as the network of 52 Energy Efficiency Advice Centres. The companies must have a code of practice explaining how they will provide this energy efficiency advice. Ofgem's role is to administer and approve the energy efficiency codes of practice.

6.16 Recent research, carried out by the University of Oxford, estimates that no more than 5 per cent of disadvantaged households receive effective energy efficiency advice from any source each year. This will need to increase if the Government is to meet its target of eradicating fuel poverty in vulnerable households by

2010. The report makes a series of recommendations to improve the quality and dissemination of energy efficiency advice.

6.17 **This summer Ofgem hosted a 'Summit'[15] to further explore the findings of the research, and is intending to agree guidelines for suppliers on providing energy efficiency advice more effectively to disadvantaged customers**.

Energy services

6.18 Domestic energy efficiency can also be promoted through the use of energy service contracts. Under such contracts, the supply of energy is linked to the provision of energy efficiency goods and services, normally in the form of a finance package. The customer receives a single bill covering the whole package. Lower energy bills resulting from increased energy efficiency may offset the cost of purchasing the equipment. There are incentives for companies to adopt this approach in the current energy efficiency standards of performance programme. Although some companies have come forward with schemes, the level of activity has been relatively low.

6.19 DTI recently commissioned a consultant to look into the reasons that the energy services approach has not been more successful in the domestic context. The report is available on the DTI website (www.dti.gov.uk). It makes a number of recommendations, which DTI are currently exploring. Ofgem has recently issued a guidance note setting out the regulatory issues which could affect the willingness of supply companies to offer energy services to domestic customers. The guidance note explores issues such as:

- what happens in the event the customer wants to switch supplier or move house before the completion of the term of the agreement, and
- what security an energy supply company can reasonably demand, and what recourse they have in the event that the customer defaults on the arrangement.

6.20 **Ofgem is involved in discussions with DTI, DEFRA, EST and other interested parties on the future of energy services for domestic customers. Ofgem will be**

[15] Ofgem press release PN60 '*Energy efficiency experts meet to discuss the way forward*' 19/7/01

evaluating the effectiveness of energy service schemes offered under the EESoP3 programme, and discussing how incentives can most effectively be built into the forthcoming Energy Efficiency Commitment.

Information on energy supply and consumption

Billing

6.21 Billing is an important means by which the energy supplier can communicate with the end customer. This is particularly true in the case of domestic customers. For this reason Ofgem considers that the bill should be as accurate and informative as possible. Estimated bills provide a less accurate basis on which customers can make decisions about the level of their consumption. Estimated bills can also contribute to the build-up of debt. Ofgem welcomes individual suppliers' initiatives to provide more frequent meter readings, and therefore more accurate bills, including by the use of advanced metering technology.

6.22 Research shows that providing customers with more information about their consumption can act as an important incentive for improved energy efficiency. Ofgem considers that it would be desirable for suppliers to use the billing system to provide their customers with more information about their overall energy consumption levels.

6.23 This coincides with the conclusions reached in Ofgem's work on making it easier for customers compare prices. A survey[16] carried out for Ofgem found that 67 per cent of customers agreed that having an annual consumption figure printed on every bill would help comparisons. This figure rose to 73 per cent in the case of people who had already switched suppliers and gone through the process.

6.24 Accurate information about annual consumption on consumers bills would help to improve awareness of energy use, and facilitate price comparisons between suppliers. **Ofgem will provide guidance to suppliers on this and will suggest that in the first instance this could be on a voluntary basis with suppliers introducing this facility as part of any routine system upgrades**.

[16] Attitudes to price information qualitative and quantitative research, MORI, March 2001

Innovative metering technology

6.25 Further research shows that consumers value ready access to precise, 'real time' usage data and that this can act as an incentive to greater energy efficiency. Innovative metering, capable of delivering this information can thus deliver important social and environmental benefits. Advanced metering uses technology capable of interactive, two-way communication of a wide range of data. In this way, electronic, remote and real time monitoring or collection of data is possible. These meters could also have positive environmental and social benefits, by increasing consumer awareness of energy use. They can provide simple feedback systems that display energy used in cash terms.

6.26 Achieving the potential benefits of such innovative metering technologies requires a number of important issues to be addressed. These are examined in Ofgem's metering strategy[17] published in March 2001. **Ofgem will also be supportive of pilot projects being run by suppliers. We will be setting up an industry working group on standards for advanced metering. Ofgem is also represented on DTI's working group on 'smart' metering.**

'Green' electricity supply

6.27 Green tariffs can be categorised as either 'green energy' tariffs, or 'green fund' tariffs. A green 'energy' tariff involves a premium being paid above the normal energy cost, which is then used to buy energy generated from renewable resources, such as solar/wind etc. A green 'fund' tariff traditionally operates by suppliers charging customers a premium which they use to finance projects of benefit to the environment. For example, this could include community renewables projects. In practice take-up of green tariffs has been slow, with some 14,000 households currently signed up.

6.28 Ofgem is responsible for assessing any new tariffs offered by dominant electricity suppliers (in practice, the Public Electricity Suppliers) for domestic customers. The aim of this is to ensure that they comply with conditions set out in their licences. 'Green' tariffs are assessed against the same criteria as other new tariffs.

[17] Ofgem's strategy for metering – A consultation paper March 2001

Ofgem only assess tariffs offered by dominant electricity suppliers but this responsibility to assess new tariffs will end once the new electricity suppliers' licences under the Utilities Act 2000 are given effect by the Secretary of State. Ofgem expects the new suppliers' licences to come into effect later this year.[18]

6.29 In assessing new tariffs Ofgem has attempted to ensure that they are broadly cost reflective and not unduly discriminatory, predatory or onerous. Ofgem has also checked that there is no tie-in which could distort customers' incentives to switch supplier. The 'greenness' of the tariff is not assessed, only whether or not the premium for the green energy broadly reflects expected future market prices for green energy. However, Ofgem points out to suppliers that advertising of the tariffs should not be untrue or misleading and that claims made about them should be verifiable. Most green tariffs are accredited by the Energy Savings Trust under their Future Energy scheme.

Future of green tariffs

6.30 As noted above, the non-discrimination licence conditions will be removed when the standard licence conditions come into effect under the Utilities Act 2000. After this date, Ofgem will no longer assess new tariffs, including green tariffs, offered by any suppliers. However, the tariffs will still be subject to Advertising Standards Authority codes of practice, and to the provisions of the misleading advertising legislation enforced by the Office of Fair Trading.

6.31 On 1 April 2001 the Climate Change Levy (CCL) was introduced in respect of non-domestic customers (see section 4.21 for more details on this). The effect of this is expected to be that most of the existing 'green' electricity is likely to be supplied to non-domestic customers to avoid paying the CCL on their electricity consumption. This could mean that suppliers are less interested in offering green 'energy' tariffs to domestic customers, although they might still be interested in offering green 'fund' tariffs.

[18] Ofgem's responsibility to assess electricity suppliers' new offers is contained in Condition 4A or Condition 31 of the current electricity suppliers' licence, the 'non-discrimination conditions'. Ofgem consulted on removing these non-discrimination conditions in July 2000, 'Gas and electricity supply licences: Proposals for standard non-discrimination conditions', Ofgem 2000. Ofgem confirmed its proposals to remove these conditions in October 2000, 'Utilities Act: Standard licence conditions: Final proposals', Ofgem, October 2000.

6.32 The Renewables Obligation will mean that some domestic and non-domestic customers will receive a percentage of their supply as 'green', without necessarily being aware of it, see section 4.23 for more details on this.

6.33 In view of these changes the Energy Saving Trust is reviewing the need for an accreditation scheme. It is likely that they will cease to accredit supply tariffs under their Future Energy Scheme from the time the Renewables Obligation comes into force. **To coincide with the introduction of the Renewables Obligation, Ofgem intends to issue guidelines to suppliers on what sort of tariffs might be considered as 'green' in the future**.

7. Environmental reporting

7.1 This chapter outlines the extent of environmental reporting by gas and electricity companies. This is based largely on research which was commissioned by Ofgem during the development of this plan. It also covers the industries' statutory requirements for reporting under the Gas and Electricity Acts.

Environmental performance

7.2 In the July 2000 discussion document Ofgem stated its intention to encourage all companies to report annually on their environmental activities. Many respondents commented on the issue of environmental reporting, stressing the need for greater transparency and consistency of information and more consistent reporting standards across companies. Their suggestions ranged from benchmarking exercises to the development of common reporting formats or performance indicators. (More details can be found in the summary of responses at Appendix 1).

7.3 Companies drew attention to the need to avoid duplicating existing reporting requirements and referred to the Government's *'Making a Corporate Commitment'* initiative which encourages environmental performance and resource efficiency reporting. Most companies considered that environmental reporting should remain a voluntary activity.

KPMG study

7.4 Earlier this year, Ofgem commissioned KPMG to carry out a study on environmental reporting within the gas and electricity sectors. The work was completed in March. The purpose of the study was to gain a better understanding of existing regulatory requirements and voluntary initiatives and to assess the level of performance as regards environmental reporting across the sector. The main results of the study are available on Ofgem's website.

7.5 The study showed strong resistance on the part of the companies to mandatory public environmental reporting requirements, reflecting the opinions expressed in the responses to the discussion document. The companies described the industry as an already 'heavily regulated' sector, with some companies already

sending statutory statements to more than one regulatory agency. Some respondents highlighted the high cost of issuing public environmental reports while others saw environmental reporting as a good opportunity for competition between companies and enjoyed the current freedom to present data when and how they choose.

Background

7.6 Gas and electricity companies are already required to report on a wide variety of data about their environmental performance. These requirements include environmental management, emission levels of heavy metals, several chlorinated organic compounds, classical air quality pollutants such as NO_x and SO_2 as well as the environmental impacts of extensions to the gas and electricity networks. The Government and other bodies regularly issue guidelines on how to report some of these environmental impacts. The Environment Agency co-ordinates the data through the Inventory of Sources and Releases and passes information on to the new European Pollutant Emissions Register.

7.7 The Government is actively encouraging each of the FTSE 350 companies to issue some form of public environmental report by the end of 2001. Furthermore, companies that have committed themselves to the Eco-Management and Audit Scheme are required to issue a public report about their environmental performance. In addition, the new FTSE4Good indices were launched at the end of July 2001. The FTSE4Good's eligibility criteria are based on three principles: companies should promote practices that mitigate environmental damage; they should encourage respectful and constructive relations with stakeholders; and they should support and respect the protection of human rights.

7.8 Within the gas and electricity utilities sector, the Electricity Association has been working on Key Performance Indicators (KPIs) to measure the sector's environmental progress as a whole. A workshop in 2000 produced a draft list of indicators including environmental management, greenhouse gases, emissions, fuel mix/renewables/CHP, energy efficiency, waste/recycling and prosecutions/reportable incidents. The Gas Forum has not addressed environmental reporting or benchmarking in its work to date.

Incidence of reporting

7.9 As part of the study, KPMG surveyed a representative sample of 29 gas and electricity companies, either by telephone or through face-to-face interviews. These interviews provided an insight into the companies' practices and attitudes towards environmental reporting. The results of this part of the survey are available on Ofgem's website.

7.10 19 of the 29 companies interviewed currently issue a public environmental report of some kind, either stand-alone or as part of a broader health and safety, sustainability or financial report. Some companies have been issuing such reports for 10 years, whilst others have only begun to do so recently. Of the 10 non-reporting companies, 2 are subsidiaries of companies that do issue reports, and four intend to issue reports in the future.

7.11 Public pressure and the desire to improve the company image are the main drivers behind reporting. The study highlighted a distinct lack of consultation with the target audience, however, making it very difficult to assess whether the reports actually perform their role as far as the different stakeholders are concerned.

7.12 Companies' views on the value of reporting varied widely. Some considered reporting to be an integral part of the strategic decision-making process while others believed the opposite, that public environmental reports did not influence decision-making but were the result of good corporate governance.

Key Performance Indicators

7.13 Based on the KPMG research and consultation with a wide range of interested parties, Ofgem favours the development of a small number of Key Performance Indicators (KPIs) which would allow more effective monitoring of the sector's environmental performance, ensuring consistency across the industry. Standards would be defined for these indicators. **Ofgem will continue to consult with DEFRA, the Environment Agency and the Electricity Association with a view to contributing to their work to develop a small number of (KPIs) for the gas and electricity sectors. Ofgem will then consult industry more widely on how this work will be taken forward.**

Reporting requirements under the Electricity and Gas Acts

Electricity

7.14 Section 38 (Schedule 9) of the Electricity Act 1989 requires licensed electricity suppliers and generators to have a transparent policy for preserving amenity when constructing or operating power stations, installing overhead (or underground) lines, or carrying out other works in connection with the transmission or supply of electricity.

7.15 Within 12 months of being granted its licence, a company is required to draw up proposals to have regard to the desirability of preserving natural beauty, or conserving flora, fauna and geological or physiographical features of special interest; of protecting sites, buildings and objects of architectural, historic or archaeological; and to do what they reasonably can to mitigate any effect which the proposals would have on the natural beauty of the countryside or on any such flora, fauna, features, sites, buildings, or objects. In Scotland, the requirements also cover the protection of fisheries.

7.16 Each company is required to produce a statement setting out how it intends to preserve amenity (and fisheries in Scotland). In doing so they must consult with English Heritage, the Countryside Agency and English Nature (or the equivalent bodies in Scotland and Wales). In these statements companies must set out their procedures for consultation on issues which may affect amenity. Companies are required to publish the statements and are expected to update them periodically.

Gas

7.17 The Public Gas Transporter Pipeline Works (Environmental Impact Assessment) Regulations 1999 require gas licensees to produce environmental statements. However, these statements are somewhat different than those required under the Electricity Act. The differences are:

- an environmental statement should be produced for <u>any</u> proposals to carry out any pipe-line works (as defined in the Regulations)
- no such work can be carried out without the Public Gas Transporter (PGT) giving the Secretary of State a notice of preparation of a statement

- once the Secretary of State has made a determination on the environmental statement, it will last for up to 5 years

- the Regulations set out the specific information to be taken into account and included when producing the environment statement (no such information is contained within Schedule 9), and

- there is no mention of any specific statutory bodies that licensees are obliged to consult. However, the PGT must consult with the relevant planning authority.

Ofgem's proposals

7.18 **Ofgem will issue, within the next six months, a revised model Schedule 9 statement to all existing licensees and any new licensees. This will set out a model format for the statement, and list the essential contents. This will ensure consistency and help with the examination process**.

7.19 **Ofgem will continue to discuss with the Environment Agency and other bodies mentioned in 7.16 about possible future input into these procedures. If as a result of these discussions any changes are proposed, Ofgem will consult further on these.**

8. Increasing openness, transparency and accountability

8.1 This chapter covers the actions that Ofgem will be undertaking to improve its internal environmental policies, in light of DEFRA's 'Greening Government' initiative. The actions include progressive improvement in the environmental performance of the management of Ofgem's buildings and operations.

8.2 The chapter also sets out the work Ofgem will carry out to promote greater environmental awareness in Ofgem's policy development and to build and maintain relationships with other relevant organisations.

Greening Government

8.3 The Department for Environment, Food and Rural Affairs (DEFRA) is promoting the 'Greening Government' initiative. The aims of the initiative are to:

- promote the integration of sustainable development across Government and the wider public sector
- encourage the use of environmental appraisals as part of policy making, and
- continue to improve the environmental performance of departments in managing their buildings and operations (otherwise known as 'greening operations').

Ofgem's internal policies

8.4 In accordance with the 'Greening Government' initiative, Ofgem is working to improve progressively its environmental performance in a variety of areas. These include:

- purchasing, including recycled materials and office equipment which minimises paper and energy consumption
- waste minimisation and recycling
- energy consumption for lighting and heating, and

- use of public transport for commuting and work-related travel.

8.5 **Ofgem is currently seeking certification under ISO 14001. This will commit us to making incremental improvements in the areas outlined above. Ofgem plans to have certification in place by the end of the 2001/2 financial year**.

Developing Ofgem's objectives and guidelines

8.6 Ofgem is committed to a full analysis of the impact of social, environmental and economic issues, and to taking proper account of these in the internal decision-making process.

Guidelines for making decisions

8.7 All of Ofgem's activities can have an impact on the environment, including those that are not specifically aimed at meeting environmental objectives, but are focused on its social or economic objectives. Table 1 (Chapter 10) outlines the environmental aspects of Ofgem's ongoing activities and shows how actions in these areas can have significant environmental benefits.

8.8 The establishment of clear guidelines and procedures will allow Ofgem to ensure that any potential conflict between its economic, social and environmental objectives are managed so as to take into account the hierarchy inherent in its duties and the key principles set out in chapter 2.

8.9 Taking due account of the environmental impact of gas and electricity supply requires Ofgem to assess, and where possible, quantify the expected positive and negative impacts of Ofgem's decisions on the environment. This environmental assessment needs to be undertaken early in the policy development process and revisited as projects progress. The level of detail and the complexity of the analysis will vary from project to project depending on the size of the project and level of environmental risk associated with it. Once environmental impacts have been assessed, these can be considered alongside the social and economic costs and benefits and unintended environmental impacts can be avoided. Ofgem has taken the first steps in incorporating environmental assessment into its project implementation process.

8.10 **Ofgem intends to develop these procedures further, to ensure that consideration of environmental impacts is fully integrated into the policy development process**.

Links with other organisations

8.11 Ofgem recognises that many organisations have an interest in the environment. In the July discussion document these were detailed in Appendix 2; an updated version of this paper is available on Ofgem's website. **As part of the Environmental Action Plan process, Ofgem has forged stronger links with many of these organisations, and will continue to build on them**.

Environment Agency

8.12 A Memorandum of Understanding (MoU) between Ofgem and the Environment Agency (EA) has been agreed. This clarifies the respective roles and sets the boundaries for working together. Discussions are underway with a view of finalising a parallel MoU with the Scottish Environmental Protection Agency by the end of the year.

8.13 Ofgem will hold regular, quarterly meetings with the EA. This MoU mirrors a similar arrangement that Ofgem has with the HSE. There may also be a need to set up working groups on specific issues of joint interest to both organisations. The most immediate example is the work going forward on the NO_x trading scheme (see paragraph 4.16 for more details).

Other Government departments

8.14 Ofgem intends to set up regular six-monthly reviews of the Environmental Action Plan with DTI, DEFRA and Scottish Executive representatives. Ofgem will shortly organise a first meeting with representatives of the new Sustainable Development Commission, and will continue to meet them on a regular basis thereafter.

Other regulators

8.15 The Chairman of the Authority regularly meets energy regulators from other EU Member States to discuss issues of mutual interest, in particular relating to cross-border trade in electricity and gas.

8.16 Ofgem held a meeting of the Joint Regulatory Group on social and environmental issues in April with representatives from Ofgem, Ofwat, Ofreg, Oftel and ORR – the second such meeting which Ofgem has hosted. In future, the meetings will take place on an annual basis. At the meeting, participants look at issues where a co-ordinated approach can help achieve social and environmental goals.

Energy Saving Trust and Carbon Trust

8.17 Ofgem works closely with the Energy Saving Trust (EST) on the implementation, monitoring and evaluation of the energy efficiency programme. Ofgem has also worked closely with EST on issues relating to renewables, green tariffs and environmental policy in general. Ofgem is establishing contacts with the newly-created Carbon Trust.

Non-governmental organisations

8.18 In March 2001 Ofgem held a workshop for representatives of non-governmental organisations (NGOs) and voluntary organisations with an interest in energy and the environment. Ofgem intends to hold regular meetings with these groups in the future. Ofgem will also continue to meet the Royal Commission on Environmental Pollution on a regular basis and remain actively involved in the Government's process for responding to their report.

9. Summary of priorities and proposals

9.1 Throughout the document specific actions for Ofgem have been identified in bold. The purpose of this Chapter is to provide an overview of these actions and to set out the timescales for their completion.

9.2 In light of the five key principles set out in chapter 2, and having regard to the Government's draft social and environmental guidance, Ofgem has identified the following priorities:

- further work on the price controls of transmission and distribution systems to see whether additional incentives are justified to reduce gas and electricity losses
- a review of the treatment of embedded generation, where Ofgem needs to ensure that the system costs to be met by embedded generators are appropriate; and that system stability is maintained if there is a substantial increase in embedded generators
- an investigation of whether, within the structure of efficient energy trading which the NETA promotes, there is a case for further facilitation of renewables or Combined Heat and Power (CHP), and if so what are the most effective mechanisms to achieve this, and
- further encouragement of a system of NO_x emissions trading, as an efficient means of encouraging compliance with environmental standards.

9.3 The following table summarises the specific actions identified in the plan and includes relevant timings. For this financial year, these are identified by quarter, however several actions have timeframes that extend beyond the current financial year. The remaining quarters are:

Q2 = July to September 2001

Q3 = October to December 2001

Q4 = January to March 2002

Action[19]	Timescale
Legislative framework	
• Implement principles for action	Ongoing
Generation	
• Review the impact of NETA on small scale generators (4.11)	Q2 – Q4
• Contribute to the EA's work on setting up a NO_x trading scheme (4.17)	Q3 – Q4
• Administer renewables scheme (4.24)	Ongoing
• Consult on the future implementation of the CHP database (4.28)	Q3
Transmission and distribution	
Electricity	
• Examine the treatment of electricity losses as part of price control (5.20)	2002 – 5
• Implement recommendations of Embedded Generation Working Group as appropriate (5.26)	2001 – 5
• Consider the effect of locational price signals (5.28)	2002 – 5
• Discuss operation of SF_6 equipment (5.30)	Ongoing
Gas	
• As part of the current price control process, propose that Transco should collect and report on certain outputs regarding losses (5.35)	Q3
• Contribute to the Government's working group on access to gas (5.42)	Q2 – Q3
• Consult on gas connections regulations (5.38)	Q2
• Seek further information and monitor the performance of RbD on an ongoing basis (5.45)	Ongoing
Supply	
• Continue to administer the Energy Efficiency Standards of Performance (6.4)	Ongoing
• Contribute to the establishment of the Energy Efficiency Commitment (6.8)	Q4
• Publish guidelines on energy efficiency advice (6.17)	Q3
• Contribute to the Government's work on energy services (6.20)	Q3
• Encourage annual consumption data to be included on bills (6.24)	Q2 – Q4
• Issue guidelines on the future of green tariffs for domestic customers (6.33)	Q4
Environmental reporting	
• Work with DEFRA and Environment Agency to consider Key Performance Indicators (KPIs) for gas and electricity sectors (7.13)	Q4
• Issue model Schedule 9 statement to all licensees and any new licensees (7.18)	Q3
Increasing openness, transparency and accountability	
• Seek certification under ISO 14001 (8.5)	Q4
• Develop Ofgem's environmental policies and practices (8.4)	Ongoing
• Maintain and improve links with other organisations (8.11)	Ongoing
• Agree MoU with SEPA (8.12)	Q2 – Q4
• Develop procedures for taking account of social and environmental considerations in Ofgem's decision making process (8.10)	Q4
Measure and review progress	
• Refine indicators for monitoring and measuring progress against the plan	Ongoing
• Issue first annual report	Q4

[19] Numbers in brackets indicate the paragraph in which the action is set out in the main body of the text

10. Measuring, reviewing and reporting progress

10.1 This chapter sets out the ways in which progress under the Environmental Action Plan will be monitored, measured, and reviewed. This will include an assessment of Ofgem's progress in implementing the actions that are identified in the Plan as well as a more general assessment of the context of those actions and broader environmental indicators.

10.2 **Ofgem will publish annually a report of progress on the actions identified in the Environmental Action plan and the influence of these actions in meeting the Government's broader environmental objectives**.

Ofgem's actions

10.3 As far as possible this document sets out specific actions to which Ofgem is committed, together with clear timescales for their completion. Chapter 9 sets out a summary of these actions and timescales for their implementation. Where appropriate, timescales also include medium and long term goals. Ofgem will review each of the actions in the table in chapter 9 and will publish an assessment of progress against these targets annually.

Environmental context

10.4 Ofgem considers that, to fully appreciate the progress being made in meeting its environmental objectives, reporting needs to go further. There needs to be an understanding of how Ofgem's actions influence the environment more generally. A range of indicators of the environmental performance of the electricity and gas industries that are relevant to Ofgem's work is listed in Table 1.

10.5 In some cases Ofgem's actions make an important contribution to these indicators, while in others can play only a minor role. The various ways in which Ofgem's actions can affect the environment are summarised in Table 2.

10.6 With sensible interpretation, inclusion of environmental data in the annual review of the Environmental Action Plan should provide a useful background to the annual review process and will assist in the setting of priorities for future action.

10.7 All the indicators in Table 1 are already monitored by the Environment Agency and other government bodies. Ofgem plans to consult further with interested parties on the choice of indicators. They have been selected, where possible, from the UK's Sustainable Development Strategy. Continuing co-ordination with other Government departments and interested parties will be important to ensure that this part of the review process is meaningful, and to prevent duplication of existing work.

10.8 In measuring and reporting on these indicators it may be important for Ofgem to consider whether or not it is relevant to distinguish between the progress of different companies, or even between gas and electricity sectors, where a policy is applicable to both. This is likely to link into Ofgem's work on environmental reporting (see section 7.18).

Future measurement issues

10.9 In future reviews of the EAP it may become important to measure the indicators set out in Table 1 company-by-company, or region-by-region. Having a more finely tuned knowledge of the environmental impact may be important for the purposes of the next year's strategy in several respects. These are:

- in order to make further improvements, policies could be better targeted where, for example, energy efficiency schemes may only be implemented by certain companies, and
- where the industry is geographically restricted, an understanding of the distribution of environmental impact will help assess the priority of environmental concerns against other priorities.

Table 1 Indicators showing the environmental impact of the gas and electricity utilities as a whole

* denotes that Ofgem has an executive function in this area

Government objectives	Measure (source)	Who is responsible	Ofgem-related activities
To reduce greenhouse gas emissions	• Greenhouse gas emissions from power generation, transmission and distribution expressed individually for each greenhouse gas and as total in tonnes of CO_2 and contribution to total UK emissions (DUKES[20])	• DEFRA Main policy document: *Climate Change, The UK Programme Nov 2000 DETR*	• Gas connections, distribution and transmission losses, embedded generation, renewables, CHP, NETA review, energy efficiency.
To improve energy efficiency*	• Money spent on EESoP (EST) • TWh of savings (EST) • Tonnes of carbon saved (EST) • Number of efficiency schemes in partnership with local authorities and housing associations (EST)	• Ofgem is responsible for EESoP target. Latest Ofgem document: *Energy Efficiency Standards for Gas and Electricity Suppliers 2000-2 Final Decisions March 2000* • DEFRA is responsible for EEC target. Latest document: *EEC 2002-5 Provisional Conclusions Nov 2000 DETR* • Ofgem is responsible for monitoring EEC target • The Energy Saving Trust assists with approval and monitoring of EESoP schemes.	• Setting EESoP targets. • Social Action Plan • Administering EEC target

[20] DUKES is the Digest of UK Energy Statistics, published annually by DTI.

Government objectives	**Measure** (source)	**Who is responsible**	**Ofgem-related activities**
To increase the percentage of renewables in the market place*	• Percentage of electricity generated from renewables as part of UK's primary energy supply (DUKES) • Number of renewables installations (DUKES)	• DTI is responsible for renewables targets. Latest document: *The Renewables Obligation Statutory Consultation August 2001.*	• NETA review, • CCL exemption, • Renewables Obligation, • embedded generation work, • green tariffs
To increase installation of CHP*	• CHP as percentage of electricity generating capacity available in UK (DUKES) • Total energy output from CHP (DUKES)	• DEFRA is responsible for CHP targets	• Encouraging CHP under EESoP3 and EEC 4. • Removing any uneconomic barriers to CHP in NETA. • Maintenance of CHP database.
To improve air quality	• Levels of SO_2 and NO_x emissions from electricity and gas industries (UK Energy Sector Indicators)	• Environment Agency • Scottish Environmental Protection Agency	• Memorandum of Understanding with EA

Table 2 Environmental aspects of Ofgem's ongoing activities

Ofgem's on-going activities		
Policy area	**Environmental actions associated with this policy area**	**Potential environmental benefits**
New Electricity Trading Agreement (NETA) *AIM To promote market efficient trading in the wholesale electricity and gas markets and to encourage competition.* *NETA became operational on 27 March 2001*	**Small Generators** Review the initial impact for small generators in the first two months of NETA, publishing an initial report in August 2001. Smaller generators are licence exempt or exemptable. The official definition includes combined heat and power installations and renewable generators. (Ofgem Terms of Reference document for the NETA Review, April 9 2001 (updated May 2001))	Reduce CO_2 emissions by increasing output of low carbon electricity generators.
Competition in generation *AIM To introduce competition in generation in line with statutory duties*	The Environment Agency (EA) is investigating setting up a NO_x trading scheme for power stations. Ofgem is co-operating with the EA on this issue. EA plans to issue a proposal for a scheme in April 2002. Trading could be extended to SO_2.	Reduce NO_x and SO_2 emissions to contribute to improved air quality at the least cost to consumers.

Ofgem's on-going activities		
Policy area	**Environmental actions associated with this policy area**	**Potential environmental benefits**
Transco price control review *AIM To regulate the monopoly gas transportation business through a price structure that promotes efficient use of the system and facilitates competition* *The draft proposal for the next Transco price control was published in June 2001, final proposal is due in September 2001, to be implemented from 1 April 2002*	**Losses** Review current incentives to reduce leakage. Consider the environmental benefits of the mains replacement programme. **Network Extensions** Participate in working group with DTI, DEFRA and some invited industry and consumer groups to look into extending the gas network. Report due out October 2001. Consult on amending the Gas Connections Charges Regulation in line with the findings above. Ofgem is considering proposing longer recovery period (currently capped at 5 years) for gas transporters' rural infill projects. **Output Measurements** Introduce medium term performance measures for transporters on methane, NO_x and CO_2 and a requirement for an environmental report.	Reduction in CH_4 emissions, a powerful greenhouse gas. Network extensions can reduce greenhouse gas emissions by encouraging switching to cleaner fuels (ie gas). However, extensions could also increase losses overall depending on the infrastructure used. Extension of the cost recovery period could make it financially viable to extend the gas network to more areas. Further incentives to reduce methane and other emissions will cointribute to Government greenhouse and air quality targets.

Ofgem's on-going activities		
Policy area	**Environmental actions associated with this policy area**	**Potential environmental benefits**
Electricity distribution price regulation *AIM To regulate the monopoly electricity distributions business through a price structure that puts obligations on Distribution Network Operators (DNOs) to promote competition and will now include, through the Information and Incentives Programme (IIP), quality standards for customer service.* *Next price control is due to take effect April 2005. A proposal in January 2002 could lead to interim changes to the price control. Ofgem statement on its future approach will be out by June 2002.*	**Distribution charge structures** A review on distribution charge structures due for September 2001 will consider connection charges for embedded generation and isolated regions and parts of the charging structure which are relavant to embedded generation. **Design and operational codes** Review guidelines to help distribution network operators (DNOs) take the contribution of embedded generation to network performance into account in design and operation. Analyses of power quality, technical contribution and island operation due in Jan 2003 and of safety considerations in Jan 2004. Prepare revised network design package to be implemented after 2005. **Losses** A review of the current financial incentives in the price control structure will consider how to limit electricity distribution losses more effectively. **Environmental performance** Consider how changed incentives in the price control might incentivise electricity distribution companies to improve environmental performance.	Reduce CO_2 emissions by increasing share of renewables, CHP and reducing electricity losses. A non-discriminatory distribution charging structure could could increase the embedded generation in the system, often renewables or CHP. Embedded generation will reduce losses if it matches local load. Increased connection of embedded generation will have implications for system design and control. Losses on distribution systems are on average 7 per cent. Reducing losses will reduce CO_2 emissions and could reduce the costs of electricity for end consumers.

Ofgem's on-going activities		
Policy area	**Environmental actions associated with this policy area**	**Potential environmental benefits**
	Information Ensure more transparency and consistency in DNO information provisions by creating a format for provision of information by distributors by January 2002 Provide information packages for potential embedded generators by June 2003	
NGC electricity transmission price regulation *AIM To regulate the monopoly electricity transmission business through a price structure that regulates the National Grid Company* *Next price control is due to take effect in 2006.*	Consider stronger locational signals to incentivise reductions electricity losses. Consider more cost-reflective pricing arrangement as far as transmission losses are concerned. Consider relationships between technology improvements and regulation.	Reduce CO_2 emissions through reduction of losses. Reduce SF_6 emissions through better management practices.

Ofgem's on-going activities		
Policy area	**Environmental actions associated with this policy area**	**Potential environmental benefits**
Competition in the energy supply sector *AIM To protect the interests of consumers by promoting competition in the energy supply sector through the removal of any remaining barriers to competition, increasing access to competitve supply markets and building consumer confidence.*	**Energy service companies for domestic customers** Evaluate effectiveness of energy services already in operation at end of EESoP programme, March 2002 onwards. Hold workshop on regulating aspects of Energy Service Companies (ESCOs). Guidelines were published on 28 March 2001. **Green tariffs** Issue guidelines to suppliers on the nature of green tariffs to coincide with the start of the Renewables Obligation (Jan 2002) **Energy efficiency advice** Produce guidelines on providing energy efficiency advice by March 2002 **Ofgem requirements on provision of information on bills** Issue consultation on the possibility of suppliers showing consumer's consumption data on bills and their average emissions profile. (Ofgem's March 2001 decision document on making gas and electricity price comparisons easier outlined some recommendations to suppliers to this effect).	Reduce CO_2 emissions by increasing energy efficiency through growth of energy services sector Reduce CO_2 emissions and lower bills by increasing energy efficiency through better quality, provision and uptake of Energy Efficiency Advice and by increased public awareness of consumption.

Ofgem's on-going activities		
Policy area	**Environmental actions associated with this policy area**	**Potential environmental benefits**
Competition in metering *AIMTo establish effective competition in metering. This should enable suppliers and customers to exercise choice over how they obtain metering and meter reading services* *Ofgem's strategy for metering consultation was published March 28 200. Second document, 'a report on progress and the way forward' is due out in September 2001.*	Consider an industry 'standard' for advanced metering to ensure, where possible, that new meter types can be supported by suppliers Consider an investigation of the cost bases for PGT current prices for metering services. Encourage the take up of advanced meters which provide information on consumption levels.	Reduce CO_2 emissions by increasing energy efficiency and improving consumer awareness of consumption. Competition in metering should facilitate the take up of domestic CHP and PV generation.

Appendix 1 Summary of responses

A1.1 Ofgem received a very full response to the July 2000 discussion document from companies, consumer and environmental groups, public bodies and other interested parties. As part of the consultation process, Ofgem also hosted two workshops and 30 bilateral meetings with interested parties. Parties that attended the workshops are listed in Appendix 3.

A1.2 Broadly speaking, respondents welcomed the Environmental Action Plan (EAP) initiative and found the discussion document to be a helpful account of Ofgem's environmental responsibilities and the context within which Ofgem operates. Many respondents, including companies, have stressed that the EAP provides an opportunity for a clearer delineation of Ofgem's role in relation to environmental issues, although opinion differed on what this role should be. There is a broad consensus that Ofgem's environmental functions should be well focussed, and clearly co-ordinated with its other duties.

A1.3 This Appendix summarises the comments received and sets out the views of respondents on the list of possible actions included in the July 2000 document. Responses have been grouped under the following areas: Ofgem's role, electricity generation, embedded generation issues, renewables and CHP, price controls and charging, gas network issues, environmental costs, externalities and incentives, energy efficiency, environmental reporting, and Ofgem's internal environmental policies.

Ofgem's role

A1.4 Much of Ofgem's work affects the environment. The plan and budget for 2001/2 makes addressing social and environmental issues a priority area. To deliver this Ofgem has increased the staff and budgetary resources available for environmental work.

A1.5 Companies responding to the consultation paper generally agreed that Ofgem should assess the environmental impact of its decisions. However, they expressed concerns over Ofgem extending its role in setting and implementing environmental policy, particularly if this were to weaken the promotion of

competition in gas and electricity markets. Detailed points made by companies included:

- Ofgem should be involved in implementing government policy only when required by legislation
- Ofgem's policy should be consistent with the achievement of the Government environmental policy, but should not attempt to better the Government's objectives (see chapter 2 of this document)
- in addition to the social and environmental objectives of the Energy Efficiency Standards of Performance (EESoPs), the links with economic regulation and competitive markets also need to be considered (see chapter 6), and
- Ofgem's role in publicising the energy efficiency standards should be minimal and their promotion and development should continue to be the responsibility of suppliers and the Energy Saving Trust (see chapter 6).

A1.6 The companies' chief concern was that actions in support of Ofgem's environmental objectives might impede competition. In their view, such actions would not be in the interests of consumers in the long term nor would they be the optimal means of achieving environmental goals. They expressed a fear that environmental policies could distort markets (gas and electricity supply and energy efficiency product markets) leading to inefficient resource allocation, causing higher prices and increased waste. Companies argued that the energy industry is already heavily environmentally regulated and that any Ofgem-initiated environmental requirements should be subject to a cost/benefit analysis. In general companies believed that Ofgem should not impose new environmental responsibilities on them and that any Ofgem action to 'encourage' companies to meet various environmental standards should not become a new regulatory burden (see chapter 2).

A1.7 In contrast, some consumer and environmental groups advocated that Ofgem should adopt a more pro-active role in setting as well as implementing environmental policies. There was general agreement that Ofgem should better

consider the environmental impact of its work and evaluate the regulatory and economic benefits against environmental impacts where these conflict. Particular suggestions included:

- taking action to try and stimulate the energy services market, through investigation of barriers to entry and competition for this market (see chapter 6)
- acting against any suppliers that encourage the wasteful use of energy, and
- considering allowing external costs of environmental impact when calculating price control allowed revenues (see chapter 5).

A1.8 Some consumer and environmental respondents would prefer Ofgem to draft one set of sustainable development guidelines, instead of tackling the economic, social and environmental elements separately, as proposed in the discussion document.

A1.9 Other general comments regarding the scope of the Plan and highlighting Ofgem's environmental role include:

- the importance of the energy industry's impact on the landscape and local amenity, and the need to incorporate such factors when considering sustainability
- the need to include quantitative and measurable targets in the Plan (see chapter 9)
- the importance of viewing environmental issues in the context of a dynamic energy market with an increasingly distributed pattern of electricity generation (see chapter 3)
- the urgency of establishing a coherent and stable policy and regulatory framework on environmental matters within which companies (and stakeholders) could plan with confidence in order to achieve the most cost effective environmental solutions
- the importance of creating a clear long term strategy

- the need for Ofgem to provide a clearer account of how it intends to tackle its environmental responsibilities – for example how it will carry out its functions in a manner which it considers best calculated to secure a diverse and viable long term energy supply (see section 2.24)

- the need for Ofgem to give due priority to its statutory duties and to avoid taking on tasks better handled by bodies with the prime responsibility for environmental issues (see section 2.33), and

- the requirement for policies on sustainability to give priority to the needs of the fuel poor, to the same degree that this had been recognised in Ofgem's Social Action Plan.

Electricity generation

A1.10 Many respondents were supportive of the emissions trading scheme approach to sulphur dioxide (SO_2) and oxides of nitrogen (NO_x) outlined in Chapter 4 of the July discussion document, although others questioned the viability of such trading schemes (see section 4.17).

A1.11 The Confederation of Coal Producers (CCP) argued that the coal industry had made a disproportionate contribution to the UK's environmental commitments due to fuel switching from coal to gas and that any further switching would compromise future security of fuel supply. CCP also claimed that electricity from FGD (flue gas desuplhurisation) plant is cheaper than that from new CCGTs and that Ofgem should actively support clean coal technology to reconcile the conflicting objectives of low prices and environmental protection (see chapter 4).

A1.12 RJB Mining argued that regulation should not favour cleaner generating sources if they threatened long term security of supply and lead to over-dependence on gas (see chapter 4).

Generation from renewable sources and CHP

A1.13 Respondents were in favour of the Government's commitment to obtaining generation from an increasing number of renewable sources. There was considerable support for generation from Combined Heat and Power (CHP)

sources, both existing and new schemes. However it was noted that the viability of these schemes is dependent on a range of potentially conflicting pressures.

A1.14 A significant number of respondents stated that to ensure that the market for CHP and renewables was level for all players, barriers to entry should be eliminated. The Energy Saving Trust (EST) supported CHP and stated that it would bring major environmental benefits. They argued that the markets should be designed to accommodate and encourage small CHP and renewable generation and that, if NETA did not encourage the development of renewables, it be revised (for renewables see 4.18, for CHP see 4.26, for NETA issues see 4.5).

Price controls and charging

A1.15 Companies generally agreed that market prices should not be influenced by the environmental concerns about the effect of lower prices on demand. However companies also said that Ofgem should clarify its view of the relationship between prices and investment in relation to the Government's sustainable development objectives. This reflected concern that lower energy prices would discourage investment in environmentally-friendly technologies including CHP and renewables.

A1.16 Some respondents expressed concern that a system of price regulation focussed on incentivising more cost-efficient networks may not result in energy efficiency or environmental benefits.

A1.17 One company, Powergen, argued that the environmental basis for the different approaches to electricity and gas network price controls had not been properly established and needed further work (see chapter 5).

Environmental costs, externalities and incentives

A1.18 There were a substantial number of comments on how Ofgem should treat extra costs due to environmental legislation and externalities; and how it should incentivise energy efficiency and positive environmental impacts. The Electricity Association commented that the new Electricity Works (Assessment of Environmental Effects) Regulation 2000 may result in increased administrative costs as well as the costs of environmental impact assessments. Companies

should notify Ofgem that environmental legislation will require them to undertake some extra activities which impose extra cost. The Electricity Association also identified the potential impacts of the Contaminated Land regime, the New Roads and Street Works Act and any 'lane charging regime as changes which could warrant such consideration [reopening of price controls]'. The EST argued that the Information and Incentives Project should "consider the effect of price control structures on incentives for suppliers to offer energy efficiency and offer energy services." (see section 5.2 on price controls and section 5.16 on Information and Incentives Project)

A1.19 On the issue of externalities, EST argued that "Ofgem should advise the Government on the relationship between the likely future emissions and costs so that future targets can be set". They urged Ofgem to consider striking a different balance between the promotion of competition and support for energy efficiency, arguing that energy efficiency is in the long term interest of consumers on the basis that it results in decreased energy consumption and lower monthly bills.

A1.20 On the treatment of externalities in price controls, EST said: "Truly cost-reflective pricing would recognise these costs…raising prices above marginal internal costs would therefore be justified by economic theory". EST also argued that in future price control reviews Ofgem should consider shifting the structure of charges towards commodity costs, rather than non-cost-reflective charging. (For more on externalities see section 2.15)

Gas network issues

A1.21 Transco commented that the structure of the liberalised market was inhibiting the further extension of the network into non-gas areas. Transco also suggested that its dominant position in the provision of pipeline services was preventing it from competing adequately in the market for new connections, for fear that it may run foul of Competition Act requirements. (Anti-competitive behaviour could include, for instance, pricing at below cost or bundling other services with its connections services). (See section 5.31).

A1.22 With regard to Transco's charging methodology and its impact on energy efficiency, one gas supplier, Amerada, as well as the EST, argued that

Reconciliation By Difference (Rbd), the method used by Transco to charge for non-daily metered sites, results in shippers being exposed to reduced income for at least one year when customers improve their energy efficiency (see section 5.43).

Embedded generation issues

A1.23 Several respondents commented on embedded generation. One company indicated that the impact of embedded generation on the investment requirements of companies should be accounted for within price controls. They also said that deep charging to embedded generators reflects the true cost of their location decisions, and that end consumers are having to bear the increased cost as a result of national targets to increase the number of embedded generators (see section 5.21).

A1.24 Scottish Power was of the view that economic regulation should not be used to alter prices or market signals on order to promote environmental objectives such as embedded generation, CHP and renewables which would otherwise be uneconomic. Rather it should be for government to alter fundamental market structures by taxation, trading regimes etc (see chapter 2).

A1.25 One company argued that the complexity involved in disaggregating cost elements is not always justified by the degree of locational signals that result and that cost reflectivity needs to be balanced against equitable treatment of different customers and customer groups.

A1.26 Concerns were expressed that the outcome of IIP project might be jeopardised if the scope of the project is widened to include consideration of targets for the reduction of system losses (see section 5.16).

Energy efficiency

A1.27 There was a spectrum of views from respondents on energy efficiency. Broadly these can be split between suppliers, consumer, social and environmental groups and other interested parties. Suppliers generally highlighted the progress that they had made in implementing the Energy Efficiency Standards but expressed concern that Standards had the potential to cause distortions in the

gas and electricity supply markets and in the market for energy efficiency products. Another concern of suppliers was that the requirement to target the Standards at disadvantaged customers constrained the potential environmental benefits.

A1.28 The consumer, social and environmental groups were generally in favour of the Energy Efficiency Standards and pointed to the benefits that had been achieved, both in terms of helping to alleviate fuel poverty and to reduce emissions. There was general support that suppliers should link energy efficiency advice and assistance under the standards to debt management/ prevention.

A1.29 Respondents from energy efficiency trade associations were concerned that Energy Efficiency Standards could be distorting the market for energy efficiency products. The availability of grants for insulation products was felt to alter the public's perception of the cost of providing such products, and to be damaging the flexibility of the industry. Publicising the low prices available for insulation, while in practice rationing the provision of the reduced cost product and not allowing all registered installers access to work on Standards' projects was distorting the energy efficiency product market (for energy efficiency issues see chapter 6).

Environmental reporting

A1.30 With regard to corporate environmental reporting, the July 2000 discussion document suggested that Ofgem might encourage companies to produce annual environmental performance reports and promote best practice in reporting. In their responses, companies highlighted the extent of their existing environmental reporting, including the links between company environmental reporting and reporting on social, health and safety and sustainability issues. Companies also emphasised the quality assurance procedures underlying their reports, notably the widespread use of ISO 14001 based reporting systems.

A1.31 In their responses companies also drew attention to the need to avoid duplicating existing reporting requirements set by other agencies, particularly the Environment Agency and the then DETR, including DETR's reporting guidelines covering greenhouse gas emission, waste and water. Companies also

referred to the Government's *'Making a Corporate Commitment'* initiative which includes environmental performance and resource efficiency reporting.

A1.32 Companies also pointed to the difficulties of ensuring comparability of performance data across companies. Another concern was that voluntary company initiatives in the field of corporate environmental reporting should not be stifled by regulatory intervention. The majority company view was that environmental reporting should remain voluntary.

A1.33 Other respondents were more supportive of Ofgem action to promote environmental reporting, and were sympathetic towards steps to ensure greater transparency of information and more consistent reporting standards across companies (for reporting issues see Chapter 7).

Responsibility for Environmental Statements

A1.34 In addition to the environmental reports that large companies produce, specific requirements apply to gas and electricity companies under schedule 9 of the Electricity Act and schedule 3 of the Gas Act.

A1.35 In the July 2000 discussion document Ofgem questioned whether or not the Environment Agency (EA) might take over responsibility for monitoring the gas and electricity companies' statutory environmental statements. Responses were divided over the issue.

A1.36 Respondents highlighted the importance of establishing which regulatory body should take responsibility for the statements. One respondent remarked that this could only be achieved by a full consideration of the nature of the statutory requirements, under both electricity and gas, as it was not obvious that responsibility should lie with one regulatory body. However another respondent considered that it was crucial for responsibility for the statements to lie with a single agency.

A1.37 One respondent also highlighted the importance of clarifying with those subject to regulation their environmental responsibilities. Another suggested that it would be difficult to ensure consistency of Schedule 3 (gas) and 9 (electricity) statements. They pointed out that the statements were different in that Schedule 9 statements cover a company's overall policy on the environment, whereas

Schedule 3 statements describe the environmental impact of specific new projects. Respondents also indicated that the statutory preparation and publication for Schedule 9 does not officially involve Ofgem or the Environment Agency, and that there was thus no basis for Ofgem's proposals.

A1.38 Two respondents viewed the current level of reporting on Schedule 3 and 9 statements as satisfactory. It was felt that the current procedures were working and that the bodies already consulted are best suited for this purpose as they have a specific interest and expertise. The extra costs associated with extending any obligations were also highlighted. One respondent thought that it is the responsibility of companies and environmental agencies to monitor compliance with environmental law (and the obligation to produce statements) – not Ofgem. However, another respondent stressed the importance of the statements being subject to Ofgem approval. Two respondents commented that there was a need for a consistent format for the statements as, at present, a comparison of relative performance is difficult.

A1.39 Comments were also made concerning National Parks. One respondent suggested that paragraph 3.21 of the discussion document should be amended to refer to section 62 of the Environment Act 1995. This sets out the requirements on statutory undertakers, including Regional Electricity Companies (now Distributors) and their commitment to National Parks purposes (Annex 4). It was suggested that companies should be encouraged to work with National Park Authorities and to consider signing joint MoUs. Another respondent highlighted the fact that NGC has prepared a statement on their commitment to National Park purposes (for Statement issues see section 7.14).

Ofgem's own internal environmental practices

A1.40 Many respondents welcomed Ofgem's approach to developing and implementing internal environmental policies. They were very supportive of work in this area, and some made specific suggestions for consideration. These included:

- introduction of performance targets
- seeking ISO 14001 certification

- seeking methods to reduce waste
- further use of recycling
- seeking to use electronic means for consultation, and
- encouraging a culture of environmental awareness within Ofgem.

A1.41 See chapter 8 for more information on Ofgem's internal environmental policies.

Appendix 2 Respondents to July 2000 Consultation

Amerada Hess Gas (Domestic) Ltd
Aquila Energy
Association for the Conservation of Energy
Association of Electricity Producers
British Gas Trading
Building Research Establishment
Centre for Management Under Regulation, Warwick Business School
Centre for Social and Economic Research on the Global Environment, UCL
Combined Heat and Power Association
Council for Energy Efficiency Development
Council for National Parks
Department of the Environment, Transport and the Regions
Department of Trade and Industry
Draught Proofing Advisory Association Limited
East Midlands Region Electricity Consumers' Committee
Electricity Association
Energy from Waste Association
Energy Saving Trust
English Nature
Entergy Wholesale Operations
Environment Agency
Exmoor National Park Authority
Friends of the Lake District
Gas Consumers Council
GMB
GPU Power UK
Green Alliance
Industrial Power Association Ltd
Innogy
Institute of Energy
Insulated Render and Cladding Association
Judge Institute of Management Studies, University of Cambridge
Landfill Gas Association
Lighting Industry Federation
London Electricity plc
National Association of Loft Insulation Contractors
National Cavity Insulation Association
National Electricity Consumers' Committee
National Energy Action
National Housing Federation
North Eastern Electricity Consumers' Committee
North of Scotland Electricity Consumers' Committee
North Yorkshire Moors Association
Northern Electric Distribution Ltd
Northern Electric plc
Northern Ireland Electricity plc
Norweb Distribution
Peak District National Park Authority
Powergen

RJB Mining
Royal Commission on Environmental Pollution
Rural England Versus Overhead Line Transmission (REVOLT)
Scottish and Southern Energy plc
Scottish Power
SEEBOARD plc
Society of British Gas Industries
South East Regional Electricity Consumers' Committee
South Wales Electricity plc
Strathclyde and Central Energy Efficiency Advice Centre
The Confederation of United Kingdom Coal Producers
Transco
TXU Europe
Unison
Western Power Distribution
Yorkshire Electricity
Yorkshire Electricity Supply Regulation
Yorkshire Water

Appendix 3 Environmental Action Plan workshops

Industry workshop
Friday March 9th 2001

Organisations represented:

British Gas Trading
Enron Europe
London Electricity
Norweb Distribution
Scottish Power plc
Transco
Unit[e] UK
Yorkshire Electricity
Electricity Association
Innogy
Northern Electric
Scottish and Southern Energy Ltd
Seeboard plc
TXU Europe Group
Western Power Distribution

NGO stakeholder consultation workshop (facilitated by Oxera Environmental)
Friday March 16th 2001

Organisations represented:

Association for the Conservation of Energy
Centre for Sustainable Energy
Combined Heat & Power Association
Earthwatch Institute
Energy Conservation Solar Centre
Energy Saving Trust
ETSU
Friends of the Earth
National Energy Action
Quantum Partnerships Ltd
The Emissions Trading Group
WWF (UK)
Association of Electricity Producers
Climate Care
Combined Heat & Power Association
Energy 21
Energy Saving Trust
energywatch
Forum for the Future
Global Action Plan
Policy Studies Institute
Summerleaze Re-Generation
University College London

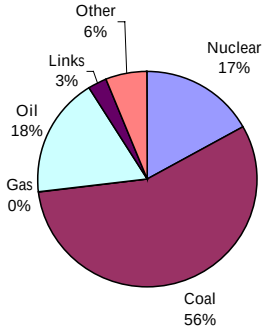
Appendix 4 Indicators of diversity and viability since 1990

A4.1 Two important features to consider in monitoring the diversity and viability of future energy supplies are the range of fuel types used in electricity generation and the extent of spare capacity in the electricity generation system.

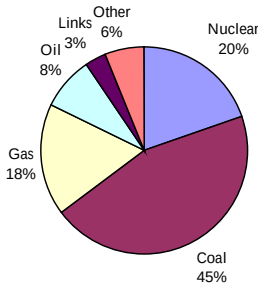
Fuel Mix

A4.2 The charts below illustrate the changing capacity mix in the years 1990, 1995 and 2000.

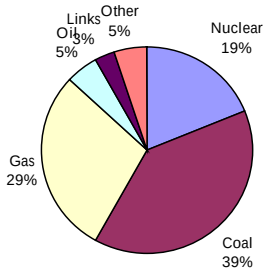
1990 Total = 70.00 GW



1995 Total = 65.5 GW



2000 Total = 71.1 GW



Source: NGC Seven Year Statement 2000, data for England and Wales, and Scottish Power and Scottish and Southern Energy's Seven Year Statements 2000 for Scotland

A4.3 Total generation output has increased by around 12 per cent during the decade from 1990 to 2000. Scottish output increased from 29 TWh to 33TWh (1.3 per cent p.a.) whilst England and Wales output increased from 267 TWh to 298 TWh (1.1 per cent p.a.)

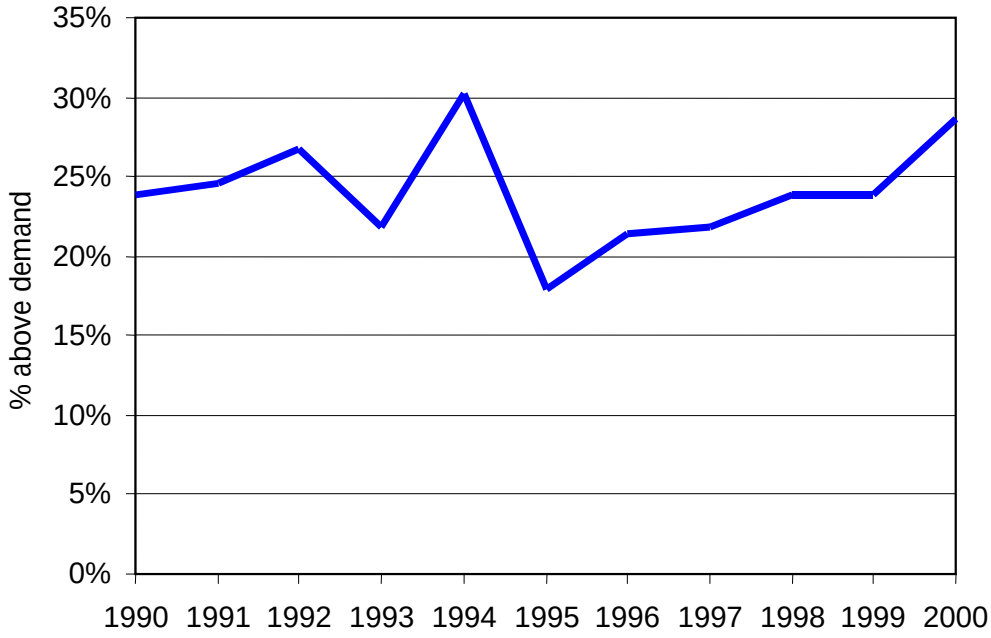
A4.4 The trend towards gas plant in output (as opposed to capacity) has been even more pronounced. During this period, output from coal and oil fired generating plant fell dramatically. In 1990, coal and oil fired plant accounted for almost 80 per cent of output, by 2000 this had fallen to 34 per cent. The fall in output from coal and oil plant has primarily been as a result of the increase in output from gas, but in the early years (up to 1995) increased in nuclear output and interconnector flows also contributed to decline in coal and oil output.

Plant Margin

A4.5 The plant margin is an important indicator of viability of supply in the medium to long term. The plant margin is the amount by which the installed capacity on the system exceeds the peak demand.

A4.6 Against the background of entry to and exit from the generation market in England and Wales since vesting and the lumpy nature of the investments involved, the plant margin has fluctuated between approximately 20 per cent and 30 per cent over time.

Percentage above demand



Source: NGC Seven Year Statements

A4.7 Historically, the CEGB sought to achieve a plant margin of 24 per cent several years ahead which it called the "planning margin" (i.e. the plant margin for planning the need for future generation). In the context of a liberalised market for electricity, current and forward electricity prices will indicate the need for new generation capacity. However, to place the UK plant margin in context, a review of generation adequacy standards[21] around the world has shown that large utilities world wide seek planning margins of up to 30 per cent.

[21] "An International Review of Adequacy Standards for Generation and Transmission Planning, CIGRE Report No 37-92 (AG)02(E)", November 1992.

Appendix 5 Glossary of Terms

CAFE	Clean Air for Europe
CCGT	Combined Cycle Gas Turbine
CERES	Coalition for Environmentally Responsible Economies
CHP	Combined Heat and Power
DEFRA	Department for Environment, Food and Rural Affairs
DNO	Distribution Network Operator
DTI	Department of Trade and Industry
DTLR	Department for Transport, Local Government and the Regions
DUKES	Digest of UK Energy Statistics, published by DTI
EA	Environment Agency
EAP	Environmental Action Plan
ECCP	European Climate Change Programme
EEC	Energy Efficiency Commitment
EESoP	Energy Efficiency Standards of Performance
EGWA	Embedded Generation Working Group
EMS	Environmental Management System
EPAQS	Expert Panel on Air Quality Standards
EST	Energy Saving Trust
FGD	Flue Gas Desulphurisation
FTSE 350	Illustrates the performance of the 350 most highly capitalised companies traded on the London Stock Exchange
GRI	Global Reporting Initiative
GWP	Global Warming Potential
HEES	Home Energy Efficiency Scheme
HFO	Heavy Fuel Oil
IIP	Information and Incentives Project
IPPC	Integrated Pollution Prevention and Control
KPI	Key Performance Indicators
LECs	Levy Exemption Certificates
MWe	Megawatts - electrical
NETA	New Electricity Trading Arrangements
NFFO	Non-Fossil Fuel Obligation
NGC	National Grid Company
NGO	Non-Governmental Organisation
PFC	Power Factor Correction
ROCs	Renewables Obligation Certificates
SEPA	Scottish Environmental Protection Agency
UNCED	United Nations Conference on Environment and Development
UNEP	United Nations Environment Programme
WHO	World Health Organisation