Environmental Action Plan

Annual Review 2004/05

August 2005

Foreword

The past year has seen major developments in energy and the environment, many of which strengthen the role of market-based instruments in environmental policy. At a global level, the Kyoto Protocol came into force on 16 February 2005, having passed the threshold of 55 per cent of rich country emissions with the ratification of the Protocol by the Russian Federation. The protocol builds on the framework of the UN Framework Convention on Climate Change. It breaks new ground with its legally-binding constraints on greenhouse gas emissions and the opportunity to use flexible mechanisms, including the trading of emission reduction commitments aimed at cutting the cost of curbing emissions.

January 2005 also saw the beginning of the EU Emissions Trading Scheme (EU ETS), a major instrument for Member States to meet their climate change goals, and in particular their shares of the EU's Kyoto target. Ofgem welcomed the Government's decision to give the EU ETS a central role in its climate change policy, recognising the significant work that has been undertaken by the European Commission, and by Defra, DTI and the environmental regulators in making the scheme a reality in such a short period of time.

A broad-based emissions trading scheme requires participants in energy markets to recognise the environmental impacts of energy production and use, and factor these impacts into energy prices. This is a significant step forward and should provide further encouragement to customers to consider ways of reducing their use of energy. Since the beginning of trading the value of allowances in the scheme has generally been increasing steadily, as has the volume of trading. The second phase of the scheme covers the Kyoto commitment period 2008-2012. The Phase II allocation plans are due to be submitted to the Commission in June 2006.

If the EU ETS is to deliver its full potential, it is important that the decisions on Phase II made by the Government, together with other Member States and the Commission, build on the objectives of the scheme. Clear signals must be sent to participants that they need to incorporate the cost of emissions in their management and investment decisions.

Parliament, by way of the Energy Act 2004 has expanded Ofgem's duties which now oblige the Authority to consider how best it can contribute to sustainable development, and commits it to apply the principles of better regulation in carrying out our activities. The sustainable development duty builds on and strengthens our existing duties with

regard to the environment. During the year, these have been subject to a re-examination by the Authority, under whose direction and governance Ofgem acts.

After considering the legal and policy framework within which we must work, the Authority adopted a new approach to its environmental work. This clarifies and builds on the previous framework for taking account of the environment which was set out in the first Environmental Action Plan in 2001.

The new approach will assist the gas and electricity industry to achieve environmental improvement as efficiently as possible. It refines our environmental principles and establishes a process to ensure that the impact on the environment is considered in all of our decisions. The framework is based on rigorous analysis and evaluation of the available evidence and will allow us to participate in the wider debate on the interactions between environmental policy and energy markets.

The fourth annual review of Ofgem's 2001 Environmental Action Plan describes the work we have done over the past year in greater detail, and sets out our plans on key priorities for the coming years. I hope you will find the report informative and useful.

Sir John Mogg
Chairman, Gas and Electricity Markets Authority

August 2005

Summary

This document is the fourth annual review of Ofgem's Environmental Action Plan (EAP). The plan was published in 2001. Each annual review assesses progress since the previous year and also sets out Ofgem's new initiatives and environmental priorities for the coming year. This document assesses Ofgem's work in the area of the environment in 2004/05 and sets out a work programme for 2005/06 taking into account its statutory duties including new duties given to Ofgem under the Energy Act 2004 in regard to sustainable development and better regulation.

Principal areas of work in 2004/05

During the year, Ofgem has tackled a substantial amount of work in the environmental area. The major projects have included the following.

- Continuing to administer a number of environmental programmes on behalf of the Government. These include:
  - the Renewables Obligation, including suppliers' compliance with the second year of the Renewables Obligation;
  - the exemption from the Climate Change Levy for renewables;
  - the exemption from the Climate Change Levy for CHP generation;
  - Renewable Energy Guarantees of Origin;
  - the Energy Efficiency Commitment; and
  - ongoing activity in relation to the Non-Fossil Fuel Obligation, Scottish Renewable Obligation and Fossil Fuel Levy.

Other work included contributions to major Government reviews of the EU Emissions Trading Scheme (EU ETS), the Climate Change Programme and the Renewables Obligation. Ofgem also organised two discussion days attended by a range of experts in this field. The first of these considered how to make sure renewables policy delivers and the second considered the impacts of the EU ETS.

The price control arrangements for electricity distribution network operators (DNOs) for the five years from 1 April 2005 were finalised, including substantial environmental components in regard to:

- the treatment of distributed generation;
- incentives for innovation in the treatment and management of distributed generation;
- revision of the incentives on DNOs to reduce losses;
- new arrangements in regard to undergrounding of electric cables in environmentally sensitive areas; and
- environmental reporting by DNOs.

Other work has included:

- The creation of a single non-discriminatory cost-reflective Great Britain transmission charging regime (BETTA) from 1 April 2005 which allows for the promotion of effective competition and therefore for environmental goals to be met in the most efficient way possible.
- Initial work on the introduction, with the DTI, of a new regulatory regime for transmission and distribution networks to connect offshore electricity generation (principally wind generation) to the national transmission and distribution systems.
- Allowing new transmission investment to support the expected rapid development of renewables in Scotland.
- Work with the DTI on a new standard licence condition in electricity supply licences to require each electricity supplier to provide details to its customers of the mix of fuels used to produce the electricity it supplies and certain environmental information.
- Continuing work with suppliers on investigating options for improving consumption information to consumers including discussions of a trial and considering the feasibility of installing smart meters.

- Ongoing work on the trial to evaluate the impact of the 28-day rule on energy services offerings runs over two years from May 2004 to April 2006 including arrangements for evaluation of the trial.

- Publication of revised green supply offerings guidelines for consultation.

- Consultation on draft guidelines for conducting impact assessments in July 2004 and the issue of final guidance in September 2004.

- Ofgem has again passed the annual audit of its ISO 14001 environmental management system in February 2005. This is the third year that Ofgem has successfully held accreditation.

Ofgem's work programme for 2005/06

In the coming year Ofgem will continue to work with relevant government departments at national and European level to encourage the delivery of future environmental policy in ways that are consistent and/or compatible with competitive energy markets and effective regulation of network monopolies. It will encourage environmental improvements that secure the best value for money for present and future consumers. Specific areas of work for the coming year include:

- transmission price control – work on environmental aspects of transmission companies' operations;

- offshore transmission – continuing to work with the Government on a regulatory regime;

- work on energy efficiency – continuing to administer the Energy Efficiency Commitment on behalf of the Government;

- ongoing work on green energy supply and fuel mix disclosure – including finalising revised green supply guidelines and monitoring the first year of fuel mix disclosure in Great Britain;

- emissions trading – continuing to contribute to the cross-governmental work on Phase II of the EU ETS;

- metering and billing – consideration of new initiatives in metering and billing;

- RO review - working closely with the Government on the major review of the obligation; and
- continuing to carry out Ofgem's executive functions efficiently.

Table of contents

Foreword **1**

1. Introduction **1**

2. Generation **7**

3. Networks **21**

4. Retail markets **33**

5. Increasing openness, transparency and accountability **41**

6. Ofgem's work programme for 2005/06 ..... **48**

7. The environmental context **52**

Appendix 1 Environmental Advisory Group members **61**

Appendix 2 Climate Change Levy exemption statistics **62**

Appendix 3 Emissions data **74**

1. Introduction

Purpose of this document

1.1 Ofgem published its first Environmental Action Plan (EAP) in 2001. That document set out Ofgem's role and responsibilities, within the context of its statutory duties. It also recognised the growing political importance of meeting environmental commitments, national and international.

1.2 Ofgem has published an annual review each year since then. These have assessed progress made since the previous year and also set out new initiatives and priorities for work in the environmental field for the coming year.

1.3 This document is the fourth annual review and assesses Ofgem's work over the past year and sets out the work programme for 2005/06 taking into account the additional duties given to Ofgem in the Energy Act 2004.

Ofgem's statutory duties

1.4 The Environmental Action Plan explains the legislative context for Ofgem's duties and functions in full. These have been slightly amended over the past year by the Energy Act 2004. In summary, Ofgem's principal objective is to protect the interests of consumers, including future consumers, wherever appropriate by promoting effective competition; secondary duties require Ofgem to take account of the effects of its policies on certain disadvantaged consumer groups and the environment, and to promote the efficient use of electricity and gas. Additional duties that have been given to Ofgem in recent legislation are: a duty to carry out impact assessments into important decisions; a duty to have regard to best regulatory practice; and a duty to contribute to the achievement of sustainable development.

1.5 Ofgem is also required to have regard to social and environmental guidance[1] from the Secretary of State for Trade and Industry in carrying out its functions.

[1] DTI (2004) *Social and Environmental Guidance to the Gas and Electricity Markets Authority*

The current guidance was issued in 2004 and sets Ofgem's work in the broader context of the Government's environmental and social policy.

The Authority's approach to the environment

1.6 Ofgem operates under the direction and governance of the Gas and Electricity Markets Authority which takes all major decisions, sets overall strategy and determines policy priorities[2]. At its meetings in September and December 2004 the Authority agreed to adopt the following approach to its environmental work. This approach clarifies and builds on the previous framework for taking account of the environment which was initially set out in the Environmental Action Plan, 2001.

Overall goal

Ofgem's overall goal in its environmental work is to assist the gas and electricity markets and industry to achieve environmental improvement as efficiently as possible.

Objectives:

- ***Coherence***

Ofgem will treat environmental issues coherently across the range of its decision-making, based on systematic and rigorous analysis. It will seek to facilitate environmental improvements, within the framework of the principal objective and general duties, and within the limits of its competencies.

- ***Balance***

The Authority will seek to maximise synergies between its economic, environmental and social objectives and, where these cannot be identified, to set out transparently the conflicting issues and their relative impacts.

[2] The terms 'Ofgem' and 'the Authority' are used interchangeably in this document.

- ***Market imperfections***

The Authority will seek to identify and, wherever possible, remove market imperfections, including regulatory barriers, which prevent environmental improvement, and to ensure that its decisions do not cause unintended environmental harm.

- ***Influence***

Ofgem will seek to influence the wider energy and environmental debate through rigorous analysis, in order that environmental improvements can be achieved by the energy sector as cost-effectively as possible.

Practical framework for decision-making

1.7 A practical framework is required to deliver the overall goal and objectives set out above in a consistent way. This framework takes as a starting point acceptance of the economic value of various environmental benefits, including reducing carbon emissions embodied in the use of a cost of carbon.

1.8 Going forward, Ofgem will systematically apply the relevant tools of economics, drawing in particular on environmental economics, to underpin the relevant cost/benefit analysis as part of the environmental appraisal process.

1.9 Based on this rigorous analysis, the Authority will be willing in principle to incorporate environmental factors into its decisions, even where it involves allocating additional sums of money, provided always that the decision can be justified and is consistent with the Authority's principal objective to protect consumers' interests.

1.10 The following process is designed to provide the Authority with the evidence it needs in order to make a careful evaluation of alternative decisions against the framework of duties.

- ***Policy appraisal***

Ofgem will carry out a rigorous, but proportionate, appraisal of the consequences of alternative decisions, in the light of *all* its statutory duties.

- ***Evaluation***

Ofgem will, wherever possible, use an agreed figure, or range of figures, to reflect the value of environmental damage in its decisions. In particular, where the decision affects the emission of carbon, the analysis will rely on a social cost of carbon value to allow consistent assessment of the economic and environmental costs and benefits of alternative decisions. This value will be reviewed periodically, and applied consistently in all policy analysis. The Environmental Policy Team will continue to work to agree a realistic approach, drawing *inter alia* on ongoing technical work across Government.

- ***Responsibility within Government***

Ofgem will also consider the allocation among Ministers and other environmental regulators of responsibilities for the issue under consideration, so as to avoid both any unnecessary duplication and any failure to address its own responsibilities, and to ensure a joined-up approach to policy-making.

- ***Balancing of duties***

The steps above are designed to produce a rigorous analysis of the issues involved in any particular decision. At the final stage of decision-making, the analysis will be presented to the Authority. Aided by the analysis, the Authority will then have to make a judgement within its margin of discretion, balancing the principal and secondary statutory duties.

- ***Positioning within the debate***

On major issues of environmental policy the Authority will decide on the appropriate forum to disseminate its views. This is likely to include policy discussions with relevant Government departments, consultation responses, position papers, newspaper or journal articles or public speeches to conferences and seminars

Climate Change Programme review

1.11 The UK Government published its Climate Change Programme (CCP) in November 2000 and on 15 September 2004 the Government launched its CCP review. Under the CCP the Government set out how it will move towards

meeting its Kyoto target of cutting greenhouse gases by 12.5% on 1990 levels and move towards its domestic goal to cut CO_2 emissions by 20% below 1990 levels by 2010. The Energy White Paper published in February 2003 set out a longer term strategic framework for the UK's energy policy and accepted that the UK should put itself on a path to reducing CO_2 emissions by some 60% by 2050.

1.12 The review considers how the existing measures are working towards meeting Government targets, how they might be improved and whether any of them should be dropped, it will also consider new policies and measures and it provides an opportunity to undertake rigorous analysis in these areas. Many of the measures in the CCP impact directly on the energy sector and are therefore central to Ofgem's present and future work. These include the EU Emissions Trading Scheme (EU ETS), Energy Efficiency Commitment and Climate Change Levy, the details of which are explained more fully in this review.

1.13 A consultation on the review of the CCP was published in December 2004 with a view to the publication of a revised CCP in 2005. The Government also plans to consult separately on the implementation of specific programmes. Ofgem responded to the consultation urging the Government to retain the central role given to the EU ETS in the White Paper[3]. Ofgem also recognised that, in the medium term, there will need to be a range of measures that cross all sectors which go beyond the EU ETS.

1.14 Working with Government on implementing and reviewing the CCP is an important element of Ofgem's work and Ofgem continues to contribute to several policy-making groups. These include the Interdepartmental Analysts Group for the CCP review, the Joint Working Group on Energy and the Environment and several EU ETS committees.

Renewables Obligation Review

1.15 Ofgem also intends to work with Government on the review of the Renewables Obligation, to be completed in 2006.

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[3] Available on www.ofgem.gov.uk

Structure of document

1.16 The structure of this review is similar to previous annual reviews. Chapters 2 to 4 cover work undertaken in the areas of generation, networks and retail markets. Chapter 5 deals with Ofgem's own environmental policy and the actions taken to increase transparency and and accountability and improving links with other organisations. Chapter 6 sets out Ofgem's environmental work programme for 2005/06 and Chapter 7 contains environmental data. There are three appendixes at the end of the document containing information on the membership of Ofgem's Environmental Advisory Group, Climate Change Levy statistics and additional environmental data.

2. Generation

2.1 Electricity generation accounts for about a third of the UK's greenhouse gas emissions. The industry also has other important environmental impacts. Retaining the benefits of a secure and affordable electricity supply as we move towards a low carbon economy was identified in the Energy White Paper as one of the greatest challenges the UK faces.

2.2 The Government's Climate Change Programme is the main policy vehicle to ensure that this challenge is met. Ofgem is responsible for administering a number of the programmes that promote low carbon generation technologies. In addition Ofgem works closely with central Government and the devolved administrations on the development and application of new policies and programmes. The key policy that started in the reporting year was the EU Emissions Trading Scheme. This is a major new market mechanism that will help to deliver carbon dioxide emissions reductions.

2.3 This section summarises Ofgem's work over the past year in relation to electricity generation.

Emissions trading

2.4 The EU Emissions Trading Scheme (EU ETS) began on 1 January 2005. The first phase of the scheme runs from 2005 to 2007, with the second phase running 2008-2012 to coincide with the first Kyoto commitment period. In the first phase, the scheme covers large industrial emitters of carbon dioxide (CO_2), including all power plants with a capacity of over 20 MW thermal input.

2.5 The Government has identified this scheme as central to meeting its climate change policy objectives. The intention is that the scheme will deliver significant emissions reductions, as well as providing a framework within which other climate change policies will operate. All major CO_2 emitters in 25 EU member states are now required to take account of the allowance cost associated with emissions in all their investment and operating decisions. This will have a profound effect on energy markets. However, a single broad scheme, covering a very large proportion of the EU's emissions and a Europe-wide market in

allowances should ensure that the emission targets are met at least cost to consumers.

2.6 Each Member State is required to submit a National Allocation Plan (NAP) to the European Commission for each phase of the scheme. The UK Government submitted a provisional NAP for the first phase in May 2004 which was conditionally accepted by the Commission in July 2004. Since the submission the Government has refined its treatment of new entrants and closures. This included allowing installations undergoing temporary or partial closure to retain all their allocated allowances and the extension of the eligibility for CHP schemes to access the New Entrant Reserve.

2.7 The provisional NAP allocated 736 million allowances to industry. Each allowance represents one tonne of CO_2. The allocation was based on preliminary projections of emissions. On 27 October 2004 the Government announced, that as a result of updated energy projections, emissions of CO_2 were expected to be 8% higher. As a result the Government proposed that the number of allowances was to be increased by 20 million to 756 million allowances and the additional shortfall was to fall on the electricity generation sector.

2.8 On 11 March 2005 the UK allocated allowances on the basis of its provisional total number of allowances on the understanding that the Commission was likely to reject the proposal to increase the total allocation. The UK Government also announced its intention to begin court proceedings against the Commission; if the Government is successful it expects to allocate the remaining 20 million allowances to the electricity generation sector.

2.9 Ofgem has been following these developments closely and providing input on issues that could enhance or distort competition in the generation market. This has involved participation in several inter-governmental policy groups in particular providing advice in relation to rules governing the allocation of allowances to new entrants, withdrawal of allowances on closure and auctioning of allowances.

2.10 The role of the EU ETS is being considered as part of the Government's Climate Change Programme review on which the Government has recently consulted. Ofgem's response urged the Government to continue to give the EU ETS a

central role in the reduction of emissions. It also emphasised the importance of an early statement from Government on the allocation methodology under Phase II to assist market confidence and minimise perverse incentives to increase emissions in the first Phase.

2.11 The NAP for Phase II is to be submitted to the commission by June 2006. Work on this has already begun and Ofgem intends to continue to participate in the decision making process including the discussions about benchmarking as an allocation methodology. At the end of March 2005 Defra published a preliminary consultation document for Phase II. Ofgem has submitted a response to this document which covers the approach that the Government will take for Phase II including options relating to allocation methodology, expansion and harmonisation of the scheme.

EU ETS discussion day

2.12 In February 2005 Ofgem held a discussion day to discuss the impacts on consumers of emissions trading. There were approximately forty attendees and eight speakers who included academics, practitioners and policy makers. It was chaired by Dr Robin Bidwell who is a non-executive member of the Gas and Electricity Markets Authority. The aims of the discussion day were to:

- consider the factors that will determine how the EU ETS will influence electricity prices;
- explore the ways in which wholesale and retail electricity markets will respond to the need to incorporate a cost for carbon;
- reach a view on what this may mean for electricity prices and
- consider what this will mean for electricity users – domestic, commercial and industrial.

2.13 The seminar provided a useful contribution to the debate in this area and was well received. Ofgem commissioned Professor Paul Ekins to prepare a report[4] of the day which is available on Ofgem's website.

Low carbon generation support programmes

2.14 Ofgem is responsible for administering aspects of the Government's programme that promotes the use of lower carbon generation technologies. These were introduced under the Climate Change Programme and include:

- Renewables Obligation;
- Climate Change Levy exemptions;
- Non-Fossil Fuel Obligation and Scottish Renewable Obligation, and
- Renewable Energy Guarantees of Origin[5].

2.15 Over the past year Ofgem has performed these executive functions and is participating in reviewing and developing them. Currently Government is reviewing the Renewables Obligation and a broad review of the Climate Change Programme is under way. See paragraph 2.28 for further information.

Renewables

Climate Change Levy exemption for renewables

2.16 The Climate Change Levy (CCL) came into effect on 1 April 2001 and applies to energy used in the non-domestic sector (i.e. industry, commerce, and the public sector). The aim of the CCL is to encourage these sectors to improve energy efficiency and reduce emissions of greenhouse gases. The CCL payable on electricity is £4.30 per MWh, with discounts available for various sectors[6].

2.17 Electricity from specified renewable generation is exempt from the CCL. To qualify for the exemption, renewable electricity must be consumed or intended

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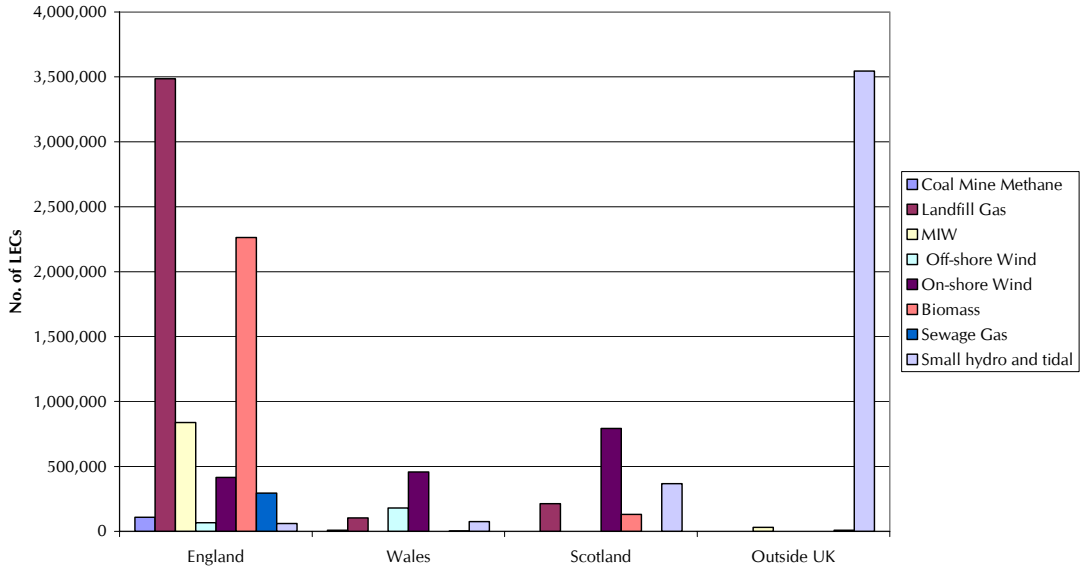
[4] Ekins, P. (2005) *Ofgem discussion day on 'Emissions trading: impacts on electricity consumers'* Policy Studies Institute London (available on www.ofgem.gov.uk)
[5] REGOs were implemented as a result of the EU Renewables Directive.
[6] The Chancellor indicated in the March 2005 Budget Statement that the CCL would remain at £4.30/MWh.

to be consumed by customers in the UK. Ofgem is responsible for administering aspects of the exemption in Great Britain which involves accrediting generators, issuing Renewable Levy Exemption Certificates (LECs), and reporting to HM Revenue and Customs (HMRC) on the numbers of LECs issued. The Northern Ireland Authority for Energy Regulation (Ofreg) has a similar role in respect of Northern Ireland.

2.18 Part of the evidence required by HMRC for this exemption is the LECs which are issued by Ofgem on a monthly basis. There are currently over 1200 generating stations accredited under the CCL exemption for renewables (approximately 400 of which are outside Great Britain) with a total installed generating capacity of 4.8 GW. One Renewables LEC is issued for each megawatt-hour of qualifying electricity produced. Following the issue of Renewables LECs, final suppliers are required to notify Ofgem of the quantity and serial numbers of the certificates acquired from generators and used against renewable source customer contracts. Ofgem then validates this information. Further detailed statistical information on the CCL exemption for renewables is in Appendix 2.

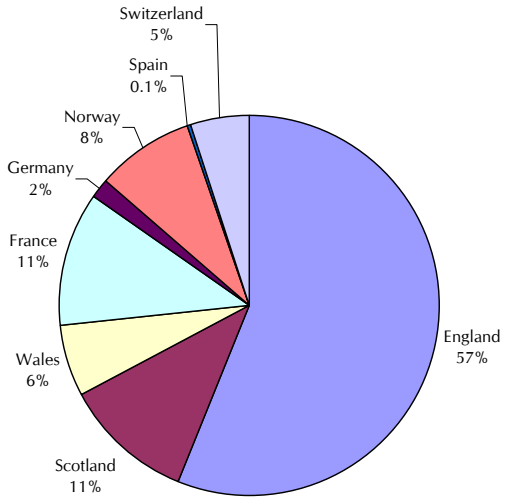
2.19 Chart 1 below shows the numbers of Renewables LECs issued between January 2004 and January 2005 broken down by technology and country of issue. The largest amount issued was for small hydro and tidal outside the UK. The next largest was landfill gas in England at 3.5 million LECs and in third was biomass at around 2¼ million LECs.

Chart 1 - LECs issued by country and technology Jan 04 - Jan 05



Source: Ofgem

Chart 2 - LECs issued by country Jan 04 - Jan 05



Source: Ofgem

2.20 Chart 2 above shows the percentage of Renewables LECs issued by country of issue. This shows that over half are issued to generators in England. A quarter are issued to countries outside the UK who supply through the interconnector and the remainder issued to Scotland and Wales.

Renewables Obligation

2.21 The Renewables Obligation (RO) and the Renewables Obligation (Scotland) (ROS)[7] are the Government's main policies for promoting renewable generation in Great Britain. Licensed electricity suppliers are required to source at least part of their electricity from renewable generation. The amount of the Obligation started at 3% in 2002/3 and will reach 15.4% in 2015/16. The Obligation will then stay at this level until 2026/27. The level of the Obligation for 2004/05 was 4.9% and for 2005/06 is 5.5%.

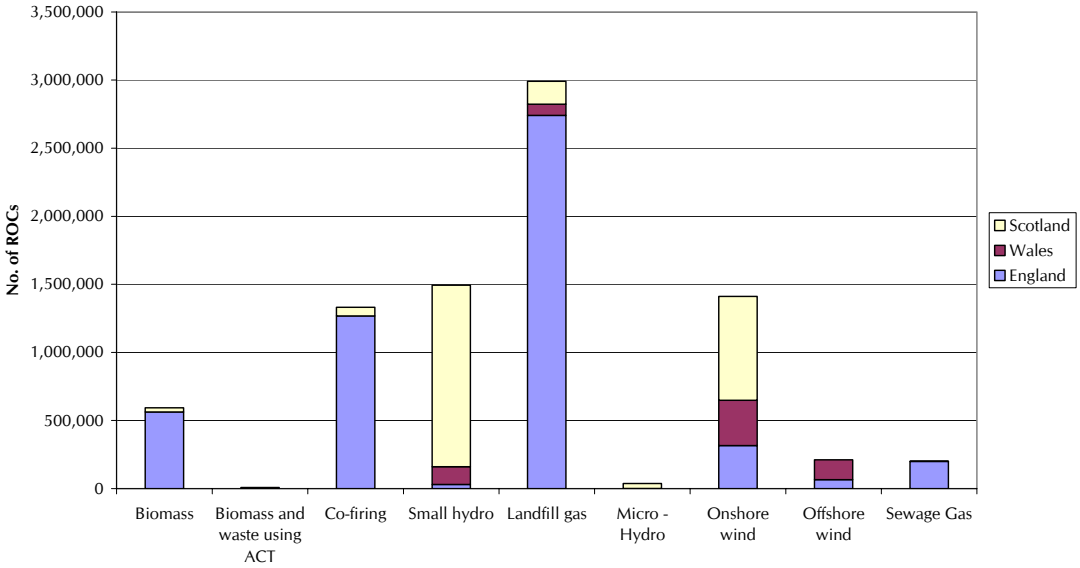
2.22 The Government has made a number of amendments to the RO since it was introduced in 2002. The most recent amendments have included establishment of a parallel scheme in Northern Ireland, increasing the profile of the RO from 10.4% in 2010/11 to 15.4% in 2015/16 and changes to the rules regarding co-firing. In addition, measures have been introduced to secure the buy-out fund including mutualisation in the event of a supplier failure and allowing late payment into the buy-out fund.

2.23 The 2004/05 year was the third year of administration of the RO and also included the completion of the compliance period for the second year (2003/04). Ofgem's second annual report[8] on the administration of the scheme was published in February 2005. The report includes information on:

- generating schemes accredited under the schemes;
- details of Renewables Obligation Certificates (ROCs) issued;
- details of compliance by generators and suppliers; and
- operational issues that arose during the second obligation period.

[7] Hereafter the two obligations are referred to together as the "Renewables Obligation"
[8] Ofgem (2005) *The Renewables Obligation – Ofgem's second annual report* 44/05

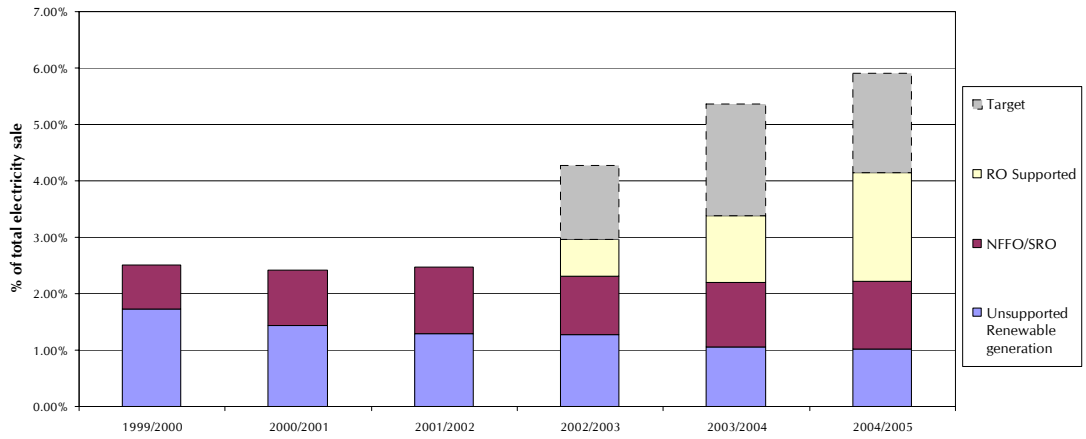
Chart 3 - ROCs issued by country and technology Jan 04 - Jan 05



Source: Ofgem

2.24 Chart 3 above shows the number of Renewables Obligation Certificates (ROCs) issued between January 2004 and January 2005 by country issued and technology. The dominance of landfill gas in England is shown by this chart with around 3 million ROCs issued for that technology in total. Small hydro and offshore wind each had around 1.5 million ROCs issued with co-firing being issued with slightly less.

Chart 4 - The growth of renewable electricity generation under the RO



Source: DTI and Ofgem

2.25 Chart 4 compares the percentage of electricity generated from renewable sources supported by the RO and NFFO/SRO[9] programmes as a proportion of total electricity sales. Over the three years prior to the introduction of the RO, generation from renewable sources increased by 8% from 2.5% of electricity sales in 1999/2000 to 2.7% of electricity sales in 2001/2002. This compares with a 40% increase during the three years of operation of the RO, generation was at 3.0% of electricity sales in 2002/2003 and increased to 4.2% of electricity sales during the 2004/2005 obligation period.

2.26 The targets from 2002/2003 represented by the grey shaded area show the additional generation that would have been necessary to meet the RO obligation level in each year.

Audits

2.27 Ofgem has an ongoing programme of audits for generating stations accredited under the CCL and RO. Generators from each technology are selected. Ofgem uses the audits to satisfy itself that the information provided in the application is accurate and that the stations are eligible for the appropriate scheme. The audits are also used to check the accuracy of the monthly information provided by the generators to inform the LEC and ROC issue.

2005/06 review of the Renewables Obligation

2.28 In March 2005 the DTI published its preliminary consultation on the 2005/06 review of the RO[10]. The preliminary consultation focuses on a limited number of options for changes to the RO. These options cover a range of issues including the profile of the RO beyond 2015/2016, modifying the rules for low cost technologies, combined heat and power, energy from mixed wastes, operation of the ROC market and various detailed administration and technical issues. The consultation invited views on each issue and ended on 13 June 2005. A parallel consultation by the Scottish Executive ended on 23 June 2005.

2.29 Ofgem has worked closely with the DTI and the Scottish Executive on the review and has submitted responses to each consultation. The response acknowledges

[9] More information about the NFFO/SRO programmes is detailed later in this chapter
[10] DTI (2005) 2005-06 *Review of the Renewables Obligation Preliminary Consultation Document*

the Government's support for renewables but encourages the Government to consider further refining the scheme to ensure that it is appropriately targeted. It also encourages the Government to focus on the most cost-effective and efficient method of securing carbon abatement. It provides the view that policy toward renewables must be developed in the context of their overall position in the portfolio of available measures. At present there are other measures available, eg through EU ETS, that could reduce carbon emissions at much lower cost than renewables. The case for supporting large-scale deployment of renewables now rather than in 10 or 20 years' time rests crucially on the potential for that deployment to reduce future costs by fostering innovation and "learning by doing".

2.30 As one contribution to the debate, Ofgem commissioned independent analysis from Cambridge Economic Policy Associates (CEPA) and Climate Change Capital (CCC)[11]. This is available on the Ofgem website. Ofgem would interpret CEPA/CCC's analysis as arguing for a degree of caution in assessing the potential for cost reductions in renewable technologies. While their analysis is by no means definitive, it should be taken into account.

2.31 On the actual main proposals, Ofgem's main views are summarised as follows:

- we oppose the extension of Obligation levels beyond 2015/16 at this stage;
- we oppose the extension of eligibility to energy from waste generation; and
- we agree that methodologies could be employed to reduce or remove support for technologies that are commercially viable or lower cost.

2.32 Ofgem will continue to work closely with the DTI and the Scottish Executive as the review progresses through to the final proposals and the amended legislation.

[11] Assessment of the benefits from large-scale deployment of certain renewable technologies, Final Report, April 2005

Non-Fossil Fuel Obligation and Scottish Renewable Obligation

2.33 Between 1990 and 1998 the principal instruments for supporting renewable energy in Great Britain were the Non Fossil Fuel Obligation (NFFO) in England and Wales, and the Scottish Renewable Obligation (SRO) in Scotland. Orders made under these schemes (five NFFO Orders and three SRO Orders) required the former Public Electricity Suppliers (PESs) to purchase a specified amount of electricity from renewable sources. The aim of the orders was to create an initial market for established renewable technologies. Ofgem has ongoing responsibilities in regard to these programmes in setting the amount of the Fossil Fuel Levy (FFL) and in the oversight of certain aspects of the contracts.

2.34 In England and Wales, the contracts, for which suppliers currently bid in six-monthly auctions conducted by the Non-Fossil Purchasing Agency (NFPA), will last for up to another 13 years. The last contract is due to terminate in 2018.

2.35 In Scotland, the Scottish companies (Scottish Power and Scottish and Southern Energy) currently carry out the equivalent administration role to that of the NFPA in England and Wales. This is in the process of changing and Ofgem has been working with Scottish Power, Scottish and Southern Energy and the Scottish Executive to ensure that there is a smooth handover and that all of the relevant legislative requirements are met.

Fossil Fuel Levy

2.36 Suppliers' additional costs in purchasing electricity from renewable sources under the NFFO and SRO contracts have been met by means of the FFL and the FFL (Scotland), which are payable on almost all electricity. The purpose of the Levies is to fund the difference between the contract prices payable to the renewable generators and the market price of electricity. Ofgem is responsible for setting the rate of the Levies.

2.37 Within the framework set by the Fossil Fuel Levy Regulations 1990, the Fossil Fuel Levy (Scotland) Regulations 1996 (both of which have been amended) and the NFFO auction arrangements, Ofgem must review the levy rate annually in England and Wales and from time to time in Scotland. Ofgem now reviews all Levy rates annually and publishes the result in each year.

2.38 In November 2004 Ofgem announced that the Fossil Fuel Levy rate in England and Wales, and in Scotland, would remain at zero for the coming year (starting on 1 April 2005). The Levy has been set at zero per cent in England and Wales because the prices currently being secured at auction for the rights to the output of the renewable generators in question, including the benefit of any CCL exemption and RO certificates, exceeds the prices guaranteed under the scheme.

2.39 Under the present arrangements in Scotland, ROCs are auctioned. The expected proceeds of the auction, together with the existing surplus of Levy funds, are such that it is possible to maintain the Levy rate at zero.

2.40 As a result of the Sustainable Energy Act 2003, £60 million of the surplus in the England and Wales Levy fund was allocated to promote renewables. Ofgem released this amount into the Consolidated Fund in July 2004 and in turn HM Treasury made the same amount available to the DTI.

2.41 A similar provision is contained in the Energy Act 2004[12] which allows Scottish Ministers to direct that surpluses in the Scottish fund are to be used to promote the use of energy from renewable sources. There is no limit to the amount of money that may be transferred for this purpose; however the surplus in the Scottish fund is much smaller.

Renewable Energy Guarantees of Origin (REGOs)

2.42 Article 5 of EU Directive 2001/77/EC on the promotion of electricity from renewable sources in the internal electricity market requires that Member States ensure that a Guarantee of Origin is issued, on request, in respect of electricity generated from renewable energy sources. It is expected that the major use for REGOs will be to support fuel mix disclosure and green supply offerings.

2.43 The Electricity (Guarantees of Origin of Electricity Produced from Renewable Energy Sources) Regulations 2003[13] implement Article 5 of the Directive. The Regulations came into force on 27 October 2003. Ofgem is responsible for issuing REGOs on request and has been given certain functions under the provisions of the Regulations.

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[12] Energy Act 2004 s. 187
[13] Statutory Instrument 2003 No. 2562

2.44 Ofgem's functions under the Regulations include:

- establishing and maintaining a register of REGOs;
- issuing REGOs on request providing certain information has been provided;
- transferring and revoking REGOs as appropriate;
- recognising REGOs issued by Ofgem and guarantees of origin issued by other Member States and Northern Ireland; and
- making certain information publicly available.

2.45 Ofgem published its Administration Procedures[14] in October 2004. This document sets out Ofgem's procedures for implementing the Regulations and provides more detail on each of the functions above.

2.46 Ofgem's web-based REGO Register has been designed to enable producers to request the issue of a REGO. It allows Ofgem to issue, recognise, revoke and transfer REGOs. The REGO Register was launched in February 2005 and is available at www.regoregister.ofgem.gov.uk. Operational and Registration procedures are available on Ofgem's website to enable suppliers and generators to apply for a REGO Register account.

CHP

Climate Change Levy exemption for good quality CHP

2.47 In addition to its responsibilities under the CCL exemption for renewables, Ofgem also administers aspects of the CCL exemption for good quality Combined Heat and Power (CHP).

2.48 On 1 April 2003, the exemption from the CCL for direct supplies of CHP was extended to include indirect supplies (those supplies exported to the grid) of qualifying CHP electricity. CHP Levy Exemption Certificates (CHP LECs) are used as part of the evidence to prove that electricity sold by a licensed supplier

[14] Ofgem (2004) *Renewable Energy Guarantees of Origin – Ofgem's administration procedures* Issue 1

to its non-domestic customers is qualifying output. CHP LECs can only be issued to CHP operators that have obtained a CHPQA[15] certificate and a Secretary of State certificate from Defra. Qualifying CHP electricity will attract one CHP LEC for each MWh of electricity generated. Ofgem and Ofreg are the relevant Authorities for issuing CHP LECs in the UK.

2.49 Ofgem uses an interactive web-based database to issue CHP LECs, to allow generators to transfer CHP LECs to suppliers and to allow suppliers to allocate CHP LECs to a CHP declaration contract. To date Ofgem has issued approximately 40 million CHP LECs and 26.5 million of these have been successfully transferred. Currently there are around 145 qualifying CHP schemes. Further data on CHP LECs are available on Ofgem's website.

CHP database

2.50 Ofgem holds, and publishes on its website, information on CHP in the form of a database[16]. This information is kept as accurate and up to date as possible by receiving data from the CHPQA scheme. Schemes that are certified under this scheme are included in the database if they agree.

2.51 Ofgem has reviewed the use of the database with interested parties including Defra and the CHPQA and will continue to publish it in its current format for the foreseeable future.

[15] The CHP quality assurance programme run by Defra
[16] http://www.ofgem.gov.uk/ofgem/work/index.jsp?section=/areasofwork/chpdatabase

3. Networks

3.1 The transportation of gas and electricity through transmission and distribution networks is the only remaining area of monopoly in the industries regulated by Ofgem. Ofgem is required to regulate prices and quality of service of these networks in the interests of consumers. The environmental performance of these networks is increasingly being recognised as an important part of their service quality. It is therefore appropriate for Ofgem to consider the environmental performance of networks, for example the scale of losses and other impacts, in line with its statutory duties.

3.2 More important perhaps is the role of the regulation of these monopoly networks in allowing the Government to meet its targets for renewables. The new five year price control of the electricity distribution networks came into effect in April 2005 having been a major area of work for Ofgem. Ofgem also considered what might be needed for additional transmission investment to support increased renewables generation ahead of the setting of the next transmission price control. Going forward, the need to make adjustments to the forthcoming transmission price control review will be another major area for Ofgem's work programme.

3.3 The following sections identify the principal actions taken in 2004/05 by Ofgem in this area.

Distribution Price Control Review (DPCR)

3.4 The review of the price control arrangements that apply to the fourteen regional Distribution Network Operators (DNOs) has led to new arrangements taking effect from 1 April 2005. How the distribution networks are developed and managed has significant effects on the environment. The most important of these impacts are:

- actions by DNOs to reduce electricity losses which could lead to substantial reductions in carbon dioxide and other emissions by electricity generators, and

- the ability of DNOs to connect and make use of small scale generation located closer to demand that could also reduce losses and which may impact on the success of the Government's renewables and CHP policies.

3.5 Other areas in which DNOs have environmental impacts is through the amenity, waste and land pollution impacts of distribution networks, the management of sulphur hexafluoride (SF_6), a potent greenhouse gas used as an electrical insulant, and the actions to incentivise power factor correction. All of these issues came under consideration as part of the DPCR.

The DPCR and distributed generation

3.6 Ofgem has developed a number of important incentive mechanisms. These include an incentive mechanism for DNOs to connect new forms of generation and to invest more in research, development and innovation to help realise the potential of renewable generation.

Distributed generation incentive mechanism

3.7 A hybrid incentive scheme for DNOs in relation to the connection of distributed generation has been introduced. Its broad characteristics are that:

- the costs incurred by the DNOs to provide network access to distributed generation are given a partial pass-through treatment, and
- the DNOs are given a further supplementary amount per megawatt revenue driver (or incentive rate) to incentivise the connection of distributed generation to the network.

3.8 The objectives of the scheme are to encourage DNOs to undertake the investment required to facilitate distributed generation connections (and generally be proactive and positive in responding to connection requests), and encourage them to undertake that investment efficiently and economically.

3.9 In addition to the incentive for relevant investment in their networks, Ofgem has also introduced an incentive on DNOs to provide ongoing network access to distributed generation.

Registered Power Zones

3.10 The Registered Power Zones (RPZs) initiative should encourage DNOs to develop and demonstrate new, more cost effective ways of connecting and operating generation to deliver specific benefits to new distributed generators and broader benefits to consumers. DNOs will be incentivised to develop RPZs by being provided with an additional revenue income where they are managing the risks of innovative technology on their networks.

3.11 Where a DNO sees an opportunity to develop an RPZ it will seek Ofgem's approval to register it as such. When appropriate, Ofgem will seek advice from an independent panel, established by Ofgem, to confirm the innovation content and potential benefits of an RPZ proposal. The generator(s) directly involved in the innovation will have to be informed of the RPZ proposal and any technical and commercial impacts it might have compared with the extant connection option as part of the negotiation of a connection agreement.

Innovation Funding Incentive

3.12 The aim of the Innovation Funding Incentive (IFI) is to encourage DNOs to invest in appropriate research and development (R&D) activities that focus on the technical development of distribution networks to deliver value, ie financial, supply quality, environmental and safety to end consumers.

3.13 As a condition of allowing this expenditure, the company will be required to develop a good practice guide to innovation management. It is likely that the companies will do this on an industry-wide basis. They will also be required to produce an annual report on their IFI activities which is to be available to the public.

3.14 A review of the IFI will be carried out by Ofgem after the publication of the second annual report, in 2007. The level of IFI funding will be reviewed for each company and it may be appropriate to make a decision then as to whether the IFI will be supported under the following distribution price control. This would allow DNOs to take a longer-term view about their R&D activities than has been possible in the past.

Distribution losses

3.15 Approximately six to seven per cent of electricity is lost as it is transported across distribution networks (this includes theft). Electrical losses on distribution systems impose a cost on society, both financial and environmental. This cost has four main components:

- the cost of purchasing lost electrical units;
- the use of the transmission system in transporting additional units;
- the cost of financing additional distribution assets to accommodate the additional electricity purchased for a given level of electricity supplied; and
- the environmental costs associated with producing and transporting additional units of energy.

3.16 The revised scheme has the following features:

- DNO performance will be measured against a target level that is fixed for the period of the price control;
- a rolling retention mechanism has been introduced to address problems of periodicity in achieving loss reductions; and
- a revised incentive rate has been set, based on an estimate of the cost of electrical losses on society.

Power factor correction

3.17 Power factor[17] refers to the extent to which the voltage and current are in phase. Poor power factors affect the performance of a distribution system and increase losses.

3.18 As part of the work that has been undertaken on the structure of electricity distribution charges Ofgem has examined the role of power factors. DNO charges can be used as an incentive on large customers to improve poor power factors.

3.19 In the structure of electricity charges consultation document[18] in October 2004, Ofgem stated that it is important that connected parties are encouraged to operate their connections at as high as possible power factor to ensure efficient use of the system and maximise available capacity, thereby avoiding a requirement for early capital expenditure in reinforcing the network and also to avoid increasing losses on the system.

Undergrounding

3.20 Ofgem reviewed its approach to network undergrounding in National Parks and Areas of Outstanding National Beauty. As well as its duties in relation to the environment and sustainable development, Ofgem also has duties under the National Parks and Access to the Countryside Act 1949 (as amended by the Environment Act 1995) and the Countryside and Rights of Way Act 2000 to have regard to the purpose of conserving and enhancing the natural beauty of national parks and areas of outstanding natural beauty.

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[17] The power delivered by an electricity distribution system is the product of the voltage and the current flowing at the connection point. With an alternating supply, if the rise and fall of current is not in phase with the rise and fall of voltage, then the power delivered at any instant, and hence overall, is less than it would be if the current was in phase with the voltage. In order to achieve the most economic energy distribution, the alternating voltage and current should be perfectly in phase. The "power factor" indicates how far the supply differs from this ideal. It is the ratio of the power actually delivered to the power that would be delivered with the same current flow if the voltage and current were perfectly in phase with one another.

Some equipment has more of an effect on the power factor than others. Consumers can install equipment that compensates for this and so produce an overall demand with a power factor that is close to 1.0.

[18] Ofgem (2004) *Structure of electricity distribution charges – consultation paper: proposed DNO charging methodology statements* 235/04

3.21 There is some evidence that customers value visual amenity and are willing to pay for improvements through their electricity bills. Although the evidence is limited, the Authority was able to approve funding for modest network undergrounding in these areas. The DPCR does allow DNOs to include an element of capital expenditure on network undergrounding in these areas. Such entitlement will be subject to the DNO demonstrating that it has taken account of advice from local environmental groups and/or planning bodies in deciding how best to prioritise any expenditure on network undergrounding.

Environmental reporting by DNOs

3.22 In addition to the reporting of environmental outputs that are specifically subject to the price control, such as losses and connection of distributed generation, Ofgem has included a small number of environmental reporting requirements. DNOs will be required to report on the following measures and provide a supporting narrative which, for example, for 2006/7 onwards looks at emerging trends in the environmental data and areas of trade-off in performance:

- use of sulphur hexafluoride;
- use of insulating fluid; and
- scope of environmental management systems.

Electricity transmission

Transmission charging

3.23 The creation of a single non-discriminatory cost-reflective Great Britain transmission charging regime (BETTA) from 1 April 2005 allows for the promotion of effective competition in generation and supply and provides a framework for environmental objectives to be met in the most efficient way possible.

3.24 The new single electricity market also needs a common approach to paying for connection to, and use of, the high-voltage transmission system. Ofgem approved new GB-wide charging arrangements for generators and customers in February 2005. This approval requires NGT to monitor and review the regime in

the first two years of operation and propose refinements where necessary. While the new arrangements have been criticised, the costs for Scottish customers will fall and for generators, the overall impact of the charges will be neutral. The new arrangements will provide easy access to a wider market for Scotland's generation capacity, helping realise Scotland's renewables potential and to meeting Scottish Executive renewables targets. The Authority's decision on GB-wide transmission charging arrangements is currently subject to challenge in the High Court through judicial review proceedings.

3.25 The new GB wide charging arrangements extend the principle of locational charges for customers and generators for using the transmission system from England and Wales to the whole of Great Britain. The charges are designed to reflect the different costs of producing or consuming electricity at different points on the network. This is because the cost of transmitting electricity increases as the distance between where it is generated and consumed increases. These charging arrangements should, over time, lead to more efficient decisions about where to locate new power stations and where to close existing ones. This will bring environmental benefits by reducing the need to build new transmission assets (or replace existing ones) and by reducing the amount of transmission losses which increases with the distance that electricity is transmitted.

Offshore

3.26 The Government has announced that it will introduce a new regulatory regime for offshore transmission and offshore distribution. The Energy Act 2004 contains provisions to allow the Secretary of State to modify the licensing regime for purposes connected with offshore transmission and distribution.

3.27 The development of offshore wind generation is likely to have implications for transmission system investment, although the extent and timing of the demand for additional investment is not yet fully clear.

3.28 Ofgem and the DTI are working on the issues involved in developing an offshore regime and have issued a consultation document in July 2005.[19]

Transmission investment in Scotland

3.29 In response to the Government's targets for renewables, and policies such as the Renewables Obligation, substantial volumes of renewable generation plants are now under construction or in the planning stage. It has become clear that investment will be required to reinforce the transmission system, particularly in Scotland and the north of England. No allowance was made for this investment when the transmission price controls were set in 1999 and 2000, at that time there was no forecast of such significant levels of connection of renewable generation.

3.30 Ofgem recently completed a project looking at transmission investment for renewables and a final proposals document was published in December 2004[20]. It assessed each investment proposal put forward by the transmission licensees to identify which projects are clearly justified to allow transmission companies to meet the needs of their customers in the most efficient manner practicable and to protect consumers from the costs of any stranded assets.

3.31 Each investment proposal was then classified into either: baseline investment, incremental investment or additional investment. Baseline investment will be funded through the incentive arrangements set out in the decision document. This amounts to approximately £560 million of investment. Incremental and additional investment projects can be considered at the next transmission price control review in 2006.

Energy Networks Strategy Group

3.32 The Distributed Generation Co-ordinating Group (DGCG) and Technical Steering Group (TSG) have removed the great majority of barriers to the connection of increasing volumes of distributed generation. It has now been decided to consider the broader, long-term issues of electricity network development. Consisting of members drawn from transmission and distribution companies, generators, Ofgem, DTI, Defra and the devolved governments, the

[19] Ofgem (2005) *Regulation of offshore electricity transmission – a joint consultation by DTI/Ofgem* 178/05
[20] Ofgem (2004) *Transmission investment for renewable generation – final proposals* 288/04

Electricity Networks Strategy Group (ENSG) is a newly-constituted group, set up to:

- identify, and co-ordinate efforts to address technical, commercial and regulatory issues in electricity transmission and distribution networks in transition to a low-carbon future;
- establish and co-ordinate Transmission and Distribution Working Groups able to build on the contribution of the Transmission Issues Working Group (TIWG) and DGCG to the removal of barriers to a low-carbon economy;
- advise Ministers and Ofgem, as required;
- disseminate the results of its activities to the wider community; and
- report annually to Ministers and Ofgem.

3.33 The former dedicated DGCG website, www.distributed-generation.gov.uk, will be taken over by the ENSG. The ENSG will use the site to publish notes of meetings, work programme reports and documents – just as the DGCG and TSG did. All the historical DGCG and TSG information will continue to be readily accessible on the website.

Distribution Working Group

3.34 The first task for the Distribution Working Group (DWG) will be to complete those of the TSG's projects that have not yet submitted final reports. These are projects primarily concerned with microgeneration (Workstream 4) and long-term network issues (Workstream 5). The DWG has set up four new work programmes to address this, and other, work.

- Programme 1: Horizon scanning – assessing the current state of technology, likely developments, R&D progress, actual and forecast trends in penetration levels and future scenarios, regulatory and political policy to guide and formulate the programmes of work that will begin in approximately 18-24 months time, on a rolling basis.

- Programme 2: Network design for a low-carbon economy – the technology, tools, techniques, processes and standards that will be required to construct power systems, compatible with the developing trends in low-carbon energy technology.

- Programme 3: Enabling active network management – developing the technologies, protocols, tools, processes, techniques and standards that will be needed to ensure that low-carbon compliant power systems can be operated on an active basis to ensure efficient use of investment and an effective contribution from potential market participants.

- Programme 4: Facilitating small-scale generation – continuing the focus on developing those solutions which will be needed to enable 'non-expert' users (such as home-owners) to take maximum advantage of emerging small-scale generation technology, so bringing maximum contribution from this part of the sector to the Government's low carbon targets.

3.35 The DWG's members are drawn from distribution companies, large and small generators, technical consultants, the universities, the Institution of Electrical Engineers (IEE), the Electricity Networks Association (ENA), the DTI and Ofgem.

Gas transmission and distribution

Transco environmental output measures

3.36 Transco is required to submit an annual environmental report on the performance of its National Transmission System (NTS) and each of its Distribution Networks (DNs). The measures are set out in the Regulatory Instructions and Guidance and include emissions of methane (losses), carbon dioxide and oxides of nitrogen (NOx) (which arise from combustion in compressor stations), and loss of gas containment[21].

3.37 The data on the DNs forms part of the gas distribution quality of service report that is published annually by Ofgem and reprinted here in addition to the NTS

[21] Defined as incidents involving the release of gas reported under COMAH Regulations. There were no such incidents in 2003/04.

data. See table 1 below. This data will continue to be required from all DNs going forward.

Table 1 – Methane emitted from pipe networks due to leakage

						Tonnes of methane
	Medium pressure				**Low pressure**	
	2003/04	2002/03			2003/04	2002/03
Scotland	1,627	1,677		Scotland	15,322	17,568
North of England	2,018	3,300		North of England	26,962	28,707
North West	1,718	1,730		North West	28,892	30,547
East of England	4,474	4,497		East of England	34,904	36,501
West Midlands	2,023	2,058		West Midlands	22,353	24,428
Wales & The West	2,713	3,243		Wales & The West	28,688	29,314
South of England	3,766	3,277		South of England	43,599	46,355
London	2,068	795		London	20,519	22,958
Total Networks	**20,407**	**20,577**		**Total Networks**	**221,239**	**236,378**

Source: Transco

3.38 Table 1 shows the amount of methane emitted from the medium and low pressure parts of the gas distribution network, broken down by distribution network. The tables show that overall, methane emissions have decreased in comparison with 2002/03, on the medium pressure network methane emissions decreased by 170 tonnes (3,570 tCO_2 equivalent) and on the low pressure network by 15,139 tonnes (317,919 tCO_2 equivalent).

3.39 Reductions in methane from the distribution system have been attributed by Transco to a combination of mains replacement, pressure management initiatives and the removal of an anomaly in the way the mains lengths were calculated.

3.40 Table 2 below shows figures for the NTS and includes methane emitted from plants and carbon dioxide and oxides of nitrogen emitted from compressors per GWh of gas throughput. All of the tables show small increases compared to 2002/03. The amount of methane emitted is shown to have increased by 0.25 kg per GWh from 2002/03. The amount of CO_2 emitted by gas powered compressors has increased by 40 kg per GWh and the amount of NOx emitted by gas powered compressors has increased by 0.28 kg per GWh.

3.41 Transco has reported that the level of utilisation of compressor stations is not directly under its control; rather it is driven by the commercial supply market

and there is little Transco can do to reduce utilisation of the stations. Investment is, however, planned at key high utilisation sites which will reduce the relative emissions through the use of more efficient plants.

Table 2 – Emissions from NTS plant and compressors

	CH_4 from plant kg/GWh	**CO_2 from compressors kg/GWh**	**NOx from compressors kg/GWh**
2003/04	1.46	1,212	2.68
2002/03	1.21	1,721	2.40

Source: Transco

4. Retail markets

4.1 Energy efficiency is increasingly being seen as a crucial element to ensure that the UK moves towards a low carbon economy. This is also reflected at EU level with the publication of a Green Paper on the issue. Supply businesses are instrumental in the delivery of energy efficiency measures and ensuring that energy services are offered to their customers.

4.2 Provision of good quality and useful information for consumers is key to ensuring consumers are able to make choices not only on the basis of price but also factors such as the environment. Giving consumers the ability to see the generation sources of the electricity that they use facilitates this aim.

Consumer information

Fuel mix disclosure

4.3 In March 2005 a new standard licence condition was inserted into electricity supply licences by Regulations[22] which implements the requirements of an EU Directive[23] concerning common rules for the internal market in electricity. This Directive obliges Member States to require each electricity supplier to provide details to its customers of the mix of fuels used to produce the electricity it supplies and certain environmental information.

4.4 In summary, suppliers are required to provide customers, at least once per year, details of the fuels used to generate the electricity that they supply. These are categorised as coal, natural gas, nuclear, renewable and other. They must also provide or make available information on the environmental impact of this generation by providing carbon dioxide emissions data and the amount of radioactive waste produced.

4.5 Responsibility for implementing this requirement was that of the DTI. Ofgem assisted by consulting on the form of the licence condition in July 2004. A

[22] The Electricity (Fuel Mix Disclosure) Regulations 2005 (SI No. 391)
[23] Article 3(6) of Directive 2003/54/EC of the European Parliament and of the Council concerning common rules for the internal market in Electricity

revised draft licence condition and summary of responses[24] was then published in November 2004. In the same document Ofgem undertook to produce non-binding guidance to encourage good practice by suppliers when complying with the licence condition. These draft guidelines were published in June 2005 for consultation.

Consumption information

4.6 As reported in previous EAP reviews, Ofgem has been investigating options for improving consumption information to consumers. A research programme produced two papers which have helped to inform Ofgem's and suppliers' work in this area. The first phase, published in 2003, examined existing work on billing from other countries and whether energy savings were achieved as a result of providing consumption information. The second phase used focus groups to examine consumer preferences and develop options for presenting consumption information on bills. The results from this were published in May 2004.

4.7 The analysis of focus groups concluded that consumers preferred simple bar charts on bills to compare energy use in the most recent quarter to either the same quarter in the previous year or the whole of the previous year. They also exhibited a strong dislike for any comparisons in their energy use with that of similar homes or of their neighbours.

4.8 Additional information that came out of the research included very low levels of awareness of the Energy Efficiency Commitment, cynicism at the motives of energy suppliers to promote energy saving but high levels of awareness and knowledge of energy saving measures.

4.9 Suppliers have been involved in each stage of the research programme. The next stage could involve some suppliers examining the possibility of individually running trials to gauge the reaction of their customers to consumption information. Some suppliers are taking work forward in this area.

[24] *Fuel mix disclosure – summary of responses and revised draft licence condition* November 2004 256/04

Energy Efficiency Commitment

EEC 2002-05

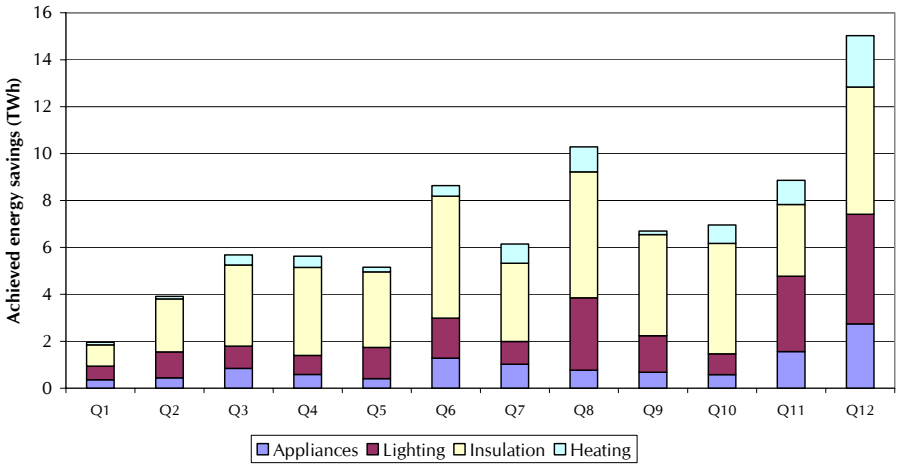
4.10 March 2005 saw the end of the first phase of the Energy Efficiency Commitment (EEC) 2002-2005 (EEC1). The programme places an obligation on electricity and gas suppliers to install measures in customers' homes to improve energy efficiency. The programme recognises both the social benefits of energy efficiency and the contribution this can make to the reduction of CO_2 emissions arising from households' energy consumption. Under EEC1 all suppliers with at least 15,000 domestic customers were given an obligation. These suppliers have now completed and submitted monitoring and completion reports for these schemes. Ofgem's analysis of EEC1 indicates that measures have been installed to achieve a saving of 86.8 TWh over the period of the programme.

4.11 Chart 5 below shows the energy savings achieved in the last three months of EEC1, i.e. January to March 2005 (Q12), to be the highest of the programme at 15 TWh. Suppliers increased their delivery of energy efficiency measures over the last three quarters despite the fact that they had been on course to meet their targets – providing evidence of the value of the carry-forward provision in ensuring suppliers did not reduce delivery rates between EEC 2002-2005 and the second EEC programme.

4.12 Another reason for the marked increase in savings is that the suppliers' quarterly reports provide an indication of the energy savings they have achieved. The actual energy savings are only confirmed once the supplier submits a completion report, which is then approved by Ofgem. The suppliers may have previously submitted a conservative indication of their delivery, and now the schemes have been completed, they have provided final accurate data.

4.13 Ofgem has completed the process of assessing all of the suppliers' completion and monitoring reports. This work involved Ofgem checking the technical monitoring forms and customer satisfaction results from suppliers' schemes and scrutinising declarations from project partners such as social housing providers and retailers.

Chart 5 - Energy savings, by measure types, achieved each quarter during the three years of EEC 1



Source: Ofgem

EEC 2005-2008

4.14 As part of the Climate Change Programme the Government will run the EEC to 2011 at roughly double the level of the 2002-05 commitment in terms of projected energy savings. For the period 2005-2008 (EEC2) the energy saving target has been set by Defra at 130 TWh of fuel-standardised lifetime-discounted energy benefits. This target has been apportioned to eight suppliers according to the number of domestic customers they supply. The threshold used to calculate which supplier has an obligation is 50,000 customers in total per supplier group. The suppliers are: British Gas, EDF Energy, Npower, Opus Energy, Powergen, Scottish Power, Scottish and Southern Energy and Telecom Plus.

4.15 Suppliers will also be required to target at least half of the energy savings from the measures to the priority group. The priority group includes households that are in receipt of income related benefits or tax credits.

4.16 Suppliers have been able to notify Ofgem of their schemes since January 2005 and to date over 75 new schemes for EEC2 have been notified.

4.17 As with EEC1, Ofgem's role under EEC2 is to administer the programme and approve each energy efficiency scheme set up by suppliers and to monitor progress.

4.18 A new feature of EEC2 is the provision for suppliers to be incentivised to deliver innovative measures. The incentive available will be a 50% increase in the energy savings from these measures, capped at 10% of a supplier's target. Innovative measures include:

- any measure that was not used under EEC1;
- a means by which a measure is undertaken which was not used under EEC1, and where the energy savings from it are significantly greater than similar measures used under EEC1; or
- a micro-generation unit with a maximum capacity below 50 kWe.

4.19 Measures include the installation of cavity wall insulation, loft insulation, heating, lighting or appliances. The means undertaken is the type of insulation material fitted, the type of heating system installed or the sort of light fitting used.

4.20 As mentioned in paragraph 4.11 suppliers have taken full advantage of the carry-over provisions under EEC. It has been calculated that around a quarter of the 130 TWh target has already been met through suppliers carrying over measures from EEC1. Further information on the EEC can be found in the *Review of the Energy Efficiency Commitment 2002-2005* which is available on the Ofgem website.

Energy services/28-day rule trial

4.21 The trial to evaluate the impact of the suspension of the 28-day rule on energy services offerings runs over two years from May 2004 to April 2006.

4.22 The terms of reference of the trial are much simplified from those originally proposed. Its operation is closely linked to the accreditation, monitoring and reporting requirements built into the EEC. Nevertheless, it was agreed at the outset that the trial would be evaluated additionally to the EEC in order to assess the evidence for or against the contention that the 28-day rule presented a barrier to the take-up of energy services in the domestic sector. Since the 28-day rule is primarily aimed at providing protection for consumers, it will be particularly important to check for any consumer detriment as a result of the trial.

4.23 To date, two suppliers have requested accreditation for energy service offerings as part of the trial. Two further suppliers are actively considering what they might do. A further supplier has indicated that its energy services activity will be carried on outside the trial, and the sixth of the major suppliers has not yet revealed its plans.

4.24 In August 2004, Ofgem wrote to all domestic suppliers setting out the ways in which it intended to conduct the evaluation of the trial. The suppliers responded, generally seeking simplification of what was being proposed. The following criteria are the basis for carrying out the evaluation, in addition to the accreditation, monitoring and reporting requirements under the EEC.

4.25 The evaluation is designed to establish:

- the number of energy services packages, as defined under the EEC, taken up before the trial began and during the trial;
- on the basis of a straightforward hypothesis, whether there is a statistically valid difference between the two numbers;
- evidence of causality if there is a statistically valid difference between the two numbers; and
- evidence of consumer satisfaction or dissatisfaction with the energy services offerings, with particular attention being paid to the associated long-term contracts.

4.26 Suppliers have been asked to provide data on an annual basis. The first tranche of data is currently being provided and the second is to be provided by mid-2006. The results of the evaluation will be made public by the end of 2006. These will be discussed with Government and others who formed part of the Energy Services Working Group.

EU Energy End-use Efficiency and Energy Services Directive

4.27 The proposal for a Directive on energy end-use efficiency and energy services forms part of a package of measures on energy security envisaged at the time

that the Directive on the internal market on electricity was agreed. It now forms part of the Commission's energy efficiency workstream, and its adoption is one of the priorities for the UK Presidency which runs to 31 December 2005.

4.28 The proposal was issued by the Commission on 10 December 2003 and then passed to the European Parliament (EP) and Council working groups for consideration. (The Directive must be jointly adopted by the EP and Council under the co-decision procedure.) The EP gave the proposal a first reading on 25 May 2005, and the Energy Council reached a political agreement on 28 June under the Luxembourg Presidency. There remains substantial divergence between the EP's, the Commission's and the Council's positions.

4.29 Ofgem has been working with Defra and other interested parties to provide input on the forthcoming draft Directive. This Directive is expected to cover sectors that are not in the EU Emissions Trading Scheme and includes the household, transport, commercial, small industry and agriculture sectors. At time of writing, the Council and the Parliament had yet to reach a common position on the draft Directive.

Green supply offerings

4.30 Ofgem first published green supply offerings guidelines[25] in 2002. In the three years since then there have been a number of developments that warrant revision of the guidelines. These include:

- the decision of the Energy Saving Trust to discontinue the Future Energy accreditation scheme;
- experience of three years of operation of the Renewables Obligation;
- the introduction of REGOs;
- the requirement for electricity suppliers to disclose the fuels used to generation the electricity they supply; and
- the growing importance of green supply for non-domestic consumers.

[25] Ofgem (2002) *Guidelines on green supply offerings* 31/02

4.31 In light of the above developments and meetings with interested parties, in which some expressed a desire for a more structured auditing and verification system, Ofgem has issued a consultation[26] on revising the green supply guidelines. The main issues that are addressed in the consultation are:

- the scope of the guidelines;
- supply in the industrial and commercial market;
- evidence of supply based on REGOs;
- links with fuel mix disclosure;
- definition, measurement and standards for additionality;
- third party accreditation; and
- enforcement.

4.32 Once responses have been received and considered, Ofgem will be publishing final revised guidelines later in 2005.

[26] Ofgem (2005) *Revision of guidelines on green supply offerings* 109/05

5. Increasing openness, transparency and accountability

5.1 Ofgem undertakes work to promote greater environmental awareness in its policy development and to build and maintain relationships with other relevant organisations. The Energy White Paper places great emphasis on partnerships between Government agencies, regulators, devolved administrations, regions, local government and business. This chapter describes key elements of this work and covers the actions that Ofgem undertakes to continue to improve its internal environmental practices.

5.2 This chapter starts by describing some of the activities Ofgem has undertaken to promote its and others' understanding of the environmental agenda in relation to energy.

Renewables policy discussion day

5.3 Prior to the successful EU ETS discussion day referred to in chapter 2, in May 2004 Ofgem held a discussion day entitled *Making sure renewables policy delivers*. The purpose of the day was to explore the key issues that need to be addressed, in order for renewables to deliver their full contribution to the achievement of the Government's energy policy. The format of the day included presentations, discussions and a panel session at the end. Those attending included academics, government officials, industry representatives and consultants.

5.4 To ensure that a record of the discussions was kept, Ofgem commissioned Professor Paul Ekins to produce a summary report of the day. This report is available on the Ofgem website.

Impact Assessments

5.5 Ofgem has a duty under the Utilities Act to produce Impact Assessments (IA). This duty was conferred on Ofgem by the Sustainable Energy Act 2003. In all cases where Ofgem is proposing to do anything for the purposes of, or in connection with, the carrying out of its functions under Parts 1 of the Electricity

or Gas Acts, and it appears that the proposal is important, then it must carry out and publish an IA. If Ofgem considers it unnecessary to carry out an IA then it must publish a statement setting out the reasons why it considers that this is the case.

5.6 Ofgem considers that conducting an assessment of impacts is an integral part of policy development and is not only about publishing reasons for a decision but also about a structured approach to policy development and decision making. Ofgem considers that effective consultation is at the heart of good quality policy development and that IAs, as evolving documents, have a significant role to play in this.

5.7 To this effect Ofgem issued a consultation document[27] on draft guidelines for conducting IAs in July 2004. This was followed by final guidance[28] in September 2004. This document sets out: the legal framework within which Ofgem will conduct IAs, the procedures to be followed when conducting IAs including arrangements for consultation, the times when Ofgem will conduct an IA, the scope of IAs and the particular arrangements for code modifications. It also sets out how Ofgem will assess environmental impacts.

5.8 Environmental appraisal is specifically required to be included in IA. As reported in last year's Review, Ofgem has produced internal guidance on carrying out environmental appraisals which builds on the guidance mentioned above.

Sustainable Energy Policy Network and Inter-departmental Analysts Group

5.9 The Government set up the Sustainable Energy Policy Network (SEPN) following the Energy White Paper in 2003 to take forward implementation. The network is a forum in which issues of cross-departmental or cross-sectoral interest can be raised. Ofgem has taken part in SEPN meetings when developments relevant to the gas and electricity industries are being discussed.

[27] Ofgem (2004) *Draft guidance on impact assessments* 172/04
[28] Ofgem (2004) Guidance on impact assessments 229a/04

5.10 Ofgem also participates in the regular meetings of the Inter-departmental Analysts Group (IAG) which provides cross-cutting analytical support and advice to SEPN.

Joint Working Group on Energy and the Environment

5.11 DTI, Defra and Ofgem established the Joint Working Group on Energy and the Environment in 2003, fulfilling a commitment to do so in the Energy White Paper. The Group, which also includes the Environment Agency, HM Treasury and the devolved administrations, first met in December 2003 and has so far met seven times. It has discussed a very wide range of environmental issues relating to the gas and electricity industries and, through providing a forum for discussion of high-level issues of this nature, has made an important contribution to the Sustainable Energy Policy Network and the development of policies.

5.12 Amongst the issues that have been considered by the Group are methodologies for assessing the environmental impacts of gas and electricity and, in particular, best practice in the design of environmental impact assessments. Infrastructure issues have been considered, including the future contribution of micro-generation and the trend towards more distributed generation. On the technology side, the group is monitoring work by various agencies to look at the opportunities for billing and metering to help customers manage their energy more effectively.

5.13 The Group also stimulated new work to develop indicators to show progress towards environmental targets, including information on different sectors of the economy and the impacts of different technologies and policy measures. A separate Sub-Group on indicators was set up to take this work forward.

5.14 The Group adopted an open way of working and a full set of its papers and discussions are available at: http://www.dti.gov.uk/energy/environment/jwgee/jwgee.shtml. This website reports on the development of indicators of the environmental impacts of the electricity and gas industries developed by the Sub-Group on indicators. Indicators are already available for the domestic sector and plans are outlined for indicators for the industrial, transport and service sectors.

5.15 Also available on the website is information on the Group's future work programme. This addresses issues covering regulation of the gas and electricity industries, their infrastructure and emergent technologies, the further development of emissions trading and other strategic issues.

Inter-departmental Group on the Social Cost of Carbon

5.16 Ofgem is one of the departments that have been working with Defra on the Inter-departmental Group on the Social Cost of Carbon (IGSCC). This group was set up in 2003 to take forward a review of the social cost of carbon that is used by the Government.

5.17 A research project is being progressed in conjunction with a number of leading academics, Defra and the IGSCC, which is examining a number of key issues in this area. These include evaluating uncertainties in estimates of a social cost of carbon (SCC), providing plausible ranges of estimates of the SCC and examining possible future areas of further research and assessment. This work is due to be published later in 2005.

Environmental Consultants Panel

5.18 Ofgem's environmental work programme is intended to provide a broad understanding of the interaction between energy provision and environmental impacts. Ofgem has appointed a panel of consultants in the field of environmental economics to help advise it in this area. The Panel can be called upon to comment on specific pieces of work or advise on particular items of policy.

5.19 The type of work that the Panel may be called upon to comment on includes:

- preparing short briefing or scoping papers, which may include some quantitative analysis, on issues raised by Ofgem's research programme, or other relevant areas;
- commenting on project outlines and proposals; and
- commenting on research proposals and draft documents.

5.20 The panel will be helpful in informing the Authority of relevant research results and other developments in environmental economics.

Environmental Advisory Group

5.21 Ofgem's high-level Environmental Advisory Group (EAG) has been in place for three years. Its purpose is to advise Ofgem on the priorities for its work in relation to the environment. The Group is chaired by Sir John Mogg and comprises 16 members from a variety of backgrounds appointed on a personal basis for their expertise in their area. For a full list of members see Appendix 1.

5.22 The EAG advises Ofgem on a number of issues, in particular:

- developing its work on the environment;
- reviewing achievements under the Environmental Action Plan and annual reviews of the plan;
- identifying areas of future research on environmental issues; and
- considering the role that Ofgem's executive functions play in meeting the Government's environmental targets.

In addition, members submit papers for discussion within the group. Recent subjects discussed include:

- biomass;
- EU proposals for energy efficiency and energy services; and
- consumers' understanding of green electricity.

5.23 Agendas and papers from the EAG can be found on Ofgem's website.

Bilateral work with environmental regulators

5.24 Ofgem and the Environment Agency (EA) have a Memorandum of Understanding which allows the two regulators to have a formal structure for the joint work that they undertake. It also provides for annual bi-lateral meetings to be held at a high level with the aim of discussing joint matters of interest.

5.25 Ofgem has also maintained contacts with the equivalent regulator in Scotland, the Scottish Environment Protection Agency (SEPA), and attended a workshop run by the Agency in February 2005 to foster further understanding of the two organisations' roles.

CEER Environmental Task Force

5.26 Ofgem plays a key role in the Council for European Energy Regulators (CEER) and participates in various working groups, one of which is the Environmental Task Force. This group is focusing on three areas: recommendations regarding necessary improvements in the field of Renewable Energy Sources for Electricity (RES-E) support schemes leading to harmonisation; recommendations and basic principles in order to minimise fraud risks in connection with disclosure systems and to strengthen the reliability of tracking systems; and a paper highlighting the impacts of different Directives on the Internal Energy Market and containing recommendations for improvements to ensure coherence and efficiency.

Other groups

5.27 Ofgem is also a member or participates in a number of other groups. These include:

- ***Renewables Advisory Board (RAB)***

The Renewables Advisory Board provides advice to Government on a wide range of renewable energy issues and brings together government departments, the renewables industry and the unions. It aims to develop mutual understanding of the key issues for the industry – like technology development, barriers to market penetration, and export enhancement – both in the short term and over the next 20 years.

- ***Energy Efficiency Partnership for Homes***

The partnership is an independent network of over 300 organisations working together to promote energy efficiency and eradicate fuel poverty. The partnership brings together major stakeholders in home energy efficiency from private, public and voluntary sectors.

Ofgem's internal environmental management

ISO 14001

5.28 Ofgem has again passed the annual audit of its ISO 14001 environmental management system in February 2005. This is the third year that Ofgem has successfully held accreditation under this scheme. Ofgem's environmental management system is managed by a dedicated team in the Operations division. The system has specific policies on:

- building management;
- information technology;
- procurement;
- the building's CHP unit;
- recycling; and
- other issues including business travel and cycling to work. (Ofgem provides an interest-free loan to any member of staff who wishes to purchase a bicycle).

5.29 Ofgem has an ongoing policy to examine the impact of the building that it occupies and, when essential maintenance is undertaken, thought is given to improving the environmental footprint of the building. For instance, passive infra-red lighting control is now operating on all of Ofgem's floors and has recently been extended to plant rooms. A 'freecooler' that provides cool air to the IT server room, has now been installed. This device will save around £4,000 per annum by reducing reliance on air conditioning.

6. Ofgem's work programme for 2005/06

Changes to organisational structure

6.1 Ofgem's work on the environment is now being taken forward in two separate divisions. Environmental policy has been separated from executive functions (ie the environmental programmes which Ofgem's runs on behalf of the Government). Policy work is being given a greater focus and will be taken forward within the Markets division. Ofgem's executive functions are now under the auspices of the Chief Operating Officer, in recognition of the increasing financial implications. This section comprises:

- Renewables and CHP support programmes;
- Fossil Fuel Levy; and
- Energy Efficiency.

6.2 Under this new arrangement all environment policy work will be undertaken by the environmental policy unit, leaving operational decisions and advice on the schemes mentioned above separate from policy.

6.3 In recognition of the fact that environmental work cuts across all of Ofgem's policy areas, a cross-divisional forum continues to meet monthly and discuss matters that are of interest across the organisation.

Priorities for 2005/6

6.4 Ofgem's Corporate Strategy[29] outlines how environmental issues are to be incorporated into its work over the coming years. It identifies a number of priorities for the coming year. Ofgem's work programme reflects the Energy White Paper, which sets out a clear commitment to a low carbon economy.

[29] Ofgem (2005) Ofgem Corporate Strategy and Plan 2005 – 2010

6.5 Working from the principles and processes developed by the Gas and Electricity Markets Authority, Ofgem will continue to improve the environmental analysis that informs its own policy decisions, as well as the wider environmental debate within Government and continue to encourage the delivery of future environmental policy in ways that are compatible with competitive energy markets and effective regulation.

6.6 Ofgem will continue to administer Government environmental programmes in the energy sector as efficiently and effectively as possible – the Renewables Obligation, the exemptions from the Climate Change Levy for renewables and CHP, the Renewable Electricity Guarantees of Origin, the Energy Efficiency Commitment and the CHP database.

6.7 Work on the review of the price controls for the three electricity transmission businesses (National Grid Company (NGC), ScottishPower Transmission Limited (SPTL) and Scottish Hydro-Electric Transmission Limited (SHETL)) and the gas transmission business (Transco) to take effect from 1 April 2007 will include significant work on environmental aspects of their operation. This will recognise the significant direct impacts that the transmission systems have on the environment, as well as the role the transmission systems play in facilitating broader social and environmental objectives. These include the significant changes that will be needed in investment and operation of the transmission networks as a result of changes to the electricity generation system resulting from the rapid growth in renewables and the change of fuel mix that is likely to come about as a result of the Large Combustion Plant Directive and the EU ETS.

6.8 The Energy Act 2004 provides powers for the Secretary of State for Trade and Industry to put in place new regulatory arrangements for offshore electricity transmission. Ofgem will work with the DTI in developing and administering an appropriate regulatory framework that facilitates the meeting of the Government's renewables targets, while providing best value for consumers.

6.9 In the context of major European Union policy initiatives including the proposed Directive on Energy End-use Efficiency and Energy Services, Ofgem will continue to work with Government on developing and implementing instruments to improve the efficiency of energy use. This will include long term

development of the new Energy Efficiency Commitment (EEC) as well as consideration of energy efficiency measures in the non-domestic sectors.

6.10 Ofgem will continue to participate with the Government in the current major review of the Renewables Obligation to be completed in 2006.

6.11 Ofgem will continue to take forward several significant initiatives to improve consumer awareness of the environmental consequences of their energy use. This will include:

- the first information to consumers provided from the EU fuel mix disclosure provisions, and the ongoing monitoring of compliance with the relevant licence condition;
- further work with suppliers on testing and evaluation of options for improving consumption information;
- finalising revised guidelines for green supply offerings; and
- consideration of new initiatives in metering and billing in the non-domestic sector.

6.12 Ofgem will work to ensure that these consumer initiatives are coordinated and provide maximum benefits to consumers to assist choice and to improve the environment, and can be implemented by suppliers at least cost. It is also important to evaluate the effects of these initiatives.

6.13 Ofgem will continue to monitor progress of the major pilot project in which suppliers are permitted to offer domestic consumers energy service packages linked to longer term supply contracts than are possible under the normal 28-day rule arrangements.

6.14 Many measures which form part of the Climate Change Programme, designed to deliver the Government's aim to reduce carbon dioxide (CO_2) emissions by 20% by 2010, impact directly on energy markets and are therefore central to Ofgem's present and future work. Ofgem therefore considers that working with Government on implementing and reviewing the Programme is an important element of its work.

6.15 Ofgem will monitor progress on the implementation of the Large Combustion Plant Directive and assess the likely ongoing impact on many aspects of the energy system including generation, transmission, wholesale markets and security of supply.

6.16 Ofgem will participate in the development process for the allocation plan for Phase II of the EU ETS and will undertake research to assist the process. Ofgem will also monitor the development of the allowance market and any impacts that this may have on the underlying energy markets.

7. The environmental context

7.1 Ofgem's commitment to report annually on progress against the Environmental Action Plan includes a set of indicators which were developed by Ofgem and revised last year in conjunction with the JWGEE indicators sub-group. These are used to help identify changes in the gas and electricity industries. The indicators are:

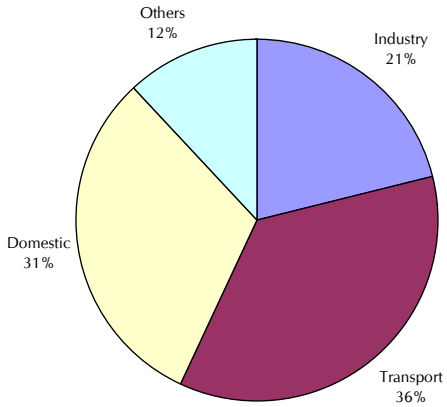
- emissions data – greenhouse gases, sulphur dioxide and oxides of nitrogen;
- renewables data – percentage of electricity generated from renewables and renewables capacity;
- Combined Heat and Power – electrical capacity;
- radioactive waste – volume of wastes in stock; and
- historical CO_2 emissions from power stations.

7.2 Throughout most of the data a baseline of 1990 is used. This is consistent with baselines used in Government targets to reduce CO_2 emissions by 20% on 1990 levels by 2010 and to reduce greenhouse gas emissions by 12.5% on 1990 levels.

Final energy use

7.3 Chart 6 shows final energy use in the UK by sector for 2003. It shows a small change compared with 2002. Transport remains the largest user of energy at 36%, up by 1% on 2002, with domestic energy use the second largest on 31% with no change on 2002.

Chart 6 - Final energy consumption by sector 2003



Source: DUKES

Electricity and gas industries' contribution to emissions

7.4 Table 3 and chart 7 show data on the gas and electricity industries' contribution to the UK's greenhouse gas emissions. Emissions from the electricity sector are from generation (CO_2 and nitrous oxide (N_2O)) and sulphur hexafluoride from distribution and transmission equipment. CO_2 is the main emission from generation with the others being relatively minor.

7.5 Emissions from the onshore gas industry are through gas end use (CO_2) and pipeline leakage (CH_4). Ofgem has no remit over the offshore gas industry; therefore emissions from this sector have not been included. Data on HFCs and PFCs have been included for completeness to show the basket of six greenhouse gases, though neither the gas or electricity sectors emit these gases. Data for all greenhouse gases has have been converted into tonnes of carbon equivalent (tC) using global warming potentials.[30] This year, data for 2003 is available to the necessary level of disaggregation and has therefore been included. For completeness data for 2002 is shown in a combined table showing data for 2000- 2003 which has been included in Appendix 3. Data for 2000 and 2001 has been recalculated due to changes in the national reporting methodology.

[30] Global Warming Potential (GWP) is a method to compare the relative effects of different greenhouse gases. For example, methane is 21 times more potent than carbon dioxide over a 100 year time horizon.

7.6 In table 3 the first main column shows data for 2003 and the second for the base year of 1990. Figures are for emissions from the gas and electricity sectors as a proportion of total emissions. The table shows that CO_2 emissions from power stations fell in 2002 but rose again in 2003. Provisional data for 2004 shows a continued rise in CO_2 emissions mainly due to an increased use of coal generation in response to high gas prices. Electricity generation and gas end use accounted for 52% of all carbon dioxide emissions in 2003.

7.7 Methane is a significant greenhouse gas with a global warming potential of 21. Emissions of methane from the gas industry arise from fugitive pipeline emissions, primarily from the low pressure distribution system. As mentioned in chapter 3, leakage from the distribution network is decreasing primarily as a result of the mains replacement programme. This has meant a drop in emissions of methane over the last three years. In 2003 leakage accounted for 13% of UK methane emissions, a drop of 3% on 2002. More significant sources of methane are the waste and agricultural industries and coal mining.

7.8 Emissions of N_2O have remained fairly constant over the past few years with a slight increase between 2002 and 2003 (0.02 MtC). In this same period national emissions reduced by 0.2 MtC leading the proportion of N_2O emitted from the gas and electricity sectors to rise to 6.2% in 2003. This small proportion is overshadowed by emissions from transport, agriculture and industrial processes.

7.9 Sulphur hexafluoride is one of the most potent greenhouse gases and is widely used in transmission and distribution equipment. Since 2002 SF_6 emissions have been broadly static nationally but emissions from the gas and electricity sectors reduced slightly by 0.01 MtC. Although the proportion of emissions from the electricity sector is improving it was still responsible for a third of all SF_6 emissions in the UK.

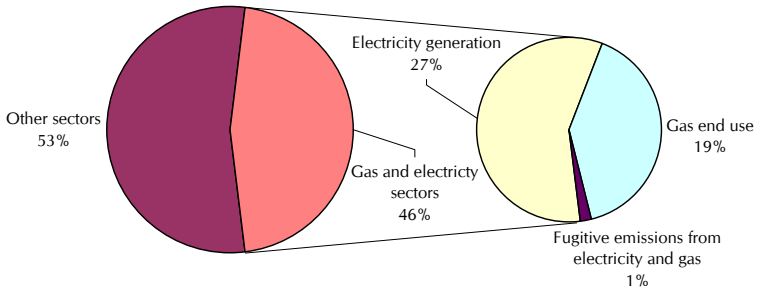
7.10 There are no significant emissions of HFCs or PFCs linked to the gas and electricity industries.

Table 3 – Emissions from the gas and electricity sectors 1990 and 2003

	2003				1990			
	Ofgem regulated industries		National emissions	% of national	Ofgem regulated industries		National emissions	% of national
	Sub totals	Total			Sub totals	Total		
Carbon dioxide (CO_2)								
Electricity generation								
Coal	32.33				49.95			
Gas	14.29				0.004			
Oil and other[1]	0.96				5.75			
Gas end use[2]								
Domestic	20.00				15.57			
Industrial	9.52				7.96			
Other[3]	4.22				4.55			
CO_2 total		81.32	156.1	52.1%		83.78	165.4	50.7%
Methane (CH_4)								
Gas losses	1.40				2.28			
CH_4 total		1.40	11.1	12.6%		2.28	21.1	10.8%
Nitrous oxide (N_2O)								
Electricity generation	0.62				0.52			
Gas end use	0.06				0.02			
N_2O total[4]		0.68	11.0	6.2%		0.54	18.5	2.9%
Sulphur hexafluoride (SF_6)		0.14	0.43	32.6%		0.16	0.30	53%
Hydrofluorocarbons (HFC)	0	0	2.92	0%		0	3.10	0%
Perfluorocarbons (PFC)	0	0	0.10	0%		0	0.38	0%
Totals		**83.54**	**181.65**	**46.0%**		**86.76**	**208.8**	**41.6%**

Sources: DUKES, National Atmospheric Emissions Inventory, Digest of Environmental Statistics
1 Includes MSW, scrap tyres and sour gas (and for 1990 orimulsion)
2 Excludes electricity generation, oil and gas extraction and non-energy use and losses
3 Includes commercial, agriculture and public administration
4 Includes emissions from combustion of natural gas, domestic, industrial, railways and power stations
All figures MtC unless stated

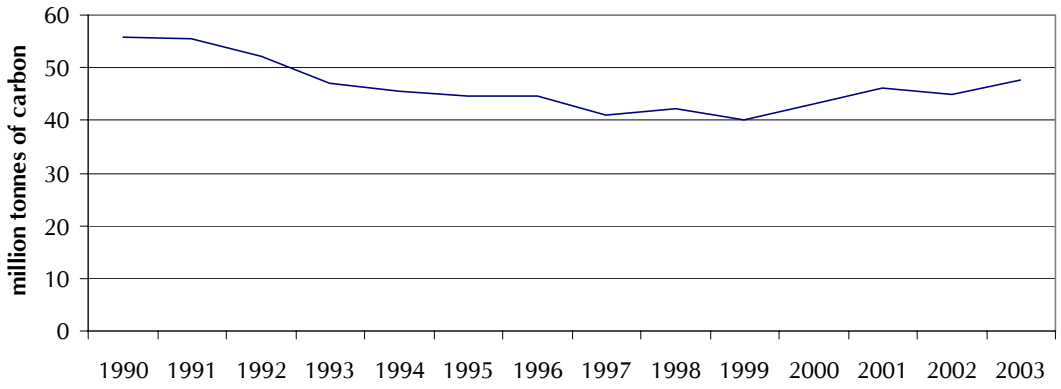
Chart 7 - Greenhouse gas emissions from the gas and electricity sectors 2003



Source: NAEI, Digest of Environment Statistics, DUKES
Leakage comprises CH_4 emissions from the gas distribution system and SF6 from the electricity transmission and distribution systems.

7.11 Chart 8 below shows CO_2 emissions from power stations from 1990 to 2003. The chart shows that between 1990 and 2003 CO_2 emissions fell by 5.6%. However emissions in 2003 were 2.2% higher than in 2002. This increase was largely due to greater use of coal in electricity generation and a decrease in net imports of electricity from the continent.

Chart 8 - CO_2 emissions from power stations 1990 - 2003



Source: Digest of Environmental Statistics

Air quality

7.12 Emissions of the major air quality pollutants, SO_2 and NOx have been steadily falling over the past fifteen years.

7.13 Charts 9 to 11 below show the historical trend of both NOx and SO_2 emissions from power stations between 1990 and 2003. Total SO_2 emissions fell by 74% and total NOx emissions by 44% between 1990 and 2003.

Chart 9 - SO_2 power station emissions as a proportion of national SO_2 emissions 1990 - 2003

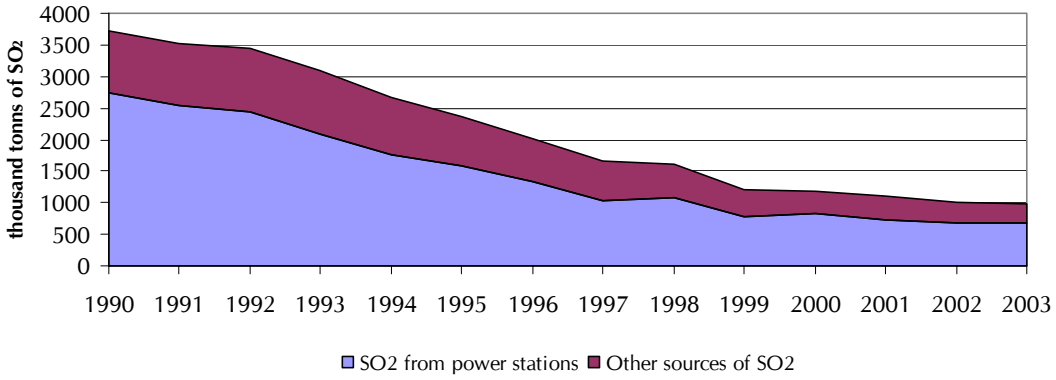
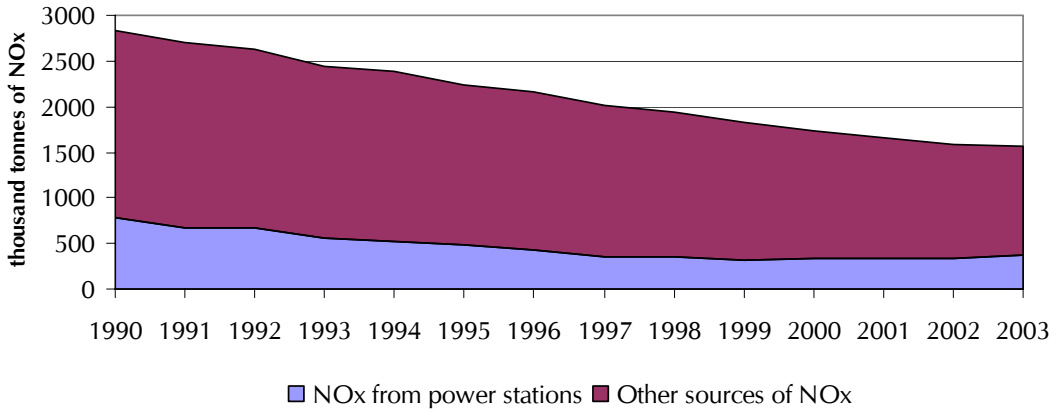
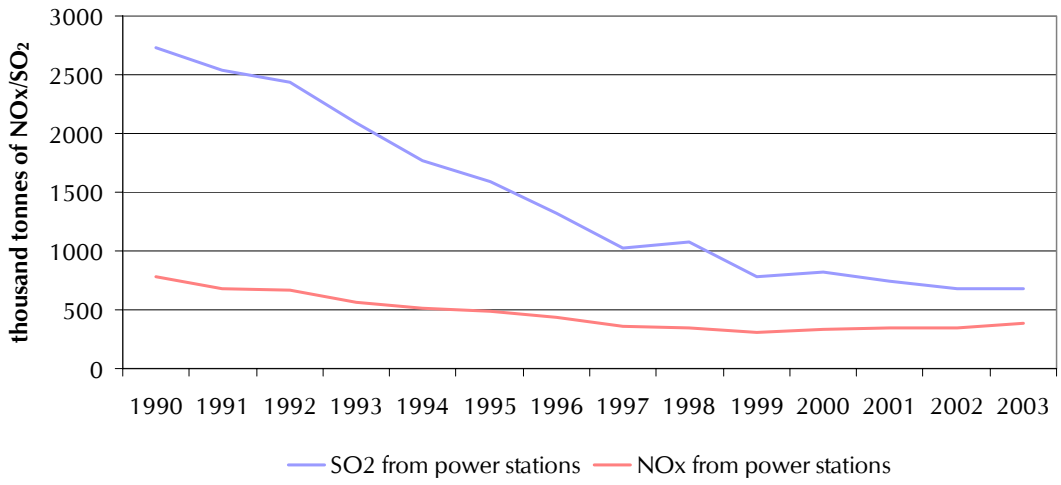


Chart 10 - NOx from power stations as a proportion of national NOx emissions 1990 - 2003



Source: Digest of Environmental Statistics

Chart 11 - NOx and SO_2 emissions from power stations 1990 - 2003



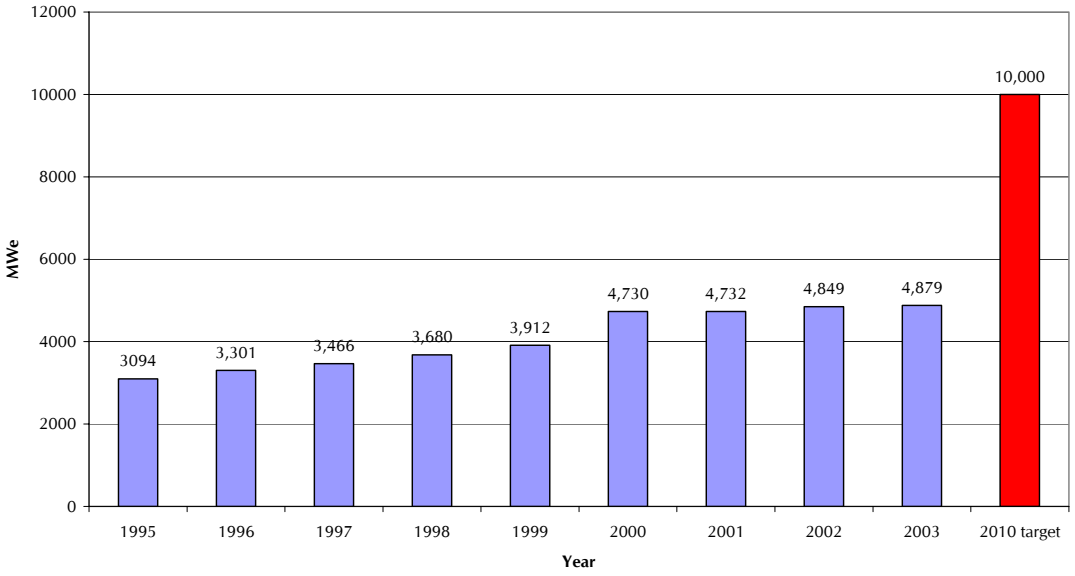
Source: Digest of Environmental Statistics

Combined Heat and Power

7.14 Over the last five years the Government has introduced a package of fiscal and regulatory measures designed to encourage use of CHP in light of adverse economic and market conditions faced by the UK CHP industry. These have included the Climate Change Levy exemption for good quality CHP, business rates exemption for CHP plant and machinery, a reduction in VAT on certain domestic micro-CHP installations and a 15% target for Government departments to use CHP generated electricity.

7.15 Chart 12 below shows the historical trend of CHP electrical capacity in the UK and also the Government's 10,000 MWe CHP target for 2010 (shown in red). Revised data for 2002 now shows that there was an increase of 117 MWe between 2001 and 2002 and an increase of 30 MWe between 2002 and 2003.

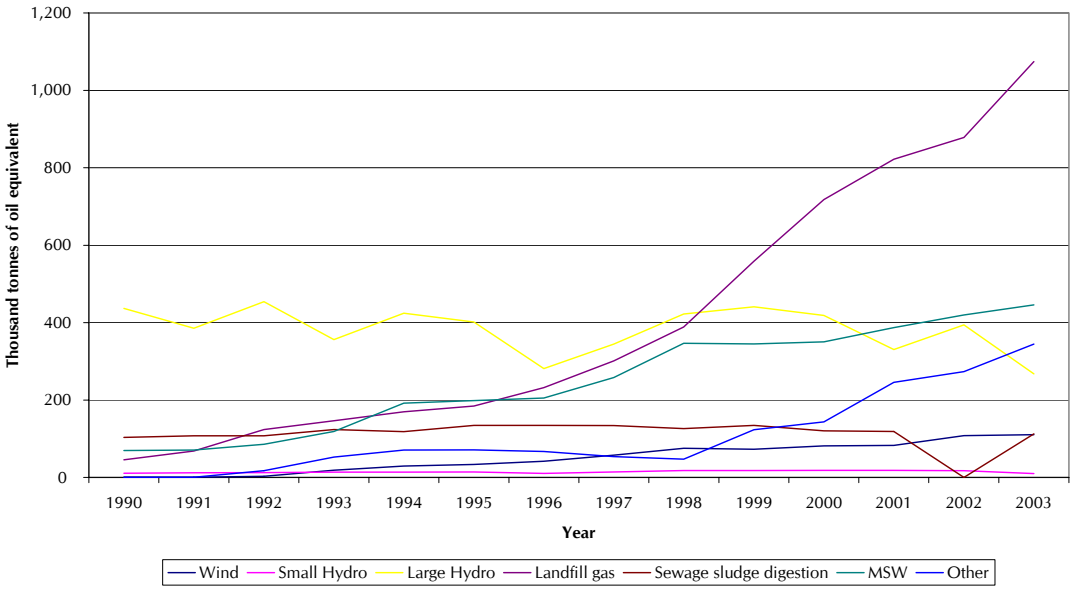
Chart 12 - CHP capacity 1995 - 2003 (inc. 2010 target)



Renewables

7.16 Table 13 shows the proportion of renewables sources used to generate electricity from 1990 to 2003. Total electricity generation from renewables in 2003 was 10,649 GWh which is a reduction of around 4% on generation in 2002. The largest proportion was from landfill gas at 34% and the second largest proportion was from biofuels. Renewables accounted for 2.7% of electricity generated in the UK in 2003.

Chart 13 - Renewable sources used to generate electricity 1990 - 2003



Radioactive waste

7.17 At time of going to print the latest edition of the United Kingdom Radioactive waste inventory was unavailable. NIREX have advised that it will be published in the Autumn of 2005.

Appendix 1 Environmental Advisory Group members

Chaired by Sir John Mogg, Chairman of Gas and Electricity Markets Authority

Robin Bidwell, non-executive member of the Gas and Electricity Markets Authority

Mark Candlish, Slough Heat and Power

Juilet Davenport, Good Energy

Neil Davies, Environment Agency

Henry Derwent, Defra

Andy Duff, Innogy

Professor Paul Ekins, University of Keele and Policy Studies Institute

Paul Jefferiss, Royal Society for the Protection of Birds

Eoin Lees, Eoin Lees Energy

Joan MacNaughton, DTI

Ian Marchant, Scotttish and Southern Energy

Jeremy Nicholson, Energy Intensive Users' Group

John Roberts, United Utilities

Bryony Worthington, Friends of the Earth

Philip Wright, Scottish Executive

Appendix 2 Climate Change Levy exemption statistics

A2.1 This appendix is a new addition to the EAP annual report for this year. It is intended to fill a gap in statistics that Ofgem provides on the Climate Change Levy (CCL) exemption for renewables. Ofgem has a statutory duty to provide a detailed annual report on the Renewables Obligation (RO), however, there is no equivalent requirement for the CCL exemption for renewables.

A2.2 This appendix provides information on the following:

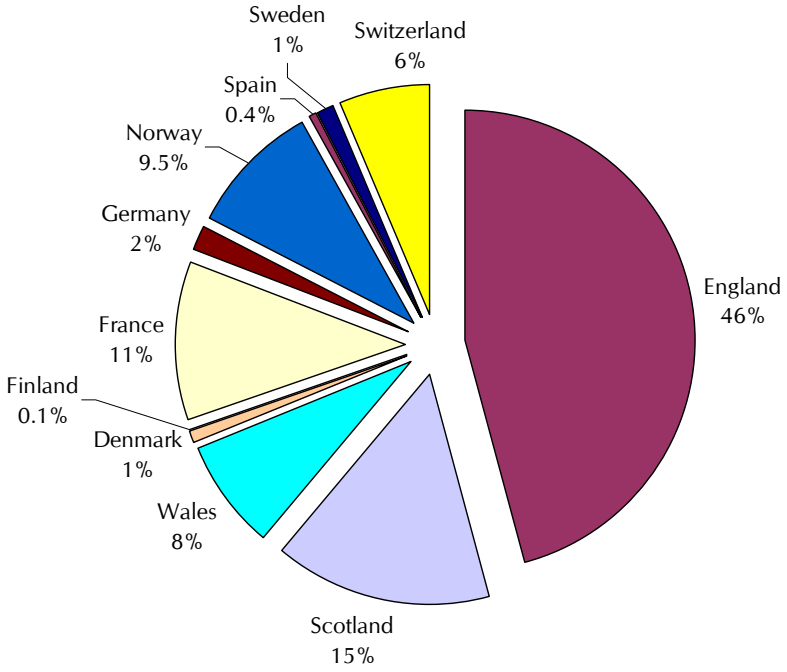
- the number of accredited generating stations by technology and location;
- the capacity of accredited generating stations by technology and location;
- the number of Renewable LECs issued by month and technology; and
- the number of Renewable LECs issued by month and location.

A2.3 If Ofgem receives positive feedback relating to this additional section it will consider expanding the range of information included or issuing a separate document.

Accredited generating stations

A2.4 Chart A1 shows the number of accredited generating stations and their location. Just over two thirds are situated in the UK, many of which also benefit from the Renewables Obligation. Of the remaining third most are located in France, Norway or Switzerland. The number of accredited generating stations located outside the UK and the number of countries taking part has significantly increased over the last two years of the scheme, which is further demonstrated in Chart A3.

Chart A1 - Number of generating stations by location



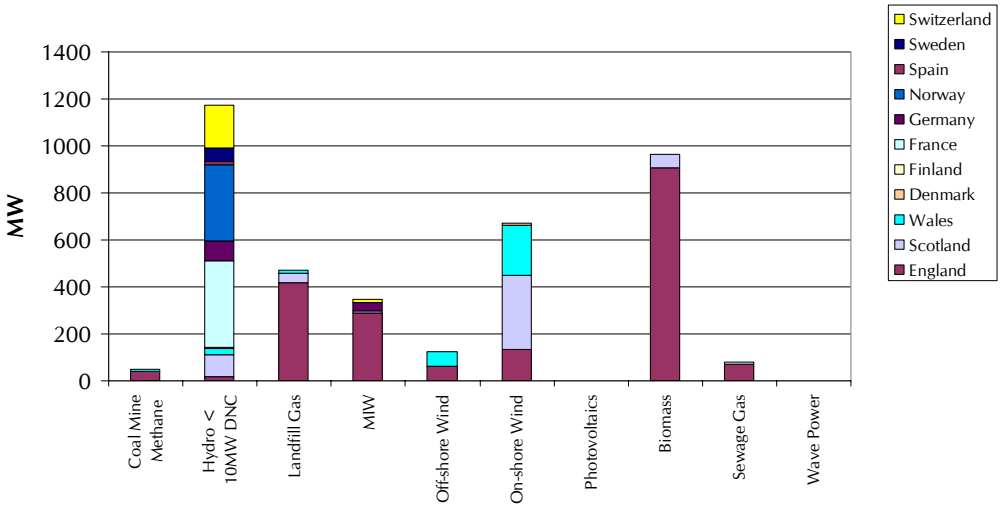
Source: Ofgem

A2.5 Chart A2 below shows the capacity of the generating stations accredited for each technology and the country in which they are located. Hydro generating stations have the highest total capacity with almost 1.2 GW currently accredited. Although the capacity of eligible hydro stations is limited to 10 MW Declared Net Capacity (DNC) the total capacity of hydro stations under the scheme accounts for over double the capacity accredited under any other technology. Only one of the 11 countries with accredited generating stations does not have any generating station accredited under this technology and generating stations located in the UK comprise just 12% of the total accredited capacity of hydro generating stations less than or equal to 10 DNC. This is in stark contrast to the other technologies.

A2.6 Biomass accounts for a relatively large proportion of the accredited capacity under the scheme at just under 1 GW, due in the main to co-fired generating stations located in England. Although a large proportion of the accredited

generating stations are landfill gas these stations tend to have a smaller capacity and so this technology accounts for just 12% of the total accredited capacity.

Chart A2 - Total installed generating capacity by technology and location



Source: Ofgem

Renewables LECs issued

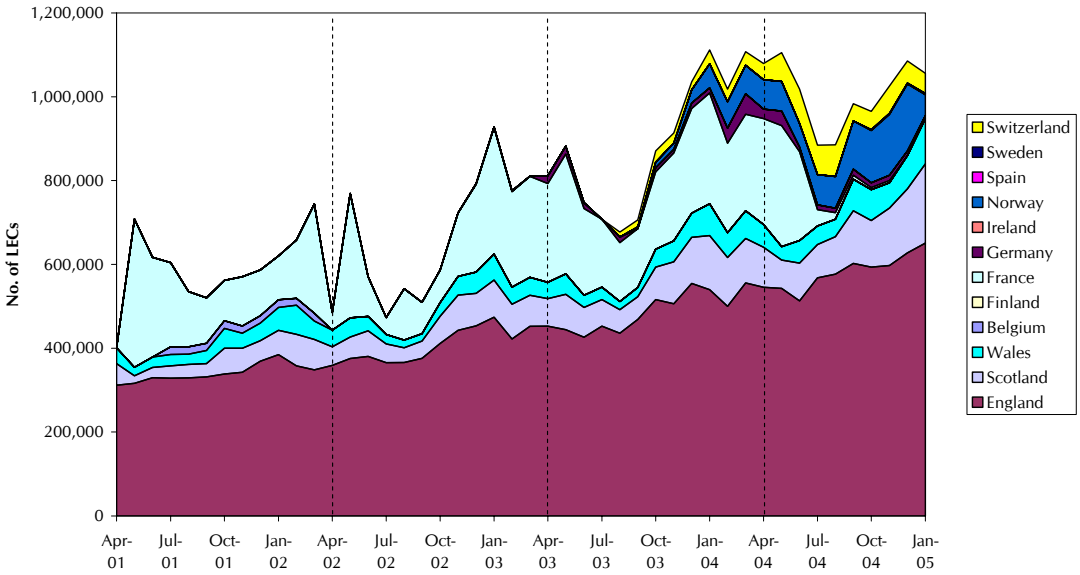
A2.7 Chart A3 shows numbers of Renewables LECs issued by country from April 2001 to January 2005. One Renewables LEC is issued for one megawatt hour of electricity generated from eligible renewable sources. The number of Renewables LECs issued each month has generally increased throughout the duration of the scheme with a reasonable amount of variability. There is generally a peak during winter and in May with lower activity around August. The sources of this overall trend become clear on closer inspection of the breakdown by country.

A2.8 The Renewables LECs issued to generating stations located in the UK have generally increased with some seasonal variability. However, more Renewables LECs have been issued to French generating stations. These numbers have varied substantially from month to month which may be for several reasons. First, most French stations are accredited as hydro less than or equal to 10MW DNC so some seasonal variation is to be expected. Second, for generation to qualify for Renewables LECs it must be consumed or intended to be consumed within the UK. If French generating stations can obtain a better price for their electricity by choosing to sell it in another country, Renewables LECs will not be claimed.

Since July 2004 some French stations have received other benefits from selling their electricity outside the UK and in December 2004 the number of Renewables LECs issued to these generating stations fell to zero.

A2.9 Renewables LECs issued to non-UK generating stations other than France increased noticeably from October 2003. Norway in particular has begun to take advantage of the benefits offered by the scheme.

Chart A3 - LECs issued by country 2001-2005

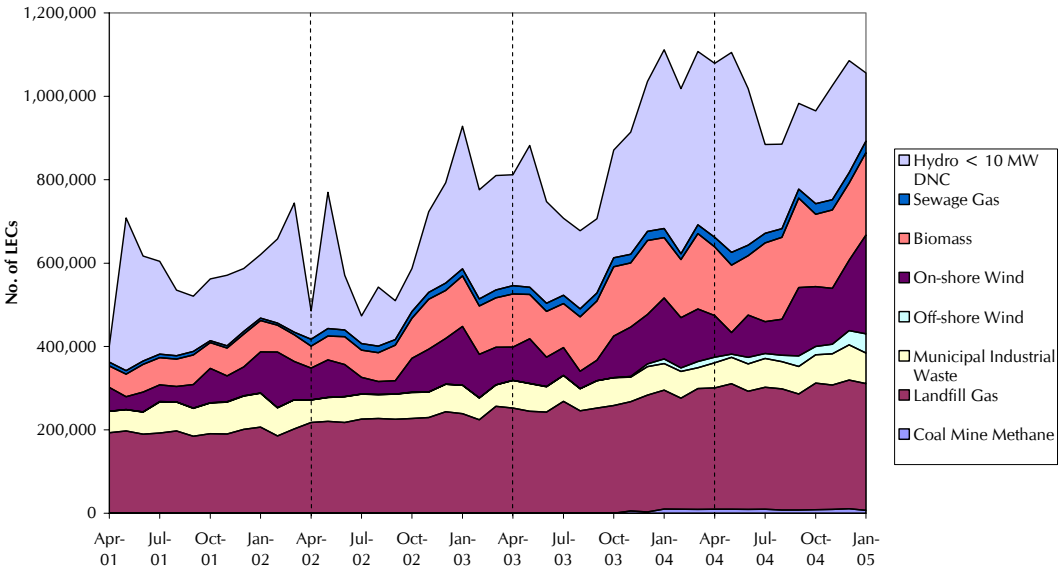


Source: Ofgem

A2.10 Chart A4 shows numbers of Renewables LECs issued by technology over the same period. The majority of Renewables LECs have been issued for landfill gas and hydro less than or equal to10 MW DNC with each technology receiving over 11 TWh of Renewables LECs to date. Over a quarter of Renewables LECs have been issued in relation to biomass and on-shore wind respectively.

A2.11 There are contrasting trends in the numbers of Renewables LECs issued to the different technologies since the beginning of the scheme. At the bottom of the chart Renewables LECs issued for landfill gas increase steadily. On-shore wind also shows an increase but with clear seasonal variation. Biomass shows the largest growth rate over the time period owing at least in part to the introduction of the Renewables Obligation in April 2002. Hydro is perhaps the most erratic month on month, combining seasonal variation with foreign generating stations' participation in the scheme.

Chart A4 - LECs issued by technology 2001 - 2005



Data tables

A2.12 The following pages contain tables giving the following detailed statistical information from which the above charts are derived:

- number of accredited generating stations by technology and location;
- installed generation capacity by technology and location;
- numbers of Renewables LECs issued by country; and
- numbers of Renewables LECs issued by technology.

Table A1 – Number of accredited generating stations accredited by technology and location at June 2005 (Source: Ofgem)

Technology	Denmark	England	Finland	France	Germany	Norway	Scotland	Spain	Sweden	Switzerland	Wales	Total
Coal Mine Methane	0	5	0	0	0	0	0	0	0	0	2	7
Hydro < 10MW DNC	0	44	1	87	12	78	72	3	10	51	21	379
Landfill Gas	0	158	0	0	0	0	18	0	0	0	9	185
Municipal Industrial Waste	0	20	0	0	1	0	1	0	0	1	0	23
Off-shore Wind	0	3	0	0	0	0	0	0	0	0	1	4
On-shore Wind	6	48	0	1	0	0	28	0	0	0	25	108
Photovoltaics	0	4	0	0	0	0	0	0	0	0	0	4
Biomass	0	32	0	0	0	0	2	0	0	0	0	34
Sewage Gas	0	61	0	3	0	0	1	0	0	0	6	71
Wave Power	0	0	0	0	0	0	2	0	0	0	0	2
Total	6	375	1	91	13	78	124	3	10	52	64	817

Table A2 –Total installed generating capacity of accredited generating stations accredited by technology and location at June 2005 (Source: Ofgem)

Technology	Denmark	England	Finland	France	Germany	Norway	Scotland	Spain	Sweden	Switzerland	Wales	Total
Coal Mine Methane	0	39312	0	0	0	0	0	0	0	0	11508	50820
Hydro < 10MW DNC	0	19136	6300	365595	85540	326210	90366	10518	60900	178155	28421	1171141
Landfill Gas	0	415874	0	0	0	0	39910	0	0	0	17271	473055
Municipal Industrial Waste	0	287708	0	0	37000	0	10500	0	0	12900	0	348108
Off-shore Wind	0	63800	0	0	0	0	0	0	0	0	60000	123800
On-shore Wind	8300	133003	0	1800	0	0	315744	0	0	0	212646	671493
Photovoltaics	0	72	0	0	0	0	0	0	0	0	0	72
Biomass	0	908286	0	0	0	0	57297	0	0	0	0	965583
Sewage Gas	0	69173	0	9100	0	0	177	0	0	0	1509	79959
Wave Power	0	0	0	0	0	0	1250	0	0	0	0	1250
Total	8300	1936364	6300	376495	122540	326210	515244	10518	60900	191055	331355	3885281

Table A3 – Numbers of Renewables LECs issued by country 2001 – 2005 (Source: Ofgem)

Month	Belgium	England	Finland	France	Germany	Ireland	Norway	Scotland	Sweden	Spain	Switzerland	Wales	Total
04/2001	0	311,713	0		0	0	0	52,004	0	0	0	37,248	400,965
05/2001	0	316,368	0	353,746	0	0	0	17,735	0	0	0	20,415	708,264
06/2001	0	329,945	0	237,500	0	0	0	23,917	0	0	0	25,320	616,682
07/2001	18,211	328,514	0	201,019	0	0	0	29,594	0	0	0	26,858	604,196
08/2001	17,183	329,470	0	131,963	0	0	0	31,940	0	0	0	24,554	535,110
09/2001	17,645	331,588	0	108,314	0	0	0	31,803	0	0	0	31,125	520,475
10/2001	18,233	338,322	0	96,545	0	0	0	61,336	0	0	0	47,541	561,977
11/2001	17,628	342,731	0	117,486	0	0	0	57,049	0	0	0	35,834	570,728
12/2001	17,944	369,003	0	108,959	0	0	0	49,085	0	0	0	41,705	586,696
01/2002	18,233	384,835	0	104,734	0	0	0	57,900	0	0	0	54,673	620,375
02/2002	16,449	357,710	0	138,925	0	0	0	75,423	0	0	0	69,664	658,171
03/2002	18,729	348,395	0	260,325	0	0	0	72,533	0	0	0	44,104	744,086
04/2002	0	359,195	0	42,213	0	0	0	43,976	0	0	0	39,700	485,084
05/2002	0	375,814	0	296,985	0	0	0	50,963	0	0	0	45,833	769,595
06/2002	0	380,567	0	94,596	0	0	0	61,421	0	0	0	33,866	570,450
07/2002	0	365,506	0	40,663	0	0	0	44,848	0	0	0	22,345	473,362
08/2002	0	366,142	0	122,937	0	0	0	35,184	0	0	0	18,003	542,266
9/2002	0	376,174	0	74,630	0	0	0	40,949	0	0	0	17,948	509,701
10/2002	0	411,733	0	77,760	0	0	0	64,439	0	0	0	32,791	586,723
11/2002	0	442,466	0	151,254	0	403	0	84,515	0	0	0	44,622	723,260
12/2002	0	453,561	0	209,674	0	1,304	0	77,475	0	0	0	50,642	792,656
01/2003	0	474,041	0	302,056	0	1,470	0	88,827	0	0	0	61,867	928,261
02/2003	0	422,543	0	227,807	0	2,245	0	82,379	0	0	0	40,888	775,862
03/2003	0	452,023	0	240,769	0	159	0	74,384	0	0	0	42,982	810,317

Month	Belgium	England	Finland	France	Germany	Ireland	Norway	Scotland	Sweden	Spain	Switzerland	Wales	Total
04/2003	0	452,693	0	235,569	19,355	0	0	65,807	0	0	0	38,522	811,946
05/2003	0	444,404	0	285,689	18,817	0	0	84,446	0	0	0	48,743	882,099
06/2003	0	426,201	0	206,981	13,911	0	0	71,481	0	0	0	28,909	747,483
07/2003	0	452,532	0	161,725	0	0	0	63,458	0	0	0	29,812	707,527
08/2003	0	435,538	0	140,339	13,439	0	0	56,178	0	0	12,186	19,796	677,476
09/2003	0	468,592	0	139,877	0	0	4,409	54,493	0	0	16,980	22,120	706,471
10/2003	0	516,132	0	184,728	10,029	0	13,242	77,210	0	0	26,791	42,922	871,054
11/2003	0	506,181	0	209,760	8,448	0	15,261	99,678	0	0	24,154	50,370	913,852
12/2003	0	554,691	0	249,632	13,021	0	31,513	110,100	0	0	18,946	57,683	1,035,586
01/2004	0	539,968	0	264,084	12,602	0	57,164	128,822	0	0	33,029	75,999	1,111,668
02/2004	0	500,117	0	213,601	35,891	0	63,341	116,394	0	0	29,867	59,025	1,018,236
03/2004	0	555,733	0	230,627	48,814	0	67,627	106,077	0	0	32,592	66,052	1,107,522
04/2004	0	545,404	0	252,887	22,266	0	70,451	95,617	0	0	38,384	54,241	1,079,250
05/2004	0	542,875	0	289,070	34,857	0	70,476	67,635	0	0	68,681	31,648	1,105,242
06/2004	0	513,068	0	211,881	11,170	0	56,123	89,775	0	0	82,142	54,114	1,018,273
07/2004	0	568,115	0	38,939	11,353	0	72,392	79,476	0	0	70,015	44,148	884,438
08/2004	0	576,604	0	15,905	10,239	0	75,790	89,441	0	0	75,390	41,807	885,176
09/2004	0	602,793	0	9,762	14,436	0	115,151	125,242	0	0	40,886	75,048	983,318
10/2004	0	593,339	0	4,742	11,794	0	124,102	111,444	0	2,263	43,869	73,838	965,391
11/2004	0	597,297	0	5,154	12,496	0	145,154	137,185	0	2,749	65,306	60,516	1,025,857
12/2004	0	627,781	0	0	11,223	0	159,343	152,390	0	2,157	52,865	79,792	1,085,551
01/2005	0	651,136	0	0	7,602	0	49,767	188,860	0	3,048	48,090	107,503	1,056,006
02/2005	0	568,849	1,610	0	5,489	0	39,757	127,132	23,446	2,912	39,390	66,462	875,047
Total	**160,255**	**21,208,402**	**1,610**	**7,091,812**	**347,252**	**5,581**	**1,231,063**	**3,608,020**	**23,446**	**13,129**	**819,563**	**2,139,598**	**36,649,731**

Table A4 – Number of Renewables LECs issued by technology (Source: Ofgem)

	Coal Mine Methane	Landfill Gas	MIW	Off-shore Wind	On-shore Wind	Plant/Animal Substances/Energy Crops	Sewage Gas	Hydro	Total
04/01	0	192,846	51,376	0	57,201	51,689	9,427	38,426	400,965
05/01	0	197,483	50,800	486	30,667	54,120	8,360	366,348	708,264
06/01	0	189,452	53,220	382	47,222	66,461	8,506	251,439	616,682
07/01	0	192,196	74,704	698	40,257	65,028	8,617	222,696	604,196
08/01	0	197,357	69,433	285	36,601	65,725	8,128	157,581	535,110
09/01	0	184,675	66,551	802	56,662	70,523	9,028	132,234	520,475
10/01	0	190,760	73,446	664	82,236	61,770	5,085	148,016	561,977
11/01	0	189,919	76,591	570	62,171	66,679	5,744	169,054	570,728
12/01	0	201,271	79,417	738	69,238	78,606	6,558	150,868	586,696
01/02	0	206,404	81,189	412	98,786	75,004	6,176	152,404	620,375
02/02	0	185,116	67,944	0	133,405	64,602	5,028	202,076	658,171
03/02	0	202,183	69,798	0	91,627	64,514	6,106	309,858	744,086
04/02	0	217,573	54,246	11	76,455	52,419	16,434	67,946	485,084
05/02	0	220,356	57,119	236	90,026	57,325	17,652	326,881	769,595
06/02	0	217,587	62,063	222	76,594	66,755	16,186	131,043	570,450
07/02	0	225,713	59,995	146	40,271	64,937	15,621	66,679	473,362
08/02	0	227,336	56,987	176	31,530	69,217	15,539	141,481	542,266
09/02	0	225,009	60,566	96	31,865	85,545	13,102	93,518	509,701
10/02	0	227,182	62,470	511	81,253	96,185	15,939	103,183	586,723
11/02	0	229,642	60,718	336	102,716	119,975	16,611	193,262	723,260
12/02	0	243,450	65,966	214	109,420	114,903	18,043	240,660	792,656
01/03	0	238,728	68,198	96	140,905	121,597	16,802	341,935	928,261

	Coal Mine Methane	Landfill Gas	MIW	Off-shore Wind	On-shore Wind	Plant/Animal Substances/Energy Crops	Sewage Gas	Hydro	Total
02/03	0	224,307	52,262	312	104,470	115,778	16,911	261,822	775,862
03/03	0	256,275	51,417	17	90,205	118,971	18,588	274,844	810,317
04/03	0	252,067	66,520	157	79,825	127,447	20,010	265,920	811,946
05/03	0	244,338	66,415	225	107,588	106,133	17,355	340,045	882,099
06/03	0	242,522	61,046	258	70,440	109,819	19,502	243,896	747,483
07/03	0	268,046	62,125	146	66,854	105,870	20,012	184,474	707,527
08/03	0	245,672	52,773	208	41,543	130,877	19,207	187,196	677,476
09/03	0	251,893	65,643	144	49,051	141,999	19,507	178,234	706,471
10/03	0	257,987	67,039	247	99,691	166,137	21,886	258,067	871,054
11/03	5,386	262,072	59,128	1,692	118,165	153,587	21,012	292,810	913,852
12/03	3,132	280,253	68,343	6,376	118,777	177,367	21,751	359,587	1,035,586
01/04	10,211	284,860	63,830	11,171	146,102	144,734	21,804	428,956	1,111,668
02/04	9,572	266,217	64,185	8,697	120,307	139,645	13,863	395,750	1,018,236
03/04	9,337	289,843	49,934	14,601	126,112	180,700	21,416	415,579	1,107,522
04/04	9,599	290,821	60,515	13,485	99,857	164,590	22,864	417,519	1,079,250
05/04	9,721	300,534	63,544	7,614	52,030	161,484	30,889	479,426	1,105,242
06/04	9,165	283,241	65,861	15,574	101,164	142,734	24,878	375,656	1,018,273
07/04	9,695	292,370	68,954	11,930	76,404	188,971	23,268	212,846	884,438
08/04	7,590	290,429	65,378	15,639	85,840	197,169	20,257	202,874	885,176
09/04	7,434	278,542	66,228	24,906	163,904	214,973	21,612	205,719	983,318
10/04	8,056	304,089	67,742	20,137	143,868	173,033	25,610	222,856	965,391
11/04	9,117	298,358	75,180	22,640	133,909	188,516	24,095	274,042	1,025,857
12/04	10,617	308,905	84,246	34,206	168,831	184,882	25,577	268,287	1,085,551
01/05	6,927	303,973	73,185	46,002	237,018	197,719	27,688	163,494	1,056,006

	Coal Mine Methane	Landfill Gas	MIW	Off-shore Wind	On-shore Wind	Plant/Animal Substances/Energy Crops	Sewage Gas	Hydro	Total
02/05	2,436	277,198	42,501	33,577	139,480	214,420	20,738	144,697	875,047
Total	**127,995**	**11,457,050**	**3,006,791**	**297,042**	**4,328,543**	**5,581,134**	**788,992**	**11,062,184**	**36,649,731**

Appendix 3 Emissions data

A3.1 The table below is an extended version of table 3 in Chapter 7 showing emissions from the gas and electricity sectors from 2000 – 2003 and 1990.

	2003				2002				2001			
	Ofgem regulated industries		National emissions	% of national	Ofgem regulated industries		National emissions	% of national	Ofgem regulated industries		National emissions	% of national
	Sub totals	Total			Sub totals	Total			Sub totals	Total		
Carbon dioxide (CO_2)												
Electricity generation												
Coal	32.33				29.13				30.90			
Gas	14.29				14.53				13.77			
Oil and other[1]	0.96				1.13				1.31			
Gas end use[2]												
Domestic	20.00				19.50				19.66			
Industrial	9.52				9.17				9.98			
Other[3]	4.22				4.20				4.44			
CO_2 total		81.32	156.1	52.1%		77.66	152.7	50.9%		80.06	157.4	50.9%
Methane (CH_4)												
Gas losses	1.40				1.94				1.96			
CH_4 total		1.40	11.1	12.6%		1.94	12.3	15.8%		1.96	12.8	15.3%
Nitrous oxide (N_2O)												
Electricity generation	0.62				0.59				0.59			
Gas end use	0.06				0.06				0.05			
N_2O total[4]		0.68	11.0	6.2%		0.65	11.2	5.8%		0.64	11.6	5.5%
Sulphur hexafluoride[5](SF_6)		0.14	0.43	32.6%		0.15	0.43	34.9%		0.16	0.40	40.0%
Hydrofluorocarbons (HFC)	0	0	2.92	0%	0	0	2.84	0%		0	2.65	0%
Perfluorocarbons (PFC)	0	0	0.10	0%	0	0	0.10	0%		0	0.12	0%
Totals		**83.54**	**181.65**	**46.0%**		**80.40**	**179.57**	**44.8%**		**82.83**	**184.97**	**50.2%**
	2000				1990							

	Ofgem regulated industries		National emissions	% of national	Ofgem regulated industries		National emissions	% of national
	Sub totals	Total			Sub totals	Total		
Carbon dioxide (CO_2)								
Electricity generation								
Coal	27.71				49.95			
Gas	13.95				0.004			
Oil and other[1]	1.45				5.75			
Gas end use[2]								
Domestic	19.17				15.57			
Industrial	10.13				7.96			
Other[3]	4.27				4.55			
CO_2 total		76.68	152.8	50.2%		83.78	165.4	50.7%
Methane (CH_4)								
Gas losses	1.92				2.28			
CH_4 total		1.92	13.6	14.1%		2.28	21.1	10.8%
Nitrous oxide (N_2O)								
Electricity generation	0.57				0.52			
Gas end use	0.06				0.02			
N_2O total[4]		0.63	12.2	5.2%		0.54	18.5	2.9%
Sulphur hexafluoride[5](SF_6)		0.17	0.51	33.3%		0.16	0.30	53%
Hydrofluorocarbons (HFC)	0	0	2.48	0%		0	3.10	0%
Perfluorocarbons (PFC)	0	0	0.15	0%		0	0.38	0%
Totals		**79.40**	**181.74**	**43.7%**		**86.76**	**208.8**	**41.6%**

Sources: DUKES, National Atmospheric Emissions Inventory, Digest of Environmental Statistics

1 Includes MSW, scrap tyres and sour gas (and for 1990 orimulsion)

2 Excludes electricity generation, oil and gas extraction and non-energy use and losses

3 Includes commercial, agriculture and public administration

4 Includes emissions from combustion of natural gas, domestic, industrial, railways and power stations

All figures MtC unless stated