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**Ofgem's response to the Government's
consultation on energy policy**

Summary

This paper sets out Ofgem's response to the Government's consultation on energy policy that is being carried out in preparation for an energy white paper around the end of this year. The response takes as its starting point the need to address two key issues in relation to the present debate on energy policy:

- ◆ the importance of ensuring energy security, and the most effective means of delivering it, and
- ◆ the increased importance being given by the Royal Commission on Environmental Pollution and others to achieving a low carbon economy, and the most effective means of delivering this.

Security of supply

Ofgem works within its statutory duties to deliver security of gas and electricity supply through two principal mechanisms:

- ◆ by promoting and monitoring the operation of a competitive market framework, which allows market participants to compete on price, service level, and choice of product, and allows prices to signal to investors the returns available from new investment (for example, in new electricity generating capacity), and
- ◆ the regulation of network monopolies to ensure their efficient operation, maintenance and enhancement, and including the setting of quality standards and regulatory incentives to deliver improvements in quality (where appropriate).

It is Ofgem's view that the operation of competitive markets, together with regulation where necessary, will continue to deliver security of supply most effectively and efficiently. Where investment in gas and electricity security is being delivered through the operation of competitive markets, it is important to recognise that intervention in the market to increase security, or the possibility of such intervention, might actually have the effect of deterring investment. Given the importance of security of supply it will always be important to review on an ongoing basis the barriers which may prevent the market from operating effectively and take action where appropriate to address these

barriers. Further work is being carried out in this regard as part of the joint process to monitor security of supply together with the Department of Trade and Industry (DTI).

Policy objectives and instruments

The RCEP and others have suggested that a significant ongoing reduction in emissions of greenhouse gases is required to help address global climate change. Against this background of a potentially substantial change in environmental and energy policy, there are real questions about the most appropriate instruments for delivering these policy objectives.

At present there are in place a range of instruments in the gas and electricity sectors designed to contribute to meeting the UK's domestic and international commitments to reduce greenhouse gas emissions. These schemes—which include the Renewables Obligation, the Climate Change Levy, the Energy Efficiency Commitment and the UK Emissions Trading Scheme—have the following features:

- ◆ each allows some flexibility of implementation, although there is limited transferability between schemes
- ◆ most of the schemes focus on the means by which greenhouse gas emissions can be reduced, for example, by increasing the amount of renewable generation, rather than targeting a reduction in emissions directly, and
- ◆ each of the schemes has other objectives. For example, the Energy Efficiency Commitment has objectives relating to comfort and fuel poverty.

A review of these schemes shows that each implies a different range of values of reducing greenhouse gas emissions. These differences reflect, to an extent, the multiple objectives of the schemes. However, the multiple objectives also make it difficult to assess the cost effectiveness of the different schemes. By deciding centrally how much resource is to be spent under each of these schemes, the total cost of delivering emissions reductions is likely to be greater than the cost of achieving the same amount of reduction through a broad instrument focused on one objective (reducing greenhouse gas emissions), and which would then be taken into account in the decentralised decisions of market participants.

In the medium term, Ofgem considers that a more effective basis for achieving the Government's objectives on climate change, at least cost to consumers, is likely to come from moving towards a broad instrument targeting greenhouse gas emissions (for example, a carbon tax or emissions trading scheme). Other policy objectives (for example, fuel poverty) would then need to be addressed through separate policy instruments.

Renewables, distributed generation and networks

Increased generation from renewable sources will require increased amounts of generation to be connected to electricity distribution networks. Ofgem is committed to putting in place fair and transparent arrangements for distributed generation. In the short term, changes to the arrangements for distributed generators to connect to the network have been proposed. For the medium term, a number of work programmes are being undertaken within Ofgem, and jointly with the DTI and the industry more generally, to look at the implications for the network monopoly businesses of a substantial increase in distributed generation.

If further increases in distributed generation are envisaged, it is important that a full assessment of the costs is made. This work should include analysis of the network-related costs associated with an increase, and not just the incremental generation costs. Ofgem will work alongside others in this area.

Energy efficiency

Ofgem considers that effective competition in energy markets should, in time, support improvements in energy efficiency (for example, by encouraging suppliers to offer their customers integrated energy management services). If the Government gives consideration to the use of a broad instrument targeted only at reductions in greenhouse gas emissions, it will be appropriate to review the operation of existing schemes, including energy efficiency schemes. The latter play a significant role in alleviating fuel poverty, which will still need to be addressed. Further analysis of the impact of past and current schemes on energy efficiency and energy consumption could inform developments to these schemes.

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1. Introduction

Ofgem's approach to the energy policy debate

- 1.1 The principal objective of the Gas and Electricity Markets Authority is to protect consumers (including future consumers), wherever appropriate by promoting effective competition.¹ In so doing, the Authority has a range of general duties to which it must also have regard, including: the interests of certain priority consumer groups; the impact of the activities it regulates on the environment; efficient use of electricity and gas; the need for secure and diverse energy supplies; and safety.
- 1.2 Ofgem recognises that there are trade-offs to be made between low-cost energy supplies, environmental protection, and security of supply. Decisions in relation to these and other trade-offs are a necessary part of developing an energy policy for the UK. Ofgem welcomes the contribution to the energy policy debate made by the recent report of the Cabinet Office Performance and Innovation Unit,² and the further work being carried out by the Government as part of its preparation for publishing a White Paper. This document is part of Ofgem's ongoing contribution to the energy policy debate, and the process of developing ideas in advance of the White Paper.
- 1.3 In addition to this document, formally Ofgem's response to the government publication *Energy Policy: Key Issues for Consultation*, Ofgem has also considered the detailed recommendations in the PIU report that are addressed directly to Ofgem, and is responding to these in a separate document. Issues relating specifically to the New Electricity Trading Arrangements (NETA), and particularly the impact that NETA has had on smaller generators (including renewable generators and CHP plants), are not addressed in this document, but are covered in Ofgem's report on the first year's operation of NETA.³ Ofgem will continue to contribute to discussions of the scope of and priorities for the White Paper as appropriate. Ofgem is also organising an expert workshop on

¹ Ofgem operates under the direction and governance of the Gas and Electricity Markets Authority which sets all major decisions and policy priorities. Its powers are provided for under the Gas Act 1986 and the Electricity Act 1989, as amended by the Utilities Act 2000. The Gas and Electricity Markets Authority also has powers under the Competition Act 1998.

² The Energy Review: a Performance and Innovation Unit Report, February (2002).

³ The review of the first year of NETA, Ofgem (2002).

renewables and network issues (jointly with the DTI and the Institution of Electrical Engineers), to be held in September 2002.

1.4 There are a number of ongoing work programmes with which Ofgem is involved that are already addressing some of the important issues raised by the PIU.

- ◆ Ofgem and the Department of Trade and Industry (DTI) are members of the Joint working group on Energy Supply Security (JESS).⁴ JESS has a remit to monitor energy supply security, and to make six-monthly reports, the first of which was published in June 2002.⁵
- ◆ Ofgem and the DTI jointly chair the Distributed Generation Co-ordination Group, an industry steering group for addressing issues raised by the projected substantial increases in the amount of distributed generation. In addition, Ofgem plays an active role in the Technical Steering Group that is addressing both short- and longer-term issues.
- ◆ A major piece of work for Ofgem over the next two years will be the forthcoming Distribution Price Control Review for the period beginning in April 2005, and the possibility of increased amounts of renewable and fossil-fuelled distributed generation will be of considerable importance for this work.

The purpose of this document

1.5 A draft of the Secretary of State's proposed environmental and social guidance to Ofgem was laid before parliament in June 2002, and is likely to come into force later in 2002. This draft sets out the Government's broad objectives for environmental policy; an objective with clear significance for energy regulation is to reduce emissions of greenhouse gases. Commitments were made as part of the Kyoto Protocol to reduce overall UK greenhouse gas emissions; in addition, the Government also has more specific targets, including for UK carbon dioxide emissions, renewables and CHP (combined heat and power). The PIU and the Royal Commission on Environmental Pollution (RCEP) has made further recommendations for additional targets or strengthening of existing ones.

⁴ The terms of reference of the joint working group are described below, paragraph 2.49.

⁵ Joint Energy Security of Supply Working Group First Report, DTI (2002).

- 1.6 In responding to the Government's consultation on energy policy, Ofgem is seeking to contribute to the debate on how Government's environmental and energy policy objectives in general can best be achieved, recognising the trade-offs with other objectives that this may involve. Ofgem is keen to work with the Government and other stakeholders to meet these objectives. In preparing this response, Ofgem has not sought to reach a view on the costs associated with meeting these objectives, although clearly some of the proposals in the PIU report are likely to result in additional costs. Instead, it puts forward a framework for meeting these objectives most cost-effectively, and identifies areas where further work is required. In addition to the environmental debate, this response also looks again at the security of Great Britain's gas and electricity supplies.
- 1.7 This document covers four topics that are central to the energy policy debate, and which are directly relevant to Ofgem's statutory functions. Chapter two deals with security of gas and electricity supply; chapter three with energy policy objectives and instruments, concentrating on climate change; chapter four with renewables, distributed generation and networks; and chapter five with energy efficiency.

2. Gas and electricity supply security

2.1 In September 2001, as part of its submission to the PIU's review of energy policy, Ofgem set out a detailed description of the regulatory and legal background to security and diversity of gas and electricity supplies; the role of competitive markets in delivering security; and areas where barriers or distortions to the efficient operation of competitive markets may compromise security in the short and long term (for example, failure effectively to liberalise the European Gas and Electricity industry).⁶ The PIU's review of energy policy recommended that gas and electricity security could be enhanced by a variety of measures, including further action to liberalise international gas and electricity markets, and continued monitoring. The PIU considered that there appeared to be no pressing problems with regard to the UK's increased dependence on gas, including imported gas.

2.2 The purpose of this chapter is to:

- ◆ summarise the general framework for delivering gas and electricity security, including the role of competitive markets and regulation
- ◆ provide an update on developments in the gas and electricity wholesale markets, and
- ◆ describe the development of the monitoring framework which has been undertaken by JESS, including areas where further work may be appropriate to enhance monitoring.

Ofgem's duties

2.3 The Gas Act 1986 and the Electricity Act 1989, as amended by the Utilities Act 2000, give Ofgem and the Secretary of State the principal objective, in carrying out their functions, to protect the interests of consumers, wherever appropriate by promoting effective competition.

⁶ Performance and Innovation Unit Energy Policy Review, a submission by the Office of Gas and Electricity Markets (66/01), Ofgem (2001).

2.4 In furthering the principal objective of protecting the interests of consumers, Ofgem and the Secretary of State consider a number of general duties to which they are required to have regard, including:

- ◆ the need to secure that, so far as it is economical to meet them, all reasonable demands in Great Britain for gas conveyed through pipes are met, and
- ◆ the need to secure that all reasonable demands for electricity are met.

Subject to these requirements, Ofgem and the Secretary of State must carry out their functions in the manner considered best calculated to secure a diverse and viable long-term energy supply. Furthermore, in relation to the gas network, Ofgem may have regard to the interests of electricity consumers, and *vice versa*.

Defining supply security

2.5 The principal components of energy supply in Great Britain include energy carried over the electricity and gas networks (and the associated upstream primary inputs), the supply of liquid fuels for transportation, and the supply of solid and liquid fuels for heating and industrial processes. Ofgem's duties and functions in regard to security of energy supply cover only energy carried over the gas and electricity networks in Great Britain. Ofgem is not responsible for regulating or licensing the offshore parts of the gas sector, and has limited responsibilities and influence over gas and electricity interconnectors and gas terminals. Nevertheless, Ofgem has an interest in the operation of the offshore parts of the industry as it affects operations onshore, which would include security of supply concerns.

2.6 Since natural gas has a significant and increasing share of the fuel mix for electricity generation, Ofgem is aware of the need to consider the interactions between the two markets and networks with regard to supply security. In contrast, Ofgem considers that other parts of the energy supply chain (for example, supply of transportation fuels) raise separate and distinct issues with respect to energy supply security, falling outside Ofgem's remit and duties.

- 2.7 Ofgem considers that a secure supply system is one which ensures that reasonable demands for gas and electricity are met economically. A lack of supply security could lead either to the physical inability to deliver gas and electricity to consumers (at any price), or to gas and electricity prices rising to artificially high levels. Ofgem aims to ensure that prices reflect the cost of delivering gas and electricity to consumers in an efficient manner, through effective regulation of the network businesses, and through the monitoring of wholesale and retail gas and electricity markets to help ensure that competition is effective.
- 2.8 Competitive gas and electricity markets entail a degree of price volatility, reflecting, for example, the changing costs of primary inputs and of balancing gas and electricity networks in response to changing demand and supply. Changing prices are important in allowing efficient operational decisions to be made by the many participants in the gas and electricity supply industries, and in signalling the need for new investment. In particular, if prices in the wholesale gas and electricity markets are not free to rise as supply and demand conditions change then market participants may not invest to achieve an efficient level of supply security. Ofgem regards it as beneficial that some gas and electricity consumers are able, where they benefit from so doing, to cut back their demands (or to sell-on rather than consume energy supplied to them) in response to price signals.
- 2.9 A secure supply system should be able to withstand shocks, which will be unpredictable in timing and severity. Shocks are likely to range from those which have relatively low impact, but which occur often, to those with severe impacts that occur very rarely. It is important that the risk of insecurity associated with the full range of such shocks is appropriately taken into account.
- 2.10 Even with efficient operation of gas and electricity networks, there is likely to be a certain level of supply interruptions due, for example, to adverse weather or equipment failures. To put this another way—there is likely to be a point beyond which the benefits of reducing the level of interruptions (ie, increasing supply security) would not justify the additional expense of doing so (and, consequently, the resultant higher prices). It has always been recognised that it is not possible to guarantee energy supplies to all consumers in all circumstances.

Ofgem considers it important that consumers have as much opportunity as possible to choose how they manage their exposure to supply risks, and to signal their willingness to pay for gas and electricity security through the operation of a competitive gas and electricity supply market.

Delivering gas and electricity supply security

2.11 Gas and electricity supply security is delivered through two principal mechanisms.

- ◆ A competitive market framework allows market participants to compete on price, service level, and choice of product, and allows prices to signal to investors the returns available from new investment (for example, in new electricity generating capacity).⁷
- ◆ Ofgem ensures that efficient operation, maintenance and enhancement of the network monopolies can be financed from regulated revenues, and applies regulatory incentives rewarding improved standards (for example, in relation to customer minutes lost from failures in electricity distribution). In addition, enforceable licence conditions, impose minimum standards where consumers are not able to choose their own preferred standards, or where transaction costs would preclude individual standards. For example, transmission network operators are required to plan their systems to certain minimum design standards.

2.12 It is Ofgem's view that the operation of competitive markets can best deliver diversity and security of supply in gas and electricity. In relation to gas and electricity transmission and distribution networks, where the development of competitive markets is limited by the existence of natural monopolies, it is important to have effective regulation to ensure diversity and security of supply.

⁷ Where competition is relied upon to protect consumers' interests, Ofgem has a range of monitoring and enforcement powers to ensure that competition is operating effectively (for example, powers under the Competition Act 1998).

The role of competitive markets in delivering security of supply

- 2.13 It is Ofgem's view that any barriers or distortions to the efficient operation of the competitive gas and electricity markets should be identified, and addressed if they are likely to have a material effect on achieving adequate security of supply. Government or regulatory intervention beyond addressing such material barriers or distortions may impose additional, unnecessary costs. With the support of an effective regulatory regime, and the enforcement of competition law, Ofgem is firmly of the view that it is appropriate to promote effective competition as the main tool used to deliver supply security.
- 2.14 Companies trading in gas and electricity markets risk exposure to very significant contractual penalties in the event that they are not able to match their commitments to supply with the ability to source secure supplies. Hence the interests of consumers and market participants are broadly aligned with respect to supply security.
- 2.15 Where investment in supply security is being delivered through the operation of competitive markets, it is important to recognise that government intervention to increase security (for example, by investing in new capacity) might have the effect of *displacing*, rather than adding to, private investment. Hence the intervention could have the effect of subsidising the cost (either to market participants or to final consumers) of supply security, without increasing the level of security provided. For example, if forward electricity prices are the signal of or the need for investment in new generating capacity, government action to commission a new power station before forward prices reached the level at which private investment would be justified would depress forward prices and delay further private investment.
- 2.16 Furthermore, private investment in gas and electricity markets is made following an assessment of the returns on the investment that might be delivered by the market. In addition to any direct effects through energy prices, investors' views of potential returns could be influenced by the threat of government intervention. Since such intervention, if it occurred, could undermine (strand) some private investment, the threat of intervention could result in increased risk premia (ie, investors might require a higher expected rate of return on their

investment) and hence reduced amounts of private investment. Similar arguments would apply to any threat, or perceived threat, of government action to prevent prices rising to market clearing levels,⁸ irrespective of the proposed mechanism of action.

- 2.17 An issue related to the threat of government intervention in gas and electricity markets is that of regulatory uncertainty. In this regard, there are significant benefits from the existence of independent economic regulators that are required to pursue well-defined statutory duties. Moves to reduce regulatory independence from the Government would be likely to increase the risks perceived by investors, and hence increase the cost of capital, with consequent reduction in private investment and security of supply.
- 2.18 A significant proportion of gas and electricity is consumed by large industrial and commercial customers that can respond to short-term price signals (whether by participating directly in trading markets, through the agency of their energy supplier, or by contracting with the gas and electricity transmission system operators to provide balancing services). This flexibility allows markets to clear at lower prices than would otherwise be the case. In the longer term, advances in metering technology and increased competition may increase demand-side flexibility for domestic and smaller commercial or industrial consumers, thereby further reducing the costs of achieving desired levels of supply security.

The role of effective regulation in delivering security of supply

- 2.19 Where there are fundamental barriers to the introduction of competition, or where competition is insufficiently developed, Ofgem uses its regulatory powers to discharge its duties with respect to security of supply. In particular, Ofgem seeks to implement effective regulation of the monopoly activities of the network operators.
- 2.20 Ofgem's work in regulating the network monopoly parts of the gas and electricity industries includes determining the framework within which networks are maintained and new capacity is added. The security of supply dimension is implicit in all of this work, including, for example, the specification of technical engineering standards, included in licences, and reviewing expenditure

⁸ market clearing refers to the process by which demand and supply balance through changes in price alone

programmes as part of the price control review process. In addition, regulatory incentives are in place (for gas) or are being developed (for electricity) under which the system operators are incentivised to respond promptly and efficiently to signals of their customers' future needs for transmission system capacity (paragraphs 2.41–2.46 below).

- 2.21 For both electricity and gas transmission systems, the system operator is obliged to (and has commercial incentives to) ensure that the system is balanced in real time, thereby ensuring short-term security of supply. The system operator is free to achieve this using a number of different mechanisms available in the market, and is incentivised to minimise the cost of doing so. Hence, for example, the electricity system operator can contract with generators to provide a certain amount of standby capacity, to be called on if required to balance physical demand and supply positions.
- 2.22 The existence of some transmission constraints is a normal feature of an efficiently operated network, and does not itself give rise to concerns about inadequate security of supply. Excessive levels of constraints, arising from inadequate investment, can, however, lead to artificially high prices and possibly also to increased risks to supply security, which may be leveraged further upwards if the constraints facilitate the exploitation of local market power. Since those market participants who can potentially benefit from the exploitation of market power may favour low levels of investment in network capacity, it is important that the underlying issues be effectively addressed. Ofgem is, therefore, tackling these issues by ensuring that the structure of gas and electricity markets in Great Britain is conducive to effective competition (to hinder the development of local monopolies when constraints arise), and by ongoing work on the development of more effective regulatory incentives for investing in new network capacity (described below in paragraphs 2.41–2.46).

Recent performance of the gas and electricity supply systems

- 2.23 As a greater portion of the gas and electricity sectors has been opened to full competition, gas and electricity prices have fallen. At the same time, there have been no serious widespread gas or electricity supply interruptions.

- 2.24 The frequency and severity of interruptions due to network failures have been falling in recent years (although, as in the past, severe weather events have caused interruptions on occasion). Ofgem expects that the recently implemented Information and Incentives Project⁹ will result in further reductions, now that electricity distribution companies have a direct financial incentive to improve their performance. Companies that outperform their targets for number and duration of interruptions in 2004–5 will receive a revenue uplift of up to 2 per cent. Companies under-performing their targets will be penalised by up to 1.75 per cent of revenue.
- 2.25 It is important that the regulated companies deliver not only good performance in the short term, but also undertake effective asset stewardship for the longer term. Ofgem is currently implementing the Asset Risk Management project¹⁰ to provide assurance and promote best practice in this area.
- 2.26 Asset Risk Management refers to the policies and practices used by companies to gather, analyse, and act on information, and review the effects in relation to the assets that are integral to the service performance of the network businesses. The project covers the major electricity and gas network companies of Great Britain, and will result in a survey, to be completed in late 2002, followed by a seminar for Ofgem and the participating companies. The survey process will also be reviewed and developed for operation in future years.
- 2.27 Following the introduction of the New Electricity Trading Arrangements (NETA), which has resulted in a much greater degree of competition in the wholesale electricity markets, there have been no non-network related supply failures, and trading arrangements have proved robust, both relative to past standards in Great Britain and relative to electricity markets in Europe and North America (coping, for example, with the collapse of Enron and the consequent transfer and unwinding of very significant trading positions).

⁹ Information and incentives project—Incentive schemes: Final proposals, Ofgem (2001).

¹⁰ Asset Risk Management in electricity and gas networks—Conclusions on framework and proposals for the survey, ref 30/02, Ofgem (2002).

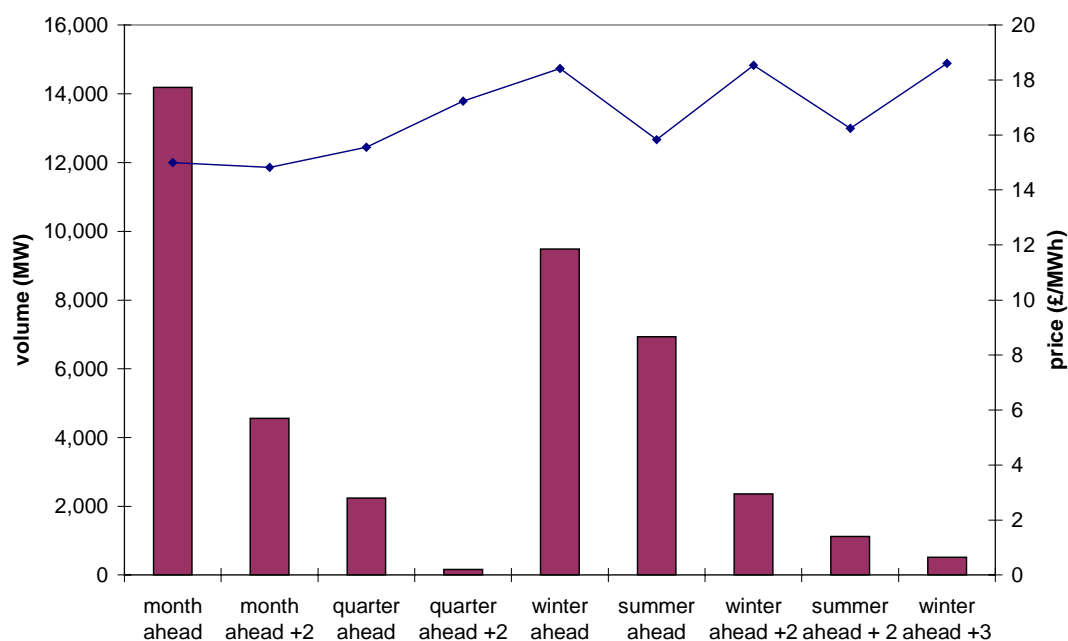
Future gas and electricity supply security

- 2.28 Future supply security will require the availability of sufficient supplies of gas and electricity, as well as adequate provision of network capacity and efficient balancing of the gas and electricity systems in real time. Broadly speaking, Ofgem expects new investment to be driven by market-based price signals. Investment in new network capacity will continue to be determined by a combination of forecasting by the network operators and regulatory incentives linked to the demand for the new capacity, but with increasing emphasis on the latter. Increasingly, therefore, investment across the industry will be driven by the views of a range of well informed network users, rather than simply by the view of one network operator/owner.
- 2.29 The interaction between gas and electricity networks is likely to be particularly important in reviewing planning for emergency response measures. This is addressed below (paragraph 2.52).

Non-network investment

- 2.30 As recent gas and electricity wholesale trading reforms continue to bed in, Ofgem expects that price signals of the need for new investment will grow stronger. Forward prices in both electricity and gas can already be observed up to three years ahead, and there is significant trading relating to energy delivery further out into the future. As shown in the chart below, reported traded volume of winter-ahead contracts currently represents around 70 per cent of month-ahead traded volume. As market participants adjust their behaviour in response to the new gas and electricity trading arrangements, forward trading may develop further, and new investment will be made on the basis of the revealed forward price curves. There have also been a number of examples recently of contracts signed for periods beyond the end of the reported forward curve, including Centrica's new gas supply contracts with Gasunie and Statoil.

Figure 1: Forward trading in electricity¹¹



Source: Ofgem calculations based on Heren market reports.

Electricity

2.31 In electricity generation, plant margins¹² are currently generous (total installed capacity in Great Britain is around 25 per cent in excess of peak demand), in comparison with levels in the recent past. In addition, forecasts of plant margin based on NGC's Seven Year Statement (and described in the first JESS report) indicate that margins are likely to remain above the notional 20 per cent planning margin that NGC, taking into account international experience, believes to be appropriate;¹³ NETA is now providing stronger rewards for reliable operation of generating plant.

2.32 Generation plant margins could fall if generators mothball plant (or exit the market) in response to low wholesale prices, and, in fact, such behaviour would

¹¹ Source: Ofgem analysis of Heren market reports; the data represents the sum of all contract volumes reported as having been traded in May 2002, and the average prices reported for those trades.

¹² NGC's definition of plant margin is the amount by which the total installed capacity of directly connected Power Stations and embedded Large Power Stations exceeds the net amount of the ACS (average cold spell) Peak Demand less the total imports from External Systems, where ACS Peak Demand is the estimated winter peak during a cold spell which has a 50 per cent chance of being exceeded as a result of weather variations alone.

¹³ NGC's forecasts do not assume any plant closure beyond that formally notified; furthermore, NGC's role in relation to plant margins is purely to collect information on generators' plans, for the purposes of ensuring that transmission grid security remains within the parameters set out in the relevant codes.

be expected from a competitive generation market in response to sustained low prices. While this process does not threaten the adequacy of plant margins at present, Ofgem recognises the need to ensure that information about plant mothballing is available and well understood, including information about the time required to return plants to the market (currently, it is estimated that most plant can come back on to the system within about a month). Work is underway to review the availability of information on mothballing, as well as the factors determining return times for various different plants. Similarly, as part of its ongoing work, Ofgem is seeking to identify and address remaining obstacles to increased flexibility on the demand side (which might dampen customers' responses to price signals), since increased flexibility serves as an alternative (or supplement) to plant margins in ensuring security of supply.

- 2.33 Diversity of fuel input types (or sources) for electricity generation can contribute to security by diversifying the risk of upstream supply interruption. Ofgem considers that the share of gas in electricity generation raises two important issues: first, interactions between the gas and electricity networks need to be evaluated and any potential problems found need to be addressed; and, second, access to European (and wider) gas and electricity networks and markets will become increasingly important for UK consumers (possibly including access to Liquefied Natural Gas supplies). Ofgem does not consider that further increases in the share of gas used in electricity generation will raise any major security of supply concerns, provided that these two issues are accorded sufficient attention. It is a characteristic of competitive markets that they tend to recognise the risks associated with supply chains and with over-reliance on a single source of fuel, and provide financial incentives to develop parallel sourcing where appropriate.

Gas

- 2.34 Access to European and wider gas networks and markets will assume increasing importance if, as is currently projected, the UK becomes a net gas importer (albeit at modest levels compared with some other EU Member States). Open access to networks, and competition in gas supply and transportation, would allow UK gas suppliers access to diverse gas sources at competitive prices. Without open access and liberalisation of European gas markets, there is a risk

that gas consumers in the UK will be exposed to uncompetitive prices, or will not be able to access the full range of possible sources of gas. Accordingly, Ofgem considers it to be important that liberalisation of European gas markets continue, and that regulation of these markets be effective; Ofgem would encourage the Government to press for these objectives. In particular, in Ofgem's view, there are significant weaknesses in the legislation presently being considered by the European Commission, and the results of the liberalisation process to date (especially when considered in the context of the evolving industry structure) have been limited. Third-party access to offshore gas pipes also remains potentially a significant problem. European competition policy in the energy sector could be more vigorous, and the current European emphasis on market opening at the retail level is likely to be much less effective in the absence of strong action on vertical separation between transportation and supply.

2.35 Ofgem made proposals in February 2002 to reform the gas balancing regime, designed, among other things, to increase security of supply by promoting more competition between gas shippers and by providing for greater consistency in balancing arrangements for gas and for electricity.¹⁴ Ofgem's proposed reforms include three main elements: balancing periods shorter than the current one day; the sale to shippers of the linepack (storage) available in Transco's system; and better incentives for the provision of accurate information to Transco. These proposals are designed to address the weaknesses of the current gas balancing regime, which Transco has raised with Ofgem.

2.36 Ofgem expects future investment in gas storage facilities to be made in response to price signals. As with investment in electricity generating capacity, it is important that, once a requirement for additional capacity has been identified, new facilities can be constructed in a timely way. Planning delays can increase significantly the lag-time between the signal that investment is required and the provision of new capacity. Hence it is important that planning delays are no longer than necessary, and that the planning process takes account of the potential costs of delay, as well as the balance of benefits and disbenefits associated with the project. Unpredictability of outcome and timing of the

¹⁴ The New Gas Trading Arrangements, Reform of the gas balancing regime, Revised proposals, Ofgem (2002).

planning process is also likely to deter investment; hence it is also important that this uncertainty be reduced where possible.

- 2.37 The PIU concluded that there is currently no need to restrict the market share of gas in the electricity generation mix. Ofgem would agree that current and projected levels of gas-fired generation do not, *per se*, raise concerns. Furthermore, Ofgem is of the view that intervening to restrict the share of gas in the electricity generation mix would result in unnecessary costs (to consumers), not least by undermining the confidence of market participants in the future of competitive gas and electricity markets.

Network investment

- 2.38 Network investment depends partly on forward-looking planning activities undertaken by the network operators, and partly on investment incentives delivered through the price controls and system operator incentive schemes.
- 2.39 Transco and NGC have a number of duties to fulfil in order to ensure the long-term security of the respective transmission systems. Transco's gas transporter licence obliges it to plan and develop its pipe-line system so as to enable it to meet the peak aggregate daily demand for gas which is likely to be exceeded only in 1 out of 20 years. NGC is obliged to plan its system such that the flows likely to result under conditions of peak demand in 'average cold spell' conditions can be met, taking into account demand, generation, and system availability contingencies.¹⁵

¹⁵ The details of NGC's transmission system planning criteria are described in NGC Transmission System Security and Quality of Supply Standard, Issue 2, NGC (2000).

2.40 NGC and Transco are also obliged to produce forecasts that will allow their customers to plan their own activities. Transco must produce a statement including forecasts of the likely use of the pipe-line system over the succeeding ten years, and the likely developments of the system which may affect connection and transportation charges and terms. This statement must be revised annually. NGC must prepare a similar annual statement for the succeeding seven years. This includes forecasts of power flows and loading on each part of the transmission system, and must also include:

- ◆ information as shall be reasonably necessary to enable those seeking to use the system to identify and evaluate the opportunities available, and
- ◆ views as to those parts of the transmission system most suited to new connections.

2.41 System operation incentives have been placed on NGC to encourage it to operate its system efficiently and economically. Similar incentives in relation to the operation of the gas transmission system for Transco have been proposed by Ofgem.¹⁶

2.42 In addition to these proposed system operation incentives, Ofgem has also proposed strengthening the incentives on Transco to meet changes in the demand for network capacity in a timely and efficient manner. It is currently proposed that Transco would offer for sale financially firm tradable short and long-term capacity rights at entry terminals through a series of auctions for up to fifteen years ahead.

2.43 Emerging market signals from the auctions and subsequent trading will enable Transco to plan its future investment more effectively. In particular, Transco will have strong financial incentives to deliver more capacity than is forecast in the price control in response to signals created by the long term auctions and the secondary trading of capacity rights. Under the proposed investment incentive scheme Transco would be able to earn incentive revenues based on a higher

¹⁶ Ofgem issued a notice under section 23 of the Gas Act 1986 in respect of proposed modifications to Transco's gas transporter licence to introduce, with effect from 1 April 2002, new price controls and system operator incentives for Transco. Having considered the responses to this consultation Ofgem identified a number of changes to the proposed modifications and on 1 August 2002 issued a further section 23 notice. Ofgem is currently awaiting responses to this further consultation.

rate of return for a rolling five-year period from the date when the additional capacity is delivered.

- 2.44 In addition, to the extent that Transco's customers will have entered binding commitments to purchase entry capacity, Transco will either have to invest in its network to deliver any additional capacity to which rights have been sold in the auctions, or, in the event that physical capacity is less than the total capacity rights being exercised, Transco will have to buy back some rights on the open market, potentially at a financial cost to itself.
- 2.45 Since Transco will potentially be exposed to the costs of under-providing network capacity (ie, costs of purchasing capacity rights likely to be exercised that would exceed the physical capacity of the system), and will be able to keep additional revenues from investing in additional capacity, it will have strong incentives to respond efficiently to its customers' requirements for network capacity.
- 2.46 Such capacity investment incentive arrangements do not currently apply to NGC in respect of the electricity transmission system, but Ofgem intends to introduce similar arrangements from April 2003. Thus, access to NGC's transmission system would involve firm, tradable access rights. NGC would be exposed to the costs of constraints where it fails to deliver the capacity outputs agreed as part of its Transmission Price Control, and it would be allowed to earn additional revenues from exceeding the agreed outputs in response to customers' signals of the need for additional capacity.
- 2.47 Ofgem remains concerned that there are no provisions within the Gas or Electricity Acts to ensure that, in the event of a major network business becoming insolvent, supply would not be disrupted. Although the risk of insolvency is mitigated to a degree by the ring-fencing conditions in the relevant licences, these do not obviate the risk, and there remains considerable uncertainty as to the outcome in the event that insolvency nonetheless occurs. It is for this reason that Ofgem has been urging the Government to introduce Special Administrator arrangements, such as currently exist for the railways, air traffic control, and water industries.

2.48 It is also Ofgem's view that, in respect of network development, it is important that the planning process take account of the potential costs of delay and of uncertainty of timing and outcome.

The Joint working group on Energy Supply Security

2.49 The DTI and Ofgem jointly chair the working group on energy supply security (JESS), which published its first report in June 2002.¹⁷ The terms of reference of the group are as follows.

To assess the available data relevant to security of supply, to identify the gaps in that data and develop appropriate indicators;

To monitor at a strategic level, over a timescale of at least seven years ahead,

(a) the availability of supplies of gas;

(b) the availability of supplies of electricity and fuels used for electricity generation;

(c) the adequacy of generating capacity; and

(d) the adequacy of the UK's gas and electricity infrastructure;

To assess whether appropriate market-based mechanisms are bringing forward timely investment to address any weaknesses in the supply chain that are anticipated;

To identify relevant policy issues and consider implications.

2.50 The remit of JESS is thus one of monitoring the operation of gas and electricity markets in relation to supply security. Ofgem will continue to work with the DTI in JESS, to publish forward-looking indicators on supply security for both gas and electricity.

¹⁷ Joint Energy Security of Supply Working Group, First Report, DTI (2002).

Emergency Response Measures

- 2.51 In the event of a serious disruption to gas and electricity supplies, for whatever reason, the Government has a range of powers to intervene. Interventions could, for example, be aimed at prioritising supplies to key consumers, or co-ordinating the management of limited energy stocks. While Ofgem would not have a formal role in such intervention, Ofgem does participate in development of emergency response plans.
- 2.52 One issue of particular importance is the interaction between gas and electricity supply security due to the operation of gas-fired power stations, which are supplied (in general) through the same network that supplies gas to domestic and industrial consumers. In the event of an interruption of gas supplies, end consumers must be actively re-connected by qualified technicians, due to the risk of air having entered de-pressurised supply pipes, or pilot-lights failing to re-ignite (unlike electricity supplies which can be reconnected without the need for intervention). For this reason, domestic consumers would be the last to be disconnected in the event of a supply failure. Correspondingly, gas-fired power stations might have to be constrained not to operate.

Key Points

- 2.53 It is Ofgem's view that competitive markets, together with effective regulation of those parts of gas and electricity networks where competition is not currently feasible, will deliver security of supply most efficiently and effectively. As markets continue to evolve in response to the recently-introduced gas and electricity wholesale trading arrangements, Ofgem expects price signals to become increasingly effective in indicating the value of capacity in all parts of the gas and electricity systems, and in identifying where new investment is required to meet demand and maintain supply security.
- 2.54 Ofgem will continue to work on indicators of energy supply security and market responsiveness, with the DTI, through the Joint working group on Energy Supply Security. Further work will also be carried out in other areas, including, for example, developing market-based investment incentives for the electricity transmission system operator, and analysing the response of the demand side to prices.

3. Policy objectives and instruments

3.1 The current government consultation is part of a process that will lead to the publication of a White Paper on energy policy, which will contain the Government's response to the RCEP's report on energy and climate change. This chapter of Ofgem's response to the government consultation concentrates on the challenge of reducing emissions of greenhouse gases; Ofgem's views are summarised as follows.

- ◆ The White Paper process is an opportunity for a fundamental review of energy and climate change policy, and should include analysis of both objectives and the instruments through which they are best to be achieved. It should include a genuinely radical examination of options, and assessment of the instruments and schemes currently in place.
- ◆ Existing schemes in the energy sector addressing climate change have been designed to address multiple objectives, some related to climate change and some unrelated. It is clear that the existence of multiple objectives significantly reduces the efficiency of the instruments in achieving any of the objectives, and also obscures and confuses the implied trade-offs between them.
- ◆ Existing schemes in the energy sector that address climate change imply a valuation of the consequent reduction in greenhouse gas emissions. Valuations implied by the instruments cover a wide range, indicating that the current mix of schemes is likely to be more expensive than a broader instrument aimed exclusively at reducing greenhouse gas emissions.
- ◆ The Government's approach to reaching its climate change objectives should move from the current position, consisting of a set of specific schemes with multiple objectives, to a greater reliance on a broad instrument with the single objective of reducing greenhouse gas emissions.
- ◆ The Government should examine how the balance of resources could move towards a broad instrument targeting greenhouse gas emissions

without undermining or stranding investments that have already been made in response to the existing targeted schemes.

Review of energy policy objectives and instruments

- 3.2 The Government has a range of different objectives that are implemented, in whole or in part, through instruments in the gas and electricity sectors. This chapter sets out an approach that could be taken to designing instruments to deliver future objectives in the gas and electricity sectors, as these evolve from the current set of objectives and schemes.
- 3.3 The RCEP, in its report *Energy: The Changing Climate*,¹⁸ suggested that the UK might need to cut its emissions of greenhouse gases to 60 per cent below 1990 levels by 2050. However, it also recognised that effective action to reduce emissions must involve the whole international community.
- 3.4 Whatever level of emission reduction is to be attempted, instruments should be designed to deliver that level of reduction at least cost to consumers.¹⁹ This chapter examines how climate change policy in the energy sector could be developed, consistent with this overall aim. As part of its role in implementing components of the Government's energy policy, Ofgem will continue to provide feedback and advice in light of its experience.
- 3.5 Objectives can be narrowly-focussed on specific activities, or broadly defined in terms of general outcomes. For example, the overall high-level objective of the UK climate change programme is to reduce greenhouse gas emissions; within that programme, the Government's combined heat and power (CHP) strategy aims to deliver 10GW of installed CHP capacity by 2010, as an intermediate objective. A great variety of activities across the economy could potentially contribute to achieving the objective of the Climate Change Programme, whereas the CHP strategy is necessarily focussed on a narrow set of activities.
- 3.6 Progress towards different objectives can be influenced simultaneously by the same actions or events. For example, a fall in energy prices helps alleviate fuel

¹⁸ Energy—The Changing Climate, Royal Commission on Environmental Pollution (2000).

¹⁹ The assessment of cost-effectiveness may be complicated by a number of factors, including, for example, the need to weight the interests of present and future consumers. In the context of climate change, which is

poverty, but also tends to increase energy consumption, and hence greenhouse gas emissions; increased generation of electricity from renewable sources both increases diversity of energy supply and reduces greenhouse gas emissions.

- 3.7 Instruments or schemes such as the Renewables Obligation are the mechanisms through which policy objectives are achieved; they may be focused on inducing specific actions, or on a broader objective (where a range of different activities could contribute to achieving the objective). Some policy instruments are designed simultaneously to deliver progress towards more than one policy objective.

Instruments having multiple policy objectives are not efficient

- 3.8 Developing a balance between high-level objectives, such as between the interests of priority customer groups and global climate change, is an important part of the Government's policy-making process. However, where a particular objective can be specified in terms of a measurable output (such as renewable electricity or greenhouse gas emissions), the choice of actions required to achieve that output can be left open. This distinction is particularly relevant in the context of energy policy, because Great Britain's gas and electricity markets are competitive, and instruments can be designed to work with markets to deliver objectives efficiently (ie, at least cost to consumers). Nevertheless, it can be difficult to design instruments to capture all relevant costs and benefits.
- 3.9 Economic instruments work by influencing behaviour through a market-based mechanism. Such instruments typically determine what is to be delivered, but not how it is to be delivered. This allows individuals (consumers or suppliers) to decide how to respond to the instrument in the most cost effective way (or to invest in innovating to find new ways of responding). These instruments minimise restrictions on consumer choice, and can provide incentives to bring forward innovative solutions.
- 3.10 Economic instruments have the capacity to minimise costs to consumers and avoid unintended market distortions. However, because they specify overall outcomes, but not the detailed mix of actions required to achieve the outcome,

a long-term issue, the appropriate measure of cost-effectiveness is also likely to be a long-term one (ie, cost-effectiveness of a measure should be assessed over the whole period during which emissions are reduced).

it is difficult to apply broad instruments to situations where there are multiple objectives (and related targets). An economic instrument could allow the market to determine whether investment in renewables or in energy efficiency is the cheaper way to reduce greenhouse gas emissions; however, the market cannot determine the most appropriate balance between investment in energy efficiency to reduce fuel poverty and investment in renewables as part of a diverse energy mix. In some circumstances, a greater degree of diversity of response than that delivered by a pure economic instrument might be considered desirable. Specific, targeted schemes could then be used, in conjunction with a broad economic instrument, to deliver a more diverse response.

- 3.11 Where objectives are to be delivered through the operation of competitive markets, it is helpful, as a matter of principle, to focus the design of instruments on ensuring that market participants face the full costs and benefits of their actions (ie, internalising external costs and benefits)—by pricing greenhouse gas emissions, for example. In relation to fossil fuel use, an external cost arises because energy (and other) market participants do not bear the cost of emitting greenhouse gases—this cost falls on society as a whole, which has to mitigate the impacts of global warming. If this external cost were internalised, and all greenhouse gas emitters had to bear the full costs of their emissions, market pressures would lead to emissions falling to an efficient level.

Objectives and implied valuations of existing schemes

- 3.12 There are many existing schemes in the gas and electricity sectors relating to climate change policy objectives. The trend in recent years has been for a greater emphasis on economic instruments and market-based mechanisms; the remainder of this chapter describes the existing schemes, and examines how, in developing policy in this area, this trend towards broader market-based mechanisms might continue. While market-based mechanisms can also be applied to other important objectives in the gas and electricity sectors (for example, fuel poverty), climate change policy stands out as being particularly amenable to the application of broad economic instruments, and current policy risks significant inefficiencies through a multiplicity of schemes, each with multiple objectives.

3.13 Existing gas and electricity schemes aimed partly or wholly at reducing greenhouse gas emissions include:

- ◆ the Renewables Obligation
- ◆ the Energy Efficiency Commitment
- ◆ the Climate Change Levy and associated Negotiated Agreements, and
- ◆ the Emissions Trading Scheme.

While this is not a complete list, it serves to illustrate the points that some instruments have multiple objectives, and that different instruments aimed at the same objective imply very different values on reducing greenhouse gas emissions. Paragraphs 3.14–3.42 below set out the objectives and indicative estimates of the carbon valuation for each scheme, judged against the single objective of reducing greenhouse gas emissions. These estimates of carbon valuation are subject to considerable uncertainty; nevertheless, they indicate that the valuations implied by existing schemes cover a fairly broad range.

The Renewables Obligation

3.14 Government policy on renewables, within which the Renewables Obligation is the major scheme, has five objectives: 'to assist the UK to meet national and international targets for the reduction of emissions including greenhouse gases; to help provide secure, diverse, sustainable and competitive energy supplies; to stimulate the development of new technologies necessary to provide the basis for continuing growth of the contribution from renewables into the longer term; to assist the UK renewables industry to become competitive in home and export markets and, in doing so, provide employment; to make a contribution to rural development.'²⁰

3.15 The specific aims of the Renewables Obligation itself are 'to encourage the uptake of renewable power generation sources by the electricity supply industry

²⁰ The Renewables Obligation Preliminary Consultation, DTI (2000).

by developing the market for electricity from renewable sources, and to reduce emissions of greenhouse gases'.²¹

- 3.16 The Renewables Obligation will reduce UK greenhouse gas emissions because it creates a market for Renewable Obligation Certificates (ROCs), and qualifying renewable generators are thus able to sell both their electrical output and ROCs, hence increasing the potential for commercially viable investment in renewable generation. New qualifying renewable generation, which is carbon-free, is likely to displace output from conventional fossil-fuelled generation. The price of ROCs is one measure of the cost of increasing renewable generation through the Renewables Obligation, although, since renewable generators are likely to generate for many years, the whole-life cost may be very different from the cost in any one year.²² The quantity of greenhouse gas emissions displaced depends on the marginal carbon intensity of electricity (ie, on the emissions that would have been associated with the output generated from fossil-fuelled stations).
- 3.17 As the level of the Renewables Obligation is gradually increased to 10.4 per cent by 2010, the level of support available to generators will tend to reflect the difference between actual aggregate renewable output, and the aggregate total target. If the target is under-shot at an aggregate level, the level of support will tend to increase (on a per kWh basis), through the operation of the buy-out mechanism, which, in effect, raises the value of ROCs above the buy-out price if ROCs are in short supply. At the same time, the total cost to consumers is likely to be capped indirectly at 3p (in real terms) per kWh of the aggregate target (£30/MWh), again via the operation of the buy-out mechanism.
- 3.18 An estimate of the current price of ROCs can be obtained from the difference between the prices realised in February 2002 NFPA²³ auction of renewable electricity output, and those realised in the preceding August 2001 auction. This difference amounts to around 3.9 p/kWh.

²¹ Regulatory Impact Assessment: The Renewables Obligation Order 2002, DTI (2002).

²² Factors such as planning delays could result in ROC prices rising above the cost of producing them; in this case the economic cost of the renewables obligation would be lower than the cost to consumers, the difference being retained by renewable generators as excess profits.

²³ The NFPA (Non-Fossil Purchasing Agency) has long-term electricity purchase contracts with renewable generators resulting from the Non-Fossil Fuel Obligations; the NFPA auctions the output from these generators (and the associated ROCs) every six months.

- 3.19 DEFRA advises that a figure of 0.43 kgCO₂/kWh (equivalent to 0.12 kgC/kWh) be used as an average factor to convert electricity consumption to carbon dioxide emissions. A figure of 0.52 kgCO₂/kWh can be derived from total UK electricity generation and total UK carbon dioxide emissions from electricity generation.²⁴ The DTI estimate a marginal figure of 0.38 kgCO₂/kWh, based on a gas-fired plant operating at 50 per cent efficiency.²⁵
- 3.20 Combining these figures gives a range of around £210–380/tC for the value of reducing greenhouse gas emissions implied by the Renewables Obligation, assuming that the aggregate target is met or almost met.
- 3.21 The Renewables Obligation sets an exogenously-determined total amount of support for the supply of renewable electricity, increasing in proportion to the aggregate target, and incentivises market participants to deliver as much renewable output as possible for this level of support. It does not set a level of support per kWh of renewable output, and does not fix the level of implied valuation of reducing greenhouse gas emissions. The level of support is effectively linked to the cost of generation, but is not linked to an estimate of the value of the output (in terms of reducing greenhouse gas emissions, for example).
- 3.22 The Renewables Obligation is an example of a market-based economic instrument. It allows the market to determine, for example, the most cost-effective mix of qualifying renewable technologies, and the most cost-effective locations for new generators. However, the output is specified in terms of renewable electricity, which is a subsidiary objective within the overall climate change programme. There is very limited possibility for exchange with other instruments aimed at achieving reductions in greenhouse gas emissions.²⁶

²⁴ Ofgem calculations.

²⁵ Regulatory Impact Assessment: The Renewables Obligation Order 2002, DTI (2002).

²⁶ ROCs can be sold *into* the Emissions Trading Scheme, but cannot be purchased from it; the Government has proposed that action taken by energy suppliers under EEC could be converted into permits to be sold into the Emissions Trading Scheme (but not *vice versa*).

The Energy Efficiency Commitment

- 3.23 Amendments to the Gas Act 1986 and the Electricity Act 1989 by the Utilities Act 2000 allow the Government to impose an obligation on electricity and gas suppliers to achieve energy efficiency targets. The purpose of the obligation is: to make a significant contribution to the UK's legally binding target to cut greenhouse gas emissions and its domestic goal to cut emissions of carbon dioxide; to help electricity and gas consumers to use less energy or to enjoy greater comfort; and to give particular help to lower income consumers who spend a larger proportion of their income on energy, contributing to the alleviation of fuel poverty.²⁷ There are three major contributors to fuel poverty: income, energy prices, and the energy efficiency performance of the home. The elderly, rural households, those in the private rented sector, and consumers whose first language is not English are statistically more likely to be in fuel poverty.
- 3.24 The Energy Efficiency Commitment (EEC) obliges energy supply companies to support domestic energy efficiency investment over the period 2002–5. The total energy efficiency savings to be achieved under EEC is 62 TWh, as a sum over all qualifying fuels, weighted according to carbon dioxide emission factors (ie, over the course of the commitment period, new energy efficiency measures are to be installed which will, over the assumed lifetime of the measures, result in the saving of a discounted total of 62 fuel-weighted TWh). This is approximately equivalent to 1 per cent of domestic-sector energy consumption. At least 50 per cent of energy benefits delivered under EEC are to be focussed on priority consumer groups.
- 3.25 EEC is expected to reduce greenhouse gas emissions, by reducing energy consumption, and to help alleviate fuel poverty, for example by making it cheaper for priority consumers to heat their homes. EEC will result in an upward pressure on energy *prices* for all consumers, but is also expected to result in reduced energy *bills* for those consumers receiving the energy efficiency measures.

²⁷ Regulatory Impact Assessment: Electricity and Gas (Energy Efficiency Obligations) Order 2001, DTI (2001).

- 3.26 EEC is forecast to result in emissions savings of around 0.4 MtC per annum by 2005.²⁸ The total costs are likely to amount to around £162m per annum by 2005, and the annual financial benefits (for those consumers receiving the energy efficiency measures) are forecast to amount to around £248m by 2005.²⁹
- 3.27 The cost-effectiveness of EEC in reducing greenhouse gas emissions can be calculated by discounting the total costs and benefits over the assumed average lifetime of the energy efficiency measures supported. Based on the forecast 0.4 MtC annual saving in 2005, the emissions reductions will have an up-front cost to consumers equivalent to around £60/tC. However, EEC is also forecast to result in annual savings (from reduced fuel bills for those consumers receiving the measures) equivalent to around £330/tC (ie, a net cost of –£270/tC).³⁰
- 3.28 The estimates of financial benefits that are forecast to result from reduced energy bills for some consumers are subject to considerable uncertainty, since they depend in part on behavioural factors, which are difficult to predict. This uncertainty is likely to be significantly greater than the uncertainty in the cost estimates; furthermore, the financial benefits will be much more unevenly distributed than the costs.
- 3.29 As with the Renewables Obligation, EEC is a market-based instrument that allows energy suppliers (and their customers) to choose the mix of measures that are to deliver the overall target; also in common with the Renewables Obligation, suppliers can effectively trade their individual targets, meaning that whichever suppliers are able to implement energy efficiency measures most efficiently can, in theory, deliver relatively more of the total target than other suppliers.

The Climate Change Levy

- 3.30 The Climate Change Levy (CCL) is a tax on the business use of energy. The tax is not paid by domestic consumers, and the rate of the tax reflects the energy content of fuels (or primary energy input, in the case of electricity consumption). The purpose of climate change levy is specifically to encourage energy

²⁸ Energy Efficiency Commitment 2002–2005 Consultation Proposals, DEFRA (2001).

²⁹ Energy Efficiency Commitment 2002–2005: Illustrative mix of possible measures, DEFRA (2001).

³⁰ Ofgem calculations, assuming: no cost reductions due to learning or efficiencies in installing measures; an average lifetime of energy saving measure of 20 years; a real discount rate of 6 per cent.

efficiency in business, agriculture and the public sector, and to reduce emissions of greenhouse gases from these sectors.³¹

- 3.31 The CCL is paid at reduced rate (20 per cent of the full rate) on energy consumption by certain energy-intensive industries that have concluded Negotiated Agreements with the Government, which bind the industries concerned to achieve energy efficiency improvements. An exemption from the levy may be claimed for consumption (by consumers that would otherwise have to pay the levy) of electricity from renewable sources; the CCL is not paid on electricity produced from 'good quality' on-site CHP plant.
- 3.32 For businesses paying the CCL at the full rate, and which do not have CHP plants, the implied carbon valuation of the tax is £30–40/tC for consumption of electricity, £30/tC for consumption of gas, and £17/tC for consumption of coal (relatively little coal is consumed by commercial or industrial customers, except in iron and steel production, on which consumption the CCL is not paid).³² The implied carbon valuations are different for the different fuels because the CCL is levied on the basis of *energy* content, not *carbon* content. The valuations for gas and electricity consumption are fortuitously similar because of the current UK generation mix, which happens to have an average carbon intensity approximately the same as that of a gas-fired power station.
- 3.33 The relationship between energy prices and energy demand is complex. The ability of industrial consumers to reduce demand in response to price increases may be constrained, for example, by slow turnover in capital stock. Thus it is difficult to infer the likely cost-effectiveness of the CCL from the carbon-valuations implied by the levy rates.

³¹ Regulatory Impact Assessment: The Climate Change Levy, HM Treasury (2000).

³² Ofgem calculations; the range for electricity results from using the same range of carbon intensities as discussed in paragraph 3.19.

The UK Emissions Trading Scheme

- 3.34 The UK greenhouse gas emissions trading scheme (ETS) is, with certain restrictions, open to:
- ◆ companies with CCL negotiated agreements (where the negotiated agreements in effect define a baseline level of emissions)
 - ◆ companies undertaking specific projects where emissions reductions additional to business as usual can be demonstrated, and
 - ◆ companies taking on voluntary absolute emissions caps (expressed as reductions relative to a historic baseline).
- 3.35 The objective of the ETS is to reduce greenhouse gas emissions, as part of the UK Climate Change Programme. In addition, the Government considers that early experience of trading in the UK will leave the UK Government better placed to influence the development of emissions trading at international and EU levels, provide UK business with valuable experience of participating in and reacting to emissions trading markets, and give the City of London the opportunity to establish itself as a centre for international emissions trading.³³
- 3.36 In order to encourage companies to participate in the ETS by taking on voluntary emissions caps, the Government conducted an auction of incentive payments. Bidders in the auction competed with each other for the incentive payments by offering quantities of emissions reductions at various levels of payments (per tonne of carbon dioxide equivalent emission reduced). The auction proceeded by reducing the level of incentive until the total cost of the reductions purchased was equal to the pre-announced total budget.
- 3.37 The UK Emissions Trading Scheme has only recently been established, so there is relatively little price information available. Estimates of the prices at which trading is likely to take place are available from brokers active in this market, and indicate prices of around £15–22/tC.³⁴ Similarly low prices have been reported for trades outside the UK scheme.

³³ The UK Emissions Trading Scheme: Regulatory and Environmental Impact Assessment, DEFRA (2001).

³⁴ Indicative market price for spring 2002, reported by CO₂e.com.

3.38 Since greenhouse gas emissions trading schemes have only been operating for a very short period of time, and participation is on a voluntary basis, it is possible that the low prices currently observed reflect emissions reductions opportunities that may not be typical of the actions that would be required under a scheme with compulsory participation by companies facing tighter limits on their emissions.

Summary of instruments

3.39 The analysis of gas and electricity climate change schemes presented above is summarised in Table 1. The main purpose of the table is to show the wide range of objectives that these schemes seek to achieve. It should be noted that the indicative carbon valuations presented in this summary are subject to considerable uncertainty, and are intended to illustrate the likely range of implied carbon valuations.

Table 1: Gas and electricity climate change schemes

instrument	objectives	cost (£/tC)
Renewables Obligation	<ul style="list-style-type: none"> • climate change • energy security • new technologies • UK industry • rural economy 	210–380
Energy Efficiency Commitment	<ul style="list-style-type: none"> • climate change • improve energy efficiency • alleviate fuel poverty 	-270–60
Climate Change Levy	<ul style="list-style-type: none"> • improve energy efficiency • climate change 	17–40
UK Emissions Trading Scheme	<ul style="list-style-type: none"> • climate change • first mover advantage for UK firms • London as trading centre 	15–22

3.40 It can be seen from this discussion that current instruments addressing climate change also have non-climate related objectives, and that the package of instruments currently in place has a wide range of implied carbon values. None of these schemes has been in place for very long, so there is limited information available on actual outcomes. Nevertheless, the wide range of implied carbon valuations does suggest that the Government should consider very carefully the

cost to consumers of achieving reductions in greenhouse gas emissions through extensions of existing schemes.

- 3.41 However, the wide range of implied carbon valuations does indicate that the balance of measures is unlikely to deliver reductions in greenhouse gas emissions at least cost, especially since the current mix of measures cannot automatically or easily be adjusted to take account of in response to technological or other change. The current mix is complicated, and it will be difficult, at a later date, to review the cost-effectiveness of the schemes.
- 3.42 Nevertheless, as energy policy evolves, it would be beneficial to consider the advantages of moving towards broader instruments. A broad instrument focused on climate change could be complemented, where necessary, by specific instruments with other objectives. In addition to the range of climate change instruments applied in the gas and electricity sectors, there are many other instruments being applied in other sectors of the economy responsible for significant greenhouse gas emissions. The benefits of moving towards broader economic instruments across the economy as a whole are likely to be even greater than those potentially available in the gas and electricity sectors.
- 3.43 Carbon-based taxes already exist in several countries; the UK has a greenhouse gas emissions trading scheme, and the EU proposes to set up its own scheme (to be compulsory and to include electricity generators). There are also, as discussed above, strong efficiency arguments in favour of broad instruments. The choice between a tax-based instrument and one based on the trading of emissions permits may rest on practicalities such as ease of implementation, and associated transaction costs.
- 3.44 In light of the strong efficiency benefits of broad instruments, and the possibility for such instruments to be international in scope, it would seem desirable that UK schemes addressing climate change should be compatible with such an instrument.

Moving towards a broader economic instrument

- 3.45 If an approach based on a broad instrument is adopted, further thought would need to be given to any transitional arrangements. In particular, any move

towards a broad instrument should be undertaken in such a way that it does not undermine or strand investments that have already been made in response to existing schemes (such as the Renewables Obligation and the Energy Efficiency Commitment).

- 3.46 One way in which this transition could be managed might be to reduce the implicit carbon valuation in each of the targeted schemes, while simultaneously allowing action under existing schemes also to qualify for support under a much broader tax or emissions trading scheme focused exclusively on greenhouse gas emissions.

Key Points

- 3.47 Existing climate change instruments in the electricity and gas supply sectors place a range of implied values on reducing greenhouse gas emissions. By deciding centrally how much resource is to be spent under each of these schemes, the total cost of delivering emissions reductions through these schemes is likely to be greater than the cost of achieving the same amount of reduction through a broad-based economic instrument. It is difficult to make effective use of a single instrument to achieve more than one policy objective because different actions reducing greenhouse gas emissions could have very different impacts, for example on fuel poverty.
- 3.48 In the medium term, a more effective basis for achieving the Government's objectives on climate change at least cost to consumers is likely to come from moving towards a broad instrument targeting greenhouse gas emissions (for example, a carbon tax or a greenhouse gas emissions trading scheme). Other policy objectives (for example, alleviating fuel poverty) could then be implemented through separate policy instruments.

4. Renewables, distributed generation, and networks

4.1 The contribution of renewables and the Renewables Obligation to reducing emissions of greenhouse gases is discussed in chapter three above. This chapter focuses on the implications of increased amounts of renewable and distributed generation for electricity networks, and for Ofgem's regulation of these networks. The purpose of this chapter is to:

- ◆ describe the work Ofgem does in relation to government targets for renewable generation, and
- ◆ set out some of the issues raised by the prospect of substantial increases in renewable generation, in particular with respect to security of supply and electricity networks.

4.2 Ofgem is active in the field of distributed generation, both through a number of Ofgem projects and through its close involvement with the Distributed Generation Working Group (DGCG). During 2000, the joint Government–industry Embedded Generation Working Group considered network access issues arising from the proposed increase in connection of distributed generation. The final report³⁵ of that group was the basis for creating the Distributed Generation Co-ordinating Group (DGCG), created and jointly chaired by the DTI and Ofgem. The DGCG is concerned with a wide range of issues related to the connection and operation of distributed electricity generation in Great Britain, and is following up consideration of the Embedded Generation Working Group's recommendations.

³⁵ Embedded Generation Working Group Report, DTI (2001).

4.3 The DGCG set up a Technical Steering Group (TSG), drawing on a wide range of expertise from the electricity industry and associated external organisations, to steer and report on work programmes necessary across the industry to support the objectives set by the DGCG. The TSG is addressing a considerable number of technical and commercial issues likely to arise from increased connection of distributed generation. The TSG co-ordinates the work of six workstreams, each of which is managing a number of projects:

- ◆ Distributed Generation Status and Projections
- ◆ Standardisation of Information and Solutions
- ◆ Short-term Network Solutions
- ◆ Micro-generation Solutions
- ◆ Long-term Network Concepts and Options, and
- ◆ Industry Skills and Resources.

4.4 Ofgem recently consulted on proposals to modify the way in which distributed generators are charged for connecting to the network. Under current arrangements, a new generator that connects to the network is charged in full for the work needed to connect them, including any reinforcement of the existing network that may be necessary in consequence. Generators who subsequently connect to the same part of the network may only pay a fraction of the amount paid by the first generator, if the work carried out to connect the first generator has resulted in some spare capacity that can be used for by the later connections. Ofgem is currently consulting on proposals that would allow the generator that initially connects to the network to share its costs with generators connecting subsequently, and would allow the cost of connection to be paid in annual instalments rather than up-front.

Investing in networks

4.5 The Renewables Obligation aims to incentivise the installation of total renewable generation sufficient to produce at least 10 per cent of total electricity supplied by 2010, subject to an acceptable cost to consumers. The PIU report

suggests that the Government should consider moving to 20 per cent renewables by 2020. The PIU has addressed the technical and economic potential for renewable generation in reaching its conclusions on the desirability of a 20 per cent target for 2020. Ofgem is primarily interested in ensuring that these targets will be met at least cost to consumers, and in whether, as more renewables capacity is built, changes need to be made to the way Ofgem regulates the network monopolies in electricity. However, as discussed above in chapter three, Ofgem considers that instruments with multiple objectives or subsidiary targets (ie, increased renewable generation rather than reduced greenhouse gas emissions) are likely to be less cost effective than an instrument targeting reduced greenhouse gas emissions directly.

- 4.6 There are two areas where renewable and distributed generation could have implications for supply security (much renewable generation is likely to be distributed, ie, connected to the lower-voltage distribution networks rather than to the high-voltage transmission network). First, renewable generation is an indigenous energy source that (at present) adds to the diversity of the electricity generation mix. Second, since existing networks were not designed to accommodate significant quantities of distributed generation, and much new renewable generation is likely to be intermittent, quality of supply could potentially be at risk.
- 4.7 Ofgem considers that competitive energy markets should be capable of rewarding contributions to diversity. As discussed in chapter three, competitive markets tend to align the interests of market participants with those of consumers with respect to security of supply. The implications of increased amounts of renewable and distributed generation for networks are examined in this chapter, and will be a significant part of Ofgem's ongoing work, for example with respect to the next Distribution Price Control Review.
- 4.8 Meeting the 2010 target will require significant investment in renewable generating capacity. It will also require investment in electricity networks, both to connect the new generators to the network, and in developing the network to accommodate the output of the distributed generators. Much of the new generation is likely to be embedded in distribution networks rather than connected directly to the high voltage transmission network. A significant

proportion of new renewable generation capacity is likely to be wind generation, the output of which is intermittent. Furthermore, the installation of the new generating capacity that would be required to meet these targets is also likely to require changes to allow these generators to supply additional services (such as capacity support), and IT systems for active management of distribution networks. Existing distribution networks have been developed over many years, largely as passively operated systems, and have not been designed to accommodate large amounts of distributed generation.

- 4.9 Since the Renewables Obligation provides support to renewable generators, it can effectively automatically support additional network investment that would be charged to generators outside the price control process. Such charges would include, for example, connection charges. However, other charges, such as generator use of system charges, only support investment that has been recognised as part of the price control process.
- 4.10 In light of the support now available to renewable generators through the Renewables Obligation and other schemes, Ofgem is aware of the need to review the incentives facing distribution network operators with respect to connection of distributed generators. Ofgem has already indicated that there may be benefits in moving to a shallower charging policy for connection after April 2005; a number of other issues, including whether any further changes need to be made to the regulatory framework to help ensure that distribution network operators have appropriate incentives relating to connection of distributed generators, and to run their networks in an economic and efficient manner, will be addressed in the run up to the next distribution price control, which will begin in April 2005.
- 4.11 As part of this work, Ofgem will be concerned that the cost of achieving renewables targets should be minimised. It is also concerned that distribution and transmission network operators both be allowed, over an appropriate time frame, to recover sufficient revenue to undertake efficiently the investment in networks that will be required.
- 4.12 Ofgem is an active participant in a number of working groups that are addressing these issues (for example, under the Distributed Generation Co-

ordinating Group, described in paragraphs 4.2 and 4.3). It is important that the distribution network operators are able to make full use of the outcomes of this working group and its technical workstreams in their own preparations for the next price control review.

- 4.13 In addressing the need for network investment as a result of increasing renewable and distributed generation, Ofgem is aware of the uncertainty that arises over exactly when and where distributed generation will be built, and its implications for the network operators. It is important that these risks are identified, as far as possible, and borne by the parties best positioned to manage them. Increments of cost need to be properly addressed and increments of risk understood, and, if appropriate, their effective management rewarded. In addition to this it will be important that incentives for efficiency and quality of service to customers remain effective.
- 4.14 In light of these issues, Ofgem welcomes the work being carried out by the Government's Interdepartmental Analysts Group to estimate the system costs of significant increases in renewable generation beyond 2010. Ofgem is carrying out separate analysis, which focuses on the regulatory issues raised by the likely requirement for network investment up to 2010. Ofgem is also organising an expert workshop on renewables and network issues (jointly with the DTI and the Institution of Electrical Engineers), to be held in September 2002.
- 4.15 The focus of Ofgem's ongoing work in these areas is on issues that might arise in meeting a 10 per cent renewables target. However, recognising the suggestion made by the PIU (and others) that further increases beyond 10 per cent should be encouraged after 2010, Ofgem is also keen that the costs and benefits of higher targets post-2010 be considered at an early stage. In considering moving beyond 10 per cent renewable generation, it will be important to determine at what point, if any, step changes in network investment or operation are required. If significant changes are required, the level of risk and uncertainty facing network operators is likely to increase. Furthermore, the need for significant changes to networks may increase the lead-time between setting targets and seeing results.

- 4.16 In considering future targets for renewable generation, it is important that all the associated costs are taken into account. The ongoing work on network costs should help to indicate the likely significance of costs additional to generation costs that would be incurred in moving beyond existing programmes.

Key Points

- 4.17 Ofgem considers that setting specific objectives under a climate change programme, such as for renewable generation, is likely to be less efficient at delivering reductions in greenhouse gas emissions than a broad instrument that explicitly targets reductions in greenhouse gas emissions alone. If such an approach were adopted, it would be for consideration whether a renewables target and specific support scheme would then also be required to deliver other objectives. A broad instrument targeting reductions in greenhouse gas emissions should be introduced in such a way as not to undermine or strand investments made on the basis of existing support measures.
- 4.18 If the Government is to consider an increased target for renewable generation post 2010, it is important that a full assessment of the costs and benefits of this level of renewable generation is made. This assessment should include a detailed analysis of the network-related costs that would be incurred as a result of the increased renewable generation associated with reaching an increased target.
- 4.19 Ofgem is working on the implications for the network monopoly businesses of increased renewable and distributed generation, particularly with regard to investment and incentives. This work is being taken forward in working groups co-ordinated by the Distributed Generation Co-ordination Group that include representatives of the network businesses, as well as through Ofgem's own workstreams.
- 4.20 For the period up to the end of the current distribution price control (April 2005), Ofgem has proposed changes to the regime for connection charging that will make it easier for smaller generators to connect to distribution networks, for example by enabling them to share connection costs with other generators subsequently connecting to the same part of the network.

5. Energy efficiency

Ofgem's duties

- 5.1 Ofgem has a statutory duty to promote the efficient use of energy delivered through the gas and electricity networks. In addition, Ofgem is also required to administer the Energy Efficiency Commitment (EEC), an obligation on electricity and gas suppliers to promote the uptake of energy efficiency measures by domestic consumers. The overall target is set by the Department for Environment, Food and Rural Affairs (DEFRA) under changes to the Gas Act 1986 and the Electricity Act 1989 made by the Utilities Act 2000. The purpose of this chapter is to highlight areas where Ofgem would like to see further analysis of the opportunities for building on existing energy efficiency support schemes.

The need to support energy efficiency investment

- 5.2 Ofgem considers that the operation of competitive energy markets can make an effective contribution to delivering energy efficiency, since competitive markets tend to deliver transparent, cost-reflective prices, and tend to make suppliers responsive to customer demands. Nevertheless, there may be reasons (at least in the short term, and possibly in the longer term) for supporting the uptake of additional energy efficiency measures.
- ◆ On environmental grounds, it can be argued that energy prices do not reflect the true costs of energy consumption (for example, they do not, in general, reflect the cost of mitigating the impacts of greenhouse gas emissions on the global climate). Hence, in the absence of instruments directly addressing such externalities (as proposed in chapter three), supporting energy efficiency measures may be an alternative.
 - ◆ Support for energy efficiency investments that is targeted at priority groups (for example, those in fuel poverty) can allow these consumers to take part of any resultant energy efficiency benefit in the form of increased consumption of energy services, rather than taking all of the benefit as reduced energy bills. Thus such support can contribute to

achieving social objectives, and is in line with Ofgem's duty to have regard to the interests of priority consumer groups.

- ◆ In general, it is often observed that there is significant potential for energy efficiency investment where the reduction in ongoing energy costs is greater, on a present value basis, than the cost of installing the measure. Nevertheless, uptake is often low. The gap between expected and observed levels of uptake can be explained by a combination of factors, such as consumers lacking information on the benefits of energy efficiency measures, or the nuisance cost associated with purchasing and installing the energy efficiency measure. For some consumers, especially those in fuel poverty, restricted access to capital may also be a significant consideration.

Building on the Energy Efficiency Commitment

- 5.3 The PIU suggests that new targets for improvement in domestic energy efficiency should be set at a 20 per cent improvement by 2010, to be followed by a further 20 per cent improvement to 2020. These targets correspond approximately to a doubling of the historic rate of improvement,³⁶ although some of this increase is already being delivered by existing measures (ie, EEC and other³⁷ energy efficiency schemes).
- 5.4 A decision on whether further support beyond EEC is necessary will depend in part on the position taken in relation to a broad instrument valuing reductions in greenhouse gas emissions. Ofgem considers that there are significant benefits to be realised by delivering support for greenhouse gas emissions reductions through a broad-based economic instrument explicitly and exclusively targeting such reductions. Following the introduction of such an instrument, a key objective of EEC will have been addressed. It will then be appropriate to review EEC along with other schemes to decide how the remaining objectives—in particular, tackling fuel poverty—can best be delivered. It may well be the case that direct support for energy efficiency measures for those in fuel poverty, through a specific scheme, is still warranted. Given that a move towards a broad

³⁶ Energy Paper 66, DTI (1997).

³⁷ including Warm Front, Welsh Home Energy Efficiency Scheme, Warm Deal, the Scottish Central Heating Initiative, and Local Authority schemes

instrument valuing carbon may take time, it is appropriate to consider in more detail the operation of the existing schemes.

- 5.5 Ofgem determines compliance with, and hence the impact of, EEC by assessing investment in energy saving measures. In order to assess these measures against the EEC absolute energy saving target, Ofgem allows an assumed energy saving for each measure allowed under the commitment. These savings are based on modelling work and trials carried out by the BRE and others, following the same methodology as that used by DEFRA in setting the 62 fuel-adjusted TWh overall target. For new types of energy saving schemes (including, for example, solar heating and domestic CHP), energy suppliers commission independent research to verify estimates of the savings that might be delivered. Hence approval of EEC measures is based on delivered inputs (investment in energy saving measures) rather than directly-measured outputs (quantified improvements in energy efficiency or reduction in energy use). Nevertheless, incentives for efficient delivery are likely to be stronger under EEC than under the forerunner EESoP programmes, which allowed suppliers a fixed budget per customer.
- 5.6 Ofgem notes that there is considerable uncertainty associated with estimating the impact of some energy saving measures on energy efficiency and energy consumption. For example, measuring the balance between comfort and energy savings as a result of home insulation measures requires very detailed temperature monitoring inside and outside the home over a long period of time, as well as assessing behavioural changes (such as controlling temperature by opening windows). In contrast, the impacts of improved efficiency of certain domestic appliances (for example, refrigerators) can be determined much more easily, because the utilisation of such appliances, once purchased, can be assumed independent of running costs. A study of the measured impacts of EESoP1 and 2 is ongoing, and Ofgem is closely involved. A further study of the measured impacts of EESoP3 is planned.
- 5.7 Given the uncertainty over the impacts of some energy efficiency investments, Ofgem would be keen to see further research into the actual out-turn effects of energy efficiency programmes on domestic energy efficiency and domestic energy consumption, especially if the rate of spending on domestic energy efficiency is to increase (such an increase is likely as implementation of EEC

continues). Ofgem is working with DEFRA and the Energy Savings Trust to ensure that there is proper monitoring and evaluation of EEC.

- 5.8 As discussed in paragraph 5.2, support for energy efficiency measures can be justified on the grounds of environmental externalities (which have not been correctly internalised through other instruments such as energy or emissions taxes), and barriers to uptake, such as the costs of collecting information on energy efficiency measures. These factors may also affect commercial consumers for which energy consumption is not a significant part of the cost base. These consumers may, as may be the case for domestic consumers, under-invest in energy efficiency measures. If the Government is to consider more ambitious energy efficiency targets, it might be necessary to consider the balance of resource across different consumer groups. Ofgem has extended the energy-efficiency licence condition to ensure that suppliers provide advice to all consumers, and has sent suppliers a copy of an industry standard code of practice to be implemented by autumn 2002.
- 5.9 Ofgem notes that improvements in some components of domestic energy efficiency are constrained by the nature of the housing stock, which tends to be replaced relatively slowly in the UK. An assessment of the potential for improvement in energy efficiency should take this factor into account.
- 5.10 Ofgem welcomes the recent consultation paper³⁸ on the use of economic instruments to promote domestic energy efficiency. There are several components to the barriers preventing increased uptake of energy efficiency measures; it is therefore possible that a broader range of schemes, including fiscal instruments, could increase the rate at which energy efficiency improves. Careful consideration should be given to targeting schemes (for example, EEC-type, fiscal incentives for consumers, or minimum standards) at the type of energy efficiency investment most likely to respond to the scheme. Consideration should also be given to the issue of minimising the 'dead-weight' associated with any new schemes (ie, the support given to measures that would have been implemented anyway in the absence of the support). It may also be

³⁸ Economic instruments to improve household energy efficiency, Consultation Document, HM Treasury (2002).

necessary to ensure that energy efficiency programmes take account of new consumer goods appearing on the market.

- 5.11 Ofgem also notes that concerns have been raised by energy suppliers about the increase in capacity (for example, in installing energy efficiency measures such as insulation) required consequent on the transition from EESoP 3 to EEC. It is important that any successor to EEC take into account experience from implementing EEC.

Key Points

- 5.12 Ofgem considers that there are significant benefits to be realised by delivering support for greenhouse gas emissions reductions through a broadly-based economic instrument explicitly and exclusively targeting such reductions. Following the introduction of such an instrument, one of the key objectives of EEC will have been addressed. It will then be appropriate to review EEC along with other schemes to decide how the remaining objectives—in particular, fuel poverty—can be delivered. It will be important that the introduction of a broad instrument not undermine or strand investments already made in response to existing schemes.
- 5.13 In the short term, and as part of any further consideration of the impact of moving to a broad instrument aimed at reducing emissions of greenhouse gases, Ofgem welcomes:
- ◆ consideration of a wider range of schemes, including fiscal measures, and
 - ◆ further analysis of the impact of existing programmes on energy efficiency and energy consumption.