

Regulating energy networks for the future: RPI-X@20 Context of energy regulation since privatisation

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Target audience: Consumers and their representatives, gas and electricity transmission and distribution companies, generators and offshore producers, energy suppliers, gas shippers, government, the city, academics and other interested parties.

Overview:

In March 2008 we announced RPI-X@20, our review of our current approach to energy network regulation. The review is considering whether the existing regulatory regime remains appropriate for the likely new challenges facing the energy networks. These challenges include the need to accommodate targets for tackling climate change, maintaining security of supply, and undertake widespread maintenance and upgrading of our ageing networks.

We published the first in a series of consultation documents relating to RPI-X@20 today. This supporting paper complements the RPI-X@20 consultation by providing an overview of the context of energy network regulation. An understanding of the context within which energy network regulation has developed over time will help inform an understanding of the reasons for changes made since privatisation and the potential impact of changes made as part of this review.

This supporting document describes the different elements of the context facing each of the energy network sectors. It includes trends in demand and supply; technological advances; industry structure and ownership; government and regulatory institutions; energy and energy related environmental policy, initiatives to tackle fuel poverty and other social policy initiatives and measures to improve energy efficiency. We also review the impact of changes in the UK economy and financial markets.

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Summary

1.1. RPI-X@20 is Ofgem's review of the way we regulate Britain's gas and electricity networks. We will step back and consider holistically the appropriate regulatory framework. The timeframe allows us to develop proposals that could potentially be implemented in the next transmission review. It also allows us to take the time to engage with stakeholders and adopt a measured approach to assessing a range of fundamental and complex issues.

1.2. We have published the first consultation of RPI-X@20 today, "Regulating energy networks for the future RPI-X@20 Principles, Process and Issues."

1.3. This supporting paper examines the context within which the regulation of energy networks takes place. An understanding of the context within which energy network regulation has developed over time will help inform an understanding of the reasons for changes made since privatisation and the potential impact of changes made as part of this review. The paper looks at how that context has developed since privatisation.

1.4. We describe details of changes in energy, energy related environmental and social policy, at national and EU level, and associated changes in industry and company structure, in this paper. The history of price control regulation of energy networks during the period is discussed in an associated paper also being published today¹.

1.5. We have found that the history of energy and sustainable development policy, and associated changes in industry and company structure, can be categorised into three periods.

- **Initial phase:** following flotation, the priority was ensuring the success of privatisation and encouraging competition where possible.
- **Second phase:** between the mid 1990s and the mid 2000s the focus was on ensuring effective competition developed and there was an increasing emphasis on meeting environmental and social policy objectives.
- **Third phase:** recently, there have been changes in policy that signal increased commitment to meeting environmental and social policy objectives, and more challenging targets.

1.6. There is no clear delineation between the phases. All of the issues, including encouraging effective competition and delivering environmental aims, are present throughout. The three phases are differentiated by a change of focus and emphasis in policy making, and the third phase is materially different from the earlier phase.

¹ Ofgem(2009): RPI-X@20 project, Principles, process and issues document, supporting paper, history of energy networks regulation (Ofgem 2009). This is available on our website at <http://www.ofgem.gov.uk/Networks/rpix20/publications/Pages/Publications.aspx>.

For example, on environmental policy objectives, in the first phase the problem is recognised and debated but without a formal policy target, the second phase contains a policy target, but in the third phase the scale of the challenge has changed, and there is increasing uncertainty about the impact on the energy sector, including energy networks, for the future.

1.7. As shown in the final section of this paper, this third phase coincides with a downturn in the economy and uncertainty in the financial markets. Energy networks are therefore facing new challenges in an uncertain economic climate. The effect of this is difficult to ascertain, and it is unclear over what timescale any effects will be felt. This paper does not speculate on the effects but does identify the economic trends and sets out some of the issues that we might need to explore in RPI-X@20.

1.8. This paper is not a consultation paper. No questions are posed in it and no comments are sought on it. The paper is being published as a high level information paper aimed at providing background to compliment as opposed to providing the main focus for the RPI-X@20 consultation.

1. Introduction

1.1. In this paper, we review the context in which the energy networks and the regulatory frameworks applying to them have operated since privatisation. Changes in this context, where these are sustained, influence what network companies have to deliver and also explain many of the changes that have been made to the regulatory framework.

1.2. This paper describes the context of energy network regulation and explains the development since privatisation of:

- demand and supply of electricity and gas;
- industry and company structure (for both electricity and gas);
- the use of technology associated with a low carbon economy, more efficient use of energy or facilitating better planning by industry and customers;
- Government and regulatory institutions relating to energy;
- the main features of UK energy policy;
- the main features of EU energy policy;
- energy related environmental policy;
- energy related social policy; and
- the UK economy and financial markets.

1.3. This paper provides a reference point to support RPI-X@20. As a starting point we identify the main trends and consider whether there are any lessons to be considered further for the development of a future framework for energy network regulation.

1.4. This paper is not a consultation paper. No questions are posed in it and no comments are sought on it. The paper is being published as a high level information paper aimed at providing background to compliment as opposed to providing the main focus for the RPI-X@20 consultation. It is not intended to be fully comprehensive or act as a legal record. Rather it is intended to contextualise the work we are undertaking.

2. Demand, supply and technology

2.1. This section considers the trends in the demand and supply of both electricity and gas. In electricity, the trends in demand and supply suggest that changes are needed to continue to deliver a secure and sustainable supply. In gas, in the 1990s gas demand increased but in recent years this has levelled off. Peak demand has declined in the last few years - initially in response to significant increases in the wholesale price of gas and electricity and energy efficiency but more recently in response to the slowing economy as well as energy efficiency measures. The UK has recently gone through a transition from being a net exporter to being a net importer of gas as its North Sea reserves are depleted.

2.2. Various technologies have come into greater focus as ways of supporting a low carbon economy and to facilitate more efficient use of energy.

Electricity demand and supply

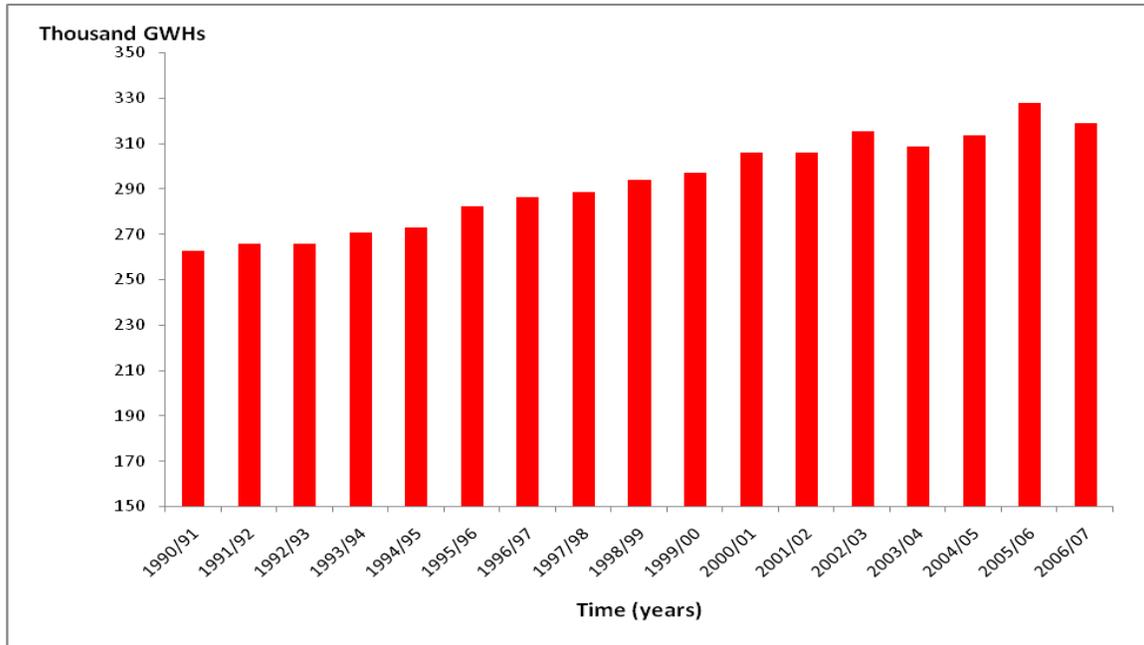
2.3. Delivery of security of supply on the electricity system has gained more focus recently because of the combination of increasing demand and potential reduction in supply arising from the need to replace major sources of generation. EU environmental legislation is driving many of the generating plant closures and 2015/2016 is a key milestone, when around 12GW of generation plant (8GW of Coal and 4GW of Oil) will close due to the environmental constraints imposed by the Large Combustion Plant Directive (LCPD). In addition, to this it is anticipated that some nuclear power stations will close between now and the end of 2015.

Electricity demand

2.4. Electricity demand has increased consistently since privatisation.

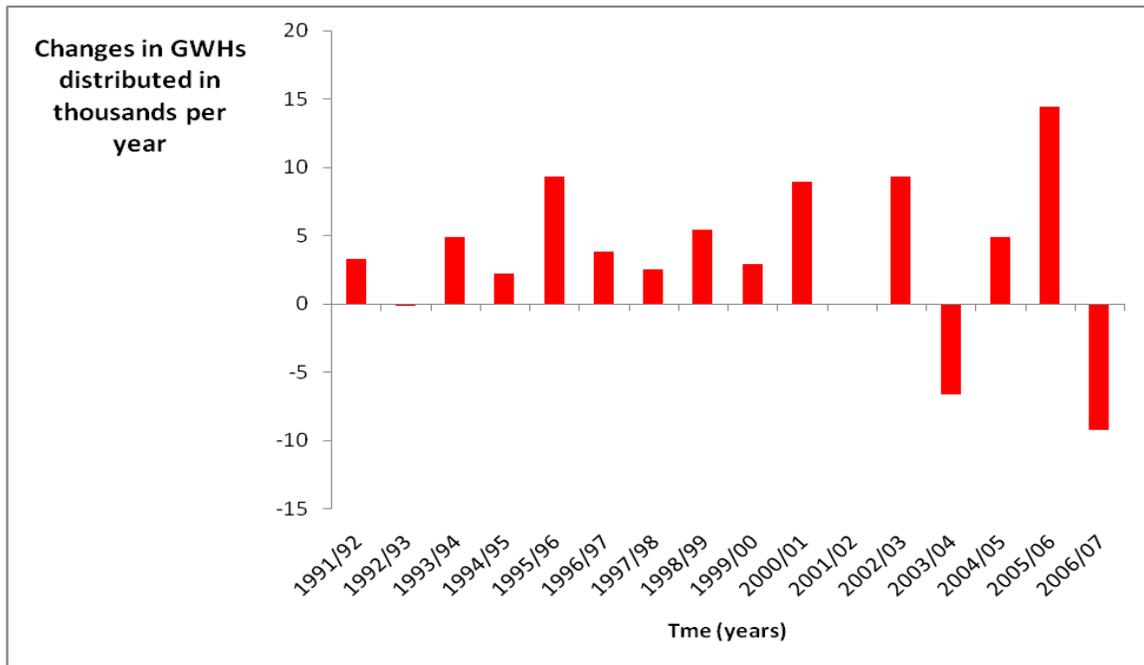
2.5. Figure 1 shows the consistent increase in demand for electricity, which has an average annual growth rate of 1.2% over the period. Figure 2 shows the annual growth rates (positive for all but two years).

Figure 1: Electricity distributed by 14 distribution network operators (DNOs) in Great Britain (Giga watt hours (GWHs))



Source: Electricity Association, Business Information Centre: Electricity industry reviews 1990/91 - 2006/07

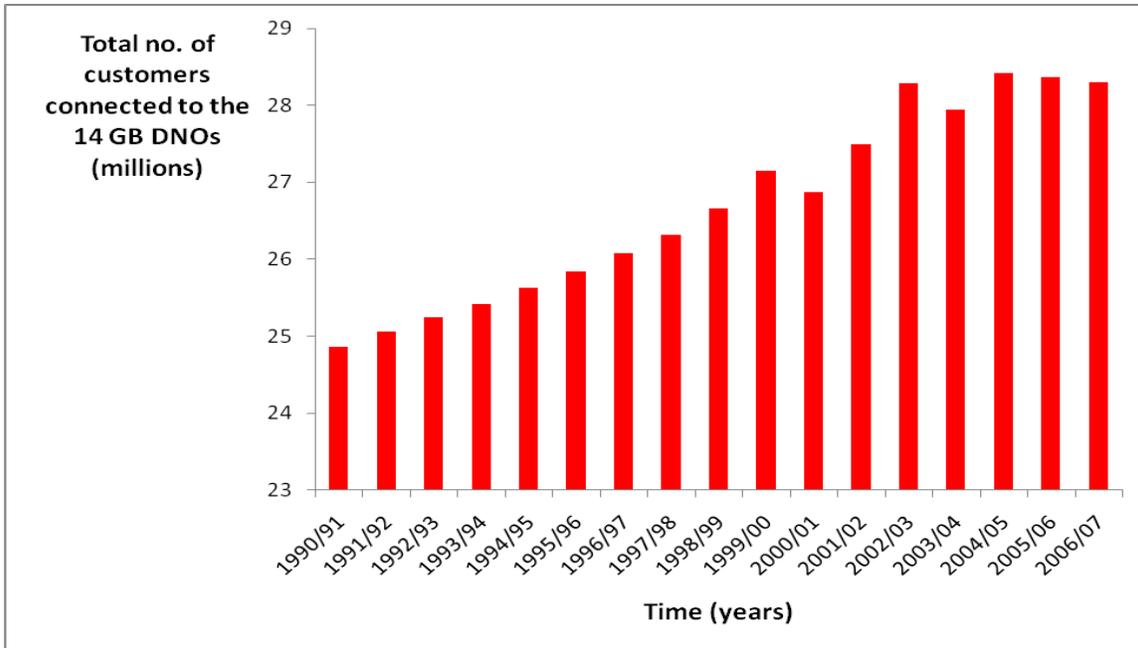
**Figure 2: Annual growth in electricity distributed by the 14 GB DNOs
1990/91 - 2006/07**



Source: Electricity Association, Business Information Centre: Electricity industry review 1990/91 - 2006/07

2.6. Figure 3 shows the total number of customers (industrial and domestic) connected to the 14 GB DNO's networks each year from 1990/91 - 2006/07.

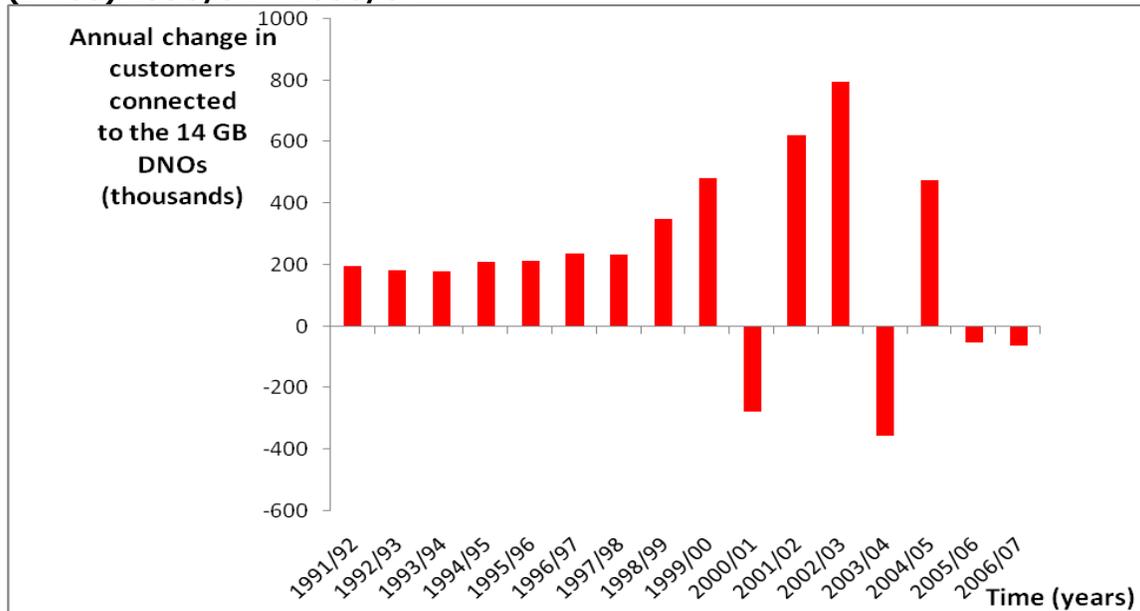
Figure 3: Total number of customers connected to the 14 GB DNO's networks 1990/91 - 2006/07



Source: Electricity Association, Business Information Centre: Electricity industry reviews 1990/91 - 2006/07

2.7. Figure 4 shows the year on year growth in the number of customers connected to the electricity DNO networks. This has grown in most years in the period and has an average annual growth rate of 0.8%.

Figure 4: New connections by electricity distribution network operators (DNOs) 1990/91 - 2006/07



Source: Electricity Association, Business Information Centre: Electricity industry reviews 1990/91 - 2006/07

Electricity generation (supply)

2.8. Concerns about security of supply, particularly as demand has increased, have been considered in a number of government energy reviews, most recently in 2006/07. The 2007 review focused on the use of low carbon energy generation and on insuring provision for future diversity and security of supply. This led to the changes introduced through the Energy Act 2008 and to a number of ongoing government and Ofgem projects including the Transmission Access Review (TAR)².

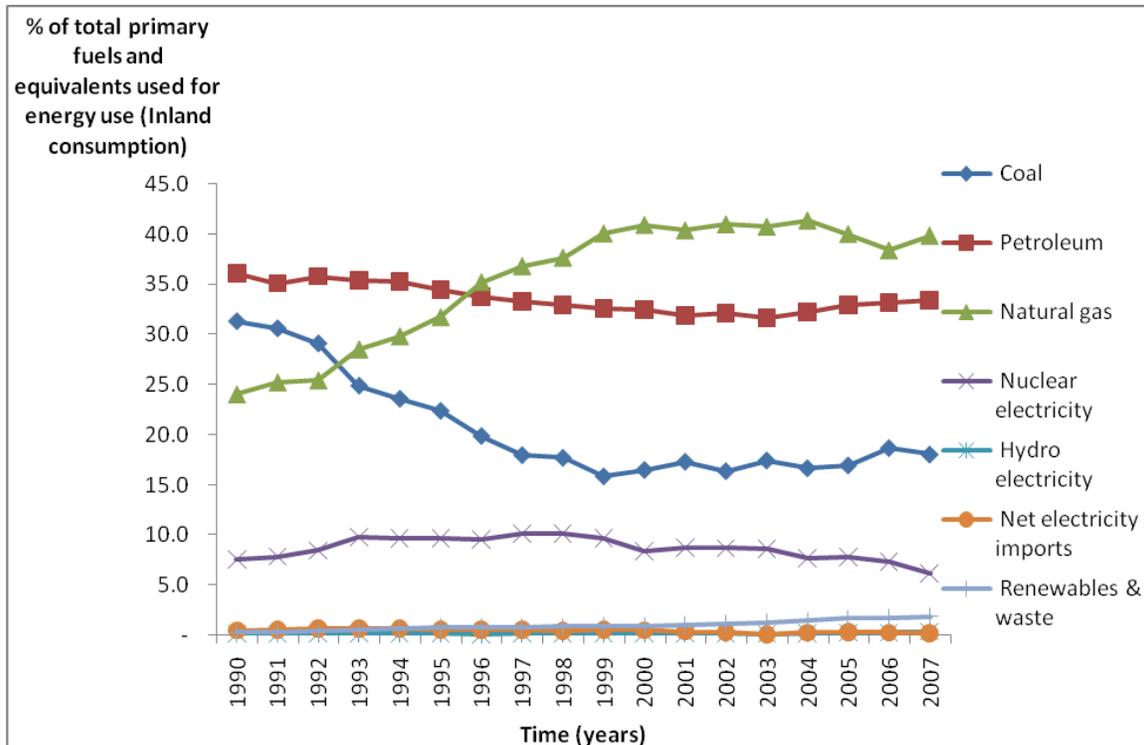
2.9. Figure 5 shows the proportion of electricity generation by source (the UK fuel mix) between 1990 and 2007. There has been a move away from coal and oil-fired power stations. Gas has increased as a primary source of electricity with combined cycle gas turbine (CCGT)³ becoming increasingly important. Hydroelectric is small across GB although particularly prevalent in North West Scotland.

² For further details see Appendix 2 of the principles, process and issues document (<http://www.ofgem.gov.uk/Networks/rpix20/publications/Pages/Publications.aspx>)

³ Combined cycle gas turbine technology acts with a double cycle where waste heat produced at the same time as the gas is turned into steam and generates additional electricity.

2.10. Renewables provide a low, but growing, share of generation. The modest increase in renewables has occurred partly because of the introduction in 2002 (in Great Britain) of renewable obligations. These are designed to facilitate greater use of renewable sourced electricity by requiring electricity suppliers to source more of their electricity from renewable sources. Significant growth in renewable generation will be needed to meet the government's specific renewables targets (described later in this paper).

Figure 5: Sources of energy generation since privatisation



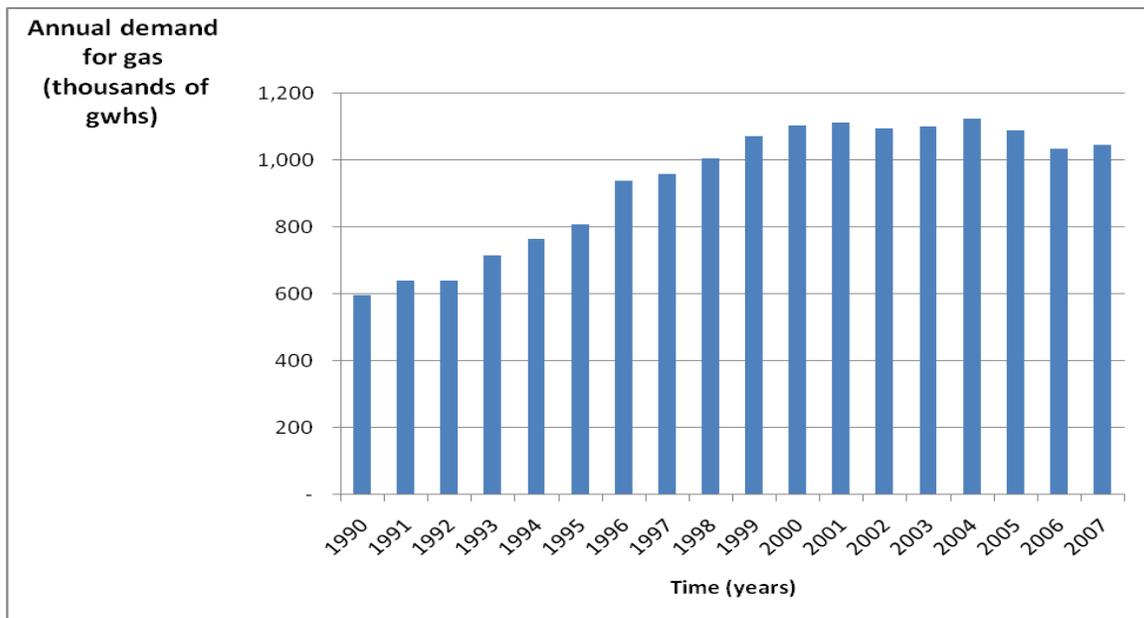
Source: BERR Digest of UK Energy Statistics 2008

Gas demand and supply

Demand for gas rose sharply from the time of privatisation and throughout the 1990s. This so called 'dash for gas' reflected its appeal; gas being deemed as cleaner and cheaper than coal as a primary fuel. Demand has since levelled off and started to decline. At the same time the UK's North Sea gas reserves are declining and it became a net importer of gas in 2004.

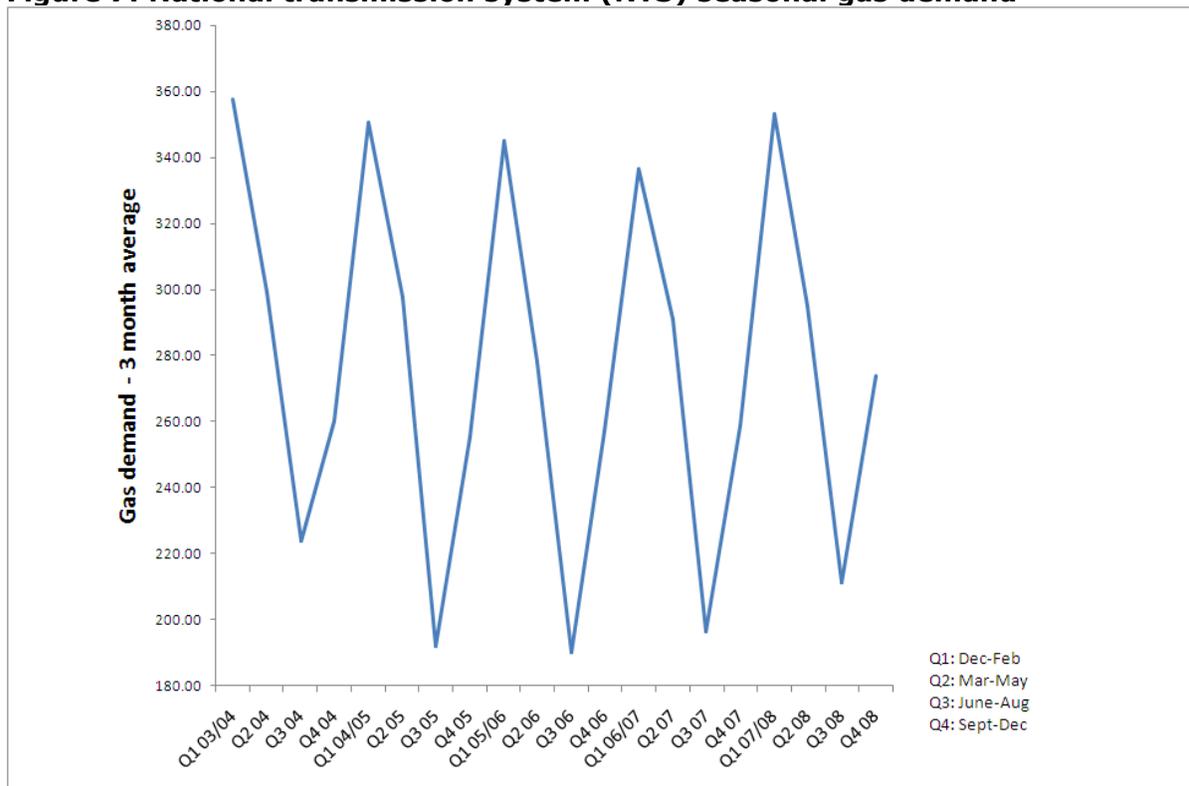
Gas demand

2.11. The overall trend in the demand for gas is shown in figure 6. This shows the increase in demand through the 1990s and the levelling off that followed. Also, although an increase is shown to 2007 this was driven by greater consumption in the power generation sector, while demand fell in the distribution network markets.

Figure 6: Annual demand for gas (gwh)

Source: BERR Energy Statistics

2.12. Figure 7 illustrates demand by time of year. It shows three-month averages of daily demand, showing the fluctuations between the peaks and troughs in gas demand across the year. Peak winter demand declined between 2003/04 and 2006/07, and this is not associated with any significant variation in temperature.

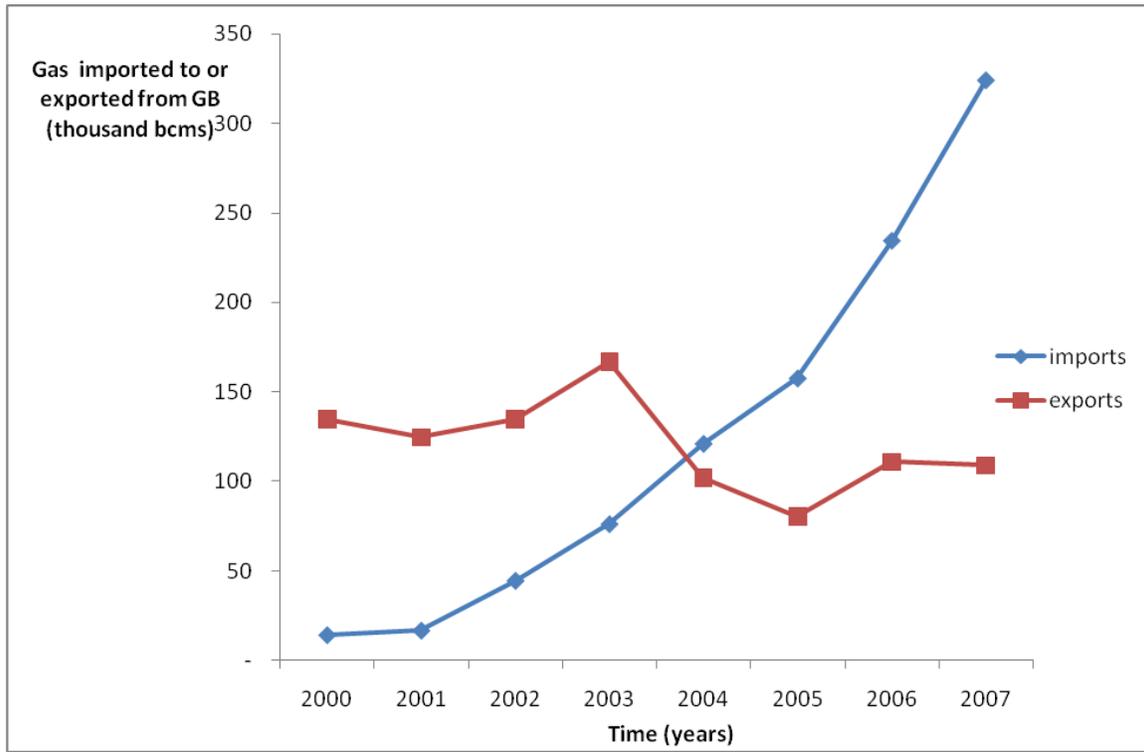
Figure 7: National transmission system (NTS) seasonal gas demand

Source: National Grid

Gas supply

2.13. From the mid 1990s, and particularly since 2000, domestic gas reserves have reduced. The UK's gas reserves are categorised by the level of certainty of them being technically and commercially available. Proven and probable (the two most certain categories) gas reserves have been steadily declining since 1994. The year to 2007 saw a reduction of 37 bcms to 647 bcms.

2.14. The UK became a net importer of gas in 2004, as shown in Figure 8. Imports are made up of gas passing from Norway through the Langeled and Vesterled pipelines, and the Tampen Link; gas through the interconnectors from Belgium (Bacton - Zeebrugge interconnector) and the Netherlands (BBL pipeline); and liquefied natural gas imported from various sources around the world.

Figure 8: UK gas imports/exports

Source: BERR

Technologies for a low carbon energy sector

2.15. This section looks at the technological context of energy network regulation. The technological advancements discussed are not necessarily new technology as such but in some cases the economic case for their implementation/development changes over the time period because of the change in development costs and in the price of carbon.

2.16. For most of the time since privatisation, technological advancement has not been a key part of the context of energy network regulation. However, in recent times this has changed.

2.17. Delivery of a low carbon energy sector will require the adoption of different technologies. Some of these technologies have existed for some time, but the push for low carbon energy is expected to make it more likely that they will need to be adopted or adapted in GB going forward.

2.18. The main technologies of interest for the future development of networks include: heat technology, smart metering, microgeneration and smart grids.

2.19. These technologies provide an opportunity to reduce energy use, make more efficient use of current transmission and distribution networks, and in some cases reduce carbon emissions. They are being looked at as mechanisms to deliver the UK's sustainable development targets. A number of reviews are currently underway to determine how these technologies could be implemented and to consider whether any barriers (e.g. relating to availability of funding) could be removed. In RPI-X@20 we will consider whether the energy networks have the incentive to innovate (adopting new or adapting available technologies) and to respond effectively and efficiently to changing technologies upstream and downstream.

2.20. As described in chapter 5, on 12 February 2009, Government consulted on its heat and energy efficiency strategy. This is examining how the use of these technologies could be increased to meet the environmental targets, including the issue of how to fund the new technologies and the role of all energy companies in supporting the growth in use of technology.

Heat technology

2.21. The generation of heat either in tandem with electricity generation or separately, but using low carbon sources, is an important part of the technological context.

2.22. Heating of water and property can be achieved directly from electricity generated or gas supplied. However, it can also be achieved indirectly as a by product of the electricity generation process or be separately produced from renewable sources. Less total energy is needed if the heat is obtained indirectly via generation. Overall carbon emissions will be lower where heat is produced from renewable sources. This also reduces the need for electricity network re-enforcement/expansion of network capacity. Combined heat and power (CHP) generators enable indirect heat production when generating electricity and in 2007, CHP generating plants accounted for around 7%⁴ of electricity generation.

2.23. Low carbon sources can also be used to achieve heat production. For example, heat can be produced directly via:

- solar water heating;
- heat pumps; and
- biomass stoves and boilers.

2.24. In 2006 the Department for Trade and Industry (DTI) and Ofgem launched a joint review into the barriers and incentives for distributed generation. This included consideration of combined heat and power.

4 Combined Heat and Power Association.

Smart metering

2.25. Government's objective is to have smart meters fitted in every household by 2020⁵. Industry is working with DECC to determine details on the specific type of meters to be used, the rules about who will install, operate, control and use data from the smart meters, and the timescale for roll-out.

2.26. Smart meters will allow the electricity needs of individual users to be measured on a real time basis. If appropriate tariffs are introduced, this would provide a powerful tool to encourage more efficient use of energy. Depending on the sophistication of technology used, it may also be possible to use the meters to change demand patterns automatically (e.g. by switching off appliances or interrupting supply at particular times).

2.27. It is important to distinguish between automated meter reading (AMR) and automated meter management (AMM) meters. The first allows one way communication allowing the meter showing usage to be read remotely. AMM allows two way communication allowing:

- supply to be disconnected remotely by the network operator (for example in an emergency) or to be set remotely to limit the amount of energy that can be used - this could help prevent large-scale blackouts in emergencies;
- allow energy prices and tariffs to be changed without the need to visit the customers home to re-set the meter manually, reducing costs. The information on real-time tariff data, energy use, and energy efficiency can be displayed in the customer's house; and
- the supplier to switch the meter between credit or prepayment payment methods remotely..

2.28. Work is now underway to finalise the detail of the roll-out and prepare for phasing. The model for roll-out will depend on whether it is left to the market or some of the services are centralised. The most efficient options are currently under review.

2.29. There are also ongoing discussions with industry about the appropriate functionality of the smart meters. Industry has been asked to set the technical specification, subject to minimum government standards (for example to ensure interoperability). Suppliers and networks are inputting into discussions. Decisions on the specification of the meter will affect the quality, granularity and timeliness of information provided. It will also affect the 'size' of the infrastructure needed to transmit the available data. A balance will need to be reached in terms of getting meters that are as 'smart' as possible, so that innovative network management can

⁵ Energy Act 2008 (<http://www.berr.gov.uk/whatwedo/energy/act/page40931.html>) .

be considered in the future, and over specifying resulting in a high cost to consumers.

Microgeneration technology

2.30. Microgeneration technology allows electricity to be generated at a small scale locally e.g. per building or set of buildings. Microgeneration is made possible through various technological means including:

- micro CHP;
- solar photo voltaic (PV) panels;
- various small scale wind turbines; and
- biomass generation.

2.31. The Energy Act 2004 requires Government to prepare a strategy for the promotion of microgeneration in Great Britain⁶. Microgeneration is defined in the Act as meaning the use for the generation of electricity or the production of heat of any plant where one of the following technologies is used and where the capacity for the generation of electricity is 50 kilowatts (45 kilowatts for heat production):

- biomass;
- biofuels;
- fuel cells;
- photovoltaics;
- water (including waves and tides);
- wind;
- solar power;
- geothermal sources;
- combined heat and power systems; and
- other sources of energy and technologies for the generation of electricity or the production of heat, the use of which would, in the opinion of the Secretary of State, cut emissions of greenhouse gases in Great Britain.

2.32. The Government consulted on a microgeneration strategy in 2005⁷ and followed this with a strategy document in 2006⁸. The strategy was aimed at promoting conditions in which microgeneration as a source of electricity and heat production could significantly increase. In 2004 there were 82,000 microgeneration installations in the UK. A realistic long term aim according to a study DTI commissioned from the Energy Saving Trust (EST) at the time was 30 - 40 % of the

⁶ Department of Trade and Industry: Section 82, Energy Act 2004. This is available at http://www.opsi.gov.uk/acts/acts2004/plain/ukpga_20040020_en#pt2-ch1-l1g82.

⁷ Department of Trade and Industry: Microgeneration strategy and low carbon buildings programme: consultation, London, June 2005.

⁸ Department of Trade and Industry: Microgeneration strategy, London, March 2006.

UK's electricity needs being met by microgeneration by 2050 helping to reduce household carbon emissions to 15% per annum. The strategy's objective was to create conditions under which microgeneration becomes a realistic alternative way of electricity generation/heat production or a supplement to current electricity generation/heat production.

Smart grids

2.33. The concept of a SmartGrid⁹ has recently been developed both across Europe and America. Ofgem has played an active role in the EU's SmartGrids Technology Platform, which describes a SmartGrid as an electricity network that can intelligently integrate the actions of all the users connected to it - generators, consumers and those that do both - in order to deliver sustainable, economic and secure electricity supplies efficiently. This would include techniques such as active network management (ANM), which uses intelligent technology and control to use better the capacity of the network, and Demand Side Management (DSM), which manages the level of demand and therefore electricity flows through the network.

⁹ Vision presented by the Advisory Council of the Technology Platform for Europe's Electricity Networks of the Future.

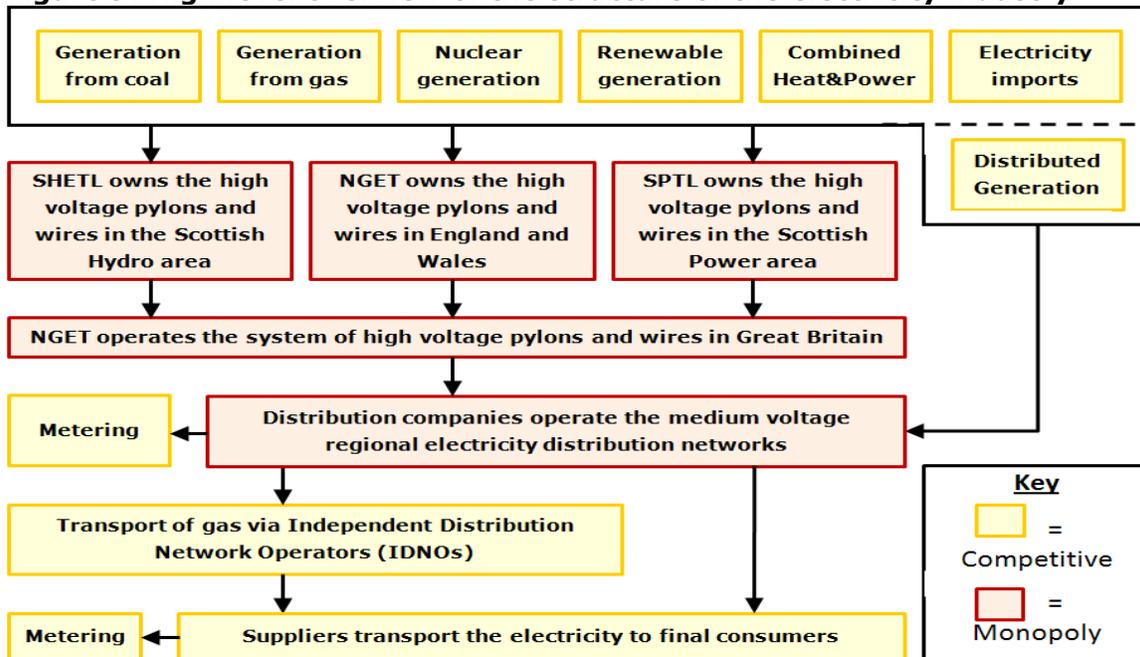
3. Industry structure

3.1. This section describes changes in the structure of the electricity and gas industry since privatisation. It also describes the changes in company ownership, through takeovers and mergers. It does not focus on the detail of the price controls applied to the gas and electricity distribution and transmission companies as this is detailed in another supporting paper¹⁰.

Structure of the electricity industry

3.2. Figure 9 provides an overview of the structure of the electricity industry today. This is very different to the nationalised industry, which incorporated a Central Electricity Generating Board responsible for generation and transmission, and monopoly Local Area Boards responsible for distribution and supply. We outline here the main changes that were introduced at privatisation and afterwards to create the current structure.

Figure 9: High level overview of the structure of the electricity industry



¹⁰ Ofgem: RPI-X@20, Principles, process and issues, Supporting document, History of energy network regulation 27 February 2009 (insert web reference).

Overview

3.3. Before electricity privatisation there was an attempt, through the Energy Act 1983, to introduce competition into the electricity industry. This was done by allowing competition in both electricity generation and supply with the incumbent publicly owned Central Electricity Generating Board (CEGB) and the Local Boards. However, their strong incumbent position prevented this being successful.

3.4. The Electricity Act 1989 set the framework for privatisation and regulation of the electricity industry. It also established the structure of the industry. In contrast to gas (see the next section), the Electricity Act separated the vertically integrated industry in England and Wales. In March 1990 the CEGB and the Area Boards were separated into generators, a transmission company and twelve Regional Electricity Companies (RECs) which provided distribution and supply services. Electricity was traded between generators and suppliers through the pool market arrangements, and National Grid (the transmission company) had responsibility for managing the Pool system.

3.5. In Scotland the market structure remained distinct from England and Wales with two vertically integrated generation, transmission, distribution and supply companies; one covering the North of Scotland (Hydro-Electric), and one covering the South of Scotland (Scottish Power). Physical electricity flows are connected through interconnectors between Scotland and England. The upstream markets were separate, until 2005 when the British Electricity Trading and Transmission arrangements (BETTA) were introduced.

3.6. Developments in the structure of the electricity industry can be categorised into a number of phases.

- Privatisation and the Pool (1990) - the separation of generation from transmission was a first step to creating a division between the physical network for electricity (moving electricity from upstream to consumers) and the commercial arrangements (linking generators to suppliers, with a System Operator to ensure supply meets demand at all times). The separation created the need for a market to link upstream generation to suppliers and to ensure the system was balanced. Distribution and supply were also separated from transmission, largely keeping the regional structure of the Area Boards.
- Competition phased in from 1990 onwards (for customers with >1MW consumption until 1994, then >100KW before full competition from 1999).
- Concerns about upstream competition and takeovers (1990s) - much of the 1990s was dominated by concerns about generation market power, and a number of measures were introduced to try to make competition more effective. From the mid-1990s, distribution companies were subject to a series of takeovers.
- Full retail competition for all electricity customers and NETA (late 1990s/early 2000s) - retail competition was introduced, supply companies were separated from distribution companies and New Electricity Trading Arrangements (NETA) were introduced. This introduced new commercial and trading arrangements to promote more competition in generation and supply.

- Consolidation and vertical integration (2000s) - after the introduction of retail competition and NETA, the separated supply businesses consolidated and there was vertical integration, with generators buying a number of the supply businesses. Takeover activity also resulted in consolidation in distribution, with the fourteen DNOs owned by seven companies.
- Ensuring effective retail competition and low carbon generation (since 2000) - ongoing concern about climate change has resulted in a push for more low carbon generation (renewables and recently nuclear), connecting to both the transmission and distribution networks. The British Electricity Transmission and Trading Arrangements (BETTA) were introduced to widen the benefits of retail competition to all consumers. There is also ongoing monitoring of retail markets, most recently our 2008 Energy Supply Probe.

3.7. The first stage of the electricity supply chain is generation. Most generation is carried out upstream, with electricity supplied in the first instance to the high voltage transmission network. Some generation is also connected directly to the distribution network or on-site for large business uses and large commercial/residential properties. This is referred to as distributed generation or embedded generation.

3.8. We describe developments in each element of the supply chain below.

Generation

3.9. The first stage of the electricity supply chain is generation. Most generation is carried out upstream, with electricity supplied in the first instance to the high voltage transmission network. Some generation is also connected directly to the distribution network. This is referred to as distributed generation or embedded generation.

Generation companies

3.10. In 1990 two non-nuclear generators for England and Wales were created: National Power and PowerGen. The vertically integrated Scottish companies (ScottishPower and Scottish Hydro-Electric) also had generation activities. Nuclear generation was undertaken by Nuclear Electric (England and Wales) and Scottish Nuclear (Scotland), both publicly owned.

3.11. National Power and PowerGen were part privatised in March 1991 with the Government selling its remaining share in March 1995 but retaining a golden share until 2000. The vertically integrated Scottish companies were privatised in 1990.

Nuclear

3.12. In May 1995, the Government published a White Paper on 'The Prospects for Nuclear Power in the UK. Following this paper, British Energy was set up and took over the (newer) commercially viable nuclear plants from Nuclear Electric and Scottish Nuclear. British Energy was floated in June 1996. Older, Magnox type nuclear power stations remained in the public sector, and were taken over by British

Nuclear Fuels Ltd (BNFL) in 1998. BNFL was the company responsible for decommissioning.

3.13. By the late 1990s, it was concluded that there was no case for further public expenditure on new nuclear generating plant. Much of the government's focus was on plans for managing and financing the decommissioning of existing nuclear power stations. However, in the 2007 Energy Review this position changed and has been confirmed in the Nuclear White Paper 2008¹¹, where the government proposes that new nuclear power stations should have a role to play in the future energy mix and that energy companies should be allowed to have the option of investing in new nuclear power stations.

Takeovers and mergers

3.14. Up until 2000, ownership of the main generators did not change significantly. In 2001, National Power was separated into Innogy and International Power. PowerGen was bought by E.ON in 2002 and Innogy was bought by RWE. In 2007, Iberdola merged with ScottishPower. Since 2001/02, there has been a move to greater vertical integration through takeovers. These followed a number of bankruptcies including Enron around that time. The big six¹² companies have, since 2004, accounted for between 50% and 60% of generating capacity.

3.15. There have also been a number of mergers within the electricity sector that have resulted in vertical re-integration. In the 1990s, ScottishPower merged with Manweb and Southern Water, creating a multi-utility company. The water business has since been sold and ScottishPower has focused on becoming a global energy company. Scottish-Hydro also merged with Southern Electric. When distribution and supply were separated, a number of the supply businesses were acquired by the generators.

Concerns about effective competition and efficient investment decisions

3.16. From the early 1990s, there were concerns that the generators were potentially dominant in the wholesale market and that insufficient competition opportunities were being exploited. Various remedies were tried including:

- temporary price controls;
 - divestment of 6GW of plant by generators in 1993;
 - further divestment of plant by National Power and PowerGen in 1997/98;
-

¹¹Department of Business, Enterprise and Regulatory Reform, White paper on the future of nuclear policy, January 2008.

¹² The 'big six' refers to British Gas, EDF Energy, E.ON, RWE npower, ScottishPower and SSE.

- the market abuse licence condition (gas only); and
- a number of wholesale market probes between 2003 and 2006.

3.17. The separation of generation from transmission meant that the Grid was not involved in decisions about the location of power stations. The Grid was required to facilitate the plans of generators. The Secretary of State had the power to intervene and grant or amend consents for power station construction. The Secretary of State in granting approval under section 36 also grants planning permission under Schedule 8 of the Act. Whether or not location decisions were efficient, for the electricity system as a whole, depended on whether or not transmission network charges provided efficient pricing signals. As discussed in another supporting paper on the history of energy network regulation (see footnote 1), there have been ongoing concerns about the structure of charges and implications for efficient location decisions.

The wholesale market

The Pool

3.18. From March 1990, electricity in England and Wales was traded through the 'pool arrangements'. A market was needed because of the separation of generation from the transmission network.

3.19. The Pool was managed by the transmission company, National Grid Company (NGC). To be part of the wholesale market you needed to be a member of the Pool. Generators sold into the pool and suppliers purchased electricity from the pool subject to a set of contractual rules. Generators bid in a price (marginal cost, which could be zero) and were paid the system marginal price that cleared demand and supply in half-hourly periods.

NETA

3.20. In 1997 the government announced a review of the wholesale trading arrangements in England and Wales. This reflected concerns about the effectiveness of competition in the generation market and the need to facilitate effective competition in the new retail market. The aim was to move away from the managed energy market and create an energy market that was similar to standard commodity markets. This required creation of a balancing mechanism, to ensure supply met demand in real time.

3.21. Offer and DTI proposed the establishment of New Electricity Trading Arrangements (NETA), which became operational on 27 March 2001. NETA represented a major structural change. Generators, suppliers and customers were able to choose how to contract, including bilaterally. Short- and long-term contracts could be entered into and choices would be market led. A balancing mechanism was set up to ensure short-term demand and supply were balanced in real time. NGC was given the System Operator role to balance the system. Balancing needs to take account of location and quality of electricity, as well as aggregate level of supply and

demand. Changes in fuel mix, for example increases in renewables and increased distributed generation, will change the complexity of the task and the associated costs.

BETTA

3.22. Until 2005 the Scottish and England/Wales markets remained generally separate subject to trading through the interconnector. Electricity was exported from Scotland to England and Wales, as the Scottish electricity industry had generating capacity that normally far exceeded demand. Since 1 April 2005 the British Electricity Trading and Transmission arrangements (BETTA) have applied across Great Britain. BETTA is a single integrated and competitive wholesale market for electricity across Great Britain with:

- a single system operator;
- common rules and charges for connections and use of transmission system; and
- a single balancing and settlement code.

3.23. This enabled a widening of the benefits from competition to the Scottish as well as other GB consumers.

System operator

3.24. An electricity system operator balances supply and demand on the system in real time. Under the Pool, balancing was managed by NGC through the Pool and short-term supply measures.

3.25. A separate balancing mechanism was created with NETA, and NGC, as System Operator (SO) had the responsibility for balancing the system. The SO role was formally separated from NGC's transmission owner role in 2002. System operator incentives are used to provide rewards and penalties to the system operator in order to encourage efficient behaviour in carrying out this function. Details of how these incentives are set can be found in the supporting document on the history of energy network regulation (see footnote 1).

3.26. From the creation of NETA until September 2004, there were separate system operators (SOs) for England and Wales (National Grid SO) and Scotland (Scottish Power SO and Scottish Hydro Electric SO). As part of BETTA National Grid SO became the system operator role for the whole of Great Britain. There are provisions in National Grid's licence and industry codes to ensure that it carries out its system operator role independently of its role as the largest transmission network operator. In Scotland, National Grid SO is the system operator but the operation, maintenance and development of the two Scottish transmission networks remains the responsibility of Scottish Power Transmission and Scottish Hydro-Electric Transmission.

Transmission network

3.27. The Scottish companies were privatised as vertically integrated operations in 1990. National Grid was initially owned jointly by the regional electricity companies (RECs). It was floated on the stock exchange in December 1995, when the RECs were required to dispose of all but 1% of their shares. While the Government had held and divested golden shares in RECs in 1995, it retained a special share in National Grid until 2004.

3.28. The Scottish Companies were privatised as vertically integrated operations in 1990. National Grid was initially owned jointly by the regional electricity companies (RECs). It was floated on the stock exchange in December 1995, when the RECs were required to dispose of all but 1% of their shares. While the Government had held and divested golden shares in RECs in 1995, it retained a special share in National Grid until 2004.

3.29. In 2002, National Grid merged with Lattice, the gas transmission operator, creating National Grid Transco plc. This was rebranded as National Grid Plc in 2005, with two separate businesses National Grid Gas and National Grid Electricity Transmission. The vertically integrated Scottish companies also integrated with other businesses (notably distribution and supply companies), as discussed below.

3.30. Price controls were established for transmission companies. Details on how the transmission network price controls have been set since privatisation can be found in the supporting paper on the history of energy network regulation (see footnote 1).

Distribution and supply

3.31. The twelve RECs in England and Wales were privatised in December 1990. They provided distribution and supply services. In June 1991, the vertically integrated Scottish companies were part-privatised (60%). These companies were responsible for transmission, distribution and supply.

3.32. The RECs, and the Scottish companies, had separate price controls for supply and distribution from privatisation. Details on how these price controls were set, and how they have changed over time, can be found in the supporting paper on the history of energy network regulation (see footnote 1). Details on how quality of supply is regulated can also be found in this paper.

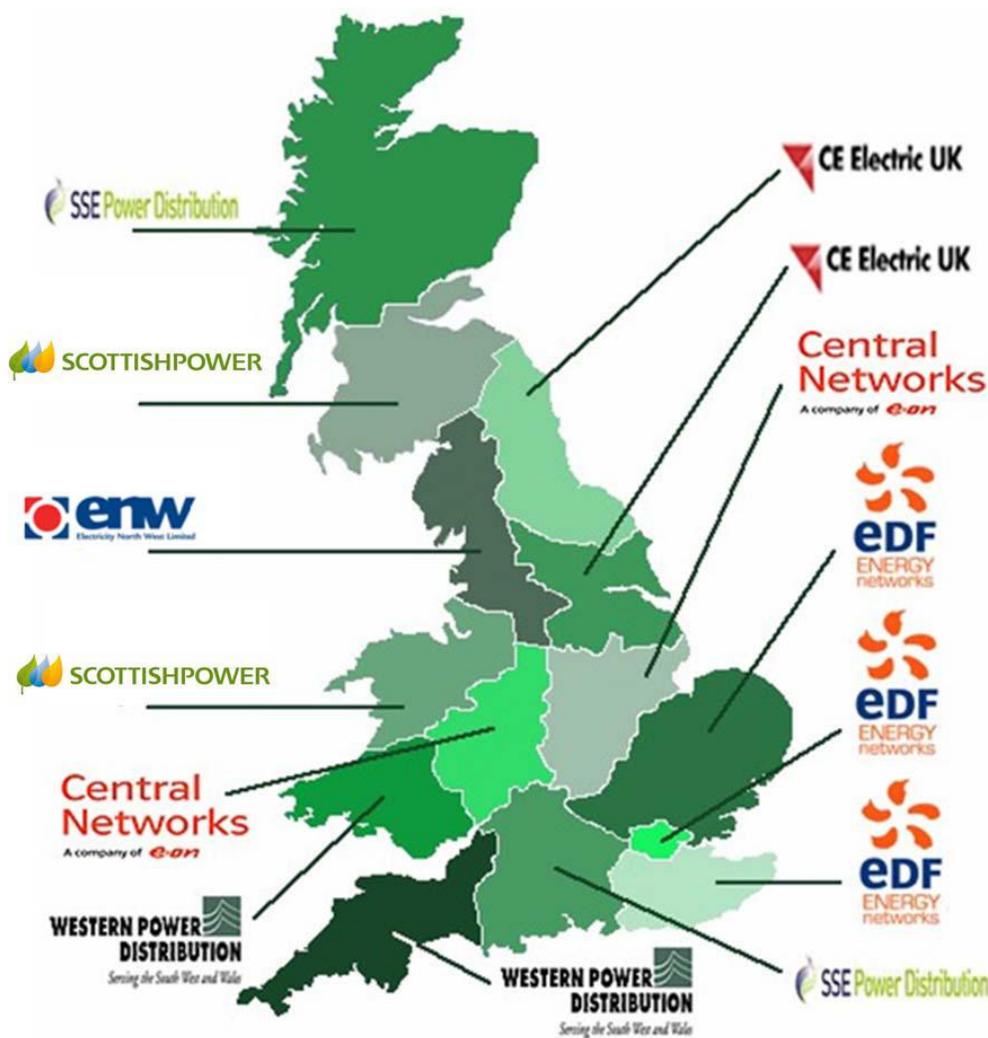
Distribution takeovers and mergers

3.33. In the mid- to late-1990s, the (then) regional electricity companies were subject to a number of takeovers. Takeovers were possible after the Government's Golden Share expired in 1995. All of the RECs went through at least one takeover between 1995 and 2000, and many had two or more. In many cases the companies were bought by US owners, while in others they became part of multi-utility businesses.

3.34. From 1998, the US companies withdrew and many of the RECs were purchased by generators and European energy companies. The industry became more consolidated (providing scale) and there was vertical integration, through common ownership, of generation, supply and network businesses. There has also been horizontal integration, with the fourteen distribution network operators now owned by seven companies, although separate licences (and price controls) apply to each of the DNOs. Ownership has remained relatively stable in recent years.

3.35. The current ownership structure of the DNOs is shown in the map below.

Figure 10: Map of GB electricity distribution licence areas



Source: Ofgem

3.36. From 1995, Offer, and subsequently Ofgem, considered the impact, on consumers, of the various mergers in preparing advice to the Office of Fair Trading

(OFT). The benefits of scale needed to be balanced against the cost of losing comparators when using benchmarks to set price controls. The mergers also meant that financial market data was not available on each of the separate DNOs. The approach to this for distribution companies was published in 2002¹³ (see the supporting paper on the history of energy network regulation for more detail (see footnote 1)).

Retail competition

3.37. The 14 regional public electricity suppliers retained their monopolies in the initial privatised structure but competition was introduced in phases up to May 1999 when the market was fully opened to competition. Price controls applied temporarily ran on until 2002. At this stage, they were removed because Ofgem understood that competition was developing well. By April 2004 we judged that competition was bringing benefits but not fully mature.

3.38. We continue to monitor competition through energy market outlook and, most recently, our energy supply probe¹⁴.

Separation of distribution and supply

3.39. In May 1998 Offer started to consult on the separation of the distribution and supply businesses of the RECs. The treatment of metering and meter reading was also reviewed. A second consultation on separation was published in November 1998 with a related paper on accounting separation published a month earlier. The government also published its consultation paper on the future of gas and electricity regulation in October 1998, including proposals on separation. Offer recommended full ownership separation, but the government recommended that separate licences should be held by separate companies, although these companies could have a common owner.

3.40. The distribution and supply businesses were formally separated through the Utilities Act 2000, although they could still be in common ownership. Following this, a number of the supply businesses consolidated. There are now six major energy supply companies and all but one of these (Centrica) is part of a group that owns network businesses either in GB or in the EU.

¹³Ofgem, Mergers in the electricity distribution sector, a policy statement, May 2002. (<http://www.ofgem.gov.uk/About%20us/enforcement/mergers/oft/Documents1/mergersandaquisitions%20048.pdf>).

¹⁴Ofgem, Energy supply markets probe, Initial findings report, October 2008. (<http://www.ofgem.gov.uk/Markets/RetMkts/ensupro/Documents1/Energy%20Supply%20Probe%20-%20Initial%20Findings%20Report.pdf>).

Independent distribution network operators

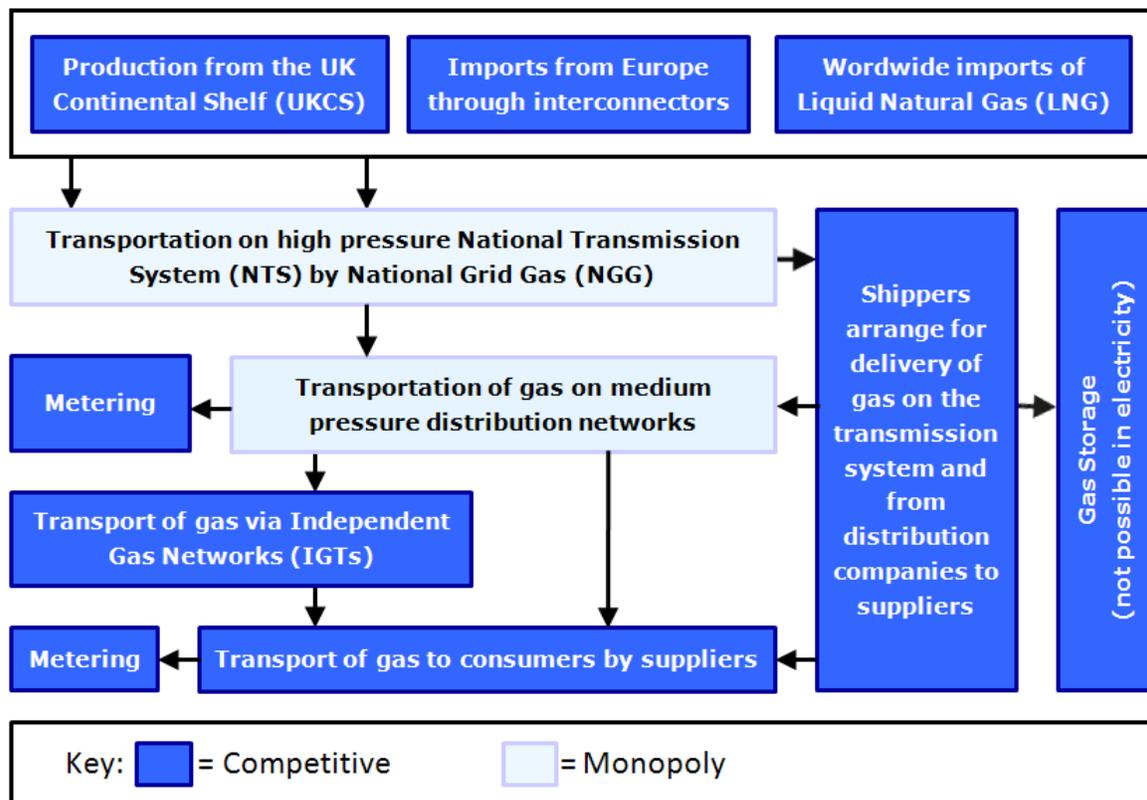
3.41. In addition to the fourteen electricity distribution network operators (DNOs) created at privatisation, there are six independent distribution network operators (IDNOs).

3.42. DNOs were granted separate distribution licences on 1 October 2001. They have specific distribution service areas. Licences for IDNOs have also been available since 1 October 2001. IDNOs are also licensed distributors but they do not have a distribution services area. Instead they own and operator electricity distribution networks that are predominantly network extensions, e.g. to serve new housing developments. We regulate IDNOs using relative price control (RPC) arrangements.

Structure of the gas industry

3.43. Figure 11 provides an overview of the structure of the gas industry today. This is very different to the vertically integrated industry that was privatised in 1986. We outline here the main changes that were introduced since privatisation, leading to the current structure.

Figure 11: Structure of gas industry



3.44. The main developments in the structure of the gas industry are as follows:

- Internal separation of gas transportation and storage from supply (1986-1995): there was concern about the development of competition in the non-tariff market and a series of reviews were undertaken by Ofgas, the Office of Fair Trading (OFT), and the Monopolies and Mergers Commission (MMC). These resulted in internal separation of gas transportation and storage from supply (Gas Act 1995).
- Roll-out of retail competition (from April 1996): retail competition was rolled out between April 1996 and May 1998. There were a number of reviews to ensure that competition was effective before retail price controls were removed in 2002. Energy supply companies, offering dual fuel packages, emerged and there are now six major energy suppliers. We continue to monitor competition in the energy supply market, for example most recently in our 2008 Energy Supply Probe.
- Formal separation of British Gas (1997 to 2002): in 1997 British Gas demerged its supply business from Transco (the gas transportation and storage business). In October 1997, BG Storage was established as a separate stand-alone business. In October 2002, National Grid Group merged with Lattice (the owner of Transco) creating a single gas and electricity transmission company.
- Sale of four regional distribution networks: In June 2005, National Grid Gas sold four of the gas distribution networks (GDNs) to three new owners (Scotia gas networks, Northern Gas Networks and Wales and West Utilities). The remaining four were retained by National Grid Gas.

3.45. We discuss these developments in chronological order below.

Privatisation and the 1987 MMC review

3.46. Under the 1986 Gas Act, British Gas was privatised as a vertically integrated national monopoly. There was a separate licence for the transportation company (incorporating storage and metering) and the gas supplier, both established as subsidiaries of British Gas. Rights and obligations of licence-holders and customers were established in the Gas Code.

3.47. The 1982 Oil and Gas (Enterprise) Act had allowed third parties to use the British Gas pipeline sector to introduce competition in gas supply. At privatisation, the market for industrial and commercial gas customers (those with demand above 25,000 therms) could be supplied by other licensed suppliers with third party access arrangements to British Gas's pipeline system. This was called the non-tariff market. All other customers were supplied by British Gas.

3.48. However competition in the non-tariff market did not develop¹⁵. The regulator, Ofgas, and others were keen that obstacles to competition in gas supply be removed.

¹⁵ Ofgas Annual Report 1987.

The Director General of Fair Trading referred British Gas to the Monopolies and Mergers Commission (MMC)¹⁶ in November 1987, in response to complaints about price discrimination in the non-tariff market. The MMC found that British Gas was guilty of discrimination in pricing, as a result of its monopoly position. The MMC recommended a number of undertakings including:

- a requirement to publish a schedule of prices;
- British Gas was not to refuse to supply interruptible gas on the basis of the use made of the gas or the alternative fuel available;
- a requirement to publish information on common carriage terms to enable a customer to estimate the charge it would have to pay to British Gas; and
- an agreement to contract for no more than 90 per cent of any new gas field initially.

3.49. A series of undertakings between British Gas and the Secretary of State were signed in February 1990. In March 1991 British Gas also agreed to the Gas Release Scheme proposed by the OFT, whereby it would reduce its share of the contract market to 40% by 1995 and release gas to competitors in tranches between 1992 and 1995.

1993 MMC review

3.50. The OFT reviewed progress relative to the undertaking in 1991 and found that competition was not developing, even with British Gas adhering to the terms of the undertaking. The OFT proposed releasing a significant proportion of British Gas's contracted gas and relaxing the tariff monopoly. Restructuring was also proposed; separation of transmission and storage from the rest of the British Gas (particularly supply).

3.51. Relaxation of the tariff monopoly was made feasible by the 1992 Competition and Service (Utilities) Act which gave the Secretary of State the power to reduce the 25,000 therms a year threshold that defined the competitive gas supply market. This opened up the possibility of increasing supply competition without the need for legislative change. The threshold was reduced to 2,500 therms a year in August 1992.

3.52. Following the OFT review the Secretary of State referred two British Gas cases to the MMC under the Fair Trading Act in 1992. The inquiry was wide-ranging, relating to supply of gas in GB, tariff and non-tariff supplies, and the transportation and storage of gas supplies. At the same time, in July 1992, the DG asked the MMC to consider whether the British Gas transportation and storage business operated against the public interest. This referral by Ofgas was necessary as British Gas had

¹⁶ The Competition Commission replaced the MMC in 1999 through provisions in the Competition Act 1998.

rejected its price control proposals. In August 1992, the DG also asked the MMC to investigate whether British Gas was fixing supply tariffs.

3.53. The MMC's findings were published in August 1993. The MMC recommended that British Gas divest its supply business and that a separate transportation and storage unit should be created. The MMC also recommended regulation of the transportation business indefinitely and charged British Gas with responsibility for maintaining the security of the system, balance supply and demand and enabling competition in metering. Domestic competition was to be considered in the future (no earlier than 2002), based on a detailed analysis of the case for introducing competition. The MMC also relaxed the price control from RPI-5 to RPI-4, to reflect the impact of the change in monopoly threshold. The change also partly reflected an alteration in the allowed rate of return to 6.5 to 7.5% for new investment and 4 to 4.5% on pre-1992 assets. The rate of return reflected views on the differential risk of new and existing investments.

3.54. Ofgas introduced separate price controls for transportation (Transco) and supply in April 1994. Details of how these and subsequent controls were set can be found in the supporting paper on the history of energy network regulation.

3.55. In response to the MMC's findings, the Secretary of State proposed internal separation of transportation and storage from supply rather than full divestment. He also established a timetable for roll-out of competition that was faster than proposed by the MMC. The proposals required legislative change and led to the Gas Act 1995.

The Gas Act 1995

3.56. The Gas Act 1995 amended the 1986 Act. This Act introduced a new industry structure and regulatory regime, to facilitate introduction of domestic competition by May 1998. The roll-out of competition began with the first pilot phase in April 1996. The DG was provided with powers, similar to those of the Director General of Fair Trading (DGFT), to regulate possible monopoly situations.

3.57. The licensing regime was also changed in the 1995 Act to allow for three types of operator: public gas transporters (including storage), gas shippers and gas suppliers. A Network Code was established to lay down the rules and conditions for access arrangements between shippers and the Public Gas Transporters. The Code provides details of the daily balancing system, requirements for non-discriminatory access, cost based pricing, and Transco's responsibilities for ensuring safety and efficiency of the system. Transco was provided with commercial incentives to ensure efficient operation and balancing of the system in October 1999.

Restructuring of British Gas

3.58. The combination of the introduction of competition and a significant reduction in the spot price of gas led to British Gas's long-term contracts for gas being stranded. To deal with the problem, British Gas separated out its supply contracts from the transmission and distribution businesses. In 1996 British Gas transferred

its supply business assets to British Gas Trading (BGT), the renamed supply business.

3.59. In 1997, British Gas demerged the supply business, and other assets (including the stranded contracts), to a newly formed listed company Centrica. The remaining parts of British Gas were renamed BG plc, incorporating Transco the gas transportation and some gas production and gas storage assets.

3.60. In October 1997, BG Storage was established as a separate stand-alone business within BG plc. Further restructuring of BG Plc was announced in August 1999. On 23 October 2000 Lattice group (owner of Transco) demerged from BG plc. In October 2002, National Grid Group merged with Lattice creating a single gas and electricity transmission company. National Grid Gas (NGG) and National Grid Electricity Transmission (NGET) operate as separate entities within the same company. National Grid Gas owned eight Gas Distribution Networks (GDNs) and the gas National Transmission System (NTS).

Gas retail competition

3.61. In 2003 Ofgem reviewed the progress of both electricity and gas supply competition. It found that good progress had been made since full competition in 1998. There was a much higher recognition of the presence of alternative suppliers, a greater amount of switching and higher levels of satisfaction than in previous studies. It also recognised that BG's market share was falling at a slowing rate and was still high at over 60%. The market remains concentrated to the present day.

Regional distribution networks

3.62. British Gas, and later Transco, operated with a regional local distribution structure. In 1994 this was replaced by five separate business units, although local distribution zones remained from an operational perspective. In 2001, Transco was separated into the National Transmission System (NTS) and the local distribution companies. These networks were regulated separately from 2002.

3.63. In June 2005, National Grid Gas sold four of the gas distribution networks (GDNs) to three new owners (Scotia gas networks, Northern Gas Networks and Wales and West Utilities). The remaining four were retained by National Grid Gas. NGG has a single licence to operate its four GDNs, but each one has a separate price control.

3.64. The sale of the 4 GDNs marked a key point in the evolution of the commercial, regulatory and operational arrangements for gas distribution. When Ofgem gave consent for the sales to be cleared, those using the gas network for the first time had to deal with multiple network owners. The regulatory arrangements were revised. This particularly involved the extent of separation of the national transmission system (NTS) from those GDNs sold and those retained by National Grid. Rules were established to ensure non-discrimination and to allow separate network owners to interact with each other and set the operational rules by which the transmission and

distribution networks would be run given the change of ownership of some of the distribution companies.

Independent gas transporters

3.65. In addition to the 8 GDNs there are smaller Independent Gas Transporters (IGT). These are similar to IDNOs in that they generally have been built to serve new housing. The IGTs are regulated through relative price controls, capping the charges at an equivalent level to the relevant GDN charge.

4. Government and regulatory institutions

4.1. This chapter describes the changes and development of the Government and regulatory institutions relevant to the energy network sector.

Government departments responsible for energy

4.2. Energy policy at privatisation was initially the responsibility of the stand alone Department of Energy. This Department was merged into the Department of Trade and Industry (DTI) in 1992, with the Department having a new Energy Division responsible to the Secretary of State. General competition and regulatory matters were also the responsibility of DTI but within other specialist teams.

4.3. The DTI was rebranded as the Department of Business, Enterprise and Regulatory Reform (BERR) in June 2007. In October 2008 a new Department of Energy and Climate Change (DECC) was created. This took over responsibility for energy policy from BERR and climate change policy from the Department for Environment, Food, and Rural Affairs (DEFRA). BERR retained its competition and regulatory role.

4.4. Environmental policy was set by the Department of Environment (1990 to 1997), the Department of Environment, Transport and the Regions (1997 To 2001), the Department for Environment, Food and Rural Affairs (DEFRA) (2001 to October 2008) and now by the new Department of Energy and Climate Change (2008).

4.5. Government Departments are responsible for setting energy policy but they have not been directly involved with the regulation of the energy networks. For example, there is no formal role for government in the price review process. The Secretary of State has, since the Utilities Act 2000, the right to provide Ofgem with guidance (social and environmental guidance) 'as to the contribution which he/she considers the Authority should make towards the attainment of the Government's social and environmental policies'¹⁷. The Authority has to have regard to this guidance when discharging its statutory functions. We expect new guidance to be provided in Spring 2009, reflecting the creation of DECC, the Energy Act 2008, and consequent changes in energy and environmental policy.

¹⁷ Department of Trade and Industry: explanatory summary of its social and environmental guidelines to GEMA introduced through the Utilities Act 2000.

Regulatory institutions

The economic regulator

4.6. Initially, gas and electricity were regulated separately through separate regulatory bodies.

4.7. The Gas Act (1986) created Ofgas as the regulatory authority for the gas industry. In addition to the regulator, the Gas Consumer Council was set up to represent consumers and to investigate complaints made to it. The Director General (DG) of Ofgas was appointed by the Secretary of State for a five-year period, with the ability for reappointment. The Act set out the duties of both the Secretary of State and the DG.

4.8. The Electricity Act (1989) created the Office of Electricity Regulation (Offer), with the Director General of Electricity Supply (DGES) at its head. The Act established the duties and objectives of the new electricity regulatory authority. It also established the duties of the Secretary of State.

4.9. Under the Utilities Act (2000) a single energy regulatory authority, the gas and electricity markets authority (GEMA) and its office (Ofgem), was created. The new regulatory office began operating in June 1999. The merger of the two previous regulators (Offer and Ofgas) was aimed at introducing an integrated approach to regulating the two industries; to allow for cross-industry challenges related to the social and environment agenda; and for competition in the energy sector to be considered in-the-round.

4.10. The structure of management for the new regulator was also markedly different to either of its predecessors with a Chairman and Chief Executive as part of a board structure rather than an individual regulator or Director General. Details of current members of GEMA (the Authority) can be found on the Ofgem website.

4.11. Offer, Ofgas and Ofgem are all independent regulatory authorities. All regulatory decisions need to be taken in the context of the office's statutory duties. These duties have changed over time. The focus has been on protecting the consumer interest, promoting competition where feasible and ensuring that regulated businesses can finance their functions. The environment, and wider sustainability goals, have always been incorporated within the duties, but have moved up in terms of prominence over time.

Other regulators

4.12. There are a number of other agencies responsible for regulating energy companies. In particular, the Health and Safety Executive is responsible for safety on the networks (most notably the gas networks) and the Environment Agency is responsible for regulating the environmental impact of the sector (for example emissions from generators).

4.13. Ofgem has concurrent powers under the Competition Act 1998 with the Office of Fair Trading. The jurisdiction of the Authority regarding Articles 81 and 82 of the European Treaty, Chapter I and II prohibitions under the Competition Act 1998 are set out in section 36A of the Gas Act 1986 and section 43 of the Electricity Act 1989.

4.14. In August 2003, Ofgem signed a Concordat with the Financial Services Authority to work together effectively where appropriate.

4.15. Appeals can be made to the Competition Commission on both licence modifications and through Competition Appeals Tribunal on Competition Act 1998 matters. Ofgem can also refer markets to the Competition Commission under the Enterprise Act 2002.

4.16. The Nuclear Decommissioning Agency is a non-departmental public body, established under the Energy Act 2004. It is responsible for the decommissioning and clean-up of the UK's civil public sector nuclear sites. Its sponsoring Government department is the Department for Energy and Climate Change (DECC and for some aspects of our functions in Scotland it is responsible to Scottish Ministers).

4.17. It is responsible for

- developing UK-wide nuclear Low Level Waste (LLW) strategy and plans;
- the long-term management arrangements for the UK's higher radioactive wastes; and
- 19 former UKAEA and BNFL sites.

4.18. The Coal Authority was established by Parliament under the Coal Industry Act 1994 to undertake specific statutory responsibilities associated with:

- licensing coal mining operations in Britain
- handling subsidence damage claims which are not the responsibility of licensed coal mine operators
- dealing with property and historic liability issues, such as treatment of minewater discharges
- providing public access to information on past and present coal mining operations; and
- provide a 24 hour call-out service for reported surface hazards.

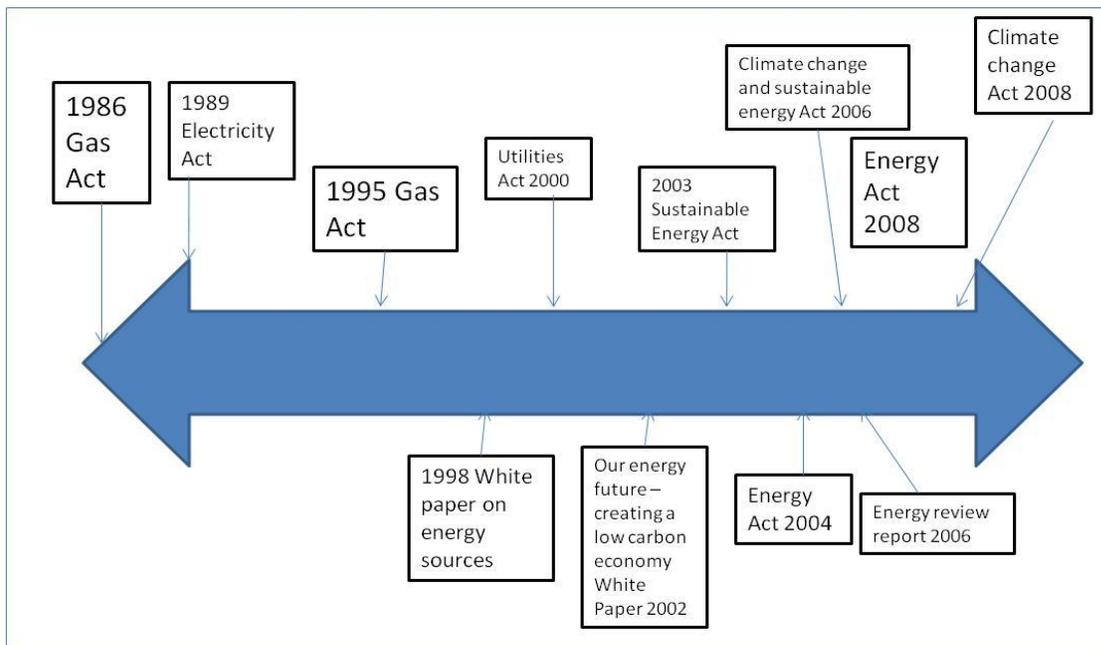
4.19. There are also specialist nuclear police agencies.

5. GB energy policy

5.1. This section looks at the main developments of GB energy policy since privatisation. We pay particular attention to developments that impact on the energy network companies and/or on the regulatory institutions and processes. We describe related EU policy developments in Chapter 6, and developments in environmental and social policy in Chapters 7 and 8 respectively.

5.2. The timeline in Figure 12 sets out the major pieces of relevant legislation (Acts and White Papers). The key elements of these are drawn out in the later text and tables, with environment and social legislation discussed in later chapters. Even such a high level timeline indicates that the legislative framework has faced significant changes in recent years.

Figure 12: Major pieces of energy and environmental legislation



5.3. Policy has changed to deal with a range of issues. Initially the focus was on making the gas and electricity privatisation a success. Government and regulators took forward work on encouraging competition where possible in both gas and electricity and facilitating this with policy on the transmission and distribution elements of the industry. In the current and recent times the focus has been on delivering specific environmental and social objectives in a sustainable way and protecting security of supply.

5.4. Recently policy-makers have recognised the role that transmission and distribution networks must take in facilitating a reduction in carbon emissions and the use of renewable sources of generation. In our DPCR5 December 2008

document¹⁸, we recognised for example the important role that electricity distribution network operators can play in achieving a low carbon future. This is not just directly in relation to their own carbon footprint (including management of losses) but also the need for them to facilitate change to deliver low carbon energy demand and respond effectively to changing energy demand patterns. These issues are central to RPI-X@20.

Overview of GB energy policy

5.5. Table 4 provides a summary of the main energy policy documents (including legislation) since privatisation. Details of the most relevant ones are discussed later.

5.6. Energy policy has changed the nature and role of energy network operators, for example by enabling the original privatisations, setting up the regulatory frameworks and changing industry structure. It has also changed the nature and role of the regulatory institutions, for example by changing the structure of the regulatory agency and the duties.

5.7. There have been a number of changes in policy recently, and a number of other potential changes are currently under review. Recent trends in policy were summarised by Ed Milliband the Secretary of State in a speech soon after the formation of the new Department of Energy and Climate Change¹⁹. He said that there were new assumptions about our energy policy:

- 'compatible with tackling climate change';
- 'meet people's need to have access to energy...'; and
- 'energy at the lowest prices possible, consistent with the need for investment'.

5.8. These are all themes which will be considered when we review the development of an effective regulatory framework for the future in RPI-X@20.

¹⁸ Ofgem, Electricity Distribution Price Control Review 5, Policy Paper, 5 December 2008. DPCR5 documents can be accessed on our website at:

<http://www.ofgem.gov.uk/Networks/ElecDist/PriceCtrls/DPCR5>.

¹⁹ Speech by Ed Miliband at Imperial College, London, 9 December 2008. This is available on the DECC website at: <http://www.decc.gov.uk/pdfs/miliband-speech-imperial-091208.pdf>.

Table 1: Main developments in energy policy

Date	Legislation or other key policy document	Summary of relevant content
1976	Energy Act	Provided Emergency Power provisions and provision with respect to the nation's resources and use of energy.
1982	Oil and Gas (Enterprise) Act	Enabled sale of assets and third party access to gas pipelines and abolished National Oil Account.
1986	Gas Act	Set out provisions for privatisation of British Gas and regulation of the gas industry in Great Britain. Also provided for appointment and functions of a Director General of Gas Supply and the establishment of a Gas Consumers' Council.
1988	White papers published on privatising electricity in England/Wales and Scotland	Government announced its intention to privatise the electricity supply industry.
1989	Electricity Act	Set out provisions for privatisation and regulation of electricity industry in Great Britain and initial restructuring of industry. Also provided for the appointment and functions of a Director General of Electricity Supply and of consumers committees for the electricity supply industry.
1995	Gas Act	Introduced re-structuring of industry and licensing regime for gas shippers, suppliers and transporters.

Date	Legislation or other key policy document	Summary of relevant content
1998	Competition Act	Prohibited horizontal and vertical anti-competitive activity following Articles 81 and 82 of the EU Treaty. Ofgas and Offer (and subsequently Ofgem) have concurrent powers with OFT.
2000	Utilities Act	Set out new regulatory arrangements, including creation of GEMA and provision for Government guidance to Ofgem on social and environmental issues.
2002	Enterprise Act	Provided for new competition and consumer policy approach, including less political intervention on mergers, new market investigation powers and introduction of super complaints approach. Also provided for the functions of the Office of Fair Trading, Competition Appeal Tribunal and Competition Service. Act also created an offence for those entering into certain anti-competitive agreements and for the disqualification of directors.
2003	Energy White Paper	60% cuts in UK CO ² emissions by 2050 Focus on environmental targets and security of supply Nuclear power not seen as key ongoing energy source

Date	Legislation or other key policy document	Summary of relevant content
2003	Sustainable Energy Act	Provides for Government reporting against specific environmental objectives, provisions for promoting energy efficiency and requirement for Ofgem to carry out an impact assessment where a proposal would have significant effects on the environment.
2004	Energy Act	New duty for Ofgem to act 'in a manner best calculated to contribute to the achievement of sustainable development.
2006	Climate Change and Sustainable Energy Act	Principal objective of Act is to enhance the UK's contribution to combating climate change. Duties on councils to have regard to 'alleviating fuel poverty'-enable targets (+ progress on meeting them) on microgeneration. Government to publish steps taken to reduce greenhouse gases.

Date	Legislation or other key policy document	Summary of relevant content
2008	Planning Act	Established the Infrastructure Planning Commission and made provisions about its functions.
2008	Energy Act	<p>Inserted provisions into the Electricity Act 1989. Amended Ofgem's powers to enable it to run the offshore transmission licensing regime more effectively. Introduced provisions in relation to: smart metering, renewable heat.</p> <p>Energy provisions include:</p> <ul style="list-style-type: none"> Provisions facilitating gas importation and decommissioning of energy installations. Environmental provisions include: <ul style="list-style-type: none"> Increase efficiency of renewals obligations framework. Promoted Ofgem's sustainable development duty. Provisions to support renewable heat development.

Date	Legislation or other key policy document	Summary of relevant content
2008	Climate change Act	Statutory obligation to make emissions reductions of at least 80% in specified Greenhouse gases (1990 – 2050). 5 yearly carbon budgeting required of Government, including medium term commitment to reduce emissions of carbon dioxide by at least 26% between 1990 and 2020. Committee of Climate Change set up to provide published advice to Government on the targets and the carbon budget levels. Devolved administrations can set up trading schemes.
2009 (February)	Government consult on: draft long term heat and energy efficiency strategy; design of Community Energy Saving Programme (CESP) and 20% increase to the CERT	Plans for improving the energy and heat efficiency of homes, with the long term vision of homes making zero carbon emissions by 2050.

5.9. Many other aspects of Government policy impact on the energy sector. For instance health and safety obligations, planning policy, and transport policy. While it is beyond the scope of this paper to detail these policy developments, we recognise the impact they have on the energy sector. However, some recent examples include:

- The recent planning legislation (Planning Act 2008) is designed to make the planning process more efficient, including for the development of electricity generation plant and large scale energy network projects.

- Transport policy both for rail and road includes the framework for electric versus non-electric powered transport.

5.10. We will consider the impact of this legislation on the challenges facing networks and development of the future regulatory framework in RPI-X@20.

Initial post-privatisation policy

5.11. The initial period of energy policy, and associated legislation (including the 1995 Gas Act), was focused on creating a privatised sector, with effective competition and effective regulatory arrangements where needed. As discussed in Chapter 3 and 4, a number of changes were made to industry structure and the duties of the regulator to ensure effective competition developed where possible.

The Utilities Act 2000

5.12. A number of energy-related reviews were announced in 1997:

- review of utility regulation (June 97)
- review of electricity trading arrangements (October 97)
- review of energy policy (December 97)

5.13. In July 1997, a windfall tax was levied on all companies privatised by floatation and regulated by statute²⁰. The tax was calculated at a rate of 23% to the difference between the companies' valuations at floatation and a reassessment of the companies values taking account of up to four years of profits.

5.14. Details on the review of electricity trading arrangements, and the creation of NETA, are provided in Chapter 3 (paragraphs 3.20 - 3.21).

Review of utility regulation

5.15. The initial ideas from the review of utility regulation were published in a Green Paper in March 1998 and final conclusions were published in July 1998. Changes proposed included introducing a single primary duty to protect consumer interests, the issuing by the Government to the regulators of guidance on social and environmental policy and the introduction of social action plans. Social and environmental policy that would have significant financial implications was to be introduced via legal provisions rather than guidance.

²⁰ All companies privatised by floatation and regulated by statute through the following legislation faced the tax: Telecommunications Act 1984, the Airports Act 1986, the Gas Act 1986, the Water Act 1989, the Electricity Act 1989 (and the Electricity (Northern Ireland) Order 1992) and the Railways Act 1993.

5.16. Conclusions specific to the energy sector were published in October 1998. These included:

- creating a combined regulator and regulatory regime (e.g. combined duties);
- heading the regulator with a Board rather than an individual;
- separating distribution and supply licenses;
- supporting the introduction of competition in metering, potentially with separate licences for metering activities;
- appointment of a special administrator for the energy networks businesses; and
- consideration of legislative changes, if any, to supply implementation of new electricity trading arrangements.

Review of energy sources

5.17. The preliminary conclusions from the review of energy sources were published in June 1998 and conclusions were published in a White Paper in October. The review was prompted by concerns about security and diversity of supply, including an overdependence on gas.

5.18. The government affirmed its central objective of ensuring diverse, secure and sustainable energy supplies. This was to be done by:

- overhauling the electricity trading arrangements;
- reforming the functions of NGC;
- ensuring full competition among electricity supply companies;
- establishment of regulatory regime that distinguishes distribution and supply activities;
- divestment of coal-fired plant by the major generators; and
- ongoing pressure for development of a Europe-wide open market.

5.19. The government also confirmed that a moratorium on new gas-fired power stations would be retained. There was to be increased focus on ensuring that policy was consistent with sustainable development, covering a range of factors such as social, environmental and economic growth.

The Utilities Act 2000

5.20. The government proposed reforms for regulation of electricity and gas industries in a consultation paper in October 1998. The recommendations reflected the findings discussed above of the three reviews. These findings were implemented through the Utilities Act (2000).

Energy reviews from 2000 to 2007

5.21. A number of reviews of the energy sector were undertaken between 2000 and 2007. These were primarily focused on the need to ensure that the sector delivered

sustainable objectives relating to security of supply, environmental targets and social policy.

2000 Royal Commission of Environmental Pollution (RCEP)

5.22. In 2000, the Royal Commission for Environmental Pollution (RCEP) published a report on climate change. The RCEP suggested that UK CO₂ emissions burnt by fossil fuels would need to be reduced by 60% by 2050. It was noted that a renewables and energy efficiency approach, with a new nuclear programme would help deliver this challenging objective.

2002 Performance and Innovation Unit Report

5.23. In 2001-02 the Cabinet Office's Performance and Innovation Unit (PIU) undertook a review of energy policy, reflecting concerns about oil and gas price shocks, security of supply, environmental objectives and potential network problems.

5.24. The PIU concluded that the introduction of NETA was satisfactory subject to some transitional arrangements being introduced to help small generators and as long as the charges generated by the arrangements were cost reflective and did not act against renewables generation. It was argued that the UK should only make efforts to tackle climate change if other countries were doing so. The PIU recommended a 20 per cent Renewables Obligation by 2020 and an energy efficiency target. The main institutional change recommended was the establishment of a Sustainable Energy Policy Unit. It was also recommended that the objectives of energy policy should be consistent with objectives of sustainable development.

5.25. While not part of its central focus, the PIU report briefly comments on the application of RPI-X to the energy network companies. It considered some form of regulation of natural monopolies necessary and noted that Ofgem was modifying and improving its RPI-X framework e.g. in relation to providing appropriate incentives for investment. It noted that a longer control period than the 5 years might be appropriate for longer investments.

5.26. The PIU review was followed by a DTI consultation, leading to a February 2003 White Paper.

2003 Energy White Paper

5.27. In the 2003 White Paper, 'Our Energy Future - creating a Low Carbon Economy', the government recognised that a target would need to be set to limit carbon dioxide emissions. A target of 60% reduction by 2050 was suggested, through the development of 'cleaner, smarter energy'.

5.28. The focus of the paper was on the environment, energy reliability, and affordable energy for the poorest and competitive markets. These are themes that would recur in subsequent energy reviews and Acts, and remain fundamental to

current government policy, Ofgem's objectives and duties, and the delivery of these objectives by regulated networks.

5.29. The expectation was that solutions would be delivered by the markets, with consumers making decisions to improve energy efficiency because it would save costs. Notably, nuclear power was not considered a major element of the delivery of the government's objectives in the 2003 Paper.

2004 Energy Act and 2006 Climate Change and Sustainable Energy Act

5.30. The 2004 Energy Act's main provisions were:

- changes to the renewables obligations;
- requirements for Government to publish a strategy on microgeneration
- arrangements for nuclear decommissioning;
- changes to the GB electricity trading arrangements; and
- changes to the regulation of interconnectors for electricity and gas.

5.31. The 2006 Climate Change and Sustainable Energy Act's main provisions were:

- assess appropriate national microgeneration targets;
- requirement for progress report on energy efficiency;
- provisions to support CERT;
- report on the potential for dynamic demand solutions; and
- require the promotion of community energy schemes.

2006 Energy Review

5.32. It was announced in November 2005 that the Government was to undertake a further detailed Energy Review. The Review was to consider progress relative to the suggested objectives in the 2003 White Paper (e.g. reduction in carbon and security of supply considerations).

5.33. The review emphasised that meeting the challenges of climate change and ensuring security of supply required an international response. Both demand-side and supply-side responses were needed. It recommended that less energy needs to be used in products and services, and that homes and businesses need to save energy. The review also concluded that more energy needed to come from low-carbon sources.

5.34. The development of a more diverse fuel mix was also considered desirable from the perspective of improving security of supply. The government recognised that there was a need for investment, at the right time, in generation capacity and networks. It was expected that the markets would deliver this investment. Most notably, the Government said they would leave it to the market to decide whether or not to build nuclear power plants.

Recent energy policy

5.35. The reviews between 2000 and 2007, led to a White Paper in 2007 and the 2008 Energy Act. Policy continues to develop in response to the findings of these reviews, and subsequent developments at national and EU level.

Energy White Paper 2007

5.36. In May 2007 the government published the Energy White Paper, 'Meeting the energy challenge'. This paper followed on from the 2003 Energy White Paper and the 2006 Energy Review. The main recommendations and conclusions of the paper were brought into law through the Energy Act 2008 (November 2008).

5.37. The Energy White Paper 2007 focused on addressing the two long-term challenges of the sector: tackling climate change and security of supply. This would be achieved by delivering four government's policy goals:

- cut carbon dioxide emissions by 60% by 2050, and to make real progress towards this target by 2020;
- maintain reliable energy supplies;
- promote competitive markets in the UK and beyond; and
- ensure that every home is adequately and affordably heated.

5.38. A range of measures are being or have been considered to deliver these goals. These included measures to encourage energy conservation by businesses (particularly intensive energy users) and households. This will be supported by an extension of smart metering. There are also measures under review to increase the diversity of fuel mix and to increase share of generated electricity from cleaner technologies. They include expanding use of biomass as an energy source, increasing the share of renewable generation, proposals to increase investment in nuclear power and the removal of planning barriers to development of new energy infrastructure and power plants through the 2008 Planning Act. The government is also promoting measures to increase distributed electricity generation and distributed heat generation, and is looking at the development of carbon capture and storage technology. The Renewables Transport Fuel Obligation also proposes that 5% of transport fuel should come from biofuels by 2010/11.

5.39. All of these strategies impact on generation and supply of electricity. They have an immediate knock-on impact on networks as well. Changes in fuel mix, in location of new plants and particularly in development of distributed generation will change the level of capacity needed in aggregate and in particular locations. Similarly, changes in supply and metering will change the nature of demand on the networks, potentially in aggregate but certainly variability over time (e.g. within day, across seasons).

5.40. The 2007 Energy White Paper announced the implementation of the Carbon Reduction Commitment. This is a capped emissions trading scheme to secure cost-

effective carbon savings from large non-energy intensive business and public sector organisations over a minimum level of electricity use. There is a long lead time involved in this implementation with the introductory phase due to start in April 2010 and the first phase with a cap in place on overall carbon emissions planned for April 2013.

Transmission Access Review (TAR)

5.41. The Energy White Paper published in May 2007 announced a joint review by Ofgem and BERR of the access regime for electricity transmission networks in Great Britain –the Transmission Access Review (TAR). The objective of the review was to deal with the large (and growing) queue of electricity generators that have been unable to gain access to the transmission system for a number of years.

5.42. Ofgem and BERR concluded in the TAR Final Report²¹ that enduring access arrangements should be based on a clear set of high-level principles. New generation projects should be offered firm connection dates, reasonably consistent with the development time of their project. Generators wanting long-term, financially firm access to the system needed to make long term financial commitments. Transmission companies needed to have appropriate incentives to respond to the long term demand for access signalled by generators. They also needed the freedom and incentives to invest ahead of full user commitment. Access rights should to be more clearly defined and generators needed to be offered choice about how to access the system (a choice between short-term and long-term products with varying degrees of flexibility). In order to make more efficient use of existing and new capacity, it was concluded that better arrangements to share and trade access rights were required.

5.43. During the TAR process, it was perceived that the management of the connection queue was not optimal. This issue is mainly being addressed by the transmission companies, though we are playing a role in granting permission, for an interim period, for lower grid standards to be adopted. National Grid has identified scope initially to advance the connection dates of 450MW of renewable generation in Scotland, but is also exploring the scope to advance a further 1,600MW of renewable generation later on. This will enable new generators to gain access to the system.

5.44. The TAR process highlighted a number of inefficiencies with the existing capacity allocation mechanism. In particular, there is a lack of user commitment which leads to potentially inefficient investment decisions (“stranded assets”). Furthermore, the “first come first served” allocation method is inefficient because it does not necessarily allocate capacity to those parties that value it most. The “invest and connect” principle has caused some delays. Access rights are not being shared, preventing some renewable generators from accessing the system and the wholesale

²¹ <http://www.ofgem.gov.uk/Networks/Trans/ElecTransPolicy/tar>

market. National Grid developed a suite of proposals to change the Connection and Use of System Code (CUSC) which could be assembled to form (at least) three different models to reform the arrangements:

- Evolutionary change; this model would not seek to change the current allocation of access rights in a fundamental way but comprises a suite of enhancements to the way in which system capacity is made available and charged closer to real time; new user commitment provisions would generate better signals which would improve NGET's investment decisions and thereby make the system more efficient.
- Connect and manage; generators wanting to use the transmission system would be offered a firm connection date. If the transmission capacity was not provided on time, the generator would be entitled to compensation. This would enable generators to access the system prior to the completion of wider reinforcement works.
- Entry capacity auctions; transmission system capacity would be auctioned to bidding generators. These auctions would ensure that those that value the capacity most would be the ones using it. This could lead to more efficient capacity allocation and provide better investment signals to National Grid.

5.45. The TAR Final Report concluded that to facilitate the 2020 targets, TOs needed to be allowed to make investments ahead of user commitment. We therefore signalled our intention to develop enhanced incentives for the TOs which would allow them to do this. These are divided into short term measures to be implemented on 1 April 2009 and long term measures for implementation later this year.

- Charging; a number of the TAR proposals have major interactions with the charging arrangements. We are working with industry, NGET in particular, to develop charging modifications required in association with the Connection and use of system code (CUSC) changes. Areas of work include: potential long term fixed charges for use of the transmission network as key part of long term user commitment for finite rights, cost-reflective charging of short run costs for new type of access such as overrun, charging arrangements for "local only" access rights and calculating prices for auctions.
- SO incentives; some of the CUSC proposals imply significant interactions with the way in which the GB System Operator and the transmission owners are incentivised to build and release capacity and to manage the constraints on the transmission system.
- Security and quality of supply standard (SQSS) review; Building on earlier reviews, we have asked the three TOs to undertake a fundamental review of the British SQSS arrangements to consider the implications of moving to a transmission system with over 35GW of connected renewable generation.

5.46. An Impact Assessment for the CUSC modifications will be published in April. This document will also include analysis on necessary changes to SO incentives and charging arrangements. This will enable the Authority to take decisions on the modifications in July. Most changes to the CUSC could then be implemented in April 2010. This timetable is currently under review because some of the charging modifications will not be submitted to us in time to be included in an IA in April. We

have completed an initial consultation on enhanced TO incentives and are in the process of developing final proposals for the short term measures in time for implementation on 1 April 2009. Long term measures will be consulted upon again and implemented next winter. The GBSQSS review is due to publish its findings in September 2009 and will produce proposals for change in December 2009.

5.47. Ofgem's chairman provided the Secretary of State for Energy and Climate Change with a progress update in December 2008²². Some significant steps had been taken including over £4 billion committed investment and the transmission companies had been invited to develop detailed plans that could deliver the 2020 renewables targets. However, there remain risks that the current industry structure and rules will not facilitate the major changes needed. A further update will be provided in March 2009

2008 Energy Act

5.48. In November 2008, four pieces of legislation were given Royal Assent that had direct impact on the energy sector including the energy network companies:

- Energy Act 2008;
- Climate change Act 2008;
- Planning Act 2008; and
- Planning and energy policy Act 2008.

5.49. The Energy Act provides for:

- the offshore storage of gas and unloading of liquefied natural gas;
- an increase in the efficiency of the renewables obligations;
- the next steps in work to build offshore transmission infrastructure;
- arrangements for decommissioning and to meet the decommissioning costs;
- changes to the dispute rules for oil and gas and specific changes to the petroleum licensing regime; and
- a number of miscellaneous changes including changes to GEMA's duties (described in the previous chapter), reporting on energy requirements, smart meters, renewable heat incentives, transmission access powers and costs relating to network connections.

5.50. These changes are important steps towards meeting renewables targets and also providing security of supply. This is the current legislative framework relevant for RPI-X@20.

²² Letter from Lord Mogg to the Secretary of State for Energy and Climate Change, 17 December 2008. TAR documents can be accessed on our website at: <http://www.ofgem.gov.uk/Networks/Trans/ElecTransPolicy/tar>

5.51. In the 2008 Nuclear White Paper the Government proposed that an energy mix which would deliver the UK's environmental targets would need to include nuclear and that firms should have the right to have the option to build new power stations. On 15 January 2008 two German companies RWE and E.ON announced that they were planning to invest £20 billion to build at least 4 nuclear reactors.

5.52. Last year's Climate Change Act is also important. It set climate change targets in statute and created the Committee on Climate Change to assess Government performance and provide advice on future progress and carbon budgeting over 5 yearly periods. The work of the Climate Change Committee is discussed in Chapter 7, in the context of environmental policy.

5.53. The Planning Act is intended to provide for a more efficient planning regime and sets up a framework with fewer applications and permits and a key role for a new independent body called the Infrastructure Planning Commission (IPC). Major energy projects are explicitly included under the new regime.

5.54. In addition the Planning and Energy Policy Act provides for local authorities to be able to stipulate requirements both in terms of energy efficiency and in terms of energy generation (low carbon and/or renewable sources).

Government consultations in 2009

5.55. Since the Energy Act 2008 and the creation of DECC, there have been a number of Government consultations. In particular these have related to energy efficiency and technology. These are discussed further in chapter 7 and include the consultation on heat and energy efficiency strategy.

6. EU energy policy

6.1. GB energy policy, and energy network regulation, is shaped by developments in EU energy policy. In this chapter we discuss the main EU policy developments over recent years affecting both the gas and electricity networks.

6.2. EU energy policy has focused on three areas:

- Creation of an internal market for gas and electricity, including development of cross-border interconnector arrangements. There has been a series of Directives (Packages) focused on the internal energy market.
- Setting and delivery of climate change targets, including targets for greenhouse gas emissions and renewables.
- More recently, delivery of a sustainable energy sector, incorporating security of supply and environmental targets.

6.3. We focus on core energy policy here and consider developments in energy-related EU environmental policy in Chapter 7.

6.4. EU Directives are directly transposed into GB energy and environmental policy. Wider policy developments have also been reflected in changes in GB energy and environmental policy. Given the major re-structuring of the GB sector at privatisation, many aspects of EU policy development were introduced at an early stage e.g. the development of rules to facilitate a single electricity market in advance of the directives. More recent EU policy, for example the Second Strategic Energy Review, is still developing and we, and DECC, are working to consider implications for GB energy policy and network regulation.

Overview of EU energy policy

6.5. Table 2 provides a chronological list of the main energy Directives and associated policy developments in the EU. Key developments are discussed in more detail below.

6.6. The current stated aim of EU energy policy²³ is similar to UK policy in that it aspires to the production of:

- secure energy (less reliance on imports);
-

²³. EU Commission, Andris Piebalgs, EU Energy Commissioner, Speech Securing your energy future: Commission presents energy security, solidarity and efficiency proposals, 13 November 2008 (<http://europa.eu/rapid/pressReleasesAction.do?reference=IP/08/1696&format=HTML&aged=0&language=EN&guiLanguage=en>).

- greater use of lower carbon sources of energy; and
- all this at affordable prices.

6.7. The creation of a single energy market across Europe has been a high priority since the mid-1990s. EU environmental policy, discussed in more detail in Chapter 7, has also developed since the GB energy networks were privatised. This includes policy relating to market-based tools and energy technologies; energy efficiency; greenhouse gas emissions; energy efficiency; and nuclear energy. Concerns about security of supply have also influenced the development of EU policy.

Table 2: EU Legislation and initiatives on energy policy

Date	Legislation/initiative/event	Summary of main provisions
2008/09	Implementation of the third package.	Key step in implementation of internal EU energy market. Project team established to develop Association for the Co-operation of energy regulators.
2008/09	Second Strategic energy review	(see below)
2007	First Strategic energy review	(see below)
2007	Amendments to internal electricity market rules directive and gas (2003/54 and 2003/55)	Propose single EU energy regulator .
2007	Gas suppliers directive	Consumers – free choice of gas supplier.
2007	Third Energy Package	Key step in implementation of internal EU energy market.
2006	Launch of gas and electricity regional initiatives	Facilitating development of regional energy markets.
2005	Launch of EU emissions Trading Scheme	
2005	Energy Efficiency – or doing more with less Commission Green Paper	Measures for greater efficiency of energy consumption.
2005	European Commission's green paper 'A European Strategy for sustainable, competitive and secure energy	Outlines common energy strategy focusing on security of supply and climate change.

Date	Legislation/initiative/event	Summary of main provisions
2003	'Gas' directive 2003/55/EC	Common rules for the internal market in natural gas.
2003	'Electricity' directive 2003/54/EC	Common rules for the internal market in electricity.
2002	'Draft' directive on energy end use efficiency and energy services	Aims to increase end use energy efficiency.
2001	Energy efficiency Directive 2002/91/EC	On the energy performance of buildings.
2001	'Renewables' directive 2001/77/EC	Promotes electricity produced from renewable sources in the internal electricity market.
2001	Large combustion plant Directive 2001/80/EC	Limits emissions of certain air pollutants from large combustion plants.
1998	Green Paper, 'Towards a European Strategy for the Security of Energy Supply'	Issues of security of supply and reducing CO2 emissions.
1996	Directive 98/30/EC (the IMG)	Set out the common rules for an internal market in natural gas.
1996	Directive 2003/54/EC (the IMED)	Set out the common rules for an internal market in electricity.
1990	Single European Market – Transmission Directive Council Directive 90/547/EEC	Transit of electricity through transmission grids.

1996 and 1998 Internal Market Directives (First Package)

6.8. The 1996 Internal Market for Electricity Directive set out the common rules for an internal market, with the aim of establishing a completely liberalised European electricity market. Provisions of the directive included:

- Open national markets to competition progressively (threshold reduced from 40GWh to 20Gwh over three years and then to 9GWh after six years).

- Giving new companies the right to build capacity anywhere in the EU, but no changes to ownership structure of existing generation assets. New capacity could be agreed by authorisation or by tender.
- Priority should be given to renewables, waste and CHP sources (Article 8).
- Requiring the owner of the transmission system to designate a system operator to manage the network. The system operator must not discriminate in favour of subsidiaries or shareholders.
- Ensuring customers are able to contract with the generator of their choice, requiring access to the transmission and distribution systems.
- Establishment of separate accounts for generation, transmission and distribution activities and demonstration that there are no cross-subsidies across these activities.

6.9. Third party access or single buyer models (Articles 15 or 18) for development of competition.

6.10. The 1998 Single Market for Natural Gas Directive (98/30/EC) established common rules for the internal natural gas market. It relates to gas transmission, distribution, supply and storage of natural gas. The Directive allowed for terms to access the gas networks to be negotiated or regulated. It also set out a timetable to open up supply markets to competition in stages, with August 10th 2008 identified as a milestone for all customers with 5mcm a year or more to be open to competition. There was also a requirement for integrated gas companies to keep separate account for transmission, distribution, storage and non-gas activities.

6.11. Member states were given considerable freedom on how to implement the Directive requirements. In many cases, the UK legislation had already gone further than the requirements of the Directive.

2003 Internal Market Directives (Second Package)

6.12. At the Stockholm Summit (Heads of State) (March 2001) proposals were put forward to speed up completion of internal energy market, with competition for all customers by 2005. A range of associated measures were proposed including: non-discriminatory access terms required, legal separation of the management of grids from production and supply, network access tariffs to be set, published and approved by national regulators, and establishment of a regulator for each Member State. Cross-border tariff-setting and congestion management were also proposed. Many of these proposals were reflected in the 2003 Gas and Electricity Directives.

Electricity Directive

6.13. 2003/54/EC 'Internal Market in Electricity' Directive established common rules for generation, transmission and distribution of electricity. It required member states to:

- impose on undertakings operating in the electricity sector public service obligations which may relate to security, including security of supply, regularity, quality and price of supplies and environmental protection, including energy efficiency and climate protection;
- ensure that all household customers and small enterprises, at least, enjoy the right to be supplied with electricity of a specified quality within their territory at reasonable, easily and clearly comparable and transparent prices;
- take appropriate measures to protect end-users and vulnerable customers, including measures to help them avoid disconnection;
- ensure the implementation of a system of third party access to the transmission and distribution systems for all eligible customers;
- inform the Commission upon implementation of this Directive.

6.14. There must also be the possibility of tendering (or some equivalent for new capacity or demand-side management measures.

6.15. In addition, electricity transmission operators have to:

- ensure the long-term ability of the system to meet reasonable demands for the transmission of electricity;
- contribute to security of supply through adequate transmission capacity and system reliability;
- manage energy flows on the system, taking into account exchanges with other interconnected systems;
- provide the operator of any other system to which its system is interconnected with sufficient information to ensure secure and efficient operation;
- ensure non-discrimination between system users; and
- provide system users with the information they need for efficient access to the system.

6.16. Under the same legislation, the distribution system operator needs to:

- maintain a secure, reliable and efficient electricity distribution system in its area with due regard for the environment;
- ensure non-discrimination between system users;
- provide system users with the information they need for efficient access to the system;
- give priority to generating installations using renewable energy sources or waste or producing combined heat and power;
- procure the energy they use to cover energy losses and reserve capacity in their system according to transparent, non-discriminatory and market-based procedures;
- take energy efficiency/demand-side management and/or distributed generation measures that supplant the need to upgrade or replace capacity.
- apply a minimum criteria to safeguard the independence of transmission or distribution system operators are that:
- not participate in the integrated electricity undertaking responsible, directly or indirectly, for the day-to-day operation of the generation, transmission or supply of electricity;

- ensure that the professional interests of the persons responsible for the management of the distribution system operator are taken into account so that they are capable of acting independently;
- have effective decision-making rights, independent from the integrated electricity undertaking, with respect to assets necessary to operate the network; and
- establish a compliance programme, which sets out the measures taken to exclude discriminatory conduct, and make sure that it is adequately monitored.

6.17. Other rules include the need to keep separate accounts for transmission and distribution businesses with a common owner.

Gas Directive

6.18. Directive 2003/55/EC 'Gas directive' sought to open up the national markets for gas and create a truly competitive gas market within the EU. It provides the rights of third parties to non-discriminatory access to the transmission and distribution networks as well as to liquefied natural gas (LNG) facilities. The access has been co-ordinated by transmission system operators and distribution system operators.

6.19. Across the EU from 1 July 2004 industrial customers have had free choice of gas supplier and all customers have had this ability since 1 July 2007 where the same arrangements have been in place.

6.20. The key provisions from the electricity internal market identified above also generally apply to gas.

6.21. The EU 2003 legislation also included provisions for independent regulators to be set up in each member state to oversee this market. Again the UK of course had such a body in Ofgem.

2007 First Strategic Energy Review

6.22. The First Strategic Energy Review was announced on 10 January 2007. In recognition of the energy and related environmental challenges it identified the need for targets in carbon emission reduction and renewables energy generation as a share of the energy mix. It also highlighted the importance of completing the internal market in electricity and natural gas.

6.23. The 2007 Spring European Council suggested the Commission consider matters including:

- effective separation between supply/production and network operation;
- further harmonisation of powers and greater independence of national regulators;
- better ways for national regulators to cooperate;
- improve co-ordination of energy grids and cross-border trade; and

- greater transparency in energy market operations.

6.24. The First Strategic Energy Review led in March 2007 to the European Council agreement on European energy policy targets.

2007/2008 The Third Package

6.25. The third package is a key step in implementation of internal EU energy market. It recognises the need for better co-ordination between European network operators and continuing co-ordination between regulators at that level. It continues many of the internal market principles identified above in relation to the earlier First and Second Packages.

2008/09 Second Strategic Energy Review

6.26. On November 2008, the EU has proposed a wide ranging energy programme. In particular it is intended to:

- build up solidarity between member states on energy issues;
- stimulate energy network investment to facilitate low carbon energy sources;
- secure sustainable energy supplies through a 'Security and Solidarity Action Plan'; and
- promote greater efficiency in use of energy.

6.27. This review sits against the backdrop of the EU being a net energy importer and with renewables playing a larger but still small element of electricity generation (estimated at around 7% of the total electricity generation fuel mix).

6.28. The review's priorities are:

- adopt and rapidly implement the measures to reach the EU energy policy targets announced in January 2008; that is by 2020, 20% reduction in greenhouse gas emissions, 20% contribution of renewables in final energy consumption and 20% saving in future energy demand; and
- make Europe's energy supply more secure which in particular requires improvements in energy efficiency.

6.29. The Commission see the role of networks as crucial and note that they are in need of billions of Euros of investment both in replacing old infrastructure and to be equipped to facilitate the low carbon energy generation.

6.30. Six strategic network issues are identified:

- Baltic interconnection plan;
- Mediterranean energy ring;
- adequate North-South gas and electricity interconnections with central and South East Europe;
- North Sea offshore grid;
- Southern gas corridor; and
- effective liquefied natural gas supplies.

European regulators co-operation

6.31. Two organisations, the Council of European Energy Regulators (CEER) and European Regulators' group for electricity and gas (ERGEG) have been formed. These groups facilitate co-operation between energy regulators in different countries across Europe. CEER is based on a voluntary agreement while ERGEG is a European Commission advisory group set up by Commission decision in 2003²⁴. CEER dates back to March 2000 when ten regulators signed a memorandum of understanding. Their objectives are broadly the same the support of the development of a single European energy market, promoting competition, efficiency and sustainability. The key policy initiatives taken forward by these groups are:

- regional initiatives;
- 3rd package (see above section);
- Blackouts;
- consumer protection; and
- gas balancing and storage.

Regional Initiatives

6.32. Another aspect of EU policy applying to both gas and electricity is the regional initiatives. Launched in 2006, these facilitate the creation of regional energy markets. In electricity, the UK is in a region with Ireland and France, while in gas the region (North West region) includes Netherlands, Belgium, France, Ireland, Northern Ireland, Germany, Denmark, Sweden and Poland.

6.33. These initiatives are aimed at promoting regional energy market co-operation and cross border markets for the benefits of EU citizens.

6.34. One of the benefits of the regional initiatives is that for both electricity and gas it provides better information about how the overall regional systems might respond to changes for instance in gas the recent Russia - Ukraine gas dispute. On 11

²⁴ Commission decision 2003/796/EC, 11 November 2003. This is available at http://www.energy-regulators.eu/portal/page/portal/EER_HOME/EER_PUBLICATIONS/CEER_ERGEG_PAPERS/Founding%20Documents%20and%20Rules/Founding%20Documents/ERGEGdecision_11-11-03.pdf.

February 2009 ERGEG provided advice to the Commission. This included the recognition that the dispute had not just impacted upon the South-South East region but on others.

6.35. ERGEG recommended:

- Better regional co-ordination including on
 - emergency planning;
 - pipeline access;
 - improving interconnector access; and
- Improve the monitoring and planning procedures.

Blackouts

6.36. 2003 saw a number of interruptions to the electricity transmission system or blackouts including one that affected most of Italy and parts of Switzerland. After a subsequent extensive blackout on the electricity transmission system that affected France, Germany, Italy, Spain, Belgium and the Netherlands on 4 November 2006, ERGEG worked to make recommendations on how to avoid such future interruptions publishing recommendations in April 2007. It recommended that the way forward was to establish a legal and regulatory framework to support an integrated electricity transmission grid. One issue recognised was the need for a European networks body in relation to electricity transmission and some form of regulatory organisation described as ERGEG plus to oversee this.

Consumer protection

6.37. From July 2007, customers across the EU have been able to choose their electricity and gas suppliers. Work is ongoing on consumer protection to enable this to fully provide the potential gains.

6.38. ERGEG and CEER do significant work in this area including publishing unbiased information. In its work in October 2008, ERGEG found that regulated prices remained a big obstacle to the end consumer getting sufficient information to switch suppliers.

Gas balancing and storage

6.39. In April 2006 ERGEG consulted on guidelines for gas balancing. The purpose was for the gas balancing arrangements cause a 'safe, efficient and reliable operation is of the network'²⁵.

²⁵ ERGEG press release 25 April 2006

7. Environmental policy

Overview

7.1. An overview of energy-related environmental policy is provided in Table 3.

7.2. Concerns about climate change, and specifically about the levels of carbon and other greenhouse gasses emitted, were recognised around the time that RPI-X was first applied in the energy sector. For example, the 1990 Government White Paper 'This common inheritance' stated that global warming was 'one of the biggest challenges facing the world'.

7.3. Various environmental-related policies were introduced over the next 10 years e.g. the introduction of the fuel escalator in 1993 to set the annual change in petrol prices at 3% higher than inflation. However, comprehensive targets for emissions reductions were only introduced following the Kyoto Protocol (1997).

7.4. At the time of the most recently completed energy network price controls²⁶, longer term targets were present, e.g. 20% of electricity generation from renewables by 2020. This has been reflected in Ofgem decisions, e.g. the TPCR4 controls included a significant increase in allowed investment facilitating efficient new connections for low carbon generators.

Table 3: Key events in energy related environmental policy

Date	Event
1990	UK Government recognises in White Paper 'this common inheritance' (1990) that 'global warming' is one of the biggest challenges facing the world
1997	Kyoto conference held. The Kyoto Protocol requires developed countries to reduce greenhouse gas emissions 12.5% compared to 1990 levels by 2008-12. 183 countries had ratified the protocol by 2008.
June 1998	EU burden sharing agreement distributes the EU Kyoto target among Member States. UK's target is a 12.5% reduction compared to 1990 levels by 2008-2012.

²⁶ TPCR4's final conclusions (December 2006) are available at <http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=191&refer=Networks/Trans/PriceControls/TPCR4/ConsultationDecisionsResponses>, while GDPCR1's final conclusions (December 2007) are available at <http://www.ofgem.gov.uk/Networks/GasDistr/GDPCR7-13/Documents1/final%20proposals.pdf>.

Date	Event
November 2000	UK Climate Change Programme 2000 published More ambitious domestic goal set to reduce CO ₂ emissions 20% by 2010 first renewables targets set as proportion of total energy mix (5% by end of 2003 and 10% by 2010)
April 2001	Introduction of the Climate change levy. This was a tax where approximately 15% was added to the typical energy bill of UK businesses to promote energy efficiency and reduce greenhouse gas emissions.
September 2001	Introduction of the renewables directive to facilitate the adoption of renewables and also introduced the concept of Guarantees of Origin (which are referred to as Renewable Energy Guarantees of Origin (REGOs) in the UK).
April 2002	Implementation of the Renewables Obligation (RO) which placed an obligation upon suppliers to source an increasing proportion of their electricity supply from renewable sources.
February 2003	Energy White Paper 2003 'Our energy future, creating a low carbon economy' restates target of 10% of electricity generation through renewables by 2010 includes aspiration of 20% of electricity generation through renewables by 2020 60% reduction in CO ₂ BY 1990 - 2050
October 2003	Sustainable Energy Act 2003 requires Secretary of State to report on White Paper targets and amends Ofgem's duty to require it to carry out impact assessments where the impact of a proposal would have significant effects on the environment
July 2004	Energy Act 2004 requiring publication of progress on renewables and microgeneration new duty for Ofgem to act 'in a manner best calculated to contribute to the achievement of sustainable development
January 2005	Phase 1 of the UE Emissions Trading Scheme commences
2005	UK Sustainable Development Strategy published which identified Climate Change and Energy as one of the four priority areas for action.

Date	Event
March 2006	Revised UK Climate Change Programme published restating UK's domestic goal of a 20% reduction in carbon dioxide emissions by 2010.
April 2006	Implementation of the directive on energy end-use efficiency and energy services which places a requirement upon Member States to adopt an indicative target for saving energy of 9% by 2015. Also includes requirements on the provision of consumption information to customers.
June 2006	Climate Change and Sustainable Energy Act 2006 Required Secretary of State to report annually on greenhouse gas emissions and steps taken to reduce emissions duties on councils to act in way to 'alleviate fuel poverty' enable targets (+ progress on meeting them) on microgeneration
October 2006	Stern review on the economics of climate change published – concludes that costs incurred now to avoid climate change are likely to be significantly lower than the costs of the impacts of climate change in the future.
May 2007	2007 Energy White Paper includes aim for 60% reduction in carbon emissions (1990 – 2050) with 'real progress' by 2020
March 2007	EU heads of state commit to binding targets to source 20% of final energy consumption from renewables and a 20% reduction in Green House Gas emissions, as compared with 1990 levels, both by 2020. They also commit to a non-binding target to improve energy efficiency by 20%.
January 2008	EU recommendation of UK contribution to renewable energy target of 15%. A revised draft of the renewables directive is published for consultation which seeks to mandate the renewables targets as well as allowing priority access for renewables and making provision for transfer and trade of existing guarantees of origin. Phase 2 of the EU ETS commences.

Date	Event
June 2008	Consultation on renewable energy strategy – looked at way the EU could meet its proposed share of the EU target for renewable energy in the most cost-effective way.
November 2008	<p>Climate change Act 2008</p> <p>Statutory obligation to make emissions reductions of at least 80% in specified greenhouse gases (1990 – 2050) and 5 yearly carbon budgeting required of Government including medium term commitment to reduce emissions of carbon dioxide by at least 26% between 1990 and 2020</p> <p>Committee of Climate Change set up to provide published advice to Government on the target and the carbon budget levels</p> <p>Enabling powers on domestic emissions trading schemes</p> <p>Reporting requirements on adaptation</p>
November 2008	<p>Energy Act 2008, environmental provisions include</p> <p>increase efficiency of renewals obligations framework</p> <p>highlighting of 'future consumers' in Ofgem's primary duty</p> <p>promoted Ofgem's sustainable development duty in importance</p> <p>provisions to support renewable heat and small-scale low carbon generation</p> <p>legal framework for carbon capture and storage</p> <p>enabling powers on smart metering</p>
December 2008	Committee on Climate Change publishes first recommendation of cuts of 34% (or 42% if global agreement is in place) between 1990 - 2020
December 2008	UNFCCC Poznan conference committed governments to negotiations on an international response to climate change to be agreed in Copenhagen at the end of 2009. .

7.5. As the table shows, RPI-X@20 is being carried out in a significantly different environmental policy context than was present at privatisation, and even than was present during the recent price controls. The main differences are:

- more ambitious targets on carbon emissions with statutory duty on Government to deliver them;
- greater acceptance of the importance of a low carbon economy and a stronger economic case for action to reduce carbon emissions now rather than waiting e.g. the Stern review²⁷ in the UK;
- 5 yearly carbon budgeting to develop a path of commitments leading to the longer term targets;
- the creation of the Committee on Climate Change to provide published advice to Government on its performance against its targets and on the carbon budget levels over each 5 years;
- the first report²⁸ of the Committee on Climate Change recommending cuts of at least 34% in carbon emissions (1990 – 2020);
- the inclusion, following the Energy Act 2008, in Ofgem’s primary duty of a reference to ‘future’ in addition to current consumers and a ‘moving up’ of the sustainability duty in terms of importance;
- a mature emissions trading scheme in the EU and much other work to introduce a carbon price; and
- Ofgem’s own work e.g. on TAR, Lens and the 3rd sustainable development report.

7.6. It is against this policy context that we have decided that one of the key themes of RPI-X@20 is ‘to ensure that networks facilitate delivery of a sustainable energy sector’.

7.7. Developments in climate change targets (greenhouse gas and carbon dioxide emissions), renewables obligations and energy efficiency policy are discussed here. We also briefly describe the EU Emissions Trading Scheme (ETS).

Climate change targets

7.8. Table 4: provides a summary of the greenhouse gas (GHG) and carbon dioxide (CO₂) emissions reduction targets that have been set since 2000.

Table 4: summary of climate change targets

2000 Climate Change Programme	20% reduction in CO ₂ 1990 – 2010 23% reduction in GHG 1990 – 2010
2003 Energy White Paper	60% reduction in CO ₂ 1990 - 2050

²⁷ HM Treasury: Stern review on the economic of climate change, October 2006 (http://www.hm-treasury.gov.uk/sternreview_index.htm).

²⁸ Committee on Climate Change, First Report 'Building a low carbon economy, the UK's contribution to tackling climate change, December 2008 (<http://hmccc.s3.amazonaws.com/pdf/TSO-ClimateChange.pdf>)

2008 Climate Change Act	80% reduction in CO ² 1990 - 2050 At least 26% reduction in CO ² 1990 - 2020
2008 Climate Change Committee	34% reduction in GHG 1990 - 2020 (or 42% if global agreement in place)

Table 5: Renewables as part of energy mix

2000 Climate Change Programme	5% of electricity generation from renewables by end of 2003 and 10% by 2010.
2003 Energy White Paper	10% of electricity generation through renewables by 2010; aspiration of 20% of electricity generation through renewables by 2020.
2008 UK share of EU target	15% of electricity generation from renewables by 2020.

Energy efficiency

7.9. Another area where focus was always present but where greater focus was given to it over time is the reduction of wasteful demand energy or greater energy efficiency. There is a number of reasons why an inefficiently large amount of energy is used. These in particular include the conditions of buildings e.g. the level of insulation and the lack of information about the amount of energy being used, in the absence of smart meters or features of our high tech goods e.g. the standby function on televisions.

7.10. The first regulatory approach used to encourage greater energy efficiency was 'The Energy Efficiency Standards of Performance' (EESoP)²⁹ programmes which started in 1994. These were administered by Offer (and then Ofgem) and the Energy Saving Trust. EESoP 1 (1994-98) focused mainly on vulnerable customers and involved energy efficiency targets being set on suppliers. EESoP 2 and 3 (set in 1998 and 2000 respectively), carried this on but focused two thirds of the targets on vulnerable consumers. In each case the suppliers were rewarded for meeting targets

²⁹ Ofgem and Energy Savings Trust: A review of the Energy Efficiency Standards of Performance 1994 - 2003. This is available on our website at http://www.ofgem.gov.uk/Sustainability/Environment/EnergyEff/Documents1/4211-EESoP_report_July03.pdf.

and third party money was also encouraged e.g. into improving the energy efficiency of buildings.

7.11. From 2002 the EESoP was replaced by the Energy Efficiency Commitment (EEC). Three year EECs then ran from 2002 - 2005 and from 2005 - 2008. The EEC and EESoP were fundamentally different although the latter built on the success of the former³⁰. These differences were much higher targets (around 3 times higher than EESoP 3 in the equivalent year, set by Defra with Ofgem administering and were expected to get a 1% year on year reduction in carbon from domestic sources.

7.12. From 2008 EECs were replaced by carbon emissions reduction target (CERT) which runs from 2008 - 2011.

7.13. CERT sets an obligation on electricity suppliers to reduce the use of energy by the equivalent of twice that under EEC 2 (154 million lifetime tonnes of carbon reduced). Because it is a carbon dioxide target rather than an energy saving target it allows other things such as microgeneration to be rewarded. Ofgem report quarterly updates of suppliers' progress against the CERT.

7.14. Government is currently consulting on policy changes in this area to provide for greater energy efficiency savings. DECC consulted on 12 February 2009 on Government's heat and energy strategy with the aim of making the use of the heat and energy in houses and other buildings more efficient.

7.15. Government is also consulting on its community energy savings programme focusing specifically on house building and energy efficiency.

7.16. In addition Government is consulting on whether to increase CERT by 20% on household energy suppliers. In addition, the same consultation proposes changes to incentives to encourage more loft insulation, promote real time energy display units and allow targets to be met through a greater proportion of innovative measures.

EU Emissions Trading Scheme

7.17. The EU emission allowance trading scheme was established through Directive 2003/87/EC. From 1 January 2005 all installations carrying out specified activities, including electricity generation, need to surrender tradable allowances to cover their emissions of carbon dioxide. Allowances were allocated to participating installations, largely free of charge, by each Member State through a National Allocation Plan approved by the European Commission. This created a financial incentive for companies to reduce their emissions as firms who could reduce their emissions

³⁰ Refer to NAO report and key conclusion

relatively cheaply could invest in abatement and sell any surplus allowances. Similarly, firms with high abatement costs could buy allowances to cover their emissions at a lower cost than reducing emissions themselves.

7.18. The UK emissions trading scheme started significantly before the EU arrangements in 2002. It was a voluntary scheme with an incentive payment involved in encouraging organisations to take part. Part of the Government's aim was to use the UK scheme to influence the design of the EU emissions trading scheme.

8. Social policy

8.1. Sustainable development has three pillars, environmental, social and economic. Our work to contribute to sustainability encompasses:

- helping to facilitate the transition to a low carbon economy;
- eradicating fuel poverty and protecting vulnerable customers;
- promoting energy saving;
- ensuring a secure and reliable gas and electricity supply; and
- supporting improvement in all aspects of the environment.

8.2. We also have a specific duty to have regard to the interests of individuals who are disabled, chronically sick, of pensionable age or on low incomes and our policies reflect this. Since 2006 we have published a sustainability report each year. We also include specific allowances and incentives in price controls to encourage energy networks to meet sustainability objectives.

8.3. In this chapter we focus on social policy related to the energy networks. Environmental policy was discussed in Chapter 7. We do not consider the economic aspect of sustainable development in this paper. However, we recognise that energy networks also have a wider impact on the economy and that they could play a role in delivering specific economic policies (e.g. regional regeneration) in the future.

8.4. We describe policy relating to fuel poverty and then describe a range of other social policies that impact on energy networks and energy network regulation.

Fuel poverty

8.5. A fuel poor household is defined as one that needs to spend at least 10% of household income on all fuel use in order to maintain a satisfactory heating regime³¹.

8.6. The Warm Homes and Energy Conservation Act 2000 required the Secretary of State to develop and implement a strategy to reduce fuel poverty. The Government published this strategy in 2001³². This set targets that sit alongside the environmental targets as part of the overall sustainable development objectives.

³¹ Using World Health Organisation temperatures as the UK Government do this means 21 degrees in the living room and 18 degrees in other occupied rooms.

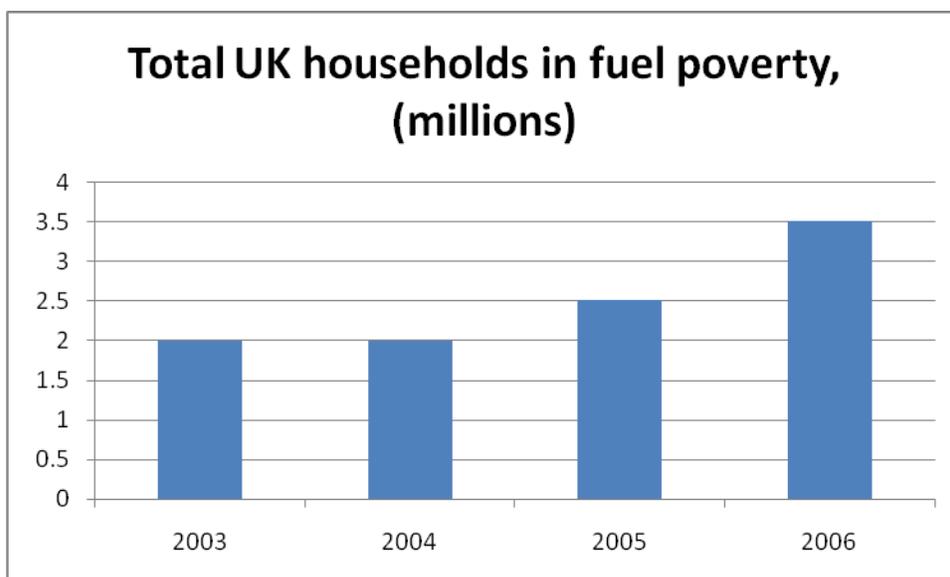
³² DTI, The UK fuel poverty strategy, November 2001. This is available on BERR's website at <http://www.berr.gov.uk/files/file16495.pdf>.

8.7. The Government aims to eradicate fuel poverty in the UK as a whole in two steps; by 2010 for vulnerable consumers (elderly or disabled users) and at some point soon afterwards for all consumers (by 2018 for the whole UK).

Trends in fuel poverty

8.8. Figure 13 shows the increase in fuel poverty between 2003 and 2006. While for a time the benign economic conditions and trends in energy prices led to a significant reduction in households judged to be in fuel poverty (down from 5.5 million to 2.25 million between 1996 and 2002), since then there has been an increase and the meeting of the 2010 target is now challenging.

Figure 13: Total UK households in fuel poverty (millions)



Source BERR, Fuel Poverty Strategy, progress update 2006

8.9. In 2006 (the most recent year for which data is available) there were 3.5m fuel poor households. Because of the upward trends in energy prices, and the economic downturn, it is expected that this number has increased further since then.

Fuel poverty policy

8.10. Much work has already gone into reducing fuel poverty e.g. the winter fuel payments first introduced in the winter 1997-98. Energy efficiency grants and warm front grants also provide support for people to make energy efficient improvements to their home so that wasteful demand can be removed.

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Role of energy networks and Ofgem

8.12. Given our duties, we play a leading role on fuel poverty issues. To reflect this we held a fuel poverty summit with companies, Government and consumer representatives on 23 April 2008. It agreed to provide progress checks on the actions taken from the summit.

8.13. Fuel poverty is the responsibility of all companies along the energy supply chain. Network companies cannot meet the targets on their own. However, they currently represent a significant proportion of the final consumer's bill. This proportion is also expected to grow, particularly for electricity given the investment challenge. Fuel poverty is therefore one of the central issues to be considered in RPI-X@20.

Ofgem's work to meet wider social policy objectives

8.14. We have a duty to contribute to the achievement of sustainable development. This has been one of our duties since 2004 and the Energy Act 2008 promoted this duty in importance. In addition our primary duty to protect the interests of current and future consumers means that sustainability in gas and electricity is important. This relates to environmental issues as well as fuel poverty as discussed in the previous section. It also encompasses broader social policy issues, for instance relating to the interests of vulnerable consumers.

8.15. We discuss our work on broader social policies here, focusing on those relevant for the regulated energy networks.

Social Action Strategy (SAS)

8.16. The Social Action Strategy (SAS), launched in 2005, sets out how we will seek to meet our social obligations³³. Our SAS is reviewed and updated on annual basis. SAS includes how we will help the Government meet its targets for eradicating fuel poverty.

³³ The Gas and Electricity Acts require Ofgem to have regard to the interests of individuals who are disabled, chronically sick, of pensionable age or on low incomes.

8.17. SAS identifies four key themes for our work on social issues:

- **regulatory obligations, monitoring and reporting** - securing compliance with regulatory obligations and effective monitoring and reporting by the companies;
- **research and best practice** - encouraging best practice among energy suppliers, using research to identify effective ways to address fuel poverty and help vulnerable customers;
- **knowledge & influence** - influencing the debate about measures to help tackle fuel poverty, working with other stakeholders; and
- **information for customers** - informing consumers about ways to lower their energy bills.

8.18. Within these four themes identified above, eradicating fuel poverty is a key issue. However, we also have a wider social policy remit to consider all consumers, though the focus in the SAS is on the most vulnerable.

8.19. Social policy initiatives identified within SAS, other than those addressing fuel poverty directly are as follows:

- We will launch investigations in response to widespread consumer concern. For example, in early 2008, we investigated the competitiveness of energy markets in the wake of marked rises in global fuel prices.
- Our Consumer First initiative launched in March 2007, undertakes consumer research to inform key policy decisions. The programme was expanded in October 2008 to include our Consumer First Panel, which gathers together a cross section of consumers, to discuss key issues impacting on their participation in the energy market, as well as other key issues related to energy. Also established was a Consumer Challenge Group, consisting of six consumer experts, to give informed insight in to high level policy decisions. This Group is currently contributing to DPCR5.
- We also look to facilitate debate and identify social policy solutions. The Social Action Strategy Review Group was established in 2000 to help deliver this. Recently debated topics have included financial exclusion, social tariffs, debt and disconnection, and switching amongst vulnerable consumers.
- Under the “energysmart” umbrella we work to deliver information to customers to help reduce energy costs by switching to a cheaper supplier, paying by a cheaper method and installing energy efficiency measures.

Obligations and incentives on the energy networks

8.20. The licences we issue to both electricity and gas distribution network operators include social obligations on the companies. These obligations require suppliers to have Codes of Practice (COP) in place for certain customers who may require special assistance.

The Priority Services Register (PSR) and related issues

8.21. DNOs have duties relating to priority service customers who require advance notice of planned interruptions to supply. For example, those dependent on life-supporting medical equipment.

8.22. As such, distribution companies are required to maintain a Priority Services Register (PSR) using information from energy suppliers. Also required are:

- The operation of a password for accessing premises;
- Provide information regarding interruptions to supplies;
- Provide facilities to enable customers with special communications needs to access information, complain etc.; and
- Reposition meters (under certain circumstances).

8.23. Currently we are exploring the scope for information sharing between network operators and suppliers to improve the accuracy of the PSR.

Customer service reward scheme

8.24. The electricity distribution customer service reward scheme is designed to encourage better service for consumers in areas that cannot be easily measured or incentivised.

8.25. The Customer Service Reward Scheme encourages electricity distribution companies to provide better service for consumers in three areas:

- Priority customer care initiatives
- initiatives relating to Corporate Social Responsibility (CSR); and
- wider communication strategies.

8.26. The scheme makes a total annual reward of £1 million available across all licensed distributors. Entries from distribution companies are judged by a multidisciplinary independent panel.

8.27. As part of the Gas Distribution Price control (2008-13) a similar scheme has been introduced for gas transporters. This is expected to encourage initiatives aimed, not only at the fuel poor, but also encourage schemes such as promoting gas safety and awareness of carbon monoxide.

Guaranteed standards of performance

8.28. Specific regulations provide for guaranteed service levels that must be met by each network operator, with associated penalty payments.

8.29. In electricity these cover 12 key service areas including:

- supply restoration;
- connections; and
- voltage quality.

8.30. In gas these cover similar areas such as:

- supply restoration;
- connections; and
- providing alternative heating and cooking facilities during prolonged outages.

8.31. In RPI-X@20 we will consider whether these measures are sufficient for ensuring the energy networks facilitate efficient delivery of a sustainable energy sector.

9. UK economy and financial markets

9.1. This chapter reviews trends in the GB economy and financial markets. We also highlight a number of potential implications of the current downturn in the economy and turbulence in the financial markets for regulation of energy networks. These, and other, issues will be considered in RPI-X@20.

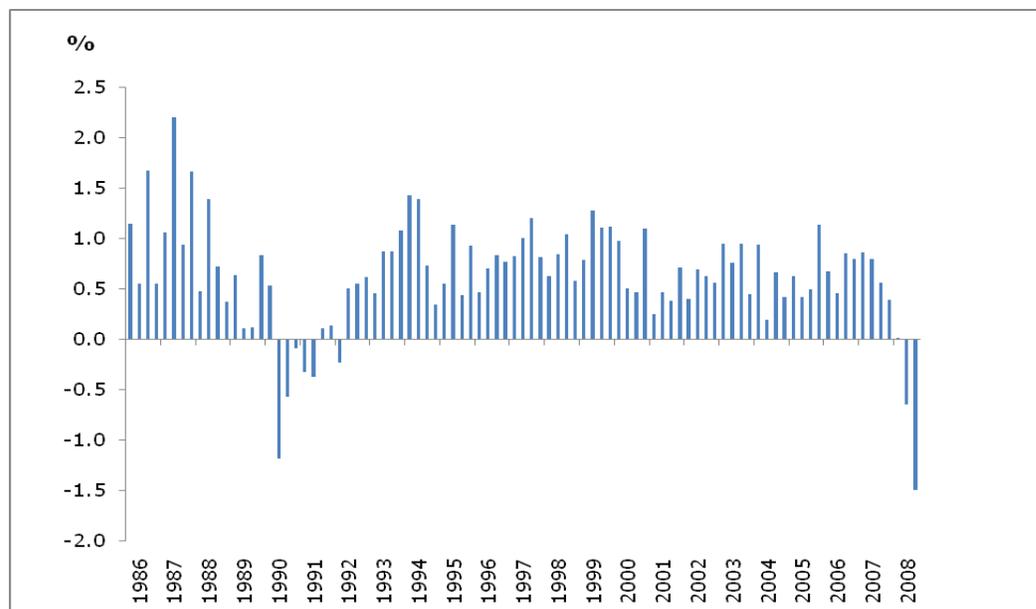
Economic and financial trends

9.2. The UK privatised energy network companies have, until relatively recently, been operating in relatively benign economic conditions (with the exception of the early 1990s) characterised by:

- positive year on year economic growth;
- low and stable inflation;
- low and stable interest rates; and at least since the mid 1990s
- low and stable unemployment levels.

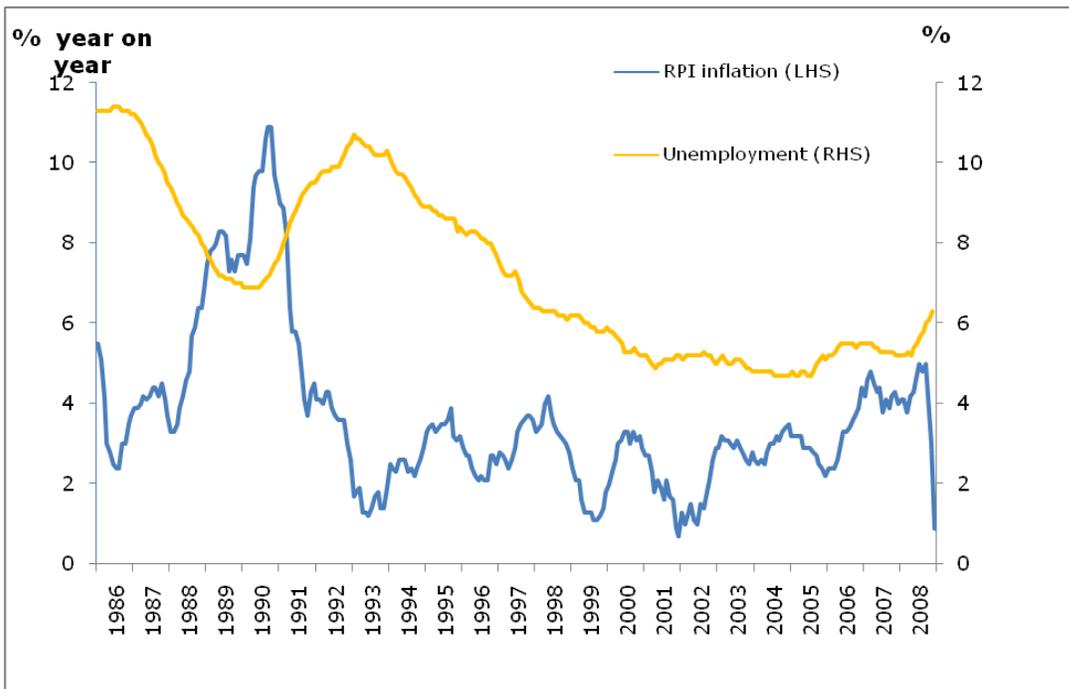
9.3. These trends are illustrated in the figures below.

Figure 14: economic growth



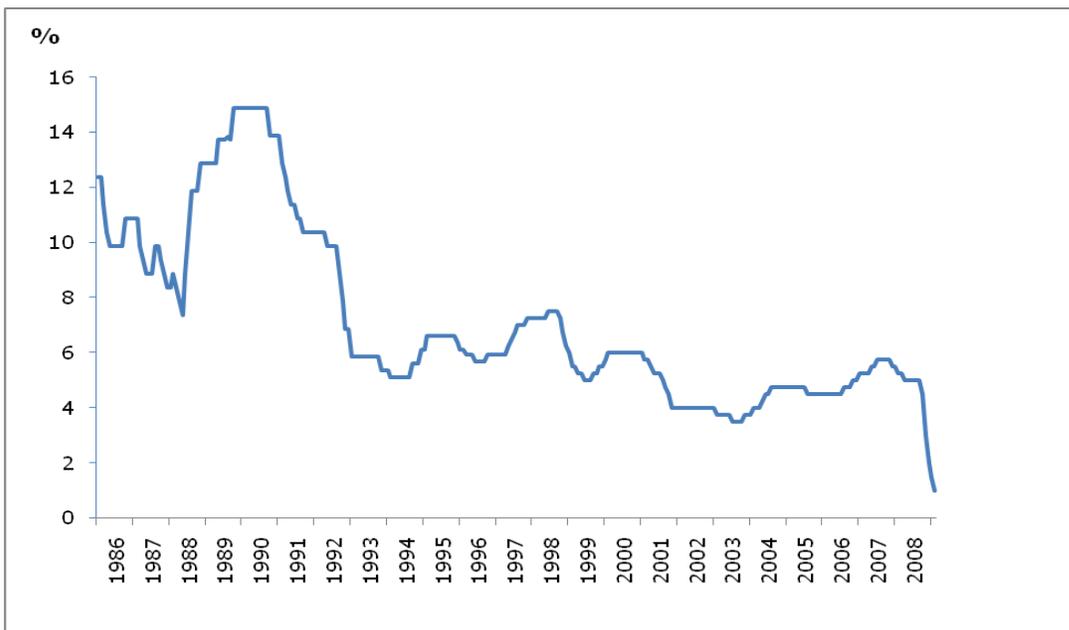
Source: Office of National Statistics (ONS) (Gross Domestic Product (GDP), year on year measure)

Figure 15: Retail Prices index and unemployment



Source: ONS; RPI (all items), unemployment measured using the International Labour Organisation definition.

Figure 16: Interest rates

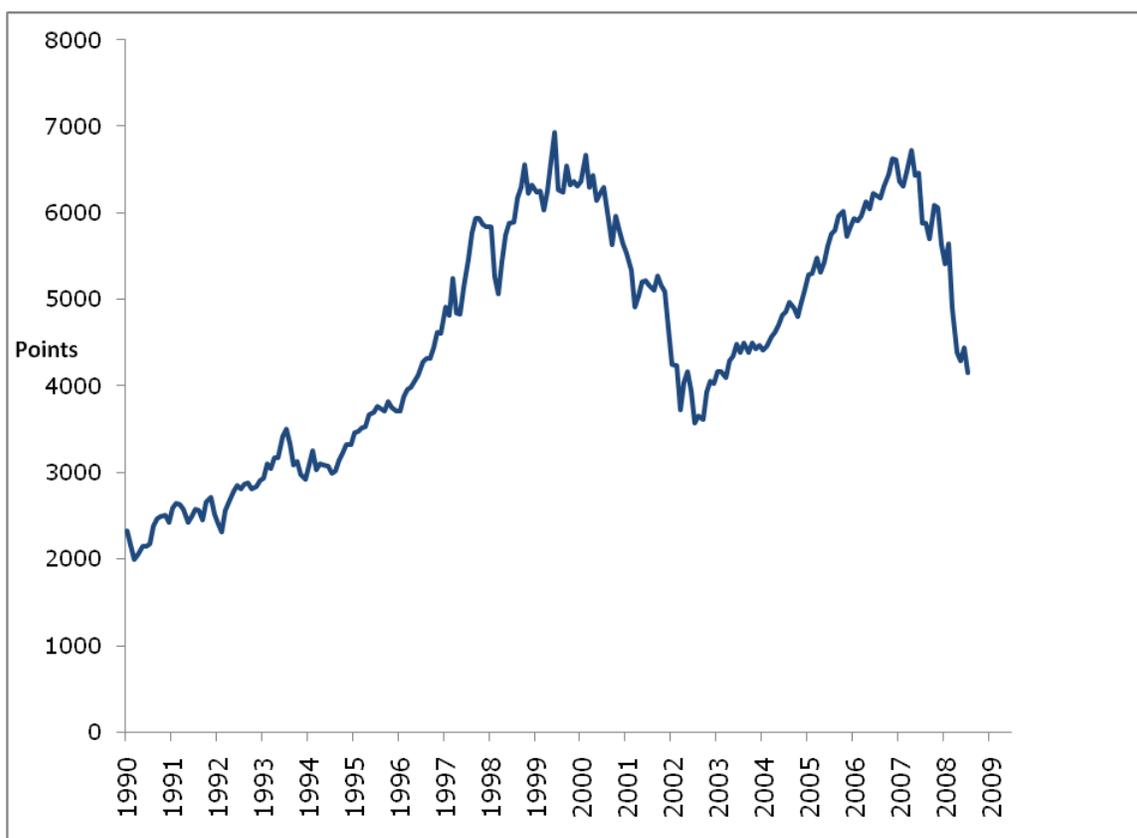


Source: Bank of England

9.4. In addition to the above macroeconomic measures, figure 17 shows movements in the FTSE 100 index over time to indicate changes in the financial markets. It shows two distinct troughs, one relating to the 'dot-com' boom in the early years of the current century and the latter coinciding with the current economic downturn.

9.5. We will examine energy networks general performance against the market to inform our review although we recognise that there is no single perfect measure of this energy network specific performance.

Figure 17: FTSE 100 movements 1990 - present



Source: Bloomberg

Implications for the regulated energy networks

9.6. Shortly after privatisation, in the early 1990s, the economy was in recession. The impact on the newly created private energy networks was likely to have been limited and by the time of the mid-1990s price reviews, the economy had stabilised and entered a sustained period of growth.

9.7. To illustrate this, during the period 1995 to 2007 GDP grew on average by 2.9% per annum while inflation (RPI) over the corresponding period was broadly stable

from year to year averaging 2.8%. In this economic environment, the energy companies faced increased demand, relatively stable input prices, stable and relatively competitive labour market conditions, and reductions in the cost of borrowing.

9.8. There was general criticism of the profitability of FTSE100 companies in the UK, including the energy companies, and concerns raised about the scale of dividends paid out (particularly in the late 1990s). This culminated in a windfall tax on utilities in 1997. At the time it was argued that one reason for the tax was that the original sales of the companies had been heavily discounted and the regulatory settlement at privatisation had not been sufficiently challenging.

9.9. The economic climate has changed significantly since the onset of the credit crunch in the summer of 2007. The crisis in financial markets has impacted on both the price and availability of credit for business and households, exacerbating the downturn in the UK economy. The Bank of England has cut interest rates significantly and there has been direct intervention in financial markets to try and restore lending and confidence. However, the UK economy has now entered a recession - the depth and duration of which, are currently very uncertain.

9.10. We do not consider the effects of the current recession or turbulence in the financial markets on energy network companies here. We regularly monitor the financial well-being of the networks and will continue to do so.

9.11. Any issues relating to the economy and the financial markets, that affect the regulatory framework, will be considered in DPCR5 and RPI-X@20. The issues which we may need to review include:

- the level of indebtedness of the network companies and across the wider economy and what impact this might have on the cost of raising capital, companies financeability and the impact of higher gearing on the way the company responds to financial incentives;
- whether the current conditions cause there to be volatility in capex projections and possibly even on opex forecasts, and whether these conditions are likely to be sustained;
- whether there is volatility in various inputs into the process, e.g. input prices, risk free rate, company specific share performance against the market (betas);
- implications for tax payments and the size of pension provisions; and
- the impact on the fuel poor and vulnerable consumers.

9.12. We will also consider the extent to which current issues in the economy and financial markets should impact on the design of an effective regulatory framework for the long-term.

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Appendix 1 - Glossary

A

Active Distribution Network

The function of an active distribution network is to efficiently link power sources with consumer demands, allowing both to decide how best to operate in real time.

Active Network Management (ANM)

Systems that operate to take action automatically to maintain networks within their normal operating parameters.

The Authority/ Ofgem

Ofgem is the Office of the Gas and Electricity Markets, which supports the Gas and Electricity Markets Authority (GEMA), the body established by section 1 of the Utilities Act 2000 to regulate the gas and electricity markets in GB.

Asset stranding

Investment in assets that ultimately are not used or needed.

B

Baseline

Baselines define the reference levels of capacity that the transmission licensee is to release. Baselines also determine the levels above (or below) which incremental capacity is defined.

Baseline Capital Expenditure

Baseline capital expenditure is the total amount of capex required in association with the baseline. It includes both load related capex and non-related capex.

Better regulation

Looking to ensure that where regulation is necessary, it is proportionate, consistent and targeted towards to the issues it is seeking to address.

British electricity Trading and Transmission Arrangements (BETTA)

BETTA introduced a single GB-wide set of arrangements for trading energy and for access to and use of the transmission system.

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Department for Business, Enterprise & Regulatory Reform (BERR)

C

Capacity (Gas)

The amount of natural gas that can be produced, transported, stored, distributed or utilized in a given period of time under design conditions.

Capital Expenditure (Capex)

Expenditure on investment in long-lived distribution assets, such as underground cables, overhead electricity lines and substations.

Carbon Capture

Removal of CO₂ from fossil fuels either before or after combustion. In the latter the CO₂ is extracted from the fluegas.

Carbon Emissions Reduction Target (CERT)

The CERT programme replaced the Energy Efficiency Commitment 2005-2008 as the government's domestic efficiency obligation on energy suppliers. It sets an obligation of energy suppliers to reduce CO₂ emissions, by promoting energy efficiency and micro renewables to domestic energy users.

Carbon Footprint

Total amount of greenhouse gas emission caused directly and indirectly by the operation of business.

Connection and use of system code (CUSC)

A multi-party document creating contractual obligations among and between users of the GB transmission system, parties connected to the GB transmission system and national grid, in relation to their connection to and use of the transmission system.

Constructive engagement

Process whereby different parties are given the opportunity to reach an agreement on a number of issues, with the regulator acting as a facilitator.

Combined Cycle Gas Turbine (CCGT)

A CCGT uses both gas and steam turbine cycles in a single plant to produce electricity with high conversion efficiencies and low emissions.

Combined Heat and Power (CHP)

Put your title here

document date

The simultaneous generation of usable heat and power (usually electricity) in a single process, thereby discarding less wasted heat.

[Council of European Energy Regulators \(CEER\)](#)

CEER brings together the independent national energy regulators from EU Member States and the European Economic Area (EEA). CEER acts as a focal point for contacts between national energy regulators and is their primary interface at a European level. Its overall aim is to facilitate the creation of a single competitive, efficient and sustainable internal market for gas and electricity in Europe.

[Customer interruptions \(CIs\)](#)

The number of customers whose supplies have been interrupted per 100 customers per year over all incidents, where an interruption of supply lasts for three minutes or longer, excluding re-interruptions to the supply of customers previously interrupted during the same incident.

[Customer minutes lost \(CMLs\)](#)

The duration of interruptions to supply per year – average customer minutes lost per customer per year, where an interruption of supply to customer(s) lasts for three minutes or longer

D

[Department for Environment, Food and Rural Affairs \(DEFRA\)](#)

[Department of Energy and Climate Change \(DECC\)](#)

[Depreciation](#)

Depreciation is a measure of the consumption, use or wearing out of an asset over the period of its useful economic life.

[Discretionary Reward Scheme \(DRS\)](#)

An Ofgem run scheme designed to financially reward DNOs and GDNs for better performance in areas that cannot be easily measured or incentivised

[Distributed Generation \(DG\)](#)

Distributed generation is also known as embedded or dispersed generation. It is an electricity generating plant connected to a distribution network rather than the transmission network.

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Distribution Network Operators (DNOs)

A DNO is a company which operates the electricity distribution network which includes all parts of the network from 132kV down to 230V in England and Wales. In Scotland 132kV is considered to be a part of transmission rather than distribution so their operation is not included in the DNOs' activities.

There are 14 DNOs in the UK which are owned by seven different groups:

CN West	Central Networks West plc licence holder for West Midlands
CN East	Central Networks East plc licence holder for East Midlands
ENW	Electricity North West Limited licence holder for North West England
CE NEDL	Northern Electric Distribution Limited licence holder for North East England
CE YEDL	Yorkshire Electric Distribution Limited licence holder for Yorkshire
WPD S Wales	Western Power Distribution (South Wales) plc, licence holder for South Wales
WPD S West	Western Power Distribution (South West) plc, licence holder for South West England
EDFE LPN	EDF Energy Networks (SPN) plc, licence holder for south east England
EDFE SPN	EDF Energy Networks (LPN) plc, licence holder for London
EDFE EPN	EDF Energy Networks (EPN) plc, licence holder for eastern England
SP Dist	SP Distribution Limited, licence holder for central and southern Scotland
SP Manweb	SP Manweb plc, licence holder for Merseyside and North Wales
SSE Hydro	Scottish Hydro Electric Power Distribution Limited, licence holder for northern Scotland
SSE Southern	Southern Electric Power Distribution Limited, licence holder for southern England

Distribution Price Control Review 4 (DPCR4)

The price control applied to the electricity distribution network operators. This price control runs from 1 April 2005 until 31 March 2010.

Distribution Price Control Review 5 (DPCR5)

The next price control to be applied to the electricity distribution network operators. This price control is expected to run from 1 April 2010 until 31 March 2015.

Demand side management (DSM)

Demand Side Management (aka Load Management) is any mechanism that allows a customer's demand to be intelligently controlled in response to events on the power system. Such events would include lack of network capacity or insufficient generation.

Drinking Water Inspectorate (DWI)

E

Environment Agency (EA)

The Environmental Advisory Group (EAG)

Put your title here

document date

An independent panel of environmental experts that help guide Ofgem's green agenda. The group is made up of policy experts from Government, industry and the green groups who advise Ofgem on the priorities for its work in relation to the environment.

[The Energy Networks Association \(ENA\)](#)

A trade body that represents the gas and electricity transmission and distribution companies in the UK.

[Electricity Networks Strategy Group \(ENSG\)](#)

Industry focus group for network issues. The aim of the ENSG is to identify, and coordinate work to address the technical, commercial, regulatory and other issues that affect the transition of electricity transmission and distribution networks to a low-carbon future.

[European Union Emissions Trading Scheme \(EU ETS\)](#)

A cap and trade scheme in which EU Member State Governments are required to set emissions limits for all installations in their country covered by the scheme. It is an administrative approach used to reduce the cost of pollution control by providing economic incentives for achieving reductions in the emissions of greenhouse gases.

F

[Financeability](#)

Financial models are used to determine whether the regulated energy network is financeable under the proposed price control. Financeability is assessed using a range of different financial ratios.

[Forecast business plan questionnaire \(FBPQ\)](#)

The FBPQ is the forecast business plan questionnaire through which data is collected on the business plans of the 14 distribution network operators to help Ofgem form initial views on the revenue requirements of the companies for the DPCR.

[Fossil Fuel Levy \(FFL\)](#)

The FFL is a tax charged on domestic and industrial bills, the levy effectively funds the difference between the contract prices payable to the renewable generators and the market price of electricity.

[Fuel poverty](#)

A fuel poor household is defined as one that needs to spend at least 10% of household income on all fuel use in order to maintain a satisfactory heating regime.

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G

[Gas distribution networks \(GDNs\)](#)

GDNs transport gas from the National Transmission System to final consumers and to connected system exit points. There are currently eight GDNs in Great Britain which comprise twelve local distribution zones, owned by four groups:

NGG, the GT licence holder for the North West, West Midlands, East England and London GDNs

Northern Gas Networks (NGN), the GT licence holder for Northern GDN

Scotia Gas Networks (SGN), the GT licence holder for Southern GDN & Scotland GDN

Wales & West Utilities (WWU), the GT licence holder for Wales & West GDN.

[Gas Distribution Price Control Review \(GDPCR\)](#)

The review of the price control applying to gas distribution networks. The review extended the existing price control for the year 2007-08 and reset the control for the period commencing 1 April 2008.

[Gearing](#)

A company's net debt expressed as a percentage of its total capital.

[Guaranteed Standards of Performance \(GSOPs\)](#)

Guaranteed Standards set service levels to be met in each individual case and are established by a Statutory Instrument. If the licence holder fails to provide the level of service required, it must make a payment to the customer affected subject to certain exemptions.

[Gas Transporter \(GT\)](#)

The holder of a Gas Transporter's licence in accordance with the provisions of the Gas Act 1986.

H

[Heat and Energy Saving Strategy Consultation](#)

A consultation document jointly published by Department of Energy and Climate Change (DECC) and the Department for Communities and Local Government (CLG). The document sets out the Government's vision up to 2020 and beyond, and seeks views on a range of policies which could help to decarbonise the way homes and businesses are heated.

[High Voltage \(HV\)](#)

Includes all voltage levels above 1kV up to and including 20kV.

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I

Independent distribution network operator (IDNO)

Own and operate electricity distribution networks, which will predominantly be networks extensions e.g. to serve new housing developments.

Innovation funding Initiative (IFI)

A mechanism to remunerate research & development expenditure by DNOs.

Independent Gas Transporter (IGT)

IGTs are GT licence holders that own and operate small local gas networks and levy distribution charges on shippers.

Information Quality Incentive (IQI)

The IQI mechanism incentivises DNOs not to inflate their forecasts. It does this in two ways: by giving additional income to companies who forecast spend close to our assessment; and by providing these companies with a higher incentive rate than those companies with higher capex forecasts, thereby increasing their rewards for outperformance.

InterGovernmental Panel on Climate Change (IPCC)

The role of the IPCC is to assess on a comprehensive, objective, open and transparent basis the scientific, technical and socio-economic information relevant to understanding the scientific basis of risk of human-induced climate change, its potential impacts and options for adaptation and mitigation.

L

Large Combustion Plant Directive (LCPD)

The LCPD aims to reduce acidification, ground level ozone and particles throughout Europe by controlling emissions of sulphur dioxide (SO₂), nitrogen oxides (NO_x) and dust (particulate matter (PM)) from large combustion plants (LCPs). These include plants in power stations, petroleum refineries, steelworks and other industrial processes running on solid, liquid or gaseous fuel.

Long-term Energy Network Scenarios (LENS)

Study which looks at a range of future scenarios for electricity networks that could arise as a consequence of market and policy developments.

Liquefied Natural Gas (LNG)

LNG is natural gas that has been condensed into a liquid at atmospheric pressure by

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document date

cooling it to approximately -163 degrees Celsius. LNG is transported by specifically designed vessels and stored in specially designed tanks. LNG is about 1/600th the volume of natural gas, making it much more cost – efficient to transport over long distances where pipelines do not exist.

Load related expenditure (LRE)

The installation of new assets to accommodate changes in the level or pattern of electricity or gas supply and demand.

Low carbon economy

An Economy which has a minimal output of Greenhouse gas emissions

Low Voltage

All voltage levels up to and including 1kV.

M

Microgeneration

The small-scale generation of heat and/or electricity from a low carbon source, for example solar panels, micro-wind, micro combined heat and power and heat pumps.

N

National Grid Gas (NGG)

The gas transporter (GT) licence holder for the North West, West Midlands, East England and London GDNs. NGG also hold the GT licence for the gas transmission system.

National Grid Electricity Transmission (NGET)

NGET owns and maintains the high-voltage electricity transmission system in England and Wales.

National Transmission System (NTS)

The high pressure gas transmission system covering Great Britain, owned and operated by National Grid.

Net present value (NPV)

Net present value is the discounted sum of future cash flows, whether positive or negative, minus any initial investment.

Non-Load related Capex

Put your title here

document date

The costs of the day to day operation of the network such as staff costs, repairs and maintenance expenditures, and overheads.

O

Offshore transmission

The majority of offshore generation will be connected to the GB electricity grid through offshore transmission cables. Offshore transmission is defined as being any offshore transmission network that operates at 132kV or above.

Operating expenditure (OPEX)

Expenditure on operating and maintaining the network, e.g. fault repair, tree cutting, inspection and maintenance, engineering and business support costs.

Option value

The potential value of a resource for future (direct or indirect) use.

Overall Standard of Performance (OSOP)

Overall standards of performance set minimum average levels of performance in areas where it is not necessarily appropriate to put in place guarantees for individual consumers. These are determined separately for each gas transporter by the Authority.

P

Pension Protection Fund (PPF)

The Pension Protection Fund established to pay compensation to members of eligible defined benefit pension schemes, when there is a qualifying insolvency event in relation to the employer and where there are insufficient assets in the pension scheme to cover Pension Protection Fund levels of compensation.

Priority Services Register (PSR)

PSR includes domestic consumers who are of pensionable age, have a disability, have long term ill health, and/ or are blind or visually impaired. Individuals on this register qualify for a selection of free services by gas and electricity suppliers.

R

Regulatory asset value (RAV)

The value ascribed by Ofgem to the capital employed in the licensee's regulated distribution or (as the case may be) transmission business (the 'regulated asset base'). The RAV is calculated by summing an estimate of the initial market value of each licensee's regulated asset base at privatisation and all subsequent allowed additions to it at historical cost, and deducting annual depreciation amounts

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calculated in accordance with established regulatory methods. These vary between classes of licensee. A deduction is also made in certain cases to reflect the value realised from the disposal of assets comprised in the regulatory asset base. The RAV is indexed to RPI in order to allow for the effects of inflation on the licensee's capital stock. The revenues licensees are allowed to earn under their price controls include allowances for the regulatory depreciation and also for the return investors are estimated to require for providing the capital.

Relative Price Control (RPC)

Under relative price controls the level and structure of charges levied by the independent operator are subject to control by capping charges to an equivalent charge for the host operator, subject to a pre-determined floor and ceiling. The levels of the floors and ceilings are defined relative to the expected path of the host operator charges.

Re-openers

A process undertaken by Ofgem to re-set the revenue allowances (or the parameters that give rise to revenue allowances) under a price control before the scheduled next formal review date for the relevant price control.

Revenue Driver

A means of linking revenue allowances under a price control to specific measurable events which are considered to influence costs. An example might be to allow a specified additional revenue allowance for each MW of new generation connecting to the network. Revenue drivers are used by Ofgem to increase the accuracy of the revenue allowances.

Renewables Obligation (RO) and Renewables Obligation Scotland (ROS)

The RO places an obligation on licensed electricity suppliers in the United Kingdom to source an increasing proportion of electricity from renewable sources. Suppliers meet their obligations by presenting Renewables Obligation Certificates (ROCs) or payment into the buy-out fund.

Renewables Obligation Certificates (ROCs)

A transferable certificate received by eligible renewable generators for each MWh of electricity generated. ROCs are traded separately from power and are used by suppliers to fulfil their Renewables Obligations under the Utilities Act 2000.

RPI-X

The form of price control currently applied to network monopolies. Each company is given a revenue allowance in the first year of the control period. The price control then specifies that in each subsequent year the allowance will move by 'X' per cent in real terms.

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Registered Power Zones (RPZ)

RPZ is a mechanism to encourage DNOs to develop and demonstrate new and more cost effective technologies for connecting and operating generation on their distribution.

S

Second strategic energy review

9.13. On November 2008, the EU proposed a wide ranging energy programme. In particular it is intended to: build up solidarity between member states on energy issues; stimulate energy network investment to facilitate low carbon energy sources; secure sustainable energy supplies through a 'Security and Solidarity Action Plan'; and promote greater efficiency in use of energy.

Scottish Hydro-Electric Transmission Limited (SHETL)

The electricity transmission licensee in northern Scotland.

Scottish Power Transmission Limited (SPTL)

The electricity transmission licensee in southern Scotland.

Shrinkage

Shrinkage is a term used to describe gas either consumed within or lost from a transporter's system. e.g. Shrinkage can result from gas transmission companies using gas within their transportation systems to fuel gas compressors. Gas leaks from distribution mains are vented by certain types of equipment and shrinkage also occurs when gas is stolen or not charged for in error.

SmartGrid

SmartGrid is an electricity network that can intelligently integrate the actions of all the users connected to it - generators, consumers and those that do both - in order to efficiently deliver sustainable, economic and secure electricity supplies.

Smart Metering

Advanced gas and electricity metering technology that offers customers more information about, and control over, their energy use (such as providing information on total energy consumption in terms of value, not only volume), or allows automated and remote measurement.

Sulphur Hexafluoride (SF6)

A potent greenhouse gas frequently used in electrical equipment.

Supply Chain

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document date

Refers to all the actors involved in the delivery of electricity and gas to the final consumers - from electricity generators and gas producers, through to electric and gas suppliers.

Sustainable development

Refers to economic development which meets the needs of the present without compromising the ability of future generations to meet their own needs.

Sustainable Development Commission

The Sustainable Development Commission is the Government's independent advisory body on sustainable development.

Sustainable energy sector

A sustainable energy sector as one which promotes security of supply over time; delivers a low carbon economy and associated environmental targets; and delivers related social objectives (e.g. fuel poverty targets).

System operator (SO)

The entity responsible for operating the GB transmission system and for entering into contracts with those who want to connect to and/or use the transmission system. National grid is the GB system operator.

T

Third Internal Energy Market Package

The third package is a key step in implementation of internal EU energy market. It recognises the need for better co-ordination between European network operators and continuing co-ordination between regulators at that level. It continues many of the internal market principles identified above in relation to the earlier First and Second Packages.

Transmission Access Review (TAR)

Following the publication of the Energy White Paper 2007, Ofgem and BERR have convened a joint review of the current framework for access to the GB transmission system. The review will explore a range of issues associated with the technical, commercial and regulatory arrangements, with the chief aim being to better support the delivery of the government's aspiration of 20 percent of electricity supplied by renewable generation by 2020 and any targets that may be agreed at European Union level.

Transmission Investment for Renewable Generation (TIRG)

In the context of this document, this means the regulatory mechanisms developed before the start of the next main price control in 2007, to fund a number of specific

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document date

network enhancement projects required to provide transmission capacity for new renewable generation plants.

Transmission Owner (TO)

There are three separate high-voltage transmission Owners in Great Britain:

National Grid Electricity Transmission plc (NGET) - owns and maintains the high voltage electricity transmission system in England and Wales. They also have the role of system operator (SO) across the whole of Great Britain.

Scottish Hydro-Electric Transmission Limited (SHETL) - the electricity transmission licensee in northern Scotland.

Scottish Power Transmission Limited (SPT) - the electricity transmission licensee in southern Scotland.

National Grid Gas NTS is the gas Transmission Owner.

Transmission Price Control Review (TPCR)

The TPCR established the price controls for the transmission licensees which took effect in April 2007 for a 5-year period. The review applies to the three electricity transmission licensees, National Grid Electricity Transmission, Scottish Power Transmission Limited, Scottish Hydro-Electric Transmission Limited and to the licensed gas transporter responsible for the gas transmission system, NGG.

U

Users of the Network

Companies along the gas and electricity supply chain (i.e. producers/generators, transmission and distribution networks, and energy suppliers).

V

W

Weighted Average Cost of Capital (WACC)

This is the weighted average of the expected cost of equity and the expected cost of debt.

Warm Front

Warm Front is the Government's grant-funded programme in England for tackling fuel poverty. The scheme was launched in June 2000 and before its name changed to Warm Front, it was called the Home Efficiency Scheme. Equivalent schemes operate in Scotland and in Wales which are funded by the respective Devolved Administrations.

X

Y

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document date

Yardstick mechanism

When the regulator uses observations of different firms to deduce their private information and regulate them consequently.

Z