

The Market for Gas A Quantitative Analysis

Research Paper 95/33

11 April 1995



This paper provides a quantitative overview of the gas industry in Britain, looking at natural gas production, consumption and trade. Statistics covering British Gas are also examined, such as profits, employment, charges, disconnections and complaints.

Readers will also be interested in Library Research Paper 95/30 *The Gas Bill [Bill 60 of 1994/95]* which summarises the background to and clauses of the Gas Bill which has its second reading in the House of Commons on 13 March 1995.

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Key

.. not available

British Gas now uses kilowatt hours (kWh) as its standard unit of measure for gas. The following conversion factors may be of use:

1 therm = 29.3 kilowatt hours (kWh)

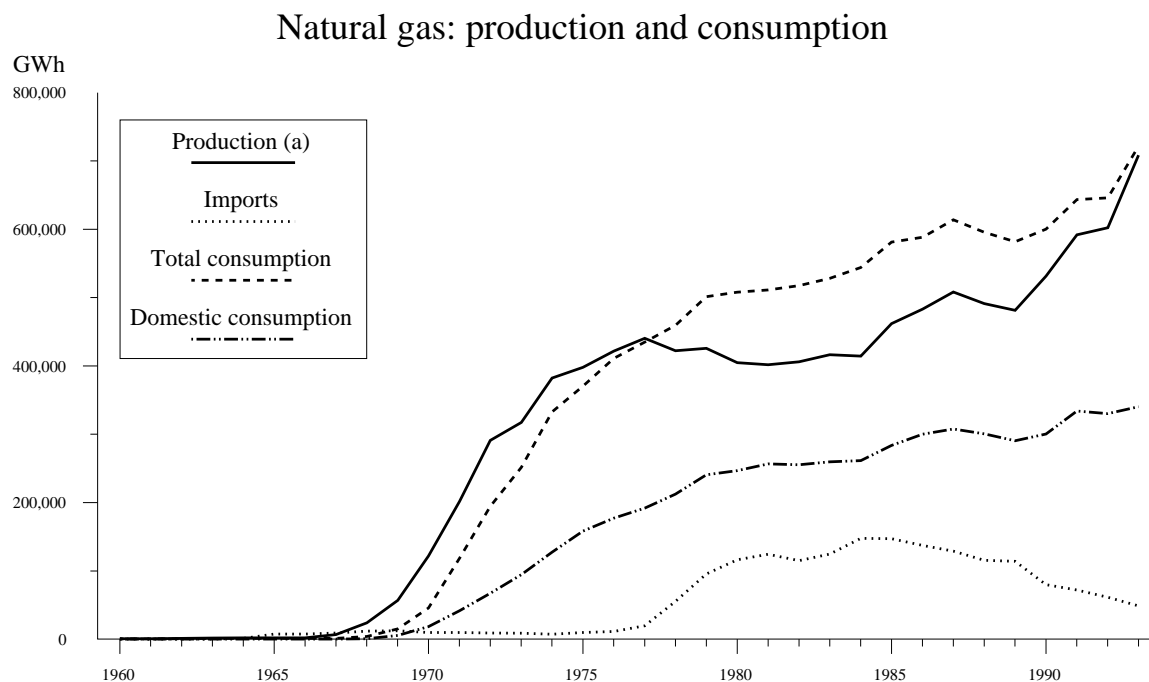
1 gigawatt hour (GWh) = 1,000,000 kilowatt hours (kWh) = 34,121 therms

I The market for gas

Table 1 shows that in 1994 United Kingdom gross production of natural gas (methane from the North Sea and onshore gas fields) totalled 703,884 GWh, up almost 18% on the previous year (597,854 GWh). Imports of natural gas in 1994 totalled 48,527 GWh, down 21% compared with 1993 (61,255 GWh).

Total consumption of natural gas in the United Kingdom in 1993 was 673,521 GWh, a 12% rise on the previous year (600,443 GWh). Domestic consumption of natural gas in 1993 totalled 340,168 GWh, a modest 3% increase on the previous year (330,100 GWh).

The graph below charts the movements in natural gas (methane) production, imports and consumption since 1960:



(a) Includes colliery methane and substitute natural gas

Consumption of methane by electricity generators in the United Kingdom has shown the most significant increase. In March 1991 the EC Directive¹ which restricted the use of natural gas in electricity generation was repealed, and this has led to what has been commonly dubbed "the dash for gas". In 1993 consumption of methane by the electricity generators totalled 88,599 GWh, a 338% rise on the previous year (20,210 GWh).

³ EC Directive 75/404/EEC

Table 1

Gas production & consumption: North Sea and onshore (GWh)

	Production		Imports		Exports		Consumption		Consumption	
	methane		methane		methane		total	domestic	electricity generation	
1989	477,554		113,770		0		541,827	290,557	6,108	
1990	527,583		79,833		0		559,118	300,410	6,410	
1991	587,825		72,007		0		600,318	333,954	7,296	
1992	597,854		61,255		620		600,443	330,100	20,210	
1993	703,976		48,528		6,824		673,521	340,168	88,599	
1994	755,358		33,053		9,557		..	..	..
Change 1992-1993	17.8%		-20.8%		1000.6%		12.2%	3.0%	338.4%	
Change 1993-1994	7.3%		-31.9%		40.0%		..	..	..
Q3 1993	109,499		9,869		1,686		101,927	37,173	22,824	
Q4 1993	236,740		12,848		2,729		226,254	123,740	30,026	
Q3 1994	117,750		4,160		2,112		108,485	32,501	28,641	
Q4 1994	222,845		5,798		2,605		..	..	..
Change Q3 1993-Q3 1994	7.5%		-57.8%		25.3%		6.4%	-12.6%	25.5%	
Change Q4 1993-Q4 1994	-5.9%		-54.9%		-4.5%		..	..	..

Source: Department of Trade and Industry "Energy Trends" February 1995

II Gas reserves

Table 2 sets out some estimates of the United Kingdom reserves of gas at the end of 1993. Government forecasts of *discovered* gas reserves remaining can only be very approximate and are published in the annual *Brown Book*² in the form of ranges of values between which the true level of reserves is estimated to lie. The lower estimate refers to proven³ reserves ranging upwards to the maximum possible reserves, which includes the proven reserves plus probable⁴ and possible⁵ reserves. On 31 December 1993, remaining gas reserves were estimated at between 630 and 1,915 billion cubic metres.

From these estimates, it is possible to calculate, albeit crudely, how long these reserves would last at current production levels, although the answer can only be very approximate. At current production levels of around 65.5 billion cubic metres in 1993 (from the United Kingdom Continental Shelf), initial recoverable gas reserves (proven plus possible) of 1,435 billion cubic metres would last for around 22 years. However, this does not take into account undiscovered recoverable reserves, which have been estimated by the Department of Trade and Industry to be between 300 and 1,297 billion cubic metres. This could prolong the "lifespan" of North Sea gas by around 20 years.

The government has not in the past estimated the future lifespan of natural gas. However, a recent parliamentary answer⁶ has suggested that total British reserves of gas in all known discoveries could last for 36 years whilst if the full potential from all possible future discoveries were to be included the estimate would increase to some 47 years. The variation in the two sets of estimates highlights the difficulty in estimating the lifespan of gas reserves.

³ Department of Trade and Industry *Development of the oil and gas resources of the United Kingdom*

ⁱⁱ those reserves which on the available evidence are virtually certain to be technically and economically producible (ie those reserves which have a better than 90% chance of being produced)

ⁱⁱⁱ those reserves which are not yet "proven" but which are estimated to have a better than 50% chance of being technically and economically producible

^{iv} those reserves which at present cannot be regarded as "probable" but are estimated to have a significant but less than 50% chance of being technically and economically producible

^v HC Deb 11 January 1995 c151W

Table 2

Estimates of discovered recoverable reserves of gas at 31 December 1993 (billion cubic metres)

	Proven	Probable	Proven plus probable	Possible	Maximum
Initially recoverable gas reserves					
Total dry gas	1,215	355	1,570	205	1,775
Gas from dry gas fields	1,215	175	1,390	80	1,470
Other significant finds not yet fully appraised	0	185	185	120	305
Gas from condensate fields	140	320	465	175	640
Associated gas from oil fields	190	130	320	105	425
Total initial gas reserves	1,550	805	2,355	480	2,835
Cumulative gas production to end of 1993	918				
Dry gas	818				
Associated gas/gas from condensate fields	100				
Total remaining gas reserves	630	805	1,435	480	1,915

Source: Department of Trade and Industry "Oil and Gas Resources of the United Kingdom" 1994

III British Gas

Table 3 sets out some financial and operating statistics for British Gas. In 1994 the level of pre-tax profits for British Gas was £1,245 million, overturning a £215 million loss in 1993. Turnover in 1994 was £9,698 million, down by 7% on the previous year (£10,376 million).

Employment at British Gas has fallen in recent years. At 31 March 1986 there were 86,100 employees based within the United Kingdom at British Gas. At 31 December 1994 this had reduced to 60,800, a fall of just over 25%.

At the end of 1994, British Gas had 18.7 million customers, of whom 18.1 million were domestic, 0.5 million were commercial and 0.1 million were industrial. At the end of March 1987, there was a total of 16.8 million customers. Over the period since March 1987 then, the number of customers has risen by 11%.

Average consumption per domestic consumer in 1994 was 18,953 kWh, which equates to around 647 therms. British Gas domestic tariffs and average bills are examined in section IV of this paper.

Table 3

British Gas: Financial and operating statistics

	1986-87	1987-88	1988-89	1989-90	1990-91	1991	1992	1993	1994
Pre-tax profits £m	1,290	1,255	1,333	1,297	1,849	1,712	1,054	-215	1,245
Turnover £m	7,610	7,364	7,526	7,983	9,491	10,485	10,254	10,376	9,698
UK-based employees at end year 000's	86.1	82.3	79.9	79.0	79.8	79.3	76.2	70.5	60.8
Turnover per employee £	88,400	89,500	94,200	101,100	118,900	132,200	134,600	147,200	159,500
Capital expenditure £m	369	488	882	783	1,194	1,772	2,006	1,607	..
Tax on profit on ordinary activities £m	487	439	437	368	640	556	371	-32	504
Number of customers at end of year									
Domestic 000's	16,235	16,495	16,842	17,054	17,311	17,510	17,802	18,094	..
Commercial 000's	483	499	510	573	581	580	569	502	..
Industrial 000's	83	85	87	90	97	93	91	86	..
Total 000's	16,801	17,079	17,439	17,717	17,989	18,183	18,462	18,682	..
Average consumption per domestic customer kWh	18,885	17,919	17,449	17,102	18,489	19,181	18,696	18,953	..

Source: *British Gas Annual Report & Accounts (various years)*
British Gas Financial & Operating Statistics (various years)

break in series

Table 4

British Gas domestic tariffs

	Standing charge pence per day	Unit charge pence per kWh
1 October 1982	10.1	1.143
1 January 1984	10.1	1.201
1 February 1985	10.1	1.262
1 May 1986	9.0	1.297
1 July 1987	8.5	1.239
1 April 1988	9.1	1.314
1 April 1989	9.5	1.358
1 March 1990	10.3	1.460
1 November 1990	10.3	1.512
1 April 1991	10.3	1.566
1 July 1992	10.3	1.507
1 October 1992	10.1	1.477
1 January 1995 (b)	10.4	1.520

Notes: (a) Credit gas tariffs

(b) Direct debit discount reduces this to 10.1 pence per day
for standing charges and 1.433 p/kWh for unit charges

Source: British Gas "Financial & Operating Statistics 1993"
British Gas press office

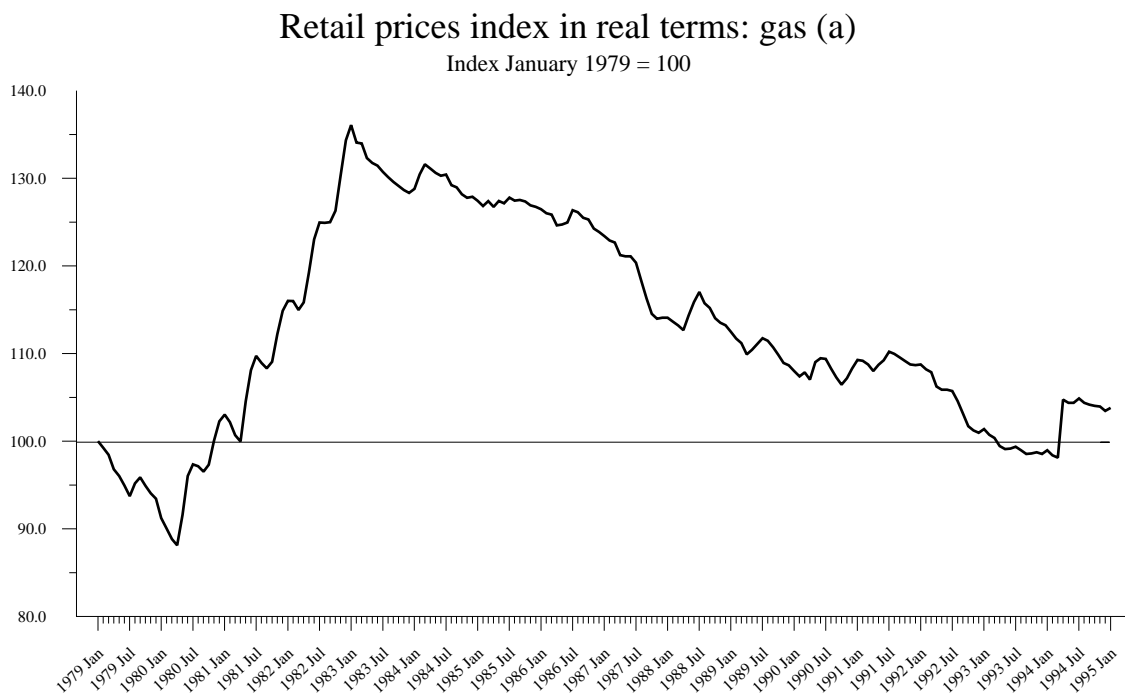
IV Prices and average bills

Table 4 sets out the credit gas tariffs for domestic customers. British Gas supplies gas to domestic consumers on the basis of credit tariffs or prepayment meters. In 1993 over 95% of domestic customers were on credit tariffs.

From 1 January 1995 new tariffs were introduced with a daily standing charge of 10.39p and a unit charge of 1.520 p/kWh. A discount was also introduced for those customers paying by direct debit. Standing charges would be levied at 10.1p per day and unit charges at 1.433 p/kWh for such customers.

Based on an average annual consumption of 19,000 kWh⁷ for domestic consumers, this would imply an average annual bill using the new tariffs of £327, or £309 if paying by direct debit. At the time of privatisation in December 1986, the annual cost of 19,000 kWh of gas would have been £279. The rise between the cost of 19,000 kWh of gas in December 1986 and now is 17% (ignoring the direct debit discount).

Another measure of the domestic price of gas which is often used is based on the retail prices index. The retail prices index can be thought of as a basket of goods and services on which consumers throughout the United Kingdom typically spend their money. The retail prices index measures changes to the cost of that basket of goods and services over time. One of the components of the index is gas. The graph below looks at the monthly change in the retail prices index for gas in real terms (using the all-items retail prices index as a deflator).



(a) Using the all-items RPI as a deflator

^K See table 3

Between December 1986 and January 1995, the retail prices index component for gas rose by 22.8% in cash terms which when deflated using the all-items retail prices index is equivalent to a 16.2% fall in real terms.

The table below sets out the annual average changes in the gas component of the retail prices index since 1980:

Table 5 - Retail prices index: gas⁸

	Cash terms change on previous year	Real terms⁹ change on previous year
1980	16.6%	-1.2%
1981	26.1%	12.7%
1982	24.6%	14.7%
1983	12.0%	7.1%
1984	3.6%	-1.3%
1985	4.1%	-1.8%
1986	1.9%	-1.5%
1987	-1.0%	-5.0%
1988	0.7%	-4.0%
1989	4.3%	-3.2%
1990	6.8%	-2.4%
1991	7.0%	1.1%
1992	-0.2%	-3.8%
1993	-3.8%	-5.3%
1994	6.0%	3.5%
January 1995	8.4%	4.9%

⁸ Source: Central Statistical Office Database

⁹ Using the all-items retail prices index as a deflator

V Disconnections

OFGAS¹⁰ collects some figures on the number of domestic disconnections for the non-payment of bills. Table 6 sets out the available data. In the year ending 31 December 1994, there were 16,393 disconnections of domestic customers for the non-payment of bills. This equates to around 0.1% of all credit gas customers. In the year ending 31 March 1988 the highest annual total for disconnections was recorded, with 61,796 customers cut off representing 0.4% of all credit gas customers.

VI Complaints and enquiries

Both OFGAS and the Gas Consumers Council collect data on the number of complaints and enquiries received. OFGAS has a narrower remit than the Gas Consumers Council but it does have legal powers of enforcement, unlike the Gas Consumers Council. OFGAS monitors the supply of gas to consumers, whereas the Gas Consumers Council also monitors British Gas's compliance and servicing obligations.

Table 7 shows that in 1994 OFGAS received 2,203 complaints and 115 enquiries. The number of complaints was up by 33% compared with 1993. This was due mainly to a late surge of complaints following the new tariff rates announced by British Gas at the end of the year and the furore over executive pay.

The Gas Consumers Council receives complaints about British Gas and other independent companies and these figures are shown in table 8. In 1994 complaints about British Gas totalled 24,359, up 19% on the previous year. Monthly figures on the number of complaints have recently been the focus of media attention. In January 1995 5,246 complaints about British Gas were received by the Gas Consumers Council, an increase of 173% compared with January 1994. Again, this is likely to be mainly due to the increased tariffs in force from 1 January 1995.

^{3ж} The Office of Gas Supply

Table 6**Domestic disconnections for non-payment of gas bills**

Year ending	Number	% of all domestic credit customers	
31 March 1988	61,796	0.40%	
30 September 1989	23,224	0.14%	
30 September 1990	19,118	0.12%	
30 September 1991	18,009	0.11%	0.11%
30 September 1992	16,991	0.10%	0.10%
30 September 1993	16,367	0.09%	0.09%
31 December 1994	16,393	0.10%	

Source: OFGAS Annual Reports & Press Office

Table 7

Complaints and enquiries received by OFGAS

	Complaints	Enquiries	Total
1986 (a)	6	0	6
1987	252	35	287
1988	275	27	302
1989	431	20	451
1990	366	31	397
1991	918	50	968
1992	1,624	203	1,827
1993	1,658	184	1,842
1994	2,203	115	2,318

Notes: (a) From 18 August 1986

Source: Office of Gas Supply Annual Reports & Press Office

VII Household expenditure on gas

Some analysis of expenditure on gas by households analysed by income group and geographical region is possible from the annual *Family Expenditure Survey* which provides information about the incomes and expenditure of households throughout the United Kingdom. Each year around 7,000 households complete detailed questionnaires on their income, capital and regular bills and maintain a two-week diary of their day-to-day expenditure.

Average expenditure on gas by households is not the same as the average bill. Not all households are connected to gas supplies, and only 78% of households in the 1993 survey recorded any gas expenditure. Hence average expenditure includes the "zero" expenditures of such households - the expenditure of gas-consuming households is averaged over *all* households, whether or not they consume gas.

Table 9 sets out the average household expenditure on gas for households in each region of Great Britain. Nationally the average expenditure was £5.20 per week, representing 1.9% of total household expenditure. The region with the lowest expenditure on gas was East Anglia (£3.78 per week, 1.5% of household expenditure) whilst the region with the highest expenditure was the North West (£6.07 per week, 2.3% per week).

Table 10 sets out average household expenditure on gas by gross income decile group. The lowest decile of households refers to those households whose gross incomes are in the lowest ten per cent of the range of all household incomes. Such households spend on average £3.18 per week on gas, representing 4.0% of total expenditure for such households. For the highest decile, expenditure on gas at £7.77 per week represents 1.3% of total expenditure.

Table 9**Average household expenditure on gas in 1993 by standard region**

	Gas <i>per week</i>	All items <i>per week</i>	% of total
North	£5.22	£245.94	2.1%
Yorkshire & Humberside	£5.83	£263.06	2.2%
East Midlands	£5.78	£262.15	2.2%
East Anglia	£3.78	£260.46	1.5%
Greater London	£5.59	£321.95	1.7%
Rest of South East	£5.70	£320.64	1.8%
South West	£4.14	£268.14	1.5%
West Midlands	£5.21	£238.19	2.2%
North West	£6.07	£261.81	2.3%
England	£5.43	£280.09	1.9%
Wales	£4.78	£249.45	1.9%
Scotland	£4.48	£264.84	1.7%
Great Britain	£5.20	£276.68	1.9%

Source: Central Statistical Office "Family Spending 1993"

Table 10**Average household expenditure on gas in 1993 by gross income decile group**

	Gas <i>per week</i>	All items <i>per week</i>	% of total
Lowest ten per cent	£3.18	£80.35	4.0%
Second decile group	£4.05	£116.86	3.5%
Third decile group	£4.30	£154.21	2.8%
Fourth decile group	£4.37	£192.88	2.3%
Fifth decile group	£4.81	£238.22	2.0%
Sixth decile group	£5.27	£265.43	2.0%
Seventh decile group	£5.54	£306.51	1.8%
Eighth decile group	£6.16	£350.11	1.8%
Ninth decile group	£6.57	£447.96	1.5%
Highest ten per cent	£7.77	£614.21	1.3%
All households	£5.20	£276.68	1.9%

Source: Central Statistical Office "Family Spending 1993"

Recent papers on related subjects have been:

Energy

Research Paper

95/30	The Gas Bill [Bill 60 of 1994/95]	06.03.95
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94/93	Regulation of the Electricity Industry	01.08.94