

# United Kingdom Minerals Yearbook 2003

Statistical data to 2002

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The compilers would also like to thank their colleagues in the British Geological Survey, in particular P Lappage, J P Stevenson and J I Rayner.

### *Bibliographical reference*

**British Geological Survey.** 2004. *United Kingdom Minerals Yearbook 2003.* (Keyworth, Nottingham: British Geological Survey.)

### *Cover photograph*

Ship loading with granite at Glensanda coastal superquarry, near Oban, Scotland. The quarry has an annual production of six million tonnes. The vessel shown has a cargo capacity of 76 000 tonnes.

(Photograph © and courtesy of Foster Yeoman Limited)

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## Preface

In 2003 the coal industry saw still more closures of deep mines and it was announced that the Selby Complex, which produces one quarter of total UK deep-mined coal, would close in 2004 after twenty-one years of production. In its energy white paper, published in early 2003, the government indicated that coal could have a part to play in the country's future energy mix. However, it seems probable that this is conditional on the technical and economic success of carbon dioxide capture and storage – an area where the BGS is actively involved in collaborative research projects. Security of energy supply appears not to feature in the government's analysis. While it is true that the UK is totally dependent on imports of many mineral-based commodities it is at least arguable that oil and gas will be more critical to the nation than any other imported commodity and also more vulnerable to supply disruption.

Aggregate minerals for the construction industry are equally critical but the UK has abundant resources of these, the necessary constraints on their use being those of environmental protection and planning consents. Pressure on land use is greatest in the south-east of the country and one solution to the problem of supply has been the mooted development of coastal 'superquarries' in Scotland. The only quarry that has become reality so far is the subject of the cover picture of this edition of the *Yearbook*. A proposal for a coastal superquarry on the Isle of Harris has been recently dropped.

The *United Kingdom Minerals Yearbook* is also available in downloadable form on the BGS website [www.mineralsUK.com](http://www.mineralsUK.com) *Minerals: Britain and the World*. The website is hosted on the BGS website [www.bgs.ac.uk](http://www.bgs.ac.uk), and is sponsored by the Office of the Deputy Prime Minister (ODPM). As well as this book, it contains a wide range of information on mineral resources, legislation, mineral exploration, mining and production and trade, and includes a number of free download reports.

I wish to record our thanks to colleagues in the Government statistical service who have collaborated so readily in providing the basic data included in this volume. In addition I would like to thank the many organisations, trade associations, companies and individuals who have generously supplied additional information. The support of the ODPM is also gratefully acknowledged.

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*Executive Director*

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Nottingham

May 2004

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## Explanatory notes

**Coverage:** Except where otherwise stated all the statistics shown relate to the United Kingdom of Great Britain and Northern Ireland.

The Channel Islands and the Isle of Man are also included in the 'United Kingdom' overseas trade statistics, but are excluded from the production statistics. The UK part of the Continental Shelf is included in both the overseas trade and the production statistics.

All figures for the latest year shown are provisional and subject to revision.

**Rounding of figures:** In tables where figures have been rounded to the nearest final digit, there may be a slight discrepancy between the sums of the constituent items and the total as shown.

**Units:** The statistics in this volume are expressed in metric units. The following factors are given for converting from or into non-metric units:

<i>Troy ounce</i>	<i>Kilogram</i>
1	= 0.0311035
32.1507	= 1
<i>Pound</i>	<i>Kilogram</i>
1	= 0.453592
2.20462	= 1
<i>Hundredweight</i>	<i>Kilogram</i>
1	= 50.8023
0.019684	= 1
<i>Long ton</i>	<i>Tonne</i>
1	= 1.01605
0.984206	= 1

<i>Square yard</i>	<i>Square metre</i>
1	= 0.836127
1.19599	= 1
<i>Cubic yard</i>	<i>Cubic metre</i>
1	= 0.764555
1.30795	= 1
<i>UK gallon</i>	<i>Litre</i>
1	= 4.54596
0.2199755	= 1

**Symbols:** The following symbols are used throughout:

...	Figures not available
0	Quantity less than half the unit shown
—	Nil
nes	Not elsewhere specified
BGS	British Geological Survey

**Apparent consumption:** BGS estimates of apparent consumption of metals are based on the formula: production (primary and secondary) plus imports minus exports. All the main traded forms of the metal are taken into account, for example, ores, concentrates, intermediate products, unwrought metal and alloys, oxides, etc. Figures are given in terms of metal content. No information is available for stock changes. Such estimates of apparent consumption are made for metals for which there are no reported consumption statistics: in this edition data are given for chromium, cobalt, manganese, molybdenum, titanium and zirconium.

**Trade:** Trade figures from INTRASTAT, the new system for measuring intra-EC trade became available from 1993. This was introduced following the abolition of Customs controls as a result of the Single Market and trade figures are now compiled from data provided directly from companies instead of Customs documents. Extra-EC trade continues to be collected from Customs declarations as before. The transition from one system to another has produced some anomalous figures in terms of the size of the trade in and unit value of certain commodities. These factors should be taken into consideration when evaluating trends. Figures given in this edition are the combined intra and extra-EC trade data.

Values of commodities are cif for imports and fob for exports.

The terms 'scrap', 'unwrought' and 'wrought' metal include alloys unless these are separately shown.

## Sources of information

In compiling this volume the British Geological Survey has largely relied upon data originally collected by other bodies. A list of the Departments and organisations concerned is given below, together with the titles of principal publications that have been used. In many cases the BGS has also been provided with supplementary or unpublished information. Interested readers are strongly advised to consult the original sources themselves wherever possible and in this connection may wish to refer not only to the publications as listed here, but also earlier issues in the same series, some of which were published under different titles.

Information about the production of minerals in the United Kingdom is given from 1853 to 1881 in a series of Geological Survey Memoirs entitled *Mineral Statistics*, by Robert Hunt, Keeper of Mining Records; earlier information for certain metalliferous minerals is also available. Since 1873 all collieries and metalliferous mines have been required by statute to complete annual returns of production, and since 1895 the same has applied to quarries. These returns were made to the Home Office, which, in 1882, was made responsible for the publication of *Mineral Statistics*. In 1920 responsibility for collection of returns was transferred to the Mines Department (Board of Trade) and statistics were subsequently published in the Annual Reports of the Secretary of Mines. The Mines Department was incorporated into the Ministry of Fuel and Power in 1942 and statistics from 1938 to 1972 were published in their Statistical Digests (subsequently the Digests of Energy Statistics of the Department of Trade and Industry). In 1973 responsibility for the collection of returns relating to most minerals other than fuels was transferred to the Business Statistics Office (formerly part of the Department of Trade and Industry, now Office for National Statistics). The Department of Trade and Industry, and previously the Department of Energy, now collects statistics relating to fuel minerals (coal, natural gas and crude petroleum). Returns of common sand and gravel were collected by the Department of the Environment up to 1974. Details of mineral production in Northern Ireland since 1922 have been obtained by the Northern Ireland Government.

1853–1881 *Mineral Statistics*, by Robert Hunt, Keeper of Mining Records; Memoirs of the Geological Survey  
1882–1896 *Mineral Statistics*; Home Office  
1897–1919 *Mines and Quarries*: General Report with Statistics; Home Office  
1920 *Mines and Quarries*: General Report with Statistics; Mines Department, Board of Trade  
1921–1938 *Annual Report of the Secretary of Mines*; Mines Department, Board of Trade (Great Britain only from 1922)  
1938–1972 *Statistical Digest*; Ministry of Fuel and Power (Great Britain only)  
1973–2003 *Digest of United Kingdom Energy Statistics*; Department of Trade and Industry, formerly published by Department of Energy  
1973–1993 *Minerals (PA1007)*; Central Statistical Office  
1994–2002 *Mineral Extraction in Great Britain (PA 1007)*; Office for National Statistics  
1922–1949 *Annual Report of the Mining and Quarrying industries in Northern Ireland*; Ministry of Commerce (Northern Ireland)  
1950–1981 *Mineral Production in Northern Ireland*; Department of Commerce (Northern Ireland)  
1982–1995 *Mineral Production in Northern Ireland*; Department of Economic Development (Northern Ireland)

1996–1998 *Annual Minerals Statement*;  
Department of Economic Development (Northern Ireland)

1999–2002 *Annual Minerals Statement*;  
Department of Enterprise, Trade and Investment (Northern Ireland)

Department of Trade and Industry  
*Digest of United Kingdom Energy Statistics (annual)*  
*Monthly Statistics of Building Materials and Components*  
*DTI website for energy and construction information*

Office for National Statistics  
*Monthly Digest of Statistics*  
*Mineral Extraction in Great Britain (annual)*  
*United Kingdom National Accounts*

H.M. Customs and Excise  
*Overseas Trade Statistics (monthly, quarterly and annual)*  
*Guide to the Classification for Overseas Trade Statistics*

Crown Estate Commissioners, The Crown Mineral Agent

Department of Enterprise, Trade & Investment (Northern Ireland)  
*Annual Minerals Statement*

Department of Trade and Industry (Isle of Man)

Advisory and Finance Committee (Guernsey)

Valuation Office Agency  
*Property Market Report*

UK Iron and Steel Statistics Bureau  
*Annual Statistics*

World Bureau of Metal Statistics  
*World Metal Statistics (monthly)*

International Fertilizer Industry Association

The Kaolin and Ball Clay Association

Quarry Products Association (QPA)

The Coal Authority

United Nations Conference on Trade and Development

## Minerals in the national economy

The importance of individual industries, including the extractive industries, to the national economy is measured by their contribution of Gross Value Added (GVA). This is a key economic indicator and refers to an increase in ability to produce goods and services. Value Added is defined as the difference between the value of the output (e.g. sales revenue) and the cost of bought in inputs used to produce it (e.g. fuel and other raw materials, but not labour). The GVA of the minerals extractive industries as a whole is included in national accounts under the heading 'Mining and quarrying', which includes the extraction of oil and gas. The GVA for Mining and quarrying was £25 531 million in 2002, or 2.8 per cent of national GVA. The extraction of oil and gas accounted for £22 743 million, the mining of coal £539 million and other mining and quarrying £2 251 million.

The total value, expressed as sales (as opposed to gross valued-added), of minerals produced in the UK on an ex-works basis decreased slightly from £26 264 million in 2001 to £26 095 million in 2002.

<b>UK: Value of mineral production</b>				£ million
	<b>2000</b>	<b>2001</b>	<b>2002</b>	
Oil and natural gas liquids	17 392	14 609	14 523	
Natural gas	6 606	8 140	8 199	
Coal	916	1 028	889	
Aggregates	1 515	1 645	1 648	
Other construction minerals	120	138	227	
Industrial minerals	753	704	609	
Metalliferous minerals	<0.2	<0.2	<0.2	
<b>Total</b>	<b>27 302</b>	<b>26 264</b>	<b>26 095</b>	

Production of oil fell by 1.2 million tonnes to 116.5 million tonnes and is estimated to have fallen to 106 million tonnes in 2003. Cumulative production of oil, including natural gas liquids, from onshore and offshore discoveries was 2 799 million tonnes to the end of December 2002. Total remaining proven, probable and possible reserves at end-December 2002 were 1 345 million tonnes, a decrease of 85 million tonnes on 2001. Natural gas production fell by 2.2 million tonnes to 103.6 million tonnes (oil equivalent). Estimated production in 2003 is 103 million tonnes. Cumulative net production of gas from onshore and offshore discoveries was 1 726 billion m<sup>3</sup> at the end of 2002. Total remaining gas reserves at end-December 2002 were 1 300 billion m<sup>3</sup>, a decrease of 210 billion on the 2001 total.

Coal production fell by 1.9 million tonnes to 30.0 million tonnes in 2002 and the total amount used in electricity generation, including imports, fell to 29.6 million tonnes of oil equivalent, accounting for 35.4 per cent of total electricity generation. This reflected a decline in gas prices, following the high levels of the previous year. Four underground mines were closed in 2002, including the last deep mine in Scotland, and it was announced that the Selby complex would close in 2004. In contrast to 2001, imports in 2002 were slightly lower than production.

### UK: Primary fuel consumption for total energy and use in electricity generation

Million tonnes of oil equivalent

	<b>Total energy</b>		<b>Electricity generation</b>	
	<b>2001</b>	<b>2002</b>	<b>2001</b>	<b>2002</b>
Coal	43.1	39.9	31.6	29.6
Petroleum	76.0	73.4	1.4	1.3
Natural gas	96.8	99.3	26.6	28.1
Nuclear	20.9	20.1	20.7	20.3
Hydroelectricity	0.4	0.5	0.4	0.4
Net electricity imports	0.9	0.7	0.9	0.7
Other fuels	—	—	1.0	1.1
<b>Total</b>	<b>238.0</b>	<b>233.9</b>	<b>84.6</b>	<b>83.6</b>

UK production of primary aggregates decreased in 2002, from a total of 254.4 million tonnes in 2001 to 238.8 million tonnes, the main decline being in the production of crushed rock aggregate, down from 153 to 144 million tonnes in 2002. Sales of china clay and ball clay both declined again in 2003 but remained the UK's most important mineral exports after oil and gas. The UK is a net exporter of potash.

The Aggregates Levy of £1.60/tonne applied to sand and gravel, and crushed rock used for aggregate purposes was introduced on 1<sup>st</sup> April 2002. The government is currently reviewing the tax and has announced that it intends to extend the scope and length of the current relief for aggregates in Northern Ireland. The Quarry Products Association has published its assessment of the impacts of the tax (see p.15).

## British Geological Survey

The BGS is undertaking a range of projects for the Office of the Deputy Prime Minister (ODPM). These include projects that deal with UK and European mineral statistics, analysis of minerals intelligence, provision of information and advice, and public awareness of minerals-related issues.

The British Geological Survey has produced a report entitled *The Economic Importance of Minerals to the UK* (British Geological Survey Commissioned Report, CR/04/070N. 32 pp. Price £10 + p&p) for the Office of the Deputy Prime Minister (Minerals and Waste Planning Division). The report was launched at the CBI Minerals Group conference on 'Living with Minerals' in London on 7<sup>th</sup> June 2004. The report is one of a number of reports, leaflets and mineral profiles prepared under the Joint ODPM-BGS Minerals Programme that, amongst other objectives, seeks to present factual information and authoritative data on the extent, availability, production, trade and use of minerals that are of economic importance to the UK. The report has been written in such a way as to be suitable for a wide non-economic audience and has avoided too much detail and economic theory. Its production contributes to a better understanding of the economic issues associated with the production and use of minerals and their contribution to sustainable economic development.

A series of **Mineral Planning Factsheets** has also been produced by the British Geological Survey for the Office of the Deputy Prime Minister to support the research project *Review of Planning Issues Relevant to some Non-Energy Minerals other than Aggregates in England*. These will form a Technical Appendix to the Final Report of research, which will be published later in the summer. This report will be entitled *Planning issues for industrial minerals* (British Geological Survey Commissioned Report, CR/04/076N). Each factsheet provides an overview of a specific industrial mineral that is extracted in England. They are primarily intended to inform the land-use planning process and are being made available as stand-alone documents for general information. It is intended that they will be updated periodically and that the series be extended to cover other minerals of economic importance to Britain. The Factsheets can be downloaded free at <http://www.bgs.ac.uk/mineralsuk/whatsnew.html>. Factsheets are available on:

Kaolin
Ball clay
Fuller's earth
Gypsum
Salt
Potash
Industrial limestone
Industrial dolomite
Cement raw materials
Silica sand
Fluorspar
Barytes
Calcite
Miscellaneous minerals

The Minerals Programme, funded by the Department of Trade and Industry, continued to provide an information and advice service to government and industry on minerals-related matters. The Minerals Programme website [www.mineralsuk.com](http://www.mineralsuk.com), dedicated to minerals issues, in Britain and overseas, continued to operate with support from the DTI and ODPM. The publication 'World Mineral Statistics 1998-2002' providing figures on global production and trade in minerals was also produced with funding from the DTI Minerals Programme. However, with effect from April 2004, DTI has ceased to fund minerals-related activities in the BGS. As a result, the Survey will continue to publish statistics on world mineral production, but not on world trade.

In 2003 the British Geological Survey's Geochemical Baseline Survey of the Environment (G-BASE) project continued the regional geochemical mapping programme in Suffolk. This project uses stream sediments, waters and soils collected at an average sampling density of one sample every one to two square kilometres. Soils and sediments are analysed by XRF for up to 36 elements. Waters are analysed by ICP-AES and other methods for 27 elements and selected ions. Sampling takes place in the summer months using earth and environment science students to collect the samples providing valuable field experience for under graduates. The results are available in the form of regional atlases of which 14 have been published to date; the processed data can also be purchased.

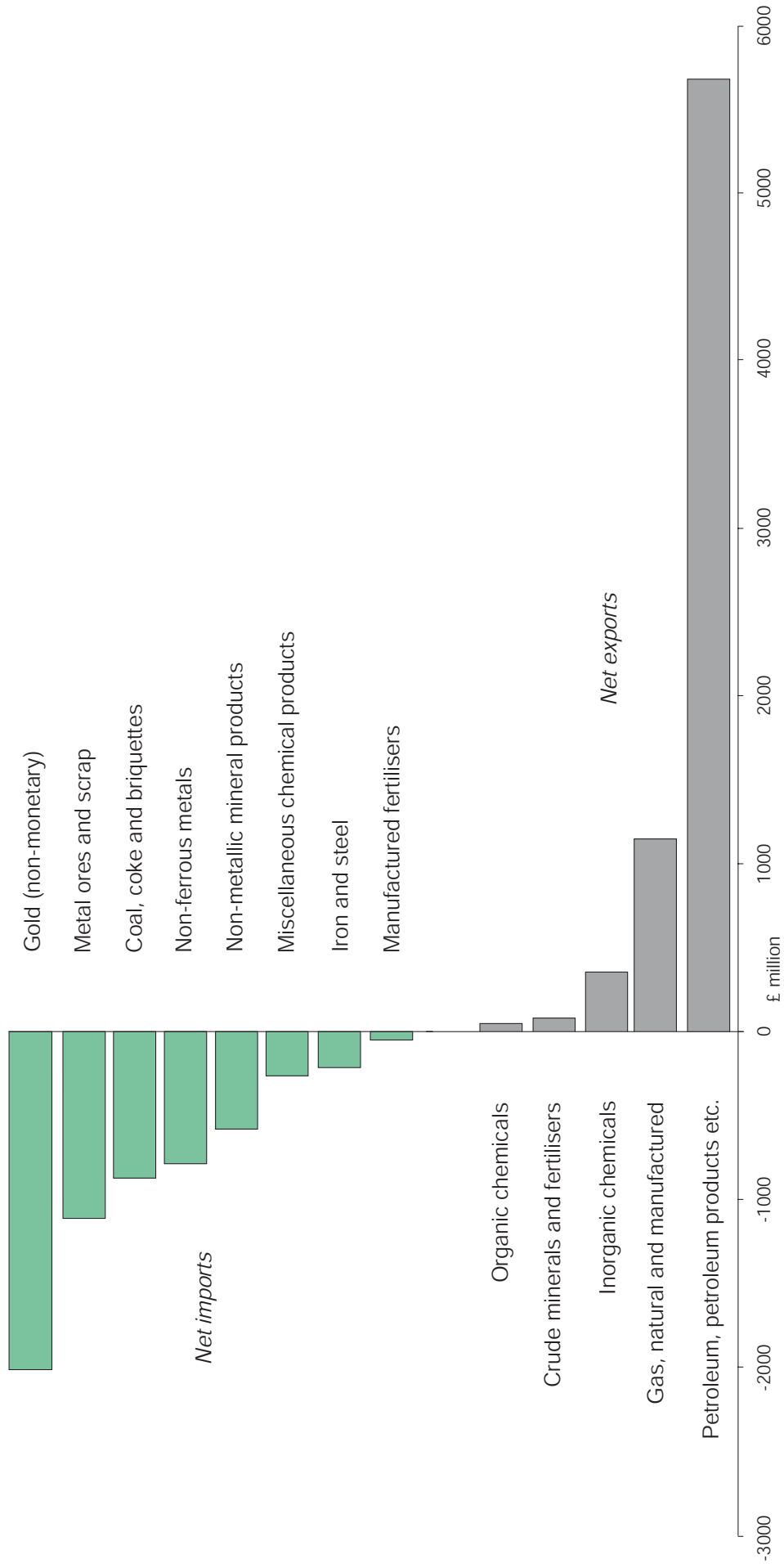


## Trade in minerals and mineral-based products compared with total trade 1996–2002

		£ million						
SITC section		1996	1997	1998	1999	2000	2001	2002
<b>Imports (c i f)</b>								
0, 1	Food, beverages, tobacco	17 473.3	16 916.0	16 983.5	17 210.3	16 936.7	18 138.7	19 046.8
2, 4	Basic materials	6 981.7	6 812.5	6 208.1	5 967.4	6 899.6	7 037.4	6 513.9
	of which: Minerals	1 981.6	1 988.7	1 903.4	1 805.1	2 378.7	2 595.1	1 995.7
3	Fuels and related materials	7 019.6	6 521.5	4 711.8	5 273.3	9 700.4	10 202.4	9 590.4
	of which: Mineral-based	6 628.5	6 115.3	4 337.5	4 877.8	9 327.8	10 023.2	9 390.3
	Manufactured goods:							
5, 6	Semi-manufactures	47 550.6	46 609.1	46 627.2	47 264.5	51 733.3	54 950.5	54 973.4
	of which: Mineral-based	20 701.8	20 157.2	19 575.6	19 812.3	22 366.8	22 683.5	21 367.1
7, 8	Finished manufactures	103 243.5	109 760.7	114 551.2	120 877.8	135 711.7	136 538.3	136 303.1
9	Other (a)	3 896.0	3 013.1	5 203.7	3 717.9	3 936.6	3 912.1	5 352.3
	of which: Mineral-based	2 358.2	1 468.3	3 533.1	2 068.2	2 248.4	2 791.1	4 060.6
	<b>Total</b>	<b>186 164.7</b>	<b>189 632.8</b>	<b>194 285.5</b>	<b>200 311.2</b>	<b>224 918.3</b>	<b>230 779.4</b>	<b>231 779.9</b>
	All traded goods							
	of which: Mineral-based	31 670.1	29 729.4	29 349.5	28 563.3	36 321.7	38 093.0	36 813.6
	As % of all traded goods	17.0	15.7	15.1	14.3	16.2	16.5	15.9
<b>Exports (f o b)</b>								
0, 1	Food, beverages, tobacco	11 355.8	11 124.7	10 277.9	10 023.7	9 916.5	9 695.0	10 035.8
2, 4	Basic materials	2 806.3	2 780.1	2 527.4	2 301.3	2 586.9	2 582.5	2 862.9
	of which: Minerals	1 163.5	1 143.5	1 042.6	964.4	1 207.2	1 267.2	1 374.6
3	Fuels and related materials	11 063.6	10 419.8	6 957.8	9 343.7	15 996.6	15 554.8	15 143.2
	of which: Mineral-based	11 062.7	10 418.9	6 954.0	9 335.3	15 991.5	15 552.1	15 042.4
	Manufactured goods:							
5, 6	Semi-manufactures	45 594.8	44 787.1	43 570.3	43 658.4	47 781.0	50 514.3	50 413.0
	of which: Mineral-based	19 720.5	18 988.2	17 515.9	17 932.7	20 700.9	21 247.6	20 011.6
7, 8	Finished manufactures	95 034.4	101 341.9	99 693.0	100 047.7	109 906.4	110 573.0	107 840.1
9	Other (a)	2 467.3	2 478.6	2 762.2	2 681.3	2 901.6	2 251.0	1 449.2
	of which: Mineral-based	646.4	638.4	949.9	1 252.5	1 301.5	1 301.9	479.2
	<b>Total</b>	<b>168 322.3</b>	<b>172 932.2</b>	<b>165 788.7</b>	<b>168 056.1</b>	<b>189 089.0</b>	<b>191 170.6</b>	<b>187 744.2</b>
	All traded goods							
	of which: Mineral-based	32 593.1	31 189.0	26 462.3	29 484.9	39 201.2	39 368.9	36 907.8
	As % of all traded goods	19.4	18.0	16.0	17.5	20.7	20.6	19.7

(a) Including non-monetary gold.

United Kingdom balance of trade in minerals and mineral-based products (2000–2002 average)



**Balance of trade in minerals and mineral-based products 1998–2002**

£ million (a)

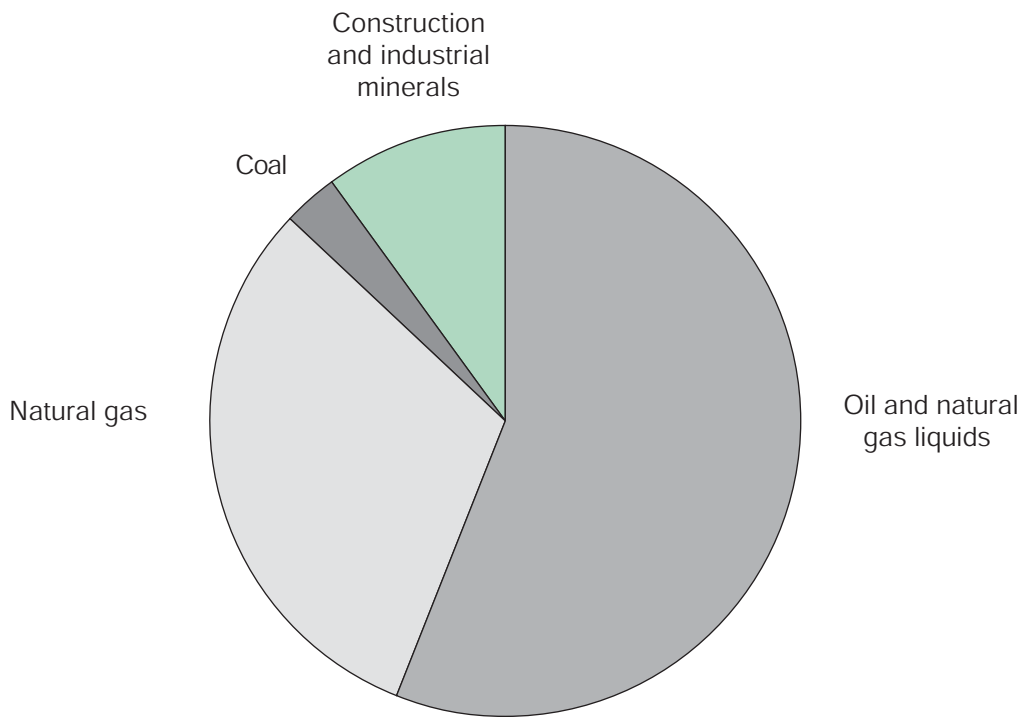
SITC (R3) divisions	1998	1999	2000	2001	2002
27 Crude minerals and fertilisers:					
imports	413.4	329.4	384.2	361.9	366.1
exports	484.4	452.6	462.1	450.8	442.9
	+71.0	+123.2	+77.9	+88.9	+76.8
28 Metal ores and scrap:					
imports	1 490.0	1 475.6	1 994.5	2 233.2	1 629.6
exports	558.2	511.8	745.1	816.5	931.7
	-931.8	-963.8	-1 249.4	-1 416.7	-697.9
32 Coal, coke and briquettes:					
imports	713.6	624.5	722.3	1 222.3	898.7
exports	75.1	66.4	75.8	65.0	65.2
	-638.5	-558.1	-646.5	-1 157.3	-833.5
33 Petroleum, petroleum products and related materials:					
imports	3 528.7	4 163.0	8 335.7	8 496.6	8 134.4
exports	6 462.7	8 537.1	14 543.8	13 991.1	13 471.1
	+2 934.0	+4 374.1	+6 208.1	+5 494.5	+5 336.7
34 Gas, natural and manufactured:					
imports	95.2	90.3	269.9	304.3	357.1
exports	416.1	731.9	1 371.9	1 495.9	1 506.1
	+320.9	+641.6	+1 102.0	+1 191.6	+1 149.0
51 Organic chemicals:					
imports	4 647.5	4 907.9	5 435.9	5 655.8	5 828.2
exports	4 862.0	5 378.5	5 552.2	5 962.5	5 551.6
	+214.5	+470.6	+116.3	+306.7	-276.6
52 Inorganic chemicals:					
imports	1 018.1	1 065.8	1 068.2	1 235.6	1 079.2
exports	1 141.9	1 142.2	1 491.1	1 637.9	1 352.3
	+123.8	+76.4	+422.9	+402.3	+273.1
56 Manufactured fertilisers:					
imports	132.3	141.4	131.4	138.7	129.5
exports	107.6	85.4	93.5	85.0	81.0
	-24.7	-56.0	-37.9	-53.7	-48.5
53–59 (part) Miscellaneous chemical products:					
imports	2 776.8	2 651.1	2 949.4	2 896.3	2 753.5
exports	2 493.4	2 471.3	2 548.0	2 615.7	2 647.6
	-283.4	-179.8	-401.4	-280.6	-105.9
66 Non-metallic mineral products:					
imports	4 529.4	5 853.5	6 554.2	6 408.5	5 687.2
exports	3 875.0	4 669.2	5 539.4	5 703.3	5 668.5
	-654.4	-1 184.3	-1 014.8	-705.2	-18.7
67 Iron and steel:					
imports	2 472.0	1 977.9	2 233.5	2 280.5	2 411.3
exports	2 476.8	1 930.3	2 191.0	2 065.0	2 027.0
	+4.8	-47.6	-42.5	-215.5	-384.3
68 Non-ferrous metals:					
imports	3 836.7	3 079.0	3 864.3	3 931.4	3 368.1
exports	2 443.3	2 153.8	3 178.8	3 053.5	2 572.8
	-1 393.4	-925.2	-685.5	-877.9	-795.3
69 Manufactures of metal:					
imports (b)	162.8	135.6	129.9	136.7	110.1
exports (b)	116.0	102.1	107.0	124.9	110.8
	-46.8	-33.5	-22.9	-11.8	+0.7
96 Coin other than gold:					
imports	2.1	3.0	1.1	1.7	3.8
exports	6.5	9.3	16.7	14.4	16.2
	+4.4	+6.3	+15.6	+12.7	+12.4
97 Gold (non-monetary):					
imports	3 531.0	2 065.2	2 247.3	2 789.4	4 056.8
exports	943.4	1 243.1	1 284.8	1 287.6	463.0
	-2 587.6	-822.1	-962.5	-1 501.8	-3 593.8
<b>Total</b>					
<b>imports</b>	<b>29 349.5</b>	<b>28 563.3</b>	<b>36 321.7</b>	<b>38 093.0</b>	<b>36 813.6</b>
<b>exports</b>	<b>26 462.3</b>	<b>29 484.9</b>	<b>39 201.2</b>	<b>39 368.9</b>	<b>36 907.8</b>
	<b>-2 887.2</b>	<b>+921.6</b>	<b>+2 879.5</b>	<b>+1 275.9</b>	<b>+94.2</b>
Gold (monetary):					
imports	3 195.6	1 804.8	2 448.0	688.5	996.0
exports	2 699.5	1 989.8	1 264.9	1 164.8	528.2
	-496.1	+185.0	-1 183.1	+476.3	-467.8
<b>Grand total</b>					
<b>imports</b>	<b>32 545.1</b>	<b>30 368.1</b>	<b>38 769.7</b>	<b>38 781.5</b>	<b>37 809.6</b>
<b>exports</b>	<b>29 161.8</b>	<b>31 474.8</b>	<b>40 466.1</b>	<b>40 533.6</b>	<b>37 436.0</b>
	<b>-3 383.3</b>	<b>+1 106.7</b>	<b>+1 696.4</b>	<b>+1 752.1</b>	<b>-373.6</b>

(a) Imports are valued c i f and exports are valued f o b.

(b) Consists of semi-manufactures and articles of beryllium, cobalt, cadmium, magnesium, molybdenum, tantalum, titanium, tungsten, zirconium and other base metals not elsewhere included.

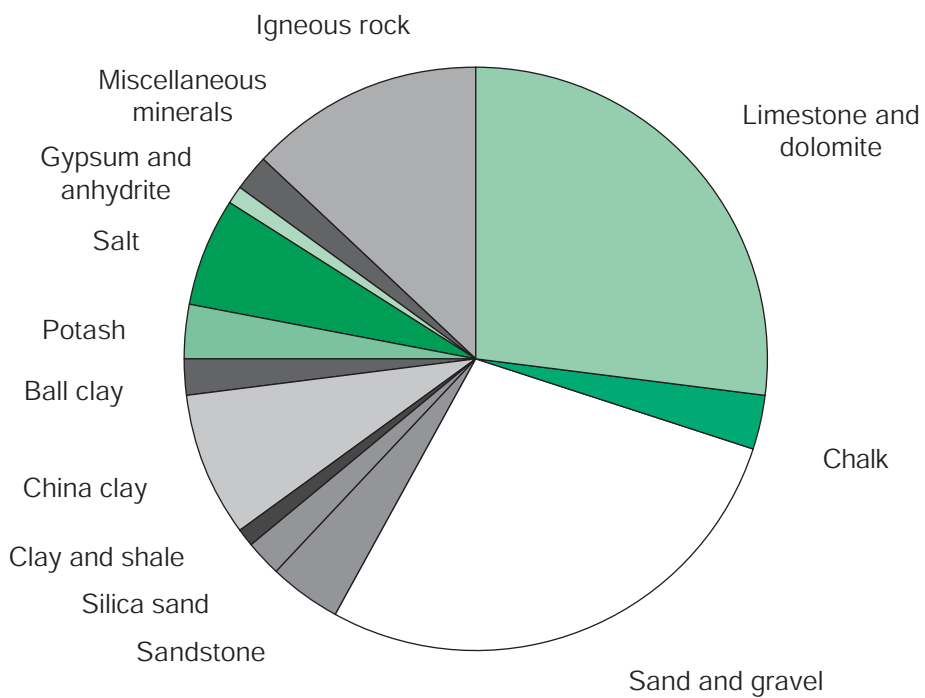
**Value of United Kingdom minerals production 2002**

**(total value £26 095 million)**



**Value of United Kingdom construction and industrial minerals production 2002**

**(total value £2 484 million)**



## Approximate value (a) of minerals produced in the United Kingdom 1995–2002

	£ million							
Mineral	1995(b)	1996	1997	1998	1999	2000	2001	2002
Coal	1 862	1 768	1 636	1 242	1 076	916	1 028	889
Natural gas	4 587	5 295	5 254	5 313	5 031	6 606	8 140	8 199
Natural gas liquids	739	748	700	551	727	1 117	963	894
Crude petroleum	9 875	11 849	10 327	7 487	10 257	16 275	13 646	13 629
Iron ore	0	0	0	0	0	0	0	0
Tin	7	8	8	1	—	—	—	—
Other non-ferrous metals	0	1	0	0	0	0	0	0
Sand and gravel	491	473	533	549	597	619	677	707
Limestone and dolomite	618	577	627	703	670	662	702	670
Igneous rock	244	247	253	276	312	320	328	336
Sandstone	94	90	94	115	95	98	119	108
Chalk	45	47	53	59	56	46	69	72
Common clay and shale	24	19	18	20	22	19	19	19
China clay	230	243	280	237	242	234	187	192
Ball clay	43	43	44	45	45	50	47	44
Fuller's earth	12	14	12	9	7	7	5	5
Salt	188	185	232	174	146	153	152	148
Silica sand	58	57	58	62	54	51	54	53
Potash	84	93	86	91	74	76	67	68
Fluorspar	6	8	8	7	5	4	5	5
Gypsum and anhydrite	20	22	16	14	13	13	15	17
Miscellaneous minerals	29	32	33	32	35	36	41	40
<b>Total</b>	<b>19 256</b>	<b>21 819</b>	<b>20 272</b>	<b>16 987</b>	<b>19 464</b>	<b>27 302</b>	<b>26 264</b>	<b>26 095</b>
<b>At 2000 constant prices</b>								
Coal	2 111	1 939	1 744	1 288	1 091	916	1 005	842
Oil and gas	17 235	19 618	17 357	13 850	16 242	23 998	22 238	21 517
Metals	8	10	9	1	0	0	0	0
Construction and industrial minerals	2 478	2 357	2 502	2 482	2 407	2 388	2 431	2 352
<b>Total</b>	<b>21 832</b>	<b>23 924</b>	<b>21 612</b>	<b>17 621</b>	<b>19 740</b>	<b>27 302</b>	<b>25 674</b>	<b>24 711</b>

(a) Calculated on an ex-works sales basis.

Source: British Geological Survey.

(b) The values of production presented in this table are estimates made by the BGS using a variety of data sources. Since 1995 selected data from the Prodcum inquiry (an EU statistical inquiry on the volume and value of products for sale) have been used for construction and industrial minerals. This has resulted for certain minerals, particularly salt, in an apparent increase in the value of production that reflects primarily the source of the information rather than a real increase in the value of production.

## Approximate value of minerals produced in each part of the United Kingdom 1995–2002

	£ million							
	1995	1996	1997	1998	1999	2000	2001	2002
England	3 603	3 586	3 517	3 046	2 876	2 893	2 984	2 847
Wales	287	278	264	255	256	243	239	222
Scotland	449	442	502	492	492	473	533	469
Northern Ireland	56	64	56	59	60	64	75	75
Offshore	14 861	17 449	15 933	13 135	15 780	23 629	22 433	22 482
<b>Total</b>	<b>19 256</b>	<b>21 819</b>	<b>20 272</b>	<b>16 987</b>	<b>19 464</b>	<b>27 302</b>	<b>26 264</b>	<b>26 095</b>

Source: British Geological Survey.

## United Kingdom mining and quarrying: Gross value added (a) 1995–2002

£ million

	1995	1996	1997	1998	1999	2000	2001	2002
<b>Production</b>								
Mining and quarrying								
Mining and quarrying of energy producing materials								
Mining of coal	1 223	1 045	988	817	643	611	564	539
Extraction of mineral oil and natural gas	13 703	17 125	15 435	13 204	15 044	22 833	21 608	22 743
Other mining and quarrying	1 442	1 599	1 695	1 645	1 717	1 795	1 855	2 251
Total mining and quarrying	16 369	19 768	18 118	15 666	17 403	25 240	24 027	25 531
<b>All industries</b>	<b>639 908</b>	<b>680 206</b>	<b>720 371</b>	<b>762 359</b>	<b>797 814</b>	<b>839 194</b>	<b>880 904</b>	<b>925 584</b>
of which: minerals related (%)	2.6	2.9	2.5	2.1	2.2	3.0	2.7	2.8

(a) At current basic prices.

Source: Office for National Statistics.

## United Kingdom employment in the minerals industry, 2002

Number

Mineral	Great Britain (a)			Total	Northern Ireland
	Mines		Quarries		
	Underground	Surface			
Ball clay	—	—	304	304	—
Calcspars	—	—	10	10	—
Chalk	—	—	483	483	(c) ...
Chert and flint	—	—	1	1	—
China clay	—	—	437	437	—
Clay and shale	—	—	1 162	1 162	(c) ...
Coal (b)	(e) 7 695	...	2 954	10 649	—
Dolomite	—	—	798	798	—
Fireclay	—	2	40	42	(c) ...
Fuller's earth	—	—	3	3	—
Gypsum and anhydrite	123	18	4	145	—
Honestone	3	1	—	4	—
Igneous rock	—	—	3 242	3 242	353
Limestone	49	27	5 179	5 255	212
Oil and gas	—	—	—	(d)	—
Ore minerals	29	12	14	55	—
Peat	—	—	232	232	—
Potash	538	215	—	753	—
Salt	34	22	3	59	(c) ...
Sand and gravel	—	—	8 108	8 108	366
Sandstone	—	—	1 730	1 730	336
Silica sand	5	5	578	588	—
Silica stone	—	—	3	3	—
Slate	7	23	394	424	—
Soapstone and talc	—	—	2	2	—
Others	—	—	—	—	113
<b>Total</b>	<b>8 160</b>	<b>648</b>	<b>25 681</b>	<b>34 489</b>	<b>1 380</b>

(a) Where more than one mineral is extracted at a mine or quarry all employment is attributed to the chief mineral. Excludes office staff.

(b) At March 2003.

(c) Included with 'Others'.

(d) Estimated workforce employed offshore, including personnel on offshore installations, mobile drilling rigs, service vessels, support barges and survey teams, 18 900 as at February 2003.

(e) Including surface workers at mines.

Sources: Office for National Statistics, Department of Enterprise Trade and Investment (Northern Ireland).

# United Kingdom production of minerals 1997–2003

Thousand tonnes

Mineral	1997	1998	1999	2000	2001	2002	2003 (Estimated)
<b>Coal:</b>							
Deep-mined	30 281	25 731	20 888	17 187	17 347	16 391	<b>15 635</b>
Opencast	16 700	14 315	15 275	13 412	14 166	13 148	<b>12 126</b>
Other (a)	1 514	1 131	914	598	417	450	<b>473</b>
<b>Natural gas and oil:</b>							
<b>Methane (oil equivalent)</b>							
Colliery	45	41	41	42	33	34	...
Onshore	360	315	297	639	518	435	<b>102 792</b>
Offshore	85 444	89 790	98 727	107 669	105 242	103 107	
<b>Crude oil</b>							
Onshore	4 949	5 161	4 269	3 234	2 944	2 652	<b>97 849</b>
Offshore	115 395	119 049	124 886	114 830	106 547	105 369	
<b>Condensates and other (c)</b>							
Onshore	224	239	200	146	139	115	<b>8 239</b>
Offshore	7 338	7 824	8 315	8 217	8 153	8 399	
Iron ore	1.2	1.2	(i) 1.0	1.0	0.5	0.5	<b>0.5</b>
<b>Non-ferrous ores (metal content):</b>							
Tin	2.4	0.4	—	—	—	—	—
Lead	(i) 1.6	(i) 1.6	1.0	(i) 1.0	(i) 0.8	(i) 0.7	<b>0.7</b>
Zinc (d)	—	—	—	—	—	—	—
Gold (kg)	...	...	...	...	...	...	...
<b>Chalk (e)</b>	9 550	9 934	9 667	9 213	8 205	8 587	<b>8 500</b>
<b>Common clay and shale (e)</b>	11 322	12 230	11 355	10 838	10 426	10 306	<b>10 400</b>
<b>Igneous rock (k) (l)</b>	48 656	45 945	53 155	54 113	51 501	51 225	<b>50 400</b>
<b>Limestone (excluding dolomite)</b>	87 752	89 274	86 933	84 348	88 238	80 688	<b>92 000</b>
<b>Dolomite (excluding limestone)</b>	17 282	15 632	13 698	13 069	14 314	12 946	
<b>Sand and gravel:</b>							
<b>Land</b>	79 500	78 316	80 302	79 950	80 793	75 401	<b>91 000</b>
<b>Marine (j)</b>	18 883	19 999	20 651	21 671	20 604	19 023	
<b>Sandstone</b>	18 499	20 129	15 485	14 900	19 967	18 362	<b>18 100</b>
<b>Slate (h)</b>	347	425	361	479	551	742	<b>900</b>
<b>Ball clay (sales)</b>	916	964	931	1 069	999	921	<b>885</b>
<b>Barytes</b>	(i) 74	64	59	54	(i) 66	(i) 59	<b>57</b>
<b>Calcspars</b>	13	15	...	...	12	(i) 10	...
<b>Chert and flint</b>	(f) ...	...	6	...	2	2	...
<b>China clay (sales) (n)</b>	2 360	2 392	2 304	2 376	2 204	2 163	<b>2 097</b>
<b>China stone</b>	8	3	2	4	3	2	<b>2</b>
<b>Fireclay (e)</b>	338	577	545	595	459	491	<b>450</b>
<b>Fluorspar (i)</b>	64	65	40	36	50	53	<b>56</b>
<b>Fuller's earth (sales) (g) (n)</b>	135	94	75	66	52	44	<b>34</b>
<b>Gypsum (natural) (i)</b>	2 000	2 000	1 800	1 500	1 700	1 700	<b>1 700</b>
<b>Lignite</b>	...	...	...	...	...	...	...
<b>Peat (000 m<sup>3</sup>)</b>	1 619	1 076	1 653	1 626	1 814	973	<b>900</b>
<b>Potash (b)</b>	941	1 014	825	966	882	900	<b>1 040</b>
<b>Rock salt (i)</b>	1 800	700	1 500	1 700	1 900	1 500	<b>1 700</b>
<b>Salt from brine (i)</b>	1 300	1 200	1 200	1 100	1 100	1 000	<b>1 000</b>
<b>Salt in brine (m)</b>	3 561	(i) 3 500	(i) 3 000	(i) 3 000	(i) 3 000	(i) 3 200	<b>3 200</b>
<b>Silica sand</b>	4 704	4 662	4 092	4 095	3 848	3 833	<b>4 000</b>
<b>Talc</b>	6	5	6	5	5	6	<b>6</b>

(a) Slurry etc. recovered from dumps, ponds, rivers etc.

(b) Marketable product (KCl).

(c) Including ethane, propane and butane, in addition to condensates.

(d) Content of mixed concentrate.

(e) Excluding a small production in Northern Ireland.

(f) Great Britain only.

(g) BGS estimates based on data from producing companies.

(h) Slate figures include waste used for constructional fill and powder and granules used in industry.

(i) BGS estimate.

(j) Including marine-dredged landings at foreign ports (exports); see p.92.

(k) Excluding a small production of granite in Northern Ireland.

(l) In addition, the following amounts of igneous rock were produced in Guernsey (thousand tonnes): 1997: 115; 1998: 119; 1999: 139; 2000: 130; 2001: 134; 2002: 138, and Jersey: 1997: 370; 1998: 390; 1999: 370; 2000: 310; 2001: 365; 2002: 370.

(m) Used for purposes other than salt making.

(n) Dry weight.

Sources: Office for National Statistics, Department of Trade and Industry, Dept. of Enterprise, Trade & Investment (Northern Ireland), Crown Estate Commissioners (marine sand and gravel produced for export), Advisory and Finance Committee (Guernsey), and company data.

## England production of minerals 1996–2002

Thousand tonnes

Mineral	1996	1997	1998	1999	2000	2001	2002
Coal:							
Deep-mined (e)	30 000	27 300	23 100	19 200	15 800	15 900	15 600
Opencast (e)	8 500	8 400	6 700	6 300	4 800	4 800	5 000
Other (a)	...	...	...	...	...	...	...
Natural gas and oil:							
Methane (oil equivalent)							
Colliery	...	...	...	...	...	...	...
Onshore	...	...	...	...	...	...	...
Offshore	...	...	...	...	...	...	...
Crude oil							
Onshore	...	...	...	...	...	...	...
Offshore	...	...	...	...	...	...	...
Condensates and other (c)	...	...	...	...	...	...	...
Iron ore	1.2	1.2	1.2	(e) 1.0	1.0	0.5	0.5
Non-ferrous ores (metal content):							
Tin	2.1	2.4	0.4	—	—	—	—
Lead	(e) 1.8	(e) 1.6	(e) 1.6	1.0	(e) 1.0	(e) 0.8	(e) 0.7
Zinc (m)	...	—	—	—	—	—	—
Chalk	9 239	9 550	9 934	9 667	9 213	8 205	8 587
Common clay and shale (b)	10 828	10 514	11 351	10 352	9 577	9 221	9 226
Igneous rock	21 526	20 335	17 228	20 803	20 435	22 647	21 889
Limestone (j)	75 633	79 342	79 780	75 820	74 954	79 902	73 528
Dolomite (k)	...	14 280	13 723	11 485	11 120	...	...
Sand and gravel:							
Land	59 067	63 010	61 241	62 954	63 196	62 177	59 633
Marine (g)	16 611	17 285	18 741	19 412	20 391	19 388	17 878
Sandstone	7 627	7 646	7 792	7 241	7 401	7 201	7 006
Slate (i)	...	...	...	...	...	...	...
Anhydrite	...	...	...	...	...	...	...
Ball clay (sales)	880	916	964	931	1 069	999	921
Barytes	...	...	...	...	...	...	...
Calcspars	...	13	15	...	...	12	(e) 10
Chert and flint	...	...	...	6	...	2	2
China clay (sales) (l)	2 281	2 360	2 392	2 304	2 376	2 204	2 163
China stone	8	8	3	2	4	3	2
Fireclay	471	...	575	545	547	419	449
Fluorspar (e)	65	64	65	40	36	50	53
Fuller's earth (sales) (h) (l)	143	135	94	75	66	52	44
Gypsum (natural) (e)	2 000	2 000	2 000	1 800	1 500	1 700	1 700
Lignite	...	...	...	...	...	...	...
Peat (000 m <sup>3</sup> )	1 315	1 229	936	1 224	1 259	1 460	857
Potash (d)	1 030	941	1 014	825	966	882	900
Potter's clay	...	...	...	...	...	...	...
Rock salt	...	...	...	...	...	...	...
Salt from brine (e)	1 300	1 300	1 300	1 200	1 100	1 100	1 000
Salt in brine (f)	3 512	3 561	(e) 3 500	(e) 3 000	(e) 3 000	(e) 3 000	(e) 3 200
Silica sand	4 270	4 103	4 064	3 504	3 599	3 343	3 349
Silica stone and ganister	...	...	...	...	...	...	...

(a) Slurry etc. recovered from dumps, ponds, rivers etc.

(b) Including potter's clay.

(c) Including ethane, propane and butane, in addition to condensates.

(d) Marketable product (KCl).

(e) BGS estimate.

(f) Used for purposes other than salt making.

(g) Including marine-dredged landings at foreign ports (exports); see p.92.

(h) BGS estimates based on data from producing companies.

(i) Slate figures include waste used for constructional fill and powder and granules used in industry.

(j) Including dolomite for constructional uses.

(k) Dolomite and magnesian limestone used for constructional and agricultural purposes as well as for refractory, chemical and other purposes specifically dependent on the high magnesium content.

(l) Dry weight.

(m) Content of mixed concentrate.

Sources: Office for National Statistics, Department of Trade and Industry, Crown Estate Commissioners (marine sand and gravel produced for export) and company data.



## Wales production of minerals 1996–2002

Thousand tonnes

Mineral	1996	1997	1998	1999	2000	2001	2002
Coal:							
Deep-mined (e)	1 000	900	800	600	700	700	800
Opencast (e)	2 300	1 800	1 400	1 500	1 500	1 200	1 000
Other (a)	...	...	...	...	...	...	...
Natural gas and oil:							
Methane (oil equivalent)							
Colliery	...	...	...	...	...	...	...
Onshore	—	—	—	—	—	—	—
Offshore	...	...	...	...	...	...	...
Crude oil							
Onshore	—	—	—	—	—	—	—
Offshore	...	...	...	...	...	...	...
Condensates and other (b)	...	...	...	...	...	...	...
Non-ferrous ores (metal content):							
Gold	...	...	...	—	—	—	—
Common clay and shale	389	280	259	346	351	365	382
Igneous rock	2 272	2 172	2 110	2 730	2 743	2 372	2 111
Limestone (d)	18 863	17 752	17 136	17 220	15 543	14 238	12 850
Dolomite (f)	...	...	...	...	...	...	...
Sand and gravel:							
Land	1 519	1 452	1 701	1 800	1 658	1 670	1 613
Marine	1 593	1 598	1 258	1 240	1 280	1 216	1 145
Sandstone	2 781	3 098	3 214	2 973	2 941	3 094	3 136
Slate (c)	...	...	...	...	...	...	...
Fireclay	—	76	—	—	—	—	—
Silica sand	27	24	...	...	...	...	...

## Scotland production of minerals 1996–2002

Thousand tonnes

Mineral	1996	1997	1998	1999	2000	2001	2002
Coal:							
Deep-mined (e)	1 300	2 100	1 800	1 100	700	700	—
Opencast (e)	5 500	6 500	6 200	7 500	7 100	8 200	7 100
Other (a)	...	...	...	...	...	...	...
Natural gas and oil:							
Methane (oil equivalent)							
Colliery	...	...	...	...	...	...	...
Onshore	...	...	...	...	...	...	—
Offshore	...	...	...	...	...	...	...
Crude oil							
Onshore	—	—	—	—	—	—	—
Offshore	...	...	...	...	...	...	...
Condensates and other (b)	...	...	...	...	...	...	...
Common clay and shale	588	528	620	657	910	839	698
Igneous rock	19 933	19 863	20 500	21 761	21 455	20 034	20 543
Limestone (d)	1 607	1 624	1 535	1 507	1 722	1 733	1 635
Dolomite (f)	...	...	...	...	...	...	...
Sand and gravel (land-won)	9 904	9 900	10 074	10 031	10 022	10 753	8 643
Sandstone	2 172	1 712	2 539	1 657	1 715	1 603	1 645
Slate (c)	...	...	...	...	...	...	...
Barytes	...	...	...	...	...	...	...
Fireclay	65	...	2	—	48	40	42
Honestone	...	...	...	...	...	—	...
Peat (000 m <sup>3</sup> )	570	390	139	429	367	355	117
Silica sand	564	576	...	...	...	...	...
Talc	5	6	5	6	5	5	6

(a) Slurry etc. recovered from dumps, ponds, rivers etc.

(b) Including ethane, propane and butane, in addition to condensates.

(c) Slate figures include waste used for constructional fill and powder and granules used in industry.

(d) Including dolomite for constructional uses.

(e) BGS estimate.

(f) Dolomite and magnesian limestone used for constructional and agricultural purposes as well as for refractory, chemical and other purposes specifically dependent on the high magnesium content.

Sources: Office for National Statistics, Department of Trade and Industry and company data.

## Northern Ireland mineral production by county 2002

Thousand tonnes

County	Limestone	Sand & Gravel	Basalt & Igneous rock (a)	Sandstone	Others (b)	Total
Down	—	142	—	5 598	135	5 875
Antrim	198	1 369	3 745	—	3	5 315
Armagh	307	178	652	970	16	2 122
Fermanagh	3 263	143	10	—	9	3 425
Londonderry	58	1 362	1 793	—	19	3 232
Tyrone	687	2 318	481	6	60	3 553
<b>Total</b>	<b>4 514</b>	<b>5 512</b>	<b>6 681</b>	<b>6 574</b>	<b>242</b>	<b>23 523</b>

(a) Excluding granite.

Source: Department of Enterprise, Trade and Investment.

(b) Including rock salt, chalk, fireclay, granite, clay and shale, and bauxite.

## Minerals produced in Northern Ireland, the Isle of Man, Guernsey and Jersey 1998–2002

Thousand tonnes

	1998 (c)	1999 (d)	2000 (d)	2001 (d)	2002 (d)
<b>Northern Ireland</b>					
Limestone	3 892	4 219	3 538	4 746	4 514
Sand and gravel	5 300	5 517	5 073	6 194	5 512
Basalt and igneous rock (a)	6 107	7 861	9 480	6 448	6 681
Sandstone	6 584	3 615	2 844	8 070	6 574
Others (b)	473	1 579	3 098	753	242
<b>Total</b>	<b>22 356</b>	<b>22 791</b>	<b>24 033</b>	<b>26 211</b>	<b>23 523</b>
<b>Isle of Man</b>					
Limestone	100	119	136	131	127
Sand and gravel	251	280	258	365	326
Igneous rock	74	93	85	115	197
Slate	17	49	56	52	46
<b>Total</b>	<b>442</b>	<b>541</b>	<b>535</b>	<b>664</b>	<b>696</b>
<b>Guernsey</b>					
Igneous rock	119	139	130	134	138
<b>Jersey</b>					
Igneous rock (e)	390	370	310	365	370
Sand and gravel	80	74	63	89	73

(a) Excluding granite.

(e) BGS estimates.

(b) Including rock salt, chalk, fireclay, granite, clay and shale, and bauxite.

Sources: Dept. of Enterprise, Trade & Investment (Northern Ireland), Department of Trade and Industry (Isle of Man), Advisory and Finance Committee (Guernsey).

(c) Year ended 30 November for Isle of Man.

(d) Year ended 12 November for Isle of Man.

## Area of land permitted for mineral working in England in 1994 and 2000

Hectares

Mineral type	Surface working		Underground mining		Areas of pithead	
	Area in 1994	Area in 2000	Area in 1994	Area in 2000	Area in 1994	Area in 2000
Ball clay (a)	—	1 066	—	—	—	—
Chalk	2 926	2 339	—	—	—	—
China clay	2 201	4 262	—	—	—	—
Clay/shale	9 107	8 430	1 339	466	7	3
Coal (opencast)	7 568	3 390	—	—	—	—
Coal (under GPDO)	—	—	184 643	163 675	1 445	775
Coal (specific planning permission)	—	—	49 545	50 400	360	362
Gypsum/anhydrite	718	368	38 215	14 894	117	125
Igneous rock	1 973	2 676	—	—	—	—
Ironstone	13 029	16 087	1 911	8 465	74	103
Limestone/dolomite	11 401	11 418	748	798	5	5
Oil/gas/coalbed methane (b)	185	166	—	—	—	—
Peat	5 661	5 263	—	—	—	—
Salt (incl. brine pump)	—	—	2 300	2 769	20	11
Sand & gravel (construction)	29 828	27 007	—	—	—	—
Sand (industrial/silica)	1 945	1 847	—	—	—	—
Sandstone	3 305	4 183	—	—	—	—
Slate	511	470	—	(c) 1	—	(c) 0
Vein minerals	2 614	23 827	376 360	29 781	30	47
Other minerals	1 053	845	5 565	13 938	34	32
<b>Totals (d)</b>	<b>94 025</b>	<b>113 644</b>	<b>660 626</b>	<b>285 187</b>	<b>2 092</b>	<b>1 463</b>
<b>Estimated Totals (e)</b>	<b>118 296</b>	<b>113 644</b>	<b>660 626</b>	<b>285 187</b>	<b>2 092</b>	<b>1 463</b>

(a) Ball clay included as a separate mineral for the first time in 2000, previously under 'clay/shale'.

(b) Coalbed methane added in to this category for the first time in 2000. In 1994, oil/gas were split into 'exploration/appraisal' and 'production' categories, but were combined in 2000.

(c) Slate was only a separate mineral category in 2000.

(d) Based on published 1994 data.

(e) Estimate, taking into account older permissions for which accurate information was not available in 1994.

Source: *Survey of Land for Mineral Workings in England 2000*, Department for Transport, Local Government and the Regions.

## Mineral bearing land royalty values

Pence per tonne

Commodity/Region	2001 (a)		2002 (b)		2003 (c)	
	Typical Maximum	Typical Minimum	Typical Maximum	Typical Minimum	Typical Maximum	Typical Minimum
<b>Sand and gravel</b>						
South East	300	120	315	120	300	120
Eastern	220	110	220	110	250	120
South West	150	80	185	80	185	80
East Midlands	125	65	125	65	140	80
West Midlands	180	80	180	80	180	88
Yorks. & Humberside	100	50	100	50	110	60
North East	80	40	80	40	100	45
North West	100	65	125	45	125	45
Merseyside	40	35	...	...	...	...
Gtr. Manchester & Cheshire	125	80	...	...	...	...
Wales	60	30	80	50	80	50
Scotland	80	40	80	40	80	40
<b>Hard rock</b>						
South East	85	55	90	60	90	60
Eastern	100	60	100	65	100	65
South West	35	25	55	20	65	20
East Midlands	60	27.5	60	27.5	65	28
West Midlands	42	30	40	30	40	32
Yorks. & Humberside	30	22.5	45	22.5	45	23
North East	30	25	30	25	42	26
North West	38	30	40	30	50	30
Merseyside	38	31	...	...	...	...
Gtr. Manchester & Cheshire	40	32	...	...	...	...
Wales	50	15	50	15	50	19
Scotland	30	20	35	25	35	25

(a) At 1 October 2001.

(b) At 1 October 2002.

(c) At 1 October 2003.

Source: *Property Market Report*, Valuation Office Agency.

### Number of mineral workings in the United Kingdom, by commodity (a) (b)

Commodity	Region										Total					
	North East England	Yorkshire & Humberside	North West England	East Midlands	West Midlands	East of England	Greater London	South East England	South West England	England Total		Wales	Scotland	Isle of Man	Northern Ireland	Channel Islands
Anhydrite	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	1
Ball clay	—	—	—	—	—	—	—	—	20	20	—	—	—	—	—	20
Barytes	—	—	—	3	—	—	—	—	—	3	—	—	—	—	—	4
Bauxite	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	1
Calcite	—	—	—	7	—	—	—	—	—	7	—	—	—	—	—	7
Chalk	—	14	—	4	—	15	—	24	5	62	—	—	—	4	—	66
China clay	—	—	—	—	—	—	—	—	17	17	—	—	—	—	—	17
China stone	—	—	—	—	—	—	—	—	1	1	—	—	—	—	—	1
Coal, underground	2	7	—	—	1	—	—	—	1	15	—	—	—	—	—	18
Coal, opencast	4	7	1	5	—	—	—	—	17	17	—	—	—	—	—	40
Common clay & shale	9	36	17	15	27	14	—	31	14	163	5	—	—	2	—	177
Fireclay	—	4	1	2	2	—	—	—	—	9	—	—	—	—	—	13
Flint	—	—	—	—	—	2	—	2	—	4	—	—	—	—	—	4
Fluorspar	—	1	—	7	—	1	—	1	—	8	—	—	—	—	—	8
Fuller's earth	—	—	—	—	—	—	—	—	—	2	—	—	—	—	—	2
Gypsum	—	—	1	3	1	—	—	1	—	6	—	—	—	—	—	6
Honestone	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2
Igneous & metamorphic rock	10	—	3	6	7	—	—	—	24	50	14	—	—	—	—	211
Iron ore - hematite	—	—	1	—	—	—	—	—	—	1	—	—	—	—	—	1
Iron ore - ironstone	—	1	—	—	1	—	—	1	—	3	—	—	—	—	—	3
Limestone	19	44	23	57	9	3	—	13	93	261	52	13	3	19	—	348
Natural gas	—	10	1	2	1	—	—	3	1	18	—	—	—	—	—	18
Oil	—	—	—	21	—	—	—	20	3	45	—	—	—	—	—	45
Peat	1	5	13	—	—	5	—	—	51	75	3	—	—	—	—	113
Potash	—	1	—	—	—	—	—	—	—	1	—	—	—	—	—	1
Salt	1	1	4	—	—	—	—	—	—	6	—	—	—	1	—	7
Sand & gravel	22	43	38	60	70	147	15	137	52	584	26	119	4	78	1	812
Sandstone	21	56	45	27	15	6	—	8	21	199	29	42	—	35	—	305
Serpentine	—	—	—	—	—	—	—	—	1	1	—	—	—	—	—	2
Silica sand	1	2	7	2	3	13	—	6	1	35	2	10	—	—	—	47
Slate	—	—	11	—	—	—	—	—	15	26	13	—	4	—	—	43
Talc	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Tufa	—	—	—	—	—	—	—	—	1	1	—	—	—	—	—	2
<b>Total</b>	<b>90</b>	<b>233</b>	<b>167</b>	<b>225</b>	<b>137</b>	<b>206</b>	<b>15</b>	<b>247</b>	<b>321</b>	<b>1 641</b>	<b>155</b>	<b>347</b>	<b>13</b>	<b>186</b>	<b>4</b>	<b>2 346</b>

Source: British Geological Survey

(a) As at February 2004.  
(b) Double counting may occur because some workings produce more than one mineral.

# Abrasives, natural

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Carats					£ thousand				
<b>Abrasives</b>										
<i>Imports</i>										
Natural abrasives–										
Industrial diamonds	28 797 763	8 406 120	16 208 556	7 344 542	7 804 225	81 619	11 461	17 853	12 334	11 694
Tonnes										
Dust and powder of precious and semi-precious stones	17	14	20	17	14	15 152	13 035	15 712	14 980	11 057
Pumice	16 061	40 873	19 210	17 165	...	1 670	1 436	2 073	2 377	2 703
Other	2 238	1 592	2 070	3 597	5 243	603	571	657	744	927
Carats										
<i>Exports</i>										
Natural abrasives–										
Industrial diamonds	35 394 187	29 978 880	27 030 867	11 861 312	7 837 074	29 220	23 127	27 900	19 047	17 199
Tonnes										
Dust and powder of precious and semi-precious stones	11	13	43	20	...	14 018	11 626	14 395	13 821	12 102
Pumice	759	282	379	1 397	319	849	459	719	666	654
Other	1 133	1 738	2 466	1 477	1 394	1 042	1 159	1 045	853	952

## Aggregates

Sales of construction aggregates (sand and gravel, and crushed rock) in Great Britain were reported as 209 million tonnes in 2002, according to the official Annual Minerals Raised Inquiry (AMRI) carried out by the Office for National Statistics. This was a significant decrease on 222 million tonnes in 2001. The Quarry Products Association estimate that in 2003 aggregate sales have declined further to about 204 million tonnes. Of this, crushed rock sales declined 1.7 per cent to about 124 million tonnes and sand and gravel by 3.5 per cent to 80 million tonnes. The poor performance of sand and gravel was largely due to a decline in the South East as construction activity, notably commercial work, diminished. The QPA also estimate that recycled and secondary aggregates now account for about 24 per cent of the aggregates market. The following table provides an indication of the growth in the market share of recycled and secondary aggregates:

### Great Britain: Trends in primary and secondary aggregates supply

Aggregate source	Million tonnes			
	1989	2001	2002	1989/2002 % change
Primary	300	222	214	-28%
Recycled/secondary	32	60	62	+94%
<b>Total</b>	<b>332</b>	<b>282</b>	<b>276</b>	
Recycled/secondary market share	9.6%	21.3%	22.5%	

Source: QPA Assessment of the Impacts of the Aggregates Levy . September 2003

The Aggregates Levy of £1.60/tonne applied to sand and gravel, and crushed rock used for aggregates was introduced on 1<sup>st</sup> April 2002. The Government has announced that it intends to extend the scope and length of the current relief for aggregates in Northern Ireland. The new relief will continue to cover aggregates in processed products and be extended to cover virgin aggregate, coming into effect during 2004 and fixed at the current level of 80 per cent of the full rate until 31<sup>st</sup> March 2012. However, only aggregates businesses that agree to implement stringent environmental improvement to their operations will benefit. A reduction in the Aggregates Sustainability Fund was announced in the Budget from £29.3 million in 2003/4 to £20 million in 2004/5.

The Quarry Products Association has published *The QPA Assessment of the Impacts of the Aggregates Levy*. Amongst their conclusions, the QPA state that a key impact of the tax on the primary aggregates market has been the replacement of lower quality

crushed rock, which is now being stockpiled, by other non-taxed materials. So while overall sales have declined due to the levy, total extraction has been less affected because of increased stockpiles and increased usage of non-taxed materials. In addition, whilst the levy has generated some additional supplies of recycled and secondary aggregates, recycling was already at a high level pre-levy (see table above). The Government is currently reviewing the levy.

The ODPM has published replacement *National and Regional Guidelines for Aggregates Provision in England for the 16-year period 2001-2016*. These replace the guidelines provided in Mineral Planning Guidance Note 6 (MPG 6) *Guidelines for Aggregates Provision in England* published in May 1994. The new guidelines are, at a national level, 19 per cent below the previous ones, although the detailed position varies from region to region. The guidelines are based on the assumption that recycled and other alternative materials will meet nationally 23 per cent of total demand for aggregates over the period. According to the new guidelines a total demand for all aggregates over this period of 4 000 million tonnes (250 Mt/y) would be met by 2 686 million tonnes (168 Mt/y) of land-won sand and gravel and crushed rock. The contribution from alternative materials would be 919 million tonnes (57 Mt/y), marine sand and gravel 230 million tonnes (14 Mt/y), and net imports to England 169 million tonnes (11 Mt/y). The guidelines reflect an overall fall in demand for aggregates from 280 Mt/y (average amounts) to 250 Mt/y with a substantial increase in the use of alternatives to primary aggregates, notably construction and demolition waste. The new guidelines assume a revision in the target for alternative materials of 60 million tonnes a year by 2011. The regional apportionments for aggregates provision are shown below:

Million tonnes

	Guidelines for land-won production			Assumptions	
	Land-won sand & gravel	Land-won crushed rock	Marine sand & gravel	Alternatives	Net imports to England
<b>Regions</b>					
South East	212	35	120	118	85
London	19	0	53	82	6
East of England	256	8	32	110	8
East Midlands	165	523	0	95	0
West Midlands	162	93	0	88	16
South West	106	453	9	121	4
North West	55	167	4	101	50
Yorkshire & the Humber	73	220	3	128	0
North East	20	119	9	76	0
<b>England</b>	<b>1 068</b>	<b>1 618</b>	<b>230</b>	<b>919</b>	<b>169</b>
<b>Proportion of total (%)</b>	<b>27</b>	<b>40</b>	<b>6</b>	<b>23</b>	<b>4</b>

Source: *National and Regional Guidelines for Aggregates Provision in England for the 16-year period 2001-2016*. ODPM

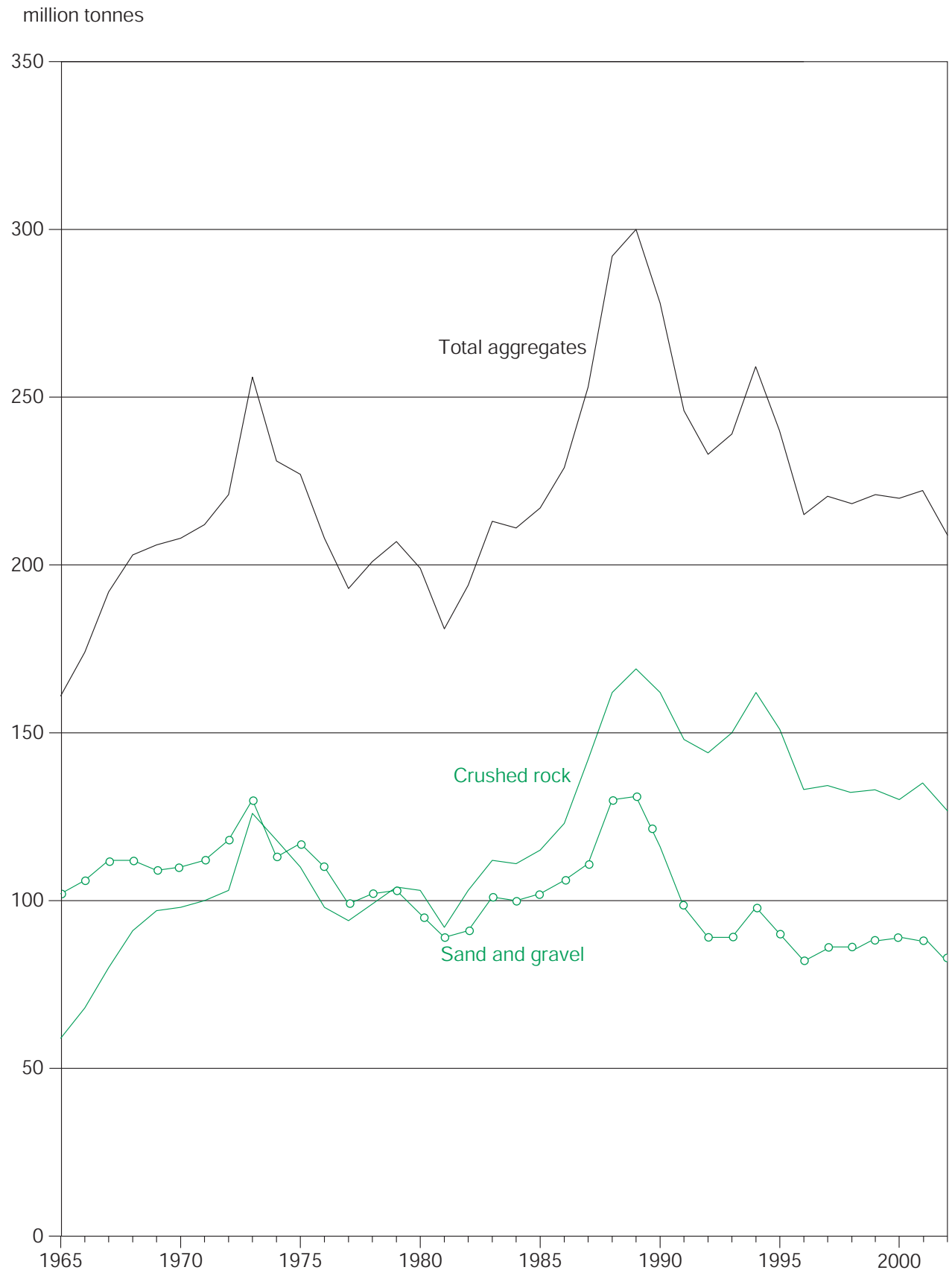
In January 2004 the Scottish Court of Session rejected plans by Lafarge Aggregates to quarry anorthosite throughout a 600-hectare site at Rodel in South Harris, Western Isles. Lafarge argued that a planning permission, originally awarded in 1965, permitted quarrying throughout the 600 hectare site. However, the Court ruled that the original permission was for three small areas (some 5 ha) within the overall site. Following this decision Lafarge Aggregates Ltd has withdrawn its interest in the Rodel site. The company's original planning application to develop a superquarry was made in March 1991. It is worth noting one of the recommendations of the Verney Committee (Aggregates: The way ahead. Report of the Advisory Committee on Aggregates): *'As the attractions offered by mammoth coastal quarries supplying aggregates by sea are great the concept should be seriously considered as a long term possibility and fully investigated.'* The Rodel decision suggests that the Glensanda quarry will be Britain's only coastal superquarry for the foreseeable future.

Kent-based Robert Brett & Sons have further increased their aggregates and ready-mix concrete business through the acquisition of Colchester-based Alresford Sand & Ballast and Suffolk's largest sand and gravel producer the Wilding Group. The Wilding Group operates three quarries and a marine aggregates wharf in the Ipswich area. The Brett Group is one of the largest independent construction materials companies with annual sales of some £160 million and over 1 000 employees.

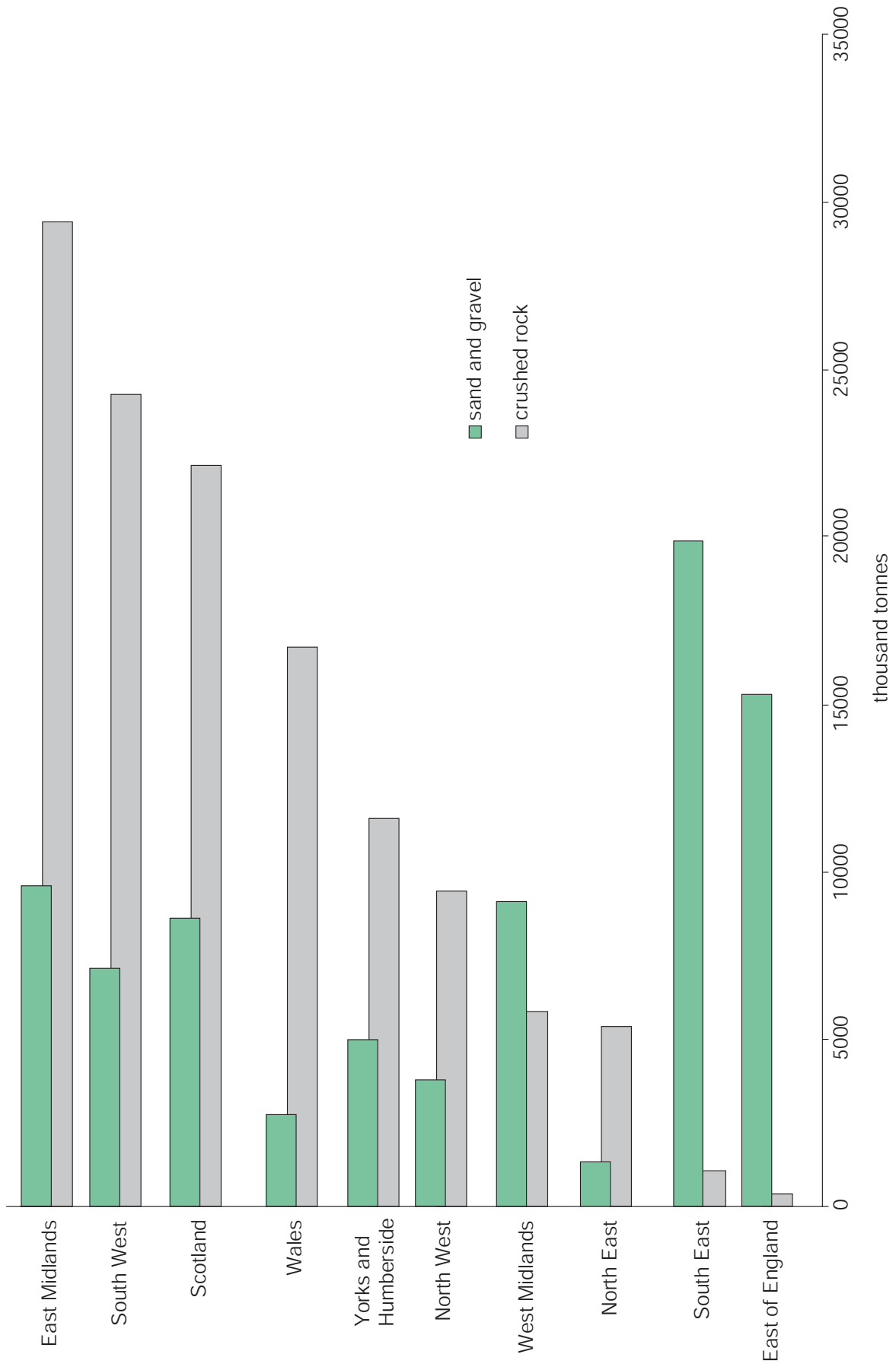
Marine dredging results for 2002 show that 21.93 million tonnes of sand and gravel were extracted from licensed areas of the seabed off England and Wales. This is a decrease on 2001 when 22.76 million tonnes were dredged.

Six companies have applied for licences to dredge in the eastern English Channel some 30 km south of Beachy Head. The companies are Britannia Aggregates Ltd, Dredging International (UK) Ltd, Hanson Aggregates, RMC Marine Ltd, United Marine Dredging Ltd and Volker Dredging Ltd. The target for the maximum dredging area in the East Channel Region is 117 km<sup>2</sup>, but active dredging is likely to be limited to localised areas ranging from 2 to 10 km<sup>2</sup> in size and totalling 43 km<sup>2</sup>.

# Great Britain production of natural aggregates 1965–2002



Great Britain production of crushed rock aggregate and sand and gravel by region 2002





## England and Wales summary of consumption of primary aggregates, by Region 2001 (a)

Thousand tonnes

Region	Land-won sand and gravel	Marine sand and gravel	Total sand and gravel	Crushed rock	Total primary aggregate
South West	5 604	659	6 263	19 140	25 404
South East	12 488	7 036	19 524	14 603	34 127
London	2 021	5 090	7 110	2 453	9 563
East of England	13 404	153	13 557	5 680	19 237
East Midlands	8 703	—	8 703	14 448	23 151
West Midlands	9 564	1	9 564	10 475	20 039
North West	3 656	425	4 081	18 058	22 139
Yorkshire and Humberside	5 337	277	5 614	12 793	18 407
North East	1 826	982	2 808	7 392	10 201
<b>England</b>	<b>62 602</b>	<b>14 622</b>	<b>77 225</b>	<b>105 042</b>	<b>182 267</b>
South Wales	283	915	1 198	8 284	9 482
North Wales	909	68	977	3 663	4 640
<b>Wales</b>	<b>1 191</b>	<b>983</b>	<b>2 175</b>	<b>11 947</b>	<b>14 122</b>
<b>England and Wales</b>	<b>63 794</b>	<b>15 606</b>	<b>79 399</b>	<b>116 990</b>	<b>(b) 196 389</b>

(a) For aggregate use only.

(b) The figure for total consumption slightly under estimates true consumption because for some regions unallocated sales have an unknown destination. Total unallocated sales were (thousand tonnes): sand and gravel: 643; crushed rock: 377.

Source: *Collation of the Results of the 2001 Aggregate Minerals Survey for England and Wales*. British Geological Survey.

## Permitted reserves of primary aggregate minerals in England and Wales for active and inactive sites at 31st December 2001 (a)

Thousand tonnes

Region	Sand and gravel					Crushed rock					Grand total
	Active	Inactive: worked in past	Inactive: yet to be worked	Total	Dormant (b)	Active	Inactive: worked in past	Inactive: yet to be worked	Total	Dormant (b)	
South West	39 028	5 248	6 000	50 276	1 515	920 399	459 965	5 300	1 385 664	92 818	1 435 940
South East	123 162	12 446	5 936	141 545	6 220	55 984	15 819	1 000	72 803	10 000	214 348
London	3 185	—	—	3 185	—	—	—	—	—	—	3 185
East of England	153 258	19 769	11 768	184 795	5 436	13 068	1 783	500	15 351	—	200 146
East Midlands	79 179	10 538	9 030	98 747	8 415	1 979 616	184 173	2 000	2 165 789	171 463	2 264 536
West Midlands	114 734	9 685	19 390	143 809	6 705	252 106	54 631	2 749	309 486	14 050	453 295
North West	55 348	1 113	1 315	57 776	—	337 090	8 869	256	346 215	—	403 991
Yorkshire and Humberside	45 100	5 780	—	50 880	—	438 197	32 315	1	470 513	22 955	521 393
North East	13 201	7 926	250	21 377	570	206 705	52 166	—	258 870	3 751	280 247
<b>England</b>	<b>626 196</b>	<b>72 505</b>	<b>53 689</b>	<b>752 390</b>	<b>28 861</b>	<b>4 203 165</b>	<b>809 720</b>	<b>11 806</b>	<b>5 024 691</b>	<b>315 036</b>	<b>5 777 081</b>
South Wales	6 806	845	—	7 651	—	465 724	181 553	400	647 677	38 210	655 328
North Wales	20 376	1 544	1 200	23 120	325	222 139	283 057	—	505 196	228 907	528 316
<b>Wales</b>	<b>27 182</b>	<b>2 389</b>	<b>1 200</b>	<b>30 771</b>	<b>325</b>	<b>687 863</b>	<b>464 610</b>	<b>400</b>	<b>1 152 873</b>	<b>267 117</b>	<b>1 183 644</b>
<b>England &amp; Wales</b>	<b>653 378</b>	<b>74 894</b>	<b>54 889</b>	<b>783 161</b>	<b>29 186</b>	<b>4 891 027</b>	<b>1 274 330</b>	<b>12 206</b>	<b>6 177 564</b>	<b>582 153</b>	<b>6 960 725</b>

(a) For aggregate and non-aggregate use.

(b) Reserves in 'Dormant' sites are included in 'Inactive sites worked in the past'.

Source: *Collation of the Results of the 2001 Aggregate Minerals Survey for England and Wales*. British Geological Survey.

## England and Wales summary sales of primary aggregates, by Region 2001

Thousand tonnes

Region	Land-won sand and gravel		Marine sand and gravel		Total sand and gravel		Crushed rock		Total primary aggregate	
	AMRI 2001	AM 2001	AMRI 2001	AM 2001	AMRI 2001	AM 2001	AMRI 2001	AM 2001	AMRI 2001	AM 2001
North East	1 071	1 177	495	985	1 566	2 162	6 338	6 596	7 904	8 758
North West	3 165	3 097	237	447	3 402	3 544	9 601	10 034	13 003	13 578
Yorkshire and Humberside	5 016	4 936	155	275	5 171	5 211	11 718	12 701	16 889	17 913
West Midlands	9 894	9 932	—	—	9 894	9 932	5 688	5 497	15 582	15 429
East Midlands	9 716	10 046	—	—	9 716	10 046	30 780	31 254	40 496	41 300
East of England	13 978	15 025	1 716	1 387	15 694	16 412	452	655	16 146	17 066
South East	11 874	12 450	6 729	7 219	18 603	19 669	1 984	2 398	20 587	22 067
London	878	837	2 523	3 725	3 401	4 562	—	—	3 401	4 562
South West	6 586	5 184	540	607	7 126	5 791	28 067	26 518	35 193	32 309
<b>England</b>	<b>62 177</b>	<b>62 684</b>	<b>12 395</b>	<b>14 644</b>	<b>74 572</b>	<b>77 328</b>	<b>94 630</b>	<b>95 653</b>	<b>169 202</b>	<b>172 981</b>
South Wales	209	115	1 172	1 174	1 381	1 289	10 612	10 021	11 993	11 310
North Wales	1 461	1 342	44	44	1 505	1 387	7 153	7 198	8 658	8 585
<b>Wales</b>	<b>1 670</b>	<b>1 458</b>	<b>1 216</b>	<b>1 218</b>	<b>2 886</b>	<b>2 676</b>	<b>17 765</b>	<b>17 219</b>	<b>20 651</b>	<b>19 895</b>
<b>England and Wales</b>	<b>63 847</b>	<b>64 141</b>	<b>13 611</b>	<b>15 862</b>	<b>77 458</b>	<b>80 004</b>	<b>112 395</b>	<b>112 872</b>	<b>189 853</b>	<b>192 876</b>

Sources: *Annual Minerals Raised Inquiry*, Office for National Statistics, *Aggregate Minerals Survey*, British Geological Survey

## England and Wales summary of estimated arisings and use of recycled and secondary materials, 2001

Thousand tonnes

	Used as aggregate		Used as non-aggregate		Total arisings (a)	
	England	Wales	England	Wales	England	Wales
<b>Recycled material</b>						
Construction & demolition waste (b)	36 470	1 550			88 890	5 020
<b>Secondary material</b>						
Blast furnace slag	700	350	1 270	640	2 010	990
Basic oxygen furnace steel slag	660	320	10	10	670	330
Electric arc furnace steel slag	280				280	
China clay waste	2 280				22 600	
Colliery spoil	780	30			7 260	250
Power station pulverised fuel ash	1 500	160	750	80	4 410	460
Power station furnace bottom ash	880	90			890	90
Spent railway track ballast	1 190	50			1 250	50
Slate waste	260	320			2 330	4 000
Waste glass	80		610	40	2 080	120
Municipal solid waste incinerator bottom ash	380				620	
Scrap tyres	90		160	10	380	20
Fired ceramic waste	90	10			90	10
Spent foundry sand	180				880	20
<b>Total</b>	<b>45 820</b>	<b>2 880</b>	<b>2 800</b>	<b>780</b>	<b>134 640</b>	<b>11 360</b>

(a) A significant proportion of total arisings are not utilised.

(b) The arisings of construction and demolition waste include excavation waste as well as the hard material most suitable for recycling into aggregates.

Source: *Survey of arisings and use of construction and demolition waste in England and Wales in 2001* and *Survey of arisings and use of secondary materials as aggregates in England and Wales in 2001*, Office of the Deputy Prime Minister.

## Great Britain estimated consumption of natural aggregates 1955–2002

Year	Crushed rock aggregate (c)							Sand and gravel (b)		Total crushed rock and sand and gravel
	Crushed rock aggregate (c)				Sand and gravel (b)			Total		
	Limestone (a)	Igneous rock	Sandstone	Total	Sand	Gravel				
1955	11	13	3	27	...	...	61	88		
1956	13	13	3	29	...	...	63	92		
1957	13	13	4	30	...	...	60	90		
1958	14	13	4	31	...	...	63	94		
1959	17	14	3	34	33	35	68	102		
1960	18	15	4	37	38	38	76	113		
1961	20	16	4	40	42	43	85	125		
1962	21	16	4	41	42	43	85	126		
1963	23	17	4	44	44	45	89	133		
1964	29	20	5	54	52	54	106	160		
1965	34	20	5	59	50	52	102	161		
1966	40	22	6	68	50	56	106	174		
1967	48	25	7	80	52	60	112	192		
1968	53	27	11	91	54	58	112	203		
1969	55	28	14	97	52	57	109	206		
1970	59	28	11	98	53	57	110	208		
1971	62	29	9	100	53	59	112	212		
1972	61	32	10	103	55	63	118	221		
1973	74	38	14	126	62	68	130	256		
1974	72	34	12	118	53	60	113	231		
1975	67	32	10	110	54	63	117	227		
1976	60	28	10	98	51	59	110	208		
1977	59	26	9	94	46	53	99	193		
1978	61	28	10	99	48	55	102	201		
1979	65	29	10	104	49	54	103	207		
1980	65	28	10	103	45	52	96	199		
1981	57	25	10	92	41	48	89	182		
1982	62	30	11	103	42	49	91	194		
1983	70	31	11	112	46	55	101	213		
1984	69	30	12	111	46	54	100	211		
1985	72	32	11	115	47	55	102	217		
1986	78	34	11	123	51	55	106	229		
1987	89	39	14	142	53	58	111	253		
1988	102	44	16	162	63	67	130	292		
1989	106	46	16	169	64	67	131	300		
1990	98	49	14	162	58	58	116	278		
1991	90	46	13	148	49	49	98	246		
1992	85	48	11	144	45	44	89	233		
1993	89	49	12	150	45	44	89	239		
1994	99	50	13	162	50	48	98	259		
1995	87	49	15	151	47	43	90	240		
1996	77	43	12	133	43	39	82	215		
1997	80	42	12	134	45	42	86	220		
1998	79	40	13	132	44	42	86	218		
1999	76	45	11	133	45	43	88	221		
2000	(d) 74	44	(d) 12	130	45	44	89	220		
2001	(d) 78	45	(d) 11	134	45	43	88	222		
2002	71	44	11	127	44	39	83	209		

(a) Including dolomite.

(b) Total production, excluding marine-dredged material for export; see table on p.95.

(c) The following amounts of crushed rock aggregate, believed to be mainly igneous rock, were exported (million tonnes): 1998: 3; 1999: 3; 2000: 2; 2001: 3; 2002: 4. These figures have not been taken into account when calculating consumption.

(d) BGS estimate.

Source: Office for National Statistics.

## Great Britain consumption of natural aggregates related to construction work (intensity of use of aggregates) 1955–2002

Year	Value of new construction work (a)	Estimated consumption of aggregate			Total value of all construction work (a)	Estimated consumption of aggregate		
		Crushed rock	Sand and gravel (b)	Total		Crushed rock	Sand and gravel (b)	Total
		£ million	Tonnes per £1000			£ million	Tonnes per £1000	
1955	15 197	1.8	4.0	5.8	26 680	1.0	2.3	3.3
1956	16 563	1.8	3.8	5.6	28 739	1.0	2.2	3.2
1957	16 856	1.8	3.6	5.3	29 924	1.0	2.0	3.0
1958	17 902	1.7	3.5	5.3	30 567	1.0	2.1	3.1
1959	19 086	1.8	3.6	5.3	33 313	1.0	2.0	3.1
1960	20 913	1.8	3.6	5.4	35 947	1.0	2.1	3.1
1961	22 926	1.7	3.7	5.5	38 428	1.0	2.2	3.3
1962	23 648	1.7	3.6	5.3	39 511	1.0	2.2	3.2
1963	24 017	1.8	3.7	5.5	40 408	1.1	2.2	3.3
1964	28 189	1.9	3.8	5.7	44 952	1.2	2.4	3.6
1965	30 046	2.0	3.4	5.4	47 249	1.3	2.2	3.4
1966	30 482	2.2	3.5	5.7	48 075	1.4	2.2	3.6
1967	33 072	2.4	3.4	5.8	51 224	1.6	2.2	3.8
1968	34 102	2.7	3.3	6.0	52 348	1.7	2.1	3.9
1969	33 734	2.9	3.2	6.1	51 537	1.9	2.1	4.0
1970	32 613	3.0	3.4	6.4	50 274	2.0	2.2	4.1
1971	33 253	3.0	3.4	6.4	51 044	2.0	2.2	4.2
1972	32 970	3.1	3.6	6.7	52 489	2.0	2.3	4.2
1973	32 808	3.8	4.0	7.8	53 275	2.4	2.4	4.8
1974	27 861	4.2	4.1	8.3	47 797	2.5	2.4	4.8
1975	26 671	4.1	4.4	8.5	44 828	2.5	2.6	5.1
1976	27 070	3.6	4.1	7.7	44 163	2.2	2.5	4.7
1977	26 261	3.6	3.8	7.4	43 948	2.1	2.3	4.4
1978	27 222	3.6	3.8	7.4	47 678	2.1	2.1	4.2
1979	25 303	4.1	4.1	8.2	48 832	2.1	2.1	4.2
1980	22 069	4.7	4.4	9.0	46 773	2.2	2.1	4.3
1981	19 689	4.7	4.5	9.2	42 176	2.2	2.1	4.3
1982	20 773	5.0	4.4	9.3	43 510	2.4	2.1	4.5
1983	22 164	5.1	4.6	9.6	47 225	2.4	2.1	4.5
1984	22 776	4.9	4.4	9.3	49 238	2.3	2.0	4.3
1985	22 624	5.1	4.5	9.6	49 915	2.3	2.0	4.4
1986	23 586	5.2	4.5	9.7	51 571	2.4	2.1	4.4
1987	26 735	5.3	4.2	9.5	57 348	2.5	1.9	4.4
1988	29 739	5.5	4.4	9.8	62 784	2.6	2.1	4.7
1989	30 912	5.5	4.2	9.7	66 072	2.6	2.0	4.5
1990	31 382	5.2	3.7	8.9	66 454	2.4	1.8	4.2
1991	30 189	4.9	3.3	8.2	61 500	2.4	1.6	4.0
1992	29 657	4.9	3.0	7.9	58 897	2.4	1.5	4.0
1993	29 221	5.1	3.1	8.2	57 762	2.6	1.5	4.1
1994	29 892	5.4	3.3	8.7	59 749	2.7	1.6	4.3
1995	29 233	5.2	3.1	8.2	59 771	2.5	1.5	4.0
1996	29 860	4.5	2.8	7.2	61 208	2.2	1.3	3.5
1997	31 191	4.3	2.8	7.1	63 010	2.1	1.4	3.5
1998	32 298	4.1	2.7	6.8	64 016	2.1	1.3	3.4
1999	33 715	3.9	2.6	6.6	64 954	2.1	1.4	3.4
2000	35 651	3.7	2.5	6.2	67 504	1.9	1.3	3.3
2001	36 270	3.7	2.4	6.1	69 306	1.9	1.3	3.2
2002	37 577	3.4	2.2	5.6	72 604	1.8	1.1	2.9

(a) Valued at constant 2000 prices.

Source: Department of Trade and Industry.

(b) Land-won and marine-dredged material.

Source: British Geological Survey.

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Aggregates</b>										
<i>Production</i>										
Sand and gravel (a)	98 315 000	100 953 000	101 622 000	101 397 000	94 424 000					
Crushed rock (b)	131 716 000	132 598 000	130 307 000	133 759 000	126 568 000					
Total	230 031 000	233 551 000	231 929 000	235 156 000	220 992 000					
<i>Imports</i>										
Natural aggregates–										
Crushed rock (c)	348 613	458 980	347 048	409 174	572 971	6 515	7 125	7 771	7 253	9 083
Sand and gravel	473 474	221 292	168 358	362 076	413 992	5 122	5 877	6 688	9 417	9 453
Total	822 087	680 272	515 406	771 250	986 963	11 637	13 002	14 459	16 670	18 536
<i>Exports</i>										
Natural aggregates–										
Crushed rock	2 812 368	2 982 440	2 402 611	3 367 217	3 593 951	16 720	11 300	9 782	15 089	13 989
Sand and gravel (d)	8 422 940	8 906 868	9 931 641	9 871 523	8 881 454	23 049	30 734	31 264	32 389	32 104
Total	11 235 308	11 889 308	12 334 252	13 238 740	12 475 405	39 769	42 034	41 046	47 478	46 093

(a) Including production from marine dredging.

(b) Great Britain only.

(c) For a number of years, a significant amount of crushed rock imports are believed to have been wrongly classified as 'granite, unworked'. In 2002, BGS estimate that crushed rock imports should be approximately 2 200 000 tonnes.

(d) Principally marine-dredged sand and gravel. Source: HM Customs and Excise. However, the Crown Estate Commissioners give the following figures for marine-dredged sand and gravel landed at foreign ports (tonnes): 1998: 7 046 645; 1999: 7 226 549; 2000: 7 314 813; 2001: 6 992 731; 2002: 6 190 905.

## Aluminium

### United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Aluminium</b>										
<i>Production</i>										
Unwrought–										
Primary	258 397	269 700	305 099	340 778	344 318					
Secondary	274 800	285 300	241 300	248 600	205 400					
<i>Consumption</i>										
Unwrought–										
Primary	579 000	496 758	575 520	433 302	427 607					
Secondary	144 632	151 649	180 085	215 424	198 388					
Ferro-aluminium (a)	3 140	3 050	2 910	2 760	2 500					
<i>Imports</i>										
Scrap	138 125	141 971	123 185	112 240	117 954	71 090	64 066	74 984	74 761	61 730
Ash and residues	710	630	184	408	647	196	177	64	38	166
Unwrought	310 767	307 607	120 138	135 094	212 046	272 637	256 868	133 644	130 562	205 256
Unwrought alloys	184 942	136 950	158 217	211 245	159 310	192 619	139 630	161 513	250 707	168 948
<i>Exports</i>										
Scrap	122 591	104 823	141 207	204 605	243 894	78 748	72 537	103 509	143 137	167 176
Ash and residues	1 950	1 170	908	971	1 402	839	541	298	364	849
Unwrought	32 067	12 415	89 761	16 855	9 403	30 118	9 392	90 564	19 196	9 264
Unwrought alloys	193 134	225 110	261 274	243 780	241 799	203 145	206 299	283 519	271 247	235 174

(a) Consumption in the iron and steel industry; ferro-alloy weight.

# Aluminium compounds

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Aluminium compounds</b>										
<i>Production</i>										
Oxide (alumina)	96 000	90 000	88 500	83 900	73 800					
<i>Imports</i>										
Oxide (alumina)	381 804	541 344	568 317	713 808	(b) 798 479	76 034	89 133	107 650	125 521	(b) 105 813
Hydroxide	79 427	102 100	73 170	63 687	(d) 79 800	12 181	12 406	9 515	9 281	...
Fused oxide (a)	39 103	28 790	45 349	43 271	19 928	17 307	13 092	17 335	19 947	13 026
Fluorides	5 238	2 317	7 645	5 460	5 962	2 659	1 150	3 104	2 461	2 763
<i>Exports</i>										
Oxide (alumina)	18 640	(b) 17 197	(b) 12 581	11 795	(b) 22 740	10 819	(b) 9 070	(b) 6 042	6 347	(b) 10 164
Hydroxide	34 778	...	(c) 30 600	42 451	(c) 32 000	7 873	...	...	15 843	...
Fused oxide (a)	19 154	13 758	8 723	6 683	5 607	12 425	10 049	9 013	9 183	8 467
Fluorides	503	89	61	28	16	163	188	106	62	142

(a) Artificial corundum.

(b) Including some bauxite.

(c) BGS estimates, based on known imports into certain countries.

(d) BGS estimates, based on known exports from certain countries.

# Antimony

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Antimony</b>										
<i>Consumption (Sb content)</i>										
Metal	480	480	480	587	480					
Scrap (a)	1 633	1 605	1 512	1 480	1 165					
<i>Imports</i>										
Metal	950	133	461	345	183	5 449	258	782	417	301
Oxides	2 105	1 707	2 082	4 103	3 164	2 768	2 309	2 556	5 270	4 217
<i>Exports</i>										
Ash and residues	102	72	20	0	...	64	43	5	0	...
Metal	100	88	...	...	...	590	373	482	543	444
Oxides	5 139	(b) 4 000	(b) 4 400	1 297	1 879	8 821	...	...	1 751	2 611

(a) Including some antimony in ore.

(b) BGS estimates, based on known imports into certain countries.

# Arsenic

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Arsenic</b>										
<i>Imports</i>										
Elemental	81	108	109	87	86	277	332	602	838	279
<i>Exports</i>										
Elemental	22	45	11	5	5	113	37	37	56	37

# Asbestos

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Asbestos</b>										
<i>Imports</i>										
Fibre	723	330	246	246	2	264	117	244	386	33
Waste	1 117	458	0	101	116	299	126	0	327	311
Fabricated asbestos	686	465	431	136	187	2 031	1 935	1 365	1 257	1 165
Friction material with a basis of asbestos etc.	5 681	6 130	5 831	6 623	10 884	19 775	21 531	22 485	29 369	40 009
Articles of asbestos cement etc.	42 236	40 324	57 126	51 314	57 890	13 668	13 756	13 488	16 131	18 142
<i>Exports</i>										
Fibre	41	49	2	1	1	14	7	12	3	16
Waste	4	—	—	—	—	91	—	—	—	—
Fabricated asbestos	4 375	1 039	1 313	943	690	10 907	7 824	8 119	5 445	5 205
Friction material with a basis of asbestos etc.	6 893	5 002	5 108	5 217	4 055	42 233	30 973	33 097	34 915	22 369
Articles of asbestos cement etc.	57 247	69 557	62 456	40 326	26 792	14 222	15 727	15 266	12 322	8 710

# Asphalt, natural

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Asphalt, natural</b>										
<i>Imports</i>	17 128	38 111	286 364	268 207	232 887	2 255	4 437	22 430	22 788	24 911
<i>Exports</i>	49 135	...	148 037	170 150	116 317	4 959	5 290	14 626	16 394	12 042

# Ball clay

Ball clays are fine-grained, highly plastic sedimentary clays, which fire to a light or near white colour. They are used mainly in the manufacture of ceramic whiteware (sanitaryware, floor and wall tiles, and tableware) and also refractories, and are valued for their key properties of plasticity, which makes them easy to mould, their unfired strength and the fact that when fired they have a light colour. Ball clays exhibit highly variable compositions and consist not of a single mineral but a mixture of predominantly three minerals: kaolinite, mica and quartz. The clay mineral kaolinite is the key component. The UK is a leading world producer and exporter of high quality ball clay.

Ball clay sales, most of which are for export, have been on a rising trend and were a record 1 068 655 tonnes in 2000. However, sales have declined since and were 921 027 tonnes in 2002 and an estimated 884 809 tonnes in 2003 of which 734 524 tonnes (83 per cent) were exports, including 563 379 tonnes to countries of the EU.

Ball clay has a restricted occurrence in the UK and resources are confined to three small areas all in the South West Region of England: the Bovey and Petrockstowe basins in Devon and the Wareham Basin in Dorset. The Bovey Basin is the most important, both in terms of total sales (72 per cent) and, importantly, the diversity of the clay qualities that are produced. The Wareham and Petrockstowe basins accounted for 17 and 11 per cent, respectively in 2002.

The two UK producers of ball clay are WBB MINERALS, the world's leading producer of high-quality ball clays, and IMERY'S Minerals Ltd. WBB is a wholly-owned subsidiary of SCR Sibelco SA, a privately-owned Belgian mineral company, and operates solely in Devon. IMERY'S Minerals is a subsidiary of the IMERY'S Group of France and has workings in all three basins.

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Ball clay</b>										
<i>Production (sales) (a)</i>	963 513	931 365	1 068 655	998 850	921 027					
<i>Imports</i>	6 012	10 160	7 763	7 502	2 577	1 151	1 790	1 216	991	730
<i>Exports (a)</i>	761 697	742 383	878 260	827 214	762 895					

(a) Source: The Kaolin and Ball Clay Association.

## Barytes

Barytes (barium sulphate, BaSO<sub>4</sub>), also referred to as barite or baryte, is the most abundant and economically important barium mineral produced in the UK and worldwide. When pure, barytes contains 58.8 per cent barium and 41.2 per cent sulphate and with a specific gravity (SG) of 4.5 it is often referred to as 'heavy spar'. Inclusions of other minerals may reduce (or in the case of metallics increase) the SG, but a high density, chemical inertness, relative softness and widespread occurrence are the properties that are valued for barytes' most important application as a weighting agent in drilling fluids. Colour and chemical purity are important properties when considering the suitability of barytes for non-drilling applications.

UK sales of barytes in 2003 were an estimated 57 000 tonnes, a small decrease on 59 000 tonnes in 2002. Output is dominated by M-I Great Britain Ltd from its Foss mine, near Aberfeldy in Scotland, which accounts for over 80 per cent of the total. The output is mainly used in drilling fluids. Following the closure of two small open-pit barytes operations in the Northern Pennine Orefield at Closehouse in Durham and Silverband in Cumbria, production in England is now confined to the Southern Pennine Orefield. The mineral is derived as by-product of processing fluorspar ore at Glebe Mines' Cavendish Mill, near Stoney Middleton in the Peak District. Output is essentially dependent on fluorspar output and the barytes content of the fluorspar ore, which varies depending on the deposit being worked. The barytes flotation concentrate is sold locally to Viaton Industries for value added processing by fine grinding for filler applications in paints and plastics. Some is also used in oil well drilling fluids.

Britain is a net importer of barytes, which is used mainly as a weighting agent in drilling fluids in oil and gas exploration. Imports for 2002 were some 74 843 tonnes valued at £3.1 million. The UK has not been a significant exporter of barytes. However, official data for 2002 report exports of 37 759 tonnes valued at £3.2 million. This is believed to be an error.

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Barium</b>										
<i>Production</i>										
Barium minerals– Barytes	64 000	59 000	54 000	(b) 66 000	(b) 59 000					
<i>Imports</i>										
Barium minerals (a)	98 506	65 703	57 362	77 273	74 935	4 409	2 963	2 877	3 624	3 208
<i>Exports</i>										
Barium minerals (a)	6 590	8 196	(c) 28 503	(c) 58 969	(c) 37 778	1 363	1 627	2 853	3 886	3 166

(a) Mainly barytes with some witherite.

(b) BGS estimate.

(c) Figure believed to be too high.

## Bauxite

### United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Bauxite</b>										
<i>Imports (a)</i>	278 737	217 514	222 319	271 404	...	10 673	8 835	8 201	12 805	...
<i>Exports (a)</i>	1 743	(b) 17 197	(b) 12 581	2 593	(b) 22 740	494	(b) 9 070	(b) 6 042	912	(b) 10 164

(a) Excluding refractory grade bauxite.

(b) Including alumina.



# Bentonite

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Bentonite</b>										
<i>Imports</i>	(a) 331 453	246 341	255 942	235 517	216 022	13 737	13 021	14 129	14 731	12 189
<i>Exports</i>	108 868	76 459	75 472	72 983	81 707	25 196	17 784	15 774	16 314	17 538

(a) Figure under investigation.

# Beryllium

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Beryllium</b>										
<i>Imports</i>										
Metal	45	29	10	12	54	1 460	1 769	709	523	1 618
Oxides and hydroxides	—	6	12	10	4	—	521	988	881	297
<i>Exports</i>										
Metal	27	13	34	58	39	593	264	689	311	259

# Bismuth

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Bismuth</b>										
<i>Imports</i>										
Metal	1 382	1 265	1 379	1 515	1 513	6 168	5 741	5 277	7 706	5 891
<i>Exports</i>										
Metal	1 973	2 381	2 987	1 269	1 793	8 080	5 914	7 352	5 799	8 028

# Boron

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Boron</b>										
<i>Imports</i>										
Boron minerals (a)	25 665	16 573	16 450	16 880	9 936	3 195	2 013	1 947	2 630	1 726
<i>Exports</i>										
Boron minerals (a)	145	320	304	96	164	93	149	62	31	158

(a) Including crude natural borates and concentrates, and crude natural boric acid.

# Bricks

Total deliveries of clay bricks increased from 2 668 million bricks in 2002 to 2 777 million bricks in 2003. In addition, the brick industry has been destocking and stocks are now at their lowest level (570 million in 2003) since 1989. The main brick manufacturers in the UK are in order of size: Istock Building Products, Hanson Brick, 'thebrickbusiness', and Baggeridge Brick.

A planning application by Hanson Brick Ltd to build a new brick factory at Broadmead Road, Wootton Broadmead near Stewartby in Bedfordshire was refused in September 2003 by Bedfordshire County Council. The proposed development would be constructed in two phases, each with a capacity to produce 50 million bricks. Total annual clay requirements would be about 225 000 tonnes, extracted on a campaign basis from Kempton Hardwick quarry to the north of the sites. The factory would produce soft-mud products, which are different to the current products produced at Stewartby. The soft mud process involves throwing the wet clay into sand-lined moulds. The bricks are then dried to reduce the moisture content from 25 per cent to 1 per cent prior to firing in tunnel kilns. The soft-mud process produces bricks of soft, slightly irregular outline often showing surface creases and sanded on all surfaces. This is different to Fletton bricks, which are currently produced at Stewartby. The aesthetic properties of soft-mud bricks have resulted in a resurgence in their popularity, and a marked increase in market share.

A number of reasons were given for the refusal, including: encroachment into open countryside and visual impact; insufficient information on the archaeological importance of the site and to assess whether the development makes an adequate contribution to the improvement of the Marston Vale; insufficient information to enable full consideration of traffic generation; the need for soft mud bricks; great crested newts in the vicinity of the site; waste arisings, and odour and other emissions. Other reasons also included unnecessary sterilisation of a mineral resource.

## Great Britain production of bricks, blocks and tiles 1993–2002

Material	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Millions										
Bricks:										
Clay	2 396	2 845	3 025	2 849	(a) 2 828	(a) 2 830	(a) 2 759	(a) 2 694	(a) 2 595	(a) 2 600
Sandlime	50	55	40	31	...	...	...	...	...	...
Concrete	192	214	191	166	169	171	180	170	159	150
Total	2 639	3 114	3 256	3 046	2 997	3 000	2 939	2 864	2 754	2 750
Brick Production Region										
North East	165	198	190	150	160	154	133	130	136	138
Yorkshire and Humberside	260	286	278	234	218	194	211	195	186	187
East Midlands	333	423	415	447	473	518	522	508	495	480
East of England	264	246	365	370	325	248	331	334	321	349
South East	396	502	540	523	535	565	409	394	385	371
South West	130	180	171	168	152	146	145	148	132	129
West Midlands	535	639	649	576	558	598	573	572	558	570
North West	268	313	313	295	295	303	320	292	299	290
<b>England</b>	<b>2 351</b>	<b>2 787</b>	<b>2 921</b>	<b>2 763</b>	<b>2 718</b>	<b>2 727</b>	<b>2 643</b>	<b>2 573</b>	<b>2 513</b>	<b>2 513</b>
<b>Wales</b>	<b>104</b>	<b>116</b>	<b>121</b>	<b>106</b>	<b>104</b>	<b>102</b>	<b>123</b>	<b>109</b>	<b>106</b>	<b>106</b>
<b>Scotland</b>	<b>183</b>	<b>211</b>	<b>214</b>	<b>177</b>	<b>176</b>	<b>172</b>	<b>174</b>	<b>181</b>	<b>136</b>	<b>131</b>
<b>Great Britain</b>	<b>2 639</b>	<b>3 114</b>	<b>3 256</b>	<b>3 046</b>	<b>2 997</b>	<b>3 000</b>	<b>2 939</b>	<b>2 864</b>	<b>2 754</b>	<b>2 750</b>
Million square metres										
Concrete building blocks:										
Dense aggregate	30.1	37.0	36.9	35.0	37.3	39.4	38.4	37.6	36.6	35.7
Lightweight aggregate	19.2	22.0	18.1	16.3	17.8	19.1	20.8	23.0	22.7	23.5
Aerated concrete	24.9	28.5	23.2	24.6	27.5	26.1	28.5	29.6	28.6	32.3
Total	74.3	87.5	78.3	75.9	82.5	84.7	87.8	90.2	87.9	91.5
Roofing tiles:										
Concrete	24.6	28.1	26.1	24.7	25.0	25.0	26.0	26.8	24.8	25.0

(a) Including sandlime bricks.

Source: Department of Trade and Industry.

# Bromine

The bromine plant at Amlwch on Anglesey, which was operated by Great Lakes (UK) Ltd and extracted bromine from seawater, closed in early 2004. The plant was originally built in 1953 for the production of dibromoethane (DBE) which was used to prevent the build up of lead in petrol engines and together with tetraethyl lead was marketed as an 'anti-knock compound'. The introduction of unleaded petrol significantly reduced demand for this product and in the late 1990s until its closure the plant was used for producing bromine and bromine intermediates for a range of consumer products.

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Bromine</b>										
<i>Production</i>	35 900	24 800	33 200	27 900	24 500					
<i>Imports</i>	8 002	6 928	5 987	5 387	2 880	3 411	3 703	3 413	2 887	1 153
<i>Exports</i>	7 011	5 335	10 850	11 304	8 672	5 267	5 144	7 410	8 385	6 149

# Building and dimension stone

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Building and dimension stone</b>										
<i>Production (a)</i>										
Sandstone	287 000	455 000	239 000	...	...					
Igneous rock	138 000	184 000	...	479 000	217 000					
Limestone	(b) 295 000	(b) 301 000	(b) 305 000	(b) 220 000	191 000					
Dolomite	10 000	14 000	15 000	34 000	9 000					
Total	(b) 730 000	(b) 954 000	...	...	...					
<i>Imports</i>										
Unworked–										
Marble and other calcareous stone	9 571	8 473	29 015	9 985	12 708	7 094	7 976	7 709	7 727	8 855
Granite (c)	736 462	1 045 451	865 710	1 781 220	1 656 235	26 546	23 980	36 452	28 908	29 447
Sandstone	2 091	10 705	13 800	17 202	50 214	289	1 932	3 113	2 577	7 050
Other stone	109 746	148 015	5 228	9 857	259 070	2 743	2 607	1 181	1 498	3 448
Worked–										
Marble and other calcareous stone	53 489	53 639	32 425	64 637	48 237	27 575	21 566	23 668	28 291	32 555
Granite	24 541	25 961	34 928	37 533	57 885	20 097	19 214	24 215	26 334	37 543
Other stone	8 984	12 018	17 839	21 256	27 063	9 712	8 688	10 538	10 947	13 552
Paving stones and flagstones	15 361	20 874	41 589	47 501	75 640	3 062	6 573	8 562	8 161	10 754
<i>Exports</i>										
Unworked–										
Marble and other calcareous stone	7 332	6 084	8 668	4 140	4 853	535	425	501	770	585
Granite	1 111	983	1 594	1 558	931	370	133	331	370	252
Sandstone	734	4 445	5 974	4 998	5 789	102	467	522	1 038	1 184
Other stone	355	...	809	281	1 168	188	...	513	134	408
Worked–										
Marble and other calcareous stone	601	622	839	526	946	1 420	1 366	1 407	1 456	1 893
Granite	101	85	713	53	732	211	82	360	99	755
Other stone	1 633	1 475	1 401	3 596	3 820	1 931	1 531	1 306	1 914	2 269
Paving stones and flagstones	3 730	4 328	3 168	5 029	5 057	1 221	1 104	937	780	1 217

(a) Great Britain only.

(b) BGS estimate.

(c) Figures believed to be too high. May include aggregate.

# Cadmium

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Cadmium</b>										
<i>Production</i> (a)	440	547	503	425	292					
<i>Consumption</i>	626	641	585	584	589					
<i>Imports</i>										
Metal	632	462	790	942	225	640	379	448	1 273	439
Pigments	35	29	52	26	31	245	243	372	155	154
<i>Exports</i>										
Metal	28	215	19	87	115	231	121	129	495	742
Pigments	615	655	748	691	640	4 809	4 555	5 389	4 849	4 504

(a) Refined.

# Calcspar

## United Kingdom summary 1998–2002

Tonnes

Commodity	1998	1999	2000	2001	2002
<b>Calcspar (Calcite)</b>					
<i>Production</i>	15 000	...	...	12 000	(a) 10 000

(a) BGS estimate.

# Cement

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002
Tonnes					
<b>Cement</b>					
<i>Production</i>					
Cement clinker	12 372 000	11 816 000	11 456 000	10 573 000	(a) 10 327 000
Finished cement	12 409 000	12 697 000	12 452 000	11 854 000	(a) 11 089 000
Fibre cement products (a)	160 900	156 200	...	...	...
Cubic metres					
Ready-mixed concrete	22 983 000	23 550 000	23 043 000	23 008 000	22 597 000
Tonnes					
<i>Consumption</i> (home deliveries) (b)					
Finished cement	11 854 000	11 736 000	11 854 000	11 350 000	(a) 10 762 000
Fibre cement products (a)	164 100	157 800	...	...	...

(a) Great Britain only.

(b) Excluding imports.

*continued*

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Cement continued</b>										
<i>Imports</i>										
Portland cement clinker	319 036	445 468	350 975	387 306	289 685	16 565	22 244	18 124	14 254	10 511
Aluminous cement	14 891	28 517	12 515	12 675	12 267	4 442	8 871	3 779	3 821	3 403
Portland cement	1 260 716	1 153 210	1 428 008	1 179 521	2 142 589	47 350	52 443	56 017	51 173	75 099
Other cement	25 520	28 438	8 913	39 736	49 060	1 966	1 660	2 191	2 718	1 996
<i>Exports</i>										
Portland cement clinker	564 214	455 830	256 077	169 344	159 252	13 849	12 827	8 266	6 573	6 685
Aluminous cement	29 964	23 985	40 165	50 085	50 501	10 369	9 305	11 687	14 578	14 498
Portland cement	681 151	596 794	528 417	229 572	305 801	31 884	29 958	21 001	14 793	14 062
Other cement	23 374	14 711	16 099	31 356	15 662	4 232	3 692	4 021	9 186	2 575

## Chalk (see Limestone)

## China clay

China clay or kaolin is a commercial clay composed principally of the hydrated aluminosilicate clay mineral kaolinite. The commercial value of china clay is based on the mineral's natural whiteness and its fine, but controllable, particle size. Particle size affects fluidity, strength, plasticity, colour, abrasiveness and ease of dispersion. Other important properties include its flat particle shape, which increases opacity or hiding power, its soft and non-abrasive texture, due to the absence of coarser impurities, and its chemical inertness. These key properties distinguish china clay from the other kaolinic clays produced in Britain, such as ball clay and fireclay. The kaolinite content of processed kaolin varies, but is generally in the range 75 to 94 per cent. China clay is mainly used in papermaking, as a coating pigment and filler, but the ceramics industry, and as a filler in paint, rubber and plastics are also important markets.

China clay resources in Britain are confined to the granites of South-west England. The deposits are world famous for their size and quality. All the main granite intrusions have been worked to a limited extent in the past. Today production is confined to the St Austell Granite and the south-western margin of the Dartmoor Granite, and on the adjacent but separate Crownhill Down Granite. Production from the Bodmin Moor Granite ceased in 2001 with the closure of the Stannon Pit. The St Austell Granite is by far the most important source accounting for about 85 per cent of total sales. The industry is of considerable national and regional importance.

China clay sales declined from 2 162 815 dry tonnes in 2002 to 2 097 137 dry tonnes in 2003, of which 1 862 437 dry tonnes (89 per cent) were exported, mainly to Europe.

The extraction and processing of china clay involves the production of very large quantities of waste. China clay waste is exempt from the Aggregates Levy and over 2 Mt are sold for aggregate use, mainly in the South West, although small quantities have also been shipped to London and the South East. However, shipments of china clay waste may expand significantly with the proposed development of the port facilities at Par and associated infrastructure. The proposals aim for a capacity of 0.75 Mt/y.

IMERY'S Minerals Ltd is the largest china clay producer accounting for about 85 per cent of total output with operations based on the St Austell Granite in Cornwall and the south-western margin of the Dartmoor Granite in Devon. The company is a wholly-owned subsidiary of the IMERY'S Group of France, which is the world's leading kaolin producer. During the year, IMERY'S published a *Vision for the future*, a 'Blueprint' for the future development of the industry in Cornwall. Goonvean Ltd, a privately-owned company, operates five quarries in the St Austell Granite and WBB MINERALS operates two sites on the Dartmoor Granite.

IMERY'S Minerals Ltd has announced plans to revive operations at the Hemerdon and Smallhanger sites on the Crownhill Down Granite during the next five to ten years. The sites have not been worked for many years and will require a considerable amount of work to bring them into operation, including steps to minimise the visual impact. The Smallhanger site is adjacent to WBB MINERALS' Headon pit, which is also on the Crownhill Down Granite.

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>China clay</b>										
<i>Production (sales) (a) (b)</i>	2 391 595	2 303 602	2 376 057	2 204 156	2 162 815					
<i>Imports</i>	47 272	28 502	42 537	95 337	56 416	5 143	3 752	6 275	8 140	5 433
<i>Exports (a) (b)</i>	2 093 460	2 018 969	2 074 548	1 928 230	1 899 220					

(a) Dry weight.

(b) Source: The Kaolin and Ball Clay Association.

## China stone

### United Kingdom summary 1998–2002

Tonnes

Commodity	1998	1999	2000	2001	2002
<b>China stone—see Feldspar</b>					
<i>Production</i>	3 278	2 448	3 645	2 995	1 896

## Chromium

### United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Chromium</b>										
<i>Apparent consumption (a)</i>	89 000	76 000	96 000	83 000	90 000					
<i>Consumption in Iron and Steel Industry (b)</i>	61 880	58 170	55 090	49 580	48 520					
<i>Imports</i>										
Ores and concentrates	120 967	83 608	163 647	135 369	139 748	7 109	4 397	7 814	6 186	5 109
Ferro-chrome—										
Under 4% carbon	30 023	16 801	16 545	12 501	10 196	18 514	11 139	10 567	8 034	6 063
4%–6% carbon	1 365	494	—	1 744	—	604	152	—	629	—
Over 6% carbon	82 810	97 615	90 499	84 749	102 702	28 817	26 181	27 792	22 868	21 079
Ferro-silico-chrome	78	5 482	7 415	5 136	2 309	50	1 488	2 365	1 488	555
Oxides and hydroxides	6 396	...	(c) 5 100	8 201	(c) 4 400	9 930	...	...	10 511	...
Metal	1 787	1 573	1 519	1 601	1 171	8 244	6 372	6 522	7 316	4 494
<i>Exports</i>										
Ores and concentrates	707	871	503	170	26	209	186	117	55	30
Ferro-chrome—										
Under 4% carbon	869	359	137	553	181	749	421	232	718	427
4%–6% carbon	531	221	265	86	55	291	104	113	78	37
Over 6% carbon	190	467	455	515	567	149	368	327	357	710
Ferro-silico-chrome	264	—	19	52	10	98	—	19	41	8
Oxides and hydroxides (d)	10 400	12 600	18 300	17 900	18 400					
Metal	5 803	5 549	8 821	4 609	3 837	22 183	19 444	21 299	18 019	15 034

(a) BGS estimates; see p.v.

(b) Chromium content of ferro-alloys.

(c) BGS estimates, based on known exports from certain countries.

(d) BGS estimates, based on known imports into certain countries.

# Clays (also see Bricks)

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Clays (not elsewhere specified)</b>										
<i>Production</i>										
Common clay and shale (a)	12 230 000	11 355 000	10 838 000	10 426 000	10 306 000					
<i>Imports</i>										
Unspecified clays	82 006	44 704	38 122	38 873	...	15 972	15 335	12 380	13 614	12 793

(a) Great Britain only. There is a small, undisclosed production in Northern Ireland.

## Great Britain production of common clay and shale by end-use and area of origin 2002

Area of origin	Thousand tonnes					
	Bricks, pipes and tiles	Cement	Lightweight aggregate	Constructional use	Other uses	Total
Durham	140	—	—	...	—	...
Northumberland	29	—	—	—	—	29
Tyne and Wear	72	—	—	—	—	72
<b>North East</b>	<b>241</b>	<b>—</b>	<b>—</b>	<b>...</b>	<b>—</b>	<b>...</b>
Humberside	...	176	—	—	20	...
North Yorkshire	12	—	...	...	...	208
South Yorkshire	...	—	—	—	—	...
West Yorkshire	386	—	—	—	—	386
<b>Yorkshire and Humberside</b>	<b>594</b>	<b>176</b>	<b>...</b>	<b>...</b>	<b>...</b>	<b>986</b>
Derbyshire	...	...	—	—	—	783
Leicestershire	710	205	—	—	—	916
Nottinghamshire	...	—	—	—	—	...
<b>East Midlands</b>	<b>1 368</b>	<b>...</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>...</b>
Cambridgeshire	...	...	—	—	—	...
Norfolk	—	—	—	—	...	...
Suffolk	3	—	—	—	—	3
Essex	...	302	—	—	—	...
Bedfordshire	...	—	—	—	—	...
<b>East of England</b>	<b>...</b>	<b>...</b>	<b>—</b>	<b>—</b>	<b>...</b>	<b>1 673</b>
Buckinghamshire	...	—	—	—	—	...
Oxfordshire	—	—	—	1	—	1
Berkshire	—	—	—	—	10	10
East Sussex	157	—	—	—	—	157
Hampshire	...	—	—	—	1	...
Kent	...	—	—	69	—	...
Surrey	269	—	—	—	—	269
West Sussex	483	—	—	—	—	483
<b>South East</b>	<b>1 060</b>	<b>—</b>	<b>—</b>	<b>70</b>	<b>12</b>	<b>1 141</b>
Avon	...	—	—	—	—	...
Cornwall	—	—	—	...	...	...
Devon	114	—	—	—	—	114
Dorset	14	—	—	—	—	14
Gloucestershire	53	—	—	...	22	...
Wiltshire	—	103	—	—	—	103
<b>South West</b>	<b>...</b>	<b>103</b>	<b>—</b>	<b>...</b>	<b>...</b>	<b>433</b>
Hereford and Worcester	...	—	—	6	—	...
Shropshire	...	—	—	—	—	...
Staffordshire	...	...	...	91	51	1 134
Warwickshire	...	345	—	—	—	...
West Midlands	...	—	—	—	—	...
<b>West Midlands</b>	<b>...</b>	<b>...</b>	<b>...</b>	<b>96</b>	<b>51</b>	<b>2 069</b>
Cumbria	30	—	—	2	40	71
Cheshire	...	—	—	—	—	...
Greater Manchester	...	—	—	...	8	...
Lancashire	296	—	—	1	—	297
Merseyside	125	—	—	—	—	125
<b>North West</b>	<b>...</b>	<b>—</b>	<b>—</b>	<b>...</b>	<b>48</b>	<b>582</b>
<b>England</b>	<b>6 579</b>	<b>2 105</b>	<b>...</b>	<b>371</b>	<b>...</b>	<b>9 226</b>

*continued*

## Great Britain production of common clay and shale by end-use and area of origin 2002 *continued*

Thousand tonnes

Area of origin	Bricks, pipes and tiles	Cement	Lightweight aggregate	Construc-tional use	Other uses	Total
Clwyd	...	89	—	2	—	...
Gwynedd	...	—	—	1	—	...
Dyfed	—	—	—	...	—	...
Powys	94	—	—	...	—	...
<b>Wales</b>	...	<b>89</b>	<b>—</b>	...	<b>—</b>	<b>382</b>
Central	95	—	—	—	—	95
Dumfries and Galloway	—	—	—	51	—	51
Highland	—	—	—	200	—	200
Lothian	—	—	—	...	—	...
Strathclyde	...	—	—	82	—	...
<b>Scotland</b>	...	<b>—</b>	<b>—</b>	...	<b>—</b>	<b>698</b>
<b>Great Britain</b>	<b>6 985</b>	<b>2 194</b>	...	<b>956</b>	...	<b>10 306</b>

Source: Office for National Statistics.

## Great Britain production of common clay and shale by end-use 1991–2002

Thousand tonnes

Year	Bricks, pipes and tiles	Cement	Lightweight aggregate	Construc-tional use	Other uses	Total
1991	9 042	2 626	...	...	...	13 038
1992	7 914	2 365	...	872	...	12 155
1993	6 914	2 366	...	1 398	...	10 891
1994	8 318	2 581	98	1 219	248	12 464
1995	9 316	2 616	—	1 914	85	13 930
1996	8 162	2 169	—	1 196	(a) 277	11 804
1997	7 560	2 339	—	1 104	(a) 319	11 322
1998	8 214	2 384	—	1 089	(a) 543	12 230
1999	8 270	2 148	—	540	...	11 355
2000	7 880	1 939	1	...	...	10 838
2001	7 574	1 884	33	625	(a) 310	10 426
2002	6 985	2 194	...	956	...	10 306

(a) BGS estimate.

Source: Office for National Statistics.

## Coal (also see Primary fuels)

Coal production fell to 29.5 million tonnes in 2002, a decrease of 2.0 million tonnes compared with the previous year, and producers' stocks fell by 0.35 million tonnes. Of the total production, underground mines contributed 16.4 million tonnes (55 per cent) and opencast mines contributed 13.1 million tonnes (45 per cent). Decreases were 0.9 million tonnes in underground production and 1.1 million tonnes in opencast production. The BGS estimates that of total output approximately 27.5 million tonnes was bituminous coal (almost entirely steam coal) and 2 million tonnes was anthracite from the South Wales Coalfield. The total value of coal production is estimated to have fallen from £1 028 million in 2001 to £889 million in 2002. Employment in UK collieries and opencast sites fell from 12 867 at end-March 2002 to 10 649 at end-March 2003, of which 7 695 were employed at underground mines. Total coal production in 2003 is estimated to have been lower than in 2002, at approximately 28.2 million tonnes.

Coal consumption fell by 5.6 million tonnes to 58.6 million tonnes in 2002, reflected by a significant fall (see below) in imports. Electricity generators used 47.7 million tonnes, or 81 per cent of total consumption. Coal accounted for 35.4 per cent of total electricity generation – slightly more than gas (33.6 per cent). Consumption in coke ovens and blast furnaces accounted for 11 per cent and industrial, domestic and other use for 7.5 per cent of the total. Total stocks of coal at end- 2002 were 16.2 million tonnes, a fall of 0.4 million tonnes. In 2003 coal consumption is reported by the DTI to have risen by 7.5 per cent to 63.0 million tonnes, with consumption by electricity generators rising by 11.6 per cent to 53.3 million tonnes.

In contrast to 2001, imports of coal in 2002, at 28.7 million tonnes, were slightly lower than production. Total demand, at 58.6 million tonnes, was 9 per cent lower than in 2001. The bulk of 2002 imports were of bituminous coal, steam coal comprising 76 per cent of the total, coking coal 22 per cent and anthracite 2 per cent. The sources of supply are summarized in the table below. The chief sources of steam coal were South Africa, Russia and Colombia and the chief sources of coking coal were Australia (67 per cent), USA and Canada. Net imports fell to 48 per cent of consumption.



	Bituminous		Anthracite	Total
	Steam coal	Coking coal		
<b>Production</b>				
Mine production	(a) 27 000	373	(a) 2 000	(b) 29 539
Other sources	...	—	...	450
Stock increase	...	162	...	350
<b>Total production</b>				<b>30 339</b>
<b>Imports</b>				
South Africa	9 769	—	107	9 876
Australia	864	4 229	—	5 094
Russia	4 294	48	26	4 368
Colombia	3 518	—	29	3 547
Poland	1 558	—	38	1 597
USA	252	1 286	29	1 567
Canada	—	750	—	750
China P.R.	208	—	80	288
Norway	163	—	1	164
Vietnam	—	—	86	86
Indonesia	45	—	—	45
Other countries	1 224	—	82	1 305
<b>Total imports</b>	<b>21 895</b>	<b>6 315</b>	<b>477</b>	<b>28 687</b>
<b>Total exports</b>	<b>-342</b>	<b>-3</b>	<b>-192</b>	<b>-537</b>
<b>Total supply</b>	...	...	...	<b>58 489</b>

(a) BGS estimate

Source: DTI

(b) Reported

Following the closure in 2002 of the Prince of Wales mine, near Wakefield, the Wrytree and Castle drift mines in Northumberland and the Longannet Mine in Fife, Scotland, further closures in 2003 were of the Clipstone mine (UK Coal) in Nottinghamshire and the Betws anthracite mine in South Wales. The Selby deep mine complex, which in 2002 produced about one quarter of total deep mine output in the UK, will close by summer 2004. It was announced in April 2004 that Coalpower Ltd, owners of the Hatfield mine, would go into liquidation. The company, set up in 2001 by Richard Budge, former chief executive of RJB Mining, re-opened Hatfield in January 2002 but began experiencing problems in the latter half of 2003 and went into administration at the end of the year. The colliery, which employed 200 people, had secured conditional approval for £15 million from the government's Investment Aid Scheme. This has now been withdrawn and will be offered to other mines.

At the end of 2003 UK Coal plc operated 11 deep mines in the UK. These were *Riccall/Whitemoor*, *Stillingfleet Combine* and *Wistow* in the Selby Coalfield, *Harworth*, *Kellingley*, *Maltby*, *Rossington*, *Thoresby* and *Welbeck* in the East Pennines Coalfield, *Daw Mill* in the Warwickshire Coalfield and *Ellington* in the North-east Coalfield. In addition to its deep mines, UK Coal and its associates are the largest owners of opencast sites in England. The only other remaining deep mine producing at end-2003 was *Tower* (South Wales), Goitre Tower Anthracite Ltd. There were also 6 smaller underground (chiefly drift) mines in operation at that time, three fewer than the number recorded twelve months earlier. Certain operations use both shaft and drift access. The Coal Authority (<http://www.coal.gov.uk>) estimated that, in March 2003, 122 million tonnes of available coal was licensed at operating underground mines, with 27 million tonnes in 'conditional' sites. The Authority's experience is that recovery in underground mining usually extracts just above 50 per cent of the total volume of available coal. These figures incorporate the findings from the DTI-commissioned report entitled *Study of coal reserves at existing deep mines in the UK* ([http://www.dti.gov.uk/energy/coal/mine\\_reviews](http://www.dti.gov.uk/energy/coal/mine_reviews)).

Coal Authority licences for opencast sites in production at end-2003 totaled 39, of which 16 were in England, 16 in Scotland and 7 in Wales. This is a decrease of ten over the number recorded at end-2002. UK Coal plc had eleven licences for producing sites in England, Scottish Coal Ltd. had eight licences in Scotland and Celtic Energy Ltd licensed three producing sites in Wales. Twelve other licensees were also producing in this sector. The Coal Authority estimated that in March 2003 46 million tonnes of available coal was licensed at operating opencast sites with an additional 156 million tonnes in 'conditional' sites and pointed out that opencast mining often achieves near-100 per cent recovery.

The Coal Authority received 45 applications for licences and agreements to enter its coal, ten fewer than the total for 2001-2002. Although there were nineteen current licences for coalbed methane (CBM) utilisation at end-2003, the Coal Authority reports that all company licence holders have now announced that future CMM/CBM developments are not currently commercially viable due to low wholesale electricity prices. The majority of UK licences refer to coal mine methane (CMM) in old workings (also known as abandoned mine methane – AMM). Methane in unworked seams, known as virgin coalbed methane (VCBM), has been the subject of commercial production only in USA and Australia. The DTI has concluded that the underground coal gasification (UCG) process has potential for UK coal reserves, particularly when considered against the massive offshore coal resource, which may be amenable to UCG.

Following the expiry of the European Coal and Steel Community (ECSC) regulations on 23<sup>rd</sup> July 2002 the EU's Coal State Aid regulation (2002-2010) has enabled the UK to pay investment aid to mines that have a viable future. This 'Investment Aid

Scheme' has a budget of £60 million, to be spent over three years. The government has so far awarded £55.8 million, of which UK Coal has accepted £37.2 million (after revision) for capital investment at Daw Mill, Thoresby, Harworth, Maltby, Kellingley, Ellington, Welbeck and Rossington — the eight underground mines that will remain following the closure of the three mines of the Selby complex. The balance of £18.6 million was awarded to Coalpower Ltd. (£15.0 million, since withdrawn due to the failure of the company), Tower Colliery Ltd., J. Flack & Son (Hay Royds Colliery), Eckington Colliery Partnerships and Energybuild (Aberpergwm Colliery).

The government's Energy White Paper: *Our energy future — creating a low carbon economy* was published in early 2003. Its conclusions on coal are, in summary, that coal fired generation, while having an important part to play in widening the diversity of the energy mix, will either play a smaller part than today or be linked to carbon dioxide (CO<sub>2</sub>) capture and storage — if that proves technically, environmentally and economically feasible. The government will continue to support relevant research projects, including internationally, to develop options for cleaner coal technologies and for carbon capture and storage. Domestic coal production is 'likely to continue to decline as existing pits reach the end of their geological and economic lives'. The British Geological Survey (BGS) is involved in a number of European and international evaluations of the feasibility of underground CO<sub>2</sub> storage. These include an actual demonstration project in Canada and current evaluations at offshore sites in the North Sea. The BGS is also evaluating possible sites in offshore locations.

### United Kingdom production and value of coal 1970–2002



## Great Britain production of deep-mined and opencast coal 1975–2002

Thousand tonnes

Year	Deep-mined			Opencast			Deep-mined and opencast		
	Anthracite	Bituminous	Total	Anthracite	Bituminous	Total	Anthracite	Bituminous	Total
1975	1 407	116 005	117 412	1 127	9 287	10 414	2 534	125 292	127 826
1976	1 249	109 016	110 265	1 114	10 830	11 944	2 363	119 846	122 209
1977	1 209	105 914	107 123	1 320	12 231	13 551	2 529	118 145	120 674
1978	1 453	106 075	107 528	1 499	12 668	14 167	2 952	118 743	121 695
1979	1 693	106 082	107 775	1 337	11 525	12 862	3 030	117 607	120 637
1980	1 607	110 823	112 430	1 295	14 484	15 779	2 902	125 307	128 209
1981	1 566	108 907	110 473	1 343	13 485	14 828	2 909	122 392	125 301
1982	1 406	104 755	106 161	1 478	13 788	15 266	2 884	118 543	121 427
1983	1 249	100 493	101 742	767	13 939	14 706	2 016	114 432	116 448
1984	256	34 987	35 243	961	13 345	14 306	1 217	48 332	49 549
1985	838	74 451	75 289	1 304	14 265	15 569	2 142	88 716	90 858
1986	984	89 382	90 366	1 001	13 274	14 275	1 985	102 656	104 641
1987	917	85 040	85 957	1 174	14 612	15 786	2 091	99 652	101 743
1988	770	82 992	83 762	1 028	16 871	17 899	1 798	99 863	101 661
1989	453	79 175	79 628	1 607	17 050	18 657	2 060	96 225	98 285
1990	573	72 326	72 899	1 372	16 762	18 134	1 945	89 088	91 033
1991	189	73 168	73 357	1 675	16 961	18 636	1 864	90 129	91 993
1992	177	65 623	65 800	1 863	16 324	18 187	2 040	81 947	83 987
1993	115	50 342	50 457	1 289	15 717	17 006	1 404	66 059	67 463
1994	...	...	31 854	...	...	16 804	...	...	48 658
1995	...	...	35 150	...	...	16 369	...	...	51 519
1996	...	...	32 223	...	...	16 315	...	...	48 538
1997	...	...	30 281	...	...	16 700	(a) 2 500	(a) 44 500	46 981
1998	...	...	25 731	...	...	14 315	(a) 2 000	(a) 38 000	40 046
1999	...	...	20 888	...	...	15 275	(a) 2 000	(a) 34 200	36 163
2000	...	...	17 187	...	...	13 412	(a) 2 000	(a) 28 600	30 599
2001	...	...	17 347	...	...	14 166	(a) 2 000	(a) 29 500	31 513
2002	...	...	16 391	...	...	13 148	(a) 2 000	(a) 27 500	29 539

(a) BGS estimate.

Source: Department of Trade and Industry.

## United Kingdom regional deep-mined coal production 1998–2003 (a)

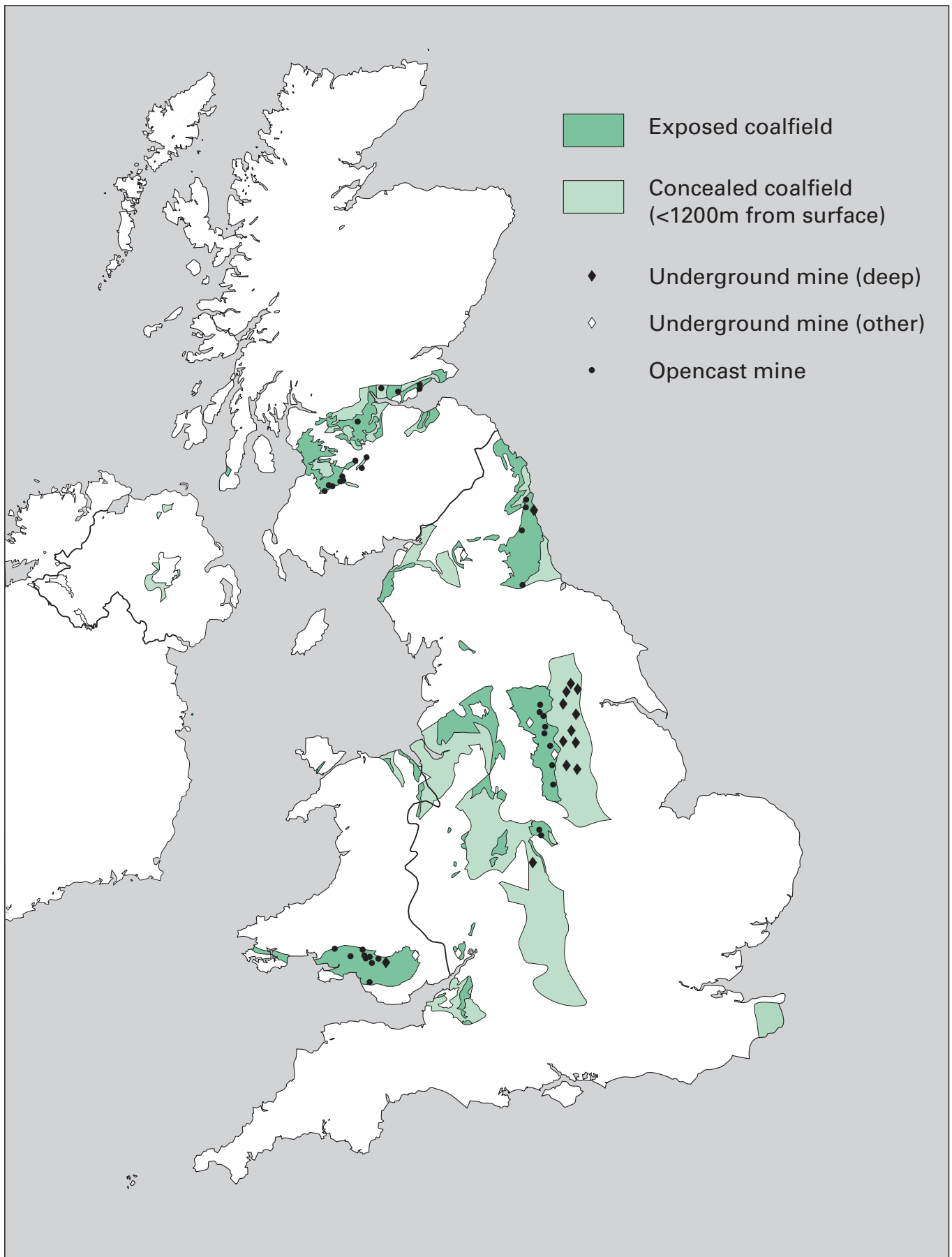
Thousand tonnes

County/Unitary Authority	1998/99	1999/00	2000/01	2001/02	2002/03
Doncaster	1 006	2 728	991	675	1 070
Kirklees	39	41	34	31	31
Sheffield	20	27	23	22	—
Rotherham	1 334	1 194	931	1 499	1 587
Wakefield	1 564	1 342	1 354	1 177	414
Leicestershire	—	—	—	—	—
Warwickshire	1 494	1 150	1 951	1 582	663
Derbyshire	—	—	—	—	22
Nottinghamshire	6 257	4 192	4 272	4 650	4 733
Durham	23	6	—	—	—
Northumberland	1 211	924	394	840	800
North Yorkshire	7 888	6 349	5 991	6 174	5 719
Lancashire	1	0	—	1	0
Cumbria	1	1	1	0	—
Staffordshire	557	—	—	—	—
Gloucestershire	0	0	0	0	1
<b>England</b>	<b>21 397</b>	<b>17 954</b>	<b>15 942</b>	<b>16 652</b>	<b>15 039</b>
Blaenau Gwent	1	2	1	0	—
Caerphilly	0	—	—	—	—
Merthyr Tydfil	6	1	—	—	—
Rhondda, Cynon Taff	506	460	569	567	632
Carmarthenshire	102	80	40	51	84
Neath Port Talbot	76	43	39	50	43
Torfaen	19	18	17	6	7
<b>Wales</b>	<b>710</b>	<b>604</b>	<b>666</b>	<b>674</b>	<b>765</b>
Clackmannanshire	1 600	996	728	756	—
West Lothian	10	—	—	—	—
<b>Scotland</b>	<b>1 611</b>	<b>996</b>	<b>728</b>	<b>756</b>	<b>—</b>
<b>United Kingdom</b>	<b>23 717</b>	<b>19 553</b>	<b>17 336</b>	<b>18 082</b>	<b>15 805</b>

(a) Financial years to March.

Source: The Coal Authority.

United Kingdom onshore coal fields and mines 2003 (a)



(a) At January 2004. Due to the close siting of some opencast mines, a map symbol may represent more than one mine.  
Source: BGS and The Coal Authority

## United Kingdom regional opencast coal production 1998–2003 (a)

Thousand tonnes

County/Unitary Authority	1998/99	1999/00	2000/01	2001/02	2002/03
Barnsley	241	177	67	261	398
Rotherham	457	519	446	525	428
Wakefield	15	215	50	—	194
Leicestershire	128	183	535	606	608
Warwickshire	8	23	36	—	—
Derbyshire	1 510	861	600	706	699
Durham	404	403	233	184	170
Gateshead	—	—	—	73	54
Newcastle upon Tyne	16	—	—	—	—
Northumberland	2 223	1 805	1 802	1 697	1 625
Leeds	800	908	752	728	685
Sunderland	313	243	61	—	—
Shropshire	25	34	7	—	—
St Helens	19	54	50	41	76
Cumbria	49	173	111	70	16
Staffordshire	420	372	—	—	—
Walsall	143	123	6	—	—
Wigan	186	71	—	—	—
Stoke on Trent	—	—	13	—	—
<b>England</b>	<b>6 956</b>	<b>6 163</b>	<b>4 768</b>	<b>4 890</b>	<b>4 953</b>
Blaenau Gwent	—	—	—	10	7
Merthyr Tydfil	375	—	—	—	—
Carmarthenshire	21	—	—	0	0
Neath Port Talbot	725	925	1 133	955	423
Powys	375	186	268	214	331
Flintshire	12	—	—	—	—
Bridgend	—	429	—	—	309
<b>Wales</b>	<b>1 507</b>	<b>1 540</b>	<b>1 401</b>	<b>1 178</b>	<b>1 070</b>
Clackmannanshire	122	391	165	211	150
East Lothian	287	524	43	—	—
Falkirk	7	—	—	—	—
Midlothian	197	253	139	341	215
Perth & Kinross	9	—	—	—	—
West Lothian	74	11	—	—	—
East Ayrshire	2 369	2 883	3 469	4 528	4 183
Fife	579	605	804	763	739
North Lanarkshire	559	716	756	651	425
South Lanarkshire	2 232	1 841	1 701	1 674	1 368
<b>Scotland</b>	<b>6 434</b>	<b>7 224</b>	<b>7 078</b>	<b>8 170</b>	<b>7 080</b>
<b>United Kingdom</b>	<b>14 897</b>	<b>14 927</b>	<b>13 247</b>	<b>14 238</b>	<b>13 103</b>

(a) Financial years to March.

Source: The Coal Authority.

## United Kingdom summary 1998–2002

Commodity	Tonnes					£ thousand				
	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
<b>Coal</b>										
<i>Production</i>	41 177 000	37 077 000	31 197 000	31 930 000	29 989 000					
<i>Consumption</i>	63 152 000	55 724 000	58 862 000	64 245 000	58 642 000					
<i>Imports</i>										
Anthracite	501 809	602 346	1 057 911	2 757 188	1 550 849	28 274	30 330	39 693	101 548	52 678
Bituminous	20 742 610	20 167 409	22 397 393	32 772 976	27 110 435	612 276	547 249	629 432	1 078 272	797 166
<b>Total</b>	<b>21 244 419</b>	<b>20 769 755</b>	<b>23 455 304</b>	<b>35 530 164</b>	<b>28 661 284</b>	<b>640 550</b>	<b>577 579</b>	<b>669 125</b>	<b>1 179 820</b>	<b>849 844</b>
Briquettes of coal	10 962	8 298	16 221	10 908	17 025	1 404	688	1 597	1 274	1 811
Lignite (including agglomerated)	2 593	949	976	3 362	1 336	764	56	49	204	203
<i>Exports</i>										
Anthracite	282 025	335 907	304 387	272 985	187 372	17 988	19 469	15 868	14 961	11 267
Bituminous	688 621	439 022	616 291	309 560	341 627	25 485	20 492	24 226	19 075	19 098
<b>Total</b>	<b>970 646</b>	<b>774 929</b>	<b>920 678</b>	<b>582 545</b>	<b>528 999</b>	<b>43 473</b>	<b>39 961</b>	<b>40 094</b>	<b>34 036</b>	<b>30 365</b>
Briquettes of coal	56 840	52 636	76 679	76 419	63 126	5 015	4 054	5 501	6 314	5 272
Lignite (including agglomerated)	3 493	4 740	2 475	2 938	3 670	356	383	248	308	688

# Cobalt

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Cobalt</b>										
<i>Consumption in Iron and Steel Industry (a)</i>										
	20	20	20	20	20					
<i>Apparent consumption (a) (b)</i>	1 500	2 600	1 600	1 500	2 300					
<i>Imports</i>										
Scrap	591	578	515	756	362	4 650	3 938	3 608	7 724	1 889
Ash and residues	18	5	38	1	...	30	62	32	4	...
Unwrought	3 088	3 625	2 781	2 646	3 201	69 446	58 768	39 752	34 076	28 560
Wrought	270	231	590	785	473	6 960	4 614	8 259	8 393	6 812
Oxides	672	504	496	641	487	11 836	5 437	6 012	6 858	3 092
<i>Exports</i>										
Scrap	642	655	379	474	212	5 454	3 645	2 823	3 119	1 257
Unwrought	891	685	787	737	522	18 076	15 656	14 476	12 960	8 956
Wrought	468	453	465	644	386	15 754	14 501	13 055	14 474	11 714
Oxides	1 323	1 012	1 141	1 256	1 233	28 295	13 912	14 504	14 111	11 072

(a) Metal content.

(b) BGS estimates; see p.v.

# Coke and breeze

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Coke and breeze</b>										
<i>Production</i>										
Coke oven										
–coke	6 178 000	5 837 000	6 058 000	5 306 000	4 335 000					
–breeze	37 000	33 000	148 000	210 000	224 000					
<i>Consumption</i>										
Coke oven coke	5 432 000	5 640 000	5 316 000	4 394 000	3 658 000					
Breeze	1 190 000	1 109 000	1 036 000	1 120 000	1 075 000					
<i>Imports</i>										
Coke from coal	830 873	429 438	482 561	139 041	200 809	44 900	18 996	24 942	11 407	14 092
<i>Exports</i>										
Coke from coal	288 637	249 577	380 146	314 024	312 724	17 786	15 254	23 615	19 604	19 175
Coke from lignite	3 670	4 294	6 898	5 253	4 660	642	646	552	578	522

# Copper

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002
	Tonnes				
<b>Copper</b>					
<i>Production</i>					
Unwrought–					
Refined, primary	7 000	1 000	—	—	—
Refined, secondary	47 000	49 000	—	—	—
Total	53 774	50 334	—	—	—
<i>Consumption</i>					
Unwrought–					
Refined	374 125	305 290	322 748	285 880	260 663
Copper in scrap for direct use (a)	65 000	112 000	132 000	127 000	120 000

(a) Additional to that used in secondary metal.

*continued*

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Copper continued</b>										
<i>Imports</i>										
Ores and concentrates	499	510	517	756	789	515	1 769	2 296	1 391	900
Matte and cement	58	428	17	92	19	115	394	59	308	69
Scrap	54 483	35 572	20 597	19 651	19 240	39 532	21 700	15 839	16 349	16 505
Ash and residues	43	1 466	122	0	87	20	47	7	1	286
Unwrought–										
Unrefined	236	629	1 085	290	89	263	730	1 339	1 467	206
Refined	348 509	303 267	337 969	310 894	316 578	373 351	294 293	415 445	368 498	330 378
Alloys	5 050	4 191	6 641	6 088	4 363	6 701	4 902	8 783	8 444	5 813
Master alloys	373	774	684	1 161	1 117	634	1 223	1 237	1 714	1 663
<i>Exports</i>										
Matte and cement	8 524	9 662	6 704	10 931	10 724	4 862	6 467	4 345	4 662	3 909
Scrap	108 407	107 527	217 016	156 121	163 579	89 440	79 948	128 092	119 579	120 540
Ash and residues	2 045	2 864	2 409	1 873	1 075	394	396	460	430	187
Unwrought–										
Unrefined	41	199	450	69	259	173	389	533	347	1 955
Refined	9 735	8 449	10 121	10 246	32 017	11 399	7 458	11 585	12 002	30 496
Alloys	23 336	31 618	17 823	19 689	22 718	29 991	33 872	22 145	25 656	24 456
Master alloys	5 460	3 994	3 405	4 119	3 948	8 380	4 906	4 664	6 318	5 970

## Crushed rock (also see Aggregates)

### Great Britain production of crushed rock by Region 1975–2002

Year	Thousand tonnes											
	North East (a)	North West (b)	Yorks. & Humberside	West Midlands	East Midlands	East of England (c)	South East (d)	South West	England	Wales	Scotland	Great Britain
1975	10 714	5 037	10 082	8 693	18 282	...	...	23 059	78 276	15 346	15 971	109 594
1976	11 363	4 285	9 483	7 903	16 094	...	...	...	70 714	14 091	13 520	98 325
1977	10 401	4 414	9 492	7 526	15 911	584	1 244	19 549	69 121	13 352	11 931	94 404
1978	10 926	5 235	9 913	7 601	15 375	693	1 296	19 965	71 006	14 164	13 567	98 737
1979	10 731	5 779	9 502	7 974	16 817	741	1 158	21 205	73 910	15 912	13 687	103 509
1980	9 948	4 951	10 714	7 364	15 996	658	1 114	21 934	72 679	15 998	13 586	102 533
1981	8 677	4 504	9 442	6 713	15 854	534	961	18 763	65 450	14 249	11 681	91 381
1982	9 362	4 779	10 108	8 181	17 237	537	1 112	21 175	72 492	16 754	13 602	102 848
1983	8 978	5 311	11 481	9 192	19 206	...	...	23 178	79 541	18 835	13 706	112 082
1984	9 668	5 116	9 557	8 861	19 142	...	...	25 107	79 650	16 965	14 063	110 678
1985	9 823	5 330	9 444	8 589	21 429	674	1 404	26 510	83 203	17 423	14 370	114 995
1986	9 861	5 469	11 201	8 780	23 038	500	1 597	29 194	89 640	17 881	14 844	122 365
1987	10 375	5 328	15 407	10 015	26 355	772	1 601	34 443	104 296	20 950	16 990	142 237
1988	11 453	6 849	14 885	12 519	32 026	853	2 589	39 108	120 283	23 102	17 629	161 014
1989	13 497	7 078	16 895	12 519	32 646	611	3 254	37 589	124 088	23 581	21 125	168 794
1990	14 602	7 533	15 449	11 047	34 143	709	1 320	33 073	117 875	22 646	21 094	161 615
1991	13 378	6 320	14 269	10 009	29 862	676	1 625	28 037	104 177	22 123	21 707	148 007
1992	12 669	5 899	12 812	8 783	29 879	...	...	28 564	100 553	21 482	21 932	143 967
1993	12 724	6 748	12 734	8 225	31 522	625	1 168	29 848	103 595	23 237	22 743	149 576
1994	13 365	7 892	15 576	8 839	33 713	1 705	1 433	32 141	114 665	24 346	22 746	161 757
1995	10 930	8 077	15 664	...	31 881	629	...	27 419	103 475	23 139	24 224	150 838
1996	10 385	6 448	12 350	6 514	29 001	595	1 210	22 940	89 444	21 273	22 177	132 894
1997	10 619	7 086	12 484	6 416	29 925	536	1 352	23 117	91 535	20 585	21 667	133 787
1998	10 246	6 348	13 745	6 028	26 933	607	1 358	23 411	88 675	19 903	23 138	131 716
1999	9 298	5 829	11 689	5 996	30 724	575	1 343	23 183	88 637	20 429	23 531	132 598
2000	5 441	10 381	11 748	5 533	28 679	475	1 624	24 146	88 027	19 044	23 236	130 307
2001	6 338	9 601	11 718	5 688	30 780	452	1 984	28 067	94 630	17 765	21 364	133 759
2002	5 390	9 426	11 620	5 835	29 604	372	1 068	24 332	87 647	16 724	22 198	126 568

(a) From 2000, excludes Cumbria.

(b) From 2000, includes Cumbria.

(c) From 2000, includes Essex, Hertfordshire and Bedfordshire.

(d) From 2000, excludes Essex, Hertfordshire and Bedfordshire.

Source: Office for National Statistics.

## Great Britain production of crushed rock by end-use and area of origin 2002

Thousand tonnes

Area of origin	Crushed rock					
	Roadstone			Fill and ballast	Concrete aggregate	Total
	Sold coated	For coating at remote plants	Uncoated			
North East	545	626	1 255	1 993	971	5 390
North West	503	970	720	4 558	2 676	9 426
Yorkshire and Humberside	434	1 279	3 255	3 416	3 236	11 620
West Midlands	1 376	965	...	...	348	5 835
East Midlands	2 165	5 038	5 827	11 530	5 045	29 604
East of England	—	—	...	...	—	372
South East	—	—	65	921	82	1 068
South West	1 910	1 190	5 145	9 589	6 498	24 332
<b>England</b>	<b>6 933</b>	<b>10 069</b>	<b>18 179</b>	<b>33 611</b>	<b>18 855</b>	<b>87 647</b>
<b>Wales</b>	<b>1 775</b>	<b>1 565</b>	<b>1 938</b>	<b>6 508</b>	<b>4 937</b>	<b>16 724</b>
<b>Scotland</b>	<b>1 729</b>	<b>1 210</b>	<b>7 206</b>	<b>9 503</b>	<b>2 550</b>	<b>22 198</b>
<b>Great Britain</b>	<b>10 437</b>	<b>12 844</b>	<b>37 323</b>	<b>49 622</b>	<b>26 342</b>	<b>126 568</b>

Source: Office for National Statistics.

## Great Britain production of crushed rock for aggregate 2002

Thousand tonnes

Mineral	Roadstone			Railway ballast	Other constructional uses	Concrete aggregate	Total
	Sold coated	For coating at remote plants	Uncoated				
Limestone (inc. dolomite)	4 664	4 194	15 308	—	26 577	20 112	70 855
Igneous rock	4 748	6 275	10 326	3 324	14 866	4 747	44 286
Sandstone	1 026	2 376	1 689	190	4 666	1 483	11 430
<b>Total</b>	<b>10 437</b>	<b>12 844</b>	<b>27 323</b>	<b>3 514</b>	<b>46 109</b>	<b>26 342</b>	<b>126 568</b>

Source: Office for National Statistics.

## Great Britain production of crushed rock by end-use 1991–2002

Thousand tonnes

Year	Roadstone		Railway ballast	Fill	Concrete aggregate	Total
	Coated	Uncoated				
1991	26 387	60 748	2 817	42 852	15 203	148 007
1992	26 647	53 471	3 150	45 770	14 930	143 967
1993	27 238	54 412	(a) 2 620	49 521	15 786	149 576
1994	28 512	51 121	(a) 2 300	63 479	16 345	161 757
1995	28 972	49 307	(a) 2 916	53 224	16 419	150 838
1996	26 270	40 893	(a) 2 061	48 921	14 748	132 894
1997	23 906	40 186	(a) 2 304	49 092	18 300	133 787
1998	23 131	36 816	(a) 2 481	49 142	20 146	131 716
1999	22 260	38 114	(a) 2 196	49 948	20 080	132 598
2000	21 785	36 509	(a) 2 189	51 228	18 595	130 307
2001	23 340	34 638	(a) 2 682	44 543	28 556	133 759
2002	23 281	27 323	3 514	46 109	26 342	126 568

(a) BGS estimate.

Source: Office for National Statistics.



## Great Britain production of crushed rock, gravel and sand for use in concrete, 1991–2002

Thousand tonnes

Year	Sandstone	Igneous rock	Limestone and dolomite	Gravel (a)	Concreting sand (a)	Total
1991	590	2 951	11 663	29 445	31 239	75 888
1992	527	2 890	11 513	28 078	28 573	71 581
1993	589	2 366	12 831	27 215	28 021	71 022
1994	434	2 744	13 166	29 600	30 977	76 921
1995	652	3 022	12 745	27 867	29 390	73 676
1996	498	2 914	11 337	26 020	28 659	69 428
1997	324	3 490	14 486	28 235	30 130	76 665
1998	686	3 749	15 711	30 369	30 244	80 759
1999	773	3 998	15 309	30 349	31 730	82 159
2000	738	3 811	14 046	30 753	31 167	80 515
2001	1 425	6 351	20 780	29 969	31 656	90 181
2002	1 483	4 747	20 112	27 699	31 224	85 265

(a) Including marine-dredged material landed at British ports.

Source: Office for National Statistics.

## Great Britain production of crushed rock for use as roadstone, 1991–2002

Thousand tonnes

Year	Sandstone		Igneous rock		Limestone and dolomite		Total	
	Coated	Uncoated	Coated	Uncoated	Coated	Uncoated	Coated	Uncoated
1991	2 373	4 290	10 955	16 635	13 060	39 823	26 387	60 748
1992	2 377	2 854	11 850	16 229	12 420	34 388	26 647	53 471
1993	2 273	2 819	12 874	17 187	12 089	34 405	27 236	54 411
1994	2 460	2 824	13 136	14 257	12 916	34 041	28 512	51 122
1995	3 227	2 743	12 297	13 932	13 448	32 631	28 972	49 307
1996	2 944	2 910	11 789	12 431	11 537	25 552	26 270	40 893
1997	2 835	2 741	10 947	12 392	10 124	25 054	23 906	40 186
1998	3 506	2 689	9 273	10 100	10 352	24 027	23 131	36 816
1999	3 140	2 326	9 945	13 307	9 175	22 481	22 260	38 114
2000	3 315	2 201	9 890	13 394	8 580	20 915	21 785	36 509
2001	3 216	1 731	9 523	10 547	10 602	22 360	23 340	34 638
2002	3 402	1 689	11 023	10 326	8 858	15 308	23 281	27 323

Source: Office for National Statistics.

## Great Britain production of crushed rock for railway ballast, 1991–2002

Thousand tonnes

Year	Sandstone	Igneous rock	Limestone/Dolomite	Total
1991	206	2 320	291	2 817
1992	153	2 564	433	3 150
1993	(a) 180	2 236	(a) 204	(a) 2 620
1994	(a) 463	1 826	(a) 11	(a) 2 300
1995	(a) 441	2 393	(a) 82	(a) 2 916
1996	(a) 339	1 643	(a) 79	(a) 2 061
1997	(a) 343	1 870	(a) 89	(a) 2 304
1998	(a) 351	2 008	(a) 122	(a) 2 481
1999	(a) 138	1 959	(a) 99	(a) 2 196
2000	(a) 100	1 965	(a) 100	(a) 2 189
2001	(a) 150	2 341	(a) 150	(a) 2 682
2002	190	3 324	—	3 514

(a) BGS estimate.

Source: Office for National Statistics.

## England production of crushed rock by end-use 1991–2002

Thousand tonnes

Year	Roadstone		Fill and ballast	Concrete aggregate	Total
	Coated	Uncoated			
1991	19 522	42 555	31 364	10 735	104 177
1992	19 345	38 255	31 649	11 304	100 553
1993	19 831	38 856	33 342	11 566	103 595
1994	20 563	36 478	46 133	11 489	114 665
1995	20 584	35 599	35 858	11 433	103 475
1996	18 381	28 932	31 992	10 139	89 444
1997	17 405	28 125	33 252	12 754	91 535
1998	16 076	25 516	33 080	14 003	88 675
1999	15 663	24 338	34 754	13 882	88 637
2000	15 618	23 568	35 500	13 340	88 027
2001	17 202	24 333	31 518	21 578	94 630
2002	17 002	18 179	33 611	18 855	87 647

Source: Office for National Statistics.

## Wales production of crushed rock by end-use 1991–2002

Thousand tonnes

Year	Roadstone		Fill and ballast	Concrete aggregate	Total
	Coated	Uncoated			
1991	...	9 441	...	2 785	22 123
1992	3 652	7 609	...	...	21 482
1993	3 645	7 314	9 330	2 949	23 237
1994	3 905	7 045	10 004	3 392	24 346
1995	3 747	6 714	9 344	3 335	23 139
1996	3 687	5 504	8 921	3 161	21 273
1997	3 235	4 827	8 946	3 575	20 585
1998	3 318	4 222	8 445	3 919	19 903
1999	3 342	4 868	8 268	3 951	20 429
2000	2 748	3 269	9 532	3 495	19 044
2001	3 269	2 436	7 212	4 848	17 765
2002	3 340	1 938	6 508	4 937	16 724

Source: Office for National Statistics.

## Scotland production of crushed rock by end-use 1991–2002

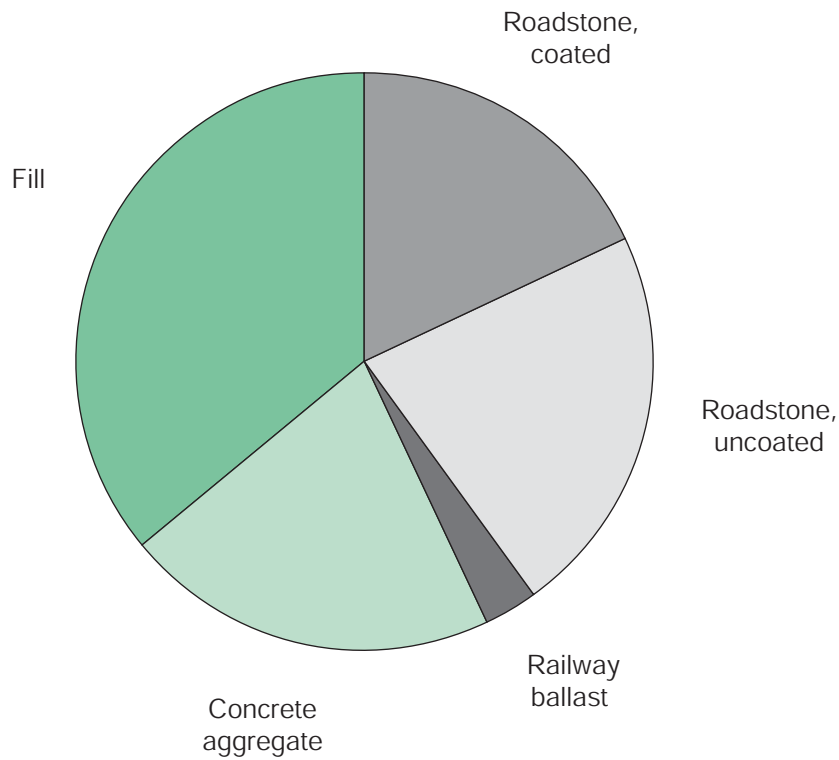
Thousand tonnes

Year	Roadstone		Fill and ballast	Concrete aggregate	Total
	Coated	Uncoated			
1991	...	8 752	...	1 683	21 707
1992	3 650	7 608	...	...	21 932
1993	3 762	8 242	9 468	1 271	22 743
1994	4 043	7 598	9 641	1 464	22 746
1995	4 640	6 994	10 937	1 652	24 224
1996	4 203	6 457	10 069	1 449	22 177
1997	3 266	7 233	9 198	1 971	21 667
1998	3 738	7 077	10 098	2 224	23 138
1999	3 255	8 907	9 122	2 247	23 531
2000	3 420	9 672	8 385	1 760	23 236
2001	2 870	7 869	8 495	2 130	21 364
2002	2 939	7 206	9 503	2 550	22 198

Source: Office for National Statistics.

Great Britain production of crushed rock by end-use 2002

(total production 126.6 million tonnes)



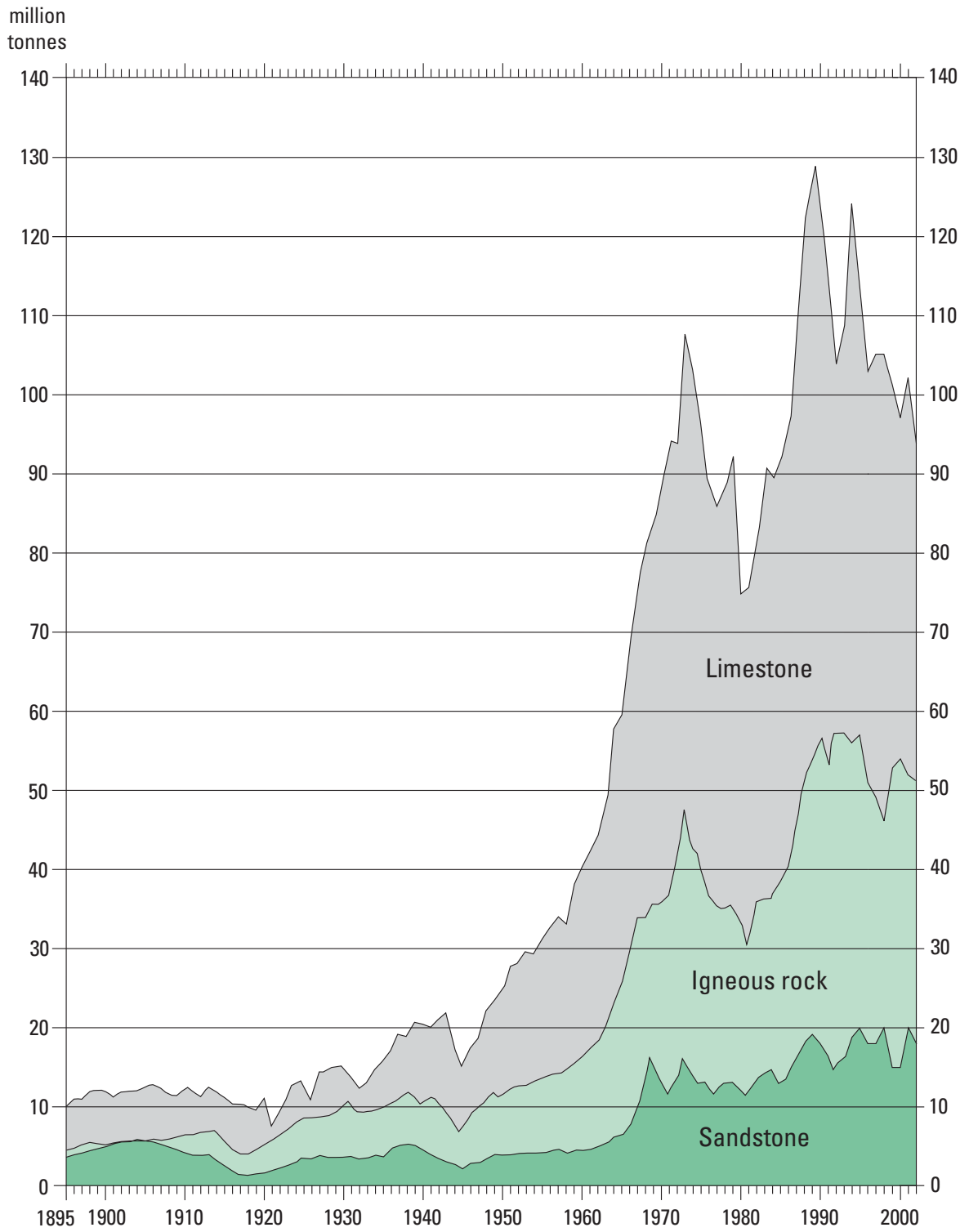
United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Crushed rock</b>										
<i>Production</i>										
Crushed rock (a)	131 716 000	132 598 000	130 307 000	133 759 000	126 568 000					
<i>Imports</i>										
Crushed rock (b)	348 613	458 980	347 048	409 174	572 971	6 515	7 125	7 771	7 253	9 083
<i>Exports</i>										
Crushed rock	2 812 368	2 982 440	2 402 611	3 367 217	3 593 951	16 720	11 300	9 782	15 089	13 989

(a) Great Britain only.

(b) For a number of years, a significant amount of crushed rock imports are believed to have been wrongly classified as 'granite, unworked'. In 2002, BGS estimate that crushed rock imports should be approximately 2 200 000 tonnes.

United Kingdom production of sandstone, igneous rock and limestone (including dolomite) 1895–2002



# Cryolite

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Cryolite</b>										
<i>Imports</i>										
Natural cryolite	276	103	673	123	...	1 067	68	336	64	...
<i>Exports</i>										
Natural cryolite	157	211	301	137	...	134	101	189	93	...

# Diamond

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Carats					£ thousand				
<b>Diamond</b>										
<i>Imports</i>										
Unsorted Gem-	10 211 264	4 676 550	5 560 568	586 774	1 794 607	384 549	152 344	216 719	31 661	80 423
Rough	105 803 662	151 651 213	79 691 733	81 302 570	70 336 037	2 212 245	3 655 177	4 160 309	4 211 641	3 094 473
Cut	6 694 184	4 809 531	6 423 082	4 396 223	5 123 898	532 256	630 116	691 740	621 099	794 171
Industrial	28 797 763	8 406 120	16 208 556	7 344 542	7 804 225	81 619	11 461	17 853	12 334	11 694
Dust	82 518 395	64 953 625	98 133 490	74 756 325	68 359 660	14 892	12 743	15 162	14 266	10 902
<i>Exports</i>										
Unsorted Gem-	5 794 334	2 784 476	8 616 140	4 030 600	...	262 423	154 677	398 825	285 275	274 317
Rough	65 595 954	63 338 299	61 757 031	69 542 709	86 681 020	1 904 688	2 877 477	3 552 051	3 754 316	3 743 858
Cut	1 729 965	1 706 334	795 268	899 959	394 881	383 084	394 650	358 908	410 299	476 463
Industrial	35 394 187	29 978 880	27 030 867	11 861 312	7 837 074	29 220	23 127	27 900	19 047	17 199
Dust	56 682 115	49 034 945	...	88 612 930	...	13 905	11 458	14 352	13 667	12 027

# Diatomite

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Diatomite</b>										
<i>Imports</i>										
Diatomite (a)	42 274	30 885	35 561	33 474	34 490	7 117	6 685	6 607	6 044	5 917
<i>Exports</i>										
Diatomite (a)	705	565	511	1 342	816	531	741	665	1 125	515

(a) Officially recorded under the heading 'Siliceous fossil meals and similar siliceous earths'. Excludes flux calcined diatomite.

# Dolomite (see Limestone)

# Feldspar

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Feldspar etc.</b>										
<i>Production</i>										
China stone	3 278	2 448	3 645	2 995	1 896					
<i>Imports</i>										
Feldspar	18 208	25 707	25 743	18 361	33 196	1 416	1 585	1 436	1 194	905
Nepheline-syenite	34 145	(a) 48 361	(a) 50 363	57 268	53 692	3 415	...	...	4 142	4 627
<i>Exports</i>										
Feldspar	148	131	101	93	209	130	130	25	20	36
Nepheline-syenite	38	17	36	54	82	19	10	15	16	31

(a) Exports from Canada and Norway.

# Fireclay

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Fireclay</b>										
<i>Production (a)</i>										
	577 000	545 000	595 000	459 000	491 000					
<i>Imports</i>										
Fireclay	3 159	241	220	260	111	274	99	89	459	197
Fireclay bricks, etc.	1 777	4 214	1 309	3 315	3 262	1 194	1 779	834	1 385	1 163
Refractory hollow-ware	1 609	1 863	2 227	1 860	996	2 186	2 135	2 038	2 725	2 234
<i>Exports</i>										
Fireclay	1 124	639	525	611	439	653	467	471	250	175
Fireclay bricks, etc.	8 375	8 371	2 252	1 956	2 312	2 436	2 814	1 482	1 751	2 157
Refractory hollow-ware	2 593	3 322	4 380	2 944	3 055	11 153	11 878	11 681	13 537	9 754

(a) Great Britain only. There is a small, undisclosed production in Northern Ireland.

## Great Britain production of fireclay by end-use and area of origin 2002

Thousand tonnes

Area of origin	Refractory purposes	Bricks, pipes and tiles	Other uses	Total
Northumberland	67	—	—	67
<b>North East</b>	<b>67</b>	—	—	<b>67</b>
West Yorkshire	—	16	—	16
South Yorkshire	—	...	—	...
<b>Yorkshire and Humberside</b>	—	...	—	...
Leicestershire	...	...	...	...
<b>East Midlands</b>	...	...	...	...
Shropshire	47	—	—	47
Staffordshire	—	25	—	25
<b>West Midlands</b>	<b>47</b>	<b>25</b>	—	<b>72</b>
Buckinghamshire	—	6	—	6
Kent	—	—	1	1
<b>South East</b>	—	<b>7</b>	<b>1</b>	<b>8</b>
<b>England</b>	...	...	...	<b>449</b>
Central	42	—	—	42
<b>Scotland</b>	<b>42</b>	—	—	<b>42</b>
<b>Great Britain</b>	...	...	...	<b>491</b>

Source: Office for National Statistics.

## Great Britain production of fireclay by end-use 1991–2002

Thousand tonnes

Year	Refractory purposes	Bricks, pipes and tiles	Other uses	Total
1991	...	475	...	867
1992	...	414	...	572
1993	85	364	30	479
1994	...	550	...	679
1995	201	441	67	708
1996	129	395	13	536
1997	170	168	—	338
1998	...	331	...	577
1999	...	243	...	545
2000	...	287	...	595
2001	...	170	...	459
2002	...	...	...	491

Source: Office for National Statistics.

## Fluorspar

Fluorspar is the commercial term for the mineral fluorite (calcium fluoride, CaF<sub>2</sub>), which is the most important, and only UK source of the element fluorine (F). All UK output is of acid-grade fluorspar (>97%, CaF<sub>2</sub>), and most is used in the production of hydrofluoric acid (HF), the starting point for the manufacture of a wide range of fluorine-bearing chemicals. Sales of acid-grade fluorspar were some 53 000 tonnes in 2002, almost all of which was derived from ore produced in the Southern Pennine Orefield in the Peak District National Park. Sales of acid-grade fluorspar increased to about 56 000 tonnes in 2003.

Trade data for fluorspar separately distinguishes between fluorspar containing more than and less than 97 per cent CaF<sub>2</sub>. The former corresponds to acid-grade fluorspar. Imports of acid-grade fluorspar in 2002 were 20 514 tonnes valued at £1.98 million and mostly derived from Spain.

Glebe Mines Ltd, a privately-owned company, is the sole producer of marketable fluorspar product in the UK. The company operates the Cavendish Mill, near Stoney Middleton for the supply of acid-grade fluorspar, together with by-product barytes, lead concentrate and limestone aggregate. The Cavendish Mill is the second-most important source of barytes in the UK and the only source of galena (PbS). Fluorspar ore, with associated barytes and galena, is obtained mainly from the company's own open pit operations on Longstone Edge. The Watersaw mine, also on Longstone Edge, supplied small amounts of ore during 2003. Local tributaries meet about 20 per cent of the company's ore requirement, which is about 350 000 – 400 000 t/y. As individual deposits are relatively small, a continuous exploration programme is required to identify new deposits and process them through the planning system. The company was granted planning permission on a deposit at Winster Moor, near Winster during 2003. The deposit, which contains 376 000 tonnes of vein minerals (fluorspar, barytes and galena) in an extraction area of 3.4 ha, will be worked over four years with an additional year to complete reinstatement of the site.

Acid-grade fluorspar is a critical raw material for the UK fluorochemicals industry. Most UK output (95 per cent) is used by two companies – INEOS Fluor at Runcorn and Rhodia at Avonmouth for the manufacture of HF. Hydrofluoric acid is an important product in its own right and, for example, is used in the manufacture of high-octane petrol. However, it is the key intermediate for the manufacture of all specialty fluorine-bearing chemicals, notably fluorocarbons. Demand for fluorspar in the UK is, therefore, principally driven by demand for HF and associated fluorochemicals production. Fluorine chemicals have many uses, including in refrigeration and air-conditioning systems, as foam blowing agents, non-stick coatings, aerosols, including medical propellants, anaesthetics, in pharmaceutical products and for specialised cleaning applications.

China accounts for more than 50 per cent of the world's fluorspar output and exports come under an export licence system. The volumes released for export have declined in recent years and, according to official Chinese export data, fell by 60 000 tonnes in 2003 to 950 000 tonnes. As a result there has been an increase in price for acid-grade fluorspar.

### United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Fluorine</b>										
<i>Production</i>										
Fluorspar (a)	65 000	40 000	36 000	50 000	53 000					
<i>Imports</i>										
Fluorspar	41 610	(a) 43 000	(a) 40 000	34 999	26 690	3 598	...	...	3 236	2 483
Natural cryolite	276	103	673	123	...	1 067	68	336	64	...
<i>Exports</i>										
Fluorspar	4 202	4 829	4 879	2 373	636	717	798	974	376	127
Natural cryolite	157	211	301	137	...	134	101	189	93	...

(a) BGS estimates.

## Fuller's earth

Fuller's earth is a sedimentary clay that contains a high proportion of clay minerals of the smectite group, the most important of which is montmorillonite. The smectite clay minerals exhibit a unique combination of properties, including a high 'cation-exchange capacity'. This means that Ca-smectite, the principal constituent of British fuller's earths, can readily be converted to Na-smectite by a simple process involving the addition of small amounts of sodium carbonate. It is commercial practice in Britain to refer to this sodium-exchanged clay, which exhibits markedly different properties, as bentonite.

Sales of fuller's earth, most of which are in the sodium-exchanged form (bentonite), declined from 44 000 tonnes in 2002 to an estimated 34 000 dry tonnes in 2003, reflecting the continuing depletion of permitted reserves. UK imports of bentonite in 2002 were 216 022 tonnes valued at £12.2 million.

Fuller's earth is produced by two companies in the UK: Rockwood Absorbents (Baulking) Ltd and Steetley Bentonite and Absorbents Ltd. Rockwood Absorbents (Baulking) Ltd produces fuller's earth at Baulking in Oxfordshire. The clay is processed on site, mainly for conversion into bentonite by a sodium-exchange process, for use as a filler and fibre retention aid in papermaking and as a bonding agent for foundry sand. The original Baulking quarry was exhausted in summer 2002 and is currently being restored. Current sales are based on clay stocks. Remaining permitted reserves of fuller's earth in the Baulking area are now confined to the small satellite deposit at Moor Mill Farm, about 2 km from the plant at Baulking. This will be opened up in spring 2004 with anticipated first production of fuller's earth in the third quarter of 2004.

Steetley Bentonite and Absorbents Ltd, a wholly-owned subsidiary of Tolsa SA of Spain, also produces fuller's earth in Bedfordshire near Woburn. The clay is processed on site and converted to bentonite, principally for use as a filler and fibre retention aid in papermaking. The company's planning application to extract fuller's earth from a southern extension to the deposit (Wavendon Heath South) was turned down in early 2001. The application was the subject of a public inquiry in September 2001 but the appeal was dismissed by the ODPM in July 2002. A challenge to this decision was made in the High Court in February 2003 but was also dismissed.

This decision will bring to an end a long history of fuller's earth working in the Woburn area where it is thought to have been extracted as early as Roman times. Large-scale extraction in the area by F W Berk Ltd (acquired by Steetley in 1970) commenced in 1950 and has continued ever since with a series of extensions to the original deposit. The Wavendon Heath South site, covering some 54 ha and containing some 320 000 tonnes of dry product, sufficient for about 10 years output, would have been the last site. Final closure of the operation will be in spring 2005.

### United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Fuller's earth</b>										
<i>Crude production</i>	111 000	83 000	103 000	...	33 000					
<i>Sales (a)</i>	94 400	74 500	65 500	52 000	(b) 44 200					
<i>Imports</i>	51 398	16 326	6 563	5 896	9 115	2 884	1 407	780	611	849
<i>Exports</i>	739	554	429	121	74	195	108	157	80	61

(a) BGS estimates based on data from producing companies. Dry weight.

(b) Including sales from stockpiles.

## Gas, natural (see Petroleum)

## Germanium

### United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Germanium</b>										
<i>Imports</i>										
Metal	14	18	75	7	10	3 119	3 563	1 845	921	478
<i>Exports</i>										
Metal	8	8	37	10	0	876	1 152	1 039	668	82



# Gold

Mines Royal (gold and silver) exploration and development in Britain requires a licence from the Crown Mineral Agent. Activity has shown a dramatic increase in interest towards the end of the year, possibly due to the increase in the gold price. This is mainly within Northern Ireland where the acreage under licence or application is at its highest level since 1991, but there has also been some interest in Scotland. The number of Mines Royal licences has increased from 7 to the current 8, with Mines Royal leases remaining constant at 6 (see map). Mines Royal licence and lease activity is distributed throughout the United Kingdom as follows:

	Exploration Licences		Mining Leases	
	Actual	In Preparation	Actual	In Preparation
England	—	—	—	—
Northern Ireland	6	5	1	—
Scotland	—	—	1	—
Wales	2	—	4	—
<b>Total</b>	<b>8</b>	<b>5</b>	<b>6</b>	<b>—</b>

*Supplied by the Crown Mineral Agent*

The eight Mines Royal licences are held by the following companies:

Northern Ireland	Conroy Diamonds and Gold plc Omagh Minerals Ltd Ulster Minerals Ltd (wholly owned subsidiary of Strongbow Resources Inc)
Wales	Cambrian Goldfields Ltd

The five pending licences are all applied for by Dalradian Gold Limited, a subsidiary of Tournigan Gold Corporation.

The six Mines Royal leases and their current status are as follows:

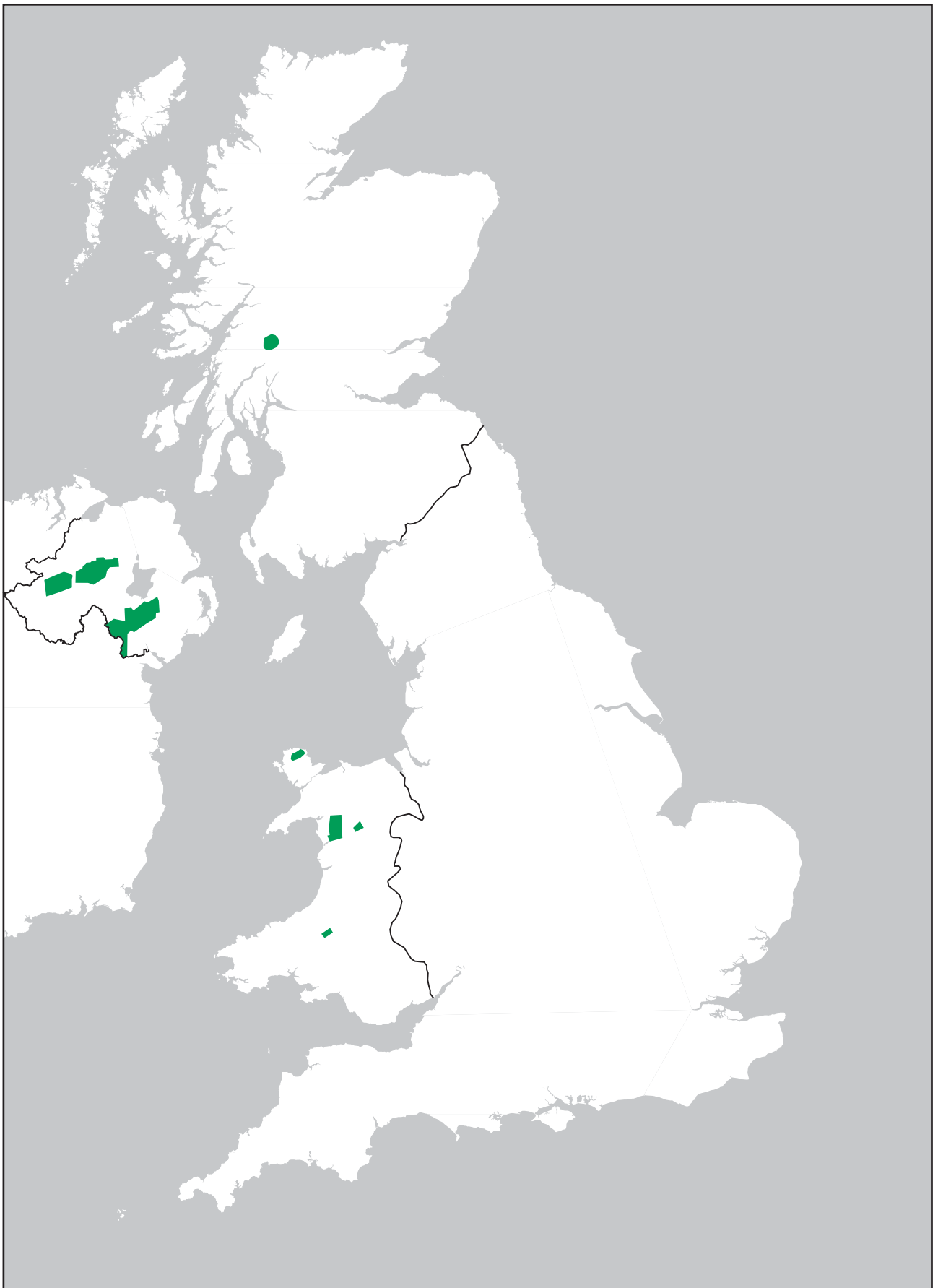
Company	Country	Activity
Anglesey Mining plc	Wales	Dormant - potential underground Zn-Cu-Pb-Ag-Au mine at Parys Mountain
Anglo Canadian Exploration	Wales	Dormant - part of Anglesey Mining plc (Dolaucothi mine)
Caledonia Mining Corporation	Scotland	Dormant - potential underground Au-Ag mine at Cononish
National Trust	Wales	Visitor and educational centre at Dolaucothi mine
Omagh Minerals Ltd	Northern Ireland	Limited open pit gold mining at Cavanacaw deposit
Stoic Mining	Wales	Small scale exploration

*Supplied by the Crown Mineral Agent*

Bullion gold price is currently above \$400 per troy ounce, compared to \$300 per troy ounce at the start of 2003. An upsurge in interest in licences is expected, but is not likely to materialise before the middle of 2004 due to the review of Mines Royal procedures currently in progress. This compares with the situation in 1990 when there were 51 exploration licences and 6 leases with a gold price of around \$400 per troy ounce.

Tournigan Gold Corporation, who entered into an agreement with Strongbow Resources in 2002 to acquire a 75 per cent interest in their Northern Ireland licences have continued to increase their exploration effort. The company's total ground holding is approximately 1050 km<sup>2</sup>. Tournigan has announced a number of results from the infill drilling programme at the Curraghinalt deposit 15 km northeast of Omagh in Co. Tyrone. This is a mesothermal quartz-vein hosted deposit with an inferred resource of 468 097 tonnes at 16.96 gram/tonne gold. The current drilling has been designed to intersect each of the veins at a 30 metre horizontal spacing to define the vein mineralisation in detail and to upgrade the classification of the Curraghinalt resource to the measured category. Seven holes have already been drilled and a further six are planned or in progress. Four additional holes have shown a continuation of the Curraghinalt veins to the southeast which should enlarge the resource. A detailed structural analysis of the area has also been completed. Seven holes totalling 730 m were drilled on the Glenark gold-base metal prospect 6 km from Curraghinalt. These confirmed the existing low-grade stratabound gold mineralisation but did not add any significant value to the area.

Mines Royal Licences and Leases in 2003



By courtesy of **The Crown Estate**

The Cavanacaw deposit, 10 km southwest of Omagh, is owned by Omagh Minerals, a wholly owned subsidiary of European Gold Resources Inc of Canada. A regional exploration programme was initiated during the year. European Gold Resources will continue to develop its Galantas Irish gold jewellery range.

Conroy Diamonds and Gold are continuing to explore the Armagh-Monaghan 'Gold Belt' in the Longford-Down Massif which extends between Northern Ireland and the Republic of Ireland. The company now controls three licences totalling 650 km<sup>2</sup> in Northern Ireland. The company reported further exploratory work, including 800 m of diamond drilling in 13 holes over a strike length of 150 m and to a vertical depth of 100 m, over the Cargallisgoran area in Co. Armagh, Northern Ireland. All but one of the holes intersected gold mineralisation with intersections up to 6.94 metres grading 4.14 g/t gold. Mineralisation at Cargallisgoran is associated with sulphides (primarily arsenopyrite), hydraulic fracturing, and quartz/carbonate and quartz/feldspar veining.

Caledonia Mining Corporation continues to provide management services to the Cononish gold exploration project in Scotland which remains dormant.

Cambrian Goldfields is continuing a re-assessment of the Clogau gold mine near Dolgellau in North Wales and other potentially interesting areas within the Dolgellau Gold belt. At Clogau, detailed geological mapping and sampling have commenced, while in other areas studies have included an in-depth examination of stable isotope geochemistry of gold grains collected from alluvial and bedrock occurrences.

As Crown Estate licences for gold and silver exploration are surrendered, the reports on the work carried out are deposited by the Crown Mineral Agent with the British Geological Survey for archive within the National Geoscience Records Centre. Thirty four reports are now held, some of which are available for public access. Others will become available as the term of confidentiality expires.

### United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Gold</b>										
<i>Imports</i>										
Waste and scrap	217	161	319	168	123	212 531	94 059	152 634	122 319	78 676
Unwrought (a)	1 090	807	915	951	1 257	5 896 163	3 647 930	4 191 091	3 231 446	4 882 625
Semi-manufactured	100	21	57	21	24	580 075	121 999	338 323	119 642	86 369
<i>Exports</i>										
Waste and scrap	105	378	356	494	549	2 503	2 771	2 747	5 471	4 503
Unwrought (a)	485	399	397	353	131	2 778 200	2 159 650	2 291 595	2 136 962	781 054
Semi-manufactured	139	190	41	52	68	812 174	1 046 693	226 774	301 266	191 856

(a) Mainly refined gold bullion in the form accepted in inter-bank transactions.

## Granite (see Igneous rock)

## Graphite

### United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Graphite</b>										
<i>Imports</i>										
Natural graphite	27 885	21 204	26 088	22 482	22 435	11 712	8 971	11 396	9 933	8 772
Artificial graphite	18 807	8 799	9 573	16 704	14 162	21 436	18 331	19 227	19 076	15 739
Graphite crucibles etc.	952	699	736	2 027	1 055	3 569	2 589	3 085	3 004	2 343
<i>Exports</i>										
Natural graphite	2 206	1 973	2 429	2 635	2 816	2 278	1 929	2 542	2 825	3 064
Artificial graphite	3 828	3 541	3 168	4 014	4 365	8 014	8 573	9 213	7 126	5 712
Graphite crucibles etc.	14 753	12 840	9 886	10 089	11 606	31 886	28 527	22 856	20 139	21 982

# Gypsum

Gypsum ( $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ ) and anhydrite ( $\text{CaSO}_4$ ) are, respectively, the hydrated and anhydrous forms of calcium sulphate. Gypsum is economically the most important. In nature they occur as beds or nodular masses up to a few metres thick. Gypsum is formed by the hydration of anhydrite at or near surface, but passes into anhydrite at depth.

Calcium sulphate is also derived as a synthetic by-product of certain industrial processes. The most important is flue gas desulphurisation (FGD), a process that removes sulphur dioxide from the flue gases at coal-fired power stations. The product, known as desulphogypsum, is now an important supplement to the supply of natural gypsum, both in the UK and elsewhere.

UK consumption of gypsum is derived from three sources: the production of natural gypsum, mainly by underground mining, but with some surface extraction in Nottinghamshire; recovery of synthetic gypsum; and imports of both natural and synthetic gypsum. Natural gypsum, of which British Gypsum Ltd is the sole producer, is extracted in Leicestershire, Nottinghamshire, Staffordshire, Cumbria and East Sussex. Extraction is mainly by underground mining. Total output has not been disclosed in official statistics for some years but is thought to be about 1.7 million tonnes a year. Official figures for imports of gypsum, mainly from Spain and Germany, were reported to be 234 397 tonnes in 2002 valued at £6.9 million.

Desulphogypsum produced by the neutralisation of sulphur dioxide contained in flue gases at coal-fired power stations, is produced at three sites in Britain. The largest is the 4 000 MW Drax power station in North Yorkshire, owned by Drax Power Ltd. Sales of desulphogypsum from Drax were 699 497 tonnes in 2003, a substantial increase on 2002. Desulphogypsum is also produced at the 2 000 MW Ratcliffe-on-Soar power station in Nottinghamshire operated by Powergen. Output was some 384 087 tonnes in 2003. The desulphogypsum from both plants is supplied to British Gypsum for plasterboard manufacture. Both plants came on stream in 1994.

	Thousand tonnes									
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Drax	300	320	510	549	323	483	565	506	485	699
Ratcliffe	200	280	300	296	278	220	260	291	358	384
<b>Total</b>	<b>500</b>	<b>600</b>	<b>810</b>	<b>845</b>	<b>510</b>	<b>703</b>	<b>825</b>	<b>797</b>	<b>843</b>	<b>1 084</b>

A further FGD plant came on stream in December 2003 at the 2000 MW West Burton power station in Nottinghamshire, which is owned by EDF Energy. It is anticipated that the plant will produce some 400 000 tonnes of desulphogypsum in 2004. FGD plants are also at the planning stage for Eggborough, Cotham and Rugeley power stations.

The amount of desulphogypsum produced at FGD plants is dependent on two main factors: the electricity output of the station and the amount of sulphur in the coal. High purity limestone for the FGD plants is obtained from the Tunstead quarry near Buxton and is delivered by train.

Synthetic gypsum is also produced by the neutralisation of acid effluent from the manufacture of titanium dioxide by the Sulphate Process at Tioxide Europe's plant at Grimsby. Production of white titanogypsum is some 200 000 t/y and is used by Knauf for the manufacture of plasterboard at their Immingham plant.

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Gypsum and plaster</b>										
<i>Production</i>										
Gypsum (natural) (a)	2 000 000	1 800 000	1 500 000	1 700 000	1 700 000					
<i>Imports</i>										
Gypsum—										
Calcined (plasters) etc.	33 227	33 818	62 728	31 481	...	5 807	6 597	9 231	6 029	7 576
Other	328 175	391 447	492 422	755 112	234 397	8 914	12 159	14 501	10 390	6 944
<i>Exports</i>										
Gypsum—										
Calcined (plasters) etc.	24 352	73 865	31 474	29 474	44 827	6 574	10 485	7 894	7 505	10 283
Other	9 322	6 746	9 709	3 049	14 460	499	1 214	657	459	692

(a) BGS estimates.

# Hafnium

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Hafnium</b>										
Imports	19	3	9	2	2	1 003	225	537	327	320
Exports	1	1	1	2	...	82	48	48	169	248

# Igneous rock (for graph, see Crushed rock)

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Igneous rock—see Building and dimension stone</b>										
Production (a)	45 945 000	53 155 000	54 113 000	51 501 000	51 225 000					
Imports										
Granite—										
Unworked	736 462	1 045 451	865 710	1 781 220	1 656 235	26 546	23 980	36 452	28 908	29 447
Worked	24 541	25 961	34 928	37 533	57 885	20 097	19 214	24 215	26 334	37 543
Exports										
Granite—										
Unworked	1 111	983	1 594	1 558	931	370	133	331	370	252
Worked	101	85	713	53	732	211	82	360	99	755

(a) Excluding a small production of granite in Northern Ireland.

## Great Britain production of igneous rock by end-use and area of origin 2002

Area of origin	Building stone	Roadstone			Railway ballast	Concrete aggregate	Other constructional uses	Other uses	Total
		Sold coated	For coating at remote plants	Uncoated					
North East	3	...	361	244	7	26	379	—	...
East Midlands	...	...	3 710	2 295	...	1 235	4 113	—	14 227
South West	4	299	118	...	...	...	1 569	—	3 189
West Midlands	...	836	379	...	—	...	493	—	2 135
North West	2	—	304	...	—	168	474	—	...
<b>England</b>	<b>12</b>	<b>2 778</b>	<b>4 872</b>	<b>3 477</b>	<b>1 612</b>	<b>2 110</b>	<b>7 028</b>	<b>—</b>	<b>21 889</b>
<b>Wales</b>	<b>9</b>	<b>375</b>	<b>366</b>	<b>241</b>	<b>219</b>	<b>396</b>	<b>506</b>	<b>—</b>	<b>2 111</b>
<b>Scotland</b>	<b>196</b>	<b>1 595</b>	<b>1 037</b>	<b>6 608</b>	<b>1 494</b>	<b>2 241</b>	<b>7 332</b>	<b>40</b>	<b>20 543</b>
<b>Great Britain</b>	<b>217</b>	<b>4 748</b>	<b>6 275</b>	<b>10 326</b>	<b>3 324</b>	<b>4 747</b>	<b>14 866</b>	<b>40</b>	<b>44 544</b>
<b>England</b>	<b>Wales</b>			<b>Scotland</b>					
County	Total	County		Total	Region		Total		
Northumberland	1 107	Powys		832	Borders			232	
Durham	...	Dyfed		1 279	Central		}	1 937	
Cumbria	...	Gwynedd			Dumfries and Galloway				
West Midlands	} 1 273	<b>Wales</b>		<b>2 111</b>	Tayside			437	
Shropshire					Grampian			927	
Warwickshire	862				Highland			1 613	
Leicestershire	14 227				Lothian			6 349	
Somerset	} 959				Strathclyde			1 892	
Devon					Shetland Islands area			6 881	
Cornwall		2 230				Western Isles area			118
								158	
<b>England</b>	<b>21 889</b>				<b>Scotland</b>			<b>20 543</b>	

Source: Office for National Statistics.

## England production of igneous rock by end-use 1991–2002

Thousand tonnes

Year	Building stone	Roadstone			Railway ballast	Concrete aggregate	Other constructional uses	Other uses	Total
		Sold coated	For coating at remote plants	Uncoated					
1991	22	4 129	2 665	7 407	1 711	1 270	5 770	151	23 126
1992	25	4 098	3 420	8 387	1 847	1 640	5 543	277	25 238
1993	47	4 139	...	8 555	...	1 190	4 901	292	24 783
1994	...	3 970	4 072	6 183	1 197	1 173	8 303	...	25 134
1995	...	4 171	3 657	6 212	...	1 272	7 434	185	24 651
1996	7	3 753	3 733	5 816	921	1 399	5 793	105	21 526
1997	49	3 120	4 412	5 141	1 020	1 434	5 073	87	20 335
1998	26	2 505	3 384	2 935	944	...	5 926	...	17 228
1999	37	2 568	3 919	...	...	1 724	7 538	...	20 803
2000	27	2 726	3 916	3 587	...	2 106	6 799	...	20 435
2001	...	2 792	3 523	2 844	...	4 059	8 051	6	22 647
2002	12	2 778	4 872	3 477	1 612	2 110	7 028	—	21 889

Source: Office for National Statistics.

## Wales production of igneous rock by end-use 1991–2002

Thousand tonnes

Year	Building stone	Roadstone			Railway ballast	Concrete aggregate	Other constructional uses	Other uses	Total
		Sold coated	For coating at remote plants	Uncoated					
1991	11	812	275	992	248	168	777	12	3 294
1992	14	826	370	927	...	...	825	8	3 329
1993	24	947	457	1 084	...	...	781	...	3 621
1994	14	...	...	1 079	...	217	1 128	...	4 208
1995	...	...	...	1 222	...	204	735	29	3 259
1996	...	...	...	...	...	157	386	—	2 272
1997	(a) 11	...	359	472	...	...	486	—	2 172
1998	4	...	339	578	...	203	364	...	2 110
1999	6	...	355	...	...	164	556	—	2 730
2000	...	314	227	659	...	...	...	—	2 743
2001	...	393	197	266	...	369	...	—	2 372
2002	9	375	366	241	219	396	506	—	2 111

(a) BGS estimate.

Source: Office for National Statistics.

## Scotland production of igneous rock by end-use 1991–2002

Thousand tonnes

Year	Building stone	Roadstone			Railway ballast	Concrete aggregate	Other constructional uses	Other uses	Total
		Sold coated	For coating at remote plants	Uncoated					
1991	94	2 356	718	8 236	361	1 513	6 298	12	19 588
1992	112	2 472	684	6 916	...	...	8 243	52	20 064
1993	142	2 613	...	7 548	...	...	8 274	...	20 806
1994	...	...	...	6 995	...	1 354	8 179	...	20 672
1995	130	...	...	6 498	...	1 546	9 407	16	21 731
1996	128	...	...	...	...	1 358	8 488	...	19 933
1997	129	...	693	6 778	...	...	7 812	(a) 24	19 863
1998	107	...	934	6 587	...	...	8 140	2	20 500
1999	141	...	804	8 367	740	2 110	7 702	...	21 761
2000	179	1 762	945	9 148	...	...	...	39	21 455
2001	423	1 608	1 010	7 437	...	1 922	...	26	20 034
2002	196	1 595	1 037	6 608	1 494	2 241	7 332	40	20 543

(a) BGS estimate.

Source: Office for National Statistics.

# Insulating materials

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Insulating materials</b> (not elsewhere specified)										
<i>Imports</i>										
Mineral wools (a)	31 546	35 346	30 735	25 008	25 520	16 986	16 564	17 128	17 266	21 003
Expanded minerals (b)	95 450	124 102	58 347	60 811	68 475	7 910	7 288	7 169	5 291	5 899
Other (c)	24 065	24 822	73 900	32 951	33 764	20 973	23 989	27 353	26 346	29 538
<i>Exports</i>										
Mineral wools (a)	6 884	12 532	14 752	12 830	12 709	26 568	26 232	20 670	22 435	21 088
Expanded minerals (b)	21 032	16 076	27 895	27 752	25 782	9 807	8 032	12 220	15 340	14 580
Other (c)	25 147	22 129	16 477	17 685	25 341	27 711	27 422	25 786	33 206	29 491

(a) Slag wool, rock wool and similar mineral wools.

(b) Exfoliated vermiculite, expanded clays, foamed slag and similar expanded mineral materials.

(c) Mixtures and articles of heat-insulating, sound-insulating or sound-absorbing mineral materials.

# Iodine

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Iodine</b>										
<i>Imports</i>										
	1 693	957	1 305	1 015	744	15 164	9 995	12 859	9 592	5 966
<i>Exports</i>										
	138	148	385	507	207	1 572	1 441	1 788	1 844	1 887

# Iron compounds and earth colours

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Iron compounds and earth colours</b>										
<i>Imports</i>										
Natural micaceous oxides	7 876	2 593	3 916	2 244	...	1 391	829	1 206	684	...
Earth colours containing 70% or more ferric oxide	209	199	93	94	65	163	88	62	43	93
Other iron compounds—Oxides and hydroxides	53 351	54 508	68 839	50 299	52 314	27 013	26 587	34 626	22 996	24 208
<i>Exports</i>										
Natural micaceous oxides	3 396	3 083	3 293	3 037	...	943	849	1 304	1 242	...
Earth colours containing 70% or more ferric oxide	120	219	92	42	144	360	257	113	50	204
Other iron compounds—Oxides and hydroxides	18 956	16 326	21 349	17 077	20 218	15 860	12 808	17 131	15 233	16 873

# Iron ore

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Iron ore</b>										
<i>Production (a)</i>	1 188	(b) 1 000	1 033	510	464					
Fe content	653	(b) 540	568	281	255					
<i>Consumption</i>										
Home-produced	1 200	(b) 1 000	1 000	500	500					
Imported	19 510 200	18 739 400	16 955 000	15 108 300	13 181 000					
<i>Imports</i>										
Iron ore	20 764 785	17 030 212	16 778 947	15 351 877	13 316 026	316 474	278 509	260 406	248 246	184 578
Fe content (b)	12 900 000	10 500 000	10 300 000	9 500 000	8 200 000					
<i>Exports</i>										
Iron ore	606	573	898	5 257	350	177	155	129	417	138

(a) The Florence mine near Egremont, Cumbria produces high-grade hematite for foundry uses, mineral specimens and jewellery. The mine is also an active tourist attraction.

(b) BGS estimates.

# Iron and steel

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Iron and steel</b>										
<i>Production</i>										
Pig iron	12 746 100	12 139 300	10 890 500	9 870 400	8 560 600					
Crude steel—										
Alloy qualities	1 170 400	1 030 600	1 151 100	1 045 900	1 008 600					
Other	16 144 600	15 253 100	14 003 500	12 496 800	10 658 500					
<b>Total</b>	<b>17 315 000</b>	<b>16 283 700</b>	<b>15 154 600</b>	<b>13 542 700</b>	<b>11 667 100</b>					
<i>Consumption</i>										
Scrap (a)	6 409 000	5 884 000	5 675 000	5 026 000	4 217 000					
Pig iron (a)	12 619 000	11 859 000	10 970 000	9 713 000	8 312 000					
Finished steel (b)	14 594 000	13 460 000	13 359 000	13 410 000	12 599 000					
<i>Imports</i>										
Scrap	179 204	164 757	201 251	178 923	113 107	43 673	41 589	72 142	50 275	46 034
Pig iron	225 303	156 325	133 734	159 725	124 682	25 126	14 608	12 887	16 087	12 229
Shot, powder, sponge etc.	43 801	37 304	56 892	37 128	43 111	22 399	20 637	21 444	19 154	20 966
Ferro-alloys	394 065	372 305	361 692	327 666	369 966	170 653	135 973	136 322	126 781	130 211
Iron and steel—										
Ingots and other primary forms	549 465	412 482	518 194	388 350	1 453 884	137 342	91 910	134 381	121 148	257 803
<i>Exports</i>										
Scrap	3 177 490	3 578 027	4 378 117	4 821 840	5 538 569	238 610	212 743	323 233	369 196	467 968
Pig iron	1 632	446	679	6 749	3 376	853	153	248	3 441	2 139
Shot, powder, sponge etc.	70 448	83 322	83 430	66 637	63 346	29 365	27 372	27 701	27 903	28 181
Ferro-alloys	49 076	37 664	38 005	36 495	44 191	90 585	58 174	65 627	68 042	90 403
Iron and steel—										
Ingots and other primary forms	561 451	407 044	520 306	746 730	560 796	232 428	154 086	193 789	219 641	289 055

(a) Consumption in steel making only.

(b) Net home disposals.



## Consumption in the United Kingdom iron and steel industry 1993–2002

Thousand tonnes

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Iron ore –										
Home produced (a)	1	1	1	1	1	1	1	1	1	1
Imported (b)	17 507	18 161	18 671	19 720	20 371	19 510	18 739	16 955	15 108	13 181
Manganese ore	152	64	32	48	36	22	14	36	4	4
Iron and steel scrap (f)	6 522	6 839	7 000	6 822	7 206	6 409	5 884	5 675	5 026	4 217
Pig iron (f)	11 554	11 889	12 121	12 753	13 018	12 619	11 859	10 970	9 713	8 312
Alloy metals (c) –										
Nickel	19.3	23.4	24.7	21.5	18.3	13.8	15.5	15.0	15.2	16.0
Molybdenum	2.2	2.6	2.9	2.7	2.7	2.5	2.4	2.3	2.0	1.9
Tungsten	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Vanadium	0.7	0.9	1.0	1.0	0.9	0.8	0.8	0.7	0.7	0.6
Cobalt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chromium	54.3	64.6	66.9	66.5	66.1	61.9	58.2	55.1	49.6	48.5
Niobium	0.4	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.4	0.4
Ferro-alloys –										
Ferro-manganese	116.3	125.4	129.1	128.1	133.8	125.2	117.7	111.5	96.5	83.0
Ferro-silico-manganese	34.4	32.4	32.5	31.7	33.7	31.5	29.9	27.8	25.1	22.3
Ferro-aluminium	3.2	2.8	2.9	2.8	3.4	3.1	3.1	2.9	2.8	2.5
Ferro-chromium	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)
Ferro-silico-chromium	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)
Ferro-silicon	43.3	49.5	51.6	51.2	53.9	50.5	45.9	43.7	38.5	33.1
Ferro-silico-zirconium	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Calcium silicide	1.3	1.3	1.2	1.1	1.3	1.2	1.1	0.1	0.1	0.1
Ferro-phosphorous	1.2	1.4	1.5	1.4	1.5	1.4	1.3	1.3	1.2	1.0
Ferro-niobium	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)
Ferro-titanium	0.7	0.9	1.1	1.1	1.2	1.1	1.1	1.0	0.9	0.8
Dolomite (raw and burnt) (e)	514.6	465.8	382.7	455.9	503.8	495.3	369.5	338.0	264.4	226.8
Limestone (e)	2 077.0	2 235.7	2 317.5	2 224.7	2 445.2	2 411.2	2 408.3	2 166.0	1 890.9	1 683.6
Lime (e)	719.3	766.8	787.3	743.9	750.5	739.0	698.4	660.1	563.6	503.7
Zinc for galvanising	105.1	107.5	110.8	89.9	104.0	96.8	88.6	87.4	63.5	66.1
Tin for tinplating	3.6	3.6	3.6	3.1	3.4	3.5	3.3	3.4	2.8	2.6

Average Fe content: (a) 2002: 55%, (b) 2002: 62%.

(c) Metal content.

(d) Included under alloying metals.

(e) Restricted to consumption in blast furnaces, sinter plants and steel furnaces.

(f) Consumption in steel making only.

Source: Iron and Steel Statistics Bureau.

## Lead

### United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002
Tonnes					
<b>Lead</b>					
<i>Production</i>					
Concentrate (a)					
Pb content	(c) 1 600	1 000	(c) 1 000	(c) 800	(c) 700
Unwrought–					
Bullion	37 927	40 635	36 700	36 000	36 000
Refined–					
Primary (b)	186 212	184 713	157 164	202 915	207 719
Secondary	163 492	162 604	170 740	163 390	166 927
<i>Consumption</i>					
Refined	275 492	283 265	293 954	298 276	305 664
Scrap	38 409	32 245	40 894	40 661	41 446

(a) Byproduct of Pennine fluorspar operations.

(b) Refined from imported bullion including lead content of alloys.

(c) BGS estimate.

*continued*

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Lead continued</b>										
<i>Imports</i>										
Ores and concentrates	(a) 34 276	(a) 34 080	(b) 34 000	(b) 33 000	(b) 30 000					
Ash and residues	1 938	2 120	2 510	2 503	406	251	152	126	212	18
Scrap	5 537	7 704	10 849	15 633	4 946	1 126	1 767	2 295	4 271	1 654
Unwrought—										
Unrefined—										
Bullion (c)	169 839	174 757	140 344	184 518	184 060	80 788	78 106	61 846	94 002	92 054
Other	50	418	1 461	1 538	697	99	171	624	1 071	519
Refined	27 238	35 789	98 090	28 623	23 993	9 648	13 795	33 095	10 738	8 188
Alloys	2 727	3 078	9 551	3 041	7 778	852	905	2 994	1 146	2 547
<i>Exports</i>										
Ores and concentrates	23	2 927	5	39	16	26	201	6	44	22
Ash and residues	21	53	—	4	0	17	24	—	1	7
Scrap	6 178	11 577	7 352	10 700	17 116	2 535	3 520	2 261	3 737	3 950
Unwrought—										
Unrefined—										
Bullion	3 081	2	306	—	24	1 089	4	143	—	14
Other	6 179	6 714	3 340	7 640	4 670	4 432	2 315	2 297	3 586	2 290
Refined	95 066	76 172	78 893	85 912	97 138	50 602	30 314	26 535	32 200	34 907
Alloys	33 096	31 460	35 145	42 308	57 249	13 525	12 364	13 024	17 495	22 813

(a) Estimates published by the World Bureau of Metal Statistics. Lead content of both lead concentrate and mixed zinc-lead concentrate.

(b) BGS estimate.

(c) Containing substantial quantities of silver; see p.102.

## Limestone, dolomite and chalk (for graph, see Crushed rock)

### Great Britain production of limestone, dolomite and chalk by broad end-uses 2002

Mineral	Thousand tonnes				
	Constructional uses (b)	Cement	Agricultural uses (a)	Industrial uses (a)	Total
Limestone	59 206	9 642	789	6 536	76 174
Dolomite	11 848	—	...	...	12 946
Chalk	905	5 550	...	...	8 587
<b>Total</b>	<b>71 959</b>	<b>15 192</b>	<b>1 639</b>	<b>8 915</b>	<b>97 706</b>

(a) Including material for calcination.

(b) Including building stone.

Source: Office for National Statistics.

### Great Britain production of limestone, dolomite and chalk for agricultural and industrial uses (a) 2002

Use	Thousand tonnes				
	Limestone	Dolomite	Chalk	Total	Of which for conversion by calcination
Agricultural	789	...	...	1 639	...
Iron and steel	1 866	314	...	...	1 228
Glass making	...	...	—	233	—
Asphalt filler	...	...	—	164	—
Other fillers	1 368	...	...	1 759	—
Chemical use	1 686	—	...	...	1 922
Building materials	401	—	...	...	537
Other uses	958	19	177	1 154	...
<b>Total</b>	<b>7 325</b>	<b>1 097</b>	<b>2 131</b>	<b>10 553</b>	<b>3 766</b>

(a) Including material for calcination.

Source: Office for National Statistics.

## Great Britain production of limestone and chalk for cement, 1991–2002

Thousand tonnes

Year	Limestone	Chalk	Total
1991	8 903	7 057	15 960
1992	8 622	...	...
1993	(a) 9 137	(a) 5 839	14 976
1994	(a) 10 089	(a) 6 731	16 820
1995	(a) 10 234	(a) 6 343	16 577
1996	(a) 9 673	(a) 5 697	15 369
1997	(a) 9 959	(a) 6 157	16 115
1998	(a) 10 465	(a) 6 736	17 201
1999	(a) 9 831	(a) 6 345	16 176
2000	(a) 9 821	(a) 6 288	16 109
2001	10 123	5 111	15 234
2002	9 642	5 550	15 192

(a) BGS estimate.

Source: Office for National Statistics.

## Great Britain production of limestone, dolomite and chalk for agricultural uses, 1991–2002

Thousand tonnes

Year	Limestone	Dolomite	Chalk	Total	Calcination (a)
1991	1 206	2 096	547	3 849	...
1992	1 384	2 114	435	3 934	...
1993	1 039	999	466	2 504	20
1994	1 169	1 070	574	2 813	18
1995	1 476	...	...	3 405	18
1996	1 414	(b) 1 321	(b) 624	3 359	20
1997	...	...	590	3 053	42
1998	(b) 1 009	...	...	2 343	10
1999	...	...	...	1 961	8
2000	...	...	...	1 749	2
2001	810	...	...	1 610	11
2002	789	...	...	1 639	...

(a) Comprises material included in the total which, after calcination, was used as lime and dolomitic lime.

Source: Office for National Statistics.

(b) BGS estimate.

## Great Britain production of limestone, dolomite and chalk for industrial uses, 1991–2002

Thousand tonnes

Year	Limestone	Dolomite	Chalk	Total	Calcination
1991	6 563	1 520	1 677	9 760	(b) 4 437
1992	6 326	...	...	9 345	(b) 4 069
1993	(c) 6 416	1 578	(c) 1 858	9 852	(a) 4 373
1994	(c) 7 489	1 397	(c) 1 955	10 841	(a) 4 316
1995	(c) 7 211	...	...	10 774	(a) 5 032
1996	(c) 7 618	(c) 1 551	1 879	11 048	(a) 5 074
1997	...	...	(c) 2 035	11 332	(a) 5 579
1998	(c) 7 705	...	...	11 345	(a) 5 694
1999	...	...	...	10 282	(a) 5 258
2000	...	...	...	9 867	(a) 4 797
2001	6 357	...	...	9 625	(a) 4 925
2002	6 536	...	...	8 915	(b) 3 766

(a) Comprises material included in the total which, after calcination, was used for industrial purposes as lime or dolomitic lime. Excludes small amounts for agricultural purposes.

Source: Office for National Statistics.

(b) Including small amounts used for agricultural purposes but excluded from the total.

(c) BGS estimate.

## Great Britain production of limestone, dolomite and chalk for industrial uses by end-use, 1991–2002

Thousand tonnes

Year	Iron and steel making (a)	Chemicals (a)	Glass making	Special fillers	Asphalt fillers	Building materials (a)	Others (a)	Total (a)
1991	4 273	2 020	330	1 490	499	302	849	9 763
1992	4 285	...	...	1 605	391	...	645	9 345
1993	4 254	1 952	...	1 710	...	220	966	9 852
1994	4 813	2 004	...	...	408	175	...	10 841
1995	4 778	...	...	...	414	292	1 067	10 774
1996	5 091	2 185	344	1 561	342	399	1 127	11 048
1997	...	...	361	...	340	...	...	11 332
1998	...	2 047	375	...	...	459	...	11 345
1999	...	1 689	203	...	...	460	...	10 282
2000	...	1 864	...	...	192	474	1 144	9 867
2001	...	2 630	278	...	211	957	1 384	9 625
2002	...	...	233	1 759	164	...	1 154	8 915

(a) Including material for calcination.

Source: Office for National Statistics.

## Great Britain production of limestone, dolomite and chalk for calcination by end-use, 1991–2002

Thousand tonnes

Year	Agriculture	Iron and Steel	Chemicals	Building materials	Others	Total
1991	...	1 944	2 020	302	...	4 437
1992	...	1 864	...	...	...	4 069
1993	20	2 081	1 952	220	120	4 393
1994	18	2 015	2 004	175	122	4 334
1995	18	2 381	2 289	291	71	5 050
1996	20	2 400	2 184	398	92	5 094
1997	42	2 595	2 332	435	217	5 621
1998	10	3 035	2 047	459	153	5 704
1999	8	2 970	1 689	460	139	5 266
2000	2	2 301	1 864	474	158	4 799
2001	11	1 248	2 630	957	90	4 936
2002	...	1 228	1 922	537	...	3 766

Source: Office for National Statistics.

## Great Britain production of limestone, dolomite and chalk for iron and steel making, 1991–2002

Thousand tonnes

Year	Limestone	Dolomite and chalk	Total	Calcination (a)
1991	2 206	2 067	4 273	1 944
1992	2 318	1 967	4 285	1 864
1993	2 438	1 816	4 254	2 081
1994	2 703	2 110	4 813	2 015
1995	2 699	2 079	4 778	2 381
1996	3 043	2 048	5 091	2 400
1997	2 935	...	...	2 595
1998	3 346	...	...	3 035
1999	3 239	...	...	2 970
2000	2 500	...	...	2 301
2001	1 844	...	...	1 248
2002	1 866	...	...	1 228

(a) Comprises material included in the total which, after calcination, was used as lime or dolomitic lime.

Source: Office for National Statistics.

## Great Britain consumption of dolomite, limestone and lime in iron and steel production, 1970–2002

Thousand tonnes

Year	Dolomite, incl. calcined dolomite (dolime)			Limestone			Lime	
	Blast furnaces and sinter plants	Steel furnaces	Other purposes	Blast furnaces and sinter plants	Steel furnaces	Other purposes	Steel Furnaces	Other purposes
1970	532.3	250.1	0.3	2 351.0	713.1	313.4	1 481.6	18.9
1971	454.8	186.2	0.1	2 072.6	570.0	281.4	1 254.0	18.1
1972	391.5	166.1	0.1	2 023.1	479.9	306.1	1 396.1	18.6
1973	445.7	156.6	7.6	2 291.4	518.1	288.0	1 531.6	22.0
1974	468.4	94.9	8.0	1 784.8	302.9	161.9	1 250.6	11.0
1975	299.5	89.6	7.7	1 735.1	280.3	65.3	1 204.6	8.2
1976	516.5	150.3	0.3	1 776.6	333.9	6.5	1 287.6	35.8
1977	642.7	192.2	—	1 487.4	252.1	5.2	1 174.5	14.1
1978	647.0	182.5	—	1 399.3	106.3	—	1 227.0	—
1979	858.7	323.2	—	1 089.6	116.2	—	1 322.6	—
1980	389.2	182.4	—	611.2	6.6	—	662.6	—
1981	400.0	307.9	—	1 030.5	1.9	—	911.2	—
1982	280.0	255.0	—	887.6	2.1	—	798.5	—
1983	400.0	298.4	—	1 164.2	0.5	—	864.8	—
1984	405.4	309.8	—	1 143.4	0.6	—	824.3	—
1985	424.7	284.1	—	1 562.0	—	—	801.3	—
1986	333.3	270.2	—	1 493.9	1.8	—	680.4	—
1987	405.1	275.0	—	1 827.3	—	—	760.9	—
1988	477.2	319.1	—	1 948.1	—	—	810.4	—
1989	429.5	315.2	—	2 061.5	—	—	822.0	—
1990	410.4	287.1	—	1 991.9	—	—	777.5	—
1991	323.0	264.4	—	2 124.1	—	—	695.7	—
1992	390.7	246.3	—	2 032.7	—	—	681.5	—
1993	276.4	238.2	—	2 077.0	—	—	719.3	—
1994	201.4	264.4	—	2 235.7	—	—	766.8	—
1995	66.9	315.8	—	2 317.5	—	—	787.3	—
1996	58.5	397.4	—	2 224.7	—	—	743.9	—
1997	41.6	462.2	—	2 445.2	—	—	750.5	—
1998	3.4	492.0	—	2 411.2	—	—	739.0	—
1999	5.4	364.1	—	2 408.3	—	—	698.4	—
2000	1.3	336.7	—	2 166.0	—	—	660.1	—
2001	7.2	257.2	—	1 890.9	—	—	563.6	—
2002	8.0	218.8	—	1 683.6	—	—	503.7	—

Source: Iron and Steel Statistics Bureau.

This table shows the consumption of fluxes used in iron and steelmaking. Dolomite and limestone are used in blast furnaces and in sinter plants, whilst lime and calcined dolomite, or dolime, are used in steelmaking. These figures do not entirely agree with those shown on p.62 for the production of limestone, dolomite and chalk for iron and steelmaking, even allowing for the conversion of lime and dolime to carbonate.

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Limestone</b> —see Building and dimension stone										
<i>Production</i>										
Limestone	89 274 000	86 933 000	84 348 000	88 238 000	80 688 000					
Dolomite	15 632 000	13 698 000	13 069 000	14 314 000	12 946 000					
<i>Imports</i>										
Dolomite	219 824	228 874	174 353	188 312	184 947	6 235	4 198	3 798	3 671	3 694
Limestone flux (a)	1 602	2 146	4 035	7 613	...	307	552	704	1 025	1 056
Lime	1 298	1 957	3 191	3 877	13 742	183	304	509	364	1 616
<i>Exports</i>										
Dolomite	137 128	(c) 91 489	(c) 112 875	(c) 131 073	(c) 104 126	8 076	(c) 4 358	(c) 4 947	(c) 4 653	(c) 4 393
Limestone flux (a)	192 715	145 544	232 480	81 519	95 364	3 756	5 187	4 180	2 094	2 513
Lime	92 881	124 910	125 104	113 753	88 783	6 512	9 037	9 047	9 404	8 628
<b>Chalk</b>										
<i>Production</i> (b)										
	9 934 000	9 667 000	9 213 000	8 205 000	8 587 000					
<i>Imports</i>										
	47 700	17 409	5 566	3 465	3 935	1 863	1 300	365	310	338
<i>Exports</i>										
	47 829	43 367	25 266	23 952	24 974	6 327	3 836	2 698	1 898	2 079

(a) Including calcareous stone commonly used for the manufacture of lime or cement.

(c) Crude.

(b) Great Britain only. There is a small, undisclosed production in Northern Ireland.

## Great Britain production of limestone by end-use and area of origin 2002

Area of origin	Building stone	For constructional uses (a)			For other uses				
		Roadstone			Railway ballast	Concrete aggregate	Other constructional uses	Agricultural use	Iron and steel
		Sold coated	For coating at remote plants	Uncoated					
North East	1	...	265	...	—	945	1 535	...	—
Yorkshire and Humberside	4	434	585	3 027	—	3 142	2 990	24	190
East Midlands	19	...	1 328	...	—	3 810	5 818	186	195
East of England	1	—	—	...	—	—	1	—	—
South East	3	—	—	65	—	81	872	...	—
South West	...	1 572	843	4 493	—	5 863	7 681	205	...
West Midlands	12	227	285	957	—	112	745	26	—
North West	...	503	449	...	—	2 033	2 056	44	954
<b>England</b>	<b>145</b>	<b>3 726</b>	<b>3 755</b>	<b>13 931</b>	<b>—</b>	<b>15 985</b>	<b>21 697</b>	<b>524</b>	<b>...</b>
<b>Wales</b>	<b>45</b>	<b>912</b>	<b>...</b>	<b>1 280</b>	<b>—</b>	<b>4 115</b>	<b>4 761</b>	<b>...</b>	<b>...</b>
<b>Scotland</b>	<b>1</b>	<b>26</b>	<b>...</b>	<b>96</b>	<b>—</b>	<b>12</b>	<b>119</b>	<b>...</b>	<b>—</b>
<b>Great Britain</b>	<b>191</b>	<b>4 664</b>	<b>4 194</b>	<b>15 308</b>	<b>—</b>	<b>20 112</b>	<b>26 577</b>	<b>789</b>	<b>1 866</b>
<b>England</b>									
County	Total		County	Total					
Avon	4 753		Nottinghamshire						
Cambridgeshire	274		Lincolnshire			} 742			
Cumbria	4 182		Dorset			} 381			
Derbyshire	18 729		Northamptonshire			} 268			
Devon	1 871		Cleveland			} ...			
Cornwall	...		Northumberland			} 722			
Durham	3 643		Tyne and Wear			} 7 331			
Gloucestershire	1 978		North Yorkshire			} 3 076			
Hereford and Worcester	452		West Yorkshire			} 636			
Warwickshire	...		South Yorkshire			} 12 026			
Shropshire	...		Oxfordshire			} ...			
Staffordshire	2 605		Somerset			} ...			
Kent	382		Wiltshire			} ...			
Lancashire	4 870		Isle of Wight			} ...			
Leicestershire	3 942		Bedfordshire			} ...			
Norfolk	1								
					<b>England</b>	<b>73 528</b>	<i>continued</i>		

(a) Including dolomite.

(b) For filler in asphalt and as mine dust.

(c) For other fillers, powders and whittings (e.g. in animal feed, polymers, paint, paper and pharmaceuticals).

Source: Office for National Statistics.

					Total
Cement	Glass making	Asphalt filler (b)	Other fillers (c)	Other uses	
425	—	—	—	—	4 415
—	—	—	—	11	10 406
4 069	...	51	1 170	2 672	23 681
—	—	22	—	—	...
—	—	—	—	—	...
—	—	30	...	—	21 049
1 179	—	—	76	—	3 619
1 922	—	5	75	362	9 052
<b>7 595</b>	...	<b>107</b>	...	<b>3 045</b>	<b>73 528</b>
<b>887</b>	—	<b>3</b>	<b>11</b>	—	<b>12 850</b>
<b>1 160</b>	—	...	...	—	<b>1 635</b>
<b>9 642</b>	...	...	<b>1 368</b>	<b>3 045</b>	<b>88 013</b>

Wales		Scotland	
County	Total	Region	Total
Clwyd	6 190	Grampian	} 237
Dyfed	1 256	Tayside	
Gwynedd	37	Strathclyde	77
Powys	} 792	Lothian	1 160
Gwent		Highland	160
Mid Glamorgan	3 560		
South Glamorgan	1 014	<b>Scotland</b>	<b>1 635</b>
<b>Wales</b>	<b>12 850</b>		

## England production of limestone by end-use 1991–2002

Year	Building stone	For constructional uses (a)			For other uses				
		Roadstone			Railway ballast	Concrete aggregate	Other constructional uses	Agricultural use	Iron and steel
		Sold coated	For coating at remote plants	Uncoated					
1991	1 407	7 053	4 173	31 691	9	9 089	19 560	836	...
1992	115	6 230	4 234	27 869	...	9 355	19 963	1 125	...
1993	105	6 025	4 282	28 252	...	9 995	21 833	758	...
1994	...	6 994	4 051	28 104	...	10 012	30 775	930	...
1995	...	6 933	4 551	27 487	...	9 793	20 968	1 174	...
1996	211	6 020	3 584	21 291	14	8 405	21 372	1 025	1 884
1997	212	5 192	3 440	21 380	18	11 144	22 775	947	2 045
1998	...	4 441	4 425	21 124	12	12 094	21 989	765	...
1999	245	4 226	3 528	19 265	...	11 610	22 616	685	...
2000	278	4 079	3 363	18 648	...	10 654	23 897	537	1 620
2001	168	...	4 956	20 502	...	16 457	19 545	561	...
2002	145	3 726	3 755	13 931	—	15 985	21 697	524	...

*continued*

## Wales production of limestone by end-use 1991–2002

Year	Building stone	For constructional uses (a)			For other uses				
		Roadstone			Railway ballast	Concrete aggregate	Other constructional uses	Agricultural use	Iron and steel
		Sold coated	For coating at remote plants	Uncoated					
1991	22	...	200	7 918	...	...	4 821	...	...
1992	25	...	285	6 269	...	...	5 706	...	...
1993	22	...	190	5 936	...	2 836	7 674	196	...
1994	...	...	182	5 687	—	3 154	7 975	...	...
1995	46	...	183	5 029	...	...	7 100	...	...
1996	10	...	177	4 164	(d) 65	...	7 192	...	1 158
1997	(d) 6	1 123	329	3 588	(d) 71	3 322	6 952	228	890
1998	37	1 107	341	2 849	(d) 110	3 607	6 653	119	...
1999	52	...	275	3 136	...	3 688	6 502	110	...
2000	45	...	206	2 177	...	3 375	6 676	106	880
2001	44	...	328	1 731	...	4 299	4 802	101	...
2002	45	912	...	1 280	—	4 115	4 761	...	...

*continued*

## Scotland production of limestone by end-use 1991–2002

Year	Building stone	For constructional uses (a)			For other uses				
		Roadstone			Railway ballast	Concrete aggregate	Other constructional uses	Agricultural use	Iron and steel
		Sold coated	For coating at remote plants	Uncoated					
1991	—	...	—	214	...	...	446	...	—
1992	—	...	—	249	—	...	114	...	—
1993	—	...	—	217	—	—	132	84	—
1994	—	...	—	249	—	—	178	...	—
1995	...	...	—	114	—	...	79	...	—
1996	—	...	—	97	—	...	108	...	—
1997	—	41	—	86	—	20	107	...	—
1998	...	38	—	53	—	10	123	(d) 125	—
1999	(d) 4	...	—	80	—	11	144	...	—
2000	...	...	—	90	—	17	149	...	—
2001	...	...	—	127	—	24	126	148	—
2002	1	26	...	96	—	12	119	...	—

*continued*

(a) Including dolomite.

(b) For filler in asphalt and as mine dust.

(c) For other fillers, powders and whittings (e.g. in animal feed, polymers, paint, paper and pharmaceuticals).

(d) BGS estimate.

Source: Office for National Statistics.



Thousand tonnes

					Total
Cement	Glass making	Asphalt filler (b)	Other fillers (c)	Other uses	
...	231	...	...	...	86 762
...	221	...	...	...	81 338
...	222	...	...	...	84 123
...	251	247	...	3 316	95 448
...	257	260	...	2 867	85 379
...	...	211	...	2 961	75 633
...	...	213	...	3 045	79 342
...	255	...	...	2 775	79 780
...	...	...	...	...	75 820
...	115	...	...	2 983	74 954
...	...	109	...	...	79 902
7 595	...	107	...	3 045	73 528

Thousand tonnes

					Total
Cement	Glass making	Asphalt filler (b)	Other fillers (c)	Other uses	
...	—	5	...	—	18 986
...	—	—	—	—	18 262
...	—	35	—	—	20 330
...	—	—	26	—	20 883
...	—	...	31	—	19 249
...	—	—	...	—	18 863
...	—	—	...	—	17 752
...	—	...	...	—	17 136
...	—	...	...	...	17 220
...	—	12	...	...	15 543
...	—	—	8	...	14 238
887	—	3	11	—	12 850

Thousand tonnes

					Total
Cement	Glass making	Asphalt filler (b)	Other fillers (c)	Other uses	
...	—	...	5	...	2 018
...	—	...	...	...	1 410
...	—	...	...	...	1 432
...	—	...	...	—	1 650
...	—	...	...	—	1 540
...	—	...	...	—	1 607
...	—	...	...	—	1 624
...	—	...	...	—	1 535
...	—	...	...	—	1 507
...	—	...	...	—	1 722
1 218	—	...	...	—	1 733
1 160	—	...	...	—	1 635

## Great Britain production of dolomite by end-use and area of origin 2002

Thousand tonnes

Area of origin	Building stone	Constructional use (a)	Agricultural use (b)	Other uses (b)	Total
North East	1	2 524	415	304	3 243
Yorkshire and Humberside	...	3 076	...	...	...
East Midlands	...	2 931	...	1	2 992
South West	—	...	7	...	...
West Midlands	—	268	42	—	310
<b>England</b>	<b>9</b>	<b>...</b>	<b>543</b>	<b>...</b>	<b>...</b>
<b>Wales</b>	<b>—</b>	<b>...</b>	<b>...</b>	<b>—</b>	<b>...</b>
<b>Scotland</b>	<b>—</b>	<b>...</b>	<b>...</b>	<b>—</b>	<b>...</b>
<b>Great Britain</b>	<b>9</b>	<b>11 839</b>	<b>...</b>	<b>...</b>	<b>12 946</b>

(a) Data also included in table for 'Limestone'.

Source: Office for National Statistics.

(b) Including material for calcination.

## Great Britain production of dolomite by end-use 1991–2002

Thousand tonnes

Year	Building stone	Constructional use (a)	Agricultural use (b)	Other uses (b)	Total
1991	70	...	2 096	...	19 454
1992	...	...	2 114	...	18 539
1993	14	15 394	999	1 578	17 985
1994	(c) 13	(c) 15 136	1 070	1 397	17 616
1995	14	(c) 15 236	...	...	17 966
1996	(c) 21	(c) 13 662	(c) 1 321	(c) 1 551	16 555
1997	(c) 10	14 465	...	...	17 282
1998	10	13 070	...	...	15 632
1999	14	11 833	...	...	13 698
2000	15	11 409	...	...	13 069
2001	34	12 381	...	...	14 314
2002	9	11 839	...	...	12 946

(a) Data also included in table for 'Limestone'.

Source: Office for National Statistics.

(b) Including material for calcination.

(c) BGS estimate.

## England (d) production of dolomite by end-use 1991–2002

Thousand tonnes

Year	Building stone	Constructional use (a)	Agricultural use (b)	Other uses (b)	Total
1991	70	...	...	...	16 602
1992	...	...	...	1 397	...
1993	13	...	918	...	...
1994	(c) 13	...	...	...	...
1995	14	...	...	...	...
1996	(c) 21	...	1 230	...	...
1997	(c) 10	11 607	1 070	(c) 1 593	14 280
1998	...	11 289	...	...	13 723
1999	...	9 681	...	...	11 485
2000	15	9 509	...	...	11 120
2001	...	...	426	...	...
2002	9	...	543	...	...

(a) Data also included in table for 'Limestone'.

(d) Small amounts of dolomite are also produced in Wales and very minor amounts in Scotland.

(b) Including material for calcination.

(c) BGS estimate.

Source: Office for National Statistics.

## Great Britain production of chalk by end-use and area of origin 2002

Thousand tonnes

Area of origin	Cement	Construc- tional use	Agricultural use	Fillers, powders, whitings	Other uses	Total
Humberside	927	...	...	...	...	3 103
North Yorkshire	—	40	10	—	—	50
<b>Yorkshire and Humberside</b>	<b>927</b>	...	...	...	...	<b>3 153</b>
Lincolnshire	—	...	...	—	...	...
<b>East Midlands</b>	—	...	...	—	...	...
Cambridgeshire	262	—	...	...	—	...
Norfolk	—	—	37	—	4	41
Suffolk	—	—	22	9	31	62
Essex	—	—	...	—	—	...
Hertfordshire	—	—	26	—	—	26
Bedfordshire	1 318	—	—	—	—	1 318
<b>East of England</b>	<b>1 581</b>	—	...	...	<b>35</b>	<b>1 840</b>
Berkshire	—	2	18	—	—	20
Buckinghamshire	—	—	...	—	—	...
East Sussex	—	—	—	—	...	...
Hampshire	—	—	...	—	...	...
Isle of Wight	—	28	1	—	—	29
Kent	1 960	...	...	—	—	1 998
Surrey	—	7	—	—	—	7
West Sussex	—	9	23	—	—	33
<b>South East</b>	<b>1 960</b>	...	<b>126</b>	—	...	<b>2 147</b>
Devon	—	30	8	—	...	...
Dorset	—	...	—	—	—	...
Wiltshire	1 082	—	—	28	...	...
<b>South West</b>	<b>1 082</b>	...	<b>8</b>	<b>28</b>	...	...
<b>Great Britain (England)</b>	<b>5 550</b>	<b>904</b>	...	...	...	<b>8 587</b>

Source: Office for National Statistics.

## England production of chalk by end-use 1991–2002

Thousand tonnes

Year	Cement	Construc- tional use	Agricultural use	Fillers, powders, whitings	Other uses	Total
1991	7 057	1 036	547	...	...	10 317
1992	...	1 260	435	483	...	9 171
1993	(a) 5 839	914	466	500	(a) 1 358	9 076
1994	(a) 6 731	976	574	479	(a) 1 476	10 236
1995	(a) 6 343	828	...	488	...	9 949
1996	(a) 5 697	1 039	(a) 624	...	...	9 239
1997	(a) 6 157	768	590	...	...	9 550
1998	(a) 6 736	768	...	397	...	9 934
1999	(a) 6 345	1 021	...	...	...	9 667
2000	(a) 6 288	683	...	352	...	9 213
2001	5 111	925	...	...	...	8 205
2002	5 550	904	...	...	...	8 587

(a) BGS estimate.

Source: Office for National Statistics.

## Lithium

### United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Lithium</b>										
<i>Imports</i>										
Oxide and hydroxide	589	389	376	374	409	1 430	916	973	1 222	1 129
Carbonate	1 925	818	779	499	626	2 314	1 133	1 197	851	889
<i>Exports</i>										
Oxide and hydroxide	134	85	116	95	186	487	333	346	663	440
Carbonate	397	308	285	214	147	509	454	623	296	197

# Magnesia

Production of refractory grades of seawater magnesia at the Hartlepool plant ceased in 2002. The plant, which is now operated by CJC Chemicals & Magnesia Ltd, is focussed on the production of smaller quantities of higher purity magnesia products with different reactivities, chemistry and particle sizes, including magnesium oxide and hydroxide products in slurry and powder form. Dolomitic lime for the process continues to be derived from Thrislington quarry.

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Magnesia</b>										
<i>Imports</i>										
Dolomite	219 824	228 874	174 353	188 312	184 947	6 235	4 198	3 798	3 671	3 694
Magnesite	12 176	38 325	24 541	7 122	9 252	2 067	3 477	2 236	693	617
<i>Magnesia—</i>										
Dead burned	67 679	59 682	34 158	32 207	38 815	12 422	11 154	7 206	7 128	8 047
Caustic-calcined	71 862	57 399	82 680	73 952	46 708	11 242	7 914	8 101	7 065	5 924
Other	7 626	5 789	10 522	2 830	12 553	2 839	2 653	4 050	2 510	4 554
Kieserite	3 733	731	4 327	6 512	6 275	649	437	735	765	637
Magnesite or chrome-magnesite refractory bricks and shapes (a) (b)	26 063	28 326	69 081	83 447	85 491	7 197	4 221	8 914	6 632	15 347
<i>Exports</i>										
Dolomite	137 128	(c) 91 489	(c) 112 875	(c) 131 073	(c) 104 126	8 076	(c) 4 358	(c) 4 947	(c) 4 653	(c) 4 393
Magnesite	234	53	89	78	337	147	90	85	41	94
<i>Magnesia—</i>										
Dead burned	8 483	5 195	632	1 044	3 300	1 176	852	170	310	1 574
Caustic-calcined	2 657	1 961	6 419	4 097	2 356	1 333	1 370	2 856	1 449	1 104
Other	35 615	29 854	36 784	34 882	20 804	18 298	16 780	17 537	16 322	13 752
Magnesite or chrome-magnesite refractory bricks and shapes (a) (b)	65 736	62 698	85 856	88 896	64 850	34 214	27 034	25 579	31 365	23 266

(a) Fired bricks and shapes only: unfired (chemically bonded) products excluded.

(b) Including dolomite bricks.

(c) Crude.

# Magnesium

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Magnesium</b>										
<i>Consumption</i>										
Magnesium and alloys (a)	5 100	9 000	12 700	15 800	10 400					
<i>Imports</i>										
Ferro-silico-magnesium	9 671	8 565	6 965	5 318	5 820	6 465	5 171	3 790	3 007	2 697
Scrap	4 822	7 275	9 670	11 385	8 470	5 733	8 921	9 607	11 299	8 071
Unwrought	7 465	5 930	7 067	6 679	4 380	12 697	9 194	10 725	8 416	5 303
Unwrought alloys	1 029	2 507	3 261	2 247	1 979	1 641	3 192	3 859	2 800	2 361
Wrought	1 756	2 853	4 250	2 326	2 007	5 424	7 532	5 948	5 193	6 963
<i>Exports</i>										
Ferro-silico-magnesium	252	367	1 543	1 453	431	265	376	1 011	1 033	361
Scrap	68	167	108	169	146	111	139	122	229	133
Unwrought	252	359	...	341	77	597	636	385	478	146
Unwrought alloys	6 049	8 087	10 646	11 879	7 789	15 060	17 139	20 220	25 702	18 965
Wrought	1 072	1 122	667	339	552	3 557	2 960	2 941	2 444	2 934

(a) BGS estimates.

# Manganese

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Manganese</b>										
<i>Consumption in Iron and Steel Industry</i>										
Ore	21 500	14 300	35 700	3 800	4 300					
Ferro-manganese	125 230	117 720	111 450	96 450	83 020					
Ferro-silico-manganese	31 500	29 930	27 830	25 050	22 340					
<i>Apparent consumption (a)</i>	135 000	115 000	123 000	102 000	117 000					
<i>Imports</i>										
Ores and concentrates	28 300	8 234	2 956	2 701	1 218	2 286	1 585	942	534	598
Ferro-manganese	111 500	90 301	91 053	73 507	86 681	32 486	25 673	26 088	22 499	24 712
Ferro-silico-manganese	49 448	53 965	66 279	53 747	64 565	15 092	14 342	18 021	15 465	18 264
Scrap	46	2	217	220	23	39	4	156	205	13
Unwrought	8 468	6 644	7 880	8 926	7 229	10 417	5 287	6 163	7 437	5 669
Wrought	282	638	523	490	348	787	621	823	640	364
Oxides	4 869	4 422	5 795	5 344	6 053	1 802	1 843	3 939	1 868	1 282
<i>Exports</i>										
Ores and concentrates	1 196	490	290	714	208	356	255	559	382	402
Ferro-manganese	2 878	452	1 327	792	1 874	2 280	529	1 219	1 342	2 029
Ferro-silico-manganese	2 456	1 327	1 307	8	116	801	377	313	7	42
Scrap	45	—	38	1	—	222	—	118	1	—
Metal	4 697	(b) 3 800	(b) 3 800	(b) 3 700	(b) 3 700	8 395	(b) 4 400	(b) 3 800	(b) 5 200	(b) 3 500
Oxides	813	725	394	1 146	279	960	1 093	763	492	348

(a) BGS estimates; see p.v.

(b) BGS estimates.

# Marble

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Marble</b>										
<i>Imports</i>										
Dimension stone—										
Unworked	9 571	8 473	29 015	9 985	12 708	7 094	7 976	7 709	7 727	8 855
Worked	53 489	53 639	32 425	64 637	48 237	27 575	21 566	23 668	28 291	32 555
Crushed and powdered	106 098	130 681	145 496	239 563	259 012	3 330	3 079	3 011	4 002	4 971
<i>Exports</i>										
Dimension stone—										
Unworked	7 332	6 084	8 668	4 140	4 853	535	425	501	770	585
Worked	601	622	839	526	946	1 420	1 366	1 407	1 456	1 893
Crushed and powdered	2 636	8 190	865	4 995	4 579	189	355	53	148	107

# Mercury

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Mercury</b>										
<i>Imports</i>										
Elemental	8	8	19	5	23	71	220	181	140	111
Oxide	3	1	1	0	0	21	20	7	20	10
<i>Exports</i>										
Elemental	35	5	3	17	6	288	121	71	65	68
Oxide	0	0	0	0	0	0	7	3	2	5

# Mica

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Mica</b>										
<i>Imports</i>										
Crude (a)	29	125	203	344	240	25	75	118	186	161
Ground	7 961	6 977	5 355	7 258	9 349	1 899	1 853	1 531	1 699	1 874
Waste	10 379	5 854	8 119	4 016	4 224	1 168	675	974	478	489
Worked	705	620	691	732	590	6 044	6 055	5 003	4 514	3 910
<i>Exports</i>										
Crude (a)	24	120	68	22	20	29	68	87	23	52
Ground	4 686	3 913	3 638	3 758	4 023	3 986	2 293	2 337	2 199	2 683
Waste	474	254	56	17	46	573	321	63	50	89
Worked	296	262	279	266	394	2 883	4 721	2 916	2 481	2 415

(a) Including sheets or splittings.

# Molybdenum

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Molybdenum</b>										
<i>Consumption in Iron and Steel Industry (a)</i>										
Apparent consumption (a) (b)	2 540	2 390	2 270	2 040	1 850					
<i>Imports</i>										
Roasted molybdenite concentrates	16 133	12 319	9 644	14 327	19 654	45 962	25 709	18 648	28 056	48 060
Other ores and concentrates	1 361	1 553	2 813	2 045	1 783	5 420	3 571	6 030	5 003	5 906
Ferro-molybdenum	599	792	490	351	338	1 902	2 130	1 304	1 041	1 545
Scrap	447	534	303	449	472	3 302	2 715	1 904	2 093	2 257
Powders	23	31	18	86	56	179	146	217	585	216
Unwrought	209	206	158	175	139	3 203	2 629	1 344	2 281	1 728
Wrought	224	603	366	455	553	5 664	5 613	7 192	10 655	8 533
Oxides and hydroxides	110	65	34	60	106	409	219	225	180	621
<i>Exports</i>										
Roasted molybdenite concentrates	2 204	918	181	213	351	7 335	1 941	398	451	907
Other ores and concentrates	197	81	136	83	67	692	434	422	285	244
Ferro-molybdenum	10 453	8 311	7 251	9 278	11 965	40 082	25 517	23 374	27 156	48 756
Scrap	33	26	21	167	64	247	217	161	778	416
Powders	25	11	13	55	46	324	293	354	598	395
Unwrought	5	15	5	26	10	60	279	54	186	106
Wrought	185	52	239	798	206	1 422	1 388	1 485	2 306	1 890
Oxides and hydroxides	20	32	7	7	11	123	135	54	58	65

(a) Metal content.

(b) BGS estimates; see p.v.

# Nepheline syenite

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Nepheline-syenite</b>										
<i>Imports</i>	34 145	(a) 48 361	(a) 50 363	57 268	53 692	3 415	...	...	4 142	4 627
<i>Exports</i>	38	17	36	54	82	19	10	15	16	31

(a) Exports from Canada and Norway.

# Nickel

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Nickel</b>										
<i>Production</i> (a) (e)	39 100	39 467	37 976	33 820	33 790					
<i>Consumption</i> (b)										
Iron and Steel Industry	13 800	15 500	15 000	15 200	15 970					
Other (c)	17 100	13 800	19 900	40 600	42 900					
Total (d)	30 891	29 276	34 870	55 802	58 905					
<i>Imports</i>										
Matte, oxide sinter etc.	59 263	57 457	54 768	51 963	52 514	111 763	96 027	156 260	131 751	122 987
Ash and residues	238	66	15	4	246	142	32	57	13	195
Scrap	11 884	15 731	22 644	14 963	25 270	15 069	14 684	26 571	19 571	28 395
Ferro-nickel	11 909	4 470	2 503	7 166	11 010	13 088	3 733	3 424	6 614	12 508
Unwrought	12 538	15 669	18 825	47 030	46 610	39 037	51 657	103 322	117 134	129 301
Unwrought alloys	4 182	7 355	2 095	2 788	1 868	18 890	22 083	15 919	23 788	14 129
Oxides	98	199	131	145	130	359	459	689	830	690
<i>Exports</i>										
Matte, oxide sinter etc.	58	197	1 634	136	128	232	546	1 772	805	515
Ash and residues	6 826	7 390	13 648	7 843	8 110	14 488	11 879	22 682	13 409	14 954
Scrap	5 109	5 432	7 015	7 736	7 912	10 316	9 932	14 383	17 893	15 495
Ferro-nickel	3 376	0	9	104	368	432	1	80	138	538
Unwrought	20 502	20 728	21 678	21 670	19 775	68 178	63 402	116 445	104 050	86 918
Unwrought alloys	4 271	3 733	5 203	5 955	4 257	35 147	30 016	49 075	64 131	33 750
Oxides	8	9	1	1	17	59	28	6	29	97

(a) Nickel content of refinery products.

(b) Metal content.

(c) Not independently recorded; obtained by subtraction. Believed to include stocks.

(d) Including the nickel content of ferro-nickel and other smelter products.

(e) Following the increase in the nickel price in 2003, there have been a number of enquiries relating to nickel in northeast Scotland where two small sub-economic deposits were discovered in the late 1960s.

# Niobium and tantalum

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Niobium and tantalum</b>										
<i>Consumption in Iron and Steel Industry</i>										
Niobium (a)	510	480	460	410	380					
<i>Imports</i>										
Ores and concentrates	1	10	9	2	8	72	594	1 026	67	5
Ferro-niobium	1 086	952	1 548	1 261	1 029	6 181	5 344	8 206	8 853	6 502
Tantalum	1 375	1 119	979	1 610	3 480	86 116	99 486	122 081	133 549	106 350
Niobium (b)	478	262	129	192	132	3 760	3 774	3 677	4 431	2 553
<i>Exports</i>										
Ferro-niobium	32	47	107	280	46	152	283	975	660	224
Tantalum	290	354	569	395	280	37 171	51 682	72 265	78 838	79 636
Niobium (b)	24	...	24	31	...	496	...	558	812	674

(a) Metal content.

(b) Including rhenium.

# Peat

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Thousand cubic metres					£ thousand				
<b>Peat</b>										
<i>Production</i>	1 076	1 653	1 626	1 814	973					
<i>Imports</i>										
Peat and agglomerated peat	370 035	411 997	407 226	414 833	441 213	23 110	24 303	24 512	25 620	26 787
<i>Exports</i>										
Peat and agglomerated peat	48 832	60 285	38 412	35 551	33 331	4 933	3 614	3 405	2 993	2 842

# Perlite

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Perlite</b>										
<i>Imports</i>	47 119	34 632	(a) 94 580	46 250	95 912	2 425	2 507	3 005	2 343	4 201
<i>Exports</i>	2 504	(a) 12 627	(a) 9 614	720	695	234	71	112	103	174

(a) Figure believed to be too high.

## Petroleum and natural gas (also see Primary fuels)

The price of crude oil was 7.5 per cent higher at the end of December 2003 (at US\$30.82 per barrel) than 12 months previously. However the year was characterized by fluctuating values caused by world events. In mid March 2003 the price peaked at \$33 per barrel due to strike action in Venezuela and tensions in Iraq. When OPEC subsequently confirmed it would maintain production levels throughout the year, in order to stabilize the price at about \$25 per barrel, the price fell and since then it has fluctuated mainly between \$25 and \$29. In September OPEC announced a surprise cut in production to 24.5m b/d to maintain its target price.

The UK North Sea continued to be a world-class basin for oil and gas production and produced 4 million barrels per day (oil equivalent) of oil and gas in 2003. Investment in drilling and infrastructure facilities (including development projects) was £3.4 billion. Operating costs exceeded £4.3 billion. However the industry faces future difficulties with rising unit costs and forecast declining production rates.

In the Budget the Chancellor announced that the Petroleum Revenue Tax would be abolished for third-party access contracts to UKCS pipelines and infrastructure. Industry estimates are that this may unlock a further 500-700m boe from the development of currently uneconomic discoveries.

The UKDEAL service continued to be expanded and improved throughout the year. In April, the wells data model, search form and downloads were upgraded to provide a more complete set of attributes. UKDEAL has become the definitive source of UKCS well headers and is now automatically updated with new wells direct from the DTI's online notification system (WONS), as they are spudded. In September, the new Data Registry was created. This is a catalogue for data held under the terms of the UK offshore hydrocarbons licences. The first release lists the DTI core for released wells, and 2D seismic documents for non-speculative surveys, held at the Gilmerton (Edinburgh) repository.

The year contained the 11th onshore and the 21st offshore licensing rounds. Offshore, companies could apply for a new style 'Promote' licence for the first time whereby they could assess the licence area for oil and gas before 'promoting' their asset to investors to finance the cost of drilling. The licence would lapse after two years unless a substantive work programme was agreed (normally the drilling of a well). The concept was developed after consultation with industry and is intended to attract smaller and/or new companies to the North Sea. Arrangements for traditional licences remained unchanged.

After consultation throughout the year the fourth Strategic Environmental Assessment document (SEA4) was published in September. This covered the area to the north, west and south-west of Shetland. Comments were due by mid December. This assessment paves the way for the 22nd offshore licensing round which will include part of the SEA4 area. Field work was undertaken for SEA5 which covers part of the North Sea stretching from the Firth of Forth to east of Shetland but not extending as far out as the UK/Norway median line. Publication is due in 2004.

The new Master Deed system, initiated by PILOT and DTI, came into effect in April. The Deed creates a mechanism which simplifies the complex procedures involved when selling offshore assets on the UKCS. The first completed transactions (in September) concerned BP, BG International Limited and Shell disposing of their Bacton area assets to Perenco UK Limited. The transfer involved about 60 companies in total.

The National Hydrocarbons Data Archive (NHDA) was established in September. As a new PILOT initiative its aim is to reduce costs, remove perpetual licence obligations and increase data availability for future exploration. It is operated by BGS and accommodates the geoscientific legacy from UK offshore oil and gas exploration and production activity. In return for donating an agreed subset of the data (defined as the Basic Licence Dataset) for a relinquished licence or field at completion of production, licensees are relieved of their obligation to store the data in perpetuity. The NHDA will then advertise the data on DEAL and make it available to the public at low cost. An Archive Project was initiated to develop the cost-model, procedures and guidelines for industry. This involved six operators, CDA, DTI and BGS. The first datasets were ready for submission by the end of December and the Archive Project is scheduled to be completed in early 2004.

In October Britain and Norway announced an agreement on principles that will be incorporated into a new Framework Treaty for future cross-border oil and gas co-operation between the two countries. The agreement provides a basis for new investments by



industry, most notably the proposed 'Britpipe' from the Norwegian Ormen Lange field that will bring an estimated 20 bcm of gas per year starting in Winter 2006/7 and supply up to 20 per cent of Britain's gas requirement by the end of the decade.

In the Autumn the industry expressed concerns to the government about the Energy Chapter of the proposed EU constitution. It was argued that shared competence in energy policy, as the chapter is currently written, would introduce significant uncertainty and risk for UK offshore operators. Industry leaders wanted Britain to retain fiscal control over key areas such as licensing, safety, offshore operations, decommissioning and security of supply.

In December the DTI published a consultation document inviting comments on the future arrangements for compulsory stocking obligations. In the near future the UK will become a net oil importer. Although the UK has systems in place to ensure continuation of oil supply, world events occasionally threaten disruption. Hence a review of the UK's ability to avoid a failure in energy supply was considered timely.

At the end of the year negotiations between the DTI and UKOOA resulted in new guidelines for the release of proprietary seismic data on the UKCS becoming effective. The aim was to encourage the rapid and innovative exploration of the UKCS through a quicker turnover of licences facilitated by easier and cheaper access to data. Release of certain categories of data would now have to be available after either 3 or 4 years.

### *New Production*

ChevronTexaco's Caledonia field, in block 16/26, came on stream in February with a single well 5.6km tie-back pipeline to Britannia. Production in the first year is expected to average 10,000 b/d.

The first phase of the Venture Production's Sycamore oil field development (Central North Sea block 16/12a) came on stream in March. Production, which started at 27,000 b/d, is expected to rise as subsequent phases are completed. Total reserves in the field are estimated at 24m boe.

First gas from the McAdam field in block 44/21a was produced in April. Initial rates from this field, operated by ConocoPhillips, were 60-65 MMcfd.

The Blake Flank accumulation in block 13/24a yielded its first oil in September at an initial rate of 5200 barrels per day. Also in September Marathon Oil produced first gas and condensate rates of 50 MMcfd and 4500 b/d respectively from the Braemar field (block 16/3c).

First production from Nuggets N4 in block 3/25a commenced in October despite development permission only being granted earlier in the year (see below). The field is producing 1.5-1.8 MMcmd of gas.

Petro-Canada achieved first oil from its Clapham field (block 21/24) in November. Probable reserves are estimated at more than 20m barrels with peak production of 15,000 b/d in 2004.

### *Development*

The number of onshore development wells (17) drilled in 2003 was just one fewer than the previous year. No onshore fields were approved for development in 2003.

A sharp fall was recorded in development drilling offshore. The number of wells drilled was down approximately 40 per cent to 151 wells. The Northern and Central North Sea were by far the most active areas.

In the Northern North Sea, the DTI approved the Broom oil field for development. It is situated in block 2/5 and operated by DNO. The field comprises the former West Heather and North Terrace oil accumulations and is located some 8km west of the Heather platform. The total recoverable, proven and probable reserves from the Heather and Broom Fields is now estimated to be some 74m barrels with the Heather Alpha platform continuing in service until 2014. The Nuggets N4 gas field, in block 3/25a (operated by TotalFinaElf), was approved for development in April. The field was discovered in 1974 in 350-400ft of water. Development will be by a single isolated subsea well and a 67km tie-back pipeline to Nuggets N3, the longest on the UKCS. When complete, production from the N1 to N4 fields will increase to 5.95 mscf/day. Permission for development of the Rhum gas field in block 3/29 (operated by BP) was granted in May. The field is located 380km NE of Aberdeen in 350ft of water. It is 44km from the BP-operated Bruce platform. Development of the field will involve a subsea tieback to the Bruce field with gas being exported onwards from Bruce via the Frigg pipeline system to St. Fergus. Associated condensate will be piped via Bruce into the Forties pipeline system. Rhum is a HPHT reservoir with estimated resources of 1.1 tcf (31 bcm) of gas, of which 800 bcf (23 bcm) is deemed recoverable.

In the Moray Firth area permission was granted in November for the development of the Buzzard oil field (operated by Encana) in block 20/6. Buzzard was discovered in 2001 and is situated 60km NE of Peterhead in 320ft of water. It is one of the largest fields to be discovered on the UKCS in the last 25 years and contains high quality 32° API oil in a 720ft hydrocarbon column with an estimated oil in place between 800m and 1100m barrels. First oil production is scheduled for 2006 and the offshore facilities design allows for production rates of 220,000 barrels per day.

In the Central North Sea the DTI sanctioned the development of the Seymour gas condensate field and first production was achieved in March. The field is situated in block 22/5b and operated by BG. Gas will be exported to Teesside via the CATS pipeline and condensate to the Grangemouth refinery via the Everest and Forties pipelines.

In the Southern North Sea, the DTI approved the development of the Carrack gas field, operated by Shell and situated in block 49/14b (120km off the north Norfolk coast close to the UK/Dutch median line). The field is estimated to contain 300 bcf of gas

and 5.3m barrels of condensate. Production will reach a peak rate of 160 mscf/d and be delivered onshore via the Sole Pit Clipper complex to the Bacton terminal. Development of the Rose gas field in block 47/10 (ENE of the Humber estuary) was also approved. This was discovered in 1998 by BG but is now operated by Centrica Resources Limited.

### *Exploration*

The number of onshore exploration wells drilled (3) was the lowest for a number of years and significantly down from the previous year (14). A single discovery was announced by Pentex who discovered oil in the Avington 2 well in Hampshire.

Offshore, a total of 26 exploration wells were spudded in 2003 (more than in 2002) but only 19 appraisal wells (fewer than in 2002). The overall combined level of drilling in these two categories remained almost constant. Most wells were drilled in the Central and Southern North Sea Basins. The following companies were the most active in drilling exploration wells: Encana, ExxonMobil, Kerr-McGee, Maersk, Shell, Talisman and Venture. Many of the wells remain tight holes with no results yet released.

In the Northern North Sea Shell drilled well 219/21-1, the second most northerly well ever drilled on the UKCS at 210km NE of Shetland. It tested the Ben Nevis prospect. The only exploration well west of Shetland in 2003 was 204/17-1 drilled by ChevronTexaco 25km west of the Foinaven field in over 1000m water depth close to the UK/Faroes median line.

In the outer Moray Firth area Talisman spudded well 15/16a-23 in June, on the Tartan North Terrace prospect, and subsequently announced it as a new oil discovery with a 302ft oil column. The well was completed as a future possible subsea producer. Later in the year Talisman also discovered oil in 21/1a-20. Test rates were 7100 b/d of oil and 7.6 MMcfd of gas. Flows were constrained by surface facilities.

BP exploration well 16/28-17 tested the Farragon prospect and discovered oil close to the existing Andrew field. The prospect is estimated to contain recoverable reserves of 30m barrels.

In the Central North Sea, Maersk well 30/6-4, drilled on the Harrier prospect, was eventually completed in June after nearly 6 months operating and 3 sidetracks. The wells involved extended lengths of horizontal drilling to test the Chalk horizon. Kerr-McGee announced an oil discovery by well 30/19-7Z. A flow rate of 4000 b/d was recorded from 120 ft of net oil pay in the Tor formation.

Total well 29/5b-F7Z, drilled on the West Franklin prospect, was finally suspended after testing and proving flow rates of 1 MMcfd of gas and 2000 b/d of condensate.

In the Southern North Sea, ConocoPhillips well 49/16-14Z, drilled on the Valkyrie prospect, was suspended as a gas well. ExxonMobil also discovered gas in the Camelot 53/2-11 well but their Gawain SE well 49/29a-10 was plugged and abandoned as a dry hole.

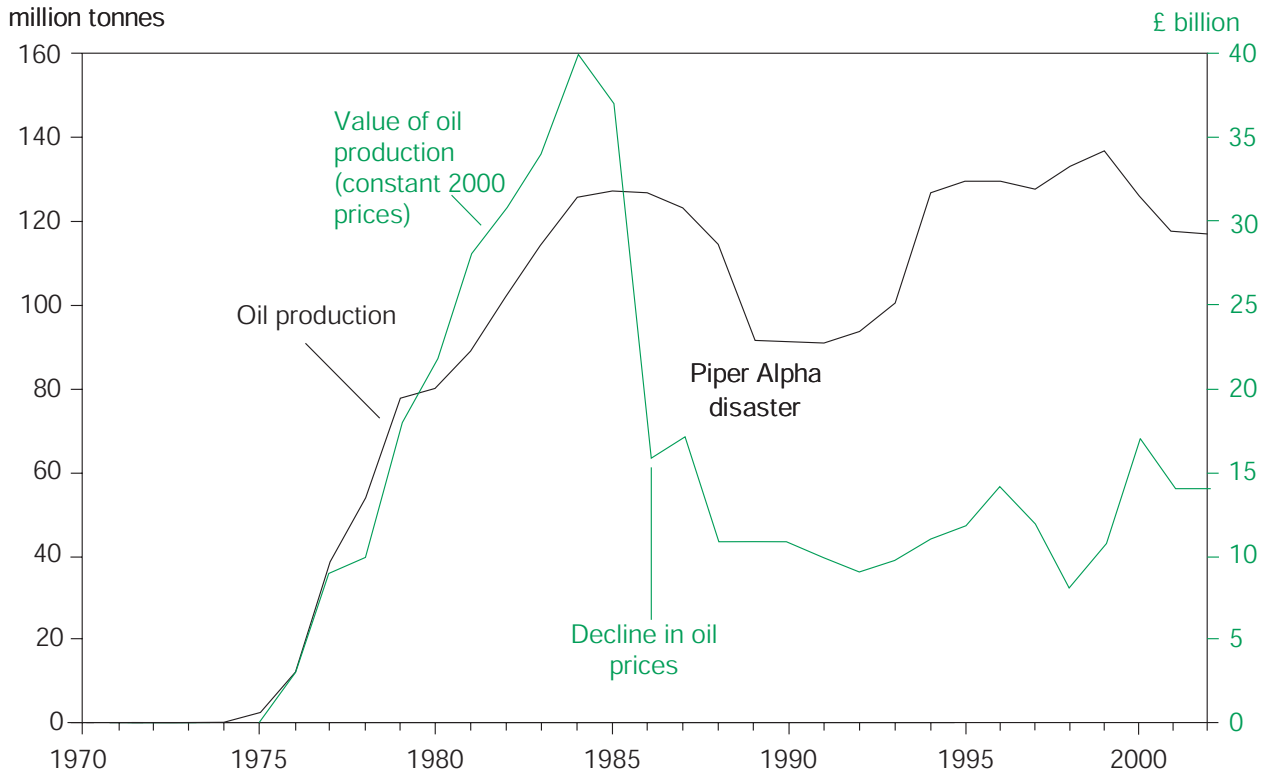
### *Licensing*

The second phase of the Fallow Initiative was instigated in March. Details of 40 fallow blocks and 37 fallow discoveries were placed on the Licence Information For Trading (LIFT) website. Companies which have not undertaken significant activity in these areas must either bring in new investment and ideas or pass the assets on to companies prepared to invest and exploit them. The first Fallow Initiative was considered very successful and had stimulated new work or caused relinquishment of blocks some of which were incorporated into the 21st offshore licensing round. The third and fourth phases were announced in May and September and, between them, listed a further 21 fallow blocks and 23 fallow discoveries.

In July the DTI announced the results of the 11th onshore licensing round. Eight applications had been received and eight licences were offered to the following seven companies: Alkane Energy UK Limited, Egdon Resources (UK) Limited, Magellan Petroleum (NT) Pty Limited, Midmar Energy Onshore Ltd, Northern Petroleum (GB) Limited, Roc Oil (UK) Ltd and Stag Energy Limited. Parts of Hampshire, Lincolnshire, Norfolk, Nottinghamshire and West Sussex are covered by these licences. Towards the end of the year the DTI stated its intention to have a 12th onshore licensing round during the first half of 2004.

In 2003 the DTI undertook the 21st offshore licensing round. The round closed on 8th May and results were announced on 31st July. Seventy applications were received (30 for traditional licences, 40 for Promote licences) from 75 different companies, 36 of which were potential newcomers to the North Sea. Applications covered 140 blocks – the largest number applied for since the early 1970s. After negotiations, 88 new licences were awarded at the end of July (35 traditional and 53 Promote) to 62 companies (including 27 newcomers) covering 137 blocks. In November the DTI offered Burlington Resources an out-of-round licence covering blocks 113/21 and 113/22 in the East Irish Sea Basin. During the year 51 licences covering 71 blocks were surrendered either on a voluntary or mandatory basis.

## United Kingdom production and value of oil, including condensate 1970–2002



## United Kingdom production of onshore crude petroleum and natural gas by fields 1992–2002

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
<b>Oil fields</b>											
	Thousand tonnes										
Beckingham W	1	1	1	1	1	1	1	1	1	1	1
Cold Hanworth	—	—	—	—	—	—	2	2	1	4	13
Crosby Warren	6	6	4	2	3	4	4	1	0	3	3
Farleys Wood	2	2	2	2	0	0	1	0	0	0	—
Fiskerton Airfield	—	—	—	—	—	—	1	19	18	5	1
Glentworth E	—	1	1	1	1	1	2	2	1	1	1
Goodworth	—	—	—	—	—	1	3	2	2	2	2
Herriard	2	2	2	4	3	2	1	1	1	—	1
Hordean	17	20	16	19	17	15	14	13	10	9	8
Humbly Grove	47	52	48	51	36	37	29	24	14	16	11
Keddington	—	—	—	—	—	—	2	5	3	1	1
Kirklington	1	—	—	0	0	0	0	—	—	—	—
Long Clawson	9	8	7	7	8	8	9	10	9	8	9
Nettleham	14	4	3	1	1	6	9	7	5	3	3
Newton-on-Trent	—	—	—	—	—	—	—	2	1	—	—
Palmers Wood	42	45	38	37	24	23	19	10	10	12	15
Rempstone	2	2	2	5	3	3	2	2	1	1	1
Scampton	—	—	—	—	1	2	0	—	—	0	0
Scampton N	15	12	8	8	13	17	12	11	11	11	10
Singleton	21	39	34	35	36	36	27	21	21	23	22
Stainton	2	2	1	1	1	1	1	0	1	1	1
Stockbridge	36	41	78	92	86	79	110	87	42	42	37
Storrington	—	—	—	—	—	—	14	15	8	4	20
Wareham	95	77	66	56	42	32	20	21	15	19	9
Welton	151	132	138	127	153	150	123	90	87	77	64
West Firsby	9	16	12	14	26	27	17	10	8	5	6
Whisby	4	4	4	4	1	0	0	0	0	0	0
Wytch Farm	3 423	3 210	4 123	4 543	4 730	4 481	4 690	3 867	2 919	2 656	2 381
Other	63	61	61	58	53	23	51	44	42	39	34
<b>Total</b>	<b>3 962</b>	<b>3 737</b>	<b>4 649</b>	<b>5 067</b>	<b>5 240</b>	<b>4 949</b>	<b>5 161</b>	<b>4 269</b>	<b>3 234</b>	<b>2 944</b>	<b>2 652</b>
<b>Gas fields</b>											
	Million cubic metres										
Wytch Farm	147	120	161	182	245	242	156	149	111	115	108
Others	60	107	80	140	137	146	179	161	564	438	354
<b>Total (a) (b)</b>	<b>207</b>	<b>227</b>	<b>241</b>	<b>322</b>	<b>382</b>	<b>388</b>	<b>335</b>	<b>310</b>	<b>675</b>	<b>553</b>	<b>462</b>

(a) Gross production, i.e. includes own use for drilling purposes, production and pumping operations, but excludes gas flared and vented.

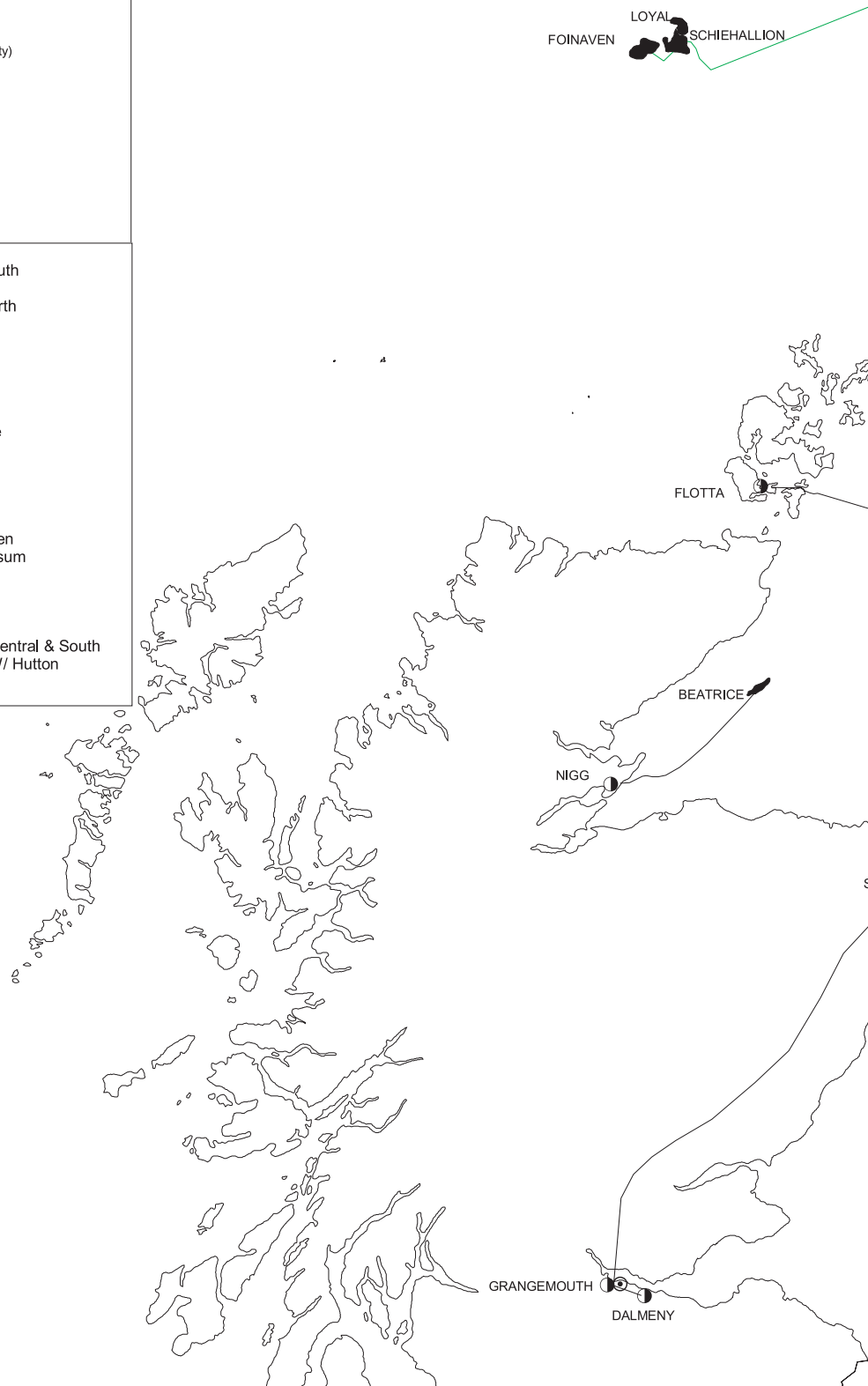
(b) Other than colliery methane.

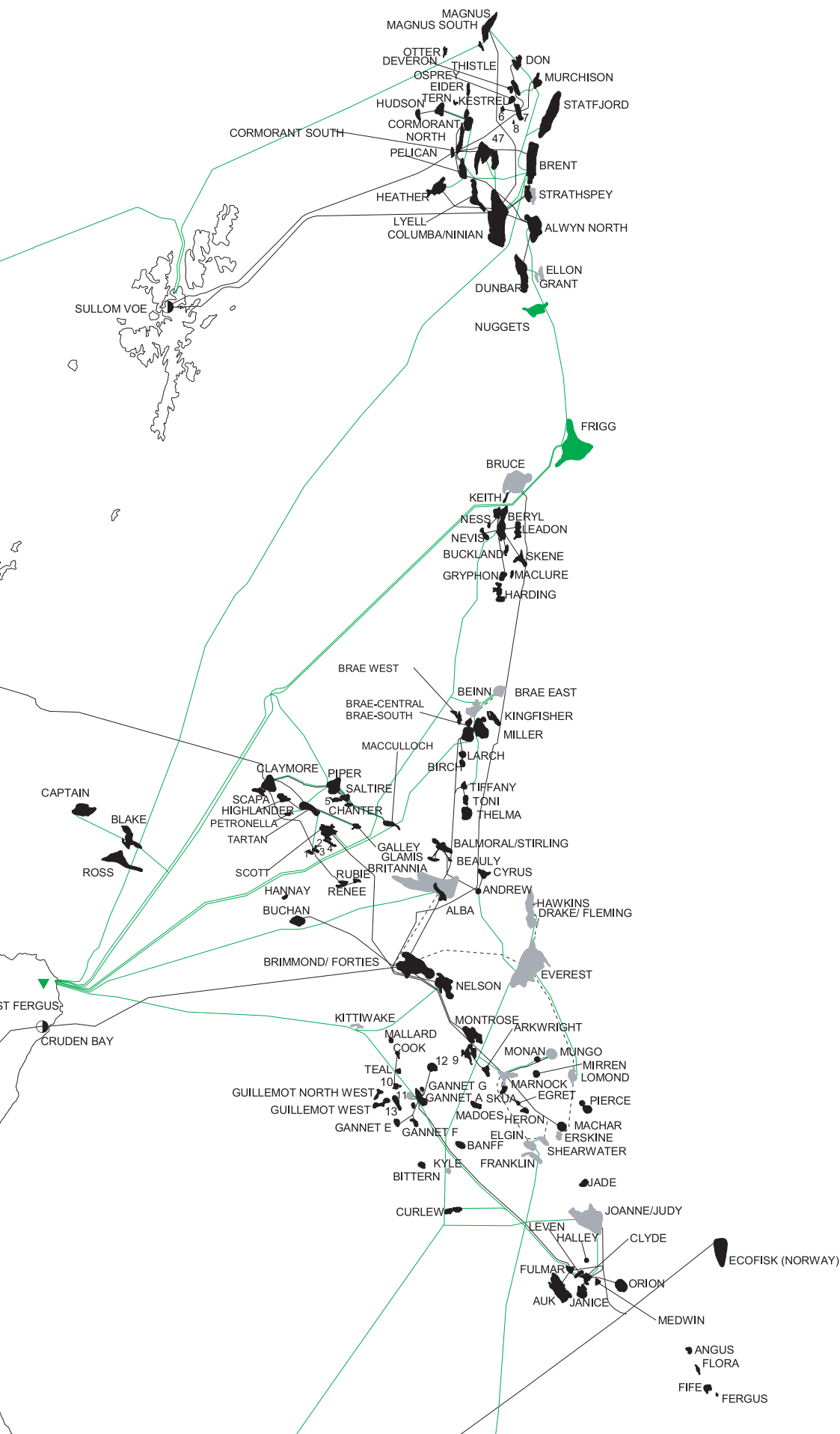
Source: Department of Trade and Industry.

# United Kingdom crude petroleum and natural gas fields (North) 2002

(Source: Department of Trade & Industry and BGS)

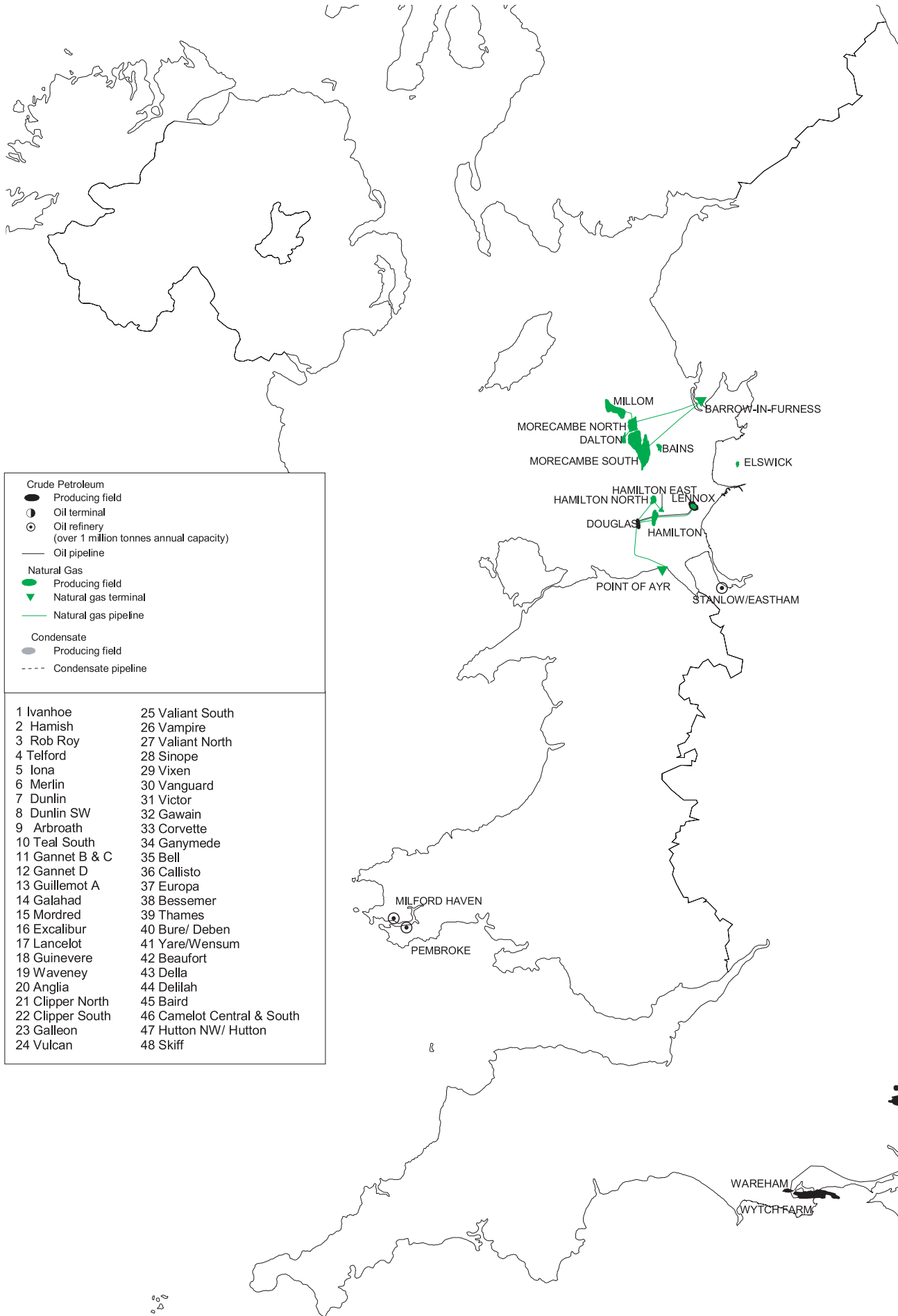
<p><b>Crude Petroleum</b></p> <ul style="list-style-type: none"> <li>● Producing field</li> <li>○ Oil terminal</li> <li>⊙ Oil refinery (over 1 million tonnes annual capacity)</li> <li>— Oil pipeline</li> </ul> <p><b>Natural Gas</b></p> <ul style="list-style-type: none"> <li>● Producing field</li> <li>▼ Natural gas terminal</li> <li>— Natural gas pipeline</li> </ul> <p><b>Condensate</b></p> <ul style="list-style-type: none"> <li>● Producing field</li> <li>- - - Condensate pipeline</li> </ul>	
<p>1 Ivanhoe 2 Hamish 3 Rob Roy 4 Telford 5 Iona 6 Merlin 7 Dunlin 8 Dunlin SW 9 Arbroath 10 Teal South 11 Gannet B &amp; C 12 Gannet D 13 Guillemot A 14 Galahad 15 Mordred 16 Excalibur 17 Lancelot 18 Guinevere 19 Waveney 20 Anglia 21 Clipper North 22 Clipper South 23 Galleon 24 Vulcan</p>	<p>25 Valiant South 26 Vampire 27 Valiant North 28 Sinope 29 Vixen 30 Vanguard 31 Victor 32 Gawain 33 Corvette 34 Ganymede 35 Bell 36 Callisto 37 Europa 38 Bessemer 39 Thames 40 Bure/ Deben 41 Yare/Wensum 42 Beaufort 43 Della 44 Delilah 45 Baird 46 Camelot Central &amp; South 47 Hutton NW/ Hutton 48 Skiff</p>

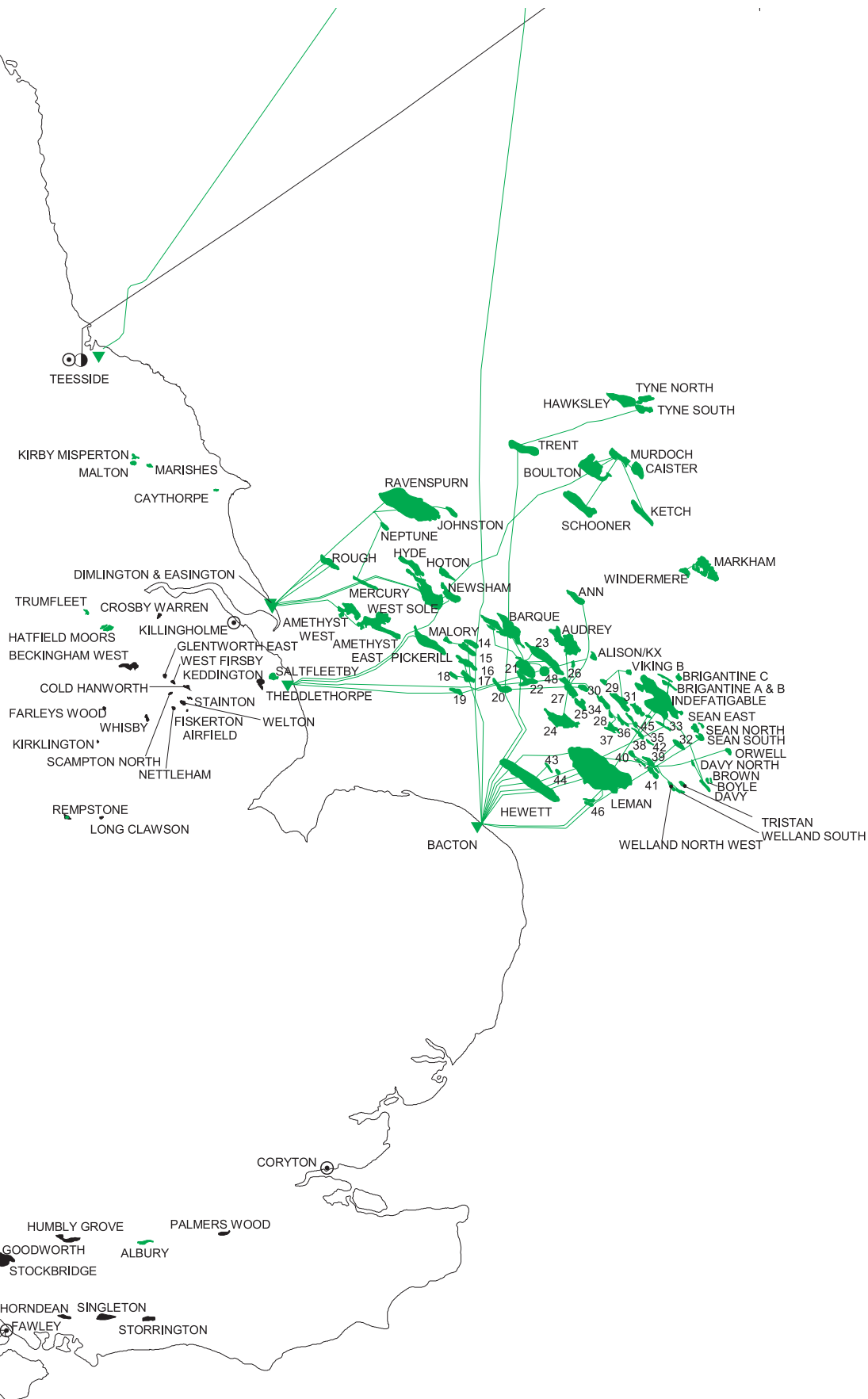




# United Kingdom crude petroleum and natural gas fields (South) 2002

(Source: Department of Trade & Industry and BGS)





## United Kingdom production of offshore crude petroleum and natural gas by fields 1992–2002

Thousand tonnes

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
<b>Oil fields</b>											
Alba	—	—	2 300	3 772	3 808	4 850	4 381	3 993	4 156	4 319	3 329
Alwyn N	3 613	2 891	1 943	1 391	1 066	966	1 078	1 093	891	808	704
Andrew	—	—	—	—	856	2 798	3 244	3 298	2 540	1 856	1 542
Angus	1 167	211	—	—	—	—	—	—	—	168	323
Arbroath	1 670	1 568	1 503	1 662	1 452	1 109	1 115	1 100	931	778	675
Argyll	186	—	—	—	—	—	—	—	—	—	—
Arkwright	—	—	—	—	65	462	300	185	261	253	227
Auk	354	399	528	607	458	647	784	621	558	392	421
Balmoral	1 344	1 011	805	637	410	467	392	354	275	292	219
Banff	—	—	—	—	380	278	—	1 102	711	834	546
Beatrice	724	605	537	473	438	151	365	194	137	97	357
Beaully	—	—	—	—	—	—	—	—	—	480	394
Beinn	—	112	212	391	389	286	214	116	30	47	93
Beryl	5 086	4 631	4 159	4 426	4 234	3 748	2 961	2 296	1 621	1 541	1 559
Birch	—	—	—	286	1 025	768	500	226	94	101	0
Bittern	—	—	—	—	—	—	—	—	1 150	2 404	2 346
Bladon	—	—	—	—	—	108	283	145	32	—	—
Blake	—	—	—	—	—	—	—	—	—	1 024	2 024
Blenheim	—	—	—	1 044	846	399	219	141	38	—	—
Brae Central	773	556	518	487	406	385	475	288	242	169	183
Brae E	—	17	2 637	3 323	2 739	2 074	1 459	1 192	837	593	374
Brae N	1 825	1 134	876	542	468	363	412	335	280	262	228
Brae S	563	459	521	533	522	443	412	268	250	275	208
Brae W/Sedgwick	—	—	—	—	—	159	1 627	1 505	1 633	1 435	1 159
Brent	10 798	10 906	9 495	9 205	9 468	6 264	6 054	4 536	3 538	2 843	1 925
Brimmond	—	—	—	—	18	60	80	48	48	31	34
Britannia	—	—	—	—	—	—	555	1 848	1 618	1 319	1 032
Bruce	—	853	2 090	1 713	1 705	1 289	898	1 845	1 647	1 448	1 328
Buchan	652	515	602	492	536	445	402	344	351	385	348
Buckland	—	—	—	—	—	—	—	474	1 601	1 141	643
Captain	—	—	—	—	—	1 461	2 836	2 525	2 458	3 107	3 109
Chanter	—	191	67	92	103	48	15	7	8	6	4
Chaymore	2 301	2 355	2 235	2 258	2 154	2 096	1 818	1 658	1 564	1 411	1 425
Clyde	1 226	976	761	797	666	698	638	586	450	400	348
Columba B & D	—	—	102	288	579	511	319	243	538	931	543
Columba E	—	—	—	—	—	—	217	170	153	136	112
Cook	—	—	—	—	—	—	—	—	406	876	796
Cormorant N	1 406	1 706	2 128	2 074	1 470	1 477	1 638	1 541	1 513	1 469	1 110
Cormorant S	1 050	685	909	810	968	1 012	820	1 023	915	626	597
Curlew	—	—	—	—	—	86	1 438	1 508	817	386	218
Cyrus	66	—	—	—	203	603	541	402	253	181	190
Dauntless	—	—	—	—	—	197	308	38	—	—	—
Deveron	59	58	46	55	58	26	52	40	10	11	19
Don	245	202	207	234	169	108	100	89	69	45	19
Donan	282	486	421	357	283	193	—	—	—	—	—
Douglas	—	—	—	—	768	1 604	1 324	937	779	1 118	918
Drake	—	—	—	—	—	80	282	317	261	226	193
Dunbar	—	—	41	1 822	2 408	2 491	2 101	1 886	1 627	1 440	1 540
Duncan	36	—	—	—	—	—	—	—	—	—	—
Dunlin	1 345	1 124	1 040	961	755	807	643	627	525	574	468
Dunlin SW	—	—	—	—	259	197	236	232	109	88	84
Durward	—	—	—	—	—	273	589	45	—	—	—
Egret	—	—	—	—	—	—	—	383	214	95	115
Eider	1 568	1 554	1 224	908	815	654	616	601	356	242	216
Elgin	—	—	—	—	—	—	—	—	—	1 974	4 146
Ellon	—	—	6	98	140	377	283	129	152	77	46
Emerald	370	899	633	423	41	—	—	—	—	—	—
Erskine	—	—	—	—	—	4	791	883	82	837	973
Everest	—	138	232	262	277	313	286	235	203	230	238
Fergus	—	—	—	—	249	562	276	161	81	57	48
Fife	—	—	—	745	1 624	1 077	820	362	585	449	539
Fleming	—	—	—	—	—	93	507	477	424	367	300
Flora	—	—	—	—	—	—	152	506	495	278	168
Foinaven	—	—	—	—	—	252	3 691	4 262	4 588	4 419	5 358
Forties	7 550	5 841	6 044	5 252	5 140	4 109	3 998	3 227	2 720	2 828	2 624
Franklin	—	—	—	—	—	—	—	—	—	199	1 006
Fulmar	3 979	2 623	1 955	1 242	1 040	547	468	373	228	172	165
Galley	—	—	—	—	—	—	946	1 333	1 602	1 099	795
Gannet A	—	19	587	956	1 315	1 192	1 015	866	711	553	562
Gannet B	4	85	87	148	97	58	35	29	29	51	72
Gannet C	5	1 295	1 423	1 573	1 640	1 151	919	688	390	417	310
Gannet D	21	320	310	303	389	437	467	359	478	538	320
Gannet E	—	—	—	—	—	—	644	366	369	383	446
Gannet F	—	—	—	—	—	327	464	327	208	148	114
Gannet G	—	—	—	—	—	—	—	261	697	317	232
Glamis	167	226	346	152	72	50	47	36	21	16	14
Grant	—	—	—	—	—	—	138	257	217	171	143
Gryphon	—	222	1 702	2 204	1 879	1 542	1 348	1 094	904	962	566
Guillemot A	—	—	—	—	249	1 026	688	420	283	213	326
Guillemot NW	—	—	—	—	—	—	—	—	20	13	216
Guillemot W	—	—	—	—	—	—	—	—	329	467	482
Halley	—	—	—	—	—	—	—	—	—	—	175
Hamish	108	13	23	5	3	17	10	8	6	3	—
Hannay	—	—	—	—	—	—	—	—	—	—	149

continued



United Kingdom production of offshore crude petroleum and natural gas by fields 1992–2002 *continued*

Thousand tonnes

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
<i>Oil fields continued</i>											
Harding	—	—	—	—	1 930	3 860	4 655	4 281	4 328	3 178	3 192
Hawkins	—	—	—	—	—	—	—	—	—	—	17
Heather	449	375	341	295	285	251	225	204	191	222	203
Heron	—	—	—	—	—	—	—	2 369	2 466	1 604	939
Highlander	532	419	415	307	272	149	188	102	160	166	144
Hudson	—	820	1 461	1 504	1 516	1 595	400	1 245	1 227	981	803
Hutton	1 110	1 078	1 227	1 186	901	787	581	558	414	147	—
Hutton NW	463	511	347	340	296	308	262	295	83	113	30
Iona	—	—	—	—	—	28	13	77	53	24	9
Ivanhoe	1 256	1 343	882	619	520	401	282	239	327	309	349
Jade	—	—	—	—	—	—	—	—	—	—	507
Janice	—	—	—	—	—	—	—	1 713	1 351	1 019	720
Joanne	—	—	—	40	258	1 200	1 249	924	537	401	385
Judy	—	—	—	27	99	651	755	532	428	525	594
Keith	—	—	—	—	—	—	—	—	59	293	152
Kestrel	—	—	—	—	—	—	—	—	—	51	221
Kingfisher	—	—	—	—	—	211	1 315	988	804	874	608
Kittiwake	1 295	1 400	1 507	1 365	1 056	629	444	228	157	33	54
Kyle	—	—	—	—	—	—	—	—	—	515	439
Larch	—	—	—	—	—	—	169	14	73	170	411
Leadon	—	—	—	—	—	—	—	—	—	158	971
Lennox	—	—	—	—	105	454	894	857	1 376	1 798	1 697
Leven	149	224	76	83	59	83	42	37	125	90	57
Lomond	—	67	194	152	181	198	207	182	186	166	160
Loyal	—	—	—	—	—	—	98	931	1 190	925	990
Lyell	—	471	775	449	433	278	215	146	116	117	88
MacCulloch	—	—	—	—	—	583	2 001	1 755	1 354	1 087	1 442
Machar	—	—	625	839	444	—	396	1 733	1 496	1 310	756
Maclure	—	—	—	—	—	—	—	—	—	—	264
Madoes	—	—	—	—	—	—	—	—	—	—	36
Magnus	6 724	6 711	6 812	5 362	4 546	3 091	3 148	3 046	2 924	2 214	1 902
Magnus S	—	—	—	—	235	383	435	482	311	256	150
Mallard	—	—	—	—	—	—	148	701	459	244	219
Marnock	—	—	—	—	—	—	12	747	982	656	503
Maureen	1 215	874	762	516	447	495	474	173	—	—	—
Medwin	—	—	84	53	7	—	—	0	—	—	—
Merlin	—	—	—	—	—	75	677	1 001	619	429	302
Miller	2 801	5 743	6 360	6 422	6 467	5 195	3 441	2 732	2 057	1 383	947
Mirren	—	—	—	—	—	—	—	—	—	—	79
Moira	94	56	55	39	29	17	12	3	—	—	—
Monan	—	—	—	—	—	—	75	560	163	87	34
Montrose	121	87	171	128	90	62	64	55	37	34	16
Mungo	—	—	—	—	—	—	706	1 876	2 440	2 534	2 343
Murchison UK	1 334	819	644	535	681	806	792	744	495	411	309
Nelson	—	—	5 123	6 869	7 082	5 603	4 695	4 515	4 089	2 913	3 907
Ness	314	292	175	92	80	171	104	123	41	134	117
Nevis	—	—	—	—	184	744	1 084	1 595	1 447	1 146	942
Ninian	3 331	3 280	3 236	2 764	2 423	2 367	2 197	2 054	1 723	1 764	1 510
Orion	—	—	—	—	—	—	—	137	322	263	211
Osprey	1 378	1 649	1 251	1 420	1 299	1 204	764	618	295	450	292
Otter	—	—	—	—	—	—	—	—	—	—	96
Pelican	—	—	—	—	1 403	1 269	1 282	1 075	717	462	551
Petronella	526	448	428	297	137	119	123	52	61	79	106
Pierce	—	—	—	—	—	—	—	1 416	2 508	1 793	1 418
Piper	—	2 604	3 811	4 027	3 148	2 416	1 951	1 490	1 156	957	813
Renee	—	—	—	—	—	—	—	715	240	44	62
Rob Roy	1 739	1 743	1 889	1 413	1 076	570	289	272	180	185	152
Ross	—	—	—	—	—	—	—	761	1 208	459	483
Rubie	—	—	—	—	—	—	—	185	346	215	191
Saltire	—	698	1 821	1 763	1 831	1 908	1 335	757	479	360	311
Scapa	1 403	1 353	1 171	847	947	915	770	638	444	370	329
Schiehallion	—	—	—	—	—	—	1 100	4 183	5 073	4 780	5 061
Scott	—	1 547	8 048	8 769	7 037	5 569	4 531	4 017	2 771	2 162	1 889
Shearwater	—	—	—	—	—	—	—	—	82	650	2 299
Skene	—	—	—	—	—	—	—	—	—	7	329
Skua	—	—	—	—	—	—	—	—	—	195	634
Staffa	266	152	93	—	—	—	—	—	—	—	—
Stafford UK	3 202	3 806	4 528	3 931	3 424	3 581	2 346	1 768	1 187	797	702
Stirling	—	—	—	61	42	37	9	16	17	28	25
Strathspey	—	—	1 408	1 686	1 499	1 331	1 006	643	414	352	530
Tartan	440	318	580	453	475	333	332	272	240	177	155
Teal	—	—	—	—	—	1 091	1 123	1 216	1 511	1 040	543
Teal S	—	—	—	—	44	268	122	136	79	86	42
Telford	—	—	—	—	104	1 519	1 521	1 014	1 092	1 141	1 128
Tern	3 579	3 323	3 668	3 326	2 781	2 593	2 287	2 125	1 803	1 681	1 370
Thelma	—	—	—	—	165	1 309	1 051	905	773	669	324
Thistle	958	876	724	665	536	430	363	305	288	191	252
Tiffany	—	197	1 751	1 802	1 764	1 205	762	425	275	190	143
Toni	—	15	602	1 331	1 057	684	794	655	467	383	378
Tulich	—	—	—	—	—	—	—	—	—	—	254
Other	—	28	83	—	—	94	—	—	202	—	—
<b>Total</b>	<b>85 222</b>	<b>90 213</b>	<b>114 383</b>	<b>115 096</b>	<b>116 500</b>	<b>115 395</b>	<b>119 049</b>	<b>124 886</b>	<b>114 830</b>	<b>106 547</b>	<b>105 369</b>

*continued*

United Kingdom production of offshore crude petroleum and natural gas by fields 1992–2002 *continued*

Million cubic metres

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
<b>Gas fields</b>											
Alison	—	—	—	31	128	91	97	18	53	55	39
Alwyn N (h)	2 981	3 100	2 508	1 876	1 829	2 039	1 730	1 608	1 288	832	1 272
Amethyst E	1 535	1 338	1 048	991	1 416	848	870	724	612	527	297
Amethyst W	122	400	451	312	421	515	423	262	471	643	509
Anglia	547	545	532	615	439	284	391	296	383	294	209
Ann	—	153	488	399	428	270	140	166	160	85	33
Audrey	1 956	1 943	1 458	1 179	1 197	1 171	729	531	624	523	172
Bains	—	—	—	—	—	—	—	—	—	—	109
Baird	—	24	193	219	459	435	374	311	138	228	214
Barque	804	952	788	577	1 829	2 244	1 503	1 327	2 190	1 823	910
Barque S	—	—	—	6	—	8	2	—	—	—	—
Beaufort	—	—	—	—	—	—	—	—	—	—	—
Bell	—	—	—	—	—	—	—	—	—	319	280
Bell Conoco	—	—	—	—	—	—	—	344	941	343	393
Bessemer	—	—	—	139	777	812	735	692	1 204	391	208
Boulton	—	—	—	—	—	—	925	459	587	299	607
Boyle	—	—	—	—	—	—	—	—	—	—	143
Brigantine A	—	—	—	—	—	—	—	—	—	637	597
Brigantine B	—	—	—	—	—	—	—	—	—	573	428
Brigantine C	—	—	—	—	—	—	—	—	—	—	344
Brown	—	—	—	—	—	—	(d)	(d)	(d)	(d) 118	39
Bruce (h)	—	1 720	4 481	5 175	6 577	5 613	4 959	5 164	5 678	6 264	6 277
Bure	106	139	103	58	55	42	64	12	35	21	18
Bure W	—	—	—	—	—	—	22	124	157	128	105
Caister Bunter	—	16	269	388	295	343	235	315	306	375	232
Caister Carboniferous	—	179	646	745	649	642	364	390	257	130	112
Callisto	—	—	—	102	254	254	199	104	24	86	95
Callisto N	—	—	—	—	—	—	—	—	16	119	69
Camelot C & S	691	371	420	526	403	846	563	187	206	150	114
Camelot N	107	55	88	246	84	49	30	1	—	11	0
Camelot NE	—	107	117	10	204	58	2	—	—	—	—
Captain (h)	—	—	—	—	—	—	—	—	—	71	72
CATS (g)	—	941	1 985	1 941	2 334	4 429	10 126	13 605	13 618	13 465	14 253
Cleeton	667	893	897	997	1 587	1 466	472	5	—	—	—
Clipper	1 109	880	954	621	1 190	1 152	669	598	1 101	903	459
Corvette	—	—	—	—	—	—	—	1 782	1 048	517	154
Dalton	—	—	—	—	—	—	—	267	471	32	2
Davy	—	—	—	197	930	806	(d) 719	(d) 908	(d) 881	(d) 381	109
Davy N	—	—	—	—	—	—	—	—	—	75	437
Dawn	—	—	—	1	170	92	94	102	29	—	—
Deben	—	—	—	—	—	—	66	240	93	28	13
Delilah	—	—	—	—	—	—	42	103	100	87	68
Dunbar (h)	—	—	23	954	1 371	1 359	1 121	1 133	1 216	1 229	1 476
Ellon (h)	—	—	26	337	521	791	448	162	129	188	116
Europa	—	—	—	—	—	—	—	—	322	451	271
Esmond	562	403	233	36	—	—	—	—	—	—	—
Excalibur	—	—	232	811	876	599	681	552	453	427	365
FLAGS (e)	6 564	6 482	6 430	6 214	6 459	6 948	7 417	7 596	(k) 10 307	(k) 11 643	(k) 10 541
Forbes	43	2	—	—	—	—	—	—	—	—	—
Frigg (UK) (h)	833	541	863	474	466	191	511	253	367	463	415
Fulmar (f)	529	1 103	1 456	1 854	1 716	1 505	1 890	2 104	(k)	(k)	(k)
Galahad	—	—	—	106	456	707	509	431	344	337	259
Galleon	—	—	270	518	1 398	1 501	1 493	1 168	1 677	1 635	1 311
Galley (h)	—	—	—	—	—	—	257	410	460	230	122
Ganymede	—	—	—	532	1 708	1 655	947	669	197	384	326
Gawain	—	—	—	92	929	820	798	666	694	690	579
Gordon	324	157	203	22	—	—	—	—	—	—	—
Grant (h)	—	—	—	—	—	—	322	672	675	557	563
Guinevere	—	144	311	358	243	271	227	232	222	138	154
Hamilton	—	—	—	—	—	1 176	1 752	1 416	1 685	1 933	1 536
Hamilton E	—	—	—	—	—	—	—	—	—	167	503
Hamilton N	—	—	—	—	625	667	546	454	543	553	368
Hawksley	—	—	—	—	—	—	—	—	—	—	489
Hewett & Della	2 547	2 164	1 671	1 290	2 188	1 301	1 324	1 133	1 484	1 211	818
Hoton	—	—	—	—	—	—	—	—	—	7	420
Hyde	—	171	415	346	357	284	291	259	219	195	163
Indefatigable	3 747	2 773	1 245	1 133	2 139	1 507	2 055	1 345	1 197	1 310	1 110
Indefatigable SW	—	—	—	63	242	210	179	198	126	188	145
Ivanhoe & Rob Roy (h)	249	221	237	159	152	79	38	48	15	22	12
Johnston	—	—	136	543	585	469	327	540	667	414	273
Keith (h)	—	—	—	—	—	—	—	—	12	79	50
Ketch	—	—	—	—	—	—	—	297	1 233	819	549
KX	—	—	—	27	81	60	62	52	46	58	55
Lancelot	—	495	888	868	685	621	557	761	696	495	504
Leman	6 130	4 874	3 584	4 049	3 468	3 013	4 740	3 060	3 957	3 835	3 061
Malory	—	—	—	—	—	—	126	668	571	449	361
Markham (UK)	57	621	865	933	807	663	514	485	463	350	304
Mercury	—	—	—	—	—	—	—	5	402	627	547
Miller (i)	834	2 126	2 388	2 467	2 534	2 028	1 254	1 109	624	334	282
Millom	—	—	—	—	—	—	—	29	144	1 023	1 048
Mordred	—	—	—	—	26	82	17	39	43	31	37
Morecambe N	—	—	555	2 399	2 626	2 930	1 294	848	3 872	3 017	3 128
Morecambe S	7 058	8 691	7 444	7 675	7 099	6 170	7 993	9 971	8 436	8 328	7 513
Murdoch	—	288	1 063	1 110	1 127	1 150	1 376	836	1 197	948	641

*continued*

United Kingdom production of offshore crude petroleum and natural gas by fields 1992–2002 *continued*

Million cubic metres

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
<b>Gas fields <i>continued</i></b>											
Neptune	—	—	—	—	—	—	—	17	1 466	2 007	1 685
Newsham	—	—	—	—	68	127	94	71	60	44	35
Nuggets (h)	—	—	—	—	—	—	—	—	—	134	1 333
Orwell	—	332	1 028	1 470	789	720	832	667	716	507	373
Pickerill	379	1 812	1 933	1 790	1 345	1 288	879	626	366	351	284
Piper & Tartan Area (h)	186	475	924	1 037	950	633	452	421	396	353	297
Ravenspurn N	2 862	2 826	2 494	1 716	2 942	2 968	1 580	1 319	1 294	761	497
Ravenspurn S	1 254	1 198	1 164	852	1 253	1 433	1 186	1 006	871	725	636
Renee/Rubie (h)	—	—	—	—	—	—	—	1	...	18	11
Ross (h)	—	—	—	—	—	—	—	28	89	60	144
Rough (b)	—	—	—	—	—	—	—	—	428	17	—
SAGE (j)	846	2 781	3 941	6 829	7 321	8 035	10 398	15 459	16 802	15 449	15 138
Schooner	—	—	—	—	243	1 245	1 088	1 237	882	917	349
Sean E	—	—	65	501	512	301	227	253	148	124	32
Sean N & S	312	186	493	428	942	639	50	312	581	1 120	494
Shearwater/Elgin (SEAL)	—	—	—	—	—	—	—	—	93	2 207	7 026
Sinope	—	—	—	—	—	—	—	75	274	20	—
Skiff	—	—	—	—	—	—	—	—	146	843	1 254
Thames	355	427	228	61	157	119	60	92	90	89	67
Wensum	10	1	2	4	3	3	—	2	—	0	0
Trent	—	—	—	—	80	279	347	521	341	228	213
Tristan	55	254	312	206	27	18	7	90	35	38	17
Tyne N	—	—	—	—	—	76	130	255	222	77	28
Tyne S	—	—	—	—	109	539	435	479	360	321	184
Valiant N	458	305	180	144	277	295	334	172	274	210	163
Valiant S	612	764	507	177	349	391	397	298	538	424	343
Vampire	—	—	—	—	—	—	—	367	727	317	122
Vanguard	247	293	134	30	109	120	132	78	166	184	158
Victor	1 006	1 226	1 545	1 399	1 657	1 724	1 064	949	970	775	525
Viking B	1 247	741	636	466	628	687	629	2 465	1 542	1 329	992
Vixen	—	—	—	—	—	—	—	—	499	1 035	771
Vulcan	1 168	1 611	915	415	656	827	816	584	952	797	642
Waveney	—	—	—	—	—	—	137	741	594	305	194
Welland NW	554	689	534	411	358	386	629	326	212	119	17
Welland S	389	366	229	208	117	173	210	155	76	44	17
West Sole	1 163	1 231	1 037	1 214	857	1 224	1 218	1 170	1 050	940	844
Windermere	—	—	—	—	—	279	438	320	273	196	166
Yare	96	126	89	63	51	14	72	21	11	45	31
Others (c)	2 437	2 453	2 989	3 016	3 175	3 361	3 719	3 937	3 763	3 821	4 161
<b>Total (a)</b>	<b>55 738</b>	<b>65 109</b>	<b>69 343</b>	<b>75 158</b>	<b>89 514</b>	<b>91 170</b>	<b>95 171</b>	<b>104 760</b>	<b>114 663</b>	<b>112 250</b>	<b>109 050</b>

- (a) Gross production, i.e. includes own use for drilling purposes, production and pumping operations, but excludes gas flared and vented.
- (b) Rough was converted for use as an off-peak storage unit with effect from 1985.
- (c) Associated gas, mainly methane, produced and used mainly on Northern Basin oil production platforms including those in the FLAGS and Fulmar systems.
- (d) From December 1998 to January 2001, Davy includes Brown.
- (e) Gas delivered to land via the Far-north Liquids and Associated Gas System from Brent, North and South Cormorant, Kyle, Magnus, Magnus South, Murchison (UK), Pelican, Staffjord (UK), Strathspey and Thistle.
- (f) Gas delivered to land via the Fulmar pipeline from Bittern, Clyde, Cook, Curlew, Fulmar, Gannet A-G, Guillemot A, NW and W, Kittiwake, Leven, Mallard, Medwin, Nelson, Orion, Teal and Teal South.

- (g) Gas delivered to land via the Central Area Transmission System from Andrew, Drake, Egret, Erskine, Everest, Fleming, Heron, Jade, Janice, Joanne, Judy, Lomond, Machar, Madoes, Mirren, Marnock, Monan, Mungo and Skua.
- (h) Associated gas used offshore or delivered to land via the Frigg pipeline system.
- (i) Gas delivered direct to Boddam (Peterhead) power station by dedicated pipeline.
- (j) Gas delivered to land via the Scottish Area Gas Evacuation system from Beinn, Beryl, Brae, Britannia, Maclure, Ness, Nevis, Scott, Skene, Thelma, Tiffany, Toni and Tullich.
- (k) FLAGS includes Fulmar.

Source: Department of Trade and Industry.

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002
Tonnes					
<b>Petroleum</b>					
<i>Production</i>					
Crude petroleum	124 210 000	129 155 000	118 064 000	109 491 000	108 021 000
Condensates and other (a)	8 063 000	8 515 000	8 363 000	8 292 000	8 514 000
Refined products	87 096 000	81 987 000	82 578 000	76 679 000	79 397 000
<i>Consumption (inland deliveries)</i>					
<i>of refined products</i>					
Used as fuels—					
Refineries	6 468 000	5 969 000	5 245 000	5 162 000	4 873 000
Elsewhere	61 246 000	61 238 000	61 333 000	62 023 000	60 855 000
Not used as fuels	10 723 000	10 771 000	10 098 000	8 891 000	9 547 000
<b>Total</b>	<b>78 437 000</b>	<b>77 978 000</b>	<b>76 676 000</b>	<b>76 076 000</b>	<b>75 275 000</b>

*continued*

- (a) Including ethane, propane and butane, in addition to condensates.

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Petroleum continued</b>										
<i>Imports</i>										
Crude petroleum	36 135 627	29 923 937	36 552 593	38 542 685	40 838 161	2 169 886	2 272 835	5 032 686	4 956 773	4 985 613
Partly refined petroleum and refined products	16 706 326	18 606 226	19 181 246	21 565 818	21 596 063	1 358 800	1 890 211	3 302 995	3 539 830	3 148 748
<i>Exports</i>										
Crude petroleum	73 428 795	75 473 136	78 022 274	82 057 946	79 943 787	4 482 384	6 193 458	10 536 029	10 497 748	9 834 692
Partly refined petroleum and refined products	23 591 120	23 238 014	24 620 358	23 050 414	25 901 034	1 980 327	2 343 648	3 977 424	3 454 196	3 636 438
<b>Natural gas</b>										
<i>Production</i>										
Methane (a)										
Colliery	41 000	41 000	42 000	33 000	34 000					
Offshore and onshore	90 106 000	99 024 000	108 308 000	105 761 000	103 542 000					
<i>Consumption</i>										
Natural gas (a)	86 861 000	91 375 000	95 626 000	95 343 000	94 676 000					
<i>Imports</i>										
Liquefied natural gas	425 264	556 224	1 119 528	1 156 724	582 878	47 609	63 023	147 348	138 255	87 293
Other natural gas	353 550	213 129	1 317 722	1 365 402	2 105 453	47 340	27 257	122 520	166 063	269 849
<i>Exports</i>										
Liquefied natural gas	3 696 891	5 076 713	5 313 838	4 173 082	4 201 100	324 104	517 783	855 754	719 608	610 297
Other natural gas	1 115 013	2 751 384	5 530 250	7 552 590	8 718 186	79 033	214 090	516 188	776 178	895 802

(a) Oil equivalent: converted from original data at 397 therms = 1 tonne.

## Phosphorus

### United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Phosphorus</b>										
<i>Consumption in Iron and Steel Industry</i>										
Ferro-phosphorus	1 410	1 340	1 280	1 160	990					
<i>Imports</i>										
Phosphate rock	23 410	19 831	13 808	9 223	10 275	3 096	2 366	1 420	1 418	1 140
Ammonium phosphates—										
Fertiliser	162 913	145 087	165 034	145 952	196 776	24 146	22 508	22 164	19 820	25 437
Other (a)	2 858	...	...	...	...	2 496	...	...	...	...
Superphosphates	261 490	232 851	221 040	230 374	204 073	29 035	25 293	22 777	21 866	19 883
Basic slag	9 394	8 178	7 888	11 216	5 150	365	297	385	462	215
Other phosphatic fertilisers	17 122	15 910	5 697	21 548	17 336	1 370	993	508	2 187	1 303
Elemental phosphorus	15 420	15 227	14 738	14 143	14 437	16 320	15 829	14 344	15 164	13 828
Phosphoric acids	420 945	408 981	318 645	315 593	197 558	65 624	57 731	50 991	48 085	37 068
Calcium phosphates	138 383	132 034	103 132	112 485	120 414	24 483	25 042	20 763	22 229	23 878
Sodium phosphates and orthophosphates	42 555	(b) 45 587	(b) 49 841	(b) 38 307	(b) 51 623	18 871	(b) 19 416	(b) 22 340	(b) 19 472	(b) 22 560
<i>Exports</i>										
Phosphate rock	321	261	1 295	317	386	144	56	269	80	79
Ammonium phosphates—										
Fertiliser	9 941	9 560	9 060	1 619	630	4 012	3 049	2 596	558	433
Other (a)	377	...	...	...	...	645	...	...	...	...
Superphosphates	24	26	3	4	5 229	206	76	2	16	670
Basic slag	34	9	3	2	—	22	42	2	1	—
Other phosphatic fertilisers	203	415	280	110	292	111	191	458	86	158
Phosphoric acids	25 765	25 970	28 851	21 109	18 755	9 458	9 660	9 403	8 299	6 911
Calcium phosphates	25 635	20 845	16 866	17 567	15 123	13 072	10 549	8 706	8 488	8 204

(a) Including polyphosphates.

(b) Excluding polyphosphates.

## Platinum group metals

In December 2003 Beowolf Gold plc announced it had signed an agreement to acquire exclusive exploration rights over a Platinum Group Element (PGE) property (the Sandison property) covering about 25 sq km of the island of Unst in the Shetland Isles. The property is underlain by a chromite-bearing ophiolite complex and sampling of dumps in abandoned chromite quarries has returned values in the range of 0.2 to 0.5 g/t total PGE. The complex has been the subject of several previous exploration programmes, including shallow drilling, and grades in excess of 100 g/t Pt and Pd have been recorded.

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Platinum group metals</b>										
<i>Imports</i>										
Scrap	384	432	593	729	776	157 238	211 107	347 219	329 986	115 886
Unwrought or partly worked–										
Platinum	17	25	36	18	10	62 946	154 395	284 668	188 045	106 075
Palladium	27	22	34	20	16	117 115	94 031	331 739	257 947	80 100
Other platinum group	9	6	10	6	4	38 075	35 088	147 893	90 525	38 840
<i>Exports</i>										
Scrap	953	924	1 156	1 124	914	24 917	23 174	47 972	37 493	15 535
Unwrought or partly worked–										
Platinum	23	24	32	32	44	161 020	177 617	387 533	436 159	448 364
Palladium	59	13	17	23	18	111 976	85 618	218 961	339 248	148 069
Other platinum group	17	5	8	6	5	47 630	43 670	128 442	115 558	47 105

## Potash

Potash is a generic term for a variety of potassium-bearing minerals and refined products. There are many potassium-bearing minerals but only those that are water-soluble are of significant commercial interest. Sylvine (potassium chloride, KCl) is by far the most important source of potash worldwide, because of its solubility and high potassium content. It accounts for all the potash produced in the UK to date. Potassium minerals rarely occur in pure form and the mined material is invariably a physical mixture of salts. Sylvinite is a mixture of sylvine and halite (salt, NaCl) in varying proportions and this is the material that is mined in the UK. Potassium is one of the three primary nutrients essential for plant growth (the others being nitrogen and phosphorus). These nutrients form the basis of fertiliser production in the UK and throughout the world. About 90 per cent of UK potash production is consumed in the manufacture of fertilisers, with the remainder in a range of industrial applications.

There is only one source of potash in the UK, the Boulby Mine in north-east England. Output was a record 1.04 million tonnes of refined KCl in 2003, of which 62 per cent was exported through the company's deepwater terminal on the River Tees. Production was 0.90 million tonnes KCl in 2002. Rock salt production was 0.59 million tonnes in 2003 (0.63 million tonnes in 2002). Salt is mined from the arterial roadways in the underlying Boulby Halite to maintain access to current potash mining areas and to explore and develop new areas for potash production.

The Boulby mine is operated by Cleveland Potash Ltd, a wholly-owned subsidiary of Israel Chemicals Ltd. The parent company is the second largest potash producer in Europe and the fifth largest in the world with a total output of some 5 Mt/y.

The Boulby Mine employs some 830 people and is the single most important non-hydrocarbon mineral operation in Britain generating total sales of £98 million in 2003, including by-product rock salt. The workings extend some 13.5 km, reaching 5 km offshore to the north where they are approximately 800 m below the seabed. In the south, a combination of seam dip and topographic relief leaves the workings more than 1300 m below the land surface.

A large carnallite (KCl.MgCl<sub>2</sub>.6H<sub>2</sub>O) resource has been identified, lying offshore at Boulby. A pilot plant for initial processing of carnallite ore was constructed in 2002 but mining and processing trials have not yet started.

Returning insoluble waste material (mainly clay) into disused mine workings was started in 2003 thereby reducing discharges into the North Sea. Infrastructure and development work for the project was part funded by a European Commission grant.

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Potassium compounds</b>										
<i>Indigenous production</i>										
KCl product	1 014 000	825 000	966 000	882 000	900 000					
<i>Apparent consumption (a)</i>										
Potassic fertilisers (K <sub>2</sub> O content)	419 200	432 900	404 100	393 800	368 300					
<i>Imports</i>										
Crude natural salts	18 325	20 628	18 050	16 154	19 366	959	1 321	1 235	1 053	1 141
Chloride	209 519	232 983	255 572	335 398	372 031	23 313	30 144	24 824	26 679	19 462
Sulphate	11 579	5 215	10 514	14 243	8 159	1 817	1 121	1 669	2 145	1 676
Other potassic fertilisers	729	1 021	376	263	645	411	475	199	215	223
<i>Exports</i>										
Crude natural salts	36	18	23	91	26	318	22	58	36	9
Chloride	570 681	(b) 420 000	(b) 630 000	(b) 530 000	(b) 440 000	39 183	...	...	...	...
Sulphate	807	905	1 036	264	283	193	202	318	73	102
Other potassic fertilisers	393	207	107	877	457	497	185	326	360	497

(a) Home deliveries plus imports.

(b) BGS estimate.

# Precious and semi-precious stones

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Precious and semi-precious stones (excluding diamond) (a)</b>										
<i>Imports</i>										
Natural stones	229	293	234	713	492	60 950	61 085	44 708	60 792	70 129
Synthetic stones	7	5	11	10	8	6 719	4 599	5 952	6 994	3 851
Dust and powder	0	1	1	2	0	260	293	551	715	154
<i>Exports</i>										
Natural stones	26	57	62	21	27	53 710	55 674	34 380	49 158	56 112
Synthetic stones	33	3	1	41	0	1 815	2 364	1 038	1 330	505
Dust and powder	0	3	0	2	...	113	168	43	153	76

(a) Unworked, cut or otherwise worked, but not mounted, set or strung.

# Primary fuels

## United Kingdom production of primary fuels 1978–2002 (energy supplied basis)

Million tonnes of oil or oil equivalent (a)

Year	Coal	Petroleum	Natural gas (b)	Nuclear electricity	Hydro-electricity (c)	Total (d)
1978	75.5	58.2	36.2	10.0	0.3	180.2
1979	74.0	84.0	36.6	10.2	0.4	205.2
1980	78.5	86.9	34.8	9.9	0.3	210.5
1981	78.0	96.9	34.7	10.2	0.4	220.2
1982	76.1	112.5	35.3	11.9	0.4	236.1
1983	72.7	125.5	36.4	13.5	0.4	248.4
1984	30.7	137.6	35.6	14.5	0.3	218.8
1985	56.6	139.4	39.7	16.5	0.4	252.5
1986	65.6	139.1	41.7	15.4	0.4	262.2
1987	63.2	135.1	43.7	14.4	0.4	256.7
1988	63.3	125.5	42.1	16.6	0.4	248.5
1989	60.9	100.4	41.2	17.7	0.4	221.3
1990	56.4	100.1	45.5	16.3	0.4	219.4
1991	57.6	99.9	50.6	17.4	0.4	226.7
1992	51.5	103.7	51.5	18.5	0.5	226.5
1993	41.6	109.6	60.5	21.6	0.5	234.9
1994	29.7	138.9	64.6	21.2	0.4	256.6
1995	32.8	142.7	70.8	21.3	0.5	269.7
1996	31.1	142.1	84.2	22.1	0.3	281.6
1997	30.3	140.4	85.9	23.1	0.4	282.1
1998	25.8	145.3	90.2	23.4	0.5	287.2
1999	23.2	150.2	99.1	22.4	0.5	297.7
2000	19.6	138.3	108.4	19.6	0.5	288.7
2001	20.0	127.8	105.8	20.8	0.4	277.4
2002	18.8	127.0	103.6	20.1	0.5	272.8

(a) Based on a standard 'tonne of oil equivalent' equal to 397 therms.

(b) Including colliery methane.

(c) Including, from 1988, other renewable primary electricity sources (wind, etc.).

(d) Including, from 1988, small amounts of primary heat sources (solar, geothermal, etc.), solid renewable sources (wood, waste, etc.) and gaseous renewable sources (landfill gas, sewage gas, etc.).

Source: Department of Trade and Industry.

# United Kingdom production and consumption of primary fuels 1950–2002

Million tonnes of oil  
or oil equivalent



## United Kingdom consumption of energy (primary fuel input) 1978–2002 (energy supplied basis)

Million tonnes of oil or oil equivalent (a)

Year	Coal	Petroleum	Natural gas (b)	Nuclear electricity	Hydro-electricity (c)	Net imports of electricity	Total (d)
1978	73.3	87.2	41.0	10.0	0.3	—	211.8
1979	78.8	87.7	44.9	10.2	0.4	—	222.0
1980	73.3	76.2	44.8	9.9	0.3	—	204.5
1981	72.9	69.5	45.4	10.2	0.4	—	198.4
1982	68.0	70.7	45.2	11.9	0.4	—	196.1
1983	68.6	67.2	47.1	13.5	0.4	—	196.8
1984	48.7	84.7	48.2	14.5	0.3	—	196.4
1985	64.8	72.2	51.8	16.5	0.4	—	205.7
1986	70.0	71.1	52.7	15.4	0.4	0.4	210.0
1987	71.7	69.4	54.1	14.4	0.4	1.0	211.0
1988	69.6	74.0	51.4	16.6	0.4	1.1	213.1
1989	67.0	75.4	49.1	17.7	0.4	1.1	211.4
1990	67.0	77.2	51.2	16.3	0.4	1.0	213.7
1991	67.1	77.1	55.4	17.4	0.4	1.4	219.5
1992	63.1	77.5	55.1	18.5	0.5	1.4	216.8
1993	54.9	78.1	62.9	21.6	0.5	1.4	220.6
1994	51.3	76.7	64.9	21.2	0.4	1.5	217.5
1995	48.9	75.4	69.2	21.3	0.5	1.4	218.4
1996	45.7	77.8	81.0	22.1	0.3	1.4	230.0
1997	40.8	75.5	83.5	23.1	0.4	1.4	226.8
1998	40.9	76.1	86.9	23.4	0.5	1.1	230.8
1999	36.7	76.0	91.4	22.4	0.5	1.2	230.2
2000	38.1	76.1	95.6	19.6	0.5	1.2	233.4
2001	41.2	75.3	95.3	20.8	0.4	0.9	236.4
2002	37.8	73.1	94.7	20.1	0.5	0.7	229.6

(a) Based on a standard 'tonne of oil equivalent' equal to 397 therms.

(b) Including colliery methane.

(c) Including, from 1988, other renewable primary electricity sources (wind, etc.).

(d) Including, from 1988, small amounts of primary heat sources (solar, geothermal, etc.), solid renewable sources (wood, waste, etc.) and gaseous renewable sources (landfill gas, sewage gas, etc.).

Source: Department of Trade and Industry.

## Pumice

### United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Pumice</b>										
Imports	16 061	40 873	19 210	17 165	...	1 670	1 436	2 073	2 377	2 703
Exports	759	282	379	1 397	319	849	459	719	666	654

## Pyrite

### United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Pyrite</b>										
Imports										
Iron pyrites (incl. cupreous) –										
Unroasted	29	11	5	220	85	86	13	6	157	25
Roasted	25 787	21 649	29 446	17 130	...	362	316	792	351	627
Exports										
Iron pyrites (incl. cupreous) –										
Unroasted	639	497	246	132	...	324	301	149	55	76
Roasted	0	31	—	0	—	2	20	—	10	—



# Quartz and quartzite

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Quartz and quartzite</b>										
<i>Imports</i>										
Quartz	2 058	1 864	7 714	2 360	3 645	1 053	1 111	1 988	2 321	1 315
Quartzite	317	339	703	1 052	851	233	365	1 037	865	490
<i>Exports</i>										
Quartz	13	112	87	146	163	13	59	86	65	176
Quartzite	20	294	190	129	125	54	206	563	233	270

# Radioactive and associated materials

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Radioactive and associated materials</b>										
<i>Imports</i>										
Natural and enriched uranium, plutonium, artificial radioactive isotopes, and their compounds	3 537	...	...	...	...	215 934	286 899	246 503	322 264	284 737
<i>Exports</i>										
Natural and enriched uranium, plutonium, artificial radioactive isotopes, and their compounds	3 850	...	...	...	...	294 037	312 702	431 878	512 972	497 413

# Rare earths

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Rare earths</b>										
<i>Imports</i>										
Rare earth metals (a)	136	107	226	172	64	2 271	1 610	3 337	2 404	529
Cerium compounds	2 039	2 265	2 388	2 227	3 070	9 733	7 161	6 035	8 367	8 598
Other rare earth compounds (b)	378	543	466	403	491	4 107	4 142	3 922	3 021	3 384
Ferro-cerium and other pyrophoric alloys	85	9	14	1	34	179	1 273	3 745	38	102
<i>Exports</i>										
Rare earth metals (a)	70	352	60	51	148	1 485	1 315	897	1 077	982
Cerium compounds	463	374	317	415	88	3 747	5 422	4 763	3 976	1 748
Other rare earth compounds (b)	261	254	354	329	1 128	3 233	2 549	3 716	3 764	6 772
Ferro-cerium and other pyrophoric alloys	15	23	26	9	...	120	84	...	85	335

(a) Including yttrium and scandium.

(b) Including yttrium and scandium compounds.

# Salt

Salt (sodium chloride, NaCl), occurs in nature in solid form as rock salt (halite), or in solution as brine. Rock salt occurs in beds, commonly associated with mudstone, up to several hundred metres in thickness. Natural brine is produced by the dissolution of salt-bearing strata by circulating groundwater or by solution mining by injecting water into salt beds and pumping out the resulting salt solution. This may contain up to 26 per cent NaCl when fully saturated.

Official figures for the production of rock salt and white (or brine) salt have not been published for a number of years. Production of rock salt, which is largely used for de-icing roads, is dependent on the weather. UK sales are estimated at about 1.7 million tonnes in 2003. Rock salt is produced at three locations in the UK. The Winsford mine in Cheshire operated by the Salt Union is the largest source, but large tonnages are also produced at the Boulby potash mine, in north-east England (see p.87). The third producer, Irish Salt Mining and Exploration Co Ltd, operates the Kilroot mine at Carrickfergus in Northern Ireland. A proportion of the rock salt from this mine is exported to the eastern seaboard of the USA.

The Winsford Mine, with some 26 million m<sup>3</sup> of space, has a constant temperature and humidity and is dry and gas-free. Part of the mine is currently being used for secure document storage. Approval to use another part of the mine for the permanent storage of hazardous wastes was granted planning permission in December 2003. Strict criteria will be used for the type of material stored, which will be dry waste that is non-flammable, non-biodegradable and non-radioactive.

In addition to the extraction of rock salt by underground mining, large quantities of salt are also produced by controlled solution mining. Production is now confined to Cheshire, where controlled solution mining is undertaken by two companies, INEOS Chlor Ltd and British Salt Ltd. INEOS Chlor supplies brine from the Holford brinefield for its own plant at Runcorn for the production of chlorine and caustic soda by the electrochemical process. The company also supplies brine to two plants operated by Brunner Mond in Northwich for the production of soda ash by the ammonia-soda process and to the Salt Union at Runcorn for white salt production by vacuum evaporation. Until recently INEOS Chlor also extracted brine by controlled solution methods at Saltholme on Teesside, but the company's chlorine plant at Wilton was closed in June 2002 removing the need to extract brine. However, there is a continuing requirement to extract salt on Teesside to produce cavities for storage purposes. INEOS Chlor have announced a £390 million modernisation and expansion programme at their Runcorn site, mainly to replace existing mercury-based cells for chlorine manufacture by state-of-the-art cell rooms based on environmentally friendly membrane technology.

British Salt Ltd also produces brine from the Warmingham brinefield in Cheshire for the production of white salt at its plant near Middlewich. British Salt is a wholly-owned subsidiary of US Salt Holdings. New Cheshire Salt Works Ltd extracts natural brine at the Wincham Brinefield, near Northwich for the production of small quantities of white salt. Total UK production of white (brine) salt is estimated to be about 1 million tonnes and salt-in-brine for use as a chemical feedstock 3.2 million tonnes.

At the Warmingham Brinefield specially created salt cavities have been produced for natural gas storage. A similar proposal for gas storage at the Holford Brinefield was the subject of a public inquiry, the result of which has still to be reported.

### United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Salt</b>										
<i>Production</i>										
Rock salt (a)	700 000	1 500 000	1 700 000	1 900 000	1 500 000					
Salt from brine (a)	1 200 000	1 200 000	1 100 000	1 100 000	1 000 000					
Salt in brine (a) (b)	3 500 000	3 000 000	3 000 000	3 000 000	3 200 000					
<i>Imports</i>	237 284	261 434	(c) 201 400	(c) 234 900	306 488	11 807	11 573	...	...	12 870
<i>Exports</i>	485 815	276 402	307 899	299 607	326 760	18 274	22 125	16 548	17 466	20 135

(a) BGS estimate.

(c) BGS estimates, based on known exports from certain countries.

(b) Used for purposes other than salt making.

## Sand and gravel (also see Aggregates)

### United Kingdom summary 1998–2002

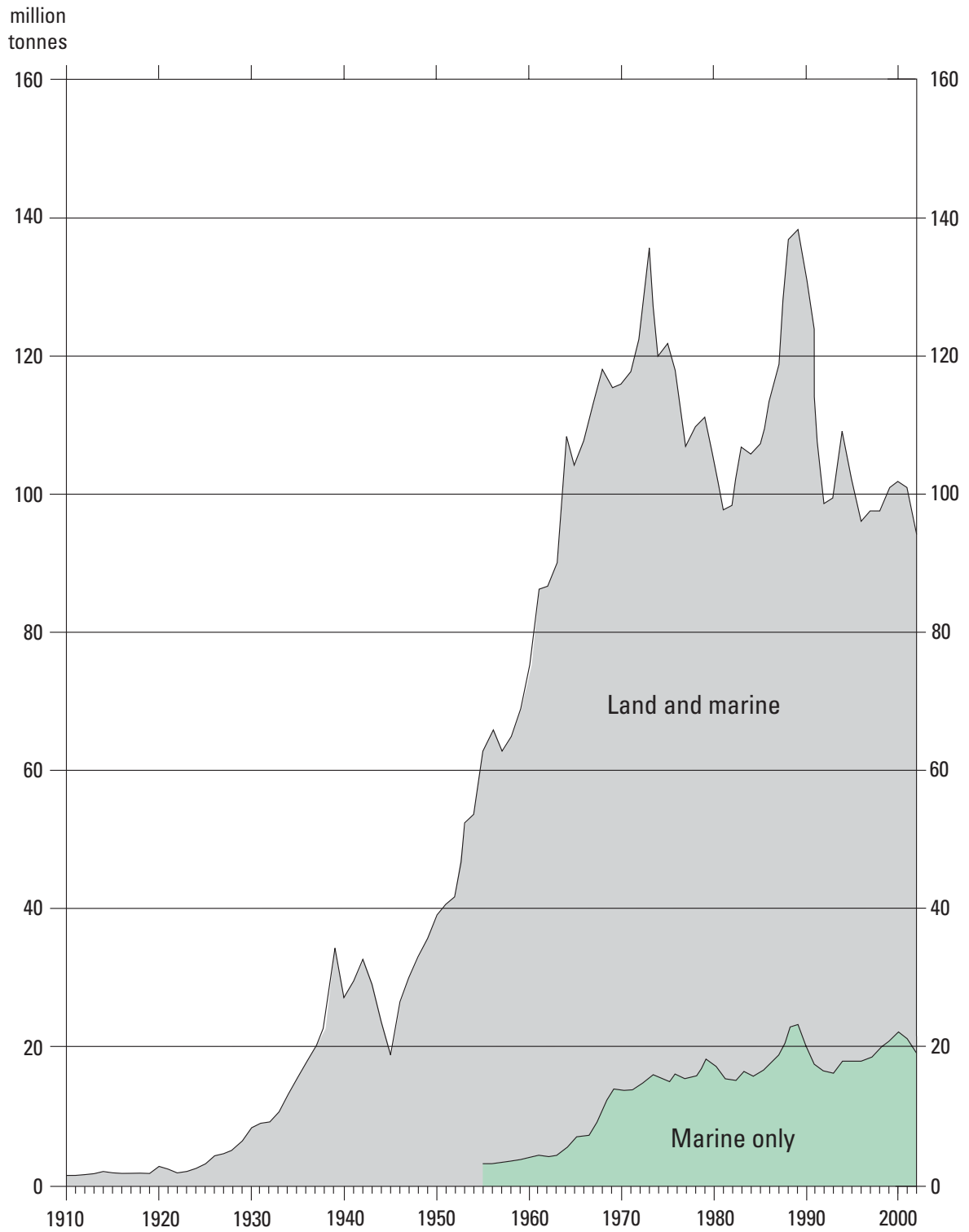
Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Sand and gravel</b>										
<i>Production</i>										
Sand and gravel (a)	98 315 000	100 953 000	101 622 000	101 397 000	94 424 000					
<i>Consumption (b)</i>										
Building sand	13 323 000	13 696 000	14 017 000	13 511 000	12 947 000					
Concreting sand	30 244 000	31 730 000	31 167 000	31 656 000	31 224 000					
Gravel and hoggin	42 401 000	42 783 000	44 049 000	43 043 000	38 550 000					
Total	85 968 000	88 209 000	89 234 000	88 210 000	82 721 000					
<i>Imports</i>										
Sand and gravel	473 474	221 292	168 358	362 076	413 992	5 122	5 877	6 688	9 417	9 453
<i>Exports</i>										
Sand and gravel (c)	8 422 940	8 906 868	9 931 641	9 871 523	8 881 454	23 049	30 734	31 264	32 389	32 104

(a) Including production from marine dredging.

(b) Great Britain: production for the home market including landings of marine-dredged materials at British ports.

(c) Principally marine-dredged sand and gravel. Source: HM Customs and Excise. However, the Crown Estate Commissioners give the following figures for marine-dredged sand and gravel landed at foreign ports (tonnes): 1998: 7 046 645; 1999: 7 226 549; 2000: 7 314 813; 2001: 6 992 731; 2002: 6 190 905.

# United Kingdom production of sand and gravel 1910–2002



## United Kingdom production of sand and gravel 1983–2002

Million tonnes

Year	Land-based production			Marine-dredged			Total production United Kingdom	For beach replenishment (c) (d)
	Great Britain (a)	Northern Ireland (b)	Total	For home market (a)	For export (c)	Total		
1983	88.0	3.2	91.2	12.8	3.1	15.9	107.1	1.4
1984	87.1	3.5	90.6	12.6	2.8	15.4	106.0	1.2
1985	87.8	3.6	91.4	13.8	2.5	16.3	107.7	1.7
1986	90.2	4.2	94.4	15.3	2.3	17.6	112.0	2.2
1987	95.4	3.6	99.0	16.2	2.6	18.8	117.8	5.5
1988	110.5	3.9	114.4	19.6	2.4	22.0	136.4	3.9
1989	110.5	4.6	115.1	20.7	2.6	23.3	138.4	4.3
1990	99.0	4.0	103.0	17.2	3.8	21.0	124.0	2.3
1991	85.5	3.8	89.3	12.4	4.6	17.0	106.3	1.9
1992	78.3	3.7	82.0	10.6	6.3	16.9	98.9	1.3
1993	79.4	4.3	83.7	10.1	6.2	16.3	100.0	0.8
1994	86.3	5.1	91.5	11.3	6.6	18.0	109.4	1.3
1995	78.0	5.3	83.3	11.6	6.8	18.4	101.7	5.2
1996	70.5	5.3	75.7	11.5	6.7	18.2	93.9	7.2
1997	74.4	5.1	79.5	12.0	6.9	18.9	98.4	4.9
1998	73.0	5.3	78.3	13.0	7.0	20.0	98.3	2.4
1999	74.8	5.5	80.3	13.4	7.2	20.7	101.0	2.8
2000	74.9	5.1	80.0	14.4	7.3	21.7	101.6	2.4
2001	74.6	6.2	80.8	13.6	7.0	20.6	101.4	1.6
2002	69.9	5.5	75.4	12.8	6.2	19.0	94.4	1.5

Sources:

(a) Office for National Statistics.

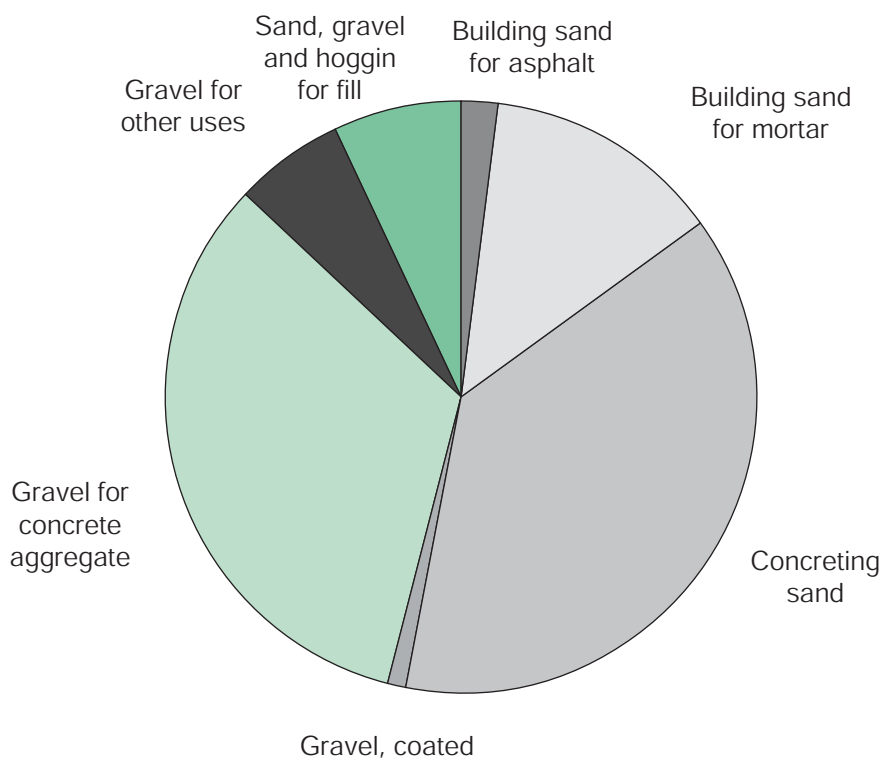
(b) Department of Enterprise, Trade & Investment.

(c) Crown Estate Commissioners.

(d) These figures for marine-dredged sand and gravel used for beach replenishment and contract fill may be included in home market production, and have therefore not been included in the totals.

## Great Britain production of sand and gravel by end-use 2002

(total production 82.7 million tonnes)



## Great Britain production of sand and gravel by end-use and area of origin 2002

Thousand tonnes

Area of origin	Sand		Gravel				Sand, gravel and hoggin for fill	Total
	Building sand		Concreting sand	Coated with a bituminous binder	Concrete aggregate	Other screened & graded gravels (c)		
	For asphalt	For use in mortar						
North East	...	...	(a) 419	—	(a) 405	71	118	(a) 1 344
Yorkshire and Humberside	44	...	(a) 2 030	...	(a) 1 713	291	216	(a) 4 999
East Midlands	...	896	4 272	...	3 571	366	389	9 608
East of England	331	(a) 1 476	(a) 5 577	73	(a) 5 880	(a) 631	(a) 1 350	(a) 15 317
South East								
Land-won	379	...	...	—	...	...	...	11 185
Marine	—	...	...	—	...	...	...	8 687
Total	379	(a) 2 539	(a) 6 249	—	(a) 9 220	(a) 640	(a) 846	(a) 19 872
South West	...	(a) 1 089	(a) 3 117	102	(a) 1 451	551	...	(a) 7 131
West Midlands	...	1 051	3 894	...	3 007	707	306	9 159
North West	106	(a) 1 202	(a) 1 773	—	174	324	311	(a) 3 890
<b>England</b>								
Land-won	1 397	...	...	...	...	...	...	59 633
Marine (b)	—	...	...	—	...	...	...	11 687
<b>Total</b>	<b>1 397</b>	<b>(a) 9 233</b>	<b>(a) 27 331</b>	<b>...</b>	<b>(a) 25 422</b>	<b>(a) 3 580</b>	<b>...</b>	<b>(a) 71 320</b>
<b>Wales</b>								
Land-won	...	...	...	—	...	134	...	1 613
Marine	...	...	...	—	...	—	...	1 145
<b>Total</b>	<b>...</b>	<b>(a) 862</b>	<b>(a) 1 140</b>	<b>—</b>	<b>(a) 487</b>	<b>134</b>	<b>...</b>	<b>(a) 2 758</b>
<b>Scotland</b>								
<b>Total</b>	<b>...</b>	<b>1 096</b>	<b>2 753</b>	<b>...</b>	<b>1 790</b>	<b>1 021</b>	<b>1 581</b>	<b>8 643</b>
<b>Great Britain</b>								
Land-won	...	10 383	26 657	274	20 380	...	5 730	69 889
Marine (b)	...	807	4 567	—	7 319	...	112	12 832
<b>Total</b>	<b>(a) 1 757</b>	<b>(a) 11 190</b>	<b>(a) 31 224</b>	<b>274</b>	<b>(a) 27 699</b>	<b>(a) 4 735</b>	<b>(a) 5 842</b>	<b>(a) 82 721</b>

(a) Including marine-dredged material.

(b) Excluding marine-dredged landings at foreign ports (exports), see p.92.

(c) This heading is now believed to include material previously classified as construction fill.

Source: Office for National Statistics.

## Great Britain production of sand and gravel (a) by Region 1976–2002

Thousand tonnes

Year	North East (b)	North West (c)	Yorks. & Humberside	West Midlands	East Midlands	East of England (d)	South East (e)	South West	England	Wales	Scotland	Great Britain
1976	3 855	3 948	5 288	10 920	11 844	7 264	43 412	6 499	93 030	4 353	12 506	109 888
1977	4 178	3 330	4 552	9 783	10 277	7 821	37 994	5 656	83 592	3 769	11 645	99 007
1978	3 995	3 371	4 469	9 546	10 620	8 511	39 730	6 067	86 310	4 229	11 817	102 356
1979	4 072	3 445	4 755	9 957	10 449	8 312	39 534	6 350	86 875	4 373	11 507	102 755
1980	3 872	3 207	4 250	9 090	10 440	7 234	36 331	6 279	80 704	4 033	11 421	96 158
1981	2 798	3 043	4 668	8 109	9 217	6 532	35 864	5 843	76 074	3 492	9 886	89 453
1982	2 685	3 410	4 397	9 892	9 100	7 026	35 374	6 017	77 901	3 444	9 861	91 206
1983	3 087	3 730	4 690	9 847	10 470	7 581	39 035	8 017	86 457	4 033	10 309	100 799
1984	3 062	4 080	4 680	10 827	10 604	6 934	38 862	7 010	86 060	3 437	10 178	99 675
1985	2 717	3 823	4 537	10 728	10 609	7 540	39 930	6 981	86 865	3 420	11 320	101 605
1986	2 863	4 036	4 686	10 486	11 743	7 547	42 192	7 152	90 706	4 083	10 710	105 498
1987	2 932	4 006	4 780	11 095	13 348	8 306	43 563	8 495	96 525	4 793	10 311	111 629
1988	3 291	4 156	5 306	14 138	15 603	11 361	50 970	9 843	114 667	4 734	10 753	130 154
1989	3 802	4 709	5 722	14 020	15 892	10 145	51 208	9 142	114 640	4 588	12 004	131 232
1990	3 951	4 641	5 485	12 581	14 051	8 762	42 516	7 559	99 547	3 990	12 634	116 172
1991	3 017	4 243	4 960	10 698	12 683	7 288	33 318	6 045	82 253	3 439	12 226	97 918
1992	2 732	3 894	4 028	9 976	12 072	6 456	28 590	6 171	73 290	3 205	11 774	88 898
1993	2 856	4 028	4 539	10 345	12 364	5 962	28 600	6 138	74 833	3 278	11 359	89 470
1994	3 268	4 843	4 907	12 207	12 860	6 947	31 140	6 765	82 937	3 312	11 423	97 672
1995	3 086	4 529	4 333	10 722	11 556	6 550	28 046	6 684	75 506	3 260	10 889	89 656
1996	2 909	3 792	3 923	9 633	10 827	5 623	26 485	5 790	68 983	3 111	9 904	81 997
1997	3 109	4 294	4 041	9 966	10 899	5 899	29 154	6 054	73 416	3 050	9 900	86 366
1998	3 056	3 579	4 381	9 721	10 416	5 979	29 637	6 166	72 935	2 959	10 074	85 968
1999	3 117	3 801	4 872	9 901	10 216	6 395	30 821	6 016	75 139	3 039	10 031	88 209
2000	2 003	4 003	4 559	9 879	10 253	15 637	22 553	7 385	76 272	2 939	10 022	89 234
2001	1 566	3 402	5 171	9 894	9 716	15 694	22 004	7 126	74 572	2 886	10 753	88 210
2002	1 344	3 890	4 999	9 159	9 608	15 317	19 872	7 131	71 320	2 758	8 643	82 721

(a) Including marine-dredged material.

(b) From 2000, excludes Cumbria.

(c) From 2000, includes Cumbria.

(d) From 2000, includes Essex, Hertfordshire and Bedfordshire.

(e) From 2000, excludes Essex, Hertfordshire and Bedfordshire.

Source: Office for National Statistics.

# England production of sand and gravel by end-use 1991–2002

Thousand tonnes

Year	Sand		Gravel				Sand, gravel and hoggin for fill	Total
	Building sand		Concreting sand	Coated with a bituminous binder	Concrete aggregate	Other screened & graded gravels (b)		
	For asphalt	For use in mortar						
<b>1991</b>								
Land-won	3 517	10 854	22 330	356	19 843	2 210	12 308	71 417
Marine (a)	86	28	3 927	—	6 256	145	393	10 836
<b>Total</b>	<b>3 604</b>	<b>10 882</b>	<b>26 257</b>	<b>356</b>	<b>26 099</b>	<b>2 355</b>	<b>12 700</b>	<b>82 253</b>
<b>1992</b>								
Land-won	...	9 735	...	484	19 880	...	...	65 006
Marine (a)	...	114	...	—	4 930	...	...	8 913
<b>Total</b>	<b>3 596</b>	<b>9 849</b>	<b>24 078</b>	<b>484</b>	<b>24 810</b>	<b>842</b>	<b>10 262</b>	<b>73 920</b>
<b>1993</b>								
Land-won	...	9 343	...	...	...	...	...	66 320
Marine (a)	...	158	...	...	...	...	...	8 513
<b>Total</b>	<b>4 113</b>	<b>9 502</b>	<b>23 719</b>	<b>...</b>	<b>24 381</b>	<b>...</b>	<b>12 058</b>	<b>74 833</b>
<b>1994</b>								
Land-won	...	...	...	...	...	...	...	73 161
Marine (a)	...	...	...	...	...	...	...	9 776
<b>Total</b>	<b>3 803</b>	<b>11 214</b>	<b>26 250</b>	<b>...</b>	<b>26 876</b>	<b>...</b>	<b>13 535</b>	<b>82 937</b>
<b>1995</b>								
Land-won	...	...	21 306	301	...	1 457	9 131	65 480
Marine (a)	...	...	3 387	—	...	—	450	10 026
<b>Total</b>	<b>3 402</b>	<b>10 776</b>	<b>24 693</b>	<b>301</b>	<b>25 297</b>	<b>1 457</b>	<b>9 581</b>	<b>75 506</b>
<b>1996</b>								
Land-won	2 663	...	20 734	237	...	752	8 179	59 067
Marine (a)	23	...	3 430	1	...	—	389	9 915
<b>Total</b>	<b>2 685</b>	<b>8 979</b>	<b>24 164</b>	<b>238</b>	<b>23 596</b>	<b>752</b>	<b>8 568</b>	<b>68 983</b>
<b>1997</b>								
Land-won	...	9 050	21 982	...	19 315	419	...	63 010
Marine (a)	...	326	3 577	...	6 250	—	...	10 406
<b>Total</b>	<b>2 634</b>	<b>9 376</b>	<b>25 559</b>	<b>653</b>	<b>25 565</b>	<b>419</b>	<b>9 210</b>	<b>73 416</b>
<b>1998</b>								
Land-won	...	8 645	21 892	...	20 495	433	...	61 241
Marine (a)	...	274	3 861	...	7 375	3	...	11 694
<b>Total</b>	<b>1 991</b>	<b>8 919</b>	<b>25 753</b>	<b>408</b>	<b>27 870</b>	<b>436</b>	<b>7 559</b>	<b>72 935</b>
<b>1999</b>								
Land-won	...	...	22 936	...	20 421	...	7 591	62 954
Marine (a)	...	...	4 297	...	7 292	...	167	12 185
<b>Total</b>	<b>1 847</b>	<b>9 372</b>	<b>27 234</b>	<b>150</b>	<b>27 713</b>	<b>1 065</b>	<b>7 758</b>	<b>75 139</b>
<b>2000</b>								
Land-won	...	9 189	22 769	...	20 164	746	...	63 196
Marine (a)	...	345	4 206	...	8 272	—	...	13 076
<b>Total</b>	<b>1 817</b>	<b>9 533</b>	<b>26 975</b>	<b>135</b>	<b>28 436</b>	<b>746</b>	<b>8 631</b>	<b>76 272</b>
<b>2001</b>								
Land-won	...	...	...	...	...	...	...	62 177
Marine (a)	...	...	...	...	...	...	...	12 395
<b>Total</b>	<b>1 605</b>	<b>9 317</b>	<b>27 658</b>	<b>189</b>	<b>26 731</b>	<b>3 994</b>	<b>5 077</b>	<b>74 572</b>
<b>2002</b>								
Land-won	...	...	...	...	...	...	...	59 633
Marine (a)	...	...	...	...	...	...	...	11 687
<b>Total</b>	<b>1 397</b>	<b>9 233</b>	<b>27 331</b>	<b>...</b>	<b>25 422</b>	<b>3 580</b>	<b>...</b>	<b>71 320</b>

(a) Excluding marine-dredged landings at foreign ports (exports), see p.92.

Source: Office for National Statistics.

(b) From 2001, this heading is believed to include material previously classified as construction fill.

## Wales production of sand and gravel by end-use 1992–2002

Thousand tonnes

Year	Sand		Gravel				Sand, gravel and hoggin for fill	Total
	Building sand		Concreting sand	Coated with a bituminous binder	Concrete aggregate	Other screened & graded gravels (b)		
	For asphalt	For use in mortar						
<b>1992</b>								
Land-won	...	229	...	—	361	...	...	1 561
Marine	—	869	...	—	243	—	...	1 644
<b>Total</b>	...	<b>1 099</b>	<b>1 114</b>	—	<b>604</b>	...	<b>208</b>	<b>3 205</b>
<b>1993</b>								
Land-won	75	275	...	—	...	(a) 144	415	1 701
Marine	2	850	...	—	...	—	(a) 3	1 578
<b>Total</b>	<b>77</b>	<b>1 124</b>	<b>1 019</b>	—	<b>496</b>	<b>(a) 144</b>	<b>(a) 418</b>	<b>3 278</b>
<b>1994</b>								
Land-won	88	...	...	—	...	...	...	1 757
Marine	...	...	...	—	...	—	...	1 555
<b>Total</b>	...	<b>1 062</b>	<b>1 210</b>	—	<b>484</b>	...	<b>381</b>	<b>3 312</b>
<b>1995</b>								
Land-won	...	...	675	—	...	—	396	1 661
Marine	...	...	631	—	...	—	3	1 599
<b>Total</b>	<b>97</b>	<b>993</b>	<b>1 306</b>	—	<b>464</b>	—	<b>399</b>	<b>3 260</b>
<b>1996</b>								
Land-won	44	...	610	—	...	—	460	1 519
Marine	33	...	683	—	...	—	4	1 593
<b>Total</b>	<b>77</b>	<b>817</b>	<b>1 293</b>	—	<b>459</b>	—	<b>464</b>	<b>3 111</b>
<b>1997</b>								
Land-won	27	162	598	—	327	—	338	1 452
Marine	32	590	774	—	201	—	1	1 598
<b>Total</b>	<b>59</b>	<b>752</b>	<b>1 372</b>	—	<b>528</b>	—	<b>339</b>	<b>3 050</b>
<b>1998</b>								
Land-won	...	270	712	—	370	—	...	1 701
Marine	...	497	570	—	162	—	...	1 258
<b>Total</b>	<b>45</b>	<b>768</b>	<b>1 282</b>	—	<b>532</b>	—	<b>333</b>	<b>2 959</b>
<b>1999</b>								
Land-won	...	...	683	—	453	2	354	1 800
Marine	...	...	543	—	175	—	3	1 240
<b>Total</b>	<b>37</b>	<b>789</b>	<b>1 226</b>	—	<b>628</b>	<b>2</b>	<b>357</b>	<b>3 039</b>
<b>2000</b>								
Land-won	...	331	502	—	404	...	386	1 658
Marine	4	620	489	—	164	—	3	1 280
<b>Total</b>	...	<b>951</b>	<b>991</b>	—	<b>568</b>	...	<b>389</b>	<b>2 939</b>
<b>2001</b>								
Land-won	...	...	...	—	...	116	...	1 670
Marine	...	...	...	—	...	—	...	1 216
<b>Total</b>	<b>16</b>	<b>1 120</b>	<b>923</b>	—	<b>524</b>	<b>116</b>	<b>187</b>	<b>2 886</b>
<b>2002</b>								
Land-won	...	...	...	—	...	...	...	1 613
Marine	...	...	...	—	...	...	...	1 145
<b>Total</b>	...	<b>862</b>	<b>1 140</b>	—	<b>487</b>	<b>134</b>	...	<b>2 758</b>

(a) BGS estimate.

Source: Office for National Statistics.

(b) From 2001, this heading is believed to include material previously classified as construction fill.

## Scotland (land-won) production of sand and gravel by end-use 1992–2002

Thousand tonnes

Year	Sand		Gravel				Sand, gravel and hoggin for fill	Total
	Building sand		Concreting sand	Coated with a bituminous binder	Concrete aggregate	Other screened & graded gravels (a)		
	For asphalt	For use in mortar						
1992	...	1 201	3 383	118	2 664	...	3 176	11 774
1993	1 169	1 421	3 283	220	2 339	175	2 753	11 359
1994	...	1 512	3 517	...	2 239	...	2 981	11 423
1995	709	1 412	3 391	96	2 106	158	3 018	10 889
1996	546	1 265	3 202	47	1 965	203	2 676	9 904
1997	547	1 268	3 199	48	2 142	64	2 632	9 900
1998	447	1 153	3 210	79	1 968	198	3 020	10 074
1999	455	1 195	3 270	95	2 008	198	2 809	10 031
2000	...	1 274	3 202	67	1 749	...	3 031	10 022
2001	374	1 079	3 075	72	2 715	1 056	2 382	10 753
2002	...	1 096	2 753	...	1 790	1 021	1 581	8 643

(a) From 2001, this heading is believed to include material previously classified as construction fill.

Source: Office for National Statistics.

# Sandstone (for graph, see Crushed rock)

## United Kingdom summary 1998–2002

Tonnes

Commodity	1998	1999	2000	2001	2002
<b>Sandstone</b> —see Building and dimension stone					
<i>Production</i>	20 129 000	15 485 000	14 900 000	19 967 000	18 362 000

## Great Britain production of sandstone by end-use and area of origin 2002

Thousand tonnes

Area of origin	Building stone	Roadstone			Railway ballast	Concrete aggregate	Other constructional uses	Other uses	Total
		Sold coated	For coating at remote plants	Uncoated					
North East	...	—	—	...	—	—	73	—	106
Yorkshire and Humberside	...	—	694	228	—	94	426	...	1 541
East Midlands	...	...	—	...	—	—	...	—	237
East of England	...	—	—	—	—	—	...	—	...
South East	2	—	—	—	—	—	49	—	51
South West	16	39	229	...	121	...	...	—	711
West Midlands	1	312	302	407	—	...	...	...	...
North West	60	—	217	44	—	475	2 027	—	2 823
<b>England</b>	<b>269</b>	...	<b>1 442</b>	<b>771</b>	<b>121</b>	<b>760</b>	<b>3 153</b>	...	<b>7 006</b>
<b>Wales</b>	<b>10</b>	...	...	<b>416</b>	—	<b>426</b>	<b>1 023</b>	—	<b>3 136</b>
<b>Scotland</b>	...	<b>108</b>	...	<b>502</b>	<b>69</b>	<b>297</b>	<b>489</b>	—	<b>1 645</b>
<b>Great Britain</b>	...	<b>1 026</b>	<b>2 376</b>	<b>1 689</b>	<b>190</b>	<b>1 483</b>	<b>4 666</b>	...	<b>11 788</b>
<b>England</b>					<b>Wales</b>				
County	Total	County	Total	County	Total	County	Total	County	Total
Avon	65	Durham	26	Powys	1 590	Somerset	...	Dyfed	...
Cheshire	79	Norfolk	119	West Glamorgan	...	Greater Manchester	735	Mid Glamorgan	474
Lancashire	1 460	Northumberland	80	Gwent	264	Lancashire	1 460	West Glamorgan	...
Cumbria	344	North Yorkshire	1 009	Gwynedd	...	Cumbria	344	West Glamorgan	...
Derbyshire	237	West Yorkshire	519	Wales	<b>3 136</b>	Derbyshire	237	Wales	<b>3 136</b>
Staffordshire	...	South Yorkshire	14	Wales	<b>3 136</b>	Staffordshire	...	Wales	<b>3 136</b>
Devon	504	Shropshire	1 344	Wales	<b>3 136</b>	Devon	504	Wales	<b>3 136</b>
Cornwall	130	West Sussex	39	Wales	<b>3 136</b>	Cornwall	130	Wales	<b>3 136</b>
Gloucestershire	...	Bedfordshire	...	Wales	<b>3 136</b>	Gloucestershire	...	Wales	<b>3 136</b>
Oxfordshire	1	Surrey	11	Wales	<b>3 136</b>	Oxfordshire	1	Wales	<b>3 136</b>
		Merseyside	205	Wales	<b>3 136</b>			Wales	<b>3 136</b>
		Hereford & Worcester	31	Wales	<b>3 136</b>			Wales	<b>3 136</b>
		<b>England</b>	<b>7 006</b>	<b>Scotland</b>				<b>Scotland</b>	<b>1 645</b>
				Region	Total				
				Central	43				
				Dumfries and Galloway	359				
				Grampian	...				
				Highland	101				
				Strathclyde	178				
				Borders	450				
				Orkney Isles area	...				
				Shetland Isles area	...				
				Fife	14				
				<b>Scotland</b>	<b>1 645</b>				

Source: Office for National Statistics.



## England production of sandstone by end-use 1991–2002

Thousand tonnes

Year	Building stone	Roadstone			Railway ballast	Concrete aggregate	Other constructional uses	Other uses	Total
		Sold coated	For coating at remote plants	Uncoated					
1991	227	803	699	3 457	...	376	4 143	...	9 907
1992	205	686	677	2 000	...	309	4 139	...	8 198
1993	192	647	...	2 048	...	381	4 786	71	9 003
1994	237	666	811	2 191	...	305	5 738	...	10 155
1995	282	640	632	1 900	...	367	5 684	...	9 719
1996	257	638	653	1 825	66	335	3 827	27	7 627
1997	(a) 243	366	876	1 604	55	176	4 312	(a) 14	7 646
1998	254	371	949	1 457	63	...	4 146	...	7 792
1999	420	333	1 090	...	68	548	3 502	...	7 241
2000	214	332	1 201	1 334	...	581	3 598	...	7 401
2001	253	...	1 375	987	110	1 061	2 474	...	7 201
2002	269	...	1 442	771	121	760	3 153	...	7 006

(a) BGS estimate.

Source: Office for National Statistics.

## Wales production of sandstone by end-use 1991–2002

Thousand tonnes

Year	Building stone	Roadstone			Railway ballast	Concrete aggregate	Other constructional uses	Other uses	Total
		Sold coated	For coating at remote plants	Uncoated					
1991	9	258	189	532	—	49	431	—	1 466
1992	5	261	271	413	—	30	748	—	1 731
1993	10	...	255	294	—	...	...	(a) 9	1 381
1994	4	...	...	279	...	20	...	8	1 568
1995	6	634	...	462	...	...	1 268	...	2 898
1996	3	648	...	...	...	...	1 111	2	2 781
1997	(a) 5	...	443	767	...	...	1 219	57	3 098
1998	16	...	667	795	...	109	...	...	3 214
1999	21	493	706	...	—	99	(a) 922	...	2 973
2000	...	...	673	433	...	...	1 355	...	2 941
2001	...	...	913	439	—	180	1 132	...	3 094
2002	10	...	...	416	—	426	1 023	—	3 136

(a) BGS estimate.

Source: Office for National Statistics.

## Scotland production of sandstone by end-use 1991–2002

Thousand tonnes

Year	Building stone	Roadstone			Railway ballast	Concrete aggregate	Other constructional uses	Other uses	Total
		Sold coated	For coating at remote plants	Uncoated					
1991	...	402	22	302	...	165	605	...	1 555
1992	9	462	19	443	...	188	489	...	1 658
1993	30	...	...	477	...	...	...	—	1 716
1994	22	...	...	353	...	109	...	...	1 772
1995	15	457	...	382	...	...	550	—	2 400
1996	11	258	...	...	...	...	646	(a) 7	2 172
1997	8	...	454	370	...	...	356	—	1 712
1998	17	...	606	437	...	...	...	—	2 539
1999	14	229	290	460	(a) 70	126	(a) 466	2	1 657
2000	...	...	523	434	...	...	371	—	1 715
2001	18	...	136	305	...	184	685	...	1 603
2002	...	108	...	502	69	297	489	—	1 645

(a) BGS estimate.

Source: Office for National Statistics.

# Selenium

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Selenium</b>										
<i>Imports</i>										
Elemental	397	518	521	436	434	1 759	1 210	1 810	1 760	2 070
<i>Exports</i>										
Elemental	161	199	279	209	99	625	493	1 369	803	529

# Sepiolite

## United Kingdom summary 1998–2002

Tonnes

Commodity	1998	1999	2000	2001	2002
<b>Sepiolite</b>					
<i>Imports (a)</i>	74 407	63 567	80 538	65 062	69 691

(a) Exports from Spain.

# Silica sand

Silica (industrial) sands contain a high proportion of silica (SiO<sub>2</sub>) in the form of quartz and are used for purposes other than as construction aggregates. They are essential raw materials for the glass and foundry castings industries, but also have a wide range of other industrial and horticultural applications, including ceramics and chemicals manufacture, and water filtration. Unlike construction sands, which are used for physical properties alone, silica sands are valued for a combination of chemical and physical properties.

Silica sand production in the UK has been around 4 Mt/y for several years and total sales were 3.83 million tonnes in 2002. The major producer is WBB MINERALS (formerly Sibelco Minerals and Chemicals). Foundry sand production has been declining for a number of years, reflecting the general decline in the UK manufacturing base. However, glass sand production has increased somewhat in the last couple of years due in part to the commissioning of two new flat glass plants. St Gobain of France operates one at Eggborough in Yorkshire and a further plant at Goole operated by Guardian came on stream during 2003. Both plants are supplied from WBB MINERALS' colourless glass sand operation at King's Lynn in Norfolk, the latter by rail. WBB MINERALS also supplies Pilkington's flat glass plants at St Helens from its site at Chelford in Cheshire.

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Silica sand</b>										
<i>Production (a)</i>	4 662 000	4 092 000	4 095 000	3 848 000	3 833 000					
<i>Imports</i>	31 784	46 934	33 209	46 500	104 232	5 492	6 095	6 489	6 624	13 020
<i>Exports</i>	52 672	42 935	28 796	54 419	39 816	5 508	4 042	3 779	4 809	5 250

(a) Silica sands for glass making, moulding and other non-constructural uses.

## Great Britain production of silica sand by end-use and area of origin 2002

Thousand tonnes

Area of origin	For foundry purposes		Glass manufacture	Other industrial uses	Total
	Naturally bonded	Other			
North East (a)	2	—	—	4	6
Yorkshire and Humberside (b)	—	...	...	...	...
East Midlands (c)	...	...	...	...	...
West Midlands (d)	10	—	...	...	...
East of England (e)	...	...	...	314	...
South East (f)	15	...	...	...	614
South West (g)	—	...	...	...	71
North West (h)	...	266	...	...	1 075
<b>England</b>	...	...	...	<b>1 266</b>	<b>3 349</b>
<b>Wales (i)</b>	—	—	—	...	...
<b>Scotland (j)</b>	...	...	...	...	...
<b>Great Britain</b>	...	...	<b>1 940</b>	<b>1 331</b>	<b>2 833</b>

(a) From Durham.

(b) From Humberside and North Yorkshire.

(c) From Nottinghamshire.

(d) From Hereford and Worcester and Staffordshire.

(e) From Norfolk, Essex, and Bedfordshire

(f) From Hampshire, Berkshire, Kent, Surrey, West Sussex

(g) From Cornwall and Dorset.

(h) From Greater Manchester, Cheshire and Merseyside.

(i) From Clwyd.

(j) From Fife, Highland, Lothian, Strathclyde, Central, Orkney Isles and Western Isles.

Source: Office for National Statistics.

## Silicon

### United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Silicon</b>										
<i>Consumption in Iron and Steel</i>										
<i>Industry</i>										
Ferro-silicon	50 450	45 910	43 690	38 450	33 050					
Silico-manganese	31 500	29 930	27 830	25 050	22 340					
Calcium silicide	1 180	1 100	100	90	80					
Ferro-silico-zirconium	70	70	70	60	50					
<i>Imports</i>										
Elemental silicon—										
Containing not less than										
99.99% silicon	392	290	758	882	1 396	15 272	14 720	24 910	25 161	31 081
Other	44 893	57 875	77 331	85 144	79 370	41 649	47 372	59 314	68 102	61 808
Doped silicon	538	407	390	196	158	68 889	64 042	74 956	48 351	34 095
Ferro-silicon	82 802	80 753	67 821	72 663	76 046	31 203	28 514	24 019	26 123	26 472
Ferro-silico-manganese	49 448	53 965	66 279	53 747	64 565	15 092	14 342	18 021	15 465	18 264
Ferro-silico-magnesium	9 671	8 565	6 965	5 318	5 820	6 465	5 171	3 790	3 007	2 697
Ferro-silico-chrome	78	5 482	7 415	5 136	2 309	50	1 488	2 365	1 488	555
<i>Exports</i>										
Elemental silicon—										
Containing not less than										
99.99% silicon	26	25	108	524	195	1 112	1 058	3 472	11 325	7 716
Other	1 514	2 340	1 469	1 390	3 855	3 624	3 922	2 589	4 845	2 477
Doped silicon	271	247	199	...	379	48 876	53 837	74 383	69 723	77 316
Ferro-silicon	2 502	2 382	1 400	2 247	3 155	2 121	1 563	1 089	2 146	3 450
Ferro-silico-manganese	2 456	1 327	1 307	8	116	801	377	313	7	42
Ferro-silico-magnesium	252	367	1 543	1 453	431	265	376	1 011	1 033	361
Ferro-silico-chrome	264	—	19	52	10	98	—	19	41	8

# Sillimanite

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Sillimanite etc.</b>										
<i>Imports</i>										
Sillimanite minerals (a)	47 985	37 870	28 081	28 470	18 588	5 948	4 154	3 614	2 511	2 071
Mullite	8 417	7 432	5 198	5 174	10 006	2 170	2 424	1 955	3 016	3 341
Chamotte earth (b)	37 789	29 858	23 804	19 300	14 925	5 202	4 017	3 170	3 526	2 551
<i>Exports</i>										
Sillimanite minerals (a)	20	5	53	54	175	2	1	15	11	74
Mullite	6 658	6 891	6 689	6 841	4 379	4 629	4 333	4 534	4 722	3 308
Chamotte earth (b)	817	112	80	290	103	181	68	61	170	41

(a) Andalusite, kyanite and sillimanite.

(b) Calcined refractory clay including flint clay.

# Silver

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Silver</b>										
<i>Imports</i>										
Scrap (a)	4 101	3 273	4 887	4 472	4 074	91 435	141 269	226 927	279 096	266 183
Unwrought	6 543	2 341	1 971	2 986	2 457	802 153	263 712	247 622	314 655	298 772
Partly worked	230	248	570	486	1 324	23 863	26 900	70 618	59 019	59 309
Silver in unrefined lead bullion (b)	380	360	280	390	390					
<i>Exports</i>										
Scrap (a)	2 811	3 284	3 455	7 269	3 776	13 511	17 819	10 717	10 880	24 161
Unwrought	1 501	1 108	3 230	2 048	1 388	163 056	113 799	356 454	160 052	143 895
Partly worked	552	298	231	234	110	42 119	22 396	20 781	22 338	10 675

(a) Including scrap of platinum group metals.

(b) BGS estimates of silver content of unrefined lead bullion imported from Australia (see p.60).

# Slate

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Slate</b>										
<i>Production</i>										
Architectural and cladding uses, roofing and damp proof courses	33 000	45 000	51 000	45 000	82 000					
Powder and granules	37 000	32 000	24 000	27 000	—					
Crude blocks	36 000	38 000	33 000	39 000	38 000					
Fill and other uses	319 000	246 000	371 000	440 000	622 000					
<b>Total</b>	<b>425 000</b>	<b>361 000</b>	<b>479 000</b>	<b>551 000</b>	<b>742 000</b>					
<i>Imports</i>										
Unworked (a)	18 507	25 708	26 672	27 351	28 168	4 536	5 954	6 416	6 844	6 823
Roofing and wall tiles	59 420	63 266	99 332	112 325	125 257	22 042	24 251	32 157	35 162	40 572
Other worked slate (b)	5 244	5 242	7 502	8 581	21 162	1 808	1 747	2 404	2 761	4 825
<i>Exports</i>										
Unworked (a)	5 037	3 526	1 272	467	653	1 053	582	329	427	359
Roofing and wall tiles	6 640	7 033	10 199	10 814	7 146	3 509	3 860	4 254	4 687	3 990
Other worked slate (b)	5 983	7 315	4 724	2 119	1 658	6 211	6 805	5 504	4 102	2 500

(a) Including roughly split or squared.

(b) Including articles of slate or agglomerated slate.

# Strontium

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Strontium</b>										
<i>Imports</i>										
Oxides	2	30	124	42	...	9	54	106	107	...
Carbonate	18 417	17 326	14 777	18 842	15 300	7 596	6 872	5 361	6 678	5 109
<i>Exports</i>										
Oxides	15	4	14	11	...	26	13	45	33	...
Carbonate	102	78	17	13	19	107	45	16	13	13

# Sulphur

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Sulphur</b>										
<i>Supply</i>										
Produced (a)	184 000	136 000	140 000	111 000	125 000					
Imported (b)	196 327	190 439	211 888	170 055	87 260					
Zinc concentrates (imported) (c)	40 500	26 600	51 400	62 400	66 400					
<i>Consumption</i>										
For sulphuric acid–										
Sulphur	370 400	316 200	324 100	276 700	170 400					
Zinc concentrates (c)	50 800	59 500	45 800	54 900	54 600					
<i>Imports</i>										
Sulphur–										
Crude	196 327	190 439	211 888	170 055	87 260	8 356	8 539	10 276	11 185	4 178
Sublimed, colloidal etc.	2 420	213	94	390	355	446	138	39	541	411
<i>Exports</i>										
Sulphur–										
Crude	(d) 51 809	50 897	10 824	376	580	2 465	1 751	1 332	674	749
Sublimed, colloidal etc.	140	277	379	386	657	263	328	234	372	554

(a) Produced from oil refineries.  
(b) Including waste and residues.

(c) Sulphur content calculated at 29%.  
(d) Figure under investigation.

# Talc

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Talc</b>										
<i>Production</i>	4 937	6 256	4 832	4 947	6 194					
<i>Imports</i>	76 744	57 439	61 975	66 737	66 119	9 587	8 558	10 209	10 730	10 303
<i>Exports</i>	4 574	3 175	3 812	4 034	3 833	1 374	1 083	1 328	1 237	1 257

# Tellurium

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Tellurium</b>										
<i>Imports</i>	87	86	140	48	23	405	271	555	371	305
<i>Exports</i>	33	31	39	54	43	240	271	288	512	564

# Tin

Baseresult Holdings Ltd, owners of the South Crofty tin mine and processing plant in Cornwall, have submitted an application to Cornwall County Council providing details of future tin mining and ancillary operations in respect of a working plan and suggested planning conditions. This application required further information which has to be supplied by April 2004.

Apart from this, the only remaining tin mining activity is the very small scale production of cassiterite by tourist operations.

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Tin</b>										
<i>Production</i>										
Concentrate (Sn content)	448	—	—	—	—					
<i>Consumption</i>										
Refined	9 779	9 583	9 963	10 303	9 948					
<i>Imports</i>										
Concentrates	11	1	0	6	—	11	17	0	2	—
Sn content (a)	7	0	0	...	—					
Scrap	477	393	388	179	188	1 095	947	630	223	191
Ash and residues	—	20	0	0	1	—	4	0	0	1
Unwrought	10 753	9 120	9 190	6 857	7 151	30 850	29 878	32 540	22 107	19 094
Unwrought alloys	1 220	952	1 760	2 442	1 437	2 988	2 554	4 215	7 789	3 585
<i>Exports</i>										
Concentrates	1 292	173	121	59	24	2 650	1 277	1 174	661	589
Scrap	1 356	3 631	1 322	2 256	2 821	1 951	3 642	1 287	2 023	2 274
Ash and residues	305	514	473	262	194	246	390	459	177	179
Unwrought	3 396	88	146	426	381	8 307	361	652	1 306	1 079
Unwrought alloys	2 100	2 239	2 993	2 485	2 165	5 681	7 567	8 081	7 314	5 092

(a) Estimated by UNCTAD.

# Titanium

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Titanium</b>										
<i>Production</i>										
Titanium dioxide pigment (c)	200 000	200 000	200 000	200 000	200 000					
<i>Apparent consumption (a)</i>										
	167 300	81 500	96 200	96 800	89 500					
<i>Consumption in Iron and Steel Industry</i>										
Ferro-titanium	1 140	1 050	1 030	920	790					
<i>Imports</i>										
<i>Ores and concentrates—</i>										
Ilmenite	100 765	95 473	134 861	112 447	106 177	7 532	8 642	11 563	9 082	7 928
Other (rutile)	181 420	84 841	70 348	110 526	82 303	18 400	20 026	19 720	30 909	24 697
Scrap	15 737	13 634	14 953	15 258	13 586	18 289	12 713	20 680	23 597	19 536
Unwrought	11 654	10 105	9 403	11 851	8 971	57 379	39 245	36 954	53 303	37 360
Wrought	3 321	3 145	2 975	3 643	2 761	79 963	64 804	71 591	80 770	60 353
Ferro-titanium (b)	4 887	4 054	2 672	2 465	2 729	7 363	4 474	4 029	4 124	4 313
Oxides	8 036	6 057	6 717	6 048	5 310	10 647	8 516	9 909	9 955	8 011
<i>Pigments based on titanium</i>										
dioxide	94 661	68 377	73 370	76 804	90 273	110 039	85 856	87 859	94 873	97 680
Titanium slag	119 386	120 890	160 738	110 697	157 020	28 105	29 151	43 704	32 353	44 468
<i>Exports</i>										
<i>Ores and concentrates—</i>										
Ilmenite	0	70	3	—	—	0	19	1	—	—
Other (rutile)	2 281	(c) 115	(c) 400	(c) 30	24	2 825	(c) 55	(c) 245	(c) 80	179
Scrap	3 672	1 995	2 888	3 188	2 503	6 629	4 105	7 389	8 557	5 775
Unwrought	3 655	4 187	7 364	4 090	4 010	16 124	13 198	15 468	16 639	14 589
Wrought	4 116	3 146	3 900	6 318	4 998	87 952	73 646	72 993	93 662	79 792
Ferro-titanium (b)	20 211	18 894	18 839	16 422	16 334	34 846	22 792	31 926	28 922	28 094
Oxides	1 415	1 482	2 135	1 788	1 490	2 714	2 810	3 494	3 026	2 811
<i>Pigments based on titanium</i>										
dioxide	164 220	188 958	207 448	205 695	237 394	200 802	214 737	234 642	243 631	265 434

(a) BGS estimates; see p.v.

(b) Including ferro-silico-titanium.

(c) BGS estimates.

# Tungsten

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Tungsten</b>										
<i>Consumption in Iron and Steel Industry (a)</i>										
	40	40	40	40	30					
<i>Imports</i>										
Ores and concentrates	0	96	...	...	...	3	138	20	66	28
W content	0	50	...	...	...					
Scrap	1 333	1 080	1 380	1 828	1 206	4 894	2 852	4 548	8 335	3 720
Unwrought	476	558	379	405	519	7 064	5 299	6 878	4 484	4 664
Wrought	246	181	417	305	396	7 189	5 697	6 552	5 990	5 647
Ferro-tungsten (b)	56	66	63	96	32	185	61	171	340	90
Carbide	2 293	752	829	1 381	759	16 341	6 829	8 256	19 297	8 020
Ash and residues	28	3	0	0	...	77	5	4	1	...
Tungstates	122	149	107	85	83	362	403	526	414	323
Oxides and hydroxides	902	1 056	1 207	1 490	877	3 197	3 343	4 329	9 151	4 394
<i>Exports</i>										
Ores and concentrates	1	5	2	11	—	15	22	4	34	—
W content	0	3	1	5	—					
Scrap	578	560	1 225	1 471	1 264	2 334	1 467	2 704	4 218	3 533
Unwrought	1 581	598	835	253	189	12 366	3 557	6 743	3 517	1 644
Wrought	141	177	2 586	149	214	1 288	1 568	4 047	1 310	1 558
Ferro-tungsten (b)	—	1	93	6	16	—	5	261	27	55
Carbide	291	481	8	20	5	3 819	5 340	168	303	92
Tungstates	9	13	3	23	130	64	62	39	180	592
Oxides and hydroxides	17	7	62	8	8	149	76	364	441	314

(a) Metal content.

(b) Including ferro-silico-tungsten.

# Vanadium

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Vanadium</b>										
<i>Consumption in Iron and Steel Industry (a)</i>										
	830	780	730	660	590					
<i>Imports</i>										
Scrap	32	38	23	7	14	195	151	115	61	71
Unwrought	129	17	69	95	98	1 463	164	624	1 139	796
Wrought	530	318	181	278	59	6 418	2 958	1 615	1 924	482
Ferro-vanadium	378	648	1 443	727	748	4 743	3 441	3 380	3 393	2 209
Oxides	156	306	277	319	962	847	1 321	613	989	1 874
<i>Exports</i>										
Ash and residues	358	0	—	0	...	258	0	—	81	...
Scrap	—	71	85	59	46	—	56	580	451	331
Unwrought	315	0	0	0	99	270	6	2	2	79
Wrought	(b) 1 546	656	1 705	1 346	1 280	(b) 2 246	468	964	723	1 587
Ferro-vanadium	96	77	49	118	55	808	403	265	484	272
Oxides	103	966	1 933	14	20	125	389	642	64	93

(a) Vanadium content of ferro-vanadium.

(b) Figure under investigation.

# Vermiculite

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Vermiculite</b>										
<i>Imports</i>	36 489	32 058	36 341	31 602	36 275	3 498	3 219	3 548	3 472	4 002
<i>Exports</i>	1 237	(a) 18 845	83	109	213	307	199	119	107	101

(a) Figure under investigation.

# Zinc

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Zinc</b>										
<i>Production (a)</i>										
Slab	99 600	132 800	99 600	99 600	99 600					
<i>Consumption</i>										
Slab	187 854	198 898	206 486	197 140	202 407					
Scrap (Zn content)	38 312	37 817	36 058	34 043	32 250					
Total	226 166	236 715	242 544	231 183	234 657					
<i>Imports</i>										
Ores and concentrates (b)	139 806	91 613	177 332	215 342	229 042	28 365	18 046	31 332	33 120	28 010
Ash and residues	6 156	7 496	11 108	4 401	3 414	5 738	...	...	...	4 099
Scrap	3 806	3 507	4 983	3 219	261	2 337	1 926	2 778	1 645	134
Unwrought	162 046	111 382	119 052	110 157	108 357	103 395	91 309	105 955	75 822	62 546
Unwrought alloys	10 908	6 293	7 133	6 363	5 738	9 056	4 137	6 140	4 990	3 832
<i>Exports</i>										
Ores and concentrates	70	3 856	1 353	72	15 744	90	1 040	266	85	2 883
Ash and residues	7 495	5 564	10 420	9 534	7 417	1 562	1 422	2 279	2 926	2 001
Scrap	21 877	43 025	45 202	19 157	15 248	10 105	23 053	24 000	11 384	7 511
Unwrought	10 879	15 924	12 231	15 455	15 686	8 893	10 120	8 749	10 595	9 098
Unwrought alloys	23 840	22 656	19 940	21 971	22 366	20 140	17 448	17 373	18 296	15 141

(a) Anglesey Mining Co continued small-scale geological and scientific studies at the Parys Mountain polymetallic Cu-Pb-Zn-Ag-Au deposit on Anglesey in North Wales.

(b) Zinc and mixed zinc-lead concentrates.

# Zirconium

## United Kingdom summary 1998–2002

Commodity	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
	Tonnes					£ thousand				
<b>Zirconium</b>										
<i>Consumption in Iron and Steel Industry</i>										
Ferro-silico-zirconium	70	70	70	60	50					
Apparent consumption (a)	24 400	17 400	15 800	20 800	12 700					
<i>Imports</i>										
Ores and concentrates (b)	54 986	37 695	34 053	46 548	30 656	13 629	10 307	13 115	16 798	9 811
Scrap	137	73	437	335	221	642	416	1 171	860	719
Unwrought	135	40	76	91	35	2 000	612	838	481	787
Wrought	238	150	220	268	137	4 967	4 200	3 039	3 622	2 911
<i>Exports</i>										
Ores and concentrates	3 039	333	567	1 776	5 033	1 423	290	496	1 022	2 303
Scrap	102	167	192	222	184	581	843	944	1 101	931
Unwrought	73	165	67	85	42	383	363	101	49	107
Wrought	71	49	57	73	37	786	913	1 491	1 348	851

(a) BGS estimates; see p.v.

(b) Mainly zircon.