

Chapter 1

Energy

Key points

- **In 2016, UK energy production was up 1.2 per cent on a year earlier.** The rise was driven by growth in UK Continental Shelf output with both oil and gas output up. There was also growth in biofuels. **However, coal output decreased to record low levels.** (Tables 1.1 and 1.2).
- Imports and exports in 2016 were both down; **overall net imports decreased though they still accounted for 36 per cent of energy used in the UK.**
- **Primary energy consumption was down 1.4 per cent; and on a temperature adjusted basis primary energy consumption was down 2.3 per cent** continuing the downward trend of the last ten years. UK temperatures were above normal, but there was a small increase in heating degree days than in 2015. (Table 1.1.7).
- **Final energy consumption rose by 1.6 per cent** as demand for heating increased with temperature adjusted final energy consumption up by 0.9 per cent on 2015 levels, mainly due to increased energy use in transport. (More details are available in Energy Consumption in the UK www.gov.uk/government/collections/energy-consumption-in-the-uk)
- **Fossil fuels remain the dominant source of energy supply, but now accounts for 81.5 per cent,** a record low level. Supply from renewables increased, with their contribution accounting for 8.9 per cent of final consumption on the EU agreed basis (see Chapter 6).
- In 2016, there was a switch in the main sources of electricity generation away from coal to gas generation. **Generation from coal fell by 60 per cent, as a number of plants closed or switched to burning biomass; gas rose by 46 per cent.** Renewables' share of generation was stable at 25 per cent in 2016, the same as in 2015. **Increased renewables generation capacity was balanced by less favourable weather conditions for solar and wind generation (see chapters 5 and 6).**
- Provisional BEIS estimates suggest that **overall emissions fell by nearly 30 million tonnes of carbon dioxide (MtCO₂) (7.4 per cent) to 374.1 MtCO₂** between 2015 and 2016, driven by the changes in electricity generation.

Introduction

1.1 This chapter presents figures on overall energy production and consumption. Figures showing the flow of energy from production, transformation and energy industry use through to final consumption are presented in the format of an energy balance based on the individual commodity balances in Chapters 2 to 6.

1.2 The chapter begins with aggregate energy balances covering the last three years (Tables 1.1 to 1.3) starting with the latest year, 2016, compiled using Gross Calorific Values (see paragraph 1.29). Energy value balances then follow this for the same years (Tables 1.4 to 1.6) and Table 1.7 shows sales of electricity and gas by sector in value terms. The explanation of the principles behind the energy balance and commodity balance presentations, and how this links with the figures presented in other chapters, is set out in Annex A. Information on long term trends (Tables 1.1.1 to 1.1.9) are available on BEIS's energy statistics web site at:

www.gov.uk/government/collections/digest-of-uk-energy-statistics-dukes

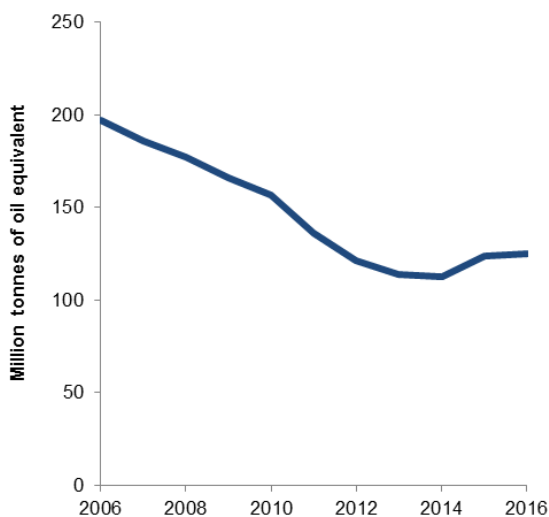
Aggregate energy balance (Tables 1.1, 1.2 and 1.3)

1.3 These tables show the flows of energy in the United Kingdom from production to final consumption through conversion into secondary fuels such as coke, petroleum products, secondary electricity and heat sold. The figures are presented on an energy supplied basis, in tonnes of oil equivalent (toe), a unit of energy where 1 toe = 41.868 GJ, see also paragraph 1.28 for other energy units. The basic principles of energy balances and guidance on what is included in each row is detailed in Annex A of this publication.

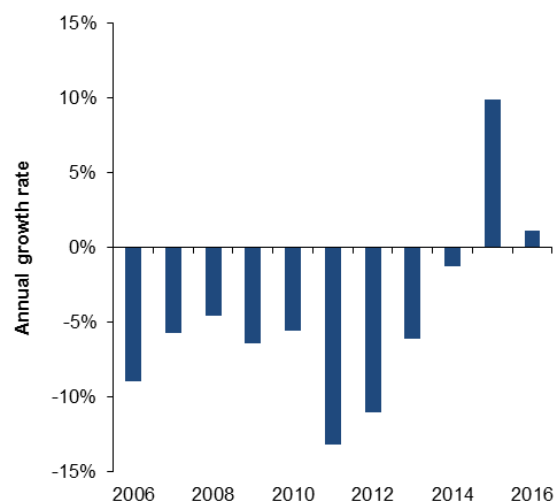
Energy production and supply

1.4 Indigenous **production in 2016 was 1.2 per cent higher than in 2015** (Chart 1.1). This small increase is the second rise in UK energy production since 1999. Production had fallen in each of the years between 2000 and 2014, mainly due to declines in output from the UK Continental Shelf (UKCS). However, despite the recent rise in output, production is 58 per cent below its peak in 1999. The rise in 2016 was mainly due to increased output from the UKCS, with crude oil production up 4.9 per cent, and with gas production up 2.4 per cent. This growth was mainly down to new fields commencing production. The other source of growth was from increased bioenergy production.

Chart 1.1: UK energy production
Level



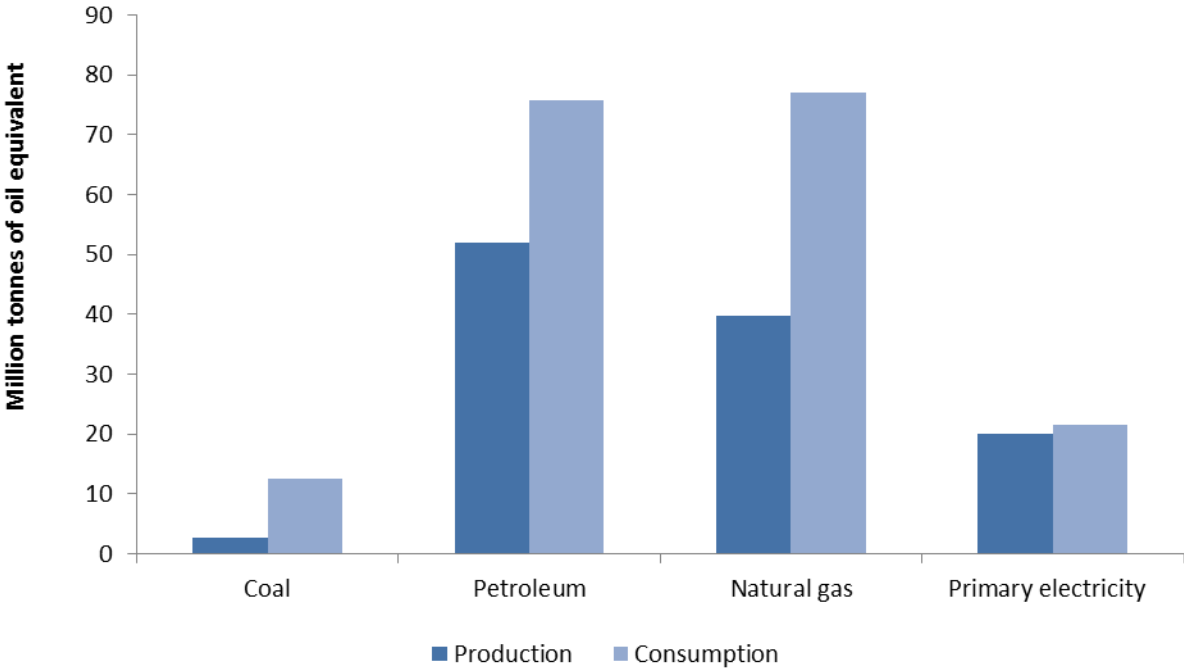
Annual growth rate



1.5 There was a sharp reduction in coal output, down by over 50 per cent on the low output levels in 2015. The decrease is due to the last large deep mines closing in 2015 and a sharp reduction in demand from electricity generators. **There was a fall in primary electricity production, with the combined output from wind, hydro and solar photovoltaics down by 1.8 per cent as adverse weather conditions (less wind, rain and sunshine) more than offset the increases in capacity.** Nuclear output was down marginally by 0.4 per cent. More details on these changes are given in the later fuel specific chapters.

1.6 **In 2016, the primary supply of fuels was 201.1 million tonnes of oil equivalent (mtoe), a 1.1 per cent decrease compared to 2015.** Chart 1.2 illustrates the figures for the production and consumption of individual primary fuels in 2016. In 2016, aggregate primary fuel consumption was not met by indigenous production; this continues the trend since 2004 when the UK became a net importer of fuel. The differences between production and consumption are met mainly by trade but stock changes and the use of fuel in international shipping (marine bunkers) are also factors.

Chart 1.2: Production and consumption of primary fuels 2016



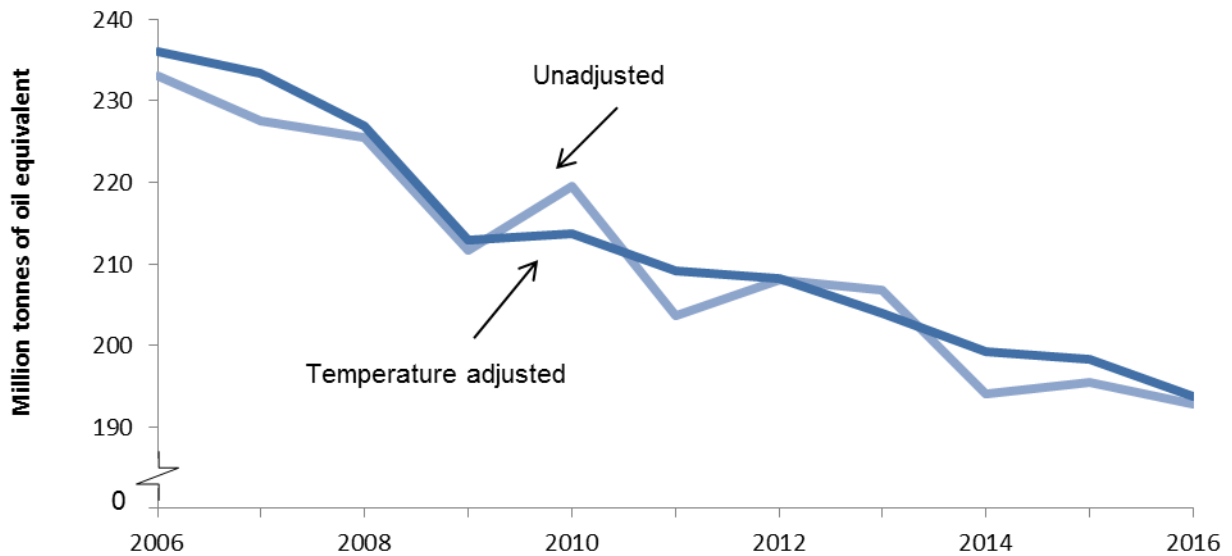
1.7 As explained in subsequent chapters, the UK has traded fuels such as oil and gas regardless of whether it has been a net exporter or importer. Imports in 2016 at 149.7 million toe fell back by 3.5 per cent from 2015 and are down 17 per cent from their peak in 2013. Exports at 75.8 million toe were down 1.1 per cent with the decrease in gas exports more than offsetting the increase in oil exports. The UK remained a net importer of all main fuel types in 2016. In 2016 the UK net import gap fell back to 73.9 million toe from the 2013 peak of 104 million toe. **Net imports accounted for 36 per cent of energy used in the UK in 2016, down from their share of 48 per cent in 2013.**

Energy demand and final consumption

1.8 **Total primary energy demand was 1.1 per cent lower in 2016 than in 2015 at 201.1 mtoe.** The slight fall in demand compared to a year earlier was mainly due to reduced losses in transformation, as more gas replaced coal in generation. Average temperatures overall in 2016 were broadly similar to those in 2015, though it is estimated that heating demand was up with the average number of heating degree days up from 5.3 to 5.5 (Summer 2016 was warmer whilst November and December were colder than in 2015).

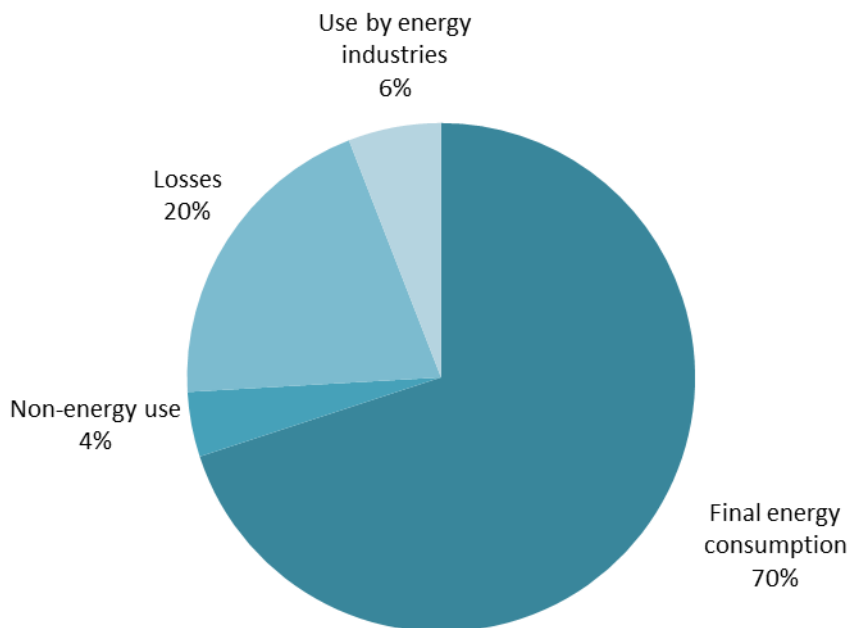
1.9 Primary energy consumption (primary supply less non-energy use) was down by 1.4 per cent in 2016. **On a temperature corrected basis, primary energy consumption was estimated to have fallen by 2.3 per cent.** A table showing temperature corrected demand is shown in Table 1.1.4 in the annex on long term trends, while Chart 1.3, shows the continued fall in primary energy consumption.

Chart 1.3: Primary energy consumption



1.10 In 2016, gas accounted for 42 per cent of UK generation up from 29 per cent in 2015. **Coal's share declined further, accounting for only 9.0 per cent share in 2016; this is down sharply from a share of just under 40 per cent in 2012 and a share of 22 per cent in 2015.** This decline is due to the closure of several power stations and the conversion of others to using biomass. Nuclear accounted for 21 per cent of generation, with thermal renewables accounting for 8.9 per cent, both shares broadly unchanged from last year. Generation from wind, hydro and solar photovoltaics fell by 1.8 per cent due to poorer weather conditions and accounted for just under 16 per cent of generation. Overall renewables' share of generation was stable at 25.4 per cent in 2016. More details on electricity are available in Chapter 5, with further information on renewable generation available in Chapter 6.

Chart 1.4: Primary demand 2016

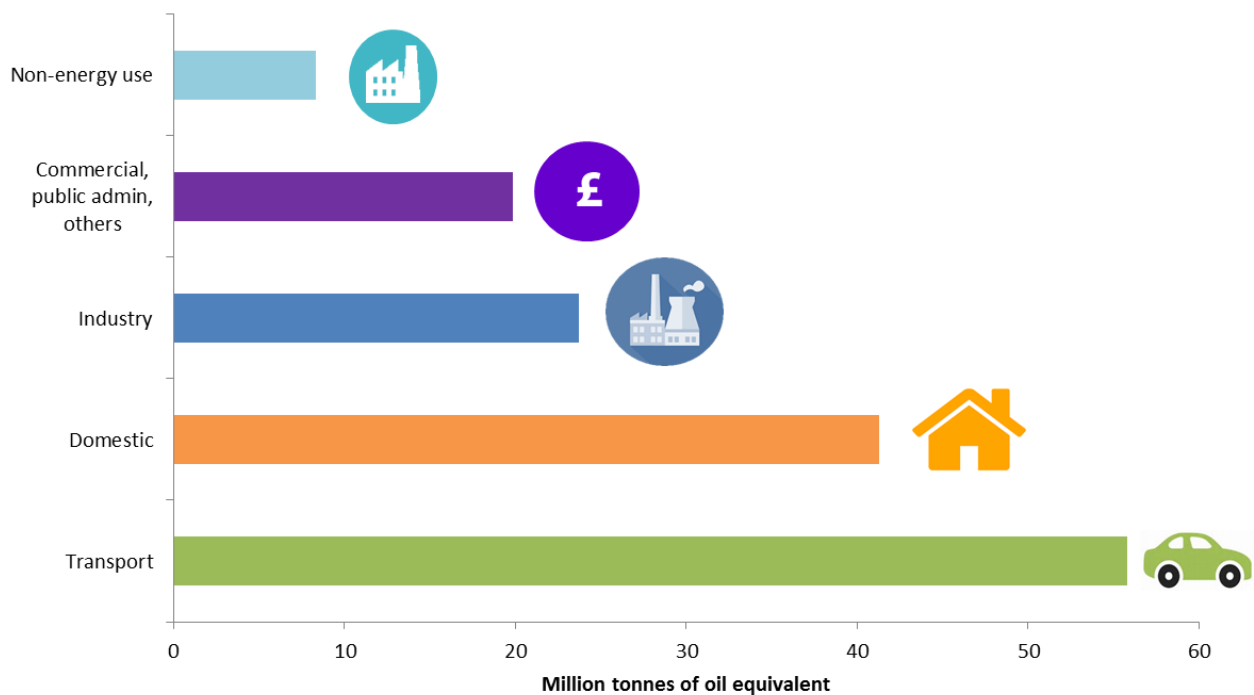


Primary demand: 201.1 million tonnes of oil equivalent

1.11 This switch from coal to gas for generation has resulted in a **sharp decrease in carbon dioxide emissions between 2015 and 2016**. Provisional BEIS estimates suggest that overall emissions fell by 29.8 million tonnes of carbon dioxide (MtCO₂) (7.4 per cent) to 374.1 MtCO₂ between 2015 and 2016. More details of carbon dioxide emissions are available in a Statistical Release, published in March, which is available on the BEIS section of the GOV.UK website at: www.gov.uk/government/collections/provisional-uk-greenhouse-gas-emissions-national-statistics.

1.12 Total **final consumption**, which includes non-energy use of fuels, was 149.0 million tonnes of oil equivalent in 2016. Chart 1.5 shows consumption by category, with transport and domestic use accounting for nearly two thirds of final consumption.

Chart 1.5: Final consumption 2016



1.13 Final consumption (including Non Energy Use) increased by 2.6 million tonnes of oil equivalent, **1.8 per cent up, on the consumption in 2015**. The increase comes mainly from the domestic and transport sectors. The domestic rise in consumption was mainly due to the cooler winter weather in 2016 compared to 2015. On a temperature adjusted basis domestic consumption is estimated to have increased by 1.4 per cent in 2016, though is down 13 per cent over the last 10 years.

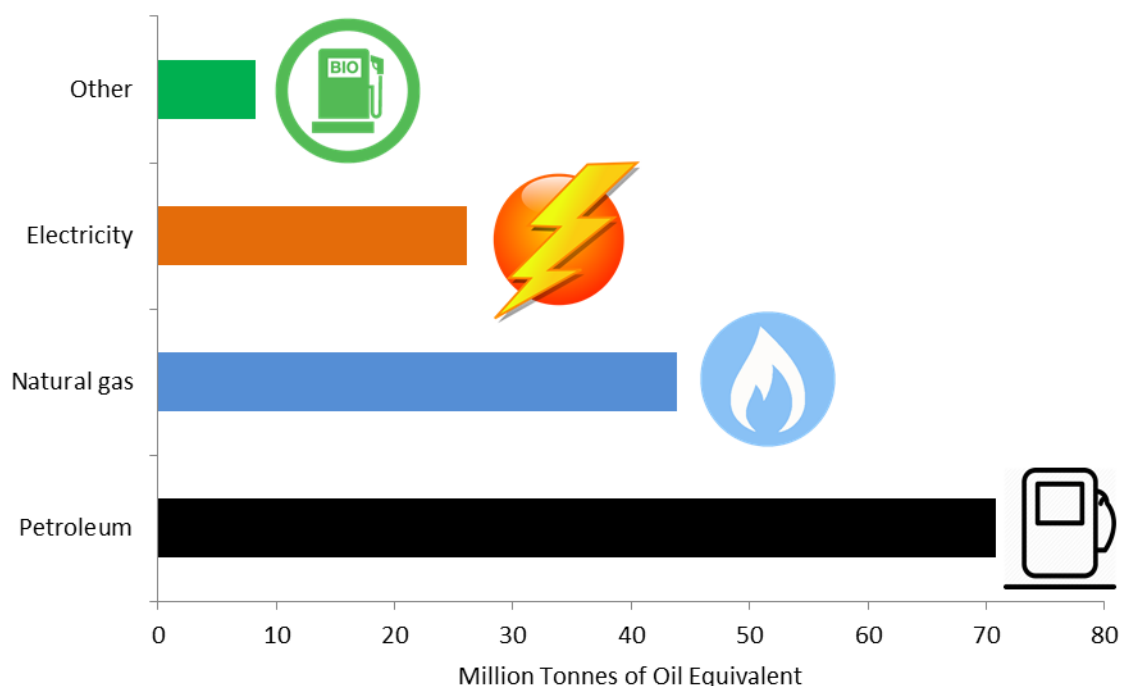
1.14 **Consumption in the transport sector rose by 1.9 per cent; this rise taking consumption to its highest level since 2008 is likely due to increased demand resulting from lower prices as petroleum product prices again fell during the year**. More details on these are published in Quarterly Energy Prices¹. Consumption in the service sector increased by 2.7 per cent on increased heating demand, whilst consumption in the industrial sector fell by 2.6 per cent. There was also a second successive rise in non-energy use; this is discussed in Chapter 3.

1.15 **Final energy consumption (where non-energy use is excluded) was up by 1.6 per cent on the year**. On a temperature corrected basis final energy consumption was estimated to be up 0.9 per cent in 2016 compared to 2015, but is down by an average of 1.2 per cent per annum over the last 10 years.

¹ www.gov.uk/government/collections/quarterly-energy-prices

1.16 The main fuels used by final consumers in 2016 were petroleum products (47.5 per cent), natural gas (29.4 per cent) and electricity (17.5 per cent). Biofuels accounted for 3.4 per cent of final consumption. The amount of heat that was bought for final consumption accounted for 0.8 per cent of the total final consumption.

Chart 1.6: Final consumption by fuel



1.17 Of the petroleum products consumed by final users 11 per cent was for non-energy purposes; for natural gas 1.1 per cent was consumed for non-energy purposes. Non-energy use of fuels includes use as chemical feedstocks and other uses such as lubricants. Non-energy use of fuels for 2016 is shown in Table 1A. Further details of non-energy use are given in Chapter 2 paragraph 2.29, Chapter 3, paragraph 3.20 and Chapter 4, paragraph 4.27.

Table 1A: Non-energy use of fuels 2016

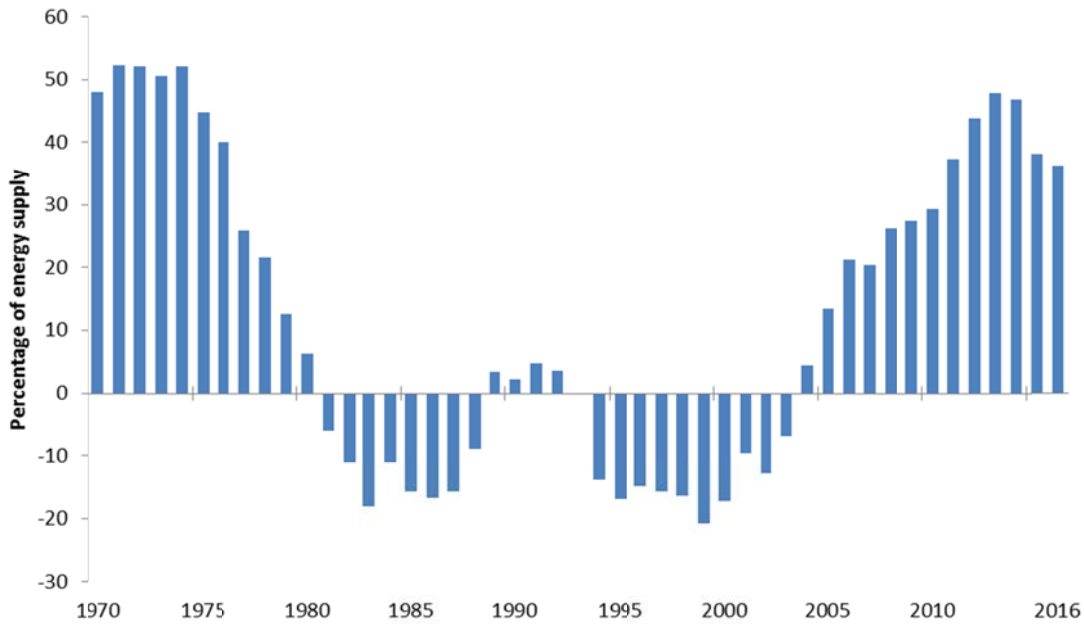
	Thousand tonnes of oil equivalent		
	Petroleum	Natural gas	Manufactured fuel
Petrochemical feedstocks	5,013	439	46
Other	2,805	-	-
Total	7,818	439	46

1.18 The data in the energy balances (Table 1.1) can be viewed in a number of ways, with a number of other statistics derived to produce different descriptions of the UK energy market. Recently greater focus has been given to looking at import dependency and also at fossil fuel dependency. Import dependency (Table 1B) is calculated by dividing net imports by primary supply, including an addition for the energy supplied to marine bunkers. Chart 1.7 shows this on a longer time frame.

Table 1B: Net import dependency 2014 to 2016

	Thousand tonnes of oil equivalent		
	2014	2015	2016
Net imports	95,702	78,490	73,924
Primary energy supply + bunkers	204,199	206,070	203,965
Net import dependency	46.9%	38.1%	36.2%

Chart 1.7: Net import dependency, 1970 to 2016



1.19 The energy used in the UK can also be classified by whether its source was from fossil fuels, low-carbon sources or other (Table 1C). The main fossil fuel sources in the UK are coal, gas and oil. The low carbon sources include nuclear and renewables such as wind; hydro; solar photovoltaics (pv) and biofuels. **In 2016, the share of energy from fossil fuels decreased further to a record low of 81.5 per cent**, whilst that from low-carbon sources increased from having a 16.4 per cent to a 17.0 per cent share.

1.20 The largest component of this series is currently nuclear; its share of energy supplied remained broadly unchanged at 8.0 per cent in 2016. There was a rise in the share from renewables; with an increase in bioenergy use. The ‘other’ category, shown for completeness, includes net imports of electricity, as imports and exports could come from either of the previous categories, and non-biodegradable wastes. Headline data, taken from Table 6.7 later in this publication, show that renewables had a “normalised” 8.9 per cent share of final energy consumption in 2016 (the normalisation process takes out weather effects from this statistic; see paragraph 6.45). There are other ways to measure renewables contribution to energy, and these are discussed in more detail in Chapter 6.

Table 1C: Fossil fuel and low carbon dependencies 2014 to 2016

	2014	2015	Per cent 2016
Fossil fuel	84.3%	82.1%	81.5%
Low-carbon	14.3%	16.4%	17.0%
Other	1.4%	1.5%	1.5%

Value balance of traded energy (Tables 1.4, 1.5 and 1.6)

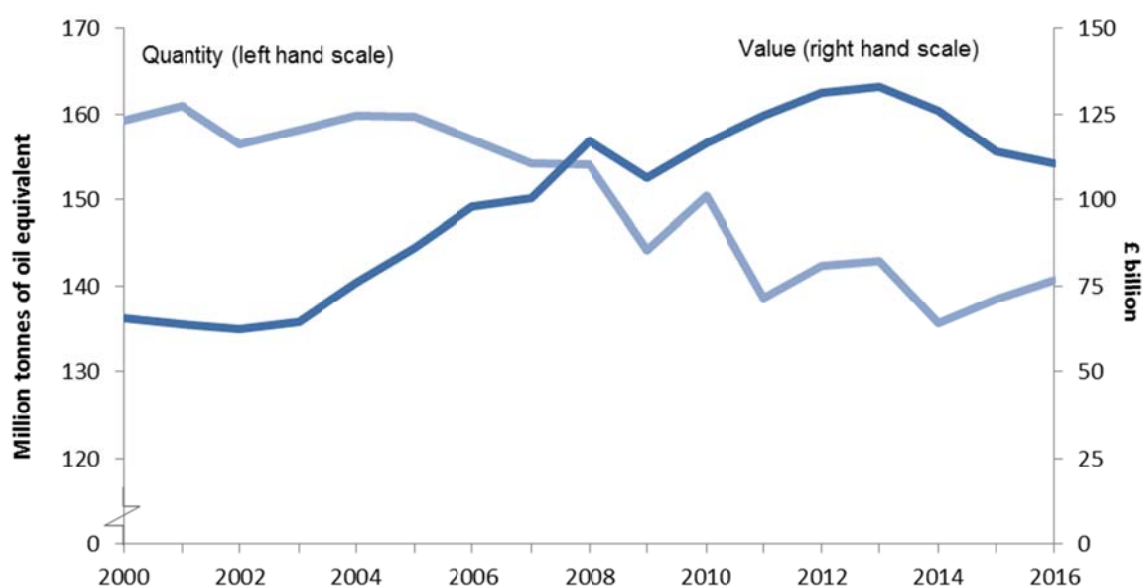
1.21 Tables 1.4 to 1.6 present the value of traded energy in a similar format to the energy balances. The balance shows how the value of inland energy supply is made up from the value of indigenous production, trade, tax and margins (profit and distribution costs). The lower half of the tables show how this value is generated from the final expenditure on energy (from the industrial and domestic sectors) through transformation processes and other energy sector users. The balances only contain

values of energy which are traded, i.e. where a transparent market price is applicable. Further technical notes are given in paragraphs 1.39 to 1.45.

1.22 **Total expenditure by final consumers** in 2016 is estimated at £110,835 million, (£110,660 million shown as actual final consumption and £175 million of coal consumed by the iron and steel sector in producing coke for their own consumption), **down by 2.9 per cent on the 2015 level.**

1.23 **Expenditure though is down by 17 per cent (down 20 per cent in real terms when adjusted for inflation) from the peak in 2013,** with the most significant changes from then being the reduced price for crude and petroleum products. In 2016, crude oil prices averaged around \$45 per barrel, down from \$54 per barrel in 2015 and much lower compared to the average of just under \$109 per barrel in 2013. Chart 1.8 shows energy consumption and expenditure by final users.

Chart 1.8: Energy consumption and estimated expenditure on energy by final users



1.24 Of the total final expenditure on energy in 2016 (£111 billion), the biggest share, 50 per cent, fell to the transport sector. Industry purchased 9.5 per cent (£11 billion), the domestic sector purchased 28 per cent (£31 billion), with the remaining 13 per cent (£14 billion) purchased by the service sector.

Sales of electricity and gas by sector (Table 1.7)

1.25 Table 1.7 shows broad estimates for the total value of electricity and gas to final consumption. Net selling values provide some indication of typical prices paid in broad sectors and can be of use to supplement more detailed and accurate information contained in the rest of this chapter. More detailed information on energy prices is available in *Energy Prices*, available on BEIS's energy statistics website at: www.gov.uk/government/collections/quarterly-energy-prices

The energy industries

1.26 **The energy industries in the UK play a central role in the economy by producing, transforming and supplying energy in its various forms to all sectors.** They are also major contributors to the UK's Balance of Payments through the exports of crude oil and oil products. The

box below summarises the energy industries' contribution to the economy in 2016, based on the latest available data from the Office for National Statistics (ONS):

- 2.3 per cent of GDP;
- 10 per cent of total investment;
- 34 per cent of industrial investment;
- 178,000 people directly employed (6.3 per cent of industrial employment);
- Many others indirectly employed (e.g. an estimated 152,000 in support of UK Continental Shelf activities).

1.27 The share of GDP at 2.3 per cent compares to a peak level of 10.4 per cent in 1982. **The share fell to below 4 per cent in most years since 2000, with the latest fall taking energy's share of the UK economy to its lowest level for over 40 years.** The latest fall is largely due to the further decline in the price of oil; which fell by around 17 per cent in 2016². In 2016 investment in the energy industries fell back from the recent high levels with reduced spending for oil and gas extraction. Employment has remained broadly unchanged in the last seven years, but up from 10 years ago.

² www.bp.com/en/global/corporate/energy-economics/statistical-review-of-world-energy/oil/oil-prices.html

Technical notes and definitions

I Units and measurement of energy

Units of measurement

1.28 The original units of measurement appropriate to each fuel are used in the individual fuel chapters. A common unit of measurement, the tonne of oil equivalent (toe), which enables different fuels to be compared and aggregated, is used in Chapter 1. In common with the International Energy Agency and with the Statistical Office of the European Communities, the tonne of oil equivalent is defined as follows:

1 tonne of oil equivalent	= 10 ⁷ kilocalories
	= 396.83 therms
	= 41.868 Gigajoules (GJ)
	= 11,630 Kilowatt hours (kWh)

This unit should be regarded as a measure of energy content rather than a physical quantity. One tonne of oil is not equal to one tonne of oil equivalent.

Calorific values when producing energy statistics

1.29 In this publication Gross Calorific Values (GCVs) are used to convert fuel from their original units to tonnes of oil equivalent (toe). An alternative is to use Net Calorific Values (NCVs) as detailed in paragraph XVII of the introduction. The fuel specific GCVs and NCVs are shown at Annex A. However, as some EU targets are calculated on data converted using net calorific values, aggregate energy balances for the most recent years have been calculated using NCVs; these are used in Table 6.7, and are available on the internet version, Annex I, of this publication at:

www.gov.uk/government/collections/digest-of-uk-energy-statistics-dukes.

Thermal content - energy supplied basis of measurement

1.30 Tables 1.1 to 1.3 and 1.1.1 to 1.1.5 (available on the BEIS section of GOV.UK at: www.gov.uk/government/statistics/energy-chapter-1-digest-of-united-kingdom-energy-statistics-dukes) are compiled on an energy-supplied basis. Detailed data for individual fuels are converted from original units to tonnes of oil equivalent using gross calorific values and conversion factors appropriate to each category of fuel. The results are then aggregated according to the categories used in the tables. Gross calorific values represent the total energy content of the fuel, including the energy needed to evaporate the water present in the fuel (see also paragraph 1.55).

1.31 Estimated gross and net calorific values for 2016 are given in Table A.1 in Annex A. Calorific values are reviewed each year in collaboration with the fuel industries, and figures for earlier years can be found in Table A.2 and A.3. To construct energy balances on an energy supplied basis calorific values are required for production, trade, and stocks, as follows:

Coal The weighted average gross calorific value of all indigenous coal consumed is used to derive the thermal content of coal production and undistributed stocks. Thermal contents of imports and exports allow for the quality of coal. Thermal contents of changes in coal stocks at secondary fuel producers are the average calorific values of indigenous coal consumed.

Petroleum Work carried out in 1997 to revise calorific values for petroleum products did not find any recent work on the subject. In the absence of such work, the gross calorific values, included in Annex A and used in the construction of these energy balances from 1990 onwards, have been calculated using a formula derived by the US Bureau of Standards. This formula estimates the gross calorific value of products according to their density as follows:

$GJ = 51.83 - 8.78 \times d^2$, where d is the density of the product in terms of kilograms per litre.

For crude petroleum and refinery losses, the weighted average calorific value for all petroleum products from UK refineries is used. A notional figure of 42.9 GJ per tonne is used for non-energy petroleum products (industrial and white spirits, lubricants, bitumen, petroleum coke, waxes and miscellaneous products).

Gases Although the original unit for gases is the cubic metre, figures for gases are generally presented in the fuel sections of this Digest in gigawatt hours (GWh), having been converted from cubic metres using gross calorific values provided by the industries concerned. Conversion factors between units of energy are given on the flap inside the back cover and in Annex A.

Electricity and heat Unlike other fuels, the original unit used to measure electricity and heat is a measure of energy. The figures for electricity and heat can therefore be converted directly to toe using the conversion factors on the flap inside the back cover and in Annex A.

Primary electricity Hydro electricity and net imports of electricity are presented in terms of the energy content of the electricity produced (the energy supplied basis). This is consistent with international practice. Primary inputs for nuclear electricity assume the thermal efficiencies at nuclear stations given in Chapter 5, Table 5.10 (40.0 per cent in 2016). (See Chapter 5, paragraphs 5.71 and 5.79).

Non-energy uses of fuel

1.32 Energy use of fuel mainly comprises use for lighting, heating, motive power and power for appliances. Non-energy use includes use as chemical feedstocks, solvents, lubricants and road making material. It should be noted that the amounts of non-energy use of natural gas included in the Digest are approximate. Further discussion of non-energy uses of lubricating oils and petroleum coke appears in Chapter 3, paragraph 3.20.

Autogeneration of electricity

1.33 Autogeneration is defined as the generation of electricity by companies whose main business is not electricity generation, the electricity being produced mainly for that company's own use. Estimated amounts of fuel used for thermal generation of electricity by such companies, the output of electricity and the thermal losses incurred in generation are included within the Transformation section in the energy balances shown in Tables 1.1 to 1.3. Electricity used in the power generation process by autogenerators is shown within the Energy Industry Use section. Electricity consumed by industry and commerce from its own generation is included as part of final consumption. This treatment is in line with the practice in international energy statistics.

1.34 Figures on total amount of fuel used and electricity generated by autogenerators, and the amount of electricity for own consumption is shown in Tables 5.1 to 5.6. Table 5.4 summarises the figures by broad industrial groups. Much of the power generated is from combined heat and power (CHP) plants and data from Chapter 7 are included within Table 5.4. Differences will occur where CHP plants are classified to major power producers, and this mainly affects the chemicals sector. The method of allocating fuel used in CHP plants between electricity production and heat production is described in Chapter 7 paragraphs 7.36 to 7.41. This method can give rise to high implied conversion efficiencies in some sectors, most notably in the iron and steel sector.

Final consumption, deliveries, stock changes

1.35 Figures for final consumption relate to deliveries, if fuels can be stored by users and data on actual consumption are not available. Final consumption of petroleum and solid fuels is on a deliveries basis throughout, except for the use of solid fuels by the iron and steel industry. Figures for domestic use of coal are based on deliveries to merchants. Figures for stock changes in Tables 1.1 to 1.3 cover stocks held by primary and secondary fuel producers, major distributors of petroleum products, and stocks of coke and breeze held by the iron and steel industry; for coal they also include an estimate of volumes in transit. Figures for stock changes in natural gas represent the net amount put into storage by gas companies operating pipelines.

1.36 Figures for final consumption of electricity include sales by the public distribution system and consumption of electricity produced by generators other than the major electricity producing companies. Thus electricity consumption includes that produced by industry and figures for deliveries of other fuels to industry exclude amounts used to generate electricity (except for years prior to 1987, shown in tables giving long term trends).

Heat sold

1.37 Heat sold is defined as heat that is produced and sold under the provision of a contract. The heat sold figures have been derived from two sources covering CHP plants and community heating schemes without CHP plants. Data for heat sold were supplied by CHP plants to the Combined Heat and Power Quality Assurance Programme and were processed by Ricardo-AEA. Data for heat consumption from community heating schemes were derived from the Building Research Establishment's (BRE) 'Nationwide Survey of Community Heating' that was carried out in 1997, a database of community heating schemes in social housing in 2000, and Community Heating Sales Surveys undertaken between 2003 and 2005. The estimates from these sources have been used to derive heat sold figures since 1999. When information about where the heat was generated was not available from the BRE sources, it was assumed that domestic sector heat consumption was provided by the commercial sector, public sector heat consumption was provided by the public administration and industrial sectors (using proportions derived from CHP statistics) and that industrial sector heat consumption was provided by the industrial sector. The introduction of heat sold into the energy balances has not affected the individual fuel totals, since the energy used to generate the heat has been deducted from the final consumption section of the energy balance and transferred to the transformation section. The figures that are included in the balances should be treated as indicative of the amount of heat sold. Annex J of the Digest, at: www.gov.uk/government/collections/digest-of-uk-energy-statistics-dukes shows the quantity of fuel by consuming sector used to produce heat that is subsequently sold.

II Energy balances (Tables 1.1, 1.2 and 1.3)

1.38 Tables 1.1, 1.2 and 1.3 show the energy flows as the primary fuels are processed (or used) and as the consequent secondary fuels are used. The net inputs to transformation are shown in the transformation rows and hence outputs from transformation processes into which primary fuels are input (such as electricity generation, heat generation or petroleum refining) appear as positive figures under the secondary product's heading in the tables. Similarly the net inputs are shown as negative figures under the primary fuel headings.

III Value balances (Tables 1.4, 1.5 and 1.6)

Valuation of energy purchases

1.39 In common with the rest of the chapter, these tables covering energy expenditure follow a balance format. While a user may derive data on a similar basis as that previously published, the balance tables allow for more varied use and interpretation of traded energy value data. That said, the tables continue to only show values for energy that has to be purchased and therefore do not include estimated values of a sector's internal consumption, such as coal used in the process of coal extraction.

The value balance

1.40 The tables balances around **market value of inland consumption**, with the lower half of the tables showing the total value of consumption by end users, sub divided into energy sector users and final users both for energy and non-energy use. The top half of the tables show the supply components that go to make up the final market value of inland consumption, namely upstream cost of production, imports, taxes and the margins and costs of delivering and packaging the fuel for the final consumer. The total final consumers' value of energy consumption is represented by the lines 'total non-energy sector use' and iron and steel sectors' purchases of coal for use in solid fuel manufacture. All figures are estimates and have been rounded to the nearest £5 million.

1.41 In keeping with the energy balances, the value balances, since 2000, have included data on heat generation and heat sold. Additionally, an estimate of the amount of Climate Change Levy (CCL) and the Carbon Price Support (CPS) paid is included in Tables 1.4, 1.5 and 1.6. The CCL was introduced in April 2001 and is payable by non-domestic final consumers of gas, electricity, coal, coke and LPG, with the Carbon Price Support (CPS), a tax on fossil fuel used to generate electricity, introduced in April 2013.

1.42 The value balance demonstrates how the value chain works in the production and consumption of energy. For example, in 2016, £12,790 million of crude oil was indigenously produced, of which £8,375 million was exported; and £11,675 million of crude oil was imported. Allowing for stock changes, this provides a total value of UK inland crude oil supply of £16,060 million. This fuel was then completely consumed within the petroleum industry in the process of producing £21,890 million of petroleum products. Again, some external trade and stock changes took place before arriving at a basic value of petroleum products of £24,340 million. In supplying the fuel to final consumers, distribution costs were incurred and some profit was made amounting to £2,045 million, whilst duty and tax meant a further £33,585 million was added to the basic price to arrive at the final market value of £60,075 million. This was the value of petroleum products purchased, of which industry purchased £1,545 million, domestic consumers for heating purposes purchased £910 million, with the vast majority £52,925 million, purchased by the transport sector.

Fuel definitions in value balances

1.43 **Crude oil** includes Natural Gas Liquids (NGLs) and refinery feedstocks. **Natural gas** does not include colliery methane. **Electricity** only includes electricity delivered via the public distribution system and therefore does not value electricity produced and consumed by autogenerators; however the fuels used by autogenerators are included under Transformation. **Manufactured solid fuels** include coke, breeze and other solid manufactured fuels, mainly products from patent fuel and carbonisation plants. **Other fuels** include all other fuels not separately listed, where they can be clearly considered as traded and some reasonable valuation can be made. Fuels mainly contributing to this year's values are wood, coke oven and colliery methane gases sold on to other industrial users and some use of waste products such as poultry litter.

Energy end use

1.44 Values represent the cost to the final user including transportation of the fuel. They are derived, except where actual values are available, from the traded element of the volumes presented in aggregate energy balance and end user prices collected from information supplied by users or energy suppliers. The **energy sector** consists of those industries engaged in the production and sale of energy products, but values are not given for consumption of self-generated fuels e.g. coke oven gas used by coke producers. Many of the processes in the **iron and steel** industry are considered to be part of the energy sector in the energy balances, but for the purposes of this economic balance their genuine purchases are treated as those of final consumers, except for purchases of coal directly used in coke manufacture, which is shown separately as part of manufacture of solid fuel. Coal used directly in or to heat blast furnaces is shown as iron and steel final use. **Transformation** includes those fuels used directly in producing other fuels e.g. crude oil in petroleum products. **Electricity generators** keep and use significant stocks of coal, and the stocks used in consumption each year are shown separately. The value and margins for these being assumed to be the same as other coal purchased in the year. **Road transport** includes all motor spirit and DERV (diesel-engined road vehicle) use. **Commercial and other users** include public administration and miscellaneous uses not classified to the industrial sector.

Supply

1.45 The supply side money chain is derived using various methods. **Indigenous production** represents the estimated basic value of in-year sales by the upstream producers. This value is gross of any taxes or cost they must meet. The valuation problems in attributing network losses in gas and electricity between upstream and downstream within this value chain means any costs borne are included in the production value. **Imports and exports** are valued in accordance with data published by HM Revenue and Customs, contained in Annex G (which can be found on the Internet at: www.gov.uk/government/collections/digest-of-uk-energy-statistics-dukes). However, crude oil is treated differently, where the value is formed from price data taken from a census survey of refiners and volume data taken from Table 3.1. These values are considered to reflect the complete money chain more accurately than Tables G.1 to G.6. **Stock changes** are those for undistributed stocks except for coal where coke oven and generators' stocks are included. A stock increase takes money out of the money chain and is therefore represented as a negative. **Distribution costs** are arrived at by removing an estimate of producers' value along with any taxes from the end user values shown. For most fuels, the estimate of producer value is derived from the consumption used for end use and the producer price taken from survey of producers. No sector breakdown is given for gas and

electricity margins because it is not possible to accurately measure delivery costs for each sector. **Taxes** include VAT where not refundable and duties paid on downstream sales. Excluded are the gas and fossil fuel levies, petroleum revenue tax and production royalties and licence fees. The proceeds from the fossil fuel levy are redistributed across the electricity industry, whilst the rest are treated as part of the production costs.

Sales of electricity and gas by sector (Table 1.7)

1.46 This table provides data on the total value of gas and electricity sold to final consumers. The data are collected from the energy supply companies. The data are useful in indicating relative total expenditure between sectors, but the quality of data provided in terms of industrial classification has been worsening in recent years. Net selling values provide an indication of typical prices paid in broad sectors.

IV Measurement of energy consumption

Primary fuel input basis

1.47 Energy consumption is usually measured in one of three different ways. The first, known as the primary fuel input basis, assesses the total input of primary fuels and their equivalents. This measure includes energy used or lost in the conversion of primary fuels to secondary fuels (for example in power stations and oil refineries), energy lost in the distribution of fuels (for example in transmission lines) and energy conversion losses by final users. Primary demands as in Table 1.1, 1.2 and 1.3 are on this basis.

Final consumption - energy supplied basis

1.48 The second method, known as the energy supplied basis, measures the energy content of the fuels, both primary and secondary, supplied to final users. Thus it is net of fuel industry own use and conversion, transmission and distribution losses, but it includes conversion losses by final users. Table 1D presents shares of final consumption on this basis. The final consumption figures are presented on this basis throughout Chapter 1.

1.49 Although this is the usual and most direct way to measure final energy consumption, it is also possible to present final consumption on a primary fuel input basis. This can be done by allocating the conversion losses, distribution losses and energy industry use to final users. This approach can be used to compare the total primary fuel use which each sector of the economy accounts for. Table 1E presents shares of final consumption on this basis.

Final consumption - useful energy basis

1.50 Thirdly, final consumption may be expressed in the form of useful energy available after deduction of the losses incurred when final users convert energy supplied into space or process heat, motive power or light. Such losses depend on the type and quality of fuel and the equipment used and on the purpose, conditions, duration and intensity of use. Statistics on useful energy are not sufficiently reliable to be given in this Digest; there is a lack of data on utilisation efficiencies and on the purposes for which fuels are used.

Shares of each fuel in energy supply and demand

1.51 The relative importance of the energy consumption of each sector of the economy depends on the method used to measure consumption. Shares of final consumption on an energy supplied basis (that is in terms of the primary and secondary fuels directly consumed) in 2016 are presented in Table 1D. For comparison, Table 1E presents shares of final consumption on a primary fuel input basis.

Table 1D: Primary and secondary fuels consumed by final users in 2016 – energy supplied basis

	Percentage of each fuel					Percentage of each sector						
	Industry	Transport	Domestic	Others	Total	Industry	Solid fuels	Petr-oleum	Gas	Electricity	Bio-energy	Total
Solid fuels	69	1	29	1	100	Industry	6	18	36	34	6	100
Petroleum	6	86	4	3	100	Transport	0	97	-	1	2	100
Gas	19	-	62	19	100	Domestic	1	6	65	23	5	100
Electricity	30	2	36	33	100	Others	0	10	42	44	3	100
Bioenergy	26	20	41	12	100							
All fuels	17	40	30	14	100	All users	1	45	31	19	4	100

Table 1E: Total primary fuel consumption by final users in 2016 - primary input basis

	Percentage of each fuel					Percentage of each sector						
	Industry	Transport	Domestic	Others	Total	Industry	Coal	Petr-oleum	Gas	Primary electricity	Bio-energy	Total
Coal	38	1	34	27	100	Industry	14	12	48	17	11	100
Petroleum	7	85	4	4	100	Transport	0	97	1	1	2	100
Gas	24	1	51	25	100	Domestic	8	5	65	13	9	100
Primary electricity	30	2	36	33	100	Others	10	7	53	20	10	100
Bioenergy	29	8	37	25	100							
All fuels	20	31	30	18	100	All users	7	35	39	11	7	100

1.52 In 2016, every 1 toe of secondary electricity consumed by final users required, on average, 0.3 toe of coal, 1.1 toe of natural gas, 0.6 toe of primary electricity (nuclear) and 0.4 toe of oil and bioenergy combined. The extent of this primary consumption is hidden in Table 1D, which presents final consumption only in terms of the fuels directly consumed. When all such primary consumption is allocated to final users, as in Table 1E, the relative importance of fuels and sectors changes; the transport sector, which uses very little electricity, declines in importance, whilst the true cost of final consumption in terms of coal use can now be seen.

1.53 Another view comes from shares of users' expenditure on each fuel (Table 1F based on Table 1.4). In this case the importance of fuels which require most handling by the user (solids and liquid fuels) is slightly understated, and the importance of uses taxed at higher rates (transport) is overstated in the "All users" line.

Table 1F: Value of fuels purchased by final users in 2016

	Percentage of each sector						
	Solid fuels	Petroleum	Gas	Secondary electricity	Heat	Biofuels	Total
Industry	5	15	15	63	1	1	100
Transport	-	96	-	1	-	3	100
Domestic	1	3	43	50	-	2	100
Others	-	7	16	76	1	-	100
All users	1	51	16	30	0	2	100

Systems of measurement - international statistics

1.54 The systems of energy measurement used in various international statistics differ slightly from the methods of the Digest. The key difference is the conversion factors used in BEIS's headline data that change the units for fuels for a volume or weight measure to an energy basis, as discussed in the paragraph below. However, in line with the International Recommendations for Energy Statistics (IRES) the UK does make data available on both bases. Other differences are that both the

International Energy Agency (IEA) as well as the United Nations' IRES have International Aviation Bunkers as well as International Marine Bunkers shown together and not included in the country's energy supply. The UK in its energy balances continues to show fuel used for international marine bunkers in this manner but has maintained its practice of showing fuel for international aviation as part of final consumption - this practice is also followed by Eurostat.

Net calorific values

1.55 Calorific values (thermal contents) used internationally are net rather than gross. The difference between the net and gross thermal content is the amount of energy necessary to evaporate the water present in the fuel or formed during the combustion process. The differences between gross and net values are generally taken to be 5 per cent for liquid and solid fuels (except for coke and coke breeze where there is no difference), 10 per cent for gases (except for blast furnace gas, 1 per cent), 15 per cent for straw, and 16 per cent for poultry litter. The calorific value of wood is highly dependent on its moisture content. In Annex A, the gross calorific value is given as 16.3 GJ at 20 per cent moisture content and 20.3 GJ for dry wood. Both gross and net calorific values are shown in Annex A. Energy balances on a net calorific basis are published in an annex to DUKES available via the internet.

V Definitions of fuels

1.56 The following paragraphs explain what is covered under the terms "primary" and "secondary" fuels.

Primary fuels

Coal - Production comprises all grades of coal, including slurry.

Primary oils - This includes crude oil, natural gas liquids (NGLs) and feedstock.

Natural gas liquids - Natural gas liquids (NGLs) consist of condensates (C₅ or heavier) and petroleum gases other than methane C₁, that is ethane C₂, propane C₃ and butane C₄, obtained from the onshore processing of associated and non-associated gas. These are treated as primary fuels when looking at primary supply but in the consumption data presented in this chapter these fuels are treated as secondary fuels, being transferred from the primary oils column in Tables 1.1, 1.2 and 1.3.

Natural gas - Production relates to associated or non-associated methane C₁ from land and the United Kingdom sector of the Continental Shelf. It includes that used for drilling production and pumping operations, but excludes gas flared or re-injected. It also includes colliery methane piped to the surface and consumed by collieries or others.

Nuclear electricity - Electricity generated by nuclear power stations belonging to the major power producers. See Chapter 5, paragraphs 5.62 to 5.69.

Natural flow hydro-electricity - Electricity generated by natural flow hydroelectric power stations, whether they belong to major power producers or other generators. Pumped storage stations are not included (see under secondary electricity below).

Renewable energy sources - In this chapter figures are presented for renewables and waste in total. Further details, including a detailed breakdown of the commodities and technologies covered are in Chapter 6.

Secondary fuels

Manufactured fuel - This heading includes manufactured solid fuels such as coke and breeze, other manufactured solid fuels, liquids such as benzole and tars and gases such as coke oven gas and blast furnace gas. Further details are given in Chapter 2, Tables 2.5 and 2.6.

Coke and breeze - Coke, oven coke and hard coke breeze. Further details are given in Chapter 2, Table 2.5.

Other manufactured solid fuels - Manufactured solid fuels produced at low temperature carbonisation plants and other manufactured fuel and briquetting plants. Further details are given in Chapter 2, Table 2.5.

Coke oven gas - Gas produced at coke ovens, excluding low temperature carbonisation plants. Gas bled or burnt to waste is included in production and losses. Further details are given in Chapter 2, Table 2.6.

Blast furnace gas - Blast furnace gas is mainly produced and consumed within the iron and steel industry. Further details are given in Chapter 2, Table 2.6.

Petroleum products - Petroleum products produced mainly at refineries, together with inland deliveries of natural gas liquids.

Secondary electricity - Secondary electricity is that generated by the combustion of another fuel, usually coal, natural gas, biofuels or oil. The figure for outputs from transformation in the electricity column of Tables 1.1, 1.2 and 1.3 is the total of primary and secondary electricity, and the subsequent analysis of consumption is based on this total.

Heat sold – Heat sold is heat that is produced and sold under the provision of a contract.

VI Classification of consumers

1.57 The Digest has been prepared, as far as is practicable, on the basis of the *Standard Industrial Classification (SIC)2007* (www.ons.gov.uk/ons/guide-method/classifications/current-standard-classifications/standard-industrial-classification/index.html). Table 1G shows the categories of consumers together with their codes in SIC 2007. SIC(2007) replaced SIC(2003) on 1 January 2008, with energy statistics being compiled on the new basis from 2010. SIC(2003) was introduced at the start of 2003; the previous classification SIC(1992) was used from 1995. Between 1986 and 1994 data in the Digest were prepared on the basis of SIC(1980). The changes in classification between SIC(1992), SIC(2003) and SIC(2007) are mainly in the very detailed classifications at the four or five digit level. As such the classifications used for energy statistics are unaffected by these changes.

1.58 The coverage varies between tables (e.g. in some instances the ‘other’ category is split into major constituents, whereas elsewhere it may include transport). This is because the coverage is dictated by what data suppliers can provide. The table also shows the disaggregation available within industry. This disaggregation forms the basis of virtually all the tables that show a disaggregated industrial breakdown.

1.59 There is also an ‘unclassified’ category in the industry sector (see Table 1G). In cases where the data supplier has been unable to allocate an amount between categories, but the Department for Business, Energy and Industrial Strategy has additional information, from other data sources, with which to allocate between categories, then this has been done. Where such additional information is not available the data are included in the ‘unclassified’ category, enabling the reader to decide whether to accept a residual, pro-rate, or otherwise adjust the figures. The ‘miscellaneous’ category also contains some unallocated figures for the services sector.

Table 1G: SIC 2007 classifications

Fuel producers	05-07, 09, 19, 24.46, 35
Final consumers:	
Industrial	
Unclassified	See paragraph 1.58
Iron and steel	24, (excluding 24.4, 24.53, 24.54)
Non-ferrous metals	24.4, (excluding 24.46), 24.53, 24.54
Mineral products	08, 23
Chemicals	20-21
Mechanical engineering and metal products	25, 28
Electrical and instrument engineering	26-27
Vehicles	29-30
Food, beverages & tobacco	10-12
Textiles, clothing, leather, & footwear	13-15
Paper, printing & publishing	17-18
Other industries	16, 22, 31-33, 36-39
Construction	41-43
Transport	49-51 (part*)
Other final users	
Domestic	Not covered by SIC 2007
Public administration	84-88
Commercial	45-47, 49-51 (part*), 52-53, 55-56, 58-66, 68-75, 77-82
Agriculture	01-03
Miscellaneous	90-99

* Note – transport sector includes only energy used for motion/traction purposes. Other energy used by transport companies is classified to the commercial sector.

1.60 In Tables 7.8 and 7.9 of Chapter 7 the following abbreviated grouping of industries (Table 1H), based on SIC 2007, is used in order to prevent disclosure of information about individual companies.

Table 1H: Abbreviated grouping of Industry

Iron and steel and non-ferrous metal	24
Chemicals	20-21
Oil refineries	19.2
Paper, printing and publishing	17-18
Food, beverages and tobacco	10-12
Metal products, machinery and equipment	25, 26, 27, 28, 29, 30
Mineral products, extraction, mining and agglomeration of solid fuels	05, 06, 08, 23
Sewage Treatment	(parts of 36 and 37)
Electricity supply	35.1
Other industrial branches	07, 13, 14, 15, 16, 19.1, 24.46, 22, 31, 32, 33, 35.2, 36 & 37 (remainder) 41, 42, 43
Transport, commerce, and administration	1, 2, 3, 45 to 99 (except 93)
Other	35.3, 93

1.61 In Table 5.4 the list above is further condensed and includes only manufacturing industry and construction as follows in Table 1I.

Table 1I: Abbreviated grouping of Industry for Table 5.4

Iron and steel and non-ferrous metals	24
Chemicals	20-21
Paper, printing and publishing	17-18
Food, beverages and tobacco	10-12
Metal products, machinery and equipment	25-30
Other (including construction)	08, 13-16, 19, 22-23, 31-33, 36-39, 41-43

VII Monthly and quarterly data

1.62 Monthly and quarterly data on energy production and consumption (including on a seasonally adjusted and temperature corrected basis) split by fuel type are provided on the BEIS section of the GOV.UK website at: www.gov.uk/government/statistics/total-energy-section-1-energy-trends. Quarterly figures are also published in BEIS's quarterly statistical bulletins *Energy Trends* and *Energy Prices*. See Annex C for more information about these bulletins.

VIII Statistical differences

1.63 Tables 1.1 to 1.3 each contain a statistical difference term covering the difference between recorded supply and recorded demand. These statistical differences arise for a number of reasons. The data within each table are taken from varied sources, as described above and in later chapters; for example producers, intermediate consumers (such as electricity generators), final consumers and HM Revenue and Customs. Also, some of the figures are estimated either because data in the required detail are not readily available within the industry or because the methods of collecting the data do not cover the smallest members of the industry. Typically, the supply of fuels is easier to measure than demand, and thus greater reliance can be made of these numbers.

IX Revisions

1.64 Table 1J below shows a summary of the revisions made to the major energy aggregates between this year's edition of DUKES and the immediately preceding version. This year, the revisions window for DUKES has been opened back to 2008. Next year revisions for earlier years are likely to be restricted to two years only, though this is subject to change. Key data changes this year include moving some indigenous gas production to imports based on revised data from terminal operators; and a reassessment of gas consumption with some use reassigned to industry from the services sector.

Table 1J: Revisions since DUKES 2016

	Thousand tonnes of oil equivalent								Percentage revisions to 2015 data
	2008	2009	2010	2011	2012	2013	2014	2015	
Production	-156	-1,256	-1,674	-1,055	-1,313	-1,172	-1,092	-874	-0.7%
Primary supply	-64	-77	155	217	161	-141	183	385	0.2%
Primary demand	-358	143	9	304	-292	-3	427	796	0.4%
Transformation	-1	-1	-48	-49	50	-3	10	-117	0.3%
Energy industry use	3	-1	142	93	-143	-57	17	-1	0.0%
Final consumption	-294	202	-124	217	-100	51	531	706	0.5%
Industry	1,167	1,298	913	910	997	1,029	584	767	3.3%
Transport	0	0	-16	-4	19	0	20	-61	-0.1%
Other	-1,461	-1,096	-1,022	-689	-1,116	-978	-134	364	0.6%
Non energy use	0	0	0	0	0	0	61	-364	-4.4%

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1.1 Aggregate energy balance 2016

Gross calorific values

Thousand tonnes of oil equivalent

	Coal	Manufactured fuel(1)	Primary oils	Petroleum products	Natural gas(2)	Bioenergy & waste(3)	Primary electricity	Electricity	Heat sold	Total
Supply										
Production	2,633	-	51,952	-	39,789	10,774	19,987	-	-	125,135
Imports	5,747	890	53,380	38,254	45,979	3,743	-	1,694	-	149,687
Exports	-333	-16	-38,180	-26,663	-10,048	-338	-	-185	-	-75,763
Marine bunkers	-	-	-	-2,840	-	-	-	-	-	-2,840
Stock change (4)	+3,658	-89	-135	+77	+1,397	-	-	-	-	+4,907
Primary supply	11,705	785	67,016	8,828	77,117	14,180	19,987	1,509	-	201,125
Statistical difference(5)	-58	+1	-86	+32	+127	-	-	+17	-	+32
Primary demand	11,763	784	67,102	8,796	76,990	14,180	19,987	1,492	-	201,093
Transfers	-	+27	-1,640	+1,629	+135	-165	-4,573	+4,573	-	-14
Transformation	-10,243	231	-65,462	64,560	-27,876	-8,964	-15,414	24,356	1,409	-37,404
Electricity generation	-7,533	-540	-	-559	-25,630	-8,894	-15,414	24,356	-	-34,214
Major power producers	-7,521	-	-	-194	-23,350	-4,233	-15,414	21,778	-	-28,934
Autogenerators	-12	-540	-	-365	-2,280	-4,661	-	2,577	-	-5,280
Heat generation	-132	-51	-	-62	-2,246	-70	-	-	1,409	-1,152
Petroleum refineries	-	-	-65,931	65,776	-	-	-	-	-	-155
Coke manufacture	-1,384	1,303	-	-	-	-	-	-	-	-81
Blast furnaces	-1,037	-656	-	-	-	-	-	-	-	-1,692
Patent fuel manufacture	-157	175	-	-81	-	-	-	-	-	-64
Other(7)	-	-	469	-515	-	-	-	-	-	-46
Energy industry use	-	417	-	4,188	4,968	-	-	2,035	273	11,881
Electricity generation	-	-	-	-	-	-	-	1,313	-	1,313
Oil and gas extraction	-	-	-	715	4,306	-	-	51	-	5,072
Petroleum refineries	-	-	-	3,473	93	-	-	379	273	4,218
Coal extraction	-	-	-	-	5	-	-	40	-	46
Coke manufacture	-	145	-	-	-	-	-	1	-	146
Blast furnaces	-	272	-	-	25	-	-	18	-	315
Patent fuel manufacture	-	-	-	-	-	-	-	-	-	-
Pumped storage	-	-	-	-	-	-	-	91	-	91
Other	-	-	-	-	539	-	-	142	-	680
Losses	-	96	-	-	464	-	-	2,263	-	2,823
Final consumption	1,520	529	-	70,797	43,818	5,050	-	26,122	1,136	148,971
Industry	1,072	316	-	4,074	8,427	1,337	-	7,894	610	23,730
Unclassified	-	-	-	3,114	1	134	-	-	-	3,249
Iron and steel	25	316	-	4	357	-	-	245	-	946
Non-ferrous metals	11	-	-	0	162	-	-	370	-	542
Mineral products	542	-	-	192	1,007	185	-	517	-	2,443
Chemicals	42	-	-	117	1,686	26	-	1,328	202	3,401
Mechanical engineering etc	8	-	-	-	523	2	-	536	-	1,068
Electrical engineering etc	3	-	-	1	293	-	-	502	-	799
Vehicles	37	-	-	200	783	-	-	402	-	1,423
Food, beverages etc	31	-	-	140	1,704	37	-	923	0	2,835
Textiles, leather etc	48	-	-	44	356	-	-	227	-	675
Paper, printing etc	75	-	-	32	716	599	-	911	-	2,333
Other industries	247	-	-	37	562	355	-	1,818	408	3,426
Construction	4	-	-	193	278	-	-	115	-	590
Transport (6)	11	-	-	54,345	-	1,010	-	401	-	55,767
Air	-	-	-	12,635	-	-	-	-	-	12,635
Rail	11	-	-	627	-	-	-	390	-	1,028
Road	-	-	-	40,429	-	1,010	-	11	-	41,450
National navigation	-	-	-	654	-	-	-	-	-	654
Pipelines	-	-	-	-	-	-	-	-	-	-
Other	437	168	-	4,559	34,952	2,704	-	17,826	526	61,170
Domestic	414	168	-	2,525	26,773	2,079	-	9,284	52	41,295
Public administration	14	-	-	377	3,203	38	-	1,705	471	5,807
Commercial	4	-	-	872	3,995	299	-	6,457	3	11,629
Agriculture	-	-	-	488	81	288	-	380	-	1,237
Miscellaneous	5	-	-	297	900	-	-	-	-	1,201
Non energy use	-	46	-	7,818	439	-	-	-	-	8,303

(1) Includes all manufactured solid fuels, benzole, tars, coke oven gas and blast furnace gas.

(2) Includes colliery methane.

(3) Includes geothermal and solar heat.

(4) Stock fall (+), stock rise (-).

(5) Primary supply minus primary demand.

(6) See paragraphs 5.42 regarding electricity use in transport and 6.66 regarding renewables use in transport.

(7) Back-flows from the petrochemical industry.

1.2 Aggregate energy balance 2015

Gross calorific values

Thousand tonnes of oil equivalent

	Coal	Manufactured fuel(1)	Primary oils	Petroleum products	Natural gas(2)	Bioenergy & waste(3)	Primary electricity	Electricity	Heat sold	Total
Supply										
Production	5,384r	-	49,544	-	38,847r	9,761r	20,137r	-	-	123,673r
Imports	14,885r	806	55,413r	35,238r	43,127r	3,712r	-	1,953	-	155,134r
Exports	-290	-79	-36,867r	-25,173r	-13,716r	-366r	-	-153	-	-76,644r
Marine bunkers	-	-	-	-2,684r	-	-	-	-	-	-2,684r
Stock change (4)	4,463r	46	-105r	-800r	302r	-	-	-	-	3,907r
Primary supply	24,443r	772	67,985r	6,581r	68,560r	13,108r	20,137r	1,800	-	203,386r
Statistical difference(5)	58r	4	-74r	-43r	67r	-	-	103r	-	113r
Primary demand	24,386r	769	68,059r	6,625r	68,493r	13,108r	20,137r	1,698r	-	203,273r
Transfers	-	34	-1,477r	1,511r	48r	-84r	-4,657r	4,657r	-	32r
Transformation	-22,588r	863	-66,582r	65,645r	-20,466r	-8,382r	-15,479	24,249r	1,412r	-41,329r
Electricity generation	-18,328r	-783	-	-608r	-18,283r	-8,311r	-15,479	24,249r	-	-37,544r
Major power producers	-18,316r	-	-	-213r	-15,989	-4,060	-15,479	21,813r	-	-32,245r
Autogenerators	-12r	-783	-	-394r	-2,294r	-4,251r	-	2,436r	-	-5,298r
Heat generation	-132r	-51	-	-62r	-2,183r	-71r	-	-	1,412r	-1,088r
Petroleum refineries	-	-	-67,032r	66,880r	-	-	-	-	-	-152r
Coke manufacture	-2,792r	2,636	-	-	-	-	-	-	-	-156r
Blast furnaces	-1,174r	-1,103	-	-	-	-	-	-	-	-2,277r
Patent fuel manufacture	-161r	164	-	-71	-	-	-	-	-	-68r
Other(7)	-	-	450	-494	-	-	-	-	-	-44
Energy industry use	-	716	-	4,293r	5,043r	-	-	2,163r	270	12,485r
Electricity generation	-	-	-	-	-	-	-	1,432r	-	1,432r
Oil and gas extraction	-	-	-	756	4,387r	-	-	52r	-	5,196r
Petroleum refineries	-	-	-	3,536r	103r	-	-	390r	270	4,300r
Coal extraction	-	-	-	-	7r	-	-	43r	-	50r
Coke manufacture	-	329	-	-	-	-	-	4	-	333
Blast furnaces	-	387	-	-	28	-	-	30	-	445
Patent fuel manufacture	-	-	-	-	-	-	-	-	-	-
Pumped storage	-	-	-	-	-	-	-	84	-	84
Other	-	-	-	-	517r	-	-	129r	-	646r
Losses	-	228	-	-	556r	-	-	2,349r	-	3,133r
Final consumption	1,798r	722	-	69,488r	42,476r	4,641r	-	26,092r	1,142r	146,359r
Industry	1,360r	457	-	4,298r	8,531r	1,121r	-	7,989r	607r	24,362r
Unclassified	-	12	-	3,351r	1	99r	-	-	-	3,462r
Iron and steel	31r	446	-	6r	462	-	-	317	-	1,262r
Non-ferrous metals	13r	-	-	0r	158r	-	-	380r	-	551r
Mineral products	698r	-	-	185r	959r	202r	-	524r	-	2,569r
Chemicals	47r	-	-	119r	1,679r	16r	-	1,342r	182r	3,385r
Mechanical engineering etc	8r	-	-	-	521r	2r	-	536r	-	1,066r
Electrical engineering etc	4r	-	-	1r	266r	-	-	515r	-	786r
Vehicles	42r	-	-	197r	748r	-	-	419r	-	1,406r
Food, beverages etc	38r	-	-	136r	1,686r	27r	-	926r	-	2,814r
Textiles, leather etc	46r	-	-	46r	384r	-	-	231r	-	708r
Paper, printing etc	77r	-	-	32r	818r	411r	-	911r	-	2,250r
Other industries	351r	-	-	35r	580r	365r	-	1,768r	425r	3,524r
Construction	5	-	-	189r	269r	-	-	117r	-	579r
Transport (6)	9r	-	-	53,354r	-	998r	-	388r	-	54,749r
Air	-	-	-	12,529r	-	-	-	-	-	12,529r
Rail	9r	-	-	633r	-	-	-	380r	-	1,023r
Road	-	-	-	39,510	-	998r	-	8	-	40,516r
National navigation	-	-	-	682r	-	-	-	-	-	682r
Pipelines	-	-	-	-	-	-	-	-	-	-
Other	429r	167	-	4,528r	33,492r	2,523r	-	17,715r	535r	59,390r
Domestic	418r	167	-	2,522r	25,587r	2,033r	-	9,266r	52	40,046r
Public administration	3r	-	-	369r	3,142r	38r	-	1,666r	475r	5,693r
Commercial	4	-	-	869r	3,792r	246r	-	6,429r	8r	11,347r
Agriculture	-	-	-	467r	84r	205r	-	354r	-	1,111r
Miscellaneous	5r	-	-	301r	887r	-	-	-	-	1,193r
Non energy use	-	98	-	7,308r	453	-	-	-	-	7,859r

(1) Includes all manufactured solid fuels, benzole, tars, coke oven gas and blast furnace gas.

(2) Includes colliery methane.

(3) Includes geothermal and solar heat.

(4) Stock fall (+), stock rise (-).

(5) Primary supply minus primary demand.

(6) See paragraphs 5.42 regarding electricity use in transport and 6.66 regarding renewables use in transport.

(7) Back-flows from the petrochemical industry.

1.3 Aggregate energy balance 2014

Gross calorific values

Thousand tonnes of oil equivalent

	Coal	Manufactured fuel(1)	Primary oils	Petroleum products	Natural gas(2)	Bioenergy & waste(3)	Primary electricity	Electricity	Heat sold	Total
Supply										
Production	7,289r	-	43,705	-	35,761r	8,324r	17,453r	-	-	112,534r
Imports	27,581	669	58,676	32,148r	42,041r	3,203	-	1,999	-	166,316r
Exports	-319	-80	-33,774	-24,848	-10,998r	-361	-	-234	-	-70,614r
Marine bunkers	-	-	-	-3,004r	-	-	-	-	-	-3,004r
Stock change (4)	-3,342r	-151	-648	309	-205r	-	-	-	-	-4,036r
Primary supply	31,208r	439	67,960	4,605r	66,600r	11,166r	17,453r	1,764	-	201,195r
Statistical difference(5)	-103r	-4	-56	-33r	-331r	-	-	-92r	-	-619r
Primary demand	31,311r	442	68,016	4,638r	66,930r	11,166r	17,453r	1,856r	-	201,814r
Transfers	-	9	-1,778	1,877r	-0r	-12r	-3,603r	3,603r	-	96r
Transformation	-29,234r	1,451	-66,238	65,001r	-20,934r	-6,855r	-13,850	25,220r	1,440r	-44,000r
Electricity generation	-23,948r	-914	-	-547r	-18,731r	-6,795r	-13,850	25,220r	-	-39,564r
Major power producers	-23,936r	-	-	-176r	-16,330	-3,156	-13,850	22,918	-	-34,531
Autogenerators	-12r	-914	-	-371r	-2,401r	-3,639r	-	2,302r	-	-5,034r
Heat generation	-169r	-51	-	-64r	-2,204	-60r	-	-	1,440r	-1,108r
Petroleum refineries	-	-	-66,677	66,172	-	-	-	-	-	-505
Coke manufacture	-3,784r	3,450	-	-	-	-	-	-	-	-334r
Blast furnaces	-1,150	-1,229	-	-	-	-	-	-	-	-2,379
Patent fuel manufacture	-183r	195	-	-78	-	-	-	-	-	-66r
Other(7)	-	-	439	-482r	-	-	-	-	-	-44r
Energy industry use	0r	802	-	4,097	4,512r	-	-	2,192r	285	11,889r
Electricity generation	-	-	-	-	-	-	-	1,417r	-	1,417r
Oil and gas extraction	-	-	-	717	3,903	-	-	46	-	4,666
Petroleum refineries	-	-	-	3,380r	103r	-	-	419r	285	4,188r
Coal extraction	0r	-	-	-	9r	-	-	57	-	66r
Coke manufacture	-	381	-	-	-	-	-	7	-	388
Blast furnaces	-	421	-	-	29	-	-	38	-	488
Patent fuel manufacture	-	-	-	-	-	-	-	-	-	-
Pumped storage	-	-	-	-	-	-	-	86	-	86
Other	-	-	-	-	468r	-	-	123r	-	591r
Losses	-	216	-	-	590r	-	-	2,452r	-	3,258r
Final consumption	2,077r	884	-	67,419r	40,894r	4,299r	-	26,035r	1,155r	142,762r
Industry	1,627r	566	-	4,238r	8,653r	594r	-	7,997r	627r	24,302r
Unclassified	-	46	-	3,344r	1	594r	-	-	-	3,985r
Iron and steel	38r	520	-	7r	469	-	-	326	-	1,360r
Non-ferrous metals	15	-	-	0r	178r	-	-	385r	-	578r
Mineral products	825r	-	-	174r	955r	-	-	539r	-	2,493r
Chemicals	68r	-	-	110r	1,682r	-	-	1,331r	219r	3,409r
Mechanical engineering etc	10r	-	-	-	511r	-	-	594r	-	1,115r
Electrical engineering etc	5r	-	-	1r	239r	-	-	491r	-	736r
Vehicles	49	-	-	186r	716r	-	-	415r	-	1,366r
Food, beverages etc	44r	-	-	135r	1,754r	-	-	915r	-	2,848r
Textiles, leather etc	52	-	-	44r	394r	-	-	234r	-	723r
Paper, printing etc	96r	-	-	31r	898r	-	-	922r	-	1,947r
Other industries	418r	-	-	35r	604r	-	-	1,725r	408r	3,189r
Construction	5r	-	-	173r	254r	-	-	120	-	553r
Transport (6)	9	-	-	52,506r	-	1,243	-	387	-	54,146r
Air	-	-	-	12,419	-	-	-	-	-	12,419
Rail	9	-	-	676	-	-	-	381	-	1,067
Road	-	-	-	38,713	-	1,243	-	6	-	39,962
National navigation	-	-	-	699r	-	-	-	-	-	699r
Pipelines	-	-	-	-	-	-	-	-	-	-
Other	441r	182	-	4,124r	31,774r	2,462r	-	17,651r	528r	57,161r
Domestic	415r	182	-	2,508r	24,393r	1,837r	-	9,293r	52	38,680r
Public administration	17r	-	-	334r	3,007r	119r	-	1,591r	470r	5,538r
Commercial	4	-	-	616r	3,456r	47r	-	6,436r	6r	10,564r
Agriculture	-	-	-	400r	92r	459r	-	331	-	1,282r
Miscellaneous	5r	-	-	266r	826r	-	-	-	-	1,097r
Non energy use	-	136	-	6,550r	467	-	-	-	-	7,153r

(1) Includes all manufactured solid fuels, benzole, tars, coke oven gas and blast furnace gas.

(2) Includes colliery methane.

(3) Includes geothermal and solar heat.

(4) Stock fall (+), stock rise (-).

(5) Primary supply minus primary demand.

(6) See paragraphs 5.42 regarding electricity use in transport and 6.66 regarding renewables use in transport.

(7) Back-flows from the petrochemical industry.

1.4 Value balance of traded energy in 2016⁽¹⁾

	€million								
	Coal	Manufactured fuels	Crude oil	Petroleum products	Natural gas	Electricity	Heat sold	Other fuels	Total
Supply									
Indigenous production	135	95	12,790	21,890	4,850	16,485	325	2,825	59,400
Imports	565	80	11,675	11,335	6,300	780	-	310	31,050
Exports	-50	-5	-8,375	-8,050	-1,350	-105	-	-	-17,930
Marine bunkers	-	-	-	-835	-	-	-	-	-835
Stock change	290	-5	-35	-	205	-	-	-	455
Basic value of inland consumption	945	165	16,060	24,340	10,005	17,165	325	3,135	72,140
Tax and margins									
Distribution costs and margins	235	30	-	2,045	10,715	16,060	-	80	29,160
Electricity generation	15	-	-	5	-	-	-	-	20
Solid fuel manufacture	50	-	-	-	-	-	-	-	50
of which iron & steel sector	40	-	-	-	-	-	-	-	40
Iron & steel final use	30	20	-	-	-	-	-	-	50
Other industry	35	-	-	325	-	-	-	-	355
Air transport	-	-	-	105	-	-	-	-	105
Rail and national navigation	-	-	-	20	-	-	-	-	20
Road transport	-	-	-	965	-	-	-	80	1,045
Domestic	100	10	-	85	-	-	-	-	195
Agriculture	-	-	-	40	-	-	-	-	40
Commercial and other services	5	-	-	115	-	-	-	-	120
Non energy use	-	-	-	390	85	-	-	-	475
VAT and duties	10	5	-	33,585	650	750	-	1,155	36,150
Electricity generation	-	-	-	30	-	-	-	-	30
Iron & steel final use	-	-	-	-	-	-	-	-	-
Other industry	-	-	-	225	-	-	-	-	225
Air transport	-	-	-	5	-	-	-	-	5
Rail and national navigation	-	-	-	155	-	-	-	-	155
Road transport	-	-	-	32,925	-	-	-	1,115	34,040
Domestic	10	5	-	60	650	750	-	35	1,510
Agriculture	-	-	-	45	-	-	-	-	45
Commercial and other services	-	-	-	135	-	-	-	-	135
Climate Change Levy/Carbon Price Support	180	-	-	105	1,030	585	-	-	1,895
Total tax and margins	425	35	-	35,735	12,390	17,390	-	1,235	67,205
Market value of inland consumption	1,365	200	16,060	60,075	22,400	34,550	325	4,370	139,345
Energy end use									
Total energy sector	875	-	16,060	985	4,865	1,170	65	1,855	25,870
Transformation	875	-	16,060	150	4,130	840	-	1,855	23,910
Electricity generation	655	-	-	135	3,800	840	-	1,855	7,280
of which from stocks	35	-	-	-	-	-	-	-	35
Heat Generation	10	-	-	20	335	-	-	-	365
Petroleum refineries	-	-	16,060	-	-	-	-	-	16,060
Solid fuel manufacture	210	-	-	-	-	-	-	-	210
of which iron & steel sector	175	-	-	-	-	-	-	-	175
Other energy sector use	-	-	-	835	735	330	65	-	1,960
Oil & gas extraction	-	-	-	190	640	50	-	-	880
Petroleum refineries	-	-	-	645	15	235	65	-	960
Coal extraction	-	-	-	-	-	40	-	-	40
Other energy sector	-	-	-	-	80	-	-	-	80
Total non energy sector use	490	185	-	56,375	17,450	33,385	265	2,515	110,660
Industry	275	85	-	1,545	1,610	6,595	140	110	10,360
Iron & steel final use	145	85	-	-	65	170	-	15	485
Other industry	130	-	-	1,540	1,545	6,420	140	95	9,875
Transport	5	-	-	52,925	-	460	-	1,605	54,990
Air	-	-	-	3,965	-	-	-	-	3,965
Rail and national navigation	5	-	-	565	-	450	-	-	1,020
Road	-	-	-	48,395	-	5	-	1,605	50,005
Other final users	210	100	-	1,905	15,840	26,330	120	800	45,310
Domestic	205	100	-	910	13,605	15,705	10	780	31,315
Agriculture	-	-	-	245	25	535	-	20	825
Commercial and other services	5	-	-	755	2,205	10,095	110	-	13,170
Total value of energy end use	1,365	185	16,060	57,360	22,315	34,550	325	4,370	136,530
Value of non energy end use	-	20	-	2,715	85	-	-	-	2,820
Market value of inland consumption	1,365	200	16,060	60,075	22,400	34,550	325	4,370	139,345

(1) For further information see paragraphs 1.39 to 1.45.

1.5 Value balance of traded energy in 2015⁽¹⁾

	€million								
	Coal	Manufactured fuels	Crude oil	Petroleum products	Natural gas	Electricity	Heat sold	Other fuels	Total
Supply									
Indigenous production	255r	205	12,985r	23,180r	6,380r	17,605r	395	2,675r	63,675r
Imports	985r	70	12,645r	12,405	6,990r	950	-	340r	34,385r
Exports	-45	-20	-9,915r	-8,675	-2,310r	-80	-	-	-21,045r
Marine bunkers	-	-	-	-855r	-	-	-	-	-855r
Stock change	320r	-20	-15r	-250	55	-	-	-	90r
Basic value of inland consumption	1,510r	230	15,695r	25,810r	11,115r	18,475r	395	3,015r	76,245r
Tax and margins									
Distribution costs and margins	375r	20	-	2,040r	11,035r	15,720r	-	85r	29,275r
Electricity generation	105	-	-	5	-	-	-	-	105
Solid fuel manufacture	85	-	-	-	-	-	-	-	85
of which iron & steel sector	75r	-	-	-	-	-	-	-	75
Iron & steel final use	35r	10	-	-	-	-	-	-	40
Other industry	65	-	-	355r	-	-	-	-	420r
Air transport	-	-	-	110	-	-	-	-	110
Rail and national navigation	-	-	-	20	-	-	-	-	20
Road transport	-	-	-	975r	-	-	-	85r	1,060
Domestic	85	10	-	100	-	-	-	-	195
Agriculture	-	-	-	30r	-	-	-	-	30r
Commercial and other services	-	-	-	85r	-	-	-	-	85r
Non energy use	-	-	-	360r	105	-	-	-	465r
VAT and duties	10	5	-	33,030r	685r	765r	-	1,160r	35,655r
Electricity generation	-	-	-	30	-	-	-	-	30
Iron & steel final use	-	-	-	-	-	-	-	-	-
Other industry	-	-	-	250r	-	-	-	-	250r
Air transport	-	-	-	5	-	-	-	-	5
Rail and national navigation	-	-	-	160	-	-	-	-	160
Road transport	-	-	-	32,345r	-	-	-	1,125r	33,470r
Domestic	10	5	-	65	685r	765	-	35	1,560r
Agriculture	-	-	-	45r	-	-	-	-	45r
Commercial and other services	-	-	-	135r	-	-	-	-	135r
Climate Change Levy/Carbon Price Support	465	-	-	270	700	325	-	-	1,760
Total tax and margins	850r	25	-	35,340r	12,420	16,810	-	1,240r	66,690r
Market value of inland consumption	2,365r	255	15,695r	61,150r	23,535	35,285	395	4,255r	142,935r
Energy end use									
Total energy sector	1,810r	-	15,695r	1,060r	4,695r	1,245r	75	1,790r	26,370r
Transformation	1,810r	-	15,695r	180r	3,770r	915	-	1,790r	24,155r
Electricity generation	1,430r	-	-	155	3,365r	915	-	1,790r	7,655r
of which from stocks	25r	-	-	-	-	-	-	-	25r
Heat Generation	10	-	-	20	405	-	-	-	435
Petroleum refineries	-	-	15,695r	-	-	-	-	-	15,695r
Solid fuel manufacture	370r	-	-	-	-	-	-	-	370r
of which iron & steel sector	335	-	-	-	-	-	-	-	335
Other energy sector use	-	-	-	880r	925r	335r	75	-	2,215r
Oil & gas extraction	-	-	-	220	810r	50	-	-	1,085r
Petroleum refineries	-	-	-	660r	20	235r	75	-	985r
Coal extraction	-	-	-	-	-	45	-	-	45
Other energy sector	-	-	-	-	95	5	-	-	100
Total non energy sector use	555r	215	-	57,490r	18,735r	34,040r	320	2,470r	113,820r
Industry	345r	115	-	1,740r	1,980r	6,895r	170r	95r	11,340r
Iron & steel final use	150r	115	-	-	105	240	-	15	625r
Other industry	195r	5	-	1,740r	1,875r	6,655r	170r	80r	10,715r
Transport	5	-	-	53,745r	-	440	-	1,655r	55,845r
Air	-	-	-	4,215r	-	-	-	-	4,215r
Rail and national navigation	5	-	-	625r	-	430r	-	-	1,060r
Road	-	-	-	48,905r	-	5	-	1,655r	50,570r
Other final users	205	95	-	2,000r	16,755r	26,705r	150r	720r	46,635r
Domestic	205	95	-	1,005r	14,350r	16,050r	15	705	32,425r
Agriculture	-	-	-	235r	30r	505r	-	15r	785r
Commercial and other services	-	-	-	760r	2,375r	10,155r	135r	-	13,425r
Total value of energy end use	2,365r	215	15,695r	58,545r	23,430r	35,285r	395	4,255r	140,185r
Value of non energy end use	-	40	-	2,605r	105	-	-	-	2,750r
Market value of inland consumption	2,365r	255	15,695r	61,150r	23,535r	35,285r	395	4,255r	142,935r

(1) For further information see paragraphs 1.39 to 1.45.

1.6 Value balance of traded energy in 2014⁽¹⁾

	£million								
	Coal	Manufactured fuels	Crude oil	Petroleum products	Natural gas	Electricity	Heat sold	Other fuels	Total
Supply									
Indigenous production	390r	265r	18,135r	34,455r	6,315r	17,715r	470	2,210r	79,950r
Imports	2,260	70r	24,335r	16,415r	7,635r	955r	-	610	52,275r
Exports	-55	-20	-14,625r	-14,060r	-2,000r	-130r	-	-	-30,895r
Marine bunkers	-	-	-	-1,405	-	-	-	-	-1,405
Stock change	-370r	-30	-275	135	-40	-	-	-	-580r
Basic value of inland consumption	2,220r	285	27,565r	35,540r	11,905	18,540	470	2,815r	99,345r
Tax and margins									
Distribution costs and margins	640r	25	-	2,285r	11,965r	15,835r	-	115	30,870r
Electricity generation	225	-	-	5	-	-	-	-	230
Solid fuel manufacture	120	-	-	-	-	-	-	-	120
of which iron & steel sector	105	-	-	-	-	-	-	-	105
Iron & steel final use	35	10	-	-	-	-	-	-	45
Other industry	150r	-	-	360r	-	-	-	-	515r
Air transport	-	-	-	175	-	-	-	-	175
Rail and national navigation	-	-	-	30	-	-	-	-	30
Road transport	-	-	-	1,105r	-	-	-	115	1,220r
Domestic	105r	10	-	130r	-	-	-	-	245r
Agriculture	-	-	-	35r	-	-	-	-	35r
Commercial and other services	5	-	-	100r	-	-	-	-	110r
Non energy use	-	-	-	345r	125	-	-	-	470r
VAT and duties	10	5	-	33,410r	690r	785r	-	1,440	36,340r
Electricity generation	-	-	-	30	-	-	-	-	30
Iron & steel final use	-	-	-	-	-	-	-	-	-
Other industry	-	-	-	225	-	-	-	-	225
Air transport	-	-	-	10	-	-	-	-	10
Rail and national navigation	-	-	-	165	-	-	-	-	165
Road transport	-	-	-	32,735r	-	-	-	1,410	34,145r
Domestic	10	5	-	85	690r	785r	-	30	1,605
Agriculture	-	-	-	35r	-	-	-	-	35r
Commercial and other services	-	-	-	120	-	-	-	-	120
Climate Change Levy/Carbon Price Support	485	-	-	280	475	260r	-	-	1,495
Total tax and margins	1,130r	30	-	35,975r	13,130r	16,880	-	1,555	68,705r
Market value of inland consumption	3,350	315	27,565r	71,515r	25,040r	35,420r	470	4,370r	168,050r
Energy end use									
Total energy sector	2,715	-	27,565r	1,210r	5,580r	1,225r	95	1,335r	39,720r
Transformation	2,715	-	27,565r	225r	4,595r	905	-	1,335r	37,335r
Electricity generation	2,170	-	-	195r	4,110	905	-	1,335r	8,710r
of which from stocks	45	-	-	-	-	-	-	-	45
Heat Generation	15	-	-	30	485	-	-	-	530
Petroleum refineries	-	-	27,565r	-	-	-	-	-	27,565r
Solid fuel manufacture	530	-	-	-	-	-	-	-	530
of which iron & steel sector	460	-	-	-	-	-	-	-	460
Other energy sector use	-	-	-	985	985r	320r	95	-	2,385r
Oil & gas extraction	-	-	-	345	860	45	-	-	1,250
Petroleum refineries	-	-	-	645	25r	210	95	-	970
Coal extraction	-	-	-	-	-	55	-	-	60
Other energy sector	-	-	-	-	105r	5	-	-	110r
Total non energy sector use	640r	260	-	67,625r	19,335r	34,195r	375	3,035r	125,465r
Industry	425r	155	-	2,245r	2,330r	6,825r	205r	65r	12,250r
Iron & steel final use	160	140	-	5	125	235	-	20	685
Other industry	265	15	-	2,240r	2,205r	6,585r	205r	50r	11,565r
Transport	5	-	-	62,905r	-	430r	-	2,310	65,650r
Air	-	-	-	6,580	-	-	-	-	6,580
Rail and national navigation	5	-	-	870r	-	425r	-	-	1,295r
Road	-	-	-	55,460r	-	5r	-	2,310	57,775r
Other final users	210	105	-	2,475r	17,005r	26,940r	170r	660r	47,565r
Domestic	205	105	-	1,425r	14,525r	16,505r	15	610r	33,395r
Agriculture	-	-	-	255r	40r	455r	-	40r	790r
Commercial and other services	5	-	-	790r	2,440r	9,980r	155r	10	13,385r
Total value of energy end use	3,350	260	27,565r	68,830r	24,915r	35,420r	470	4,370r	165,190r
Value of non energy end use	-	55	-	2,680r	125	-	-	-	2,865r
Market value of inland consumption	3,350	315	27,565r	71,515r	25,040r	35,420r	470	4,370r	168,050r

(1) For further information see paragraphs 1.39 to 1.45.

1.7 Sales of electricity and gas by sector

United Kingdom

	2012	2013	2014	2015	2016
Total selling value (£ million)⁽¹⁾					
Electricity generation - Gas	4,614	4,722	4,109r	3,366r	3,798
Industrial - Gas ⁽²⁾	2,173	2,457	2,325r	1,974r	1,608
- Electricity	7,092	7,462	7,143	7,227r	6,924
of which:					
Fuel industries	337	334	320	333r	330
Industrial sector	6,755	7,129	6,823	6,894	6,594
Domestic sector - Gas	14,970	15,822	13,833r	13,668r	12,959
- Electricity	14,942	15,809	15,720r	15,285r	14,956
Other - Gas	3,122	3,488	2,583r	2,506r	2,327
- Electricity	10,363	10,918	10,867	11,178r	11,142
of which:					
Agricultural sector	416	437	455	503r	534
Commercial sector	8,162	8,613	8,504	8,664r	8,600
Transport sector	357	398	431	442r	459
Public lighting	164	170	178	190	194
Public admin. and other services	1,264	1,300	1,299	1,378r	1,355
Total, all consumers	57,276	60,678	56,580r	55,203r	53,713
of which gas	24,879	26,489	22,850r	21,514r	20,692
of which electricity	32,397	34,189	33,730r	33,689r	33,021
Average net selling value per kWh sold (pence)⁽¹⁾					
Electricity generation - Gas	2.135	2.299	1.890	1.586	1.276
Industrial - Gas	2.375	2.616	2.310	1.990	1.641
- Electricity	7.585	7.992	8.073	8.191	8.074
of which:					
Fuel industries	8.048	8.219	8.645	8.652	8.648
Industrial sector	7.563	7.981	8.048	8.170	8.047
Domestic sector - Gas	4.338	4.606	4.876r	4.593r	4.162
- Electricity	13.089	14.017	14.666r	14.334r	14.028
Other - Gas	2.800	3.023	3.009	2.726	2.446
- Electricity	10.286	10.854	11.380	11.747r	11.635
of which:					
Agricultural sector	10.740	11.284	11.846	12.221	12.079
Commercial sector	10.740	11.284	11.846	12.221	12.079
Transport sector	8.385	9.142	9.558	9.779	9.829
Public lighting	8.590	9.166	9.622	10.041	10.012
Public admin. and other services	8.590	9.166	9.622	10.041	10.012
Average, all consumers	5.340	5.698	5.781r	5.570r	4.927
of which gas	3.256	3.494	3.323r	3.069r	2.580
of which electricity	10.505	11.146	11.585r	11.617r	11.461

(1) Excludes VAT where payable - see paragraph 1.46 for a definition of average net selling value.

(2) Excludes Fuel Industry use