Coal in 2014

Introduction

This article gives an overview of UK coal production and consumption. In 2014 UK coal production fell to an all-time low of 12 million tonnes. In 2014, demand for coal decreased by 20 per cent compared to 2013, as demand for coal for electricity generation fell. In 2014, UK imports were 42 million tonnes, a decrease of 15 per cent on 2013

Background

Until the late 1960s, coal was the main source of energy produced in the UK, peaking at 228 million tonnes in 1952. Ninety-five per cent of this came from around 1,334 deep-mines that were operational at the time, with the rest from around 92 surface mines. As UK energy started to become more[1] diverse from the early 1970s (initially, through primary electricity via hydro schemes followed by natural gas and crude oil and renewable & waste in later years), production of home-produced coal has significantly declined. However, there was (and still is) a significant demand for coal in this country. Before 1970, it was used as a fuel source in the industrial sector, for fuelling trains and used within households for cooking and heating. Since then, it has mainly been used by electricity generators, who on average consume around 80 per cent of total UK coal supply[1] each year. Therefore, to meet this demand during the last 40 years the UK has become increasingly reliant on coal imported from other countries, more specifically, steam coal, which is used at coal-fired power stations to generate electricity.

Deep mined production

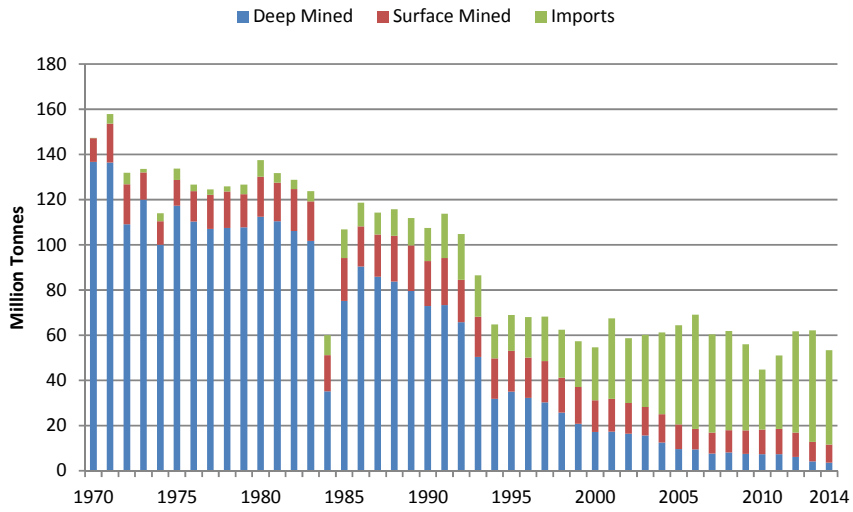
Generally, since the peak levels reported in 1954 (217 million tonnes), deep mined production has fallen by an average of 2.6 per cent each year between 1954 and 1983 (102 million tonnes)[2][2]. Although the 1984 miners' strike had a substantial effect on the amount of coal produced in the UK, which saw deep-mined production falling by 66 million tonnes (65 per cent) between 1983 and 1984, the UK coal industry recovered and returned to the long term trend in 1985 producing more than double the levels of 1984 (an increase of 40 million tonnes). Thereafter, deep-mined production decreased on average by 10 per cent a year with figures in 2014, showing a record low of 3.7 million tonnes, 98 per cent less than the post-war peak during 1954 and a 9.9 per cent decrease on 2013 (4.1 million tonnes). This was due to the closure of a number of mines in 2013 including Maltby, Daw Mill and Unity and geological conditions at some of the remaining mines. **(Chart 1)**

Surface mine production

Surface mine production (including recovered coal) increased on average by 3 per cent a year between the late 1940s and late 1980s, with production peaking in 1991, to stand at 21 million tonnes. Thereafter, although surface mine production declined by an average of 4 per cent between 1991 and 2005, it exceeded deep-mined production for the first time in 2005, accounting for 53 per cent of total production (21 million tonnes). This share continues to grow as deep mined production has been steadily declining. Surface mine production fell by 7.2 per cent in 2014 compared to a year earlier due to Scottish Coal Company going into liquidation in April 2013 and geological conditions at some mines. However, its share of all coal production was unchanged compared to 2013 at 68 per cent. **(Chart 1)**

[1] Coal Supply is calculated as sum of production, net imports and stock
[2] Between 1972 and 1974, deep mined production on average decreased by 9 per cent a year as a result of miner's striking over pay

Chart 1: UK Coal Supply, 1970 to 2014



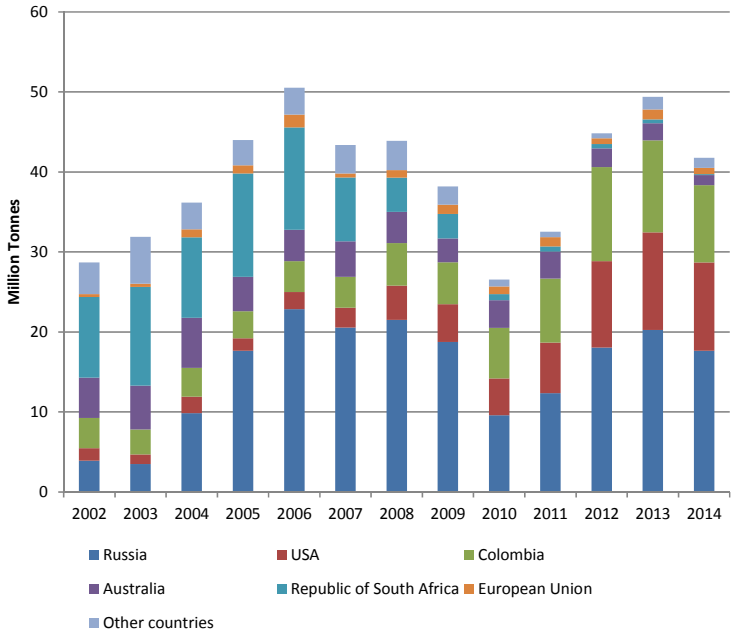
Coal Imports

Imports, initially of coal types in short supply in this country, started in 1970 and grew steadily to reach 20 million tonnes a year by the late 1990s. The very rapid expansion of imports in 2001 meant that imports exceeded the level of UK production in that year for the first time. As annual levels of UK coal production continued to fall, imports continued to grow rapidly and in 2006 reached a new record of 51 million tonnes, representing 75 per cent of total UK coal supply. From this point on, UK imports fell, mainly as a result of less demand by electricity generators, rather than higher indigenous production. However, in 2012, due to a greater demand by electricity generators and with UK production at an all-time low, imports increased by 38 per cent (+12 million tonnes) from the levels reported in 2011 (33 million tonnes). Imports continued to rise in 2013, before falling again in 2014 to 42 million tonnes due to lower demand from generators. **(Chart 2)**

Steam coal (used mainly by electricity generators) represents on average around 80 per cent of total UK imports each year and represented 85 per cent of total imports in 2014 (35 million tonnes). Russia has long been the UK's main source of imports, contributing 46 per cent of steam coal imports in 2014. In more recent years, steam coal has also been imported from Colombia and the USA, together contributing 50 per cent of total steam coal imported in 2014.

Fifteen per cent of coal imported during 2014 was coking coal (6 million tonnes), which has been used in coke ovens and similar carbonising processes within the industrial sector. Eighty-nine per cent of this total, originated from three countries alone, USA (48 per cent), Russia (22 per cent) and Australia (20 per cent). Imports of anthracite (mainly used in the domestic sector) are negligible, in comparison to steam and coking coal.

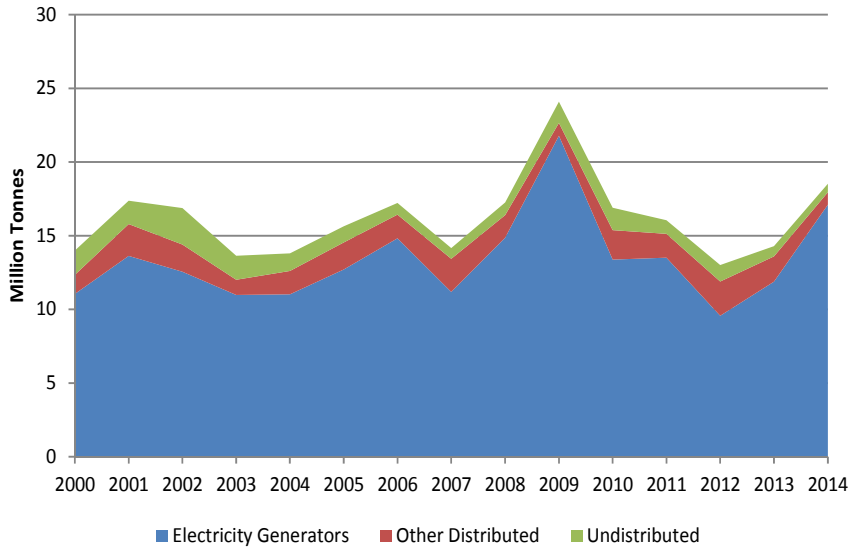
Chart 2: Total UK coal imports by country of origin, 2002 to 2014



Coal Stocks

Most coal stocks in the UK are those held by electricity generators since this sector represents the largest share of the total demand for coal in the UK. Coal stocks have generally fluctuated between 2000 and 2008, between 13 and 18 million tonnes. However, in 2009, coal stocks increased by 7 million tonnes (largest year-on-year increase) on 2008 to reach a record high of 24 million tonnes. In contrast, stocks decreased during 2010 by 7 million tonnes to 17 million tonnes as generators used their stocks as opposed to importing coal. This fall continued into 2012, where total coal stocks decreased to 13 million tonnes, the lowest level on record, of which 10 million tonnes were held by generators. In 2013 coal stocks rose again due to less consumption from generators and were at 19 million tonnes in 2014 as consumption fell further. **(Chart 3)**

Chart 3: Total UK Coal Stocks 2000 to 2014



Coal Consumption

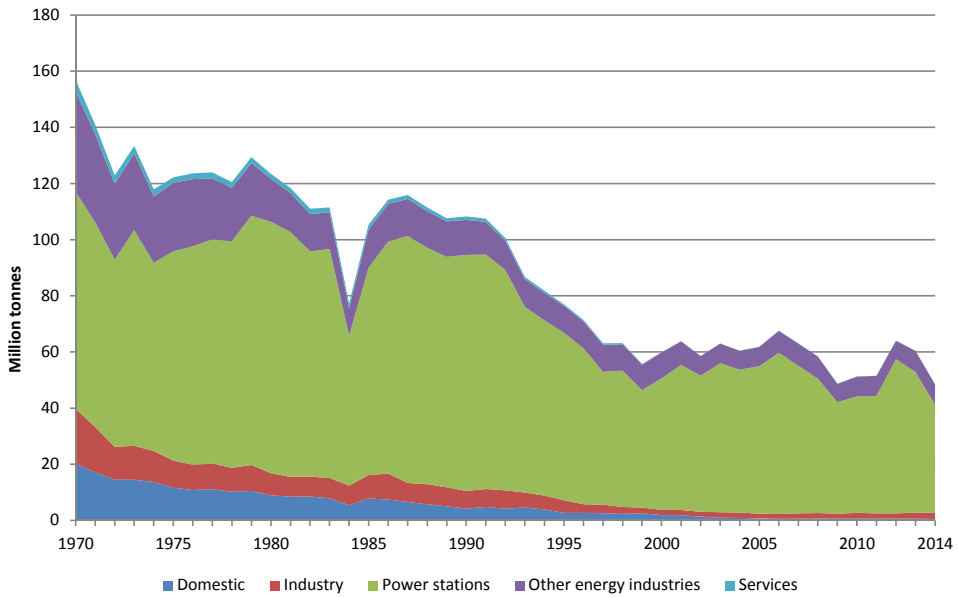
Coal consumption fell gradually from 157 million tonnes in 1970. There was a large fall in 1984 due to the miners' strike. Consumption quickly rose again to pre-1984 levels before gradually falling again. In 2014, consumption of coal was 49 million tonnes, 69 per cent lower than in 1970 and 20 per cent lower than in 2013 (60 million tonnes). **(Chart 4)**

Consumption by electricity generators increased from 77 million tonnes in 1970 to a peak of 90 million tonnes in 1980 and continued in the 80 to 90 million tonnes range until 1991, with the exception of the miners' strike years. Coal consumed by generators fell steadily after 1991 until 1999, as the UK's energy mix became more diverse, environmental regulations and high coal prices made natural gas more attractive to purchase for generation use. Coal consumption by generators broadly rose again after 1999 to 2006 as the price of gas encouraged generation from coal. From 2006 to 2010 the fall in consumption resumed. In the next three years, there was higher coal use due to higher gas prices making generation from coal more attractive. However, in 2014, the demand for coal decreased by 20 per cent compared to 2013. Consumption by electricity generators was down by 23 per cent to 38 million tonnes (a new record low). The decline was due to a number of reasons: outages at several power stations, the closure of Uskmouth power station and the partial closure of Ferrybridge C during 2014, a second unit of Drax being converted to biomass, lower demand for electricity overall and changes in the relative prices of coal and gas.

Other energy industries consumption has also fallen gradually from 1970, with the exception of 1984 when there was a miners' strike. Consumption increased by 15 per cent in 2013 compared with 2012 mainly due to coking coal in blast furnaces increasing by 43 per cent from 1.0 million tonnes in 2012 to 1.4 million tonnes in 2013. This increase was due to the re-opening of Teesside steelworks in April 2012, which gradually increased operations over the next year and the newly opened blast furnace at Port Talbot in February 2013. In 2014, however, the earlier decreasing trend resumed, and other energy industries consumption fell by 4.0 per cent.

Final consumption has fallen continuously from 1970, with the exception of an increase for two years following the 1984 strike, as gas has taken over as the main heating fuel in the UK, and the demand from industry has also declined (particularly from 1986). Domestic's share has fallen from 46 per cent to 19 per cent. As a result of this and despite coal consumption falling, industry's share of final consumption has risen from 45 per cent in 1970 to 79 per cent in 2014. The service sector's share of final consumption has fallen from 9 per cent in 1970 to under 2 per cent in 2014.

Chart 4: Coal consumption 1970 to 2014



Manufactured Solid Fuels

In 2014, around 92 per cent of manufactured solid fuel production was coke oven coke, a proportion that has remained the same for the past 15 years.

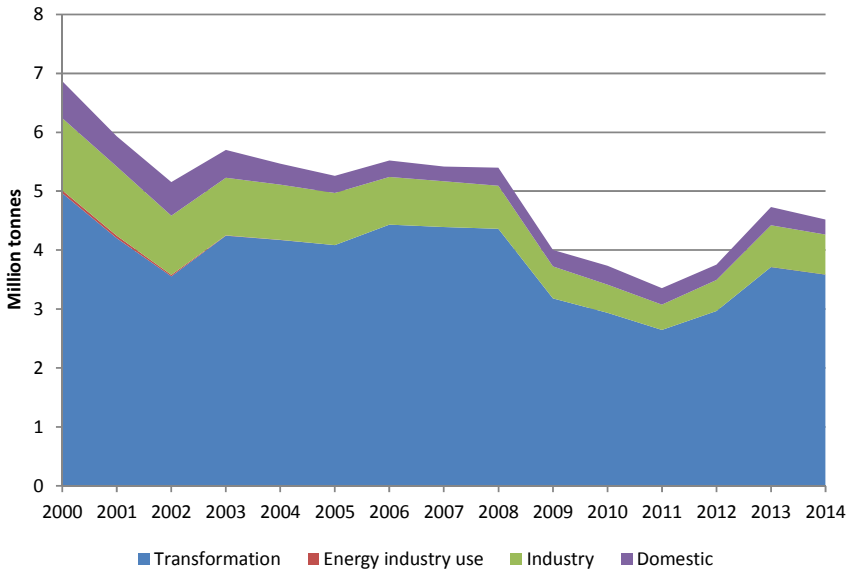
The main purpose of coke oven coke is for use in blast furnaces in the UK iron and steel industry. Between 1970 and 2013 there was an overall decline in coke oven coke production. However, in 2013 there was a 22 per cent increase in blast furnace consumption, which rose to 3.3 million tonnes from 2.7 million tonnes in 2012. This was due to the re-opening of Teesside steelworks in April 2012 which gradually increased operations over the next year, and the newly opened furnace at Port Talbot in February 2013. Demand fell in 2014 due to the reduced demand for coke oven coke. Blast furnace use represented 98 per cent of total demand (3.2 million tonnes), and was 3.9 per cent lower than in 2013.

Demand for coke oven coke fell by 4.7 per cent (3.2 million tonnes) in 2014. Monckton Coke and Chemicals, the only dedicated coke plant in the UK closed in December 2014. However, coke is still being produced and used at steelworks, mainly Port Talbot, SSI and Scunthorpe.

Most of the supply of coke breeze is from re-screened coke oven coke, with direct production accounting for only 2.9 per cent of total supply in 2014. In 2014, 41 per cent of coke breeze was used in blast furnaces (0.4 million tonnes) for transformation and 59 per cent used for final consumption (Table 2.5).

Other manufactured solid fuels (patent fuels) are manufactured smokeless fuels, produced mainly for the domestic market. A small amount of these fuels (only 5.8 per cent of total supply in 2014) was imported, but exports generally exceed this. **(Chart 5)**

Chart 5: Total Manufactured Solid Fuels Consumption in the UK 2000 to 2014

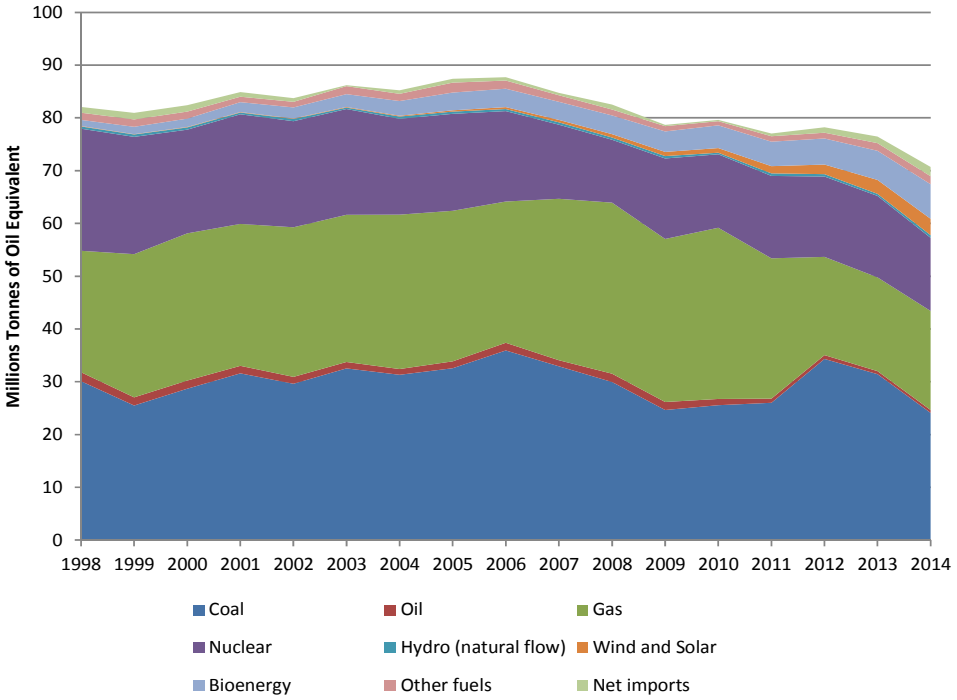


Coal used for electricity generation

Coal use has remained significant in the electricity generation sector due to fluctuations in gas prices; where these fell coal-fired stations generated electricity at a lower cost than some gas-fired stations. In 2006, coal use by electricity generators peaked at 57 million tonnes, representing 85 per cent of total coal demand. Coal use gradually fell between 2007 and 2011 before increasing again in 2012 to 55 million tonnes. Since then coal used for electricity generation fell again and was 38 million tonnes in 2014 (a new record low). The decline in 2014 was due to a number of reasons: the closure of Uskmouth, outages at some power stations, the partial closure of Ferrybridge C during

2014, a second unit of Drax being converted to biomass and changes in the relative prices of coal and gas. Electricity generation represented 79 per cent of total coal demand in 2014. **(Chart 6)**

Chart 6: Fuel used in electricity generation



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