

Coal in 2013

Introduction

This article gives an overview of UK coal and manufactured fuel production and consumption over the last four decades. It shows that UK coal production and the demand for coal has generally decreased since 1970. In 2013 coal production fell to 13 million tonnes, which was the lowest value ever recorded, whilst demand for coal fell to 60 million tonnes as more renewables were used in electricity generation.

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 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 1970, it has mainly been used by electricity generators, who on average consume around 70 per cent of total UK coal supply¹ 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. A series of miner's strikes in the early 1970s and 1980s impacted on coal production and consumption, with large temporary falls as a result, especially in 1984.

Deep mined production

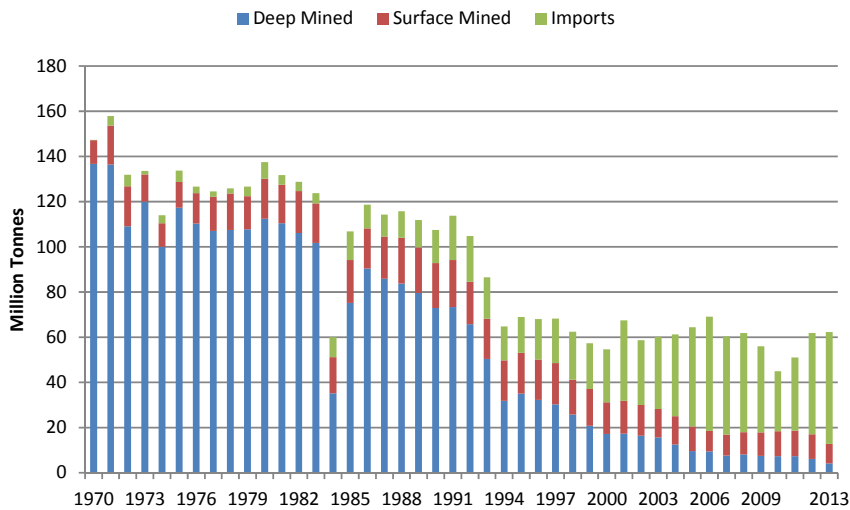
Since the peak levels reported in 1954 (217 million tonnes), deep mined production fell by an average of 2.6 per cent each year between 1954 and 1983 (102 million tonnes). Although, the 1984 miners' strike had a substantial effect on the amount of coal produced in the UK, as deep-mined production fell by 66 million tonnes (65 per cent), 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, falling to a record low of 4 million tonnes in 2013, 98 per cent less than the post-war peak during 1954 and a 34 per cent decrease on 2012 (6 million tonnes). This was due to the closure of a number of mines in 2013 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 4.5 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 declined. Surface mine production fell by 20 per cent in 2013 compared to a year earlier due to some mines going into liquidation during the year and geological conditions at remaining mines. However, its share of coal production rose to 68 per cent as there was a larger fall in production for deep mines. **(Chart 1)**

¹ Coal Supply is calculated as sum of production, net imports and stock

Chart 1: UK Coal Supply, 1970 to 2013



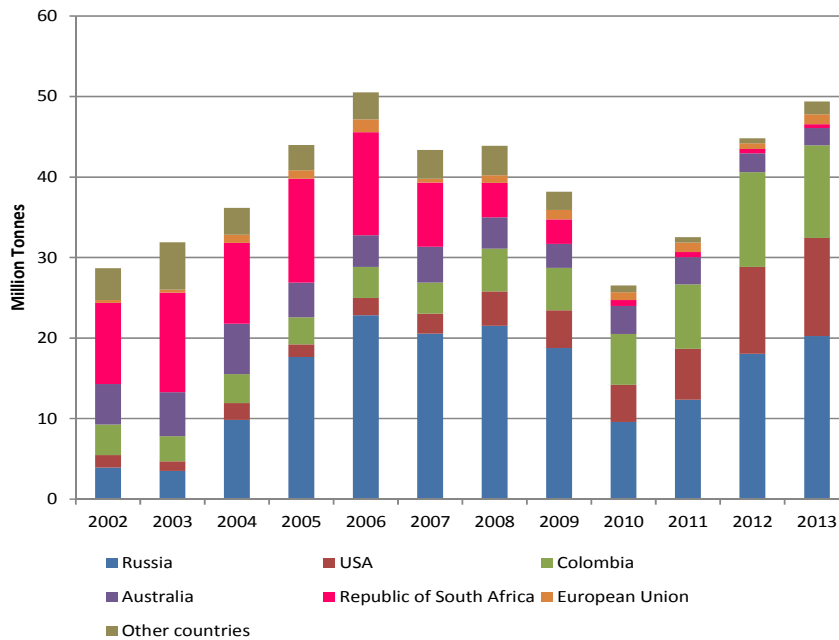
Coal Imports

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 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, from 2011 to 2013, due to a greater demand by electricity generators and with UK production at an all-time low, imports increased again and in 2013 imports were 49 million tonnes, which was close to the record high of 2006. **(Chart 2)**

Steam coal (used mainly by electricity generators) represents on average around 80 per cent of total UK imports each year and represented 87 per cent of total imports in 2013 (43 million tonnes). Russia has been the UK's main source of imports since 2004 replacing South Africa as the largest provider, contributing 45 per cent of steam coal imports in 2013. Steam coal is also imported in large volumes from Colombia and the USA, which together contributed 49 per cent of total steam coal imported in 2013.

Thirteen per cent of coal imported during 2013 was coking coal (6 million tonnes), which has been used in coke ovens and similar carbonising processes within the industrial sector. Over two thirds of this total, originated from two countries alone, USA (43 per cent) and Australia (33 per cent). Imports of anthracite (mainly used in the domestic sector) are negligible, in comparison to steam and coking coal.

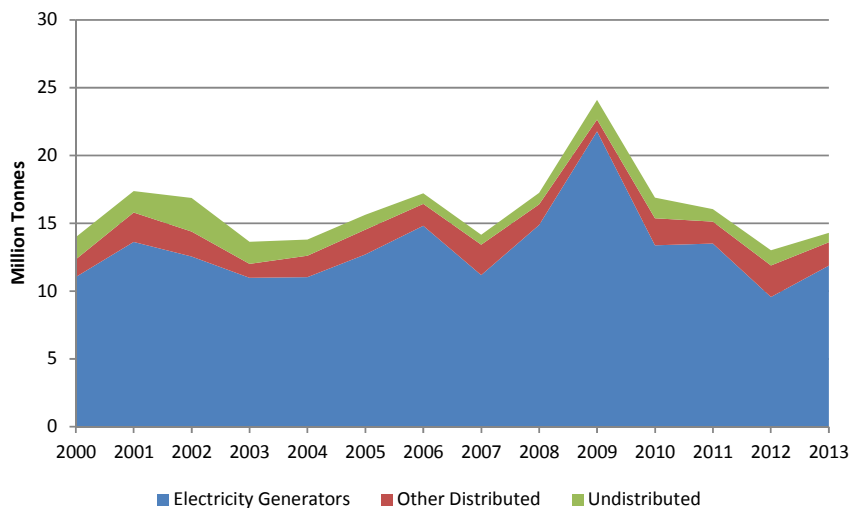
Chart 2: Total UK coal imports by country of origin, 2002 to 2013



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. Coal stocks generally fluctuated in the years 2000 to 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 increased to 14 million tonnes due to less consumption from generation. (Chart 3)

Chart 3: Total UK Coal Stocks 2000 to 2013



Coal Consumption

Coal consumption fell gradually from 157 million tonnes in 1970. In 2013, consumption of coal was 60 million tonnes, 61 per cent lower than in 1970. **(Chart 4)**

Consumption by the 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. 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 became more stable after 1999 as the higher price of gas encouraged generation from coal in some years. In 2011 and 2012, there has been higher coal use due to higher gas prices making generation from coal more attractive, although the demand fell slightly in 2013, as overall demand for electricity fell and more renewables and nuclear power were used in electricity generation. **(Chart 5)**

Other energy industries consumption has also fallen gradually from 1970. However, consumption increased by 14 per cent in 2013 compared with 2012 mainly due to coking coal used in blast furnaces increasing by 43 per cent 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 a newly opened blast furnace at Port Talbot in February 2013.

Final consumption has fallen fairly continually from 1970, as gas has taken over as the main heating fuel in the UK, and the demand from industry has also declined (particularly from 1986). However, industry's share of final consumption has risen from 45 per cent in 1970 to 76 per cent in 2013, while the domestic sector share has fallen from 46 per cent to 23 per cent and the service sector's share of final consumption has fallen from 9 per cent to under 2 per cent.

Chart 4: Coal consumption 1970 to 2013

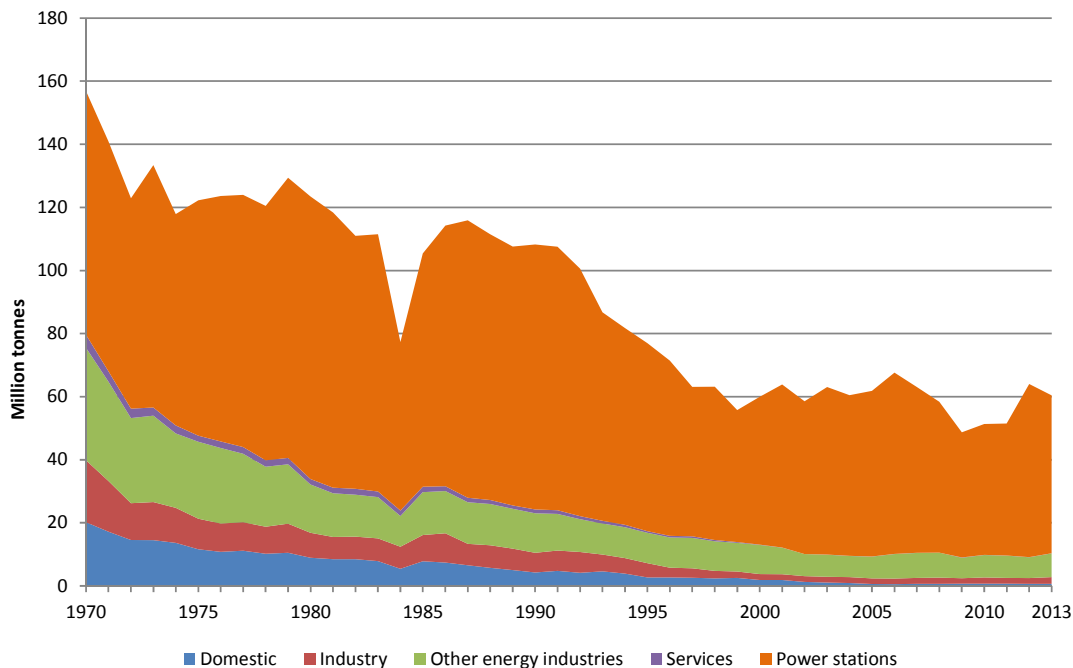
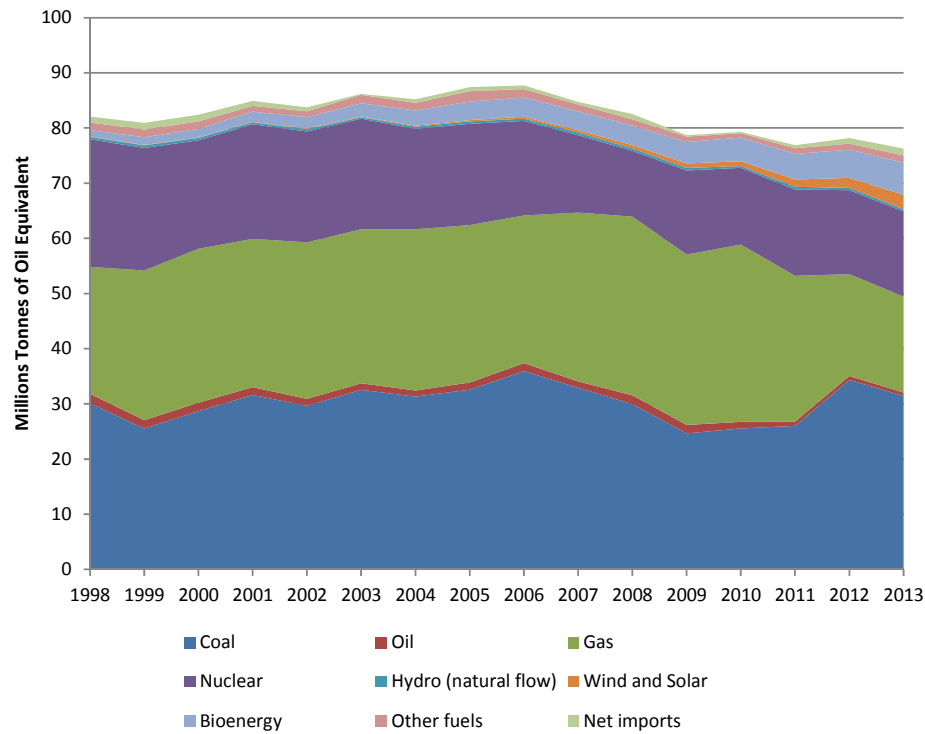


Chart 5: Fuel used in electricity generation

Manufactured Solid Fuels

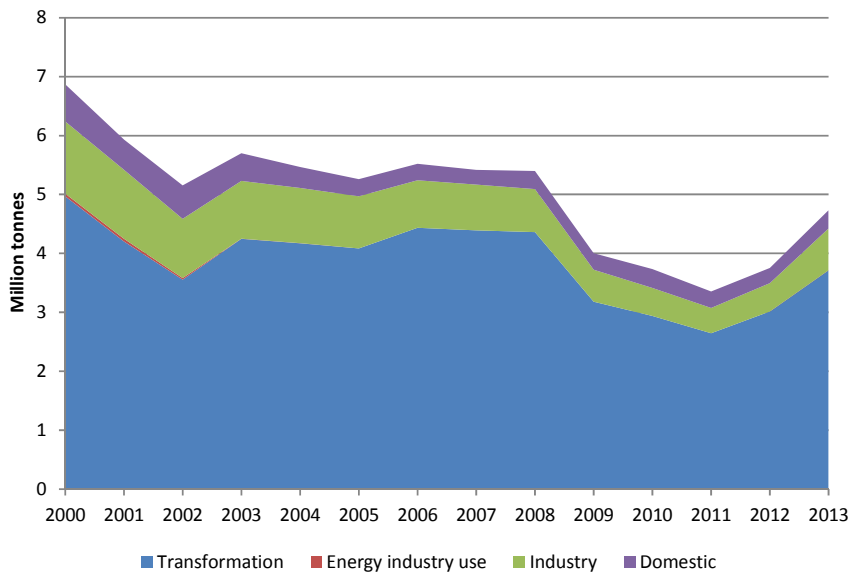
Since 1970 there has been a general fall in manufactured solid fuels consumption due to the decline in industrial (iron and steel) demand. Consumption increased in 2012 and 2013 due to the re-opening of Teesside steelworks in April 2012 and the newly opened furnace at Port Talbot in February 2013. In 2013, around 91 per cent of manufactured solid fuel production was coke oven coke, a proportion that has remained the same for the past 15 years. **(Chart 6)**

The main purpose of coke oven coke is for use in blast furnaces in the UK iron and steel industry. In 2013, this represented 97 per cent of total demand (3.2 million tonnes), and was 22 per cent higher than in 2012 (2.7 million tonnes).

Most of the supply of coke breeze is from re-screened coke oven coke, with direct production accounting for only 3.0 per cent of total supply in 2013. In 2013, 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 (Chart 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 4.8 per cent of total supply in 2013) was imported, but exports generally exceed this.

Chart 6: Total Manufactured Solid Fuels Consumption in the UK 2000 to 2013



Chris Michaels

Coal Statistics

Tel: 0300 068 5050

E-mail: Chris.Michaels@decc.gsi.gov.uk