



[Countries](#)

United Kingdom

Last Updated: May 14, 2013 ([Notes](#))

Overview

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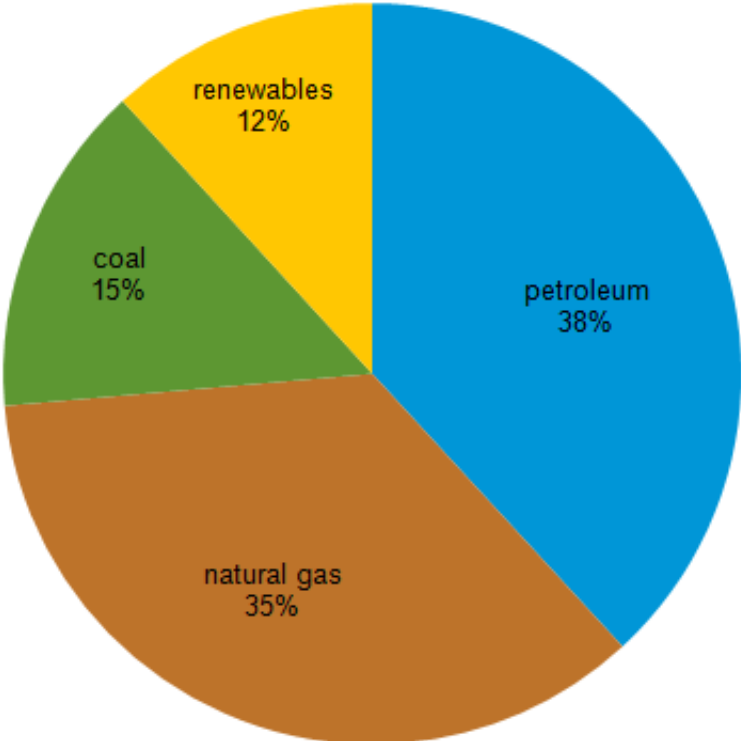
Production from UK oil and natural gas fields peaked in the late 1990s and has declined steadily over the past several years, as the discovery of new reserves and new production have not kept pace with the maturation of existing fields.

The UK government, aware of the country's increasing reliance on imported fuels, has developed key energy policies to address the domestic production declines. These include: using enhanced recovery from current and maturing oil and gas fields, promoting energy efficiency, decreasing the use of fossil fuels and thus reliance on imports, promoting energy trade cooperation with [Norway](#), and decarbonizing the UK economy by investing heavily in renewable energy. However, for the UK to decarbonize its economy, huge investments in the energy infrastructure are needed.

Despite the expanding use of renewable energy, petroleum and natural gas will continue to account for the vast majority of UK's energy consumption. In 2011, petroleum and natural gas accounted for 38 and 35 percent, respectively, of total energy consumption, with the renewable energy sources growing to 12 percent of the total. Renewable energy use, particularly in the electric power sector, has more than tripled between 2000 and 2011.

Energy use per unit of gross domestic product (GDP) in the UK is one of the lowest among western economies. The UK has seen total energy consumption decline by more than 15 percent between 2004 and 2011. This decline resulted from smaller contribution of energy-intensive industry to the economy, economic contraction, and improvements in energy efficiency.

UK's total primary energy consumption by source, 2011



Source: U.S. Energy Information Administration, International Energy Statistics Database



Oil

Although aggressive targets for renewable energy are in place, oil remains important to the UK energy balance, with oil contributing 38 percent of total energy consumption.

According to *Oil & Gas Journal* (OGJ), the UK had 3.1 billion barrels of proven crude oil reserves as of January 2013, the most of any EU member country. In 2012, the UK produced 1.0 million barrels per day of oil (bbl/d) and consumed 1.5 million bbl/d.

The vast majority of UK's reserves are located offshore in the UK continental shelf (UKCS), and most of the oil production occurs in the central and northern sections of the North Sea. Although there is a modest amount of oil produced onshore, in 2012 more than 90 percent of total UK production took place offshore.

Aging reservoirs and infrastructure have affected UK's oil production over the last few years, with production decline rate increases and wide-spread outages as a result of technical problems, which were particularly acute in 2012.

Sector organization

Recent increases in tax rates for the oil and gas sector, coupled with technical issues, have contributed to sharp declines in UK oil production. Higher tax rates have made the UK fields less competitive, which were already strained by high operating and decommissioning costs.

The UK government does not hold a direct interest in oil production, but this sector remains important to the government because Corporation Tax and Supplementary Tax income from the sector accounts for about 25 percent of UK corporate tax receipts, according to Oil and Gas UK.

Since 2011, there have been a number of tax changes that affected the UKCS, including the change in the rate of supplementary charge (an addition to the corporate tax) and the capping of relief for decommissioning costs at 20 percent of the supplementary charge. In addition, the tax rate for fields that are subject to petroleum revenue tax (PRT) increased to 81 percent of their profits (from the previous 75-percent rate), and fields that are not subject to PRT now pay a 62-percent tax (compared with the 50-percent rate in the past).

As a result of the significant increases in taxes, the UKCS projects have become even less competitive. Increases in operating costs coupled with higher taxes have resulted in decreased investment in both brownfields and new exploration. Even without the increased taxes, operating costs in the UKCS were prohibitively high, exacerbated by the high decommissioning costs of old facilities, which also discourage investors.

Almost immediately after the new tax rates were implemented, development on several start-ups was suspended, including Statoil's Mariner and Chevron's Bressay fields. In addition, Centrica launched a review of all of its exploration activities, as many projects were deemed uneconomical under the new rates. Given a nearly 16-percent decline in production following the implementation of the new tax rates, the UK government has introduced new incentives for producers to counter some of the increase in taxes.

The sector, which includes the administration of licensing, is regulated and overseen by UK's Department of Energy and Climate Change (DECC). The DECC licensing-related activities are outlined in the 1934 Petroleum Act and the 1964 Continental Shelf Act. Six types of licenses, the so-called "Seaward Production Licenses," can be awarded in the UK, which differ in length of time awarded and cost of license.

In March 2013, the UK government outlined plans to encourage continued development of the oil and gas sectors because the latest trade statistics indicated that net energy imports rose to the highest level since the 1970s. These plans included providing the industry with tax certainty, supply-chain support, and workforce skills development.

Exploration and production

Although a number of new fields are expected to come online in 2013, UK production will continue to decline as new production will not be sufficient to offset the declines.

In 2012, UK produced approximately 1 million bbl/d of liquid fuels, of which about 881,000 bbl/d was crude oil. The 2012 liquid fuels production level was about 14 percent lower than the 2011 production level, and it reached the lowest production level since the 1970s. EIA's *Short-Term Energy Outlook* expects UK oil production to continue to decline, remaining below 1 million bbl/d through the end of 2014. The main reason for this decline is the overall maturity of the country's oil fields and diminishing prospects for new substantial discoveries in the future. Although its proximity to major consuming markets makes UK exploration attractive, recent increases in taxes will continue to affect the attractiveness of the UK fields in the longer term.

Three main grades of oil are produced in the UK: Flotta, Forties, and Brent blends. They are generally light and sweet, which makes them attractive to foreign buyers.

Flotta is the smallest and lowest quality stream produced in the UK. The stream is made up of very small amounts of oil from the Claymore and Piper fields, as well as production from the North Tartan, Duart, Tweedsmuir, and Tweedsmuir South fields. The Flotta blend total production in 2012 was approximately 50,000 bbl/d. Talisman Energy operates all of the producing fields with the exception of the MacCulloch, which is operated by ConocoPhillips. Flotta crude is loaded at the Talisman Energy-operated Flotta terminal, in the Orkney Islands. The terminal has a crude oil jetty and a single-point mooring facility, which can accommodate tankers up to 200,000 deadweight tons. The jetty can accommodate tankers up to 150,000 deadweight tons. According to Energy Intelligence, the terminal has six crude oil storage tanks with a combined capacity of 3.5 million barrels.

Forties blend is made up of oil from 70 fields spread over a large area of the North Sea, the biggest of which is the Buzzard oil field. Forties contributes about half of the total UK North Sea production, totaling about 500,000 bbl/d in 2011. These various fields contribute condensate, medium-gravity oil, and moderately sour crude. The Forties system occupies most of the Central North Sea, located south of the Brent complex and east of Flotta. The Forties system has fifteen field operators, according to Energy Intelligence, including BP, Shell, Talisman Energy, CNOOC, Apache, and Suncor. Once produced, Forties blend is shipped via the 170-kilometer pipeline to Cruden Bay, where it is pumped another 200 kilometers to Hound Point, Forties' loading port. This port has two jetties that can accommodate tankers up to 300,000 and 150,000 deadweight tons, respectively. In addition, the port has 4 million barrels of storage capacity.

Brent stream is a light, sweet crude. Nearly 40 UK fields contribute to the blend, although very little production comes from the once-prolific Brent field, after which the stream was named. According to Energy Intelligence, at its peak in 1984, the Brent field alone produced 400,000 bbl/d, with the other five major contributing fields (Thistle, Dunlin, Cormorant North, Ninian, and Magnus) peaking at a total of over 100,000 bbl/d in the mid-1980s. In 2012, all of these fields combined produced about 70,000 bbl/d, according to the DECC. Despite the declining physical volumes associated with the Brent blend, its importance as a financial benchmark is increasing.

The Brent blend is transported to the Sullom Voe terminal via pipelines. This terminal, located in Shetland, is operated by BP on behalf of a consortium of companies and has four loading jetties, all of which can accommodate tankers of up to 250,000 deadweight tons. In addition, the terminal has 16 storage tanks, 12 of which store up to 7.2 million barrels of the Brent blend.

Brent, the global oil benchmark

Brent, the oil stream, is different from Brent, the price. Brent (the price) is the benchmark for approximately two-thirds of internationally traded crude oil. As a benchmark, Brent is used by producers, refiners, and traders for establishing long- and short-term contracts in both physical and financial markets for oil deliveries around the world.

The Brent crude oil price reflects not only the UK Brent stream, but also three other streams that are included in the trading and pricing at this location: Forties, Oseberg and Ekofisk streams. The latter two are produced in the Norwegian part of the North Sea. The four streams that make up the Brent benchmark produce a light, sweet crude oil.

Despite declines in physical production volumes, the popularity of the Brent futures contracts has increased as evidenced by its exchange volume. Brent is traded on the Intercontinental Exchange and, more recently, on the New York Mercantile Exchange. Futures contracts are exchange-traded contracts for the delivery of a specified quantity of a commodity at a specified time and place in the future. Brent does not require physical delivery upon contract expiration, but rather is settled financially, making it an ideal vehicle for hedgers.

UK's oil fields and operators

Nexen was the largest operator in the UK in terms of oil production, with a total of approximately 192,000 bbl/d produced in the five fields it operated in 2012, according to the DECC. Nexen-operated fields accounted for 18 percent of total UK production in 2012.

BP is also a significant operator in the UK, although its production has declined over the last few years as the company refocused its exploration and production elsewhere. It operates 20 fields in the UK, which are located offshore with a total output of approximately 132,000 bbl/d in 2012 according to the DECC.

The UK's largest producing field in 2012 was the Nexen-operated Buzzard oil field, which produced an average of 140,000 bbl/d during the year. This production volume was far short of its production capacity of more than 200,000 bbl/d, as the field was plagued by various technical and operational issues during the year. Buzzard field came online in 2007 and reached full capacity in 2008. Since then, however, average annual production at the field has declined each year.

UK's largest producing oil fields, 2012

Field	Thousand barrels per day
Buzzard	140.1
Forties	40.6
Schiehallion	40.3
Captain	31.1
Alfa	22.9

	22.9
Foinhaven	20.1
Clair	17.7
Magnus	13.2
Alwyn North	12.9
Ettrick	12.8

Source: UK's Department Of Energy and Climate Change

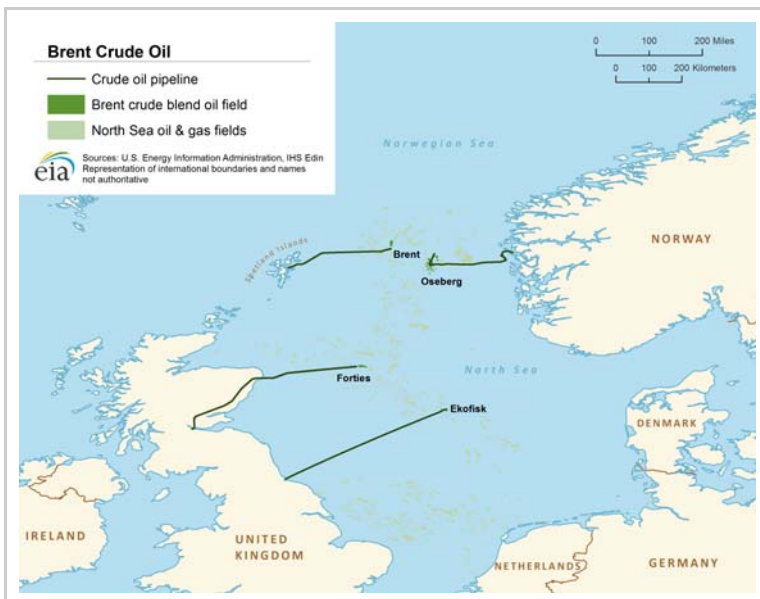
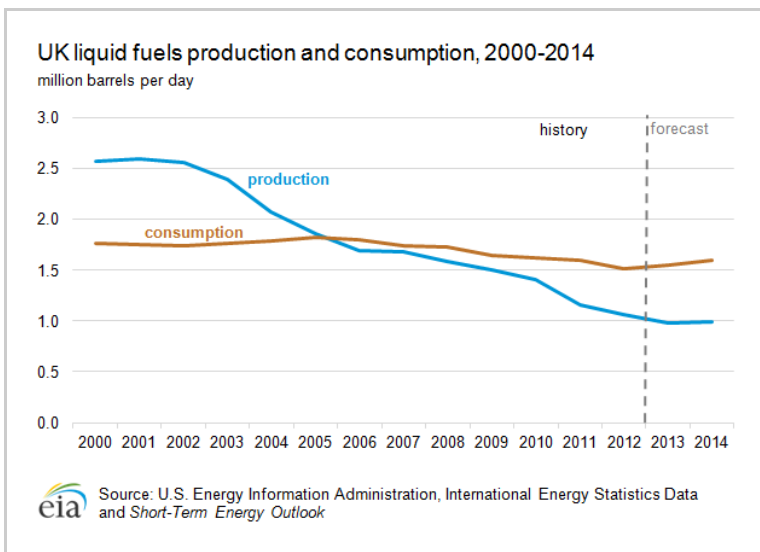
During 2012, a number of new field developments took place, mainly by smaller oil field operators. The Apache-operated Bacchus field came online in April 2012 and produced an average of 4,000 bbl/d for the year. The Lybster field, located in the Central North Sea, came online in May 2012.

A number of new fields are expected to be developed in 2013, nearly all of which are located in the North Sea. The only exception is the Conwy & Corfe field, located offshore in the Morecambe Bay in northwest England. These projects are likely to yield relatively small volumes of oil, only partly stemming the downward trend in UK's oil production. The two heavy oil projects, Statoil's Bressay and Chevron's Mariner, are expected to come online in 2015 or later.

UK's new field developments, 2013

Field name	Development start date	Operator	Total recoverable reserves (million barrels)
Godwin	January	Talisman	5.5
Ptarmigan	January	Premier	3.5
Conwy&Corfe	February	EOG	16.7
Kinnoull	March	BP	48.9
Bentley	September	Xcite Energy	25.6
Enochdhu	September	ConocoPhillips	14.7
Alma&Galia	October	EnQuest	28.9
Crawford Redevelopment	November	EnQuest	26.8

Source: UK's Department Of Energy and Climate Change



Imports and exports

Once a major exporter of oil, the UK exports have dropped in tandem with decreasing domestic production.

Despite the large declines in oil production over the last few years, the UK is still one of the largest petroleum producers and exporters in Europe. In 2011, the UK exported approximately 690,000 bbl/d. Export data published by UK's Her Majesty's Revenue and Customs show that the vast majority (82 percent) of crude oil exports were destined to EU countries, mainly Germany and Netherlands.

The United Kingdom is also a significant oil importer, receiving more than 1 million bbl/d in 2011. According to UK's Her Majesty's Revenue and Customs, the majority (67 percent) of the imports came from Norway, a decline from the 72-percent share the previous year. The remainder of UK oil imports came from [Russia](#) (8 percent), [Nigeria](#) (7 percent), and the Middle East (2 percent).

UK crude oil exports, 2011

Thousand barrels

per day

Belgium and Luxembourg	12
Denmark	9
France	79
Germany	147
Ireland	15
Italy	22
Netherlands	232
Portugal	1
Spain	3
Sweden	23
Poland	25
Total EU	568
Canada	8
Norway	3
United States	89
Other non-EU	22
Total non-EU	122
Total exports	690

Source: United Kingdom's HMRC

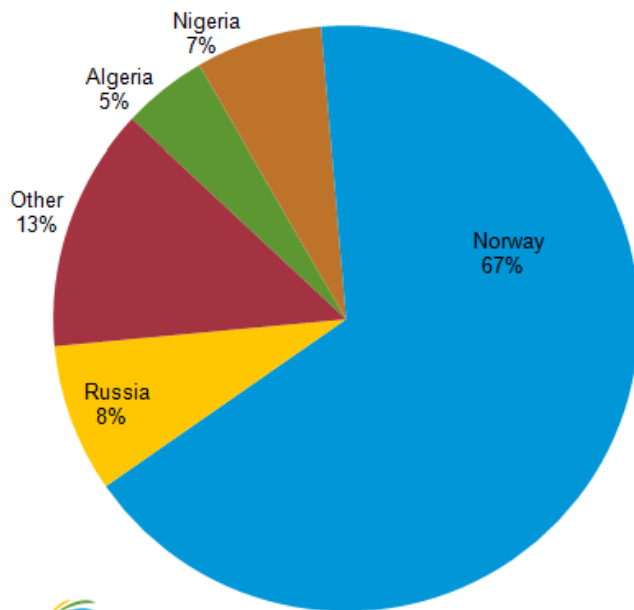
UK Crude Oil Imports, 2011

Thousand barrels
per day

Iran	14
Saudi Arabia	3
Other Middle East	5
Total Middle East	22
Algeria	50
Angola	9
Libya	15
Netherlands	1
Nigeria	70
Norway	719
Russia	88
Venezuela	13
Other non-Middle East	88
Total non-Middle East	1,055
Total imports	1,078

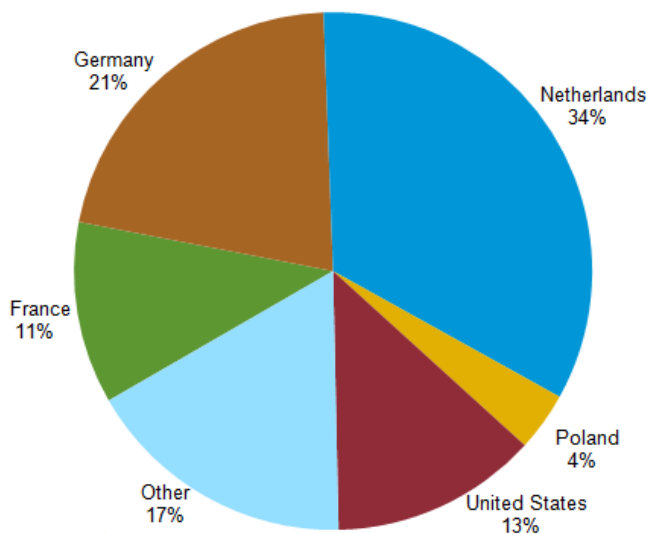
Source: United Kingdom's HMRC

UK crude oil imports by country, 2011



Source: United Kingdom's HMRC

UK crude oil exports by country, 2011



Source: United Kingdom's HMRC

Pipelines

There is an extensive network of pipelines in the UK that carry oil extracted from North Sea platforms to coastal terminals in Scotland and northern England.

- BP operates the 110-mile, 36-inch Forties-Cruden Bay pipeline, linking fields in the Forties system to the oil terminal at Cruden Bay, Scotland. The company also operates a 110-mile, 36-inch pipeline connecting the Ninnian system to the Sullom Voe oil terminal on Shetland Island.
- Britoil Plc operates a 150-mile, 24-inch pipeline linking the Bruce and Forties fields to Cruden Bay and Talisman operates a 130-mile, 30-inch pipeline connecting the

Piper system with Flotta on Orkney Island.

- Shell and Esso jointly operate a 93-mile, 36-inch connection between the Cormorant oil field and Sullom Voe. There are also many small pipelines that connect each North Sea oil platform to these major backbone lines.
- The UK has a few onshore crude oil pipelines, including a 90-mile, underground pipeline operated by BP that links the Wytch Farm field to the refinery at Fawley and the nearby oil export terminal at Southampton.
- The UK has a single international crude oil pipeline, the 220-mile, 34-inch Norpipe operated by ConocoPhillips. With a capacity of 900,000 bbl/d, Norpipe connects Norwegian oil fields in the Ekofisk system to the oil terminal and refinery at Teesside.

Downstream

The UK had 1.7 million bbl/d of refining capacity in January 2013, according to *Oil & Gas Journal*. Essar operates the single-largest refinery in the country, the 272,000-bbl/d Stanlow facility. Other companies with sizeable refining capacity in the UK include ExxonMobil (258,000 bbl/d), Phillips (221,000 bbl/d), and Valero (210,000 bbl/d).

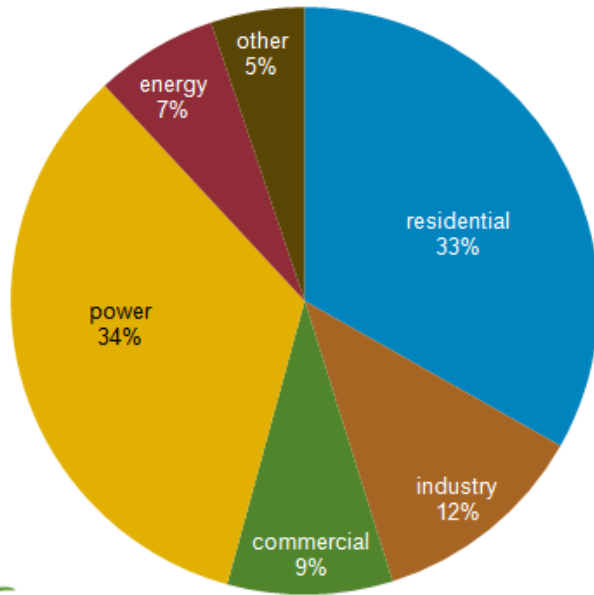
Natural gas

UK's natural gas production has been on a long-term declining trend, but the country continues to produce sizeable natural gas volumes. In 2011, domestic natural gas production was sufficient to satisfy more than half of domestic consumption.

According to *Oil & Gas Journal*, the UK held an estimated 8.7 trillion cubic feet (Tcf) of proven natural gas reserves as of January 2013. Most of these reserves occur in three distinct areas: 1) associated fields in the UKCS; 2) non-associated fields in the Southern Gas Basin, located adjacent to the Dutch sector of the North Sea; and 3) non-associated fields in the Irish Sea. The UK government has encouraged the use of natural gas as a substitute for coal and oil in industrial consumption and electricity production.

Natural gas consumption in the UK reached 2.8 Tcf in 2011, falling about 15 percent compared with the prior year. Preliminary data for 2012 show that natural gas demand fell by nearly 6 percent during the year, mostly driven by the decline in natural gas demand for electric power generation. The largest share (34 percent) of natural gas consumption is for electric power generation. The power sector combined with the residential sector accounted for 67 percent of total natural gas consumption in 2011.

UK's natural gas consumption by sector, 2011

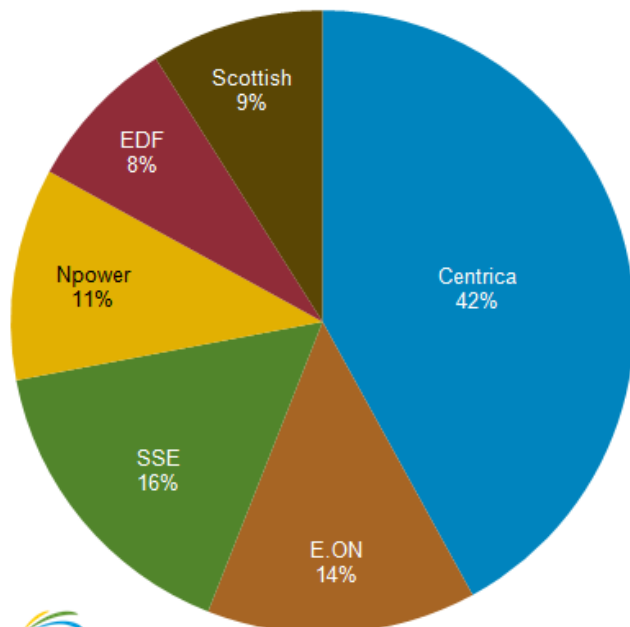


Source: PFC Energy

Sector organization

The UK natural gas sector is fully privatized, including production, transmission, and distribution. The largest gas distributor in the UK is Centrica, a spin-off of the distribution assets of formally state-owned British Gas. The UK gas distribution sector underwent a major change in 2005, when National Grid Gas sold four of the eight gas distribution networks to Scotia Gas Networks, Wales and West Utilities, and Northern Gas Networks. Prior to this sale, National Grid controlled the domestic gas distribution system.

Natural gas distribution market share by company in the UK, 2010



Source: PFC Energy, Ofgem

Exploration and production

The UK produced 1.5 Tcf of dry natural gas in 2011, falling about 5 percent compared with the previous year. During 2011, gross natural gas production totaled 1.7 Tcf. Data published by PFC Energy indicate that UK's gross natural gas production in 2012 was about 15 percent lower than the year prior, the lowest level since 1985. In addition to the long-term declining production trend, natural gas output fell as a result of the Elgin gas leak that affected natural gas production since it occurred in March 2012. According to PFC Energy, UK gross natural gas production totaled 1.5 Tcf in 2012.

The largest concentration of natural gas production in the UK is the Shearwater-Elgin area of the Southern Gas Basin. The area contains five gas fields: Elgin, Franklin, Halley, Scoter, and Shearwater. Most of the leading oil companies in the UK are also the leading natural gas producers, including BP, Shell, and ConocoPhillips.

UK's largest share of natural gas production among all fields and gathering systems comes from the Scottish Area Gas Evacuation (SAGE) system, which produced a total of 246 Bcf in 2011. The SAGE system includes the Atlantic, Beinn, Beryl, Boa, Brae (Central, East, North, South, West), Braemar, Britannia, Brodgar, Caledonia, Callanish, Cromarty, Enoch (UK), Kingfisher, Larch, Maclure, Ness, Nevis, Scott, Skene, Thelma, Tiffany, Toni, and Tullich fields. In addition to SAGE, the Shearwater-Elgin Area Line (SEAL) brought in more than 200 Bcf of natural gas during the year. Producing fields that feed this line include Elgin, Franklin, Glenelg, Halley, Scoter, Shearwater, and Starling.

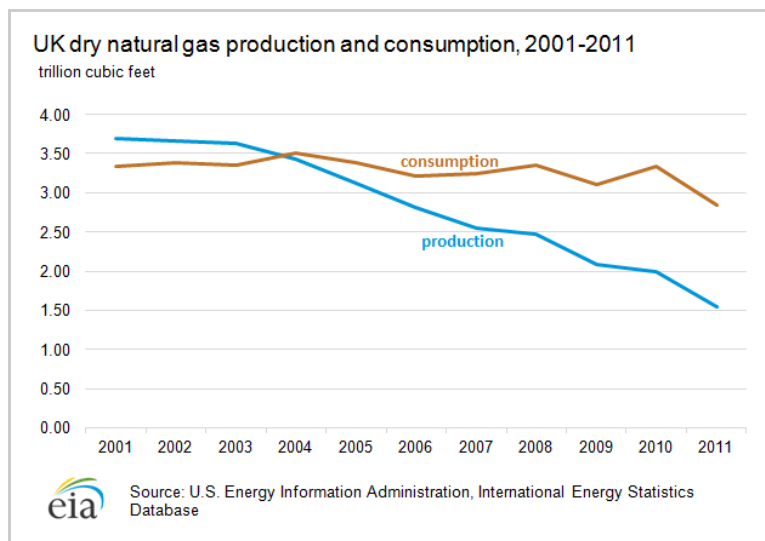
UK's new gas field developments, 2012 and 2013

Field name	Development start date	Operator	Total recoverable reserves (million barrels equivalent)	Total recoverable reserves (Bcf)
Islay UK	Apr-12	Total	17	91
Ensign	May-12	Centrica	18	96
Devenick	Jun-12	BP	60	321
Seven Seas	Jul-12	Centrica	11	59
Breagh	Aug-12	RWE	97	519
Clipper South	Aug-12	RWE	32	171
Rhyl	Sep-12	Centrica	8	43
Jasmine	Dec-12	ConocoPhillips	201	1,075
Katy	Jan-13	ConocoPhillips	12	64
Rochelle	Jan-13	Endeavour Energy	34	182
Kew	Feb-13	Centrica	7	37
York	Mar-13	Centrica	13	70
Arran	Sep-13	Dana	45	241
Greater Stella Area	Sep-13	Ithaca	50	268
Carrack	Nov-13	Shell	9	48

Sancti West	Nov-13	GDF Suez	11	59
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Source: Oil and Gas UK

A number of new fields are expected to be developed in 2013, the majority of them located in the Southern Gas Basin. Of the fields that were developed in 2012, only marginal new natural gas volumes have come online.



UK's largest natural gas producing fields/gathering systems, 2011

Field/system	Billion cubic feet
Scottish Area Gas Evacuation System (SAGE)	246
Shearwater-Elgin Area Line (SEAL)	204
Central Area Transmission System (CATS)	191
St Fergus Frigg (Associated gas)	139
Morecambe South	75
Leman	62
Far North Liquids and Gas System (FLAGS)	48
Caravel	31
Chiswick	30
Sean North & South	27
Lennox	26
Saturn (Atlas, Hyperion, Rhea)	24
Barque	24
Babbage	18

Source: UK's Department Of Energy and Climate Change

Imports and exports

Since domestic production of natural gas peaked in 2000, the UK has become increasingly reliant on imports to satisfy its demand. Initially, the UK imported liquefied natural gas (LNG), but discoveries of natural gas deposits displaced some of the LNG imports.

In 2004, the UK became a net importer of natural gas. The latest data indicate that most of its pipeline imports in 2012 came from Norway (55 percent of total), with additional gas originating in the Netherlands (15 percent) and Belgium (3 percent). LNG imports accounted for 28 percent of the total in 2012, according to PFC Energy data.

The UK also exported some natural gas to Ireland and Belgium, which totaled approximately 0.5 Tcf in 2012.

Liquefied natural gas (LNG)

Currently, the UK has four LNG import terminals. The country's longest-operating LNG terminal is National Grid's Grain LNG terminal on the Isle of Grain. The facility originally became operational in 2005, and following a number of expansions, the terminal can receive and process 1.9 Bcf per day of LNG, according to PFC Energy.

Teesside LNG, operated by the U.S.-based Exxcelerate Energy, commenced commercial operation in February 2007. This was the first dockside regasification port and the second operational LNG facility in the UK. Teesside LNG can deliver up to 400 MMcf per day of natural gas to the UK market.

The Dragon LNG terminal, a collaboration of BG, Petronas, and 4Gas, began operating in September 2009. The import, storage, and regasification terminal is located in Milford Haven in South Wales with a regasification capacity of 580 MMcf per day.

The South Hook LNG terminal, also located in Milford Haven, Wales, is owned and operated by Qatar Petroleum, ExxonMobil, and Total. Europe's largest LNG terminal became commercially operational in October 2009 with an initial capacity of 1.1 Bcf per day. Following the expansion in Phase II, the terminal's capacity has expanded to 2.1 Bcf per day.

In 2011, the UK demand for LNG surpassed that of Spain for the first time, and UK became the largest market for LNG imports in the EU. That year, UK imported a total of 892 Bcf of natural gas. However, in 2012 the UK LNG demand fell behind Spain's at 504 Bcf, according to PFC Energy. LNG imports in 2012 fell as pipeline imports rose, mainly those from Norway, as LNG cargoes were diverted to higher-priced markets in Asia.

[Qatar's](#) LNG dominated UK LNG imports in 2011, at 86 percent of total LNG imports. The remaining volumes came from [Algeria](#), [Egypt](#), and [Nigeria](#). In 2012, the UK relied almost exclusively on Qatari LNG throughout the year, according to PFC Energy.

In March 2013, Centrica signed a 20-year agreement with Cheniere to import LNG from the Sabine Pass LNG facility in Louisiana. Although Cheniere still needs to receive necessary approvals for exports, export volumes would total approximately 85 Bcf of LNG per year and would begin in 2018.

Pipelines

Domestic system

There are four main pipeline systems in the UK that carry natural gas from offshore platforms to coastal landing terminals. The responsibility for transporting natural gas throughout the country once it is brought onshore belongs to the utilities operating in the UK, including National Grid and Scotia Gas Networks.

- The Shearwater-Elgin Area Line (SEAL), operated by Shell, transports gas from the Shearwater-Elgin area to the landing terminal at Bacton, England.
- ExxonMobil operates the 200-mile, 30-inch Scottish Area Gas Evacuation (SAGE), which transports associated natural gas from UKCS fields to the landing terminal at St. Fergus, Scotland.
- The 250-mile, 36-inch Central Area Transmission System (CATS), operated by BP, links fields in the Central North Sea to Teesside.
- Shell operates the 283-mile Far North Liquids and Gas System (FLAGS) linking associated gas deposits in the Brent oil system with St. Fergus.

International pipelines

A consortium of companies operates the Interconnector pipeline between Bacton, England and Zeebrugge, Belgium. The Interconnector, inaugurated in 1998, is capable of bi-directional operation, meaning either it can export natural gas from the UK to continental Europe ("forward mode"), or it can import natural gas into the UK ("reverse mode"). Since it began operating, the Interconnector has mostly operated in forward mode, however during late fall and winter seasons, the pipeline has tended to operate in reverse mode. The pipeline has undergone three phases of expansion, with additional capacity and compression added between 2005 and 2007. The interconnector is currently capable of transporting 2.0 Bcf per day in forward mode and 2.5 Bcf per day in reverse mode.

The UK also imports natural gas through the Frigg pipeline system, operated by Total. Frigg connects the St. Fergus gas terminal with the Frigg gas field in the Norwegian sector of the North Sea. The UK-Eire Interconnector connects the UK with the Ireland, running from Moffat, Scotland to Dublin. On December 1, 2006, the Balgzand-Bacton Line (BBL), the first pipeline to link the Netherlands and the United Kingdom, began operating and supplying the UK with natural gas from the Dutch mainland. The 147-mile pipeline has a capacity of approximately 1.5 Bcf per day.

There are three pipelines connecting the UK with Norway. The Langeled pipeline, which began operating in 2007, is a 729-mile line that can transport approximately 2.5 Bcf per day. This line links Norway's Ormen Lange gas field and Easington, England via the Sleipner Riser platform in the North Sea. The Vesterled pipeline runs between the Heimdal Riser platform in the North Sea and St. Fergus in Scotland. The pipeline can transport up to approximately 1.3 Bcf per day. Finally, the Tampen pipeline that connects the Stratford field to FLAGS can transport up to 880 million cubic feet (MMcf) per day, according to PFC Energy.

Electricity

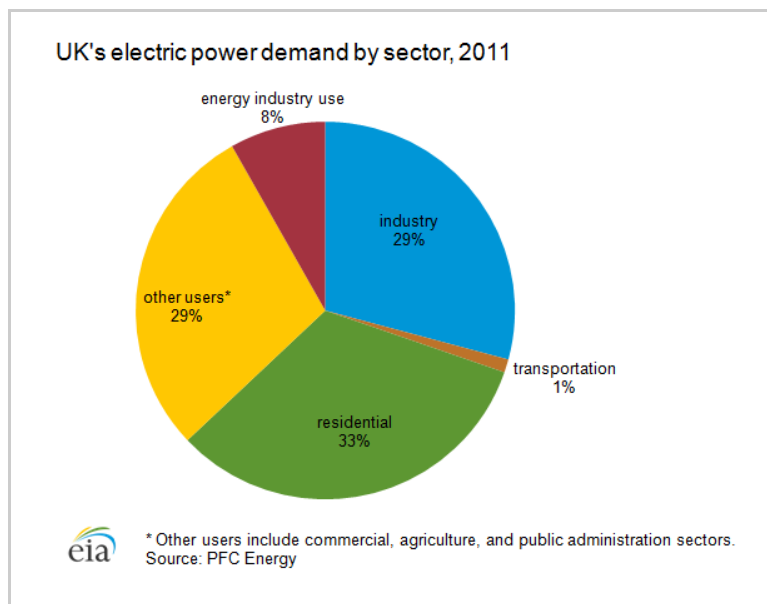
Electricity generation from fossil fuels accounts for the majority of electricity produced in the UK, with coal occupying the top spot among all sources.

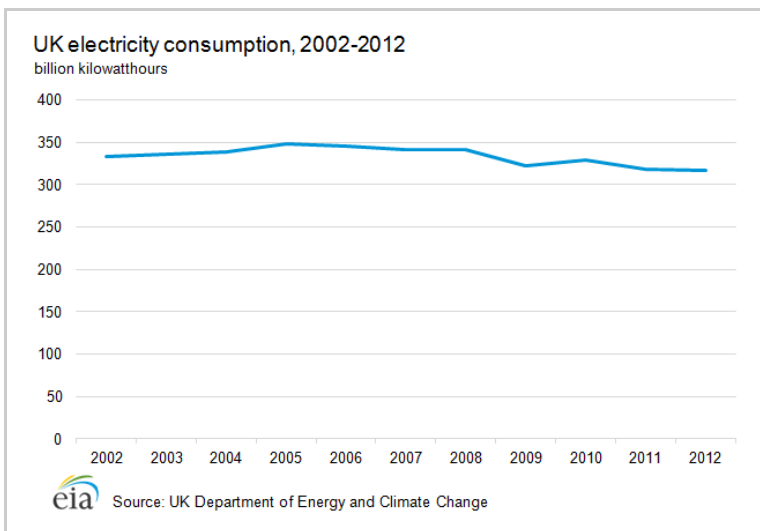
The UK had 93 gigawatts (GW) of installed electricity generation capacity of in 2010. Preliminary data published by the DECC show that in 2012, the UK generated 375 billion kilowatthours (Bkwh) of electricity while consuming 317 Bkwh. This level of consumption was slightly lower than the year before at 318 Bkwh, and it was the lowest consumption level since 1998.

Most electricity generation comes from conventional thermal sources (70 percent), followed by nuclear (19 percent), hydroelectricity (2 percent), and other renewables (9 percent). Based on the latest estimates, the DECC reported in late March that electricity generation in 2012 fell by 1.3 percent compared with the previous year, with coal, nuclear, and wind generation shares increasing year-over-year.

Declining net generation in 2012 led to increases in net imports of electricity, reaching the highest level since 2000, and nearly doubling compared with net electricity imports in 2011. According to the DECC, the increase was driven by imports from the Netherlands via the interconnector, which became fully operational in April 2011.

The industrial sector's share of electricity demand has declined since 2005. This decline was mainly the result of the economy's continued shift toward a service-based economy but also to some extent as a result of improved efficiency. Following the global recession, GDP growth slowed and contributed to further declines in demand, which dropped by 12 percent between 2008 and 2011, according to PFC Energy.





Sector organization

The UK has a privatized electricity sector, where generators and distributors trade electricity in a wholesale power market. The largest power producer in the country is Electricit  de France (EdF) Energy, which controls all of the nuclear power. Other important generating companies include E.ON UK, RWE, Scottish and Southern Energy (SSE), and ScottishPower (SP). National Grid owns and operates the national transmission system in England and Wales; SSE and SP operate the grid in Scotland; and Northern Ireland Electricity (NIE) operates the grid in Northern Ireland.

Fossil fuel generation

Although natural gas-fired power stations were replacing coal as the principle source of the UK power supply for a number of years, this trend seems to be reversing. Coal use for electric power generation increased in 2012, likely due to the relative cost of natural gas in the UK.

Fossil fuel electricity generation plants continue to provide the bulk of the electricity supply in the UK. Most of the fossil fuel generation is powered by coal at 39 percent in 2012. Coal-fired generation in the UK is experiencing somewhat of a comeback, as it overtakes natural gas following years of declining share. Coal-fired generation rose nearly 32 percent in 2012 compared with the previous year, to its highest level since 2006.

Natural gas, which accounted for about 28 percent of total generation in 2012 according to the preliminary data published by the DECC, declined more than 32 percent year-over-year, falling to its lowest level since 1996. Natural gas-fired generation was somewhat displaced by coal and nuclear power.

UK electric power has increasingly relied on combined-cycle natural gas-fired turbines (CCGTs) since they started operating in the 1990s. Although their share rose to 46 percent of total power generation in 2010, this share has since declined, according to PFC Energy. The decline in the use of natural gas for electric power generation is likely due to its relatively high price in the UK, while coal, which is relatively low priced, has regained its top spot among fuels used for electric power.

Oil-fired plants continue to provide only marginal amounts of electricity, accounting for

approximately 1 percent of total generation in 2012. Even at such a low level, oil-fired electricity continues to decline each year as old plants retire and the capacity is replaced by renewable sources.

Nuclear

Currently accounting for about one-fifth of total electricity generation, nuclear power plants are central to the UK government plans for future generation. Much of the additional generating capacity will be filled with new nuclear units.

There are 16 nuclear reactors in the UK, providing approximately 19 percent of the country's total net generation in 2012, an increase of 2 percent compared with 2011. According to World Nuclear Association, all but one of these reactors are scheduled to be retired by 2023.

All of the seven twin-unit plants are operated by EdF Energy, which include seven stations that use advanced, gas-cooled reactors (AGR) and one (Sizewell B) that uses a pressurized-water reactor (PWR). Wylfa, a first-generation magnesium non-oxidizing (Magnox) nuclear power plant, will shut down when its fuel runs out in September 2014.

Operating nuclear units in the UK (2013)

Unit	Type	Capacity	Start	Expected shut-down
Wylfa 1	Magnox	490	1971	2014
Dungeness B 1&2	AGR	2 x 545	1983 & 1985	2018
Hartlepool 1&2	AGR	2 x 595	1983 & 1984	2019
Heysham I-1 & I-2	AGR	2 x 580	1983 & 1984	2019
Heysham II-1 & II-2	AGR	2 x 615	1988	2023
Hinkley Point B 1&2	AGR	2 x 610	1976	2023
Hunterston B 1&2	AGR	2 x 610	1976 & 1977	2023
Torness 1&2	AGR	2 x 625	1988 & 1989	2023
Sizewell B	PWR	1188	1995	2035
Total Capacity		10,038		

Source: World Nuclear Association

In 2008, the UK government announced its support for additional nuclear power plants to meet projected energy needs. According to a series of papers published since 2009, the UK government projects that an additional 60 GW of net generating capacity will be necessary by 2025. Although 35 GW are expected to come from renewable energy, much of the remainder is expected to be fueled by nuclear power.

Since 2008, several utilities have begun planning construction of new power plants. Current policy discussions surrounding nuclear power in the UK include wide-ranging incentives for new nuclear plants, such as feed-in tariff and a carbon floor price. Although feed-in tariffs currently are only available to renewable generation, these mechanisms may be extended to nuclear power and would refer to payments to electricity generators that use nuclear power. In June 2011, the government designated eight sites for the development of nuclear

power stations. Given the pace of new nuclear plant development, the first of the new units is expected to come online in 2018.

Proposed nuclear units in the UK

Company	Site	Type	Capacity (MW gross)	Expected start-up
EdF Energy	Hinkley Point C-1	EPR	1,670	2018
	Hinkley Point C-2	EPR	1,670	2019
EdF Energy	Sizewell C-1	EPR	1,670	2020
	Sizewell C-2	EPR	1,670	2022
NuGeneration	Moorside	AP1000 x3	Up to 3,600	2023
Horizon	Oldbury B	ABWR x 2 or 3	2,760-4,140	2025
	Wylfa B	ABWR x 2 or 3	2,760-4,140	2025
Total Range			15,800-18,560	

Source: World Nuclear Association

Renewables

The UK government has introduced a number of regulations to increase the amount of renewable energy in the country. These regulations call for an increase in the use of renewables to 30 percent of total electricity generation in 2020. While these plans include the use of hydropower, making use of wind resources is central to the government's plans.

Renewables accounted for approximately 11 percent of total generation in 2011, and preliminary data published by the DECC show that the share increased to more than 12 percent in 2012. Much of this increase was driven by wind generation, which rose more than 31 percent year-over-year, mainly due to more favorable wind speeds. On the other hand, hydropower declined in 2012 as a result of the lower average rainfall in the areas dependent on hydroelectricity.

Coal

The UK had an estimated 251 million short tons (MMst) of recoverable coal reserves in 2008. Coal production in the UK has declined steadily and dramatically since the early 1990s, falling to its record low level in 2007. However, since then UK coal production has increased slightly and totaled 20 MMst in 2011.

Decreasing domestic consumption and a surge of low-cost imports have been the principal causes of the production decline. The UK imported 35 MMst in 2011, accounting for more than 64 percent of its total coal consumption (55 MMst). The 2011 imports increased for the first time since 2006, rising by about 22 percent compared with 2010. Of the total coal imports, 17 percent were coking coal, as very limited amounts of coking coal is produced in the UK, according to the DECC.

About 38 percent of the UK coal imports came from Russia, with another 25 percent from Colombia. Coal imports from the United States accounted for about 19 percent of the total.

UK coal imports, 2011 (thousands short tons)

	Steam coal	Coking coal	Anthracite coal	Other solid fuel	Total
Belgium/Luxembourg	129	-	180	36	345
Germany	23	-	-	63	86
Ireland	22	3	7	8	40
Netherlands	180	-	-	7	186
Poland	722	-	-	4	726
Spain	89	-	15	15	120
Sweden	-	-	-	26	26
Australia	-	3,457	-	-	3,457
Canada	-	332	-	-	332
Colombia	8,788	-	-	-	8,788
Norway	216	-	-	-	216
China	-	-	10	-	10
South Africa	683	-	-	-	683
Russia	13,116	233	-	18	13,367
United States	4,801	1,917	-	-	6,717
Other countries	21	56	1	3	82
Total Coal Imports	28,790	5,998	213	181	35,181

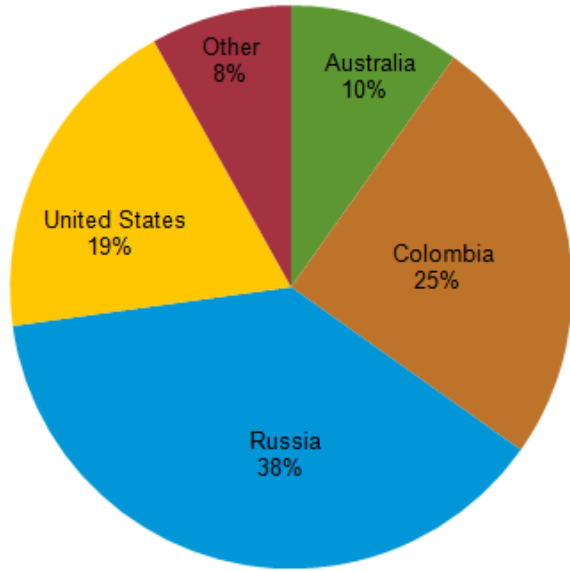
Source: World Nuclear Association


UK coal exports, 2011 (thousands short tons)

	Steam coal	Coking coal	Anthracite coal	Other solid fuel	Total
Belgium/Luxembourg	34	-	42	36	112
Denmark	9	-	-	-	9
Finland	-	-	7	54	61
France	14	-	2	42	58
Germany	94	-	-	212	305
Ireland	267	3	39	29	337
Netherlands	2	-	3	-	6
Poland	12	-	-	-	12
Spain	-	-	-	-	-
Sweden	8	-	1	-	9
Canada	2	-	-	-	2
Norway	-	-	2	-	2
South Africa	54	-	9	53	116
Other countries	7	-	-	86	93
Total Coal Exports	45	1	2	42	90

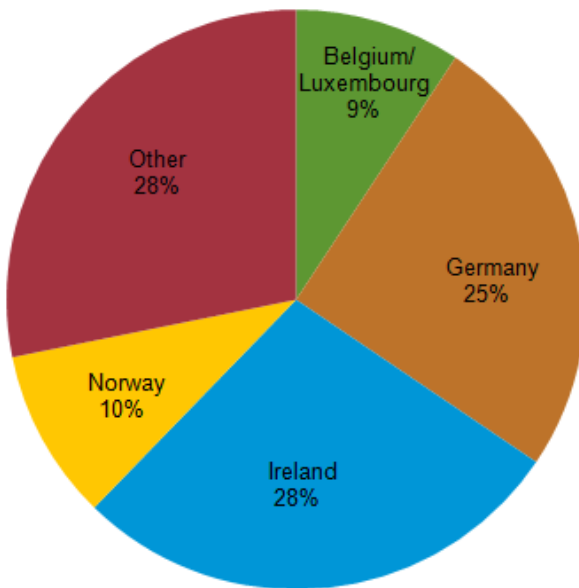
Source: World Nuclear Association


UK coal imports by country, 2011



 Source: United Kingdom's HMRC

UK coal exports by country, 2011



 Source: United Kingdom's HMRC

Notes

- Data presented in the text are the most recent available as of May 14, 2013.
- Data are EIA estimates unless otherwise noted.

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