

COUNTRY ANALYSIS BRIEFS

North Sea

Last Updated: August 2005

Background

The North Sea contains Western Europe's largest oil and natural gas reserves and is one of the world's key non-OPEC producing regions.

Significant North Sea oil and natural gas reserves were discovered in the 1960s. However, the North Sea did not emerge as a key, non-OPEC oil producing area until the 1980s and 1990s, when major projects began coming onstream. Oil and natural gas extraction in the North Sea's inhospitable climate and great depths requires sophisticated offshore technology. Consequently, the region is a relatively high-cost producer, but its political stability and proximity to major European consumer markets have allowed it to play a major role in world oil and natural gas markets.



Although the region will continue to be a sizable crude oil producer, output from its largest producers - the UK and Norway - has essentially plateaued and is projected to begin a long term decline. In the near term, improved oil recovery technologies, continued high oil prices and new projects coming online could temporarily delay declines in North Sea crude oil output. Nonetheless, only new discoveries of sizable volumes could reverse the current downward trend of oil production from the North Sea.

In regards to natural gas, the North Sea is also seen as a mature region. Only Norway has seen an increase in natural gas production in recent years, while the UK will likely become a net gas importer in the midterm. Nevertheless, the North Sea's importance as a key supplier of natural gas will continue, as natural gas consumption in Europe will increase significantly in the future. Imports from outside sources, such as Africa, the Middle East and Russia, will have to increase in order to compensate for North Sea decline.

Oil

Norway and the United Kingdom represent the large majority of oil activities in the North Sea.

According to *Oil and Gas Journal (OGJ)*, the five countries in the North Sea region had 14.8 billion barrels of proven oil reserves in 2005. Norway contains the bulk of these reserves (57 percent), followed by the UK (30 percent). Total oil production for the North Sea region, including on- and offshore, was 5.9 million barrels per day (bbl/d), down 5.6 percent from peak production in 1999. Norway and the UK are the largest producers, though Denmark is also a net exporter.

Exploration and Production

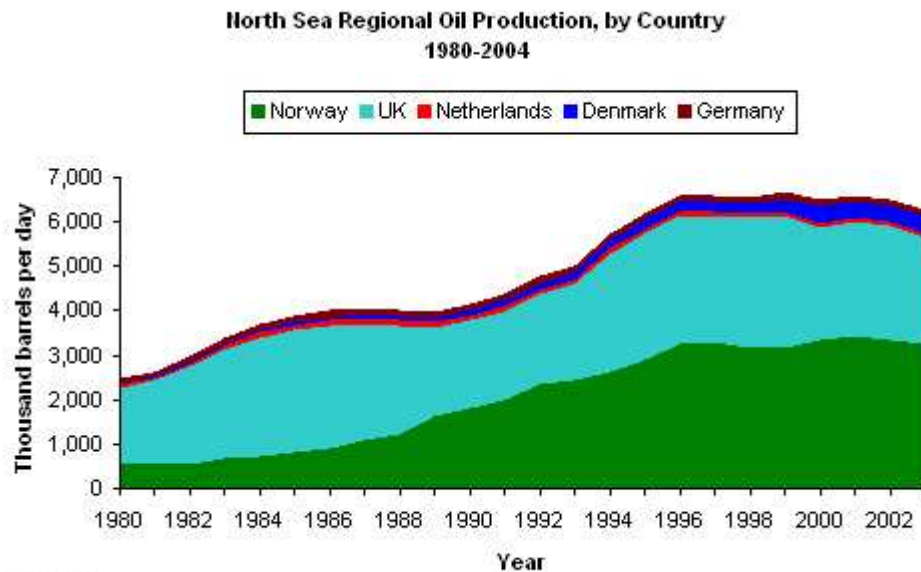
Norway

During the first 6 months of 2005, Norway's oil production averaged 2.95 million bbl/d. The bulk of Norway's oil production occurs in the North Sea, with smaller amounts in the Norwegian Sea. Norwegian oil production rose dramatically from 1980 until the mid-1990s, but has since remained flat.

The largest oil field in Norway is the Troll complex, operated by Norsk Hydro, which produced 306,000 bbl/d in 2004. Other important fields include Ecofisk (ConocoPhillips), Snorre (Statoil), Oseberg (Norsk Hydro), and Draugen (Shell). There is a great emphasis on increasing production from existing projects, including the incorporation of smaller satellite fields. Statoil, for example, plans to bring the Svale and Staer fields online by the end of 2005, a project that will take advantage of existing infrastructure at the Norne field. The company is also developing satellite wells at the Asgard field.

Industry analysts consider the Norway Continental Shelf (NCS) a mature oil producing region. Most of the country's flagship oil fields have peaked, with production remaining flat or declining slightly. For example, the Oseberg complex produced 503,000 bbl/d in 1993, but only 229,000 bbl/d during the first five months of 2005. Companies are still discovering oil in the NCS, but none of the recent finds have been significant. In 2003, the Norwegian Ministry of Petroleum and Energy (MPE) reported that oil companies made eleven new discoveries, potentially holding 189-566 million barrels of oil, far less than what the country produced for the year. There are about 60 oil and natural gas discoveries that are still undeveloped, representing about 4.4 billion barrels of liquids and 16 trillion cubic feet (Tcf) of natural gas. Drilling activity on the NCS in 2004 was the lowest it has been in a decade. At the time, many blamed the low drilling rate on a four-month rig strike; however, during the first half of 2005, the rate of exploratory drilling was similar to that of 2004.

Because Norway shares the North Sea region with the United Kingdom, the two must coordinate efforts when dealing with reserves that straddle the division of each countries' respective zone. In April 2005, the two countries signed a bilateral treaty detailing the handling of such resources. The treaty was the first step toward a general framework for inter-boundary oil projects, as previous projects have been governed by separate, one-time treaties and negotiations.



United Kingdom

Total oil production (including condensates, natural gas liquids, and refinery gain) in the UK was 2.08 million bbl/d in 2004, a 13 percent decrease from 2003 and 30 percent below the peak of production in 1999. The UK Continental Shelf (UKCS), located in the North Sea off the eastern coast of the UK, contains the bulk of the country's oil reserves. Most of the UK crude oil grades are light and sweet (30° to 40° API), which generally makes them attractive to foreign buyers.

The UK government expects oil production in the country to continue to decline, reaching 1.38 million bbl/d by 2009. Reasons for this decline include: 1) the overall maturity of the country's oil fields, 2) the application of new crude oil extraction technologies that lead to field exhaustion at a quicker rate, and 3) increasing costs as production shifts to more remote and inhospitable regions

Denmark

In 2004, Denmark's total oil production was 391,000 bbl/d. Many new fields have come onstream in the past six years, including Halfdan, Siri, and Syd Anre, Nina, Cecilie and Nif, developments which have helped to bolster Denmark's crude oil production.. In July 2004, Danish oil and gas company (DONG) announced that, after completing the CA-3 appraisal well in the Cecilie field, the company found commercial volumes of oil and will proceed with the wells development. Other fields under development include Adda and Boje.

The Netherlands

The Netherlands produced 94,900 bbl/d in 2004. Overall, the Netherlands' oil production has been in decline since 1986, when it peaked at 123,400 bbl/d.

Germany

In 2004, Germany produced 161,500 bbl/d. Most of Germany's oil production is onshore; however, the country does operate a single offshore oil field, Mittelplate, located in the North Sea.

Crude Oil Exports

Norway and the United Kingdom are significant oil exporters, though Denmark is also a small net exporter. Because Norway only consumes a relatively small amount of oil each year, the country is able to export the vast majority of its oil production. In 2003, Norway was the third-largest net oil exporter in the world, behind Saudi Arabia and Russia. The largest single recipient of Norway's exports is the United Kingdom, which imported 814,500 bbl/d from Norway, or 34 percent of Norway's total exports. Other significant destinations included the Netherlands (14 percent), the United States (11 percent), and Germany (9 percent).

The UK has been a net exporter of crude oil since 1981, though the country does import large quantities of oil from Norway. According to the British Department of Trade and Industry (DTI), the largest destinations of crude oil exports in 2003 were the United States (31 percent), the Netherlands (26 percent), France (16 percent), and Germany (14 percent). Much of the crude oil exported to the Netherlands is not actually consumed there, but rather sold at the Rotterdam spot market. In 2004, the UK exported 235,000 bbl/d of crude oil and 134,000 bbl/d of petroleum products to the U.S., contributing 2.3 percent and 4.7 percent to total U.S. crude oil and petroleum product imports, respectively.

Natural Gas

According to *OGJ*, the five countries in the North Sea region had combined, proven natural gas reserves of 169.8 trillion cubic feet (Tcf). Two countries, Norway and the Netherlands, account for over three-fourths of these reserves. On the other hand, the United Kingdom is the largest producer. The North Sea region is an important source of natural gas for Europe, second only to Russia in total exports to the European Union (EU). Natural gas production in the region has increased dramatically since the early 1980s, with a 2003 production level of 9.9 Tcf that was 56 percent above the 1980 level. However, regional natural gas production has begun to flatten, with only Norway adding any significant new capacity in recent years.

Exploration and Production

Norway

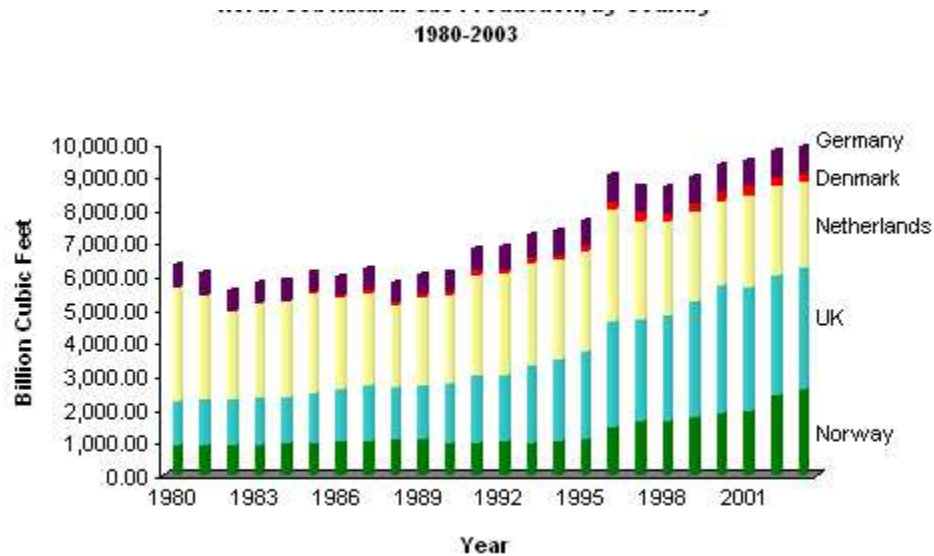
The North Sea holds the majority of Norway's natural gas reserves, but there are also significant quantities in the Norwegian and Barents Seas. Norway is the eighth-largest natural gas producer in the world, producing 2.59 Tcf in 2003. However, because of the country's low domestic consumption, Norway was the world's third-largest net exporter of natural gas in 2003, behind Russia and Canada.

A small group of fields account for the bulk of Norway's total natural gas production. The single largest field is Troll, which produced 930 billion cubic feet (Bcf) in 2004 and represents about one-third of Norway's total natural gas production. Other important fields include Sleipner Ost (450 Bcf), Asgard (360 Bcf), and Oseberg (250 Bcf). These four fields compose over 70 percent of Norway's total gas production.

Despite the maturation of its major natural gas fields in the North Sea, Norway has been able to sustain annual increases in total natural gas production by incorporating new fields. In October 2004, the Kvitebjorn field came onstream with an expected production level of 710 million cubic feet per day (Mmcf/d). Statoil expects to bring the Halten Bank West project onstream in October 2005, which includes estimated reserves of 1.2 Tcf spread among five fields (Kristin, Lavrans, Erlend, Morvin, and Ragnfrid). Over the long term, Norway is counting on non-North Sea projects to provide significant natural gas production, such as Ormen Lange (Norwegian Sea) and Snohvit (Barents Sea).

The North Sea region is the second-largest supplier of natural gas to continental Europe, after Russia.

North Sea Natural Gas Production, by Country



Source: EIA

United Kingdom

Most UK natural gas 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. Since 1997, the UK has been a net exporter of natural gas. However, as is the case with the country's oil reserves, most natural gas fields have already reached a high degree of maturity, and the UK government estimates that the country will again become a net importer of natural gas by the end of the decade. Indicative of this trend, the operators of the Interconnector natural gas pipeline linking the UK and Belgium announced in August 2005 that they would change the flow of the system, exporting gas from the Continent to the UK, rather than importing gas from the UK. In addition, the UK received in 2005 its first shipment of LNG in three decades.

The UK produced 3.6 Tcf of natural gas in 2003, a decrease from the peak of 3.8 Tcf in 2000. The country is the fourth-largest producer of natural gas in the world, behind Russia, the United States, and Canada. The largest concentration of natural gas production in the UK is the Shearwater-Elgin area of the Southern Gas Basin. The area contains five non-associated gas fields, Elgin (Total), Franklin (Total), Halley (Talisman), Scoter (Shell), and Shearwater (Shell). The UK also produces significant amounts of associated natural gas from its oil fields in the UKCS. Like the oil industry, smaller independents have been able to acquire some maturing assets from larger operators, who find it difficult to profitably operate these older, declining fields.

Denmark

Danish natural gas production has steadily increased over the last three decades, reaching 280 Bcf in 2003. More than a quarter of the country's production is re-injected to boost oil production, according to the Danish Energy Authority (DEA).

The Netherlands

In 2003, natural gas production in the Netherlands was 2.6 Tcf. Natural gas production in the country has declined, not due to natural factors, but rather government policy. The Netherlands has passed the Natural Gas Law, which caps natural gas production at 2.68 Tcf per year between 2003-2007, with this ceiling dropping to 2.47 Tcf between 2008-2013. The government made this policy decision to cut back production in order to maintain reserves for future use. According to the Dutch Ministry of Economic Affairs, Dutch natural gas production will continue to remain steady or slightly decline through 2014.

The onshore Groningen field, located in the north-east of the country, accounts for about one-half of total Dutch natural gas production, with remaining production spread across small fields both onshore and in the North Sea. The largest offshore field is K15. Nederlandse Aardolie Maatschappij (NAM), a consortium of ExxonMobil and Royal Dutch Shell, operates both K15 and the Groningen field.

Germany

Germany produced 785 Bcf of natural gas in 2003. Nearly all of Germany's natural gas production is located onshore. The country does have one offshore natural gas field, A6-B4, located in the German sector of North Sea, which began production in 2000. The largest natural gas producer in Germany is BEB, a consortium of Royal Dutch Shell and ExxonMobil, which controls half of the

country's domestic natural gas production.

Liquified Natural Gas (LNG)

Norway has a small LNG terminal located in Tjeldbergodden, with a capacity of only 12,000 tonnes per year (t/y). In 2004, all output from this plant went to Sweden, according to Statistics Norway. On a much larger scale, Statoil plans to construct an LNG export terminal at Melkoya, near Hammerfest. The Melkoya facility, which will be the first, large-scale LNG export terminal in Europe, will consist of an anchored barge with pipeline connections to the Snohvit project. Statoil plans to have the project online by the end of 2006, with an initial capacity of 4.1 million t/y (202 Bcf of natural gas) and a potential expansion to 8.2 million t/y. Most of the output from the Melkoya facility has already been contracted to El Paso for delivery to the United States, with smaller amounts going to Iberdrola in Spain.

The UK has a single LNG import terminal, though there are several in various planning stages. NGT operates the Isle of Grain LNG terminal, a converted natural gas storage facility in southern England. The terminal has a natural gas processing capacity of 470 Mmcf/d, with plans to eventually increase capacity to 1.5 Bcf/d. The terminal received its first delivery of LNG in July 2005 from Algeria.

ExxonMobil and Qatar Petroleum have received regulatory approval for the South Hook LNG receiving terminal in Milton Haven, Wales. The terminal will be dedicated to receiving LNG from the Qatargas II liquefaction project in Ras Laffin, Qatar, which is also a joint project between the two companies. The South Hook LNG project is scheduled to come online by 2007, with an initial capacity of 1.0 Bcf/d and a maximum capacity of 2.1 Bcf/d by 2009. Finally, BG has partnered with Netherlands-based Petroplus and Malaysia-based Petronas to also build an LNG receiving terminal in Milton Haven on the site of an existing natural gas storage facility owned by Petroplus. The companies received regulatory approval from Ofgem in early 2005 for the project, called Dragon. However, the European Commission announced that it would launch an investigation into the project, because Ofgem had granted the Dragon facility a waiver from EU rules requiring that all LNG terminals be open to third-party access. If the project does attain final regulatory approval, Dragon should be completed by the end of 2007 with an initial capacity of 580 Mmcf/d.

There has been discussion concerning the construction of two LNG receiving terminals in the Netherlands, at Eemshaven and Rotterdam, though neither project has progressed beyond the initial planning stages. These LNG terminals would likely facilitate re-exports to the rest of Europe, as the Netherlands is able to meet its own consumption through domestic production. A proposed LNG terminal in Wilhelmshaven, Germany has also been considered.

Links

EIA Links

[EIA - Country Information on Norway](#)
[EIA - Country Analysis Brief on Norway](#)
[EIA - Country Information on the UK](#)
[EIA - Country Analysis Brief on the UK](#)
[EIA - Country Information on the Netherlands](#)
[EIA - Country Information on Denmark](#)
[EIA - Country Information on Germany](#)
[EIA - Country Analysis Brief on Germany](#)

U.S. Government

[CIA World Factbook - Norway](#)
[CIA World Factbook - United Kingdom](#)

[CIA World Factbook - the Netherlands](#)

Associations and Institutions

[International Petroleum Exchange](#)
[United Kingdom Offshore Operators Association](#)
[Netherlands Oil and Gas Exploration and Production Association](#)
[Netherlands Institute of Applied Geoscience](#)
[Wirtschaftsverband Erdoel und Erdgasgewinnung](#)

Foreign Government Agencies

[Norwegian Petroleum Directorate](#)
[Ministry of Petroleum and Energy](#)
[Oil and Natural Gas Exploration and Production Review 2004-2005 \(Supported by the Dutch Ministry of Economic Affairs\)](#)
[Danish Energy Regulatory Authority](#)

[Danish Energy Authority](#)

Oil and Natural Gas

[BP Norway](#)

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[Gastra AS \(Denmark natural gas pipeline grid operator\)](#)

[Hovedstadsregionens Naturgas \(HNG\)](#)

[Maersk Oil](#)

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Sources

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Global Insight

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