



Norway

International energy data and analysis

Last Updated: April 28, 2014 ([Notes](#))

[full report](#)

Overview

Norway is Europe's largest oil producer, the world's third-largest natural gas exporter, and an important supplier of both oil and natural gas to other European countries.

Norway, the largest holder of oil and natural gas reserves in Europe, provides much of the oil and natural gas consumed on the continent. The U.S. Energy Information Administration (EIA) estimates that Norway was the 3rd largest exporter of natural gas in the world after [Russia](#) and [Qatar](#), and the 12th largest net exporter of oil in 2013.

In 2012, crude oil, natural gas, and pipeline transport services accounted for 52% of Norway's exports revenues, 23% of gross domestic product (GDP), and 30% of government revenues, [according to the Norwegian Petroleum Directorate \(NPD\)](#). Norway's oil production peaked in 2001 at 3.4 million barrels per day (bbl/d) and declined to 1.8 million bbl/d in 2013. Natural gas production, on the other hand, increased nearly every year since 1993. Norway experienced a slight decline in natural gas production in 2013 to 3.97 trillion cubic feet (Tcf) from 4.16 Tcf in 2012.

Hydropower is the principal source of Norway's electricity supply, accounting for 97% of total net generation. In June 2012, government officials from Norway, [Germany](#), and the [United Kingdom](#) confirmed their plans for subsea electric power interconnects between their countries to strengthen the northern European electricity grid and increase supply security. The Norwegian state-owned energy system operator, Statnett, will join with the United Kingdom's National Grid to construct the Norway-United Kingdom cable connection, expected to be completed in 2020. Statnett will also cooperate with Germany to build the Norway-Germany cable, expected to be completed in 2018.

The historic agreement between Norway and Russia, which defined their maritime boundaries in the Barents and Arctic Seas and resolved their 40-year old dispute, was fully ratified by both governments in early 2011 and went into effect in July 2011. As a result of the agreement, Norway gained an additional 54,000 square miles of continental shelf, according to the NPD. The agreement requires the two countries to jointly develop oil and

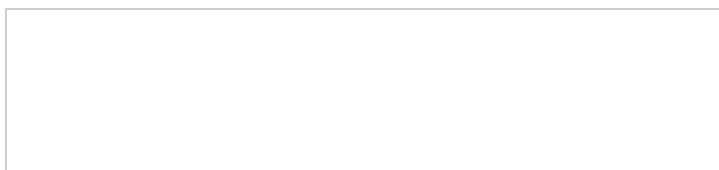
gas deposits that cross over their boundaries, a 109,360 square mile maritime area that straddles their economic zones in the Barents and Arctic Seas.

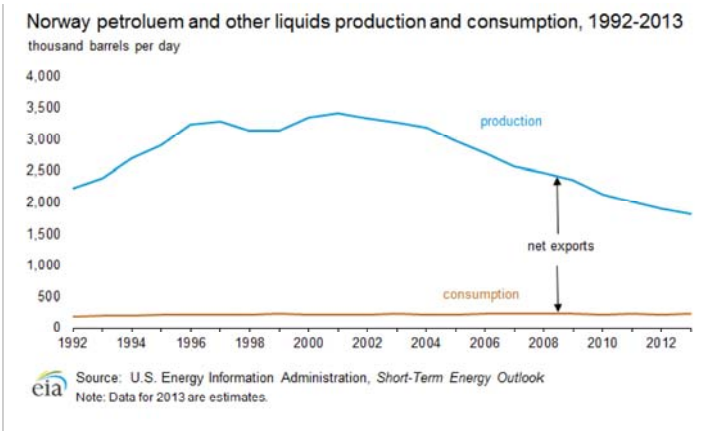


Petroleum and other liquids

Norway is the largest oil producer and exporter in Western Europe.

According to the *Oil & Gas Journal* (OGJ), Norway had 5.83 billion barrels of proven crude oil reserves as of January 1, 2014, the largest oil reserves in Western Europe. All of Norway's oil reserves are located offshore on the Norwegian Continental Shelf (NCS), which is divided into three sections: the North Sea, the Norwegian Sea, and the Barents Sea. The bulk of Norway's oil production occurs in the North Sea, with smaller amounts in the Norwegian Sea. New exploration and production activity is occurring in the Barents Sea.





Sector organization

Norway's Ministry of Petroleum and Energy (MPE) is responsible for overseeing the country's energy resources. The Norwegian Petroleum Directorate (NPD) reports to the MPE as an advisor, manages resources on the NCS, and collects and analyzes data. The largest energy company operating in Norway is Statoil ASA, controlling 70% of Norway's oil and gas production. Statoil ASA was created by the merger of Statoil and Norsk Hydro in October 2007. Norway's government is the largest shareholder of Statoil, owning 67% of the international energy company.

Statoil also has interests in more than 30 other countries. State-owned Petoro manages the commercial aspects of the government's financial interests in petroleum operations and associated activities. Petoro acts as the licensee for production licenses and companies.

International oil majors have a sizable presence in Norway. The Norwegian government's subsidy of oil and gas exploration, introduced in 2005, refunds 78% of the exploration costs to the companies. In addition, taxes from onshore oil activities and from liquefied natural gas (LNG) shipped overseas were reduced, which has attracted additional international investment. The Norwegian government is focused on increasing recovery in producing fields, further exploring producing areas, opening new areas to exploration, as well as developing new subsea technology.

Exploration and production

EIA estimates that in 2013, Norway produced 1.8 million barrels per day (bbl/d) of petroleum and other liquids. Norway's petroleum production has gradually declined since 2001 as oil fields have matured. The NPD expects that production will continue to decline slowly over the next few years, and that in the longer term the number and size of new discoveries will be a critical factor in maintaining production levels. The NPD estimates that the three largest producing oil fields in 2013 were Troll (122,000 bbl/d), Ekofisk (110,000 bbl/d), and Grane (95,000 bbl/d).

According to [Statistics Norway](#), total investments in oil and gas extraction and pipeline transport in 2013 were \$34.6 billion, \$0.6 billion higher than in 2012.

Barents Sea

Goliat is the first oil field to be developed in the Barents Sea. Discovered in 2000, it is about 45 nautical miles offshore the town of Hammerfest, which will be its land base. Goliat's oil reserves are estimated at 174 million barrels in two separate reservoirs, both with an overlying natural gas cap, and with low pressures in the reservoirs that require gas to be reinjected. The estimated gas reserves are 282 billion cubic feet (Bcf). In May 2009, the Norwegian government approved the plan for development and operation of the Goliat oil field by licensees Eni (65%) and Statoil (35%). Construction is currently underway. Production at Goliat is expected to begin in the fall of 2014. The field is expected to reach peak oil production of 93,000 bbl/d by the second year of production and decline rapidly thereafter. Gas production will reach its peak of 45.9 Bcf after the first year of production.

In April 2011, it was reported that Statoil and its partners Eni Norge and Petoro struck oil and gas at the Skrugard prospect in the Barents Sea. This discovery was one of Norway's largest in recent years. In January 2012, the Havis field was discovered in the same license block. Skrugard and Havis together, renamed the Johan Castberg field, hold between 400 and 600 million barrels of recoverable reserves. Statoil announced that it hopes to begin Skrugard production in 2018. Skrugard is located about 130 nautical miles from the coast and well north of the Goliat and Snovit fields.

North Sea

The Norwegian Parliament approved joint development and operating plans in June 2012 for Lundin's Edvard Grieg oil and gas field and Det Norske's Ivar Aasen Field (formerly called Draupne). Estimated to hold 186 million barrels of oil equivalent, Edvard Grieg is scheduled to come onstream in the fourth quarter of 2015 and produce 100,000 bbl/d of oil at its peak production. The nearby Ivar Aasen field, estimated to have 150 million barrels of recoverable oil, will be tied into Edvard Grieg and begin producing oil in the fourth quarter of 2016.

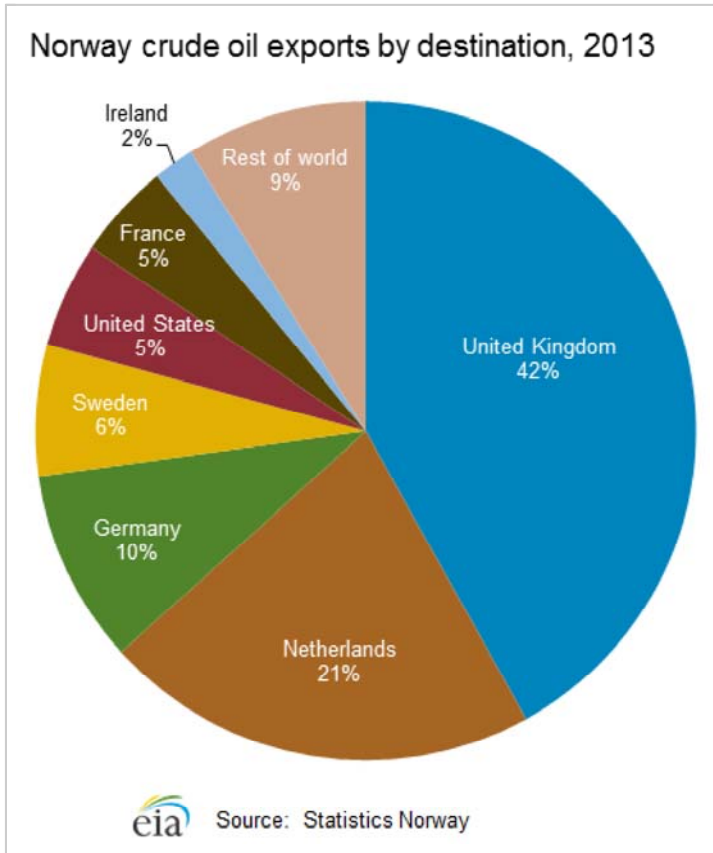
The Johan Sverdrup oil field was the largest oil discovery in the world in 2011, with reserves estimated at between 1.8 and 2.9 billion barrels of recoverable oil. It is located 75 nautical miles west of Stavanger in the North Sea. Johan Sverdrup was initially believed to consist of two fields four miles apart: Avaldnes, discovered by Lundin in 2010, and Aldous, discovered by Statoil in 2011. Further exploration activities revealed they constitute one giant field, renamed Johan Sverdrup in 2012, when a cooperation agreement was signed between the field partners naming Statoil the operator. Partners also include Maersk, Petoro, and Det Norske. The field is expected to be a new stand-alone processing and transport hub, with production starting in 2019, eventually reaching a peak of 550,000-650,000 bbl/d, accounting for 25% of the forecasted production from the NCS.

Exploration interest in the NCS remains strong on the part of major international oil companies. In February 2014, Norway announced that it will offer 61 blocks for oil and gas exploration for its 23rd licensing round on the NCS. Of the 61 blocks, 54 will be in the Barents Sea and 7 will be in the Norwegian Sea.

Oil exports

According to Statistics Norway, Norway exported an estimated 1.19 million bbl/d of crude oil in 2013, of which 92% went to European Organization for Economic Cooperation and

Development (OECD) countries. The top five importers of Norwegian crude in 2013 were the United Kingdom (42%), the Netherlands (21%), Germany (10%), Sweden (6%), and the United States (5%).



Pipelines

Norway has an extensive network of subsea oil pipelines, including eight major domestic oil pipelines with a total capacity of just under 2 million bbl/d. The pipelines connect offshore oilfields with onshore processing terminals, according to the NPD. There are many smaller pipelines that connect North Sea fields to either the Oseberg Transport System or the Troll I and II pipeline systems. Remaining offshore production is brought ashore via shuttle tanker.

International oil pipeline

ConocoPhillips operates the 913,000 bbl/d capacity subsea Norpipe, which connects Norwegian oil fields in the Ekofisk system (as well as associated fields in both Norwegian and United Kingdom waters) to the oil terminal and refinery at Teesside, England.

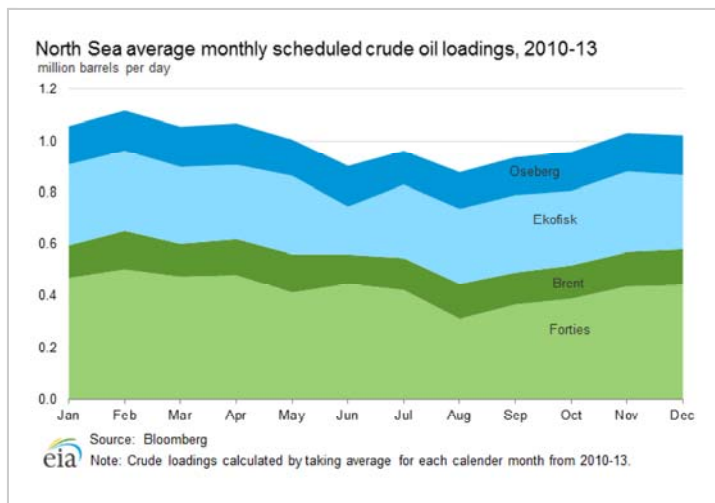
North Sea Brent crude

North Sea Brent, the most widely used global crude pricing benchmark, comprises of four crude production streams: Brent, Forties, Ekofisk, and Oseberg. The Brent and Forties crude streams are produced offshore in the waters of the United Kingdom, and the Ekofisk and Oseberg crude streams are produced offshore in the waters of Norway. From 2010 to 2013,

North Sea Brent crude oil loadings averaged 1 million bbl/d, of which the two Norwegian crude streams accounted for roughly 44%. Loadings of these four crude streams have been generally declining over the past five years, with the exception of Forties crude, which grew 7% from 2012 to 2013. In the beginning of 2014, there were discussions (primarily by the pricing agency Platts) to change the way the Brent benchmark is priced by potentially adding crude streams outside of the North Sea if new Norwegian production coming online in future years is not significant. Dwindling production raises the concern that supply shocks to the four crude streams could increase price volatility of the world benchmark. Even though the benchmark itself accounts for only a small portion of total world crude production, it remains a key indicator for world crude oil pricing.

Although crude production has been declining in the Ekofisk and Oseberg fields, the NPD is looking to improve recovery in these mature fields based on the estimated amount of resources still remaining. The NPD estimates that while 2.8 billion barrels of crude have been produced from the Ekofisk field since production began, there are still 820 million barrels of remaining reserves in the field, with potentially 3.6 billion more barrels of oil resources (not-yet economically recoverable oil) remaining after the planned, permanent shutdown of the field. Likewise, the NPD estimates that 2.3 billion barrels of crude have been produced from the Oseberg field since production began, with 142 million barrels of remaining reserves in the field and potentially 1.4 billion more barrels of oil resources that will remain after the planned, permanent shutdown.

Ekofisk and Oseberg production is typically reduced during the beginning of summer every few years as offshore production platforms undergo maintenance. From 2010 to 2013, Ekofisk, crude oil loadings in June have averaged 187,000 bbl/d, a decline of 117,000 bbl/d from the average in May. The smaller crude stream from Oseberg also undergoes maintenance during the summer months, but the reduction is not as great as that of Ekofisk production.



Refining

According to OGJ, Norway had 319,000 bbl/d of crude oil refining capacity as of December 2013. The country has two major refining facilities: the 116,000 bbl/d Slagen plant, operated

by ExxonMobil, and the 203,000 bbl/d Mongstad plant, operated by Statoil. Norway is an important supplier of gasoline and diesel fuel to the European Union (EU), as the production of these fuels at the Mongstad plant complies with stringent EU environmental rules. Statoil dominates the retail products market in Norway, and the company has also expanded into other European markets. The port of Mongstad is the largest port in Norway measured by tonnage.

Natural gas

Norway is the world's third-largest exporter of natural gas after Russia and Qatar, and, as of 2012, Norway was the sixth-largest dry natural gas producer.

According to OGJ, Norway had 74 trillion cubic feet (Tcf) of proven natural gas reserves as of January 1, 2014. Despite maturing major natural gas fields in the North Sea, Norway has been able to sustain increases nearly every year in total natural gas production since 1993 by continuing to develop new fields.

Sector organization

As is the case with the oil sector, Statoil dominates natural gas production in Norway. A number of international oil and gas companies, including ExxonMobil, ConocoPhillips, Total, Shell, and Eni, have a sizable presence in the natural gas and oil sectors in partnership with Statoil. State-owned Gassco is responsible for administering the natural gas pipeline network. The company also manages Gassled, the network of international pipelines and receiving terminals that exports Norway's natural gas production to the United Kingdom and continental Europe.

Production and development

EIA estimates Norway produced 3.97 Tcf of dry natural gas in 2013, down 0.19 Tcf from 2012. This is the second time natural gas production has declined year-over-year since 1993. The first decline occurred in 2011 as a result of what the NPD assessed to be largely market-driven forces.

Norway's [largest producing natural gas field](#) is Troll, which according to estimates from the NPD produced 1.05 Tcf in 2013, representing about 27% of Norway's total natural gas production that year. The three other largest producing fields in 2013 were Ormen Lange (0.76 Tcf), Asgard (0.34 Tcf), and Kvitebjorn (0.24 Tcf). These four fields accounted for just over 60% of Norway's total dry natural gas production in 2013.

The Gjoa oil and gas field, developed by Statoil and GDF Suez, began production in January 2011. Located in the North Sea, Gjoa is estimated to have produced 24,000 bbl/d of oil and 0.10 Tcf in 2013. The gas is transported directly via pipeline to St. Fergus, Scotland. The oil is transported to the Mongstad refinery through the Troll II pipeline. Aker Solutions, an oil services company headquartered in Norway, constructed a floating production platform for the Gjoa field. For the first time in the offshore oil and gas industry, the floating platform is

fully powered by electricity from the mainland using a 60-mile long subsea cable. The Gjoa platform opens a new area in the North Sea for production, and its infrastructure will be a hub for future developments.

Statoil was a partner with Total in Gazprom's development of the Shtokman natural gas and condensate field in the Barents Sea, 342 miles offshore Russia. Reserves have been estimated at nearly 140 Tcf. Phase 1 of field development is projected to provide annual production of 837 Bcf per year (Bcf/y). However, in 2012, Phase I of the project was indefinitely delayed largely because of technical and cost challenges. Soon after that announcement, Statoil sold its stake in the project back to Gazprom. No further announcements have been made about plans to develop the Shtokman field in the near future.

Exports

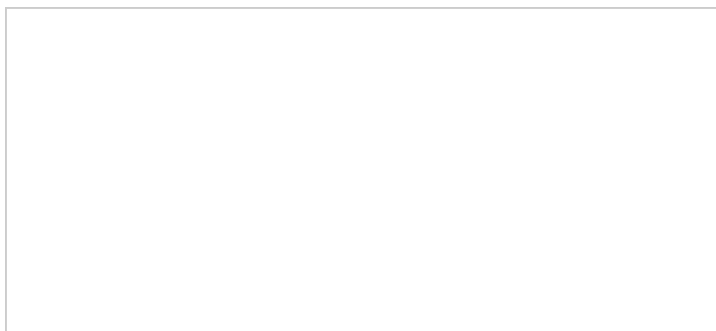
EIA estimates Norway exported an estimated 3.8 Tcf of natural gas in 2013, 96% of its production. Most of the natural gas was transported to other European countries via its extensive export pipeline infrastructure, and a small fraction was exported via LNG tanker. Norway is the 2nd largest supplier of natural gas to the EU, behind Russia, supplying about 21% of Europe's total gas demand in 2013. According to preliminary data from Statistics Norway, the largest [importers](#) of Norway's natural gas exports, as of 2013, were the United Kingdom, Germany, France, the Netherlands, Belgium, and Italy.

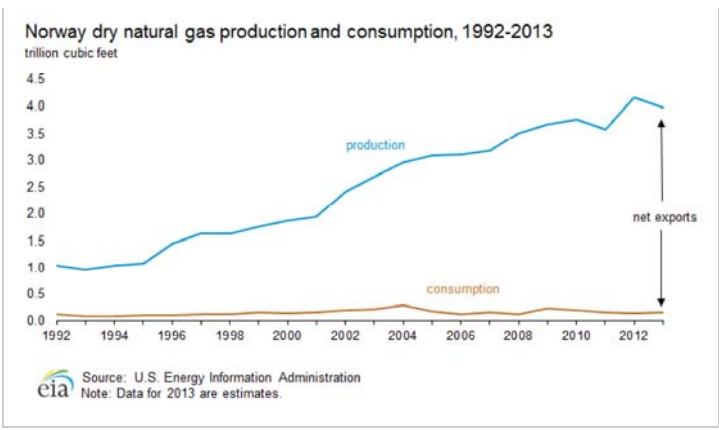
International gas pipelines

Norway operates several important natural gas pipelines that connect directly with other European countries, specifically France, the United Kingdom, Belgium, and Germany.

- Franpipe, with a capacity of 709 Bcf/y, exports gas to Dunkirk, France.
- Zeepipe I, IIA, and IIB have a total capacity of 2,435 Bcf/y and transport gas to Zeebrugge, Belgium.
- Europipe I and II, with a total capacity of 1,507 Bcf/y, export to Dornum, Germany.
- Norpipe, with a total capacity of 412 Bcf/y, runs to Emden, Germany.
- Vesterled, capacity 502 Bcf/y, links to St. Fergus, Scotland.
- Langed, capacity 928 Bcf/y, links to Easington on the east coast of England.

These pipelines are all operated by Gassco. Some pipelines run directly from Norway's major North Sea production facilities to Gassco-owned processing facilities in the receiving country. Other pipelines connect Norway's onshore processing facilities to other European markets.



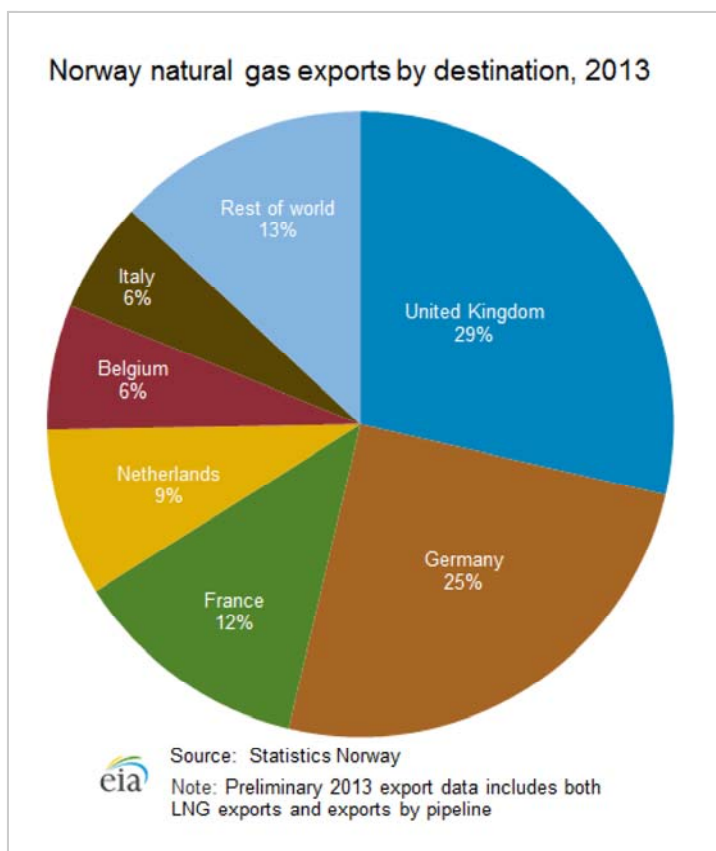


Liquefied natural gas (LNG)

According to the NPD and BP Statistical Review of World Energy 2013, shipments of Norwegian LNG in 2012 totaled 166 Bcf, up from 150 Bcf in 2011. European and Eurasian countries in 2012 received about 65% of Norway's LNG exports, most of which were exported to Spain.

Norway became an LNG exporter in 2007 with the beginning of commercial production from the Snohvit gas field, Norway's first natural gas development in the Barents Sea. Statoil

operates an LNG export terminal and liquefaction facility at Melkoya, near Hammerfest. The Melkoya facility, the first large-scale LNG export terminal in Europe, has a capacity of about 200 Bcf/y and is connected by pipeline with the Snohvit gas field. The Snohvit field is estimated to have produced 0.15 Tcf in 2013. The Melkoya facility is producing at full capacity, and Statoil was considering expanding the export capacity at the facility. However, in late 2012, Statoil announced that its partners would not continue work on a capacity increase at the Melkoya facility because gas discoveries at that point did not warrant further expansion. Instead, the focus will be on upgrading the existing LNG terminal at the Melkoya facility.



Electricity

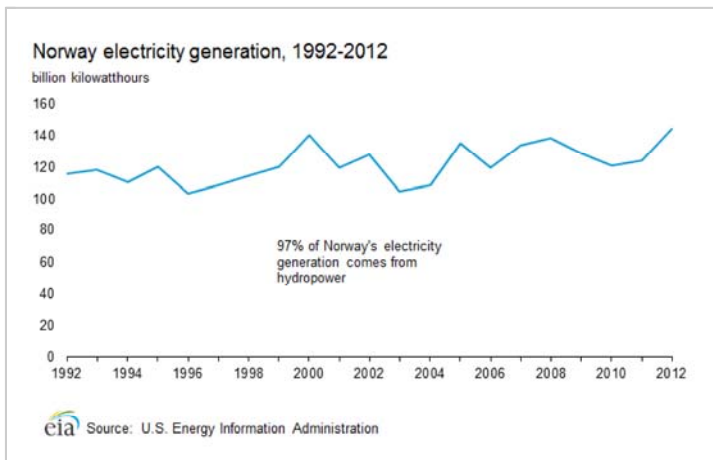
Hydropower accounts for 97% of the electricity produced in Norway.

Electricity generation in Norway in 2012 reached an all-time high of 145 billion kilowatthours (BkWh), of which 140 BkWh came from hydropower. According to Statistics Norway, [total net energy consumption](#) in 2012 was 117 BkWh, 2% higher than in 2011.

About 97% of all electricity generation in Norway comes from hydropower. The remainder is generated from fossil fuels and other renewables including wind and biomass. The largest renewable energy power generator in Europe is Statkraft, which is owned by the Norwegian state and is a major supplier of hydropower. Norway's electric grid is owned and operated by Statnett. Statnett is responsible for ensuring the reliability and efficiency of the electric grid

and for balancing electricity supply and demand. The company is owned by the Norwegian state and its revenues are regulated by the Norwegian Water Resources and Energy Directorate under the Ministry of Petroleum and Energy.

In the 1990s, Norway, Sweden, Finland, and Denmark integrated their electricity markets into a single market for the Nordic region. In 2008, a 0.7 gigawatt capacity subsea power cable allowing trade between Norway and the Netherlands began operating. In addition, there are plans to build subsea power cables connecting Norway to the United Kingdom and to Germany, both with transmission capacities of 1.4 gigawatts. Statistics Norway estimates that in 2013, Norway exported a total of 15.1 BkWh of electricity. The four countries that imported electricity from Norway were Sweden (54%), the Netherlands (28%), Denmark (17%), and Finland (1%).



Notes

- Data presented in the text are the most recent available as of April 28, 2014.
- Data are EIA estimates unless otherwise noted.

Sources

- Barents Observer
- BP Statistical Review of World Energy 2013
- Cedigaz
- Eni
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- International Energy Agency (IEA)
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