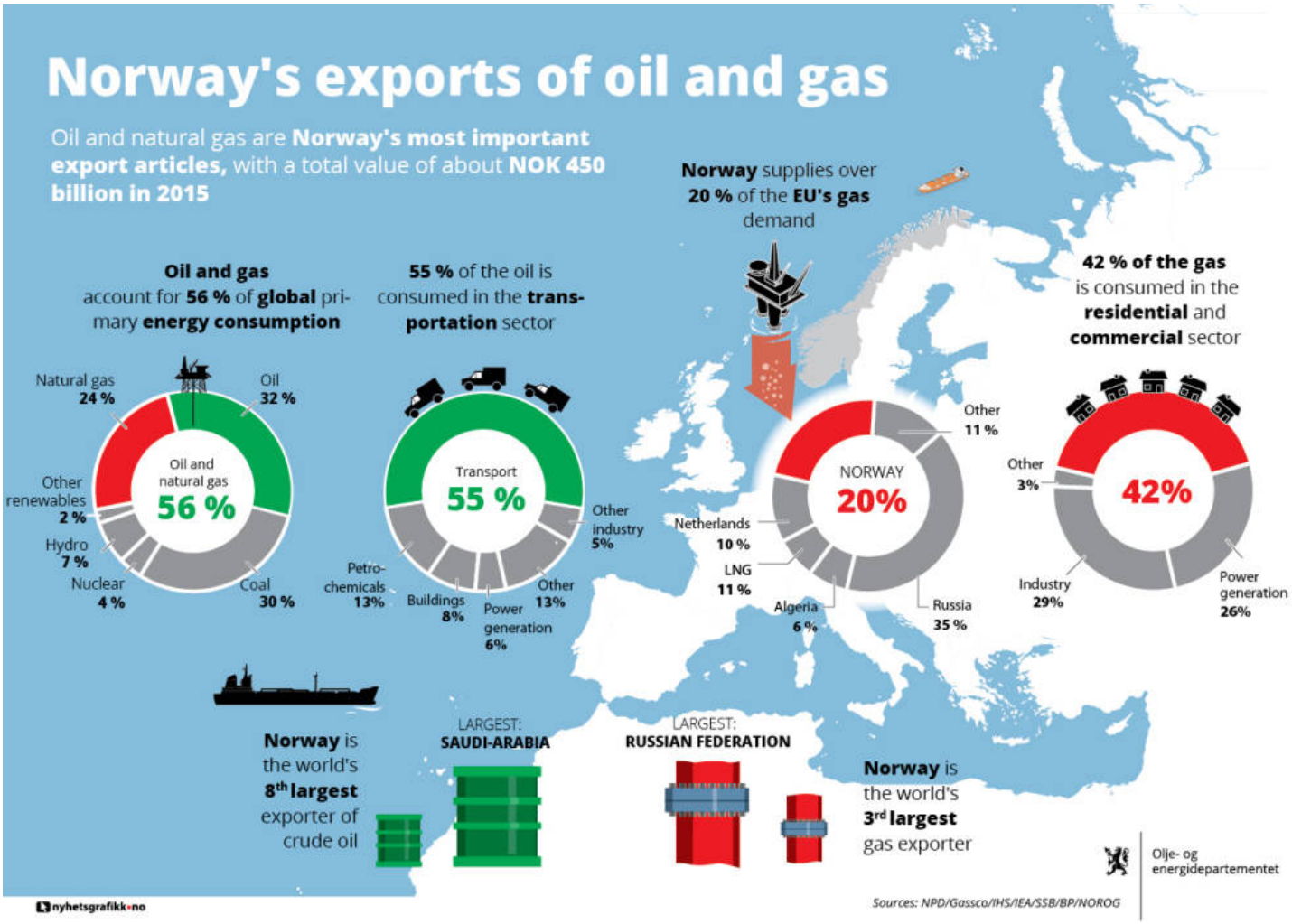
NORWEGIAN PETROLEUM

The export value of crude oil and natural gas in 2015 was about NOK 450 billion, or approximately 40 % of the total value of Norway's exports. Norway exported more gas in 2015 than ever before, 114 billion standard cubic metres (Sm^3) in all. Gas accounted for the largest proportion of total export value for petroleum.

OVERALL EXPORTS

Norway is an important supplier of oil and gas to the global market, and almost all oil and gas produced on the Norwegian shelf is exported. Company and government revenues from sales of oil and gas have played a crucial role in creating modern Norwegian society.

NORWAY'S EXPORTS OF OIL AND GAS



All licensees on the Norwegian shelf are responsible for selling the oil and gas they produce. The only exception is Statoil, which in addition is responsible for selling the government share of its oil and gas production (the SDFI share). This responsibility is set out in governmental instructions to Statoil.

Oil is a global commodity that is sold and delivered to most parts of the world. In contrast, there have historically been geographically separate regional gas markets. Almost all Norwegian gas is transported via a network of subsea pipelines to other European countries, while about 5 % is exported as liquefied natural gas (LNG). This is transported by ship from the Melkøya facility in Finnmark.

What is produced on the Norwegian shelf?

The production (wellstream) from different reservoirs contains oil, gas and water in various combinations. To get marketable products, the production from the reservois must be separated and treated. The production from different reservoirs varies from oil with low gas content to almost dry gas (methane with only small amounts of other gases).

Crude oil is a fluid that is a combination of different types of hydrocarbons. The composition varies from field to field. The quality of the oil depends on several factors, for example how much and which substances, such as wax and sulpher, it contains. The composition also determines how light or heavy (viscous) the oil is.

Rich gas, or crude natural gas, is a mixture of various gases. When necessary, the gas is separated from the oil before the rich gas is treated in a processing facility that separates the dry and wet gas components. Dry gas is often referred to as natural gas, and consists mainly of methane.Wet gas, or NGL (Natural Gas Liquids) as often referred to, consists of a mixure of heavier gases such as ethane, propane and butane. There is a gradual transition between the heaviest gas components which are called naphtha and condensate, and oil. Similar for them all is that they are liquid at room temperature, and are often mixed in, and sold as oil.

Not all gas that is produced is sold. Some of the gas is used to generate power on the fields, and small amounts are flared for safety purposes. On some fields, gas is reinjected into the reservoirs. Reinjection is often used to maintain reservoir pressure and displace the oil. This results in efficient recovery of the oil, and the gas is stored for possible recovery in the future.

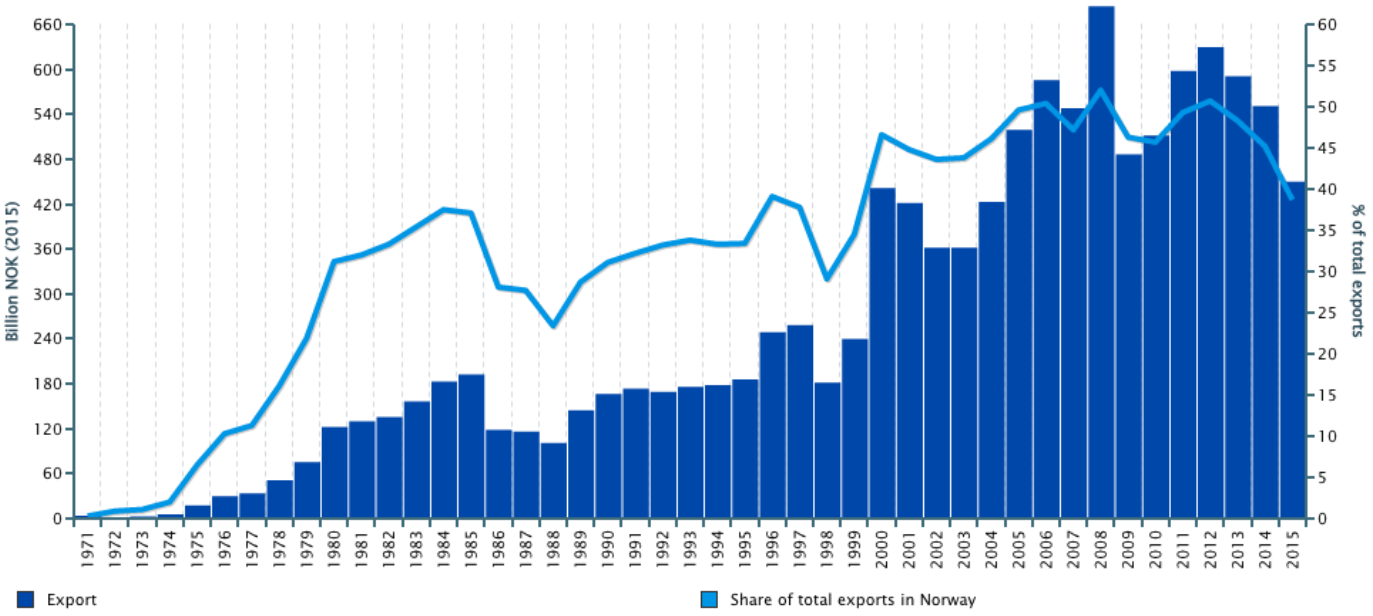
In addition to the export value of crude oil, natural gas, natural gas liquids (NGL) and condensate, the Norwegian service and supply industry has a high international turnover. You can read more about their exports of goods and services in the article about the service and supply industry.

The total export value of crude oil and natural gas in 2015 was about NOK 450 billion, or approximately 40 % of the total value of Norway's exports.

EXPORT VALUE OF CRUDE OIL AND NATURAL GAS IN NORWAY, 1971-2015

Updated: 22.02.2016

Source: Statistics Norway, Ministry of Finance



EXPORTS OF OIL, CONDENSATE AND NGL

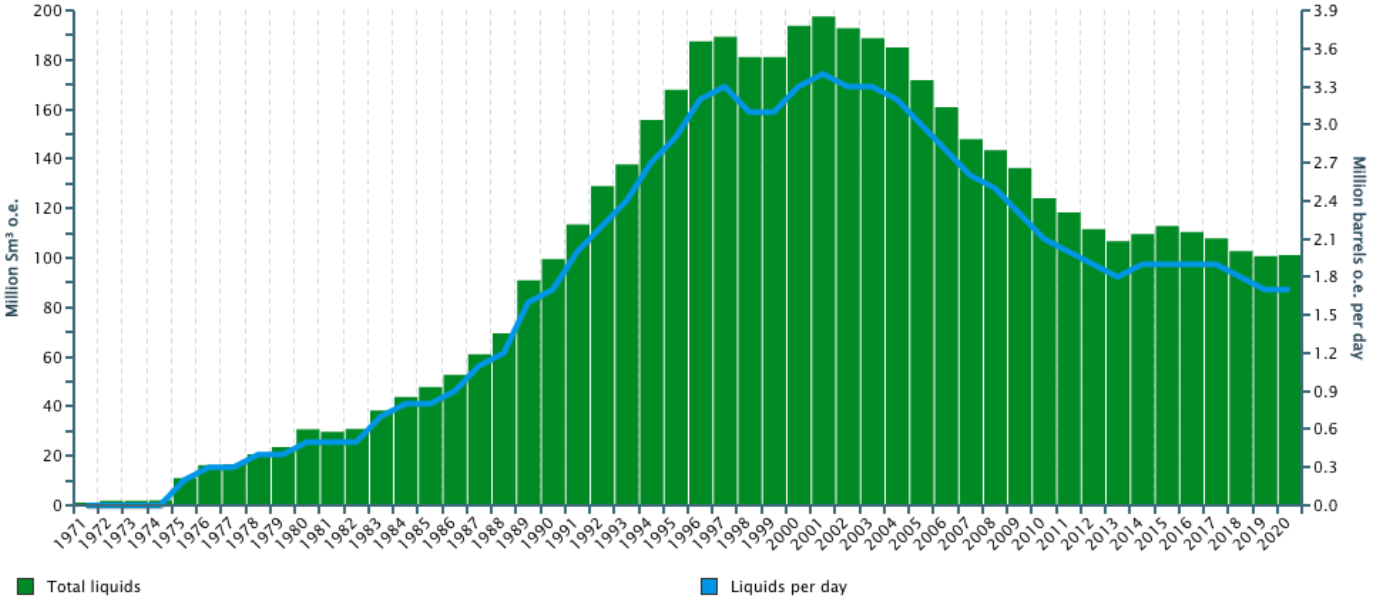
Norwegian oil production reached a peak in 2001, when total liquid production, including NGL and condensate, was 3.4 million barrels of oil equivalents a day, and then declined until 2013. However, in 2014 and 2015 oil production on the Norwegian shelf has risen again, and Norway now supplies about 2 % of global oil consumption.

What is a barrel of oil?

The barrel is a standard unit of measurement in oil markets. It dates back to the mid-1800s, when all kinds of goods were stored and transported in wooden barrels. The size of the barrel as a unit of measurement today is the same as that used in the earliest days of the oil industry, 42 US gallons, which corresponds to 159 litres or about 6.29 Sm^3.

HISTORICAL AND EXPECTED PRODUCTION IN NORWAY, 1971-2020

Source: Norwegian Petroleum Directorate



In 2015, Norway exported about 75 million Sm^3 of crude oil directly to other countries in Europe, and 20 million Sm^3 was delivered to onshore facilities in Norway. Crude oil purchasers are mainly refineries, which process the oil to produce fuel and other oil products.

The tables below show sales of oil, NGL and condensate in 2015, by first delivery point.

NORWEGIAN OIL DELIVERIES IN 2015, BY FIRST DELIVERY POINT

Updated: 10.05.2016

Source: Norwegian Petroleum Directorate

First delivery point/country	% of total	Volume (Mill. Sm³)
Canada	0.7	0.7
Denmark	3.1	2.9
France	4.6	4.3
Germany	8.3	7.8
Ireland	3.1	2.9
Martinique	0.9	0.9
Norway	19.9	18.8
Other	2.9	2.6
Spain	1.3	1.2
Sweden	5.5	5.2
The Netherlands	21.1	20.0
United Kingdom	27.3	25.7
USA	1.3	1.3

Arctic Princess at the LNG facility on Melkøya. Photo: Harald Pettersen, Statoil

SALE OF NGL AND CONDENSATE IN 2015, BY FIRST RECEIVING COUNTRY

Updated: 10.03.2016

Source: Norwegian Petroleum Directorate

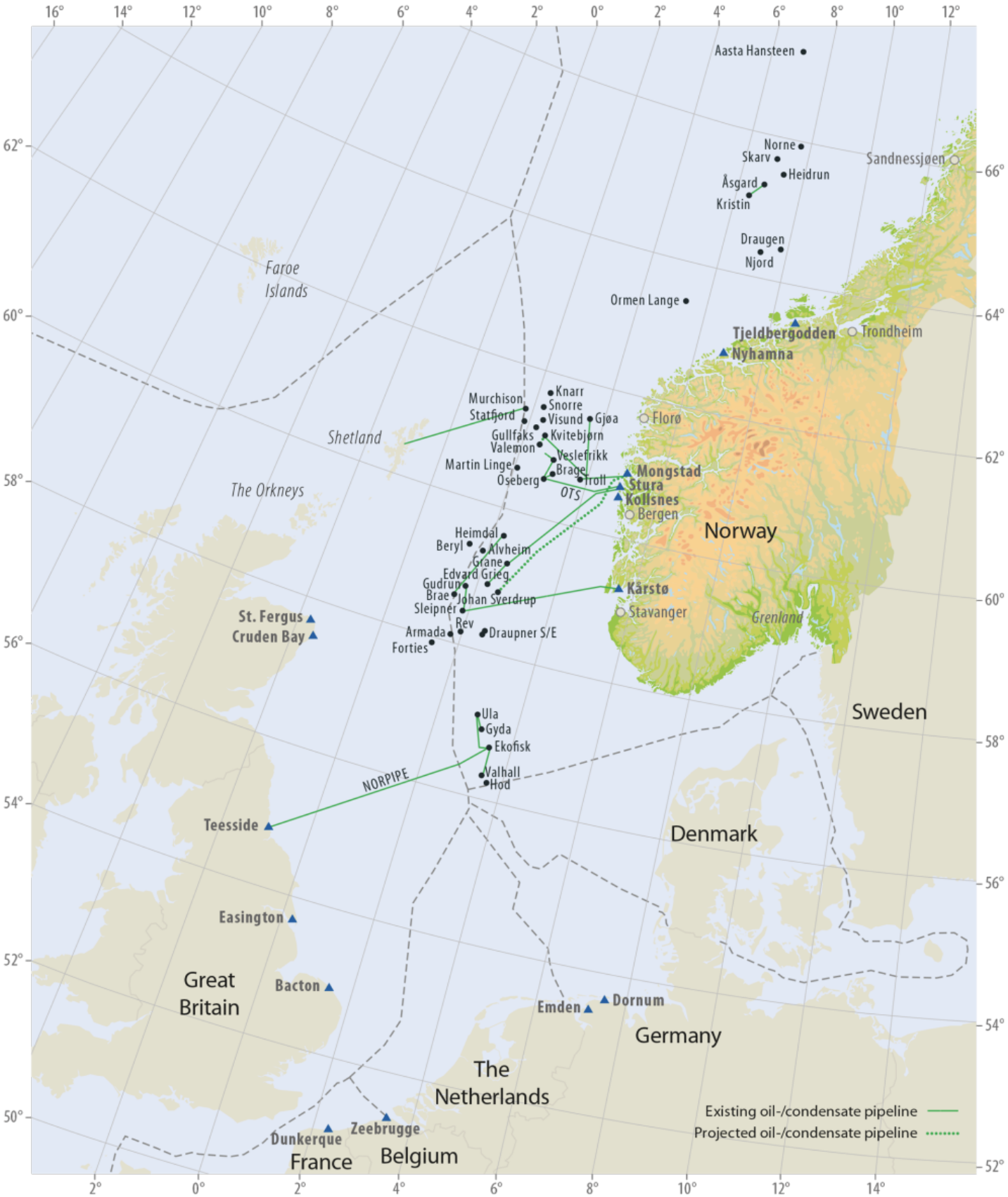
First delivery point/country	% of total	Volumes (mill. Sm^3)
Belgium	8.5	1.7
Denmark	3.1	0.6
France	6.7	1.4
Germany	3.1	0.6
Norway	28.7	5.9
Other	4.4	0.9
Portugal	1.3	0.3
Sweden	6.8	1.4
The Netherlands	18.9	3.9
Turkey	2.9	0.6
United Kingdom	15.6	3.2

Transport of crude oil

Oil is transported from fields on the Norwegian shelf by tanker or pipeline to delivery points on land. In 2015, 20 % of Norwegian crude oil production was transported to land by pipeline, and 80 % by tanker.

OIL PIPELINES ON THE NORWEGIAN SHELF

Source: Norwegian Petroleum Directorate



Oil is transported from most fields on the Norwegian shelf to the markets using shuttle tankers. These are specialised tankers that take on oil via offshore loading buoys on the oil fields. Oil platforms often have limited storage capacity, and regular calls by shuttle tankers are needed to avoid stoppages because of capacity problems. Shuttle tankers are mainly used for relatively short transport distances, and most Norwegian oil is therefore delivered to destinations in northwestern Europe.

Larger tankers are used to carry oil that is to be transported further, for example from Norway to Mediterranean countries, Asia or America. They do not carry oil directly from the offshore fields, but from large onshore terminals, which are supplied either by shuttle tankers or by pipeline from the oil fields. Pipelines are used to transport oil and condensate from the Norwegian shelf to four onshore terminals: Sture, Mongstad and Kårstø in Norway, and Teesside in the UK.

The oil market

About 86 % of global energy demand is met by fossil energy. Oil was the largest energy source in 2014, followed by coal and gas. Oil meets about 33 % of total world energy demand.

What is oil used for?

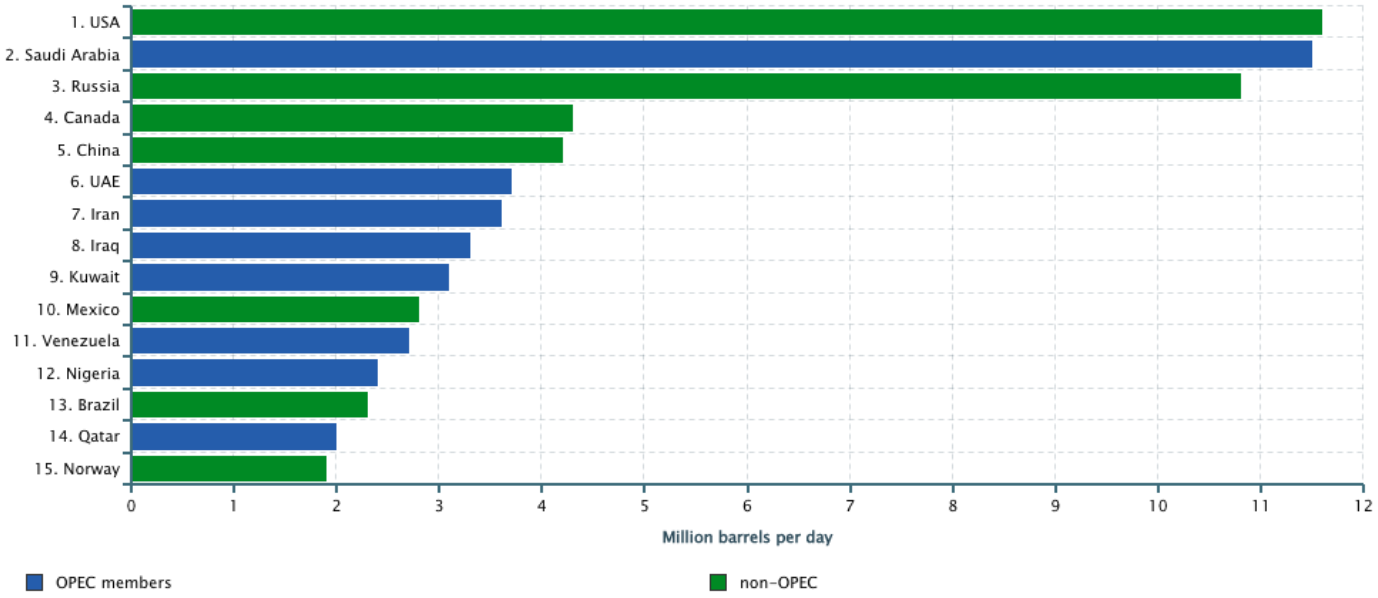
The transport sector consumes more oil than any other sector. Within this sector, light vehicles account for about 45 % of consumption, heavy vehicles about 37 %, aircraft 10 % and shipping 7 %. The next-largest sector in terms of oil consumption is the petrochemical industry, and manufacturing of plastics is the most important branch of this sector. The petrochemical industry also includes the manufacture of other oil-based products such as mineral fertiliser, paints, cosmetics and textiles and clothing. Moreover, oil is used as fuel in other energy-intensive industries such as iron, steel and cement production. The other main use of oil is to generate electricity and heat.

Which countries produce oil?

The US was the largest oil producer in 2014, followed by Saudi Arabia and Russia. OPEC, the Organization of the Petroleum Exporting Countries, accounted for about 30 % of global oil production in 2015. However, several major oil producers, including Russia, the US and Norway, are not OPEC members.

THE 15 LARGEST OIL PRODUCERS IN 2014

Source: IEA World Energy Outlook 2015



REMAINING OIL RESERVES AT YEAR END 2014

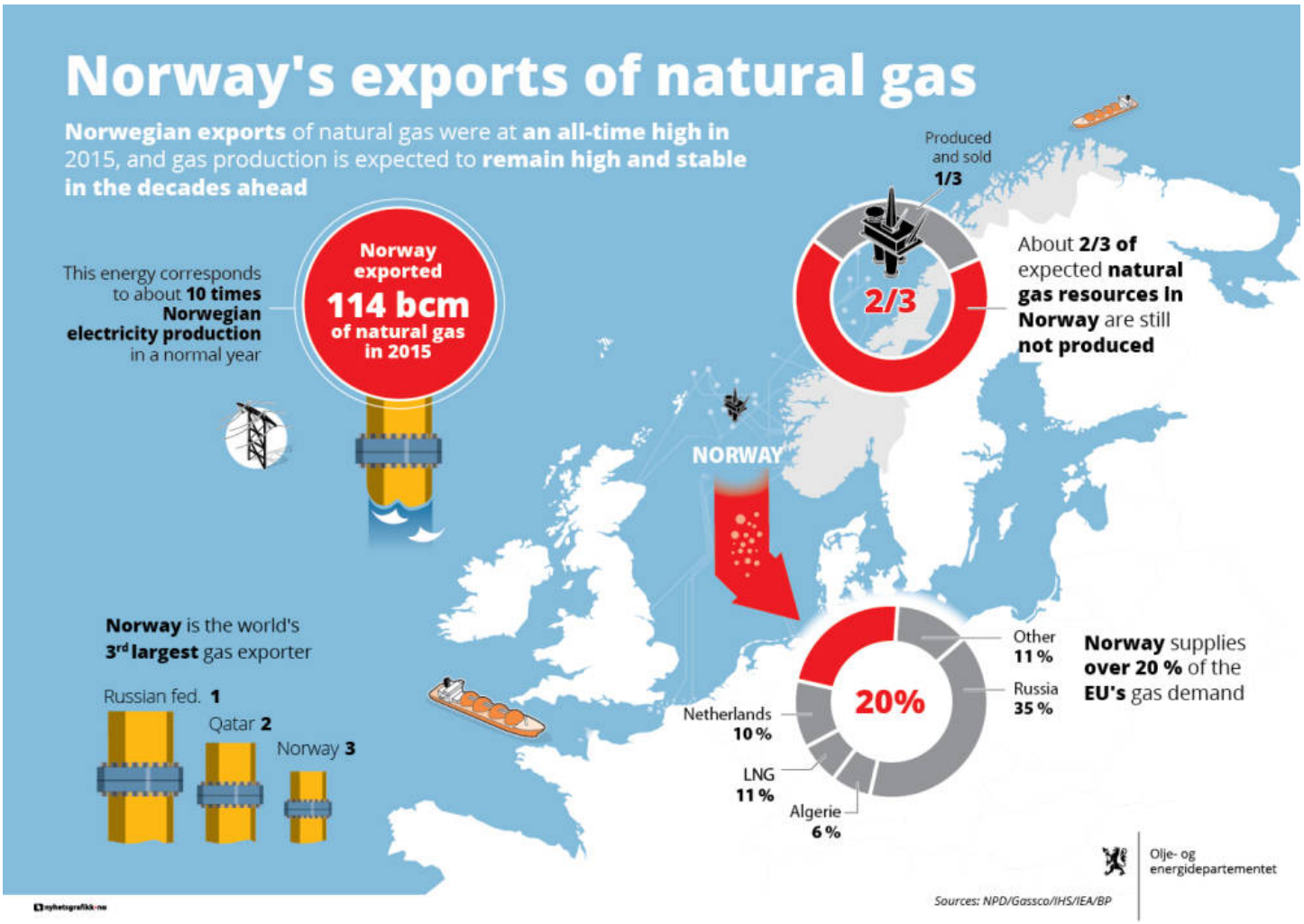
Source: BP Statistical Review 2015

Country/region	% of total	Volumes (bill. boe)
All other	18.2	308.9
Canadian Oil Sands	9.8	167.1
Iran	9.3	157.8
Iraq	8.8	150.0
Kuwait	6.0	101.5
Russia	6.1	103.2
Saudi Arabia	15.7	267.0
UAE	5.8	97.8
USA	2.9	48.5
Venezuela (other)	4.6	77.9
Venezuela Orinoco Belt	13.0	220.5

EXPORTS OF NATURAL GAS

Like oil, gas is one of Norway's most important export commodities. Domestic consumption of gas in Norway is low, and nearly all the gas produced is exported. An extensive network of subsea pipelines links Norway's offshore gas fields and onshore terminals directly to other recipient countries in Europe. In addition, liquefied natural gas (LNG) is shipped out from the Snøhvit field off Hammerfest on LNG carriers.

NORWAY'S EXPORTS OF NATURAL GAS



What is liquefied natural gas?

Liquefied natural gas, or LNG, is produced by cooling and pressurising natural gas to a liquid state. It is transported on dedicated LNG carriers.

The advantage of LNG is that transport does not require pipelines, and it can therefore be sold anywhere in the world. However, conversion to LNG and transport by LNG carrier is considerably more expensive than pipeline transport.

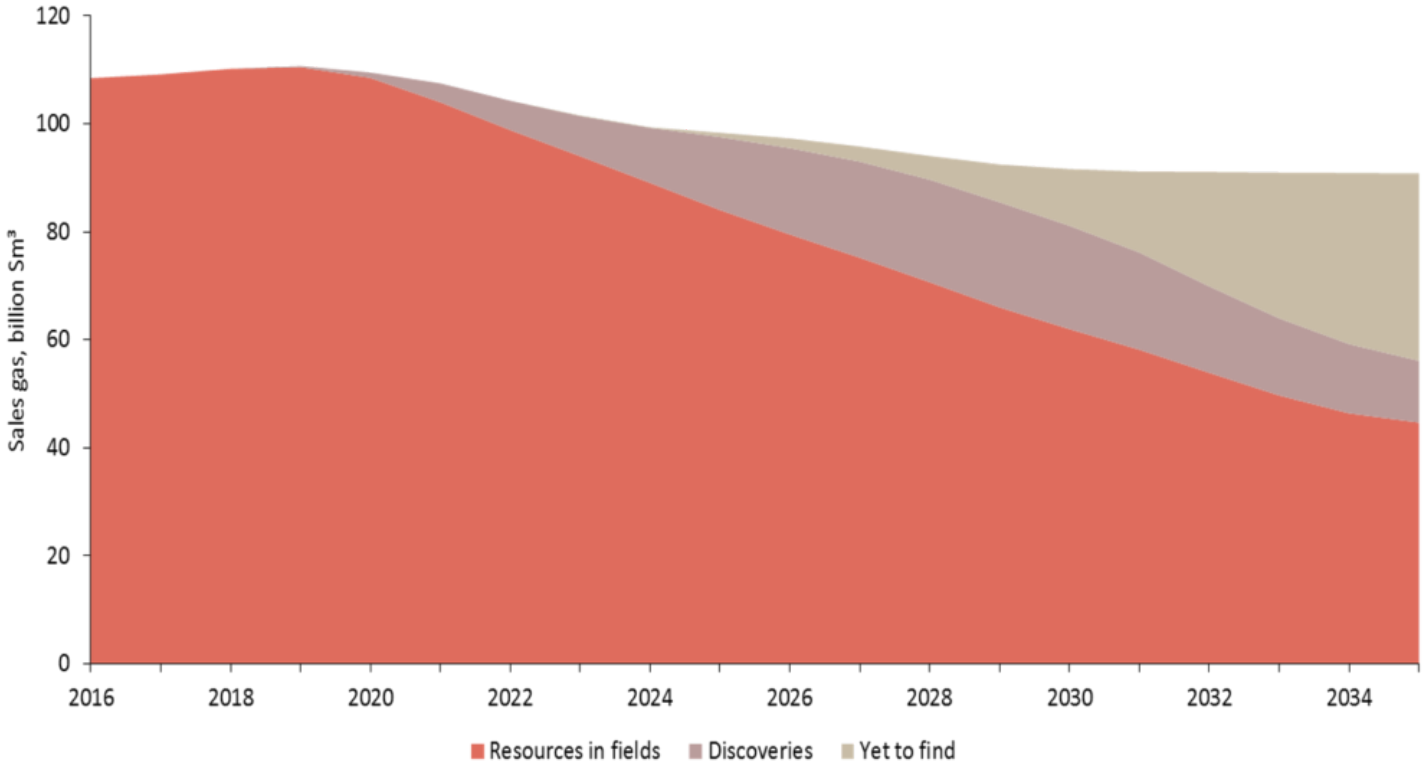
At present, only gas from the Snøhvit field is converted to LNG on a large scale in Norway.

Only about one third of the Norway's estimated gas resources have been produced so far. Production is expected to remain high for the next 20 years. The forecast is that another third of the resources will be produced during this period, and the final third can be produced after 2035. If the most optimistic resource estimates prove to be correct, production figures will be higher than the current forecasts.

EXPECTED VOLUMES OF SALES GAS FROM NORWEGIAN FIELDS, 2016-2035

Updated: 10.05.2016

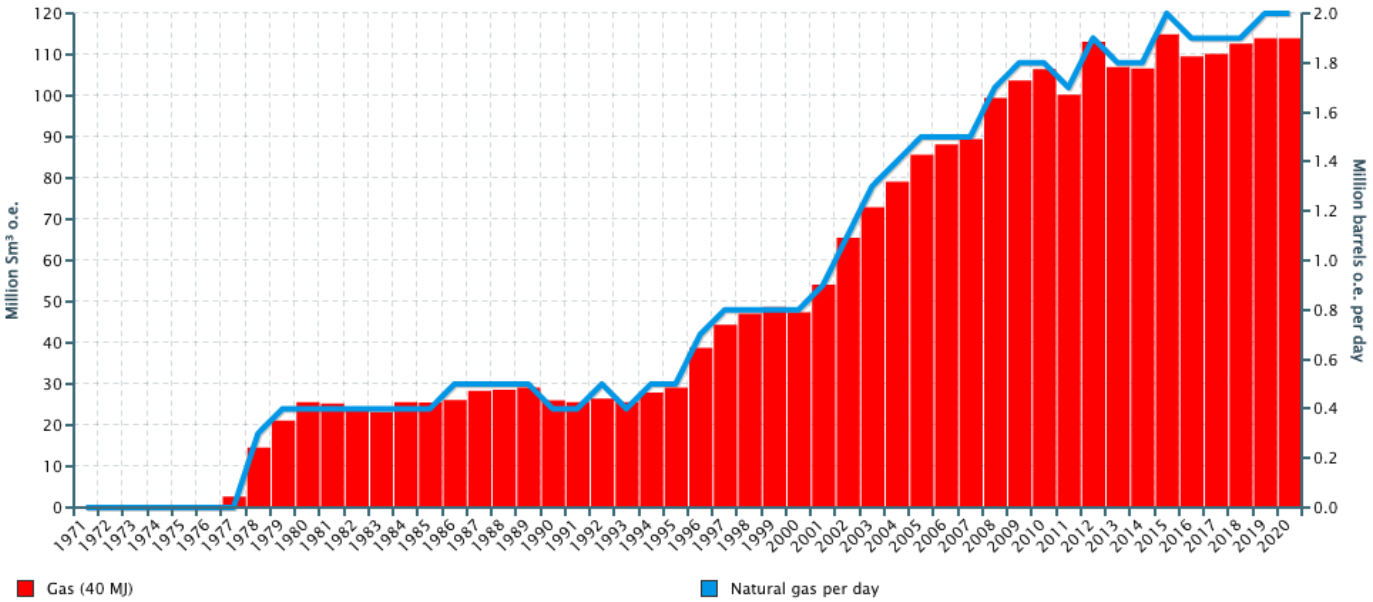
Source: The Norwegian Petroleum Directorate



Norway is the third largest gas exporter in the world. In 2015, Norway exported about 114 billion Sm^3 gas, mainly to other countries in Europe. This is the largest volume of gas ever exported from the Norwegian shelf. In much of Europe, gas is an important source of energy for heating homes and industrial buildings, and is used in gas-fired power plants to generate electricity. Norwegian gas covers more than 20 % of European gas consumption and makes an important contribution to energy security in Europe.

HISTORICAL AND EXPECTED PRODUCTION IN NORWAY, 1971-2020

Source: Norwegian Petroleum Directorate

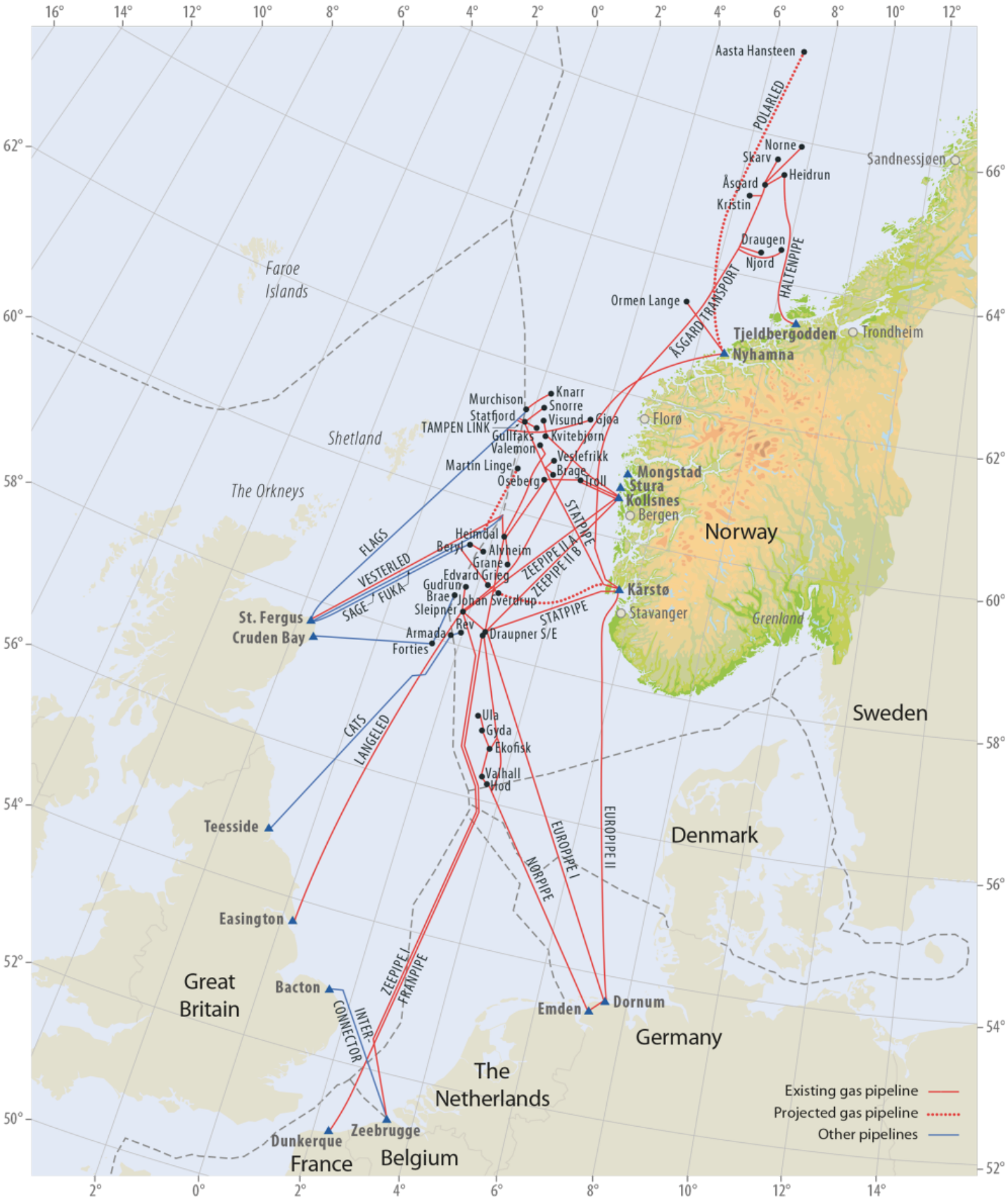


Norway is the third largest gas exporter in the world and coveres more than 20 % of total European gas consumption.

The total length of the Norwegian gas pipeline network is about 8 300 kilometres, which is roughly the distance from Oslo to Houston.

PIPELINES FOR GAS EXPORT FROM THE NORWEGIAN CONTINENTAL SHELF

Source: The Norwegian Petroleum Directorate



Most Norwegian gas sold on the European market is delivered to Germany, the UK, Belgium and France, where Norwegian gas accounts for between 20 and 40 % of total gas consumption. The energy content of the total volume of gas produced in Norway corresponds to about ten times normal Norwegian electricity production.

NORWEGIAN NATURAL GAS EXPORTS IN 2015, BY FIRST DELIVERY POINT

Source: Norwegian Petroleum Directorate and Gassco

First delivery point	% of total	Volumes (bill. Sm³)
Belgium - Zeebrügge Terminal	12.3	14.1
Denmark - Nybro	0.4	0.5
France - Dunkerque Terminal	15.1	17.2
Germany - Europipe 1 Terminal	15.3	17.5
Germany - Europipe 2 Terminal	18.8	21.5
Germany - Norsea Gas Terminal	8.2	9.4
LNG	5.3	6.0
United Kingdom - Easington Terminal	13.5	15.4
United Kingdom - Other Terminals	11.0	12.6

The total volume of gas produced in Norway can provide energy corresponding to about ten times normal Norwegian electricity production

Gas markets

How is natural gas used and what is driving growth in consumption?

Natural gas meets about 24 % of total world energy demand, and thus, like oil, plays a very important part in meeting global energy needs. Natural gas is used mainly for heating homes, cooking and power generation and in the petrochemical industry. Natural gas is transported by pipeline or is cooled and pressurised to produce LNG, which is transported on LNG carriers.

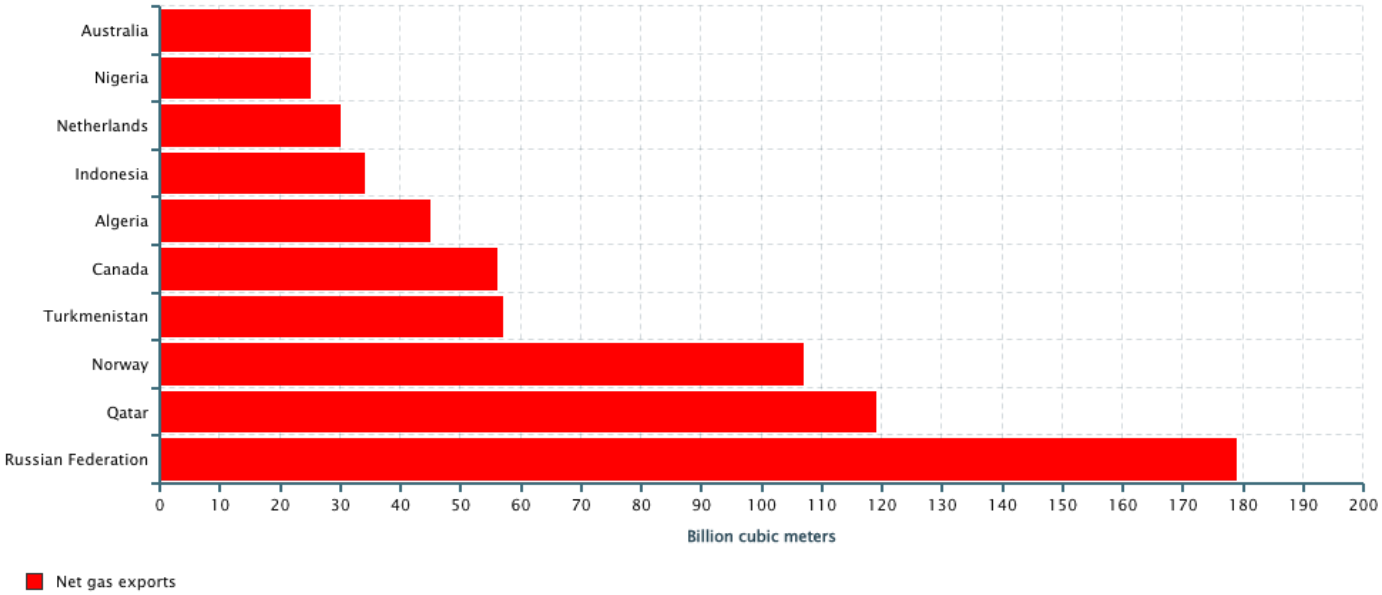
Economic growth, climate change adaptation and mitigation measures, the prices of alternative energy sources, weather and temperature are all factors that influence gas demand. Using gas instead of coal for power generation can for example yield considerable reductions in greenhouse gas emissions. Gas can also provide reserve capacity to balance fluctuations in renewable energy generation, for example when the wind drops or the sun is not shining.

Gas exporting countries

Norway is the third largest gas exporter in the world. Several of the world's largest gas producers export little to other countries. When assessing the global gas market, it is therefore most important to consider which countries have the largest volumes available for export.

NORWEGIAN NET GAS EXPORTS IN 2014 COMPARED TO OTHER GAS EXPORTING COUNTRIES

Source: IEA Key Energy Statistics 2015



Updated: 11.05.2016