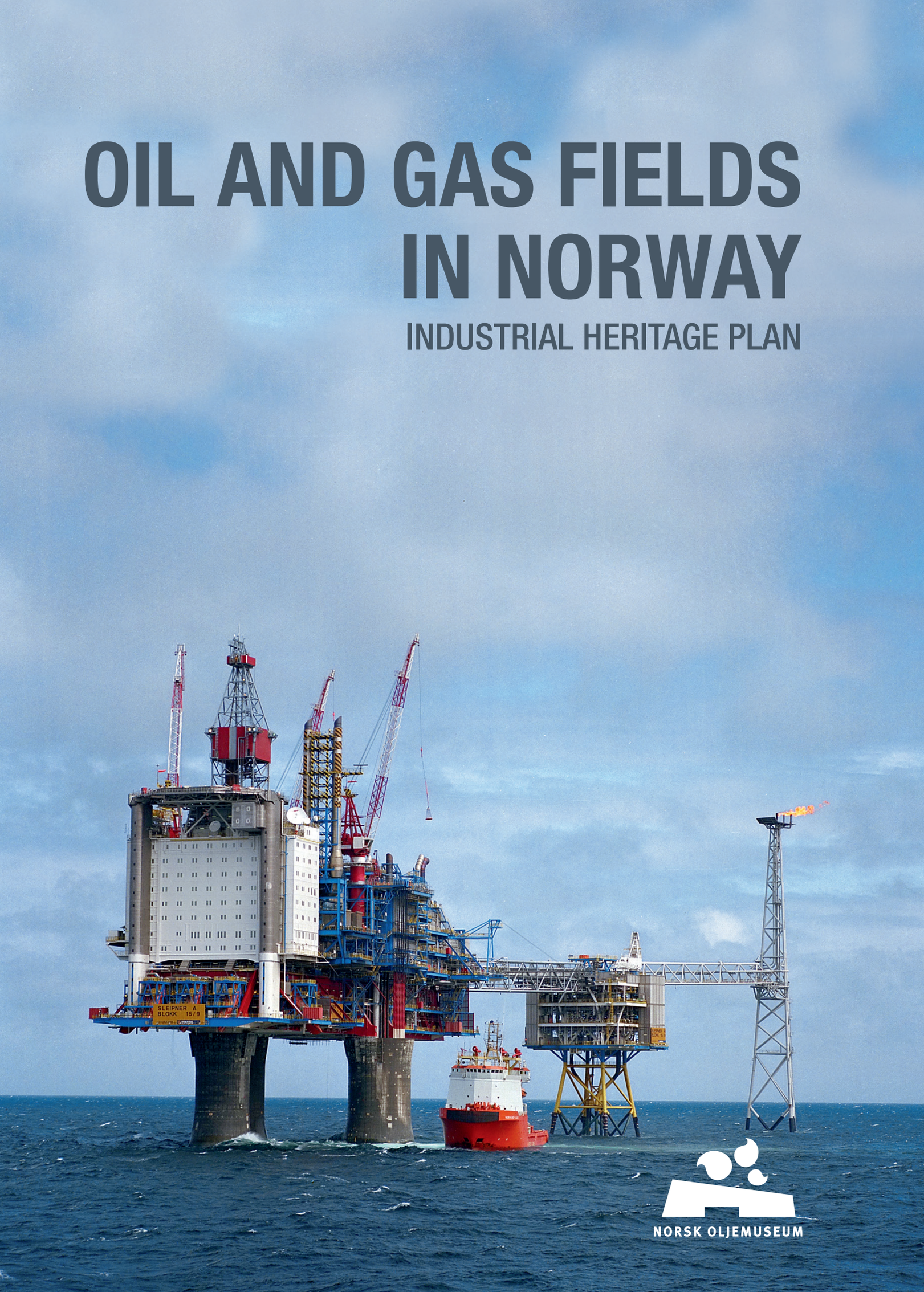
OIL AND GAS FIELDS IN NORWAY

INDUSTRIAL HERITAGE PLAN



NORSK OLJEMUSEUM

EXPORT PIPELINES

Constructing pipelines from the NCS to land has been a necessary condition for selling products to the market and developing the Norwegian petroleum industry.

A tight network of such transport systems has been built up. Many fields gather production from nearby developments in order to send this output on through pipelines to receiving facilities in Norway, the UK and continental Europe.

Oil produced from the NCS is exported either by offshore loading into shuttle tankers or through pipelines. Oseberg pipes its oil to the Sture terminal, while Troll, Kvitebjørn and Gjøa send theirs to Mongstad. Oil from the Ekofisk area and Enoch goes to Teesside and Cruden Bay respectively in the UK. Liquefied condensate is also piped from Sleipner East to Kårstø and from Heimdal to Cruden Bay.

Gas is carried in Statpipe/Norpipe and Europipe I/II to Germany, through Zeepipe and Franpipe to Belgium and France respectively, and in Norpipe, Langeled, Vesterled, NLGP/Flags, Sage and Cats to the UK.

Most exporters of Norwegian gas are members of Gassled, a joint venture which owns the great bulk of the gas transport infrastructure on the NCS. Acting as operator on Gassled's behalf, Gassco coordinates and manages gas flows through 7 800 kilometres of pipelines. This company was created by the Ministry of Petroleum and Energy in 2001, and took over the operatorship for all gas transport from the NCS at 1 January 2002. Before then, gas had been piped by various companies. Establishing Gassco was part of an extensive reorganisation of the Norwegian oil and gas sector prompted by the adoption of the EU's gas directive.

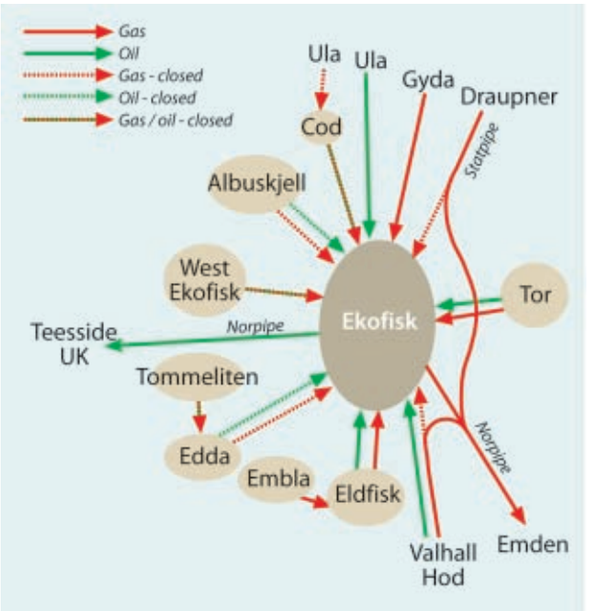
The Acergy Piper pipeline laybarge. Photo: Marit Hommedal/Statoil

Pipelines in the North Sea area. Map: Norwegian Petroleum Directorate

Norpipe

Ekofisk transport hub

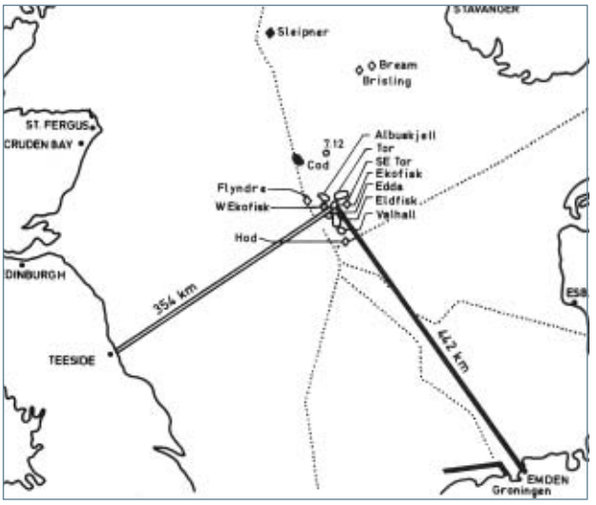
The Ekofisk field serves as an important hub for oil and gas exports to Germany and the UK. Production from Ekofisk, Albuskjell, West Ekofisk, Edda, Tommeliten, Tor, Eldfisk and Embla was originally gathered at Ekofisk for onward export. Valhall, Hod, Ula, Blane, Oselvar, Tambar, Gyda, Mime and the Statpipe system were also eventually tied into Norpipe via the Ekofisk centre for transport of oil or gas to the receiving terminals at Teesside in the UK and Emden in Germany respectively.



Norpipe oil transport system

Oil was loaded into shuttle tankers for the first five years after Ekofisk came on stream. In October 1975, however, the first export pipeline on the NCS began operation. The 34-inch Norpipe oil line runs for 354 kilometres from the field to the Teesside terminal.

In addition to oil and NGL from the Ekofisk area, this system carries oil from Valhall, Hod, Ula, Blane, Oselvar, Tambar and Gyda to the UK. A Y-piece installed in the British sector, 50 kilometres from Ekofisk, has also allowed a number of UK fields to be tied in. Capacity in the system is about 790 000 barrels of oil per day.



Norpipe 36/22 A.
Photo: Husmo Foto/Norwegian Petroleum Museum

The pipeline is owned by Norpipe Oil AS, with ConocoPhillips as its operator.

Two pumping stations, designated Norpipe 37/4 A and 36/22 A, originally stood in 85 and 81 metres of water respectively along the line in the UK sector.

These platforms were built in France, and were equipped with turbine-driven centrifugal pumps as well as pig launchers and traps. However, the turbines operated for only few years because new technology made it possible to pump oil directly from the Ekofisk 2/4 P platform to Teesside. The inter-

Norpipe 37/4 A. Photo: Husmo Foto/Norwegian Petroleum Museum

mediate stations were shut down in 1983 and the line was re-laid to bypass them in 1994.

Norpipe gas transport system

The gas pipeline from Ekofisk to Emden in Germany became operational in 1977, marking the start to dry gas deliveries from the NCS to buyers in continental Europe. With a diameter of 36 inches, the line runs for 443 kilometres – including 48 kilometres of the Danish continental shelf. It crosses the island of Juist in a buried trench before reaching the East Friesian coast north of Emden.

In addition to output from Ekofisk area fields, the system carries gas from Valhall, Hod and Gyda. Statpipe was tied in during 1985.

Norpipe oil transport system

Operator	ConocoPhillips
Development operator	Phillips Petroleum
Operational	October 1975
Diameter	34 inches
Capacity	900 000 b/d
Length	354 km
Owners	
(Norpipe Oil AS)	
ConocoPhillips	35.05%
Total E&P Norge	34.93%
Statoil	18.50%
Eni Norge	6.52%
Petoro	5.00%

The pipeline started initially from the Ekofisk 2/4 R platform, but was diverted to Ekofisk 2/4 J during a major reorganisation of the field in 1998. Statpipe was re-laid to bypass Ekofisk and tie into Norpipe south of the field.

Platforms B11 and H7, each carrying three compressors, were installed along Norpipe on the German continental shelf. Built in 1976, they are virtually identical.

The Norpipe gas line earlier belonged to Norsea Gas AS. Gassco took over as operator in 2003, with ConocoPhillips as the technical service provider (TSP). The compressors on H7 have now been shut down and the platform abandoned. Transport capacity in the pipeline is 43 million scm per day.

Norpipe gas transport system

Operator	Gassco
Development operator	Phillips Petroleum Company
TSP	ConocoPhillips
Operational	September 1977
Diameter	36 inches
Capacity	35-43 mill scm/d
Length	440 km
Owner	
Gassled	100%

Norpipe GNSC H7.
Photo: Husmo Foto/Norwegian Petroleum Museum

Norpipe GNSC B-11.
Photo: Husmo Foto/Norwegian Petroleum Museum

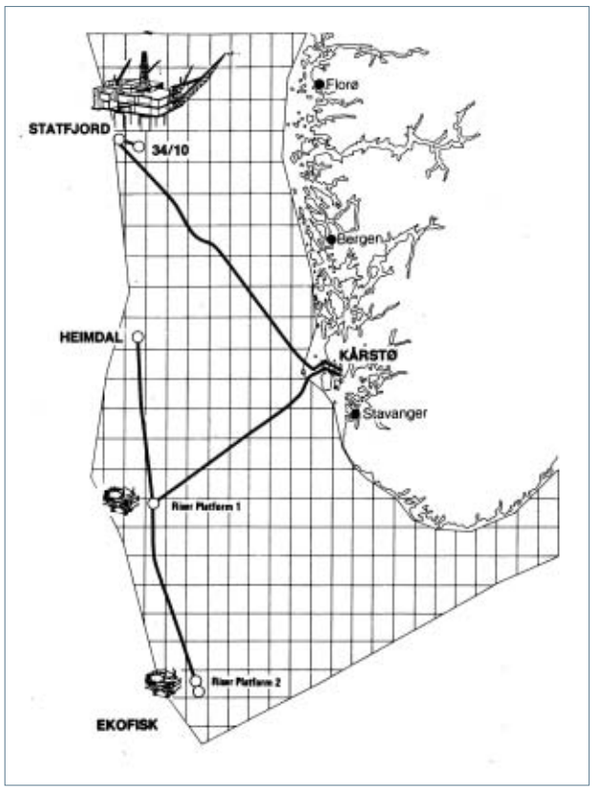
Statpipe

Statfjord gas to continental Europe

Statpipe was constructed to handle gas volumes from Statfjord and Gullfaks and to connect these big fields in the northern North Sea with markets in continental Europe. To reach the receiving terminal in Norway, the pipeline had to cross the Norwegian Trench – a submarine valley more than 300 metres deep just off the coast. Laying pipe in such depths was not technically feasible up to the early 1980s, but Statpipe became the first development to benefit from technological advances in this area. It became operational in October 1985.

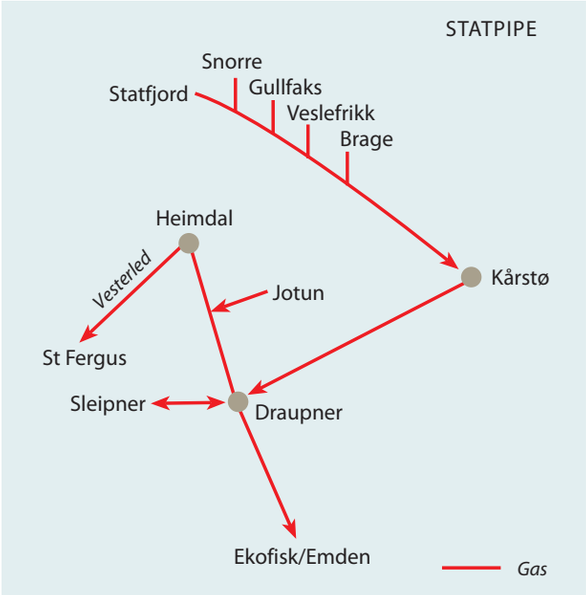
This system has four components. The first leg carries rich gas from Statfjord to the Kårstø processing plant north of Stavanger. It also gathers gas en route from Snorre, Gullfaks, Veslefrikk and Brage. Gullfaks gas travelled in the early years via Statfjord C, but was rerouted in 2001 to a new tie-in south of Statfjord. After processing at Kårstø, the dry gas is carried to Draupner S. A spur from Heimdal joins at this riser platform, and the combined flow continues to Ekofisk and a tie-in with the Norpipe line to Emden in Germany.

The initial tie-in point on Ekofisk was the dedicated 2/4 S riser platform, linked by a bridge to the field centre. A Statpipe bypass was installed around Ekofisk in the summer of 1998, and 2/4 S was removed. The system is thereby tied directly into Norpipe.



The Statpipe route. Illustration: Norwegian Petroleum Directorate

Statpipe was Statoil's first major pipeline assignment as operator, and laid the basis for developing an extensive infrastructure to export Norwegian gas. Including the Heimdal spur, the whole system is 880 kilometres long.



Statpipe gas transport system

Operator		Gassco
Development operator		Statoil
TSP		Statoil
Operational		October 1985
Length		880 km
Statfjord-Kårstø	30-inch	308 km
Kårstø-Draupner	28-inch	228 km
Heimdal-Draupner	36-inch	155 km
Draupner-Ekofisk	36-inch	213 km
Capacity scm/d		20-30 mill
Owner		
Gassled		100%

Draupner. Photo: Øyvind Hagen/Statoil

Ekofisk 2/4 S, 1986-1998. Photo: Husmo Foto/Norwegian Petroleum Museum

Zeepipe

The Zeepipe system was originally laid to carry gas from Troll, with Zeebrugge in Belgium chosen as the landfall because of its proximity to markets in Belgium, France and Spain.

Four sections

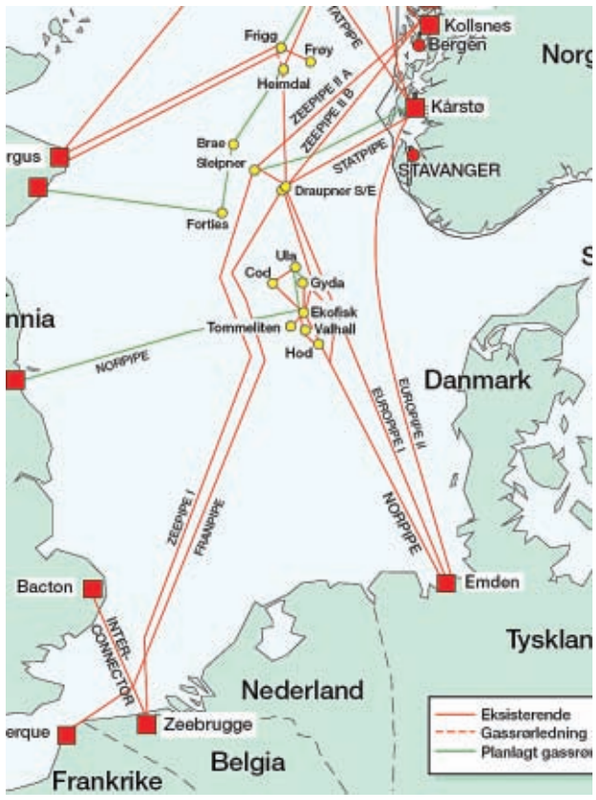
Zeepipe II A runs from the Kollsnes processing plant for Troll gas to the Sleipner R riser platform. Operational in 1996, the 40-inch pipeline is 303 kilometres long.

Zeepipe II B also runs from Kollsnes but terminates at the Draupner E riser platform. This 40-inch-diameter leg became operational in 1997 and is about 300 kilometres long.

Zeepipe P51 is a 30-inch pipeline running for 39 kilometres between Sleipner R and Draupner E.

Zeepipe I runs from Sleipner R to the receiving terminal in Belgium. With a diameter of 40 inches, it is 814 kilometres long.

Gassco is the operator, with Statoil as the technical service provider (TSP).



The Zeepipe system from Kollsnes to Zeebrugge. Map: Norwegian Petroleum Directorate

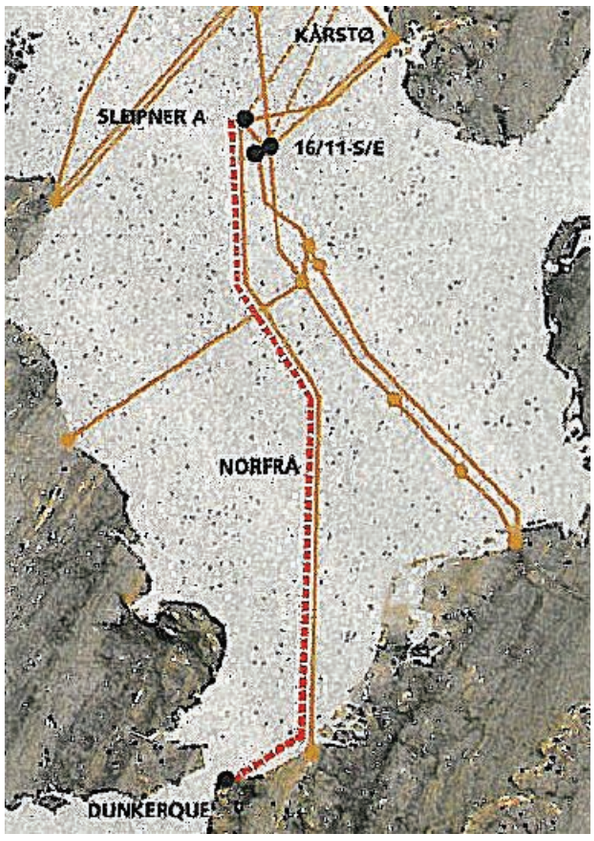
Zeepipe gas transport system	
Operator	Gassco
Development operator	Statoil
Operational, I	1993
Capacity, I	41 mill scm/d
Length, I	814 km
Operational, P51	1993
Length, P51	39 km
Operational, II A	1996
Capacity, II A	72 mill scm/d
Length, II A	303 km
Operational, II B	1997
Capacity, II B	71 mill scm/d
Length, II B	300 km
Diameters I, II A and II B	40 inches
Diameter P51	30 inches
Owner	
Gassled	100%

Franpipe

This 42-inch pipeline runs for 840 kilometres from the Draupner E riser platform to the receiving terminal at Port Ouest in Dunkerque, France.

Franpipe primarily carries gas from Troll. The first delivery from the NCS for sale via the pipeline occurred in 1998.

Until 1 October 1999, the project was known as NorFra. It was renamed after a fishing industry company called Norfra in Tromsø claimed to be adversely affected by the use of the same name for the pipeline.



The Franpipe pipeline, previously known as NorFra, runs from Draupner to Dunkerque. Illustration: Statoil

Franpipe	
Operator	Gassco
Development operator	Statoil
TSP	Statoil
Length	840 km
Capacity	52 mill scm/d
Diameter	42 inches
Operational	1 October 1998
Owner	
Gassled	100%

Europipe I

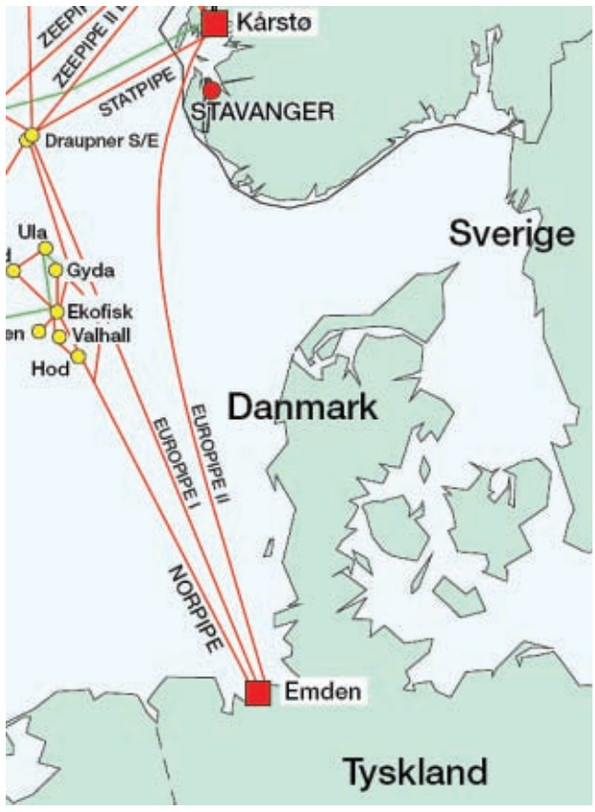
The Europipe I line runs from the Draupner E riser platform via Dornum on the German coast to Emden, carrying gas from the Sleipner area and Troll.

With an internal diameter of 40 inches, this system is 716 kilometres long and crosses the Wattenmeer coastal conservation area through a tunnel. An additional length of pipe laid in the latter when it was constructed in 1994 could later be used to bring Europipe II ashore.

A 48-kilometre land pipeline with an internal diameter of 42 inches runs from Dornum to the metering station at Emden, where gas quality and volume are checked before delivery to customers in Germany, Austria, the Netherlands and the Czech Republic.

Europipe I became operational in 1995. Gassco is the operator.

Europipe I gas transport system	
Operator	Gassco
Development operator	Statoil
TSP	Statoil
Length	660 km
Diameter	40 inches
Capacity	45.4 mill scm/d
Operational	1 October 1995
Owner	
Gassled	100%



The Europipe I and II transport systems.
Map: Norwegian Petroleum Directorate

Europipe II

Europipe II starts from Kårstø and runs directly to Dornum in Germany, primarily carrying gas from Åsgard, the Sleipner area, Gullfaks and Statfjord. Most of these deliveries go directly into the 341-kilometre Norddeutsche Erdgas Transversale (Netra) system, which runs to Salzwedel. Europipe II reaches land across the Wattenmeer coastal conservation area, where it is laid alongside Europipe I in a tunnel. It became operational in 1999.

Europipe II gas transport system	
Operator	Gassco
Development operator	Statoil
TSP	Statoil
Length	650 km
Diameter	42 inches
Capacity	71 mill scm/d
Operational	1 October 1999
Owner	
Gassled	100%

British pipeline systems

Norwegian gas, condensate and oil are carried to the UK not only in the Norpipe oil line to Teesside and Langeled to Easington, but also through British pipeline systems to St Fergus, Cruden Bay and Teesside.

Statfjord gas to St Fergus

The 20-inch Northern Leg Gas Pipeline (NLGP) gathers gas north of the Brent field, and runs for 80 kilometres from the Magnus platform to Brent A. It continues as the Far North Liquids and Associated Gas System (Flags), a 36-inch pipeline running for 452 kilometres from Brent A to St Fergus in Scotland. In addition to NLGP gas, this facility carries gas from Brent, Clapham, Cormorant, North Cormorant, Goldeneye, North-West Hutton, Ninian, Pelican, Penguin, Tern, Strathspey and Statfjord. Plans also call for Gjøa gas to be exported in a new 130-kilometre line tied into Flags.

Spur pipeline/NLGP/Flags

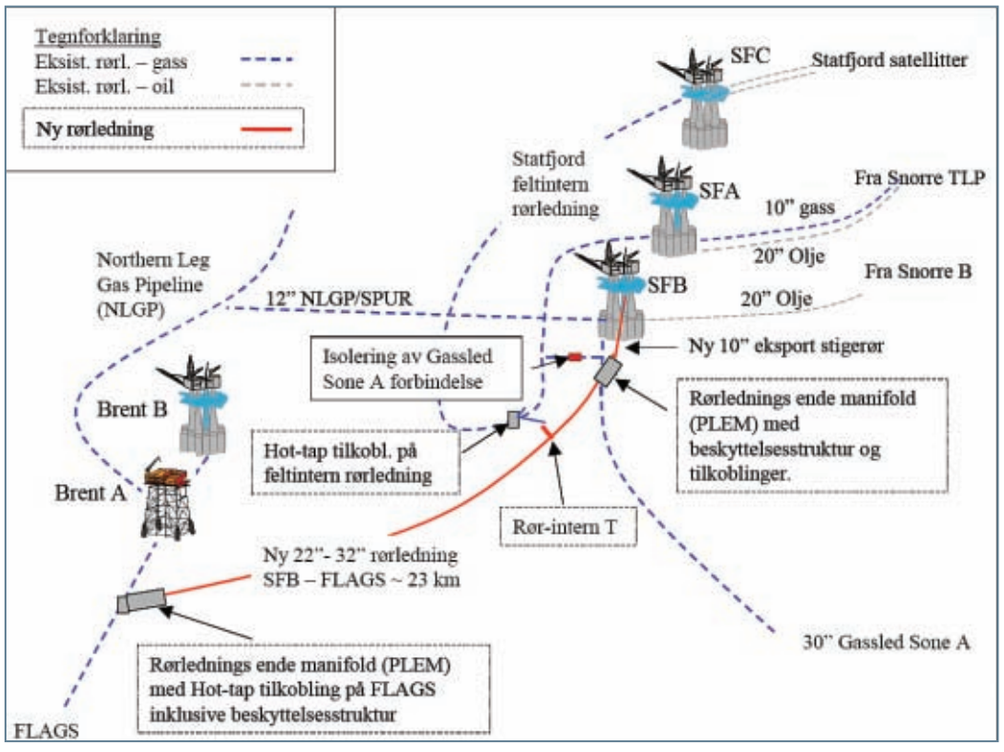
The British licensees in Statfjord were not allowed to send their share of the field's gas to continental Europe because the UK needed these supplies itself. A pipeline spur was accordingly laid from Statfjord B to carry this gas to St Fergus via a tie-in to the NLGP and Flags systems. The spur is 12 inches in diameter and 11 kilometres long. Gas exports to Scotland began in 1985.

Tampen Link

Operator	Gassco
Development operator	Statoil
TSP	Statoil
Length	23.2 km
Diameter	32 inches
Owner	
Gassled	100%

Tampen Link/Flags

The Statfjord late life development has increased gas exports from the field, and a new pipeline was accordingly needed to carry the Norwegian share of this output to St Fergus. Tampen Link is a 23-kilometre pipeline which connects Statfjord B with the Flags system. The tie-in is 1.4 kilometres south of Brent A. Gas exports through this line began in 2007.



Pipelines in the Statfjord area. Tampen Link in red. Illustration: Statoil

Gas from Heimdal to St Fergus

Vesterled

The Vesterled system links Heimdal Riser with St Fergus. A 32-inch pipeline runs for 38 kilometres from Heimdal Riser to tie into the former Frigg Norwegian pipeline (FNP) about 54 kilometres from the former Frigg field.

With a length of 361 kilometres, Vesterled's capacity corresponds to the FNP's – in other words, roughly 38.6 million scm per day or 11 billion cubic metres per year. The system became operational in 2001.

Vesterled gas transport system

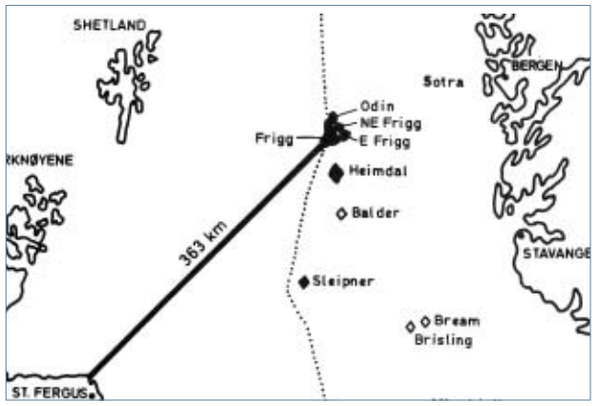
Operator	Gassco
Development operator	Norsk Hydro
TSP	Total E&P UK
Operational	1 October 2001
Diameter	32 inches
Capacity	38.6 mill scm/d
Length	361 km
Owner	
Gassled	100%

Frigg gas transport system

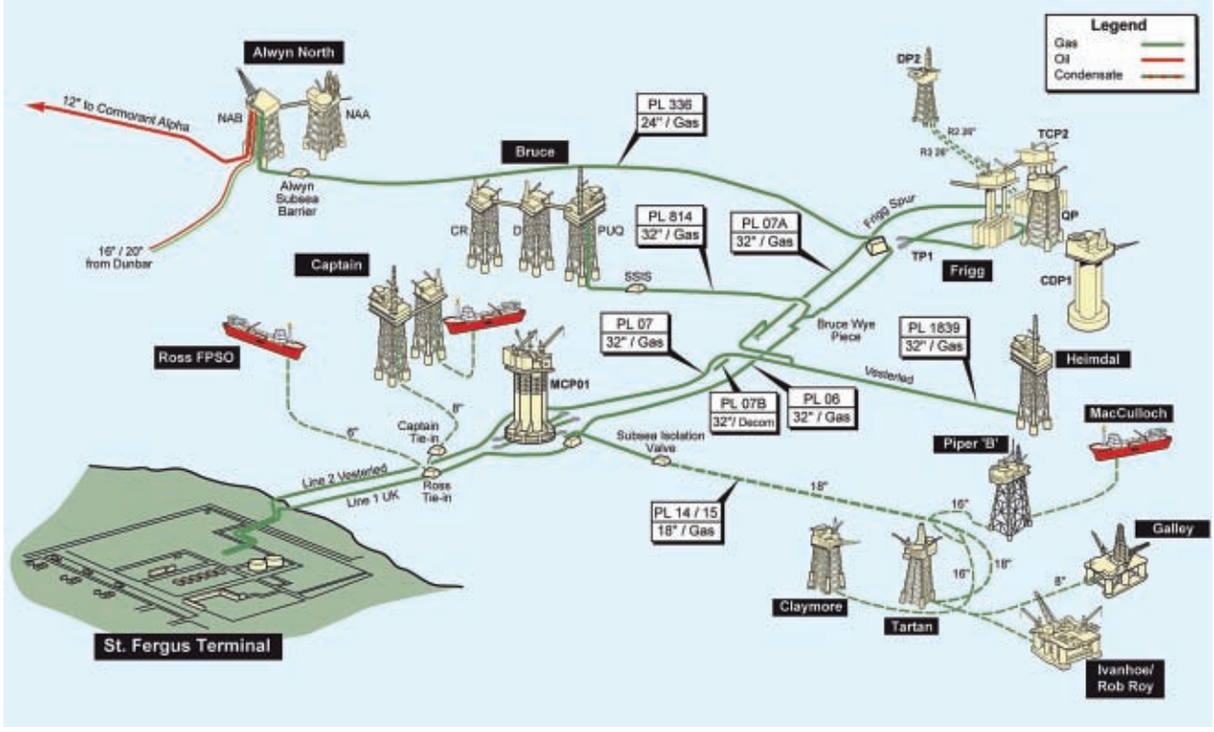
The FNP was originally built to carry gas from Frigg to St Fergus, and runs parallel to the UK's Fuka line.

Both Norwegian and British pipelines from Frigg were 32 inches in diameter and about 360 kilometres long. Total Oil Marine UK was operator for the two lines, which eventually also carried gas from North-East Frigg, East Frigg, Lille-Frigg, Odin and Frøy as well as Britain's Piper, Galley, Tartan, Claymore, Rob Roy, Ivanhoe, MacCulloch, Alwyn, Bruce and Ross fields.

The two pipelines passed through the Frigg MCP-01 compressor platform, which stood in 94 metres of



The Frigg transport system.
Illustration: Norwegian Petroleum Directorate



Vesterled from Heimdal to St Fergus. Illustration: Total E&P UK

water about halfway to land in the UK sector – 174 kilometres from the Scottish coast. Built in 1976-77, this installation served to pressurise the pipelines and as a launch and retrieval station for pigs.

Frigg MCP-01 became unstaffed in 1992 and was remotely operated from the St Fergus gas terminal until fully shut down in 2004. The removal project began in 2006 and, after consultation with the partners and the authorities, it was resolved to remove the topside and leave the concrete GBS in place.

The Norwegian Frigg Pipeline is now part of the Vesterled system, while the British line continues to carry gas from UK fields to land.

Alvheim gas to St Fergus

SAGE

Processed rich gas from Alvheim is exported via the 30-inch Scottish Area Gas Evacuation (Sage) pipeline, which runs for 350 kilometres from Beryl in the UK sector to St Fergus.

Heimdal condensate and Enoch oil to Cruden Bay

Brae and Forties pipeline systems

The 30-inch Brae pipeline system runs from that UK field's A platform to Forties, the starting point for the 36-inch Forties pipeline system (FPS). This gathers oil and condensate from more than 30 British and Norwegian fields for transport to Cruden Bay over a distance of 169 kilometres.

Condensate separated from gas on Heimdal is carried in an eight-inch pipeline to Brae A for onward transmission in these two systems to Cruden Bay.

The Enoch wellstream is piped to Brae A for processing, before the oil continues by the same route to Scotland.

Rev gas and condensate to Teesside

Central Area Transmission System (Cats)

Gas and condensate from Rev is piped for 93 kilometres to Britain's Armada field and on through Cats to Seal Sands outside Teesside.

Frigg MCP-01. Photo: Total E&P UK

Gas from the Halten Bank

Åsgard Transport

This is an important gas gathering system for fields on the Halten Bank. The 42-inch pipeline runs for 707 kilometres from Åsgard to Kårstø.

Tie-ins have been made for pipelines from Kristin, Njord, Draugen and Norne gas transport, while Skarv will also be connected when it comes on stream. Åsgard Transport became operational in 2000.

Åsgard Transport	
Operator	Gassco
Development operator	Statoil
Operational	2 October 2000
Diameter	42 inches
Capacity	70.4 mill scm/d
Length	707 km
Owner	
Gassled	100%

Norne gas transport system

Running for 126 kilometres, the 16-inch Norne gas transport system (NGTS) ties Norne into the Åsgard Transport system. The Heidrun gas export line is also tied into the NGTS.

Operational since 2001, the system became part of Gassled in 2009 with Gassco as the operator and Statoil as the technical service provider (TSP).

Norne gas transport system	
Operator	Gassco
Development operator	Statoil
Operational	February 2001
Diameter	16 inches
Capacity	98.6 mill scm/d
Length	126 km
Owner	
Gassled	100%

Haltenpipe gas transport system

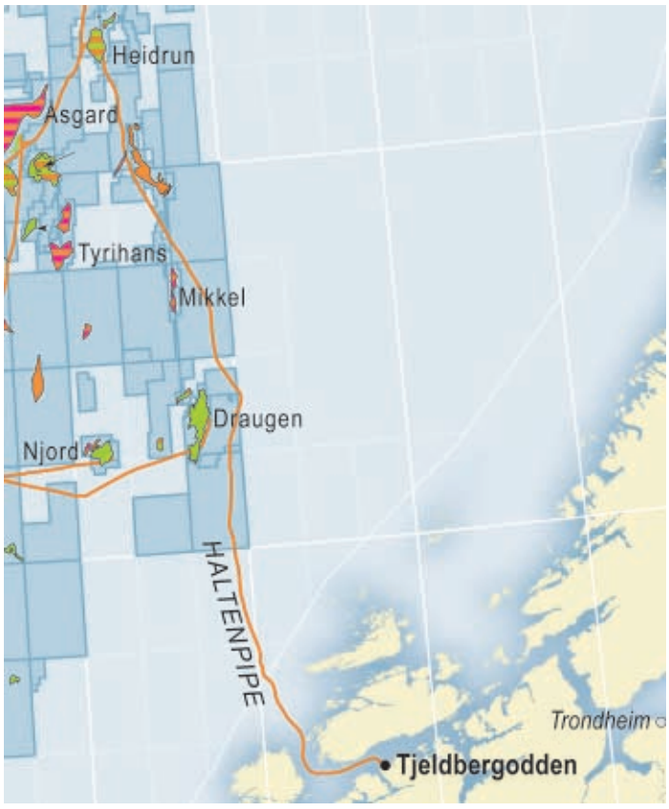
This 16-inch pipeline carries gas for 250 kilometres from Heidrun on the Halten Bank to Tjeldbergodden, which lies in Aure local authority in Møre og Romsdal county. Statoil and ConocoPhillips have built a methanol plant in conjunction with the receiving terminal, using Heidrun gas as the feedstock. Annual deliveries to this facility total about 700 million scm. Haltenpipe is operated by Gassco, with Statoil as technical service provider (TSP).

Haltenpipe

Operator	Gassco
Development operator	Statoil
TSP	Statoil
Length	250 km
Capacity	6 mill scm/d
Diameter	16 inches
Operational	December 1996

Owners

Petoro	57.8125%
Statoil	19.0625%
ConocoPhillips	18.1250%
Eni Norge	5.0000%



Haltenpipe runs from Heidrun to Tjeldbergodden.
Map: Norwegian Petroleum Directorate

Langeled

Gas, condensate and water from Ormen Lange are carried for 120 kilometres through two 30-inch multiphase flow pipelines to Nyhamna in Aukre local authority.

After processing at the receiving terminal, the dry gas continues through the Langeled system via Sleipner East to the receiving terminal at Easington in north-east England. At 1 166 kilometres, Langeled is the world's longest submarine gas pipeline.

The 42-inch northern leg runs from Nyhamna to Sleipner East, crossing the Norwegian Trench in 360 metres of water. It became operational in 2007.

With a diameter of 44 inches, the southern leg runs from Sleipner East to Easington and started operation in 2006.

Langeled

Operatør	Gassco
Operator	Gassco
Development operator	Norsk Hydro
TSP	Statoil
Length	1 166 km
Capacity	80 mill scm/d (Nyhamna-Sleipner R)
	70 mill scm/d (Sleipner R-Easington)
Diameter	42 inches (Nyhamna-Sleipner R)
	44 inches (Sleipner R-Easington)
Operational	27 Sep 2006 (Nyhamna-Sleipner R)
	October 2007 (Sleipner R-Easington)
Owner	
Gassled	100%

The Langeled system. Illustration: Tor Alvseike/Statoil

Integration with other transport systems occurs at the Sleipner R riser platform, where gas from Ormen Lange is blended with supplies from other fields to ensure the correct quality. Britain represents the primary market for Ormen Lange gas, but deliveries can also be made from Sleipner R to continental Europe via other pipeline systems. Up to 20 per cent of British gas demand will be met from Norway through Langeled in coming years.

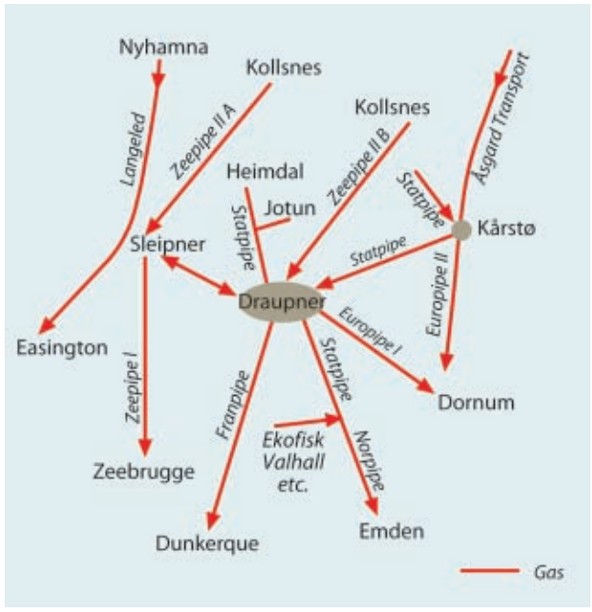
Ormen Lange. Illustration: Bjørn Brochmann/Statoil

Draupner gas hub

No gas, condensate or oil are produced at Draupner. It functions instead as an important transport hub for gas arriving through Statpipe from Kårstø and Heimdal and through Zeepipe from Troll. The gas is sent on from Draupner through Europipe I to Dornum, Statpipe to Emden and Franpipe to Dunkerque. It can also be routed via the Zeepipe P51 link to Sleipner East and through Statpipe to Heimdal.

Installations comprise the Draupner S and E riser platforms, supporting seven risers with diameters from 28 to 48 inches. Standing in block 16/11, these structures rest on steel jackets in 70 metres of water. Their most important functions are to check the pressure, volume and quality of the gas, and to launch and retrieve cleaning and inspection pigs. Transport capacity through Draupner is 130 million cubic metres per day. Gassco is the operator, with Statoil as the technical service provider (TSP).

Draupner	
Operator	Gassco
Development operator	Statoil
TSP	Statoil
Block	16/11
Capacity	130 mill scm/d
Operational	1984
Owner	
Gassled	100%



Draupner S

This platform was installed in 1984 as part of Statpipe, and became operational the following year. A bridge links with Draupner E. Its original name was Statpipe 16/11-S.

Draupner E

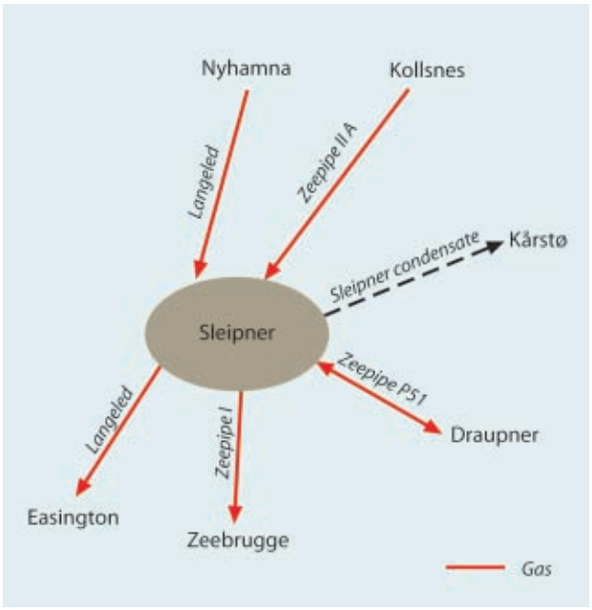
The platform was installed in 1994 as part of the Europipe I development from Sleipner East to Emden in Germany, and became operational in 1995.

The Draupner platforms, with Draupner S to the right. Photo: Øyvind Hagen/Statoil

Sleipner gas hub

In addition to producing gas and condensate, Sleipner East is a hub for gas being exported from Troll through Zeepipe to Belgium and from Ormen Lange through Langeled to the UK.

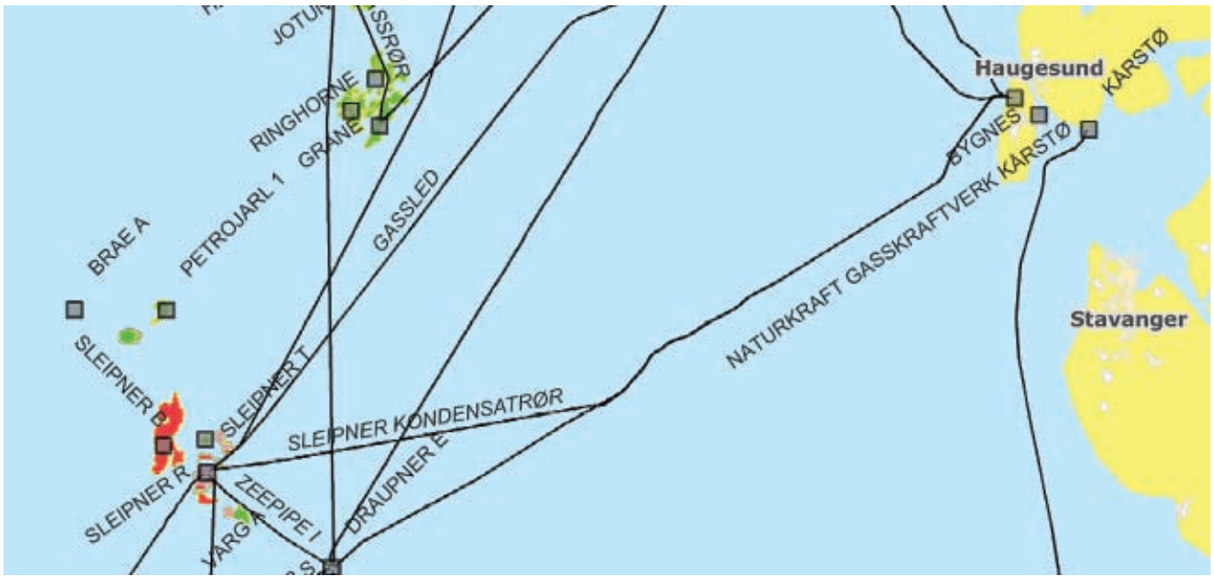
Gas from Ormen Lange is blended on Sleipner East with supplies from other fields to ensure the correct quality. Britain represents the primary market for Ormen Lange gas, but it can also be delivered from the Sleipner R riser platform to continental Europe via other pipeline systems. Similarly, other gas from the NCS can be piped via Sleipner R to the UK



Sleipner East condensate pipeline

Unprocessed condensate from Sleipner East and West, Loke and Gungne is piped for 245 kilometres from Sleipner A to Kårstø, where it is fractionated into commercial liquefied petroleum gases (LPG) and stabilised condensate.

Condensate deliveries began from Sleipner East in 1993.



The Sleipner East condensate pipeline runs from Sleipner A to Kårstø. Map: Norwegian Petroleum Directorate

Heimdal gas centre

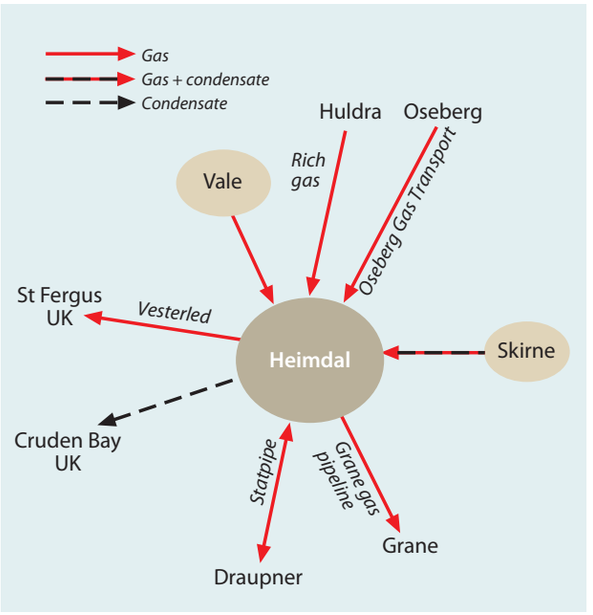
The Heimdal hub for gas processing and distribution comprises an integrated steel platform and a riser installation.

Gas from the Heimdal field itself is processed together with supplies from Vale and Skirne. The hub also receives gas from the Oseberg field centre via the Oseberg Gas Transport (OGT) line and rich gas for processing from Huldra through a 145-kilometre pipeline.

In addition, gas is periodically transported in reverse flow from Statpipe via Heimdal to the UK.

When Heimdal came on stream in 1985, its gas was carried through Statpipe to Germany. However, establishing the field as a gas centre in 2001 also made it possible to direct exports to the UK via the Vesterled line.

The Grane gas pipeline, which became operational in 2003, carries gas from Heimdal for injection into Grane. Condensate is piped via Brae in the UK sector to Cruden Bay in Scotland.



Oseberg Gas Transport

Operator	Gassco
Development operator	Norsk Hydro
TSP	Statoil
Operational	2000
Diameter	36 inches
Technical capacity	41.9 mill scm/d
Length	109 km
Owner	
Gassled	100%

Heimdal, with the HPR riser platform to the right. Photo: Norsk Hydro Media

Gas to Kårstø

The Kårstø complex north of Stavanger plays a crucial role in transporting and processing gas and condensate from key areas of the NCS.

Its purpose is to separate the hydrocarbons arriving in the Statpipe and Åsgard Transport rich gas pipelines. It also receives unstabilised condensate through a pipeline from Sleipner East.

The gas blends arriving at Kårstø are split into methane (natural gas), ethane, propane, isobutane, normal butane, naphtha (natural gasoline) and stabilised condensate.

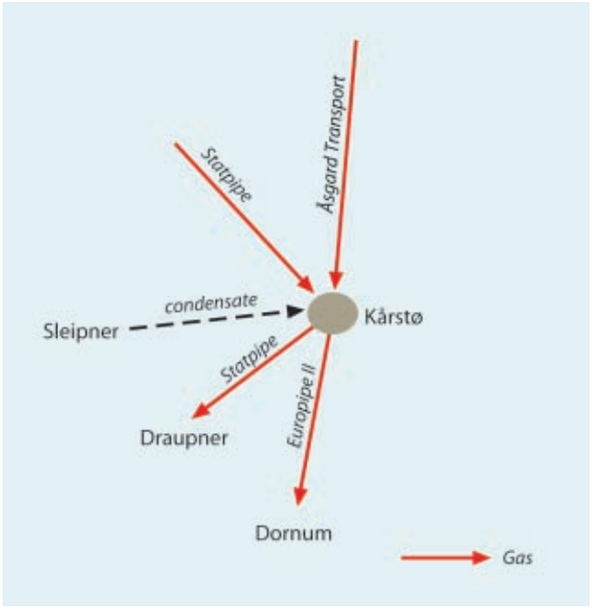
Dry gas – methane plus some ethane – is piped on through the Statpipe/Norpipe and Europipe II systems.

Kårstø ranks as one of the world's largest producers of liquefied petroleum gases (LPG), which are exported by sea to customers worldwide.

Propane is stored in two large artificial rock caverns with a combined capacity of 90 000 tonnes. Normal butane, isobutane, naphtha and stabilised condensate are held in steel tanks.

First gas reached the plant in 1985 through Statpipe from Statfjord, and the first dry gas was dispatched to Emden in Germany on 15 October of the same year.

Gassco is the operator, with Statoil as the technical service provider (TSP).



The Kårstø processing plant. Photo: Øyvind Hagen/Statoil

Gas to Kollsnes

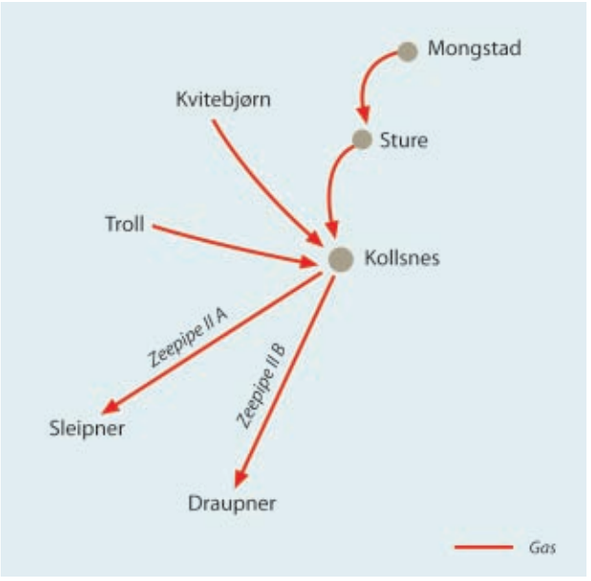
The Kollsnes processing plant north-west of Bergen became operational in 1996 as part of the Troll Gas development. It currently receives gas by pipeline from Troll, Kvitebjørn, Visund and Fram.

Two 36-inch multiphase flow pipelines from Troll A run in a shared corridor which also contains a four-inch glycol line.

The Kvitebjørn gas pipeline is 150 kilometres long and carries gas from Kvitebjørn and Visund to Kollsnes. It became operational in 2004.

Gas is dewatered and compressed in the Kollsnes processing facilities before being piped on to continental Europe through the Zeepipe, Statpipe, Europipe I and Franpipe systems.

Capacity at Kollsnes has been expanded several times since the plant became operational. It can currently process up to 143 million scm of gas and 69 000 barrels of condensate per day.



Kvitebjørn gas pipeline

Operator	Gassco
Development operator	Statoil
Length	147 km
Diameter	30 inches
Capacity	26.5 mill scm/d
Operational	October 2004

Owner
Gassled

This expansion reflects a series of substantial investments. A new plant for NGL separation became operational in 2004, two new compressors were installed on Troll A in 2005, and a sixth export compressor began operation at Kollsnes in 2006.

Kollsnes is linked to the Sture terminal and the Mongstad oil refinery by the Vestprosess pipeline for NGL.

Gassco operates the plant on behalf of Gassled, with Statoil as technical service provider (TSP).

The Kollsnes processing plant. Photo: Dag Myrestrand/Statoil

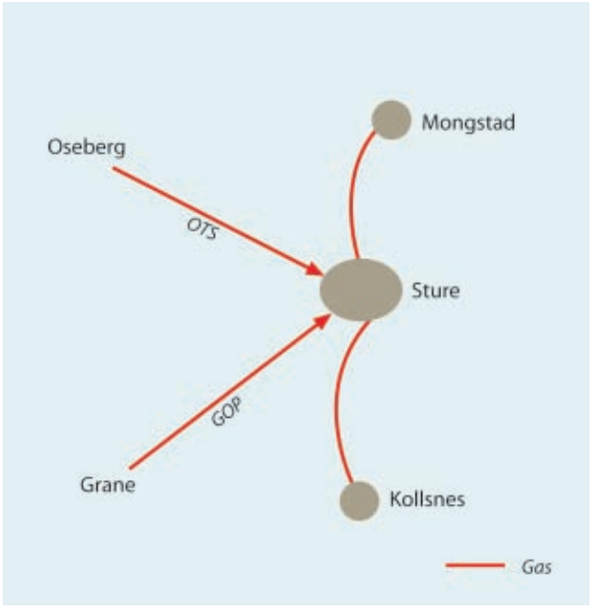
Oil to Sture

The Sture terminal in Øygarden local authority near Bergen is an important port for oil shipments. This facility receives crude oil and condensate from the Oseberg area through the 115-kilometre Oseberg Transport System (OTS) pipeline, and crude oil from Grane through the 212-kilometre Grane oil pipeline (GOP).

Laid in the summer of 1987, the 28-inch OTS was the first oil pipeline to come ashore in Norway. It has a capacity of roughly 600 000 barrels per day, which can be increased to about 735 000 barrels through the addition of friction reducers.

Frostpipe was an 82-kilometre line from Frigg to Oseberg. Oil and condensate, primarily from Frøy but including condensate from Lille-Frigg and East Frigg, were piped to Oseberg A and on to Sture through the OTS. This transport system became operational in 1994 and was shut down in 2004, with the Frøy line filled with seawater to await possible re-use.

The 29-inch GOP to Sture is 220 kilometres long and became operational when production began on Grane in 2003.



Facilities at Sture embrace two jetties able to accommodate tankers of up to 300 000 deadweight tonnes and a set of artificial rock caverns providing storage – five of one million cubic metres for oil, one of 60 000 cubic metres for LPG and one of 200 000 cubic metres for ballast water.

The Sture terminal. Photo: Øyvind Hagen/Statoil

The terminal also has a plant for recovering volatile organic compounds (VOCs), which is environmentally important when loading tankers.

Sture separates the lightest fractions from the crude oil in the form of LPG and naphtha. Stabilised crude and LPG are loaded into tankers from the jetties, with NGL and naphtha also exported to the Mongstad refinery through the Vestprosess pipeline. Tankers and LPG carriers make 250-260 calls a year at the terminal today.

Operational since 1988, Sture facility is owned and operated by I/S Oseberg Transport System.

Oseberg Transport System

Operator	Statoil
Development operator	Norsk Hydro
Length	115 km
Operational	1988
Diameter	28 inch

Owners oil pipeline
(Oseberg Transportsystem Interessentskap)

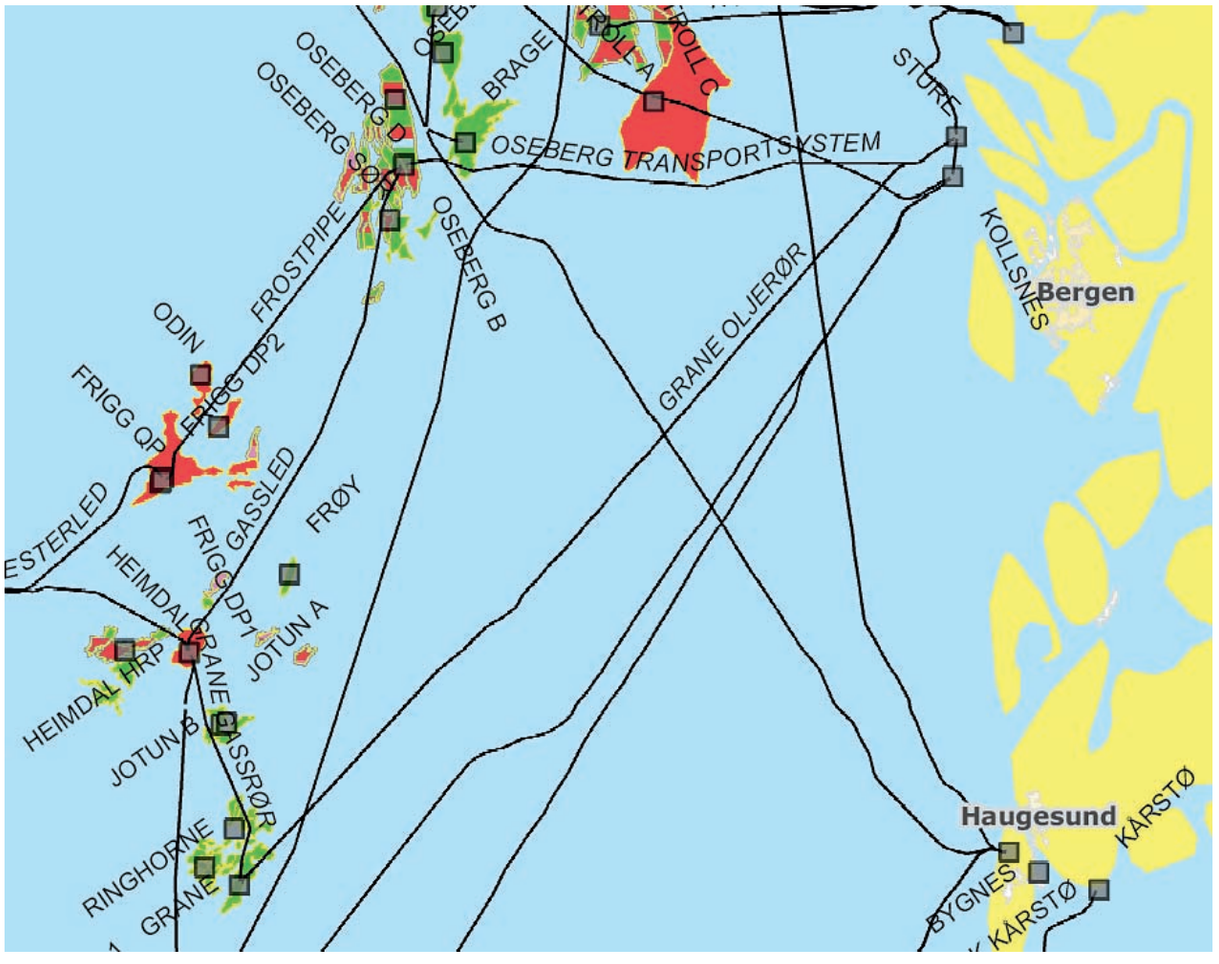
Statoil	36.24%
Petoro	48.38%
Total E&P Norge	8.65%
ExxonMobil	4.33%
ConocoPhillips	2.40%

Grane Oil Pipeline

Operator	Statoil
Development operator	Norsk Hydro
Length	220 km
Capacity	213 800 b/d
Diameter	29 inches
Operational	September 2003

Owners

Petoro	43.6%
ExxonMobil	25.6%
Statoil	24.4%
ConocoPhillips	6.4%



Oseberg Transport System and the Grane oil pipeline. Map: Norwegian Petroleum Directorate

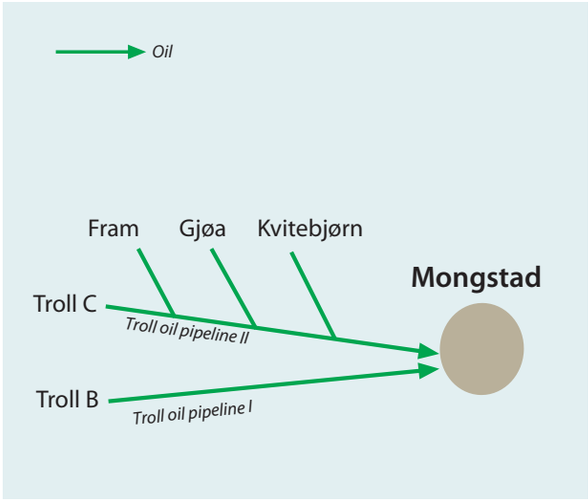
Oil to Mongstad

The facilities at Mongstad north of Bergen have been in operation since 1975, and now comprise an oil refinery, the Vestprosess NGL fractionation plant and a crude oil terminal. With an annual capacity of 10 million tonnes, the refinery is the largest in Norway.

Piped oil arrives at Mongstad from the Troll field through the Troll Oil Pipeline I and II facilities.

Troll Oil Pipeline I runs from Troll B to the Mongstad terminal. The plan for installation and operation (PIO) was approved in 1993. With a diameter of 16 inches, the pipeline is 85 kilometres long. The Troll licensees have established a separate partnership to operate the pipeline, which is owned in the same proportions as the Troll licence. Completion of Troll Oil Pipeline I coincided with the start of production from Troll B in 1995. Its licence runs until 2023.

Troll Oil Pipeline II has a diameter of 20 inches and carries oil for 80 kilometres from Troll C to Mongstad. It was completed at the same time as the platform came on stream in 2009. Oil from Fram is piped through the line via Troll C. The pipeline



licence expires in 2023.

Stabilised oil from Gjøa is exported in a new 55-kilometre pipeline, which is tied into Troll Oil Pipeline II for onward transport to Mongstad.

The Kvitebjørn oil pipeline carries condensate from this field to the Mongstad oil terminal.

It is tied into Troll Oil Pipeline II through a Y-piece.

Measuring 16 inches in diameter, the 90-kilometre pipeline became operational in 2004.

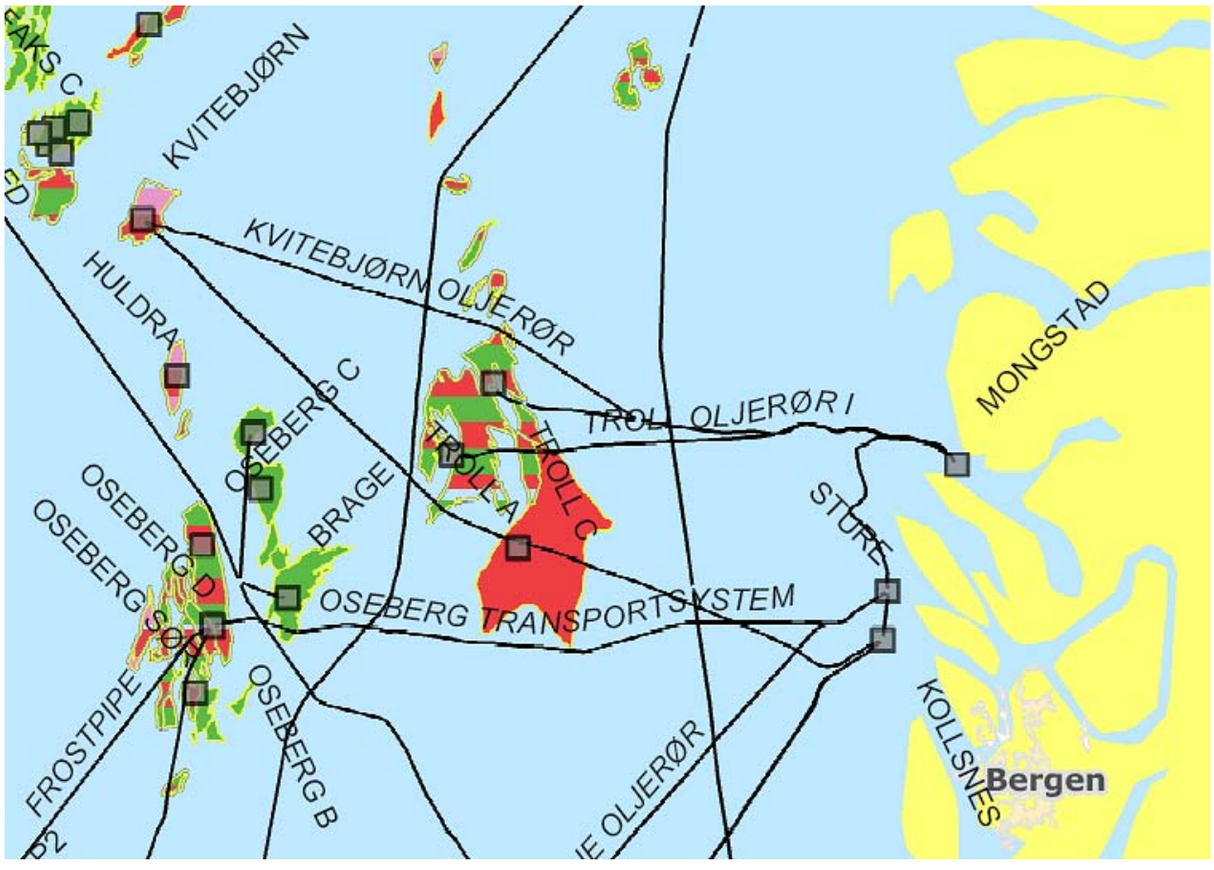
The Mongstad complex. Photo: Harald M Valderhaug/Statoil

Troll Oil Pipeline I and II

Operator	Statoil
Development operator	Statoil
Length, I	85 km
Length, II	80 km
Capacity, I	267 mill b/d
Capacity, II	252 mill b/d
Diameter, I	16 inches
Diameter, II	20 inches
Operational, I	September 1995
Operational, II	November 1999
Owners	
Petoro	55.77%
Statoil	30.58%
Shell	8.29%
Total	3.71%
ConocoPhillips	1.66%

Kvitebjørn oil pipeline

Operator	Statoil
Development operator	Statoil
Length	90 km
Diameter	16 inches
Capacity	63000 b/d
Operational	October 2004
Owners	
Statoil	58.55%
Petoro AS	30.00%
Enterprise Oil Norge	6.45%
Total E&P Norge	5.00%



The Kvitebjørn oil and gas pipelines. Map: Norwegian Petroleum Directorate