17

Pipelines and land facilities

Pipelines

Norpipe • Frigg Transport/Vesterled • Frostpipe
Sleipner East condensate • Statpipe • Zeepipe
Europipe I • Troll Oil Pipeline I • Troll Oil Pipeline II
Oseberg Transport System (OTS) • Oseberg Gas Transport (OGT)
Haltenpipe • Franpipe • Europipe II • Åsgard Transport
Norne Gas Export • Heidrun Gas Export • Draugen Gas Export
Grane Oil Pipeline • Grane Gas Pipeline

Land facilities

Kårstø gas treatment and condensate complex
Kårstø metering and technology laboratory
Bygnes traffic control centre • Kollsnes gas treatment plant
Tjeldbergodden industrial complex • Sture terminal • Vestprosess
Mongstad crude oil terminal

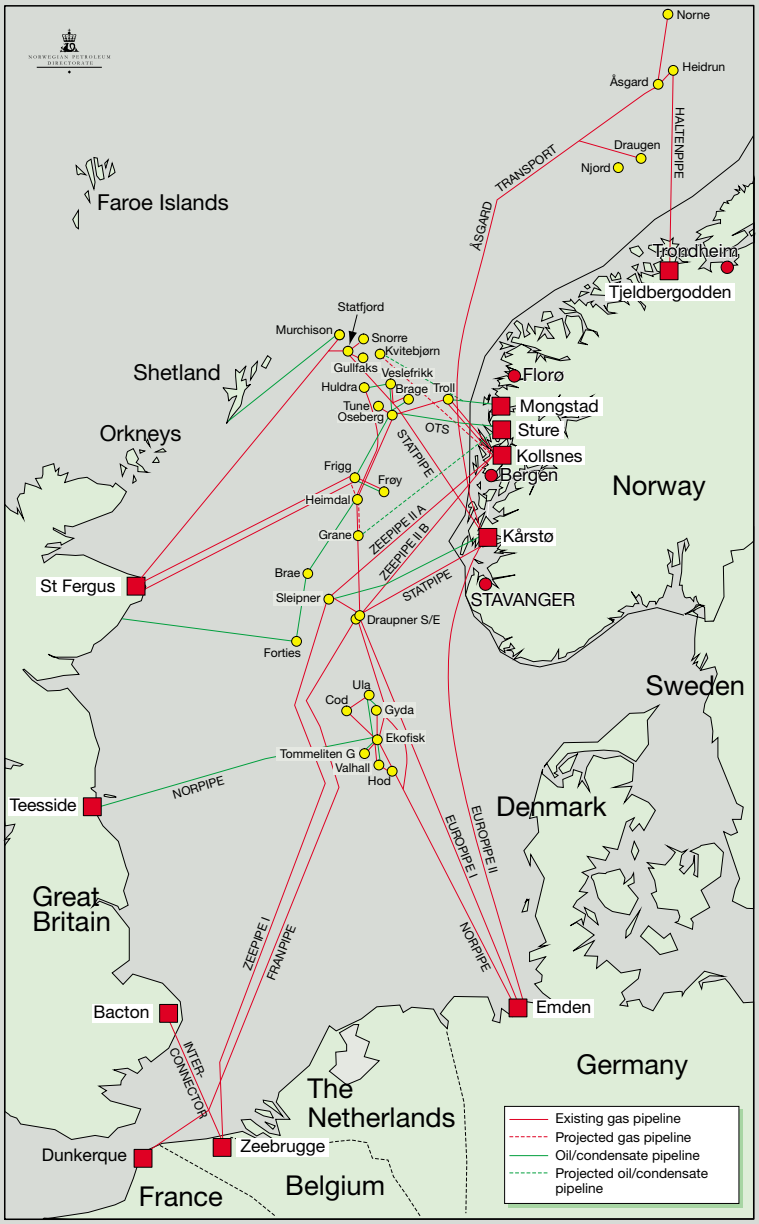

Figure 17.1 shows existing and planned pipelines in the North and Norwegian Seas. This chapter provides a more detailed description of pipelines on the Norwegian continental shelf. The transport capacities given are based on standard assumptions about pressure ratios, energy content of the gas, buyer options for varying daily deliveries, maintenance periods and operational flexibility.

Norpipe: Norpipe Oil AS

Operator	Phillips Petroleum Company Norway	
Licensees	Phillips Petroleum Company Norway	35.05%
	Total Norge AS	30.46%
	Den norske stats oljeselskap a.s	20.00%
	Norsk Agip A/S	6.52%
	TotalFinaElf Exploration Norge AS	4.47%
	Norsk Hydro Produksjon a.s	3.50%

The SDFI will receive a five per cent interest in Norpipe Oil AS on 15 October 2005 through a similar reduction in the equity interest held by Den norske stats oljeselskap a.s in the company.

Norpipe: Norsea Gas A/S

Operator	Phillips Petroleum Company Norway. Providing sufficient volumes are reserved under new transport contracts, Den norske stats oljeselskap a.s can take over as operator.	
Licensees	Den norske stats oljeselskap a.s	50.00%
	Phillips Petroleum Norsk A/S	15.89%
	Total Norge AS	15.26%
	Norsk Agip A/S	8.62%
	TotalFinaElf Exploration Norge AS	5.60%
	Norsk Hydro Produksjon a.s	4.63%
	The SDFI will receive a 20 per cent interest in Norsea Gas A/S on 15 October 2005, and a further 20 per cent on 1 October 2007. The equity interest of Den norske stats oljeselskap a.s in Norsea Gas A/S will be 40 per cent on 15 October 2005 and 30 per cent on 1 October 2007. Other interests in the company will be reduced proportionally.	
Investment	Total investment, including Norpipe Oil, is likely to be NOK 35.3 bn (2001 value)	
Operating life	Both pipelines have been designed for an operating life of at least 30 years. Extending the technical life of the pipelines is under constant review.	
Capacity	Design capacities are about 15 bn scm/year (43 mill scm/day) for the gas line and around 53 mill scm/year (900 000 b/d) for the oil line, which includes the use of friction-inhibiting chemicals. Capacity is limited by the receiving facilities to about 780 000 b/d.	

Operating organisation	Stavanger

The Norpipe gas line belongs to Norpipe a.s, a wholly-owned subsidiary of Norsea Gas A/S. Running roughly 440 km to Emden in Germany, this 36-inch line starts at the Ekofisk Centre, where two compressors are installed. Two riser platforms, each with three compressors, are positioned on the German continental shelf to pump the gas southwards. The compressors on one of these installations have now been shut down. Also owned by Norsea Gas A/S, the Emden terminal cleans and dries the gas prior to onward distribution.

Operation of the gas line began in September 1977, and Statpipe was tied to it in 1986. Statpipe was tied directly to Norpipe downstream from Ekofisk with the aid of a bypass line as part of the redevelopment of Ekofisk in 1998.

Owned by Norpipe Oil AS, the 34-inch Norpipe oil pipeline is about 354 km long and again starts at the Ekofisk Centre, where three pumps have been placed. It crosses the UK continental shelf to come ashore at Teesside. A tie-in point for UK fields is located about 50 km downstream of Ekofisk. Two riser platforms, each with three pumps, were abandoned in 1983 and early 1987 respectively.

Two British-registered companies, Norsea Pipeline Ltd and Norpipe Petroleum UK Ltd, own the oil export port and fractionation plant for extracting NGL in Teesside, and are operated by Phillips Petroleum Company UK. The oil pipeline carries crude from the Ekofisk, Eldfisk, Embla and Tor fields as well as from Valhall, Hod, Ula and Gyda. It also transports production from Britain's Fulmar, J block, Gannet, Auk, Clyde, Janice and Orion. From the summer of 2001, oil from Tambar will also be piped from Ekofisk to Teesside.

Frigg Transport/Vesterled

Operators	Norsk Hydro Produksjon a.s/Total Oil Marine UK	
Progress	The Norwegian pipeline was completed in 1977 and put into service in August 1978. Its licence was awarded in 1974 and expires in 2003, while the UK pipeline licence expires in 2026. The production licence for the Norwegian part of Frigg expires in 2015.	
Licensees	Den norske stats oljeselskap a.s (SDFI 60.00%)	72.28%
	Norsk Hydro Produksjon a.s	13.86%
	TotalFinaElf Exploration Norge AS	11.48%
	Mobil Development Norway A/S	2.38%
Investment	Total investment in the Norwegian Frigg pipeline and the Norwegian share of MCP01 is about NOK 27 bn (2001 value)	
Operating life	The licence expires in 2003	

Capacity	33 mill scm/day. At present limited to 18 mill scm/day because of Frøy (British pipeline: 33 mill scm/day).
Operating organisation	St Fergus, UK

The Frigg Norwegian Pipeline (FNP) gas transport system from Frigg to St Fergus in Scotland comprises a 32-inch pipeline and a receiving terminal on land, but not the field processing and compression facilities on Frigg. The FNP runs for about 350 km, and currently carries gas from Frigg and Frøy as well as Britain's Piper, Tartan and Galley fields. While the 32-inch UK pipeline from Frigg to St Fergus was completed in the summer of 1976, the FNP was ready the following year and came into service in August 1978.

A plan for installation and operation (PIO) for Vesterled was received by the MPE in December 1999 from the licensees in Oseberg, who currently form the Vesterled partnership. The plan embraces installation of a new pipeline from Heimdal with a tie-in to the FNP about 50 km downstream from Frigg, as well as changes to the FNP operatorship and future operation of this system.

With a total length of roughly 45 km, the new 32-inch line will have a capacity corresponding to the FNP – in other words, about 11 bn cu.m/year. The full Vesterled system will also embrace the FNP and Norway's share of the St Fergus terminal.

The authorities approved the installation plans in October 2000, and Vesterled is due to start operating on 1 October 2002. But the companies are considering opportunities for bringing the system into operation as early as 2001.

Frostpipe

Operator	TotalFinaElf Exploration Norge AS	
Licensees	Den norske stats oljeselskap a.s (SDFI 30.00%)	50.00%
	TotalFinaElf Exploration Norge AS	22.00%
	Total Norge AS	14.25%
	Norsk Hydro Produksjon a.s	13.75%
Progress	The pipeline was put into service in April 1994	
Investment	Total investment is likely to be NOK 0.9 bn (2001 value)	
Operating life	The licence expires in 2016	
Capacity	About 100 000 b/d	

This pipeline carries oil and condensate from Frigg to Oseberg. A plan for installation and operation of Frostpipe was approved by the Storting in April 1992. Providing a transport

solution for liquids from Frøy, the system has the capacity to pipe volumes from new discoveries in the area. The 16-inch pipeline is about 82 km long. Liquids are piped on from Oseberg via the Oseberg Transport System (OTS). The MPE received a programme for an impact assessment of a Frostpipe cessation plan in December 2000.

Sleipner East condensate

Operator	Den norske stats oljeselskap a.s	
Licensees	Den norske stats oljeselskap a.s (SDFI 29.6%)	49.6%
	Esso Expl & Prod Norway A/S	30.4%
	Norsk Hydro Produksjon a.s	10.0%
	TotalFinaElf Exploration Norge AS	10.0%
Investment	Total investment is likely to be NOK 1.3 bn (2001 value)	
Capacity	200 000 b/d	
Operating organisation	Bygnes, Karmøy	

The decision to land condensate from Sleipner East at Kårstø north of Stavanger rather than at Teesside in the UK meant that the field's licensees had to lay a 20-inch pipeline to the Norwegian coast and organise the required expansion of the Kårstø complex. Unprocessed condensate from Sleipner East began to flow through the 245-km pipeline in 1993. At Kårstø, it is fractionated into NGL and stabilised condensate for the market. With a daily capacity is 200 000 barrels, this line also began carrying condensate from Sleipner West, Loke and Gungne in 1997.

Statpipe

Operator	Den norske stats oljeselskap a.s	
Licensees	Den norske stats oljeselskap a.s	58.25%
	TotalFinaElf Exploration Norge AS	10.00%
	Norsk Hydro Produksjon a.s	10.00%
	Mobil Development Norway A/S	7.00%
	Esso Expl & Prod Norway A/S	5.00%
	A/S Norske Shell	5.00%
	Norske Conoco A/S	2.75%
	Total Norge AS	2.00%

Investment	Total investment is likely to be NOK 25.1 bn (2001 value) excl Kårstø
Operating life	Designed to operate for 40 years
Capacities	Rich gas pipeline Statfjord-Kårstø: 25-26 mill scm/day (about nine bn/year). Kårstø terminal: roughly 25 mill scm/day (about eight bn/year). Dry gas pipeline Draupner S-Ekofisk: 53 mill scm/day (about 17 bn scm/year). Capacities vary to a large extent in accordance with rich gas composition and pressure in Statpipe and downstream of the line.
Operating organisation	Bygnes, Karmøy, and Kårstø, Tysvær

This 880-km pipeline system includes a riser platform and a receiving facility at Kårstø north of Stavanger. Statpipe is tied to the Statfjord, Statfjord North and East, Gullfaks, Borg, Snorre, Brage, Tordis, Veslefrikk and Heimdal fields. Rich gas from fields in the northern part of Norway's North Sea sector – Statfjord, Gullfaks and the Oseberg area – is piped through a 30-inch line to Kårstø for separation and fractionation of the NGL into commercial products, which are exported by ship. The residual dry gas continues either in a 28-inch pipeline to the Draupner S riser platform and on to Emden via Ekofisk, or through Europipe II to Dornum near Emden (see page 163). Heimdal is connected to Statpipe via a 36-inch line to Draupner S. Work on the project began in 1981. A 25-year licence was awarded from the start of operation in October 1985 to 1 January 2011.

Zeepipe

Operator	Den norske stats oljeselskap a.s	
Licensees (rounded off to two decimal places)	Den norske stats oljeselskap a.s (SDFI 55%)	70.0%
	Norsk Hydro Produksjon a.s	11.0%
	A/S Norske Shell	7.0%
	Esso Expl & Prod Norway A/S	6.0%
	TotalFinaElf Exploration Norge AS	3.3%
	Norske Conoco A/S	1.4%
	Total Norge AS	1.3%
Investment	Total investment is likely to be NOK 20.1 bn (2001 value)	
Operating life	Zeepipe is designed to operate for 50 years	
Capacity	Some 13 bn scm/year for the Sleipner-Zeebrugge line	
Operating organisation	Bygnes, Karmøy, and Kårstø, Tysvær	

A staged development was adopted for Zeepipe. Phase I comprises a 40-inch pipeline running for 814 km from Sleipner East to Zeebrugge in Belgium and a 30-inch line running 30 km from Sleipner East to the Draupner S riser platform in the Statpipe system. It came into service in 1993.

Phase II consists of two pipelines from the Troll Gas treatment plant at Kollsnes near Bergen. The 40-inch Phase IIA line runs for 303 km to Sleipner East and began operating in 1996. Phase IIB, which is 40 inches in diameter and runs for 304 km to the Draupner E riser platform, came into service in the following year.

The gas receiving station in Zeebrugge belongs to a separate partnership, with the Zeepipe group holding 49 per cent and Distrigaz 51 per cent. This facility is built and operated as an integral part of Zeepipe.

Europipe I

Operator	Den norske stats oljeselskap a.s
Licensees	As for Zeepipe
Investment	Total investment is likely to be NOK 17.7 bn (2001 value)
Operating life	Europipe I is designed to operate for 50 years
Capacity	Some 17 bn scm/year
Operating organisation	Bygnes, Karmøy, and Kårstø, Tysvær

This 40/42-inch pipeline starts at the Draupner E riser platform and runs for 660 km to the final delivery point at Emden in Germany. Europipe I came into service in 1995.

Troll Oil Pipeline I

Operator	Den norske stats oljeselskap a.s	
Licensees (rounded off to two decimal places)	Den norske stats oljeselskap a.s (SDFI 62.70%)	76.62%
	Norsk Hydro Produksjon a.s	9.73%
	A/S Norske Shell	8.29%
	TotalFinaElf Exploration Norge AS	2.35%
	Norske Conoco A/S	1.66%
	Total Norge AS	1.35%
Investment	Total investment is likely to be about NOK 0.9 bn (2001 value)	

Operating life	Troll Oil Pipeline I is designed to operate for 35 years
Capacity	42 500 scm/day of oil with the use of friction inhibitors.
Operating organisation	Bygnes, Karmøy

This 85-km facility transports oil from the Troll B platform to the terminal at Mongstad near Bergen. With the plan for installation and operation approved in December 1993, the 16-inch line was ready in September 1995 and is licensed to 2023. The Troll licensees have established a separate partnership to handle operation of the line.

Troll Oil Pipeline II

Operator	Den norske stats oljeselskap a.s	
Licensees (rounded off to two decimal places)	Den norske stats oljeselskap a.s (SDFI 62.70%)	76.62%
	Norsk Hydro Produksjon a.s	9.73%
	A/S Norske Shell	8.29%
	TotalFinaElf Exploration Norge AS	2.35%
	Norske Conoco A/S	1.66%
	Total Norge AS	1.35%
Investment	About NOK 0.9 bn (2001 value)	
Operating life	Troll Oil Pipeline II is designed for a lifetime of 35 years	
Capacity	47 500 scm/day of oil	
Operating organisation	Bygnes, Karmøy	

A 20-inch pipeline has been built to carry oil over the 80 km from Troll C to the terminal at Mongstad near Bergen. The plan for installation and operation was approved in March 1998, and Troll Oil Pipeline II was ready to begin operation when Troll C started production on 1 November 1999. This line is licensed to 2023.

Oseberg Transport System (OTS)

Operator	Norsk Hydro Produksjon a.s
Progress	The pipeline was laid in 1987, the system was ready for start-up in 1988, and first oil arrived at Sture on 20 December of the same year.

Licensees	As for the Oseberg field
Investment	Total investment is likely to be NOK 7.4 bn (2001 value)
Capacity	765 000 b/d (technical), 990 000 scm (storage)
Operating life	The pipeline is designed to operate for 40 years. This may be extended.
Operating organisation	Bergen

Oil from Oseberg is piped for 115 km in a 28-inch pipeline from the field's A platform to the terminal at Sture near Bergen. The Oseberg group has established a separate partnership, owned in the same proportions as the unitised field, to operate the line. This partnership has concluded agreements with the licensees for Veslefrikk, Brage, Lille-Frigg, Frøy, Oseberg South, Oseberg East, Tune and Huldra to transport oil from these fields via Oseberg A and the OTS to Sture. Oil and NGL from Frøy are piped through Frostpipe from the TCP2 platform on Frigg to Oseberg A. The OTS partnership has concluded an agreement with the Grane shippers to receive, store and export oil from this field, starting in 2003.

Oseberg Gas Transport (OGT)

Operator	Norsk Hydro Produksjon a.s
Licensees	As for the Oseberg field
Investment	Total investment is likely to be NOK 1.6 bn (2001 value)
Operating life	The pipeline is designed to operate for 50 years
Capacity	34 mill scm/day
Operating organisation	Bergen

A plan for installation and operation of a gas pipeline from Oseberg, which will tie into Statpipe at the Heimdal platform, was submitted by the field licensees in 1996. The authorities approved these proposals on 11 May 1999 and operation began in 2000. While this 36-inch line is primarily intended for gas from Oseberg, it will have spare capacity to transport supplies from other sources. It runs for 109 km.

Haltenpipe

Operator	Den norske stats oljeselskap a.s	
Progress	Government approval to install and operate Haltenpipe was given in February 1992. Laying began in 1994, and the line came into operation in November 1996.	
Licensees (rounded off to two decimal places)	Den norske stats oljeselskap a.s (SDFI 65.00%)	76.88%
	Norske Conoco A/S	18.13%
	Fortum Petroleum AS	5.00%
Investment	Total investment in pipeline and terminal is likely to be about NOK 2.4 bn (2001 value)	
Operating life	The licence expires on 31 December 2020	
Capacity	Minimum 2.2 bn scm/year of gas	

This 16-inch gas pipeline runs for 245 km from Heidrun on the Halten Bank in the Norwegian Sea to Tjeldbergodden in mid-Norway, where Statoil and Conoco/DuPont have built a methanol plant. The latter uses Heidrun gas as feedstock. Annual gas supplies to the methanol plant total some 0.7 bn scm.

Franpipe

Operator	Den norske stats oljeselskap a.s	
Licensees (rounded off to two decimal places)	Den norske stats oljeselskap a.s (SDFI 60%)	69.71%
	Norsk Hydro Produksjon a.s	11.65%
	Esso Expl & Prod Norway A/S	3.88%
	Mobil Development Norway A/S	3.88%
	Total Norge AS	2.91%
	TotalFinaElf Exploration Norge AS	2.14%
	Norsk Agip A/S	1.94%
	A/S Norske Shell	1.29%
	Fortum Petroleum AS	1.29%
	Norske Conoco A/S	1.29%
Investment	Total investment is put at roughly NOK 8.2 bn (2001 value), including a receiving facility in Dunkerque	
Operating life	Technical operating life is 50 years. The licence expires in 2020	
Capacity	About 15 bn scm/year	

Operating organisation	Bygnes, Karmøy, and Kårstø, Tysvær

This 42-inch gas pipeline runs from the Draupner E riser platform in the North Sea to a receiving terminal at Dunkerque in France. The interests listed above could change up to 1 October 2001. A separate partnership has been established for the terminal, with the Franpipe group holding a 65 per cent interest and Gaz de France 35 per cent. With an overall pipeline length of 840 km, the system was completed in 1998. Den norske stats oljeselskap a.s and the Franpipe group were also responsible for establishing a 36-inch direct link – the Ekofisk bypass – between the Statpipe and Norpipe gas pipelines at a total cost of NOK 400 mill. The bypass started up in 1998.

Europipe II

Operator	Den norske stats oljeselskap a.s	
Licensees (rounded off to two decimal places)	Den norske stats oljeselskap a.s (SDFI 60.00%)	60.01%
	Norsk Hydro Produksjon a.s	15.36%
	Esso Expl & Prod Norway AS	7.68%
	Total Norge AS	5.91%
	Fortum Petroleum AS	3.66%
	Norske Conoco A/S	2.66%
	Norsk Agip A/S	2.36%
	A/S Norske Shell	1.18%
	Mobil Development Norway A/S	1.18%
	TotalFinaElf Exploration Norge AS	0.01%
Investment	Total investment is put at NOK 8 bn (2001 value)	
Operating life	Technical operating life is 50 years. The licence expires in 2020	
Capacity	About 18 bn scm/year	
Operating organisation	Bygnes, Karmøy, and Kårstø, Tysvær	

The plan for installation and operation of a 42-inch pipeline running for 650 km from Kårstø north of Stavanger to the existing landfall facilities near Dornum in Germany was approved by the MPE in 1996. This line started up on 1 October 1999. The interests listed above could change up to 1 October 2001.

Åsgard Transport

Operator	Den norske stats oljeselskap a.s	
Licensees	Den norske stats oljeselskap a.s (SDFI 46.95%)	60.50%
	Norsk Hydro Produksjon a.s	11.60%
	Norsk Agip A/S	7.90%
	Total Norge AS	7.65%
	Mobil Development Norway A/S	7.35%
	Fortum Petroleum AS	5.00%
Investment	Total investment is likely to be NOK 8.7 bn (2001 value)	
Operating life	Technical operating life is 50 years. The licence expires on 31.12.2020	
Capacity	About 20.5 bn scm/year	

Installation and operation of a 42-inch pipeline running the 730 km from Åsgard in the Norwegian Sea to Kårstø north of Stavanger received final approval from the MPE in 1998. This line became operational in 2000. In addition to Åsgard gas, this 730-km system also carries gas from other fields off mid-Norway.

Norne Gas Export

Operator	Den norske stats oljeselskap a.s	
Licensees	Den norske stats oljeselskap a.s (SDFI 55.00%)	79.0%
	Norsk Hydro Produksjon a.s	8.1%
	Norsk Agip A/S	6.9%
	Enterprise Oil Norwegian A/S	6.0%
Investment	Total investment is put at roughly NOK 1.3 bn (2001 value)	
Operating life	The technical operating life is 50 years	
Capacity	About 3.6 bn scm/year	

The authorities received a plan for installation and operation of Norne Gas Export in 1997, plus a supplement to this in April 1999. Approval of the proposals was given by the MPE in the spring of 2000. This 16-inch pipeline runs roughly 130 km from Norne to tie into the Åsgard Transport system. It became operational in February 2001.

Heidrun Gas Export

Operator	Den norske stats oljeselskap a.s	
Licensee (rounded off to two decimal places)	Den norske stats oljeselskap a.s (SDFI 64.16%)	76.59%
	Norske Conoco A/S	18.29%
	Fortum Petroleum AS	5.12%
Investment	Total investment is put at NOK 0.9 billion (2001 value)	
Operating life	The technical operating life is 50 years	
Capacity	About 4 bn scm/year	

The authorities received a plan for installation and operation of Heidrun Gas Export in 1997, plus a supplement to this in April 1999. Approval of the proposals was given by the MPE in the spring of 2000. This 16-inch pipeline runs roughly 37 km from Heidrun to tie to the Åsgard Transport system. It became operational in February 2001.

Draugen Gas Export

Operator	A/S Norske Shell	
Licensees	Den norske stats oljeselskap a.s (SDFI 57.88%)	57.88%
	BP Amoco Norge AS	18.36%
	A/S Norske Shell	16.20%
	Norsk Chevron AS	7.56%
Operating life	The technical operating life is about 50 years	
Capacity	About 2 bn scm/year	
Investment	Total investment is put at roughly NOK 0.9 bn (2001 value)	

A plan for installation and operation of Draugen Gas Export was received by the MPE in May 1999 and approved in April 2000. The 16-inch pipeline from Draugen to Åsgard Transport is roughly 75 km long and provides opportunities for possible tie-ins of other fields in the area. The pipeline started up in November 2000.

Grane Oil Pipeline

Operator	Norsk Hydro Produksjon a.s	
Licensees	Den norske stats oljeselskap a.s (SDFI 43.6%)	43.6%
	Esso Expl & Prod Norway A/S	25.6%
	Norsk Hydro Produksjon a.s	24.4%
	Norske Conoco A/S	6.4%
Operating life	The technical operating life is 30 years	
Capacity	34 000 scm/day of oil	
Investment	Total investment is put at roughly NOK 1.9 bn (2001 value)	

The plan for installation and operation of the Grane Oil Pipeline was approved in June 2000. This 29-inch pipeline from Grane to the Sture terminal will be 220 km long. It will start up simultaneously with the beginning of oil production from Grane, scheduled for the autumn of 2003.

Grane Gas Pipeline

Operator	Norsk Hydro Produksjon a.s	
Licensees	Den norske stats oljeselskap a.s (SDFI 43.6%)	43.6%
	Esso Expl & Prod Norway A/S	25.6%
	Norsk Hydro Produksjon a.s	24.4%
	Norske Conoco A/S	6.4%
Operating life	The technical operating life is 30 years	
Capacity	About 3.6 bn scm/year	
Investment	Total investment is put at roughly NOK 0.4 bn (2001 value)	

The plan for installation and operation of the Grane Gas Pipeline was approved in June 2000. This 18-inch pipeline from Grane to the Heimdal riser platform will be 50 km long. The licensees are planning to import gas through the line to meet injection requirements on Grane. A preliminary agreement on purchasing gas has been reached with the Gas Negotiating Committee.

Kårstø gas treatment and condensate complex

Interests	The Kårstø gas treatment and condensate facilities form part of Statpipe, and are owned by the same partnership

The Kårstø complex north of Stavanger receives rich gas from Statfjord, Statfjord North and East, Gullfaks I and II, Borg/Tordis East, Snorre, Brage, Tordis and Veslefrikk through the Statpipe rich gas leg. These facilities also receive rich gas from Åsgard, Heidrun, Norne and Draugen through Åsgard Transport, as well as unstabilised condensate from Sleipner East and West.

Rich gas is separated at Kårstø and fractionated to methane, ethane, propane, iso-butane, normal butane, naphtha and stabilised condensate. Dry gas – methane and some of the ethane – is piped either through Statpipe to the Draupner S riser platform and on to Emden in Germany, Zeebrugge in Belgium or Dunkerque in France, or through Europipe II from Kårstø to Dornum near Emden.

The rest of the ethane as well as iso- and normal butane are stored in refrigerated tanks, while naphtha and condensate are stored in tanks at ambient temperature. Propane is stored in large refrigerated rock caverns. These products are exported in liquid form by ship. The complex received 421 vessel calls in 2000 and shipped out 6.3 million tonnes of liquids.

Treatment facilities at Kårstø comprise four fractionation/distillation trains for methane, ethane, propane, butanes and naphtha, plus a fractionation line for stabilising condensate. The gas treatment facilities have a capacity of 64 mill scm per day, while the condensate and ethane plants can process roughly 3.6 mill and 620 000 tonnes per year respectively. Plans are being drawn up to expand capacity at Kårstø.

Kårstø metering and technology laboratory

The Kårstø metering and technology laboratory (K-Lab) offers services relating to the calibration of all types of gas flow meters for pressures from 20-150 bar, testing and qualification of equipment, capacity testing of control valves, and research projects. Investment in this facility, which opened in 1988, totals NOK 128 mill. The K-lab is wholly owned by Den norske stats oljeselskap a.s.

Bygnes traffic control centre

Interests	Owned by Statpipe

The traffic control centre at Bygnes north of Stavanger coordinates gas transport and deliveries through the pipeline network from producers on the NCS to buyers in continental Europe. It controls gas flows through some 5 500 km of pipelines which transport about 90 per cent of Norwegian gas flowing to European customers.

Kollsnes gas treatment plant

Interests	Interests in the Kollsnes gas treatment plant are the same as for the Troll field

The Kollsnes gas treatment plant near Bergen is part of the Troll Gas facilities, which also include Troll A and the pipelines linking this platform with the treatment plant. Construction work began at Kollsnes in 1991 and was completed by 1 October 1996, the deadline for starting contractual gas deliveries to continental Europe.

Wellstreams from Troll East are carried through two pipelines to the Kollsnes treatment plant for separation into dry gas and condensate. The gas is dried and compressed before being piped through Zeepipe to Zeebrugge, Statpipe/Norpipe to Emden and Franpipe to Dunkerque. Condensate is piped on to the Vestprosess facility at Mongstad.

The gas treatment plant can handle up to 120 mill scm of gas and 3 500 scm of condensate per day. Full utilisation of this capacity requires the installation of compressors on Troll A. Current plans call for the compressors to begin operation in 2005 or 2006. The construction of an NGL extraction facility at Kollsnes is currently under consideration to treat rich gas from such fields as Kvitebjørn.

Tjeldbergodden industrial complex

Ownership of the Tjeldbergodden plants	Statoil Metanol ANS:	
	Den norske stats oljeselskap a.s	81.875%
	Norske Conoco A/S	18.125%

Plans by Den norske stats oljeselskap a.s and Norske Conoco A/S to utilise gas from Heidrun as feedstock for methanol production at Tjeldbergodden in mid-Norway were approved by the Storting (parliament) in 1992. The methanol plant began production on 5 June 1997. Gas deliveries through the Haltenpipe line total 700 mill scm per year, which yields 830 000 tonnes of methanol.

An air separation plant – Tjeldbergodden Luftgassfabrikk DA – has been built in association with the methanol facility. This partnership has also constructed a small gas fractionation and liquefaction plant with an annual capacity of 35 mill scm.

Norferm a.s, owned by Den norske stats oljeselskap a.s, will begin producing bioproteins at Tjeldbergodden in the first half of 2001. With an annual production capacity of 10 000 tonnes, this plant will consumes 25 mill scm of methane per year. That corresponds to three per cent of the gas received from Heidrun.

Sture crude oil terminal

Interests	Interests in the Sture terminal are the same as for Oseberg, with the exception of the LPG export facilities. These are owned by Norsk Hydro Produksjon a.s (the refrigerated LPG store and transfer systems to ships) and Vestprosess DA (the transfer system to the Vestprosess pipeline).

The crude oil terminal at Sture near Bergen receives production from Oseberg, Veslefrikk, Brage, Frøy, Oseberg South, Oseberg East, Tune (from 2002) and Huldra (from 2002). This oil is carried in a 115-km pipeline from Oseberg A. From the autumn of 2003, the terminal will also receive Grane oil through the Grane Oil Pipeline.

The terminal began operating in December 1988. It incorporates two jetties able to berth oil tankers up to 300 000 tonnes, five rock caverns stores for crude oil with a combined capacity of one million scm, a 60 000-cu.m rock cavern store for LPG and a 200 000-cu.m ballast water cavern. A separate unit for recovering volatile organic compounds given off from tankers has been installed.

The MPE approved an upgrading of the facility in March 1998. A fractionation plant which came on line in December 1999 processes unstabilised crude from Oseberg to stabilised oil and an LPG mix. The latter can either be exported by ship or piped through the Vestprosess line to the Mongstad refinery.

Vestprosess

Ownership	Den norske stats oljeselskap a.s (SDFI 41%)	58%
	Norsk Hydro Produksjon a.s	17%
	Mobil Development Norway A/S	10%
	A/S Norske Shell	8%
	Total Norge AS	5%
	Norske Conoco A/S	2%

The Vestprosess DA partnership was established in October 1997 with the aim of financing, building, operating and owning a system to transport condensate and NGL from Kollsnes and Sture to Mongstad as well as a new NGL facility at the Mongstad refinery. These facilities came on stream in December 1999 and will initially carry Troll condensate from Kollsnes and Oseberg NGL from Sture to Mongstad for further processing.

The first step involves separating naphtha from the LPG to serve as refinery feedstock, while the LPG is fractionated into propane and butane in the new Vestprosess plant. Propane and butane are stored in newly-excavated rock caverns before export. The Vestprosess plant will use waste energy and utilities from the refinery.

Mongstad crude oil terminal

Ownership	Den norske stats oljeselskap a.s	100%

The terminal at Mongstad embraces two jetties able to accept vessels from 30-300 000 tonnes, as well as six caverns excavated from the bedrock 50 metres below ground. These caverns have a storage capacity of 1.3 mill cu.m of oil. Some 2 000 ship calls are handled annually.

This facility was constructed to support the marketing of crude oil loaded offshore on Gullfaks, Draugen, Norne, Åsgard, Heidrun and other fields. These consignments are loaded into shuttle tankers, which have a sailing range confined to north-west Europe. But by storing and transhipping crude at Mongstad, Statoil can sell the oil to more distant destinations. Mongstad is also the receiving terminal for the oil pipelines from Troll B and C.