

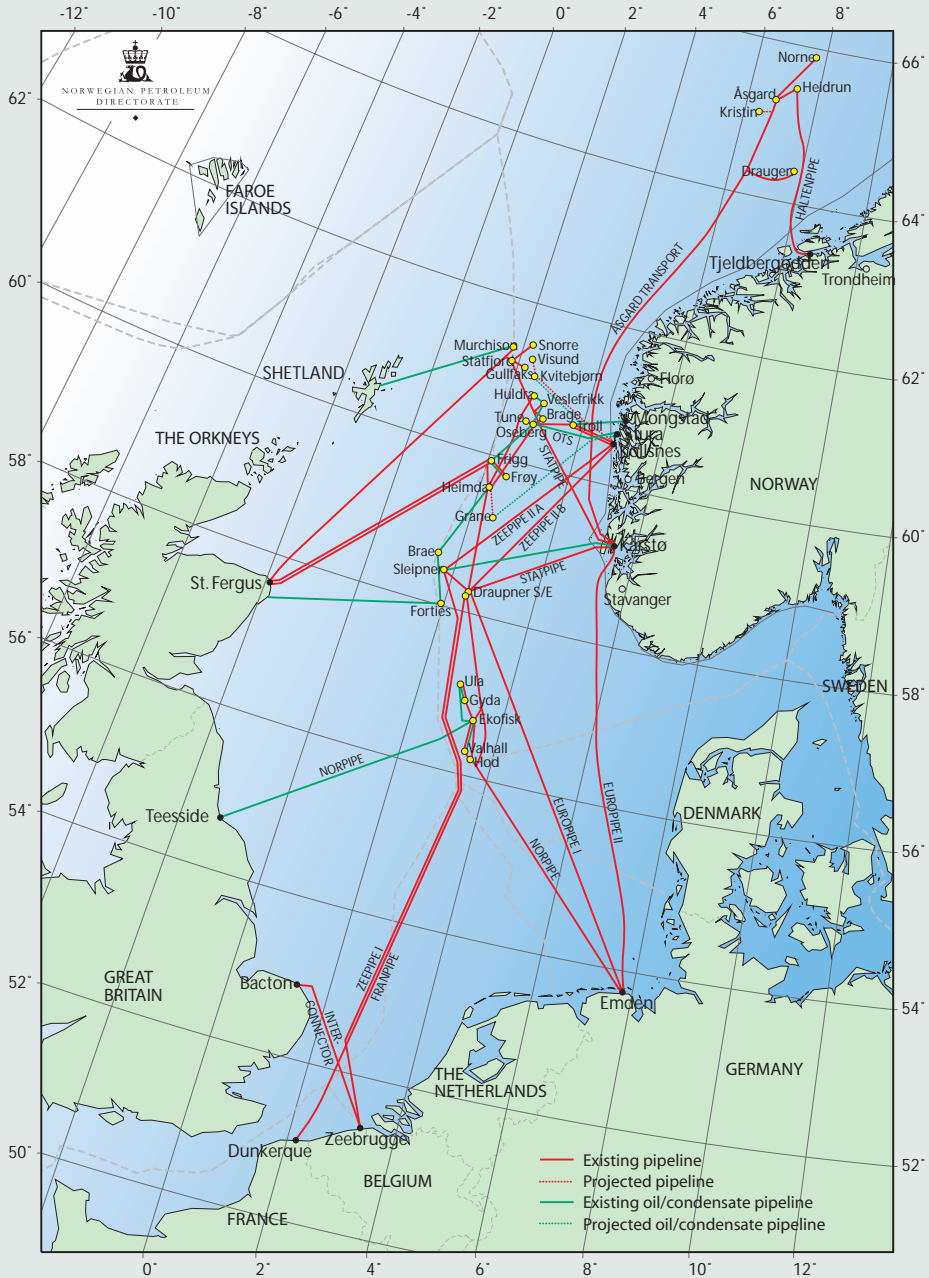
# 15 Pipelines and land facilities

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The map shows existing and planned pipelines in the North and Norwegian Seas. This chapter provides a more detailed description of pipelines on the NCS. The transport capacities given are based on standard assumptions about pressure ratios, energy content of the gas, maintenance periods and operational flexibility.

## Pipelines

### Gassled

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#### Operator: Gassco

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##### Licensees:

Petoro AS*	38.293%
Statoil ASA	20.379%
Norsk Hydro Produksjon a.s	11.134%
TotalFinaElf Exploration Norge A/S	9.038%
Esso Expl & Prodn Norway AS	5.179%
Norske Shell Pipelines AS	4.681%
Mobil Development Norway A/S	4.576%
Norsea Gas A/S	3.018%
Norske Conoco A/S	2.033%
Norsk Agip AS	0.862%
Fortum Petroleum AS	0.807%

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\*Petoro AS serves as the licensee for the SDFI.

Petoro's interest in Gassled is due to increase by 9.689 per cent with effect from 1 January 2011, when the interests of the other partners will be reduced proportionately.

The Storting requested in the spring of 2000 that the MPE invite the relevant companies to negotiations on the creation of a unified ownership structure for gas transport. Gassled represents the merger of companies owning nine pipelines between them into a single partnership. The partnership agreement establishing Gassled was signed on 20 December 2002, and came into effect on 1 January 2003. Gassled's licence runs to 2028.

Gassled embraces the following pipelines: Zeepipe, Europipe I and II, Franpipe, Statpipe (including the transport-related facilities at Kårstø), Vesterled, Oseberg Gas Transport, Åsgard Transport and the Norpipe gas line. The following presentation describes the pipelines owned by Gassled and operated by Gassco.

#### Europipe I

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. Owned by the Zeepipe group, Europipe I came into service in 1995. It has a capacity of about 46-54 mill scm/d, depending on operating mode. The pipeline has been built for an operating life of 50 years and total investment is put at NOK 20.1 bn (2003 value). Its operating organisation is at Bygnes and Kårstø.

#### Europipe II

A 42-inch pipeline running for 650 km from Kårstø north of Stavanger to Dornum in Germany was approved by the MPE in 1996. With a capacity about 71 mill scm/d, Europipe has a technical operating life of 50 years. Total investment is put at about NOK 9.1 bn (2003 value). Its operating organisation is at Bygnes and Kårstø.

### Franpipe

This 42-inch gas pipeline runs for 840 km from the Draupner E riser platform in the North Sea to a receiving terminal at Dunkerque in France. A separate partnership has been established for the terminal, owned 65 per cent by Gassled and 35 per cent by Gaz de France. The system began operating in 1998.

Franpipe has a capacity of about 52 mill scm/d. Its technical operating life is 50 years, with total investment put at roughly NOK 9.4 bn (2003 value). The operating organisation is at Bygnes and Kårstø.

### Norpipe Gas

Running roughly 440 km to Emden in Germany, this 36-inch line starts at the Ekofisk Centre, where two compressors are installed. It has an annual capacity of about 40 mill scm/d. 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 Gassled, 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. Norpipe has been designed for an operating life of at least 30 years. Extending its technical life is under constant review. Total investment is likely to be about NOK 24.8 bn (2003 value). The operating organisation is at Bygnes and Stavanger.

### Oseberg Gas Transport (OGT)

A plan for installation and operation of a gas pipeline from Oseberg, which ties 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 also has the capacity to transport supplies from other sources. It runs for roughly 109 km, with a capacity of about 40 mill scm/day. The pipeline is designed to operate for 50 years, and total investment is likely to be about NOK 1.9 bn (2003 value). Its operating organisation is at Bygnes and Bergen.

### Statpipe

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 products exported by ship. Capacity to Kårstø is about 25 mill scm/d, depending on which fields are delivering. The dry gas can be transported in a 28-inch pipeline to the Draupner S riser platform and on to Emden in Germany via the Ekofisk bypass and Norpipe, or through Europipe II to Dornum near Emden.

Oseberg, Huldra, Heimdal, Jotun and Balder are tied to the network via a 36-inch pipeline from the Heimdal Riser platform to Draupner S, with a capacity of about 30 mill scm/d. This leg can be used for reversed flow.

The project began in 1981. Total investment is put at NOK 43.5 bn (2003 value), excluding the gas treatment plant at Kårstø. The operating organisation is at Bygnes and Kårstø.

### Vesterled (formerly Frigg Transport)

The Frigg Norwegian Pipeline (FNP) gas transport system from Frigg to St Fergus in Scotland was built to transport Norway's share of Frigg gas to the UK. The system originally comprised two 32-inch pipelines and the receiving terminal on land, but not the field processing and compression facilities on Frigg.

Running for about 350 km, the FNP currently carries gas from Norway's Frigg field and Heimdal Riser platform as well as Britain's Galley, Bruce and Alwyn fields. While the UK pipeline 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 54 km, the new 32-inch line has a capacity corresponding to the FNP - in other words, about 35 mill scm/d. Vesterled began operating on 1 October 2001.

Total investment is put at about NOK 29.4 bn (2003 value) in the Norwegian Frigg pipeline and NOK1.4 bn (2003 value) in Vesterled.

### Zeepipe

A staged development was adopted for Zeepipe. Phase I comprises a 40-inch pipeline running for 814 km from Sleipner Riser to Zeebrugge in Belgium and a 30-inch line running 30 km from Sleipner Riser to the Draupner S riser platform in the Statpipe system. It came into service in 1993. Capacity in the Sleipner-Zeebrugge line is some 41 mill scm/d.

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 Riser 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 terminal in Zeebrugge belongs to a separate partnership, with the Gassled partners holding 49 per cent and Fluxys 51 per cent. This facility is built and operated as an integral part of Zeepipe.

Zeepipe is designed for a technical operating life of 50 years. Total investment (including the receiving terminal) is likely to be NOK 23.9 bn (2003 value). The operating organisation is at Bygnes and Kårstø.

### Åsgard Transport

Installation and operation of a 42-inch pipeline running from Åsgard in the Norwegian Sea to Kårstø north of Stavanger received approval from the MPE in 1998. This line became operational in October 2000, with a capacity of about 66 mill scm/d.

In addition to Åsgard gas, this 730-km system also carries supplies from other fields off mid-Norway. Its technical operating life is put at 50 years, with total investment likely to be about NOK 9.9 bn (2003 value)

## Draugen Gas Export

Operator	A/S Norske Shell <sup>2</sup>	
Licensees	Petoro AS <sup>1</sup>	57.88%
	BP Norge AS	18.36%
	A/S Norske Shell	16.20%
	Chevron Texaco Norge AS	7.56%
Investment	Total investment is put at roughly NOK 0.45 bn (2003 value)	
Operating life	The technical operating life is about 50 years	
Capacity	About 2 bn scm/year	
Operating organisation	Kristiansund	

1 Petoro AS serves as the licensee for the SDFI.

2 The operatorship is due to be transferred to Gassco AS.

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 Gas Pipeline

Operator	Norsk Hydro Produksjon a.s	
Licensees	As for the Grane field	
Investment	Total investment is put at about NOK 0.3 bn (2003 value)	
Operating life	The technical operating life is 30 years	
Capacity	About 3.6 bn scm/year	

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.

## Grane Oil Pipeline

Operator	Norsk Hydro Produksjon a.s	
Licensees	Petoro AS <sup>1</sup>	43.6%
	Esso Expl & Prod Norway AS	25.6%
	Norsk Hydro Produksjon a.s	24.4%
	Norske Conoco A/S	6.4%
Investment	Total investment is put at about NOK 1.5 bn (2003 value)	
Operating life	The technical operating life is 30 years	
Capacity	34 000 scm/day of oil	

<sup>1</sup> Petoro AS serves as the licensee for the SDFI.

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.

## Haltenpipe

Operator	Gassco AS	
Licensees	Petoro AS <sup>1</sup>	57.81%
	Statoil ASA	19.06%
	Norske Conoco A/S	18.13%
	Fortum Petroleum AS	5.00%
Investment	Total investment in pipeline and terminal is likely to be about NOK 2.7 bn (2003 value)	
Operating life	The licence expires on 31 December 2020	
Capacity	2.2 bn scm/year of gas	

<sup>1</sup> Petoro AS serves as the licensee for the SDFI.

This 16-inch gas pipeline runs for 250 km from Heidrun on the Halten Bank in the Norwegian Sea to Tjeldbergodden in mid-Norway, where Statoil ASA and Conoco 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.

## Heidrun Gas Export

<b>Operator</b>	Statoil ASA <sup>2</sup>	
<b>Licensee</b>	Petoro AS <sup>1</sup>	64.16%
(rounded off to two decimal places)	Norske Conoco A/S	18.29%
	Statoil ASA	12.43%
	Fortum Petroleum AS	5.12%
<b>Investment</b>	Total investment is put at about NOK 0.8 billion (2003 value)	
<b>Operating life</b>	The technical operating life is 50 years	
<b>Capacity</b>	About 4 bn scm/year	

<sup>1</sup> Petoro AS serves as the licensee for the SDFI.

<sup>2</sup> The operatorship is due to be transferred to Gassco AS.

The authorities received a plan for installation and operation of Heidrun Gas Export in 1997, plus a supplement to this in March 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 into the Åsgard Transport system. It became operational in February 2001.

## Kvitebjørn Oil Pipeline (KOR)

<b>Operator</b>	Statoil ASA	
<b>Licensees</b>	Statoil ASA	50%
	Petoro AS <sup>1</sup>	30%
	Norsk Hydro Produksjon a.s	15%
	TotalFinaElf Exploration Norge AS	5%
<b>Investment</b>	Total investment is likely to be NOK 0.6 bn (2003 value)	
<b>Operating life</b>	The technical operating life is 25 years	
<b>Capacity</b>	About 11 mill scm per year	
<b>Operating organisation</b>	Bygnes	

<sup>1</sup> Petoro AS serves as the licensee for the SDFI.

Being built to transport condensate from Kvitebjørn to the Mongstad oil terminal, this 16-inch line will run for about 90 km to tie into an existing connection point on Troll Oil Pipeline II. The KOR is due to be ready for making condensate deliveries on 1 October 2004.



## Norne Gas Transport System (NGTS)

Operator	Gassco AS	
Licensees	Petoro AS <sup>1</sup>	54.0%
	Statoil ASA	25.0%
	Norsk Hydro Produksjon a.s	8.1%
	Norsk Agip AS	6.9%
	Enterprise Oil Norge AS	6.0%
Investment	Total investment is put at roughly NOK 1.1 bn (2003 value)	
Operating life	The technical operating life is 50 years	
Capacity	About 3.6 bn scm/year	

<sup>1</sup> Petoro AS serves as the licensee for the SDFI.

The authorities received a plan for installation and operation of the NGTS 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.

## Norpipe: Norpipe Oil AS

Operator	ConocoPhillips Norge	
Licensees	ConocoPhillips Norge	35.05%
	TotalFinaElf Exploration Norge AS	34.93%
	Statoil ASA	20.00%
	Norsk Agip AS	6.52%
	Norsk Hydro Produksjon a.s	3.50%
Investment	Total investment is likely to be about NOK 15.3 bn (2003 value)	
Operating life	The pipeline has been designed for an operating life of at least 30 years. Extending its technical life is under constant review.	
Capacity	Design capacity is about 53 mill scm/year (900 000 b/day), including the use of friction-inhibiting chemicals. The receiving facilities restrict capacity to about 810 000 b/d. Plans call for pumping capacity on Ekofisk and stabilisation capacity at the receiving terminal in Teesside to be upgraded.	
Operating organisation	Stavanger	

Petoro AS 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 Statoil ASA in the company.

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 previously tied to the pipeline, but were bypassed in 1991 and 1994 respectively.

Two British-registered companies, Norse 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, Gyda and Tambar. It also transports production from Britain's Fulmar, J block, Gannet, Auk, Clyde, Janice, Orion, Jade and Halley fields.

## Oseberg Transport System (OTS)

<b>Operator</b>	Norsk Hydro Produksjon a.s	
<b>Licensees</b>	Petoro AS <sup>1</sup>	48.4%
	Norsk Hydro Produksjon a.s	22.2%
	Statoil ASA	14.0%
	TotalFinaElf Exploration Norge AS	8.7%
	Mobil Development Norway AS	4.3%
	Norske Conoco A/S	2.4%
<b>Investment</b>	Total investment is likely to be about NOK 9.8 bn (2003 value)	
<b>Capacity</b>	121 000 scm/day (technical), 990 000 scm (storage)	
<b>Operating life</b>	The pipeline is designed to operate for 40 years. This may be extended.	
<b>Operating organisation</b>	Bergen	

<sup>1</sup> Petoro AS serves as the licensee for the SDFI.

Oseberg oil is piped for 115 km through a 28-inch line from the field's A platform to the terminal at Sture near Bergen. The Oseberg group has established a separate partnership to operate the line.

This partnership has concluded agreements with the licensees for Veslefrikk, Brage, Oseberg South, Oseberg East, Tune and Huldra to transport oil from these fields via Oseberg A and the OTS to the Sture terminal. Oil and NGL from Frøy were piped through Frostpipe from the TCP2 platform on Frigg to Oseberg A.

After Frøy was shut down in March 2001, Frostpipe was filled with inhibited seawater and preserved for reuse by 2005. The OTS partnership has concluded an agreement with the Grane shippers to receive, store and export oil from this field, starting in 2003.

## Sleipner East condensate

Operator	Statoil ASA	
Licensees	Statoil ASA	49.6%
	Esso Expl & Prod Norway AS	30.4%
	Norsk Hydro Produksjon a.s	10.0%
	TotalFinaElf Exploration Norge AS	10.0%
Investment	Total investment is likely to be about NOK 1.5 bn (2003 value)	
Capacity	200 000 b/d	
Operating organisation	Bygnes and Kårstø	

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. The Storting approved the construction of this line in December 1989. 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. This line also began carrying condensate from Sleipner West, Loke and Gungne in 1997.

## Troll Oil Pipeline I

Operator	Statoil ASA	
Licensees (rounded off to two decimal places)	Petoro AS <sup>1</sup>	55.77%
	Statoil ASA	20.85%
	Norsk Hydro Produksjon a.s	9.73%
	A/S Norske Shell	8.29%
	TotalFinaElf Exploration Norge AS	3.70%
	Norske Conoco A/S	1.66%
Investment	Total investment is likely to be about NOK 1.1 bn (2003 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 and Kårstø	

<sup>1</sup> Petoro AS serves as the licensee for the SDFI.

This 85-km facility transports oil from the Troll B platform to the terminal at Mongstad near Bergen. With its 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

<b>Operator</b>	Statoil ASA	
<b>Licensees</b> (rounded off to two decimal places)	Petoro AS <sup>1</sup>	55.77%
	Statoil ASA	20.85%
	Norsk Hydro Produksjon a.s	9.73%
	A/S Norske Shell	8.29%
	TotalFinaElf Exploration Norge AS	3.70%
	Norske Conoco A/S	1.66%
<b>Investment</b>	About NOK 1 bn (2003 value)	
<b>Operating life</b>	Troll Oil Pipeline II is designed for a lifetime of 35 years	
<b>Capacity</b>	Current capacity is 40 000 scm/day of oil. The hydraulic capacity of the line is 47 500 scm/d (without the use of friction inhibitors)	
<b>Operating organisation</b>	Bygnes and Kårstø	

<sup>1</sup> Petoro AS serves as the licensee for the SDFI.

This 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 received government approval 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. Oil from Fram West will be piped through this line when the field comes on stream, probably in October 2003.

## Land facilities

### Bygnes traffic control centre

Interests	Gassled
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The traffic control centre at Bygnes north of Stavanger is part of the Gassco head office. It coordinates gas transport and deliveries through the pipeline network from fields on the NCS to receiving terminals in continental Europe and UK. Gassled controls gas flows through some 6 000 km of pipelines which transport all Norwegian gas flowing to market.

### Kollsnes gas treatment plant

Interests	Interests in the Kollsnes gas treatment plant are the same as for the Troll field.
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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 on 1 October 2005. Work has started on an NGL extraction facility at Kollsnes to treat rich gas from such fields as Kvitebjørn and Visund. Due to start operating on 1 October 2004, this plant will boost gas treatment capacity at Kollsnes to just over 140 mill scm per day. Condensate production capacity will also increase to 11 000 scm/d.

### Kårstø gas treatment and condensate complex

Interests	Gassled
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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, Sigyn and Gungne. Plans also call for rich gas from Mikkel to be treated at the complex from the autumn of 2003.

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-butane and normal butane are stored in refrigerated tanks, while naphtha and condensate are held 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 575 vessel calls in 2002 and shipped out 7.8 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

Ownership	Statoil ASA	100%
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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, totalled NOK 265 mill at 31 December 2001.

## Mongstad crude oil terminal

Ownership	Statoil ASA	65%
	Petoro AS <sup>1</sup>	35%

<sup>1</sup> Petoro AS serves as the licensee for the SDFI.

The terminal at Mongstad embraces two jetties able to accept vessels up to 400 000 tonnes, as well as six caverns excavated from the bedrock 50 metres below ground. These caverns have a total storage capacity of 1.5 mill cu.m of oil. Just over 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. By storing and transshipping crude at Mongstad, however, Statoil can sell the oil to more distant destinations. Mongstad is also the receiving terminal for the oil pipelines from Troll B and C.

## Sture crude oil terminal

Interests	Interests in the Sture terminal are the same as for Oseberg Transport System (OTS), with the exception of the LPG export facilities. These are owned by Norsk Hydro Produksjon a.s (the refrigerated LPG store and transfer system to ships) and Vestprosess DA (the transfer system to the Vestprosess pipeline).
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The crude oil terminal at Sture near Bergen receives production from Oseberg, Veslefrikk, Brage, Oseberg South, Oseberg East, Tune and Huldra. 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 into stabilised oil and an LPG mix. The latter can either be exported by ship or piped through the Vestprosess line to the Mongstad refinery.

## Tjeldbergodden industrial complex

Ownership of the Tjeldbergodden plants	Statoil Metanol ANS:	
	Statoil ASA	81.7%
	Norske Conoco A/S	18.3%

Plans to utilise gas from Heidrun as feedstock for methanol production at Tjeldbergodden in mid-Norway were approved by the Storting 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 Statoil ASA and DuPont, produces bioproteins at Tjeldbergodden. With an annual design capacity of 10 000 tonnes, this plant can consume up to 25 mill scm of methane per year. That corresponds to three per cent of the gas received from Heidrun.

## Vestprosess

Ownership	Petoro AS <sup>1</sup>	41%
	Statoil ASA	17%
	Norsk Hydro Produksjon a.s	17%
	Mobil Exploration Norway A/S	10%
	A/S Norske Shell	8%
	TotalFinaElf Exploration Norge AS	5%
	Norske Conoco A/S	2%

<sup>1</sup> Petoro AS serves as the licensee for the SDFI.

The Vestprosess DA partnership owns and operates a system to transport and process NGL. These facilities came on stream in December 1999. A 56-kilometre pipeline carries unprocessed NGL from the Kollsnes gas terminal, via the Sture oil terminal, to Mongstad.

At the Mongstad, processing starts by separating out naphtha and LPG. The naphtha serves as refinery feedstock, while the LPG is fractionated in a dedicated process into propane and butane. The latter are stored in rock caverns before export. The Vestprosess plant utilises waste energy and utilities from the refinery.