

OIL AND GAS FIELDS IN NORWAY

INDUSTRIAL HERITAGE PLAN



NORSK OLJEMUSEUM

THE NORNE AREA

The Norne area lies in the Norwegian Sea and embraces Norne, Urd and Alve. It ranks as the northernmost area so far developed in the Norwegian Sea.

Norne

This field lies in 380 metres of water about 80 kilometres north of Heidrun and roughly 200 kilometres from the north Norwegian coast. Statoil is the operator.

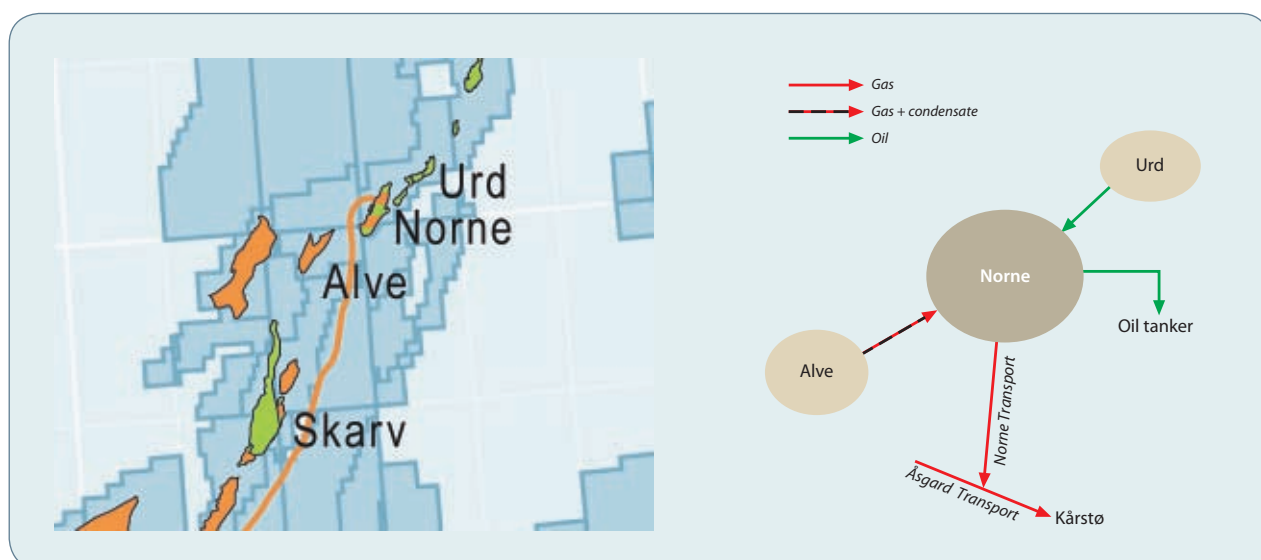
Reservoir and recovery strategy

Located in Jurassic sandstones, the Norne reservoir contains both oil and gas.

Oil from the field is produced with the aid of



water injection. While the main gas injection terminated in 2005, gas has subsequently been injected to prevent pressure declining too quickly when producing from the gas cap.





The Norne ship. Illustration and photo: Statoil

Transport

Oil is loaded into shuttle tankers and shipped to market. Gas exports began in February 2001 via a dedicated pipeline tied into the Åsgard Transport system.

Development solution

Norne has been developed with a production and storage ship tied to six subsea templates. Measuring 260 by 41 metres, the vessel can store 719 000 barrels of oil.

The subsea system tied back to the Norne ship originally comprised five templates grouped in two clusters. With one production and one injection template, the northern cluster is about two kilometres north-north-east of the vessel. The southern group, about two kilometres south-west of the ship, comprises two production templates and one for injection. Each template supports four wells. A new K template was added to the southern cluster in connection with the improved oil recovery programme.

Norne

Blocks	6508/1 and 6608/10
Production licences	128 and 128 B
Awarded	1986 and 1998
Total recoverable reserves	596.9 mill bbl oil 11 bn scm gas 1.7 mill tonnes NGL
Remaining at 31 Dec 2008	90 mill bbl oil 5.2 bn scm gas 1 mill tonnes NGL
Discovery year	1992

Approved for development	9 Mar 1995
On stream	6 Nov 1997
Operator	Statoil
Operations organisation	Harstad
Main supply base	Sandnessjøen

Licensees

Petoro	54.0%
Statoil	39.1%
Eni Norge	6.9%

Urd

This oil field lies in some 380 metres of water 10 kilometres north-east of Norne. It has been developed with templates tied back to the Norne ship. Production began in November 2005 and is due to run until 2016. Statoil is the operator.

Reservoir and recovery strategy

Urd comprises three oil-bearing structures in the 6608/10-6 Svale and 6608/10-8 Stær discoveries. These reservoirs are of early to middle Jurassic age.

While Svale crude is heavy, viscous and under-saturated, the oil in Stær is lighter and more like Norne's reserves. Both reservoirs have a lower gas/oil ratio than Norne. Neither has a gas cap, and both are being produced with the aid of seawater injection to maintain pressure. The wells are also equipped for gas lift to handle low pressure and a high water cut.

Transport

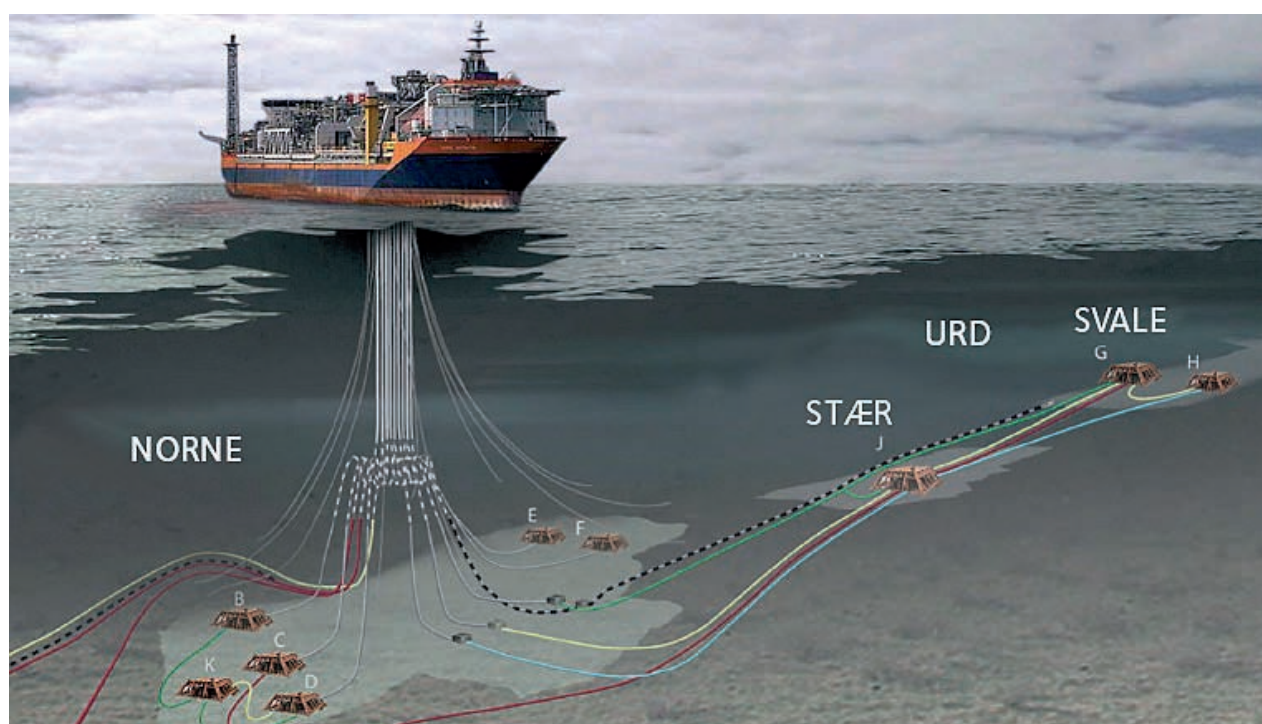
The wellstream from Urd is processed on the Norne ship. Oil and condensate are stabilised and loaded into shuttle tankers with Norne production. Rich gas is exported along with the Norne gas via Åsgard Transport for processing at Kårstø.

Urd

Block	6608/10
Production licence	128
Awarded	1986
Total recoverable reserves	59.7 mill bbl oil 0.3 bn scm gas
Remaining at 31 Dec 2008	37.1 mill bbl oil 0.2 bn scm gas
Discovery year	2000
Approved for development	2 Jul 2004
On stream	8 Nov 2005
Operator	Statoil
Operations organisation	Harstad
Licensees	
Statoil	63.95%
Petoro	24.55%
Eni Norge	11.50%

Development solution

Eight wells are drilled on Urd – three producers and two water injectors in Svale and two producers and a water injector in Stær. The subsea templates have spare slots for additional wells or for phasing in supplementary resources.



Urd (Svale and Stær) as satellites to the Norne ship. Illustration: Statoil

Alve

This gas and condensate field lies in 390 metres of water 16 kilometres south-west of Norne. Proven in 1990, Alve came on stream in March 2009.

Reservoir and recovery strategy

The reservoir lies in middle Jurassic sandstone. A combined exploration and production well drilled in 2007-08 now produces gas and condensate.

Transport

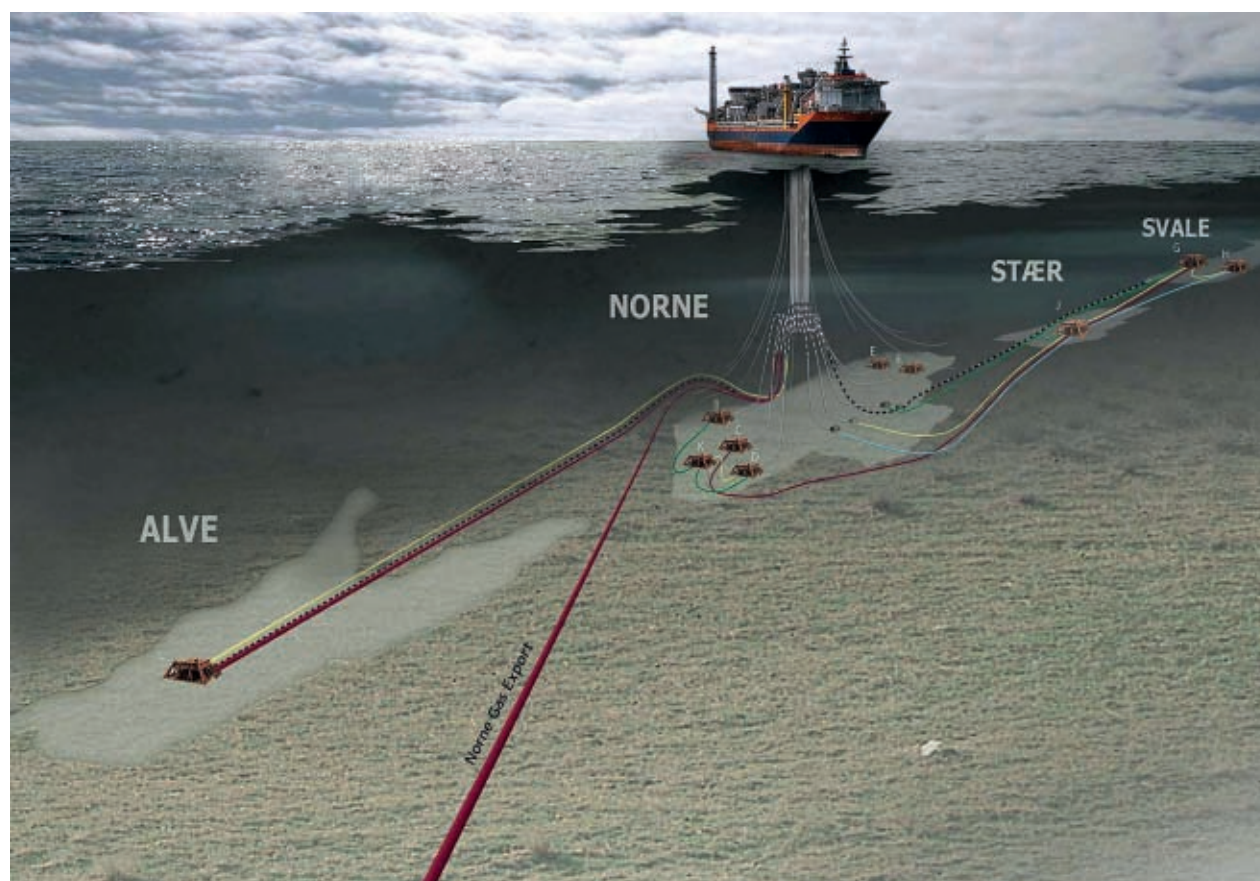
Alve is tied back to Norne by a pipeline. Gas is processed on the Norne ship and carried via the Norne gas pipeline and Åsgard Transport to Kårstø for export.

Development solution

The field has been developed with a single template supporting four well slots. Alve will ensure continued utilisation of spare capacity on the Norne ship and in the Åsgard Transport system.

Alve

Block	6507/3
Production licence	159 B
Awarded	2004
Total recoverable reserves	8.2 mill bbl oil 5.5 bn scm gas 1.1 mill tonnes NGL
Discovery year	1990
Approved for development	16 Mar 2007
On stream	19 Mar 2009
Operator	Statoil
Licensees	
Statoil	85%
Dong E&P Norge	15%



Alve tied back to the Norne ship. Illustration: Statoil