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# The Ormen Lange Langeled Development

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## Abstract

This paper provides a summary of the challenges of executing the Ormen Lange Langeled Project. Hydro is the operator responsible for the planning and development phase. After Ormen Lange comes on stream in October 2007, Shell will take over the operatorship and be responsible for the operational phase.

This paper introduces three main features of the execution phase of the project: The Ormen Lange offshore development, the Ormen Lange onshore development and the Langeled gas export system including gas receiving facility in the UK. This paper also addresses managerial perspectives concerning HSE, quality and risk management, and procurement management.

## Introduction

**Fig. 1. The Ormen Lange Langeled development project: Offshore subsea field development, onshore gas processing facilities at Nyhamna and the gas transport system, Langeled from Nyhamna via the Sleipner platform to the gas receiving facilities at Easington, UK.**

The Ormen Lange gas field was discovered by Hydro in 1997. The development of the field 120 km off the Midwest coast of Norway, is the largest industrial project carried out in Norway. As of January 2007 the Ormen Lange Langeled project is more than 90 per cent complete – on schedule for gas export by October 2007 and within sanctioned budget.

The Ormen Lange field lies some 2000 meters below the sea floor at water depths between 850 to 1,100 meters. Ormen Lange has expected recoverable gas reserves estimated at 397 billion Sm3 and 28.5 million Sm3 of condensate, making it the second largest gas field in Norway.

When Ormen Lange comes on stream in October 2007, the project will contribute to the increase of Norwegian gas export by 25 per cent. The field's peak annual gas production of 22 billion SM3 is equivalent to the total consumption of energy in Norway. Gas from Ormen Lange will be able to meet up to 20 percent of Britain's gas demand. Production life is estimated to be 30-40 years. Ormen Lange's gas export pipeline, Langeled, from Nyhamna in Norway to Easington on the east coast of England, is the world's longest subsea pipeline, with 42" and 44" diameter pipes, and a total length of 1,200 kilometers.

The total investment budget for the Ormen Lange Langeled project development, from reservoir to market, is approximately 66 BnNOK (10 billion USD), 2003. The major part of the investments took place in 2005 and 2006. The project was approved by the Norwegian parliament on April 2, 2004. The Ormen Lange field will contribute significantly to Norway becoming the second largest exporter of natural gas worldwide.

Ormen Lange is a long tieback gas field, developed with gas processing facilities onshore, 120 km from the production wells.

Nyhamna, on the Midwest coast of Norway, is the location of the Ormen Lange onshore processing plant. The Ormen Lange subsea field will produce directly to Nyhamna for well stream processing, gas export compression and condensate export offloaded to tankers. From Nyhamna, the gas will be exported through Langeled pipeline system, via the Sleipner riser platform in the North Sea, to the UK and continental Europe.

To maintain production when reservoir pressure declines, an offshore compression platform is planned for installation on the field with a start-up date in 2015 - 2016. However, a subsea compression solution will be evaluated, as a cost-effective alternative to a compression platform. A subsea compression pilot project has been approved at a cost of 2,5 Bn NOK (400 million US$), to qualify a reliable alternative by 2011.