Deepened Knowledge Shallow Gas in the Netherlands

Introduction

Shallow gas is defined as gas in unconsolidated, low pressure Tertiary sandstone formations. Depths typically range from 400 to 1000 m. Sourcing can be thermogenic, biogenic or a mixture of the two.

Why exploring for shallow gas now?

1. First shallow gas fields in production

The occurrence of shallow gas in the Dutch offshore sector has been known for a long time. However, only recently we have started producing shallow gas (2009). There are 8 proven shallow gas fields in the Netherlands of which 3 are currently producing, accounting for ~8.5 BCM recoverable. The earlier identified risk of sand and water production, given the unconsolidated nature, has been shown to be no problem.

2. New 3D seismic

The northern Dutch offshore is largely covered by 3D seismic data and in 2012 a new 3D seismic survey will become available in the DEF blocks (Fugro).

3. Marginal field tax incentive applicable

For details, see poster "Fallow acreage incentive in the Netherlands and marginal E&P projects".

4. Significant shallow gas potential

Currently, 59 shallow prospects of interest have been identified (classification type 1-3) in the northern Dutch offshore (A-H blocks). A significant number of these prospects are situated in open acreage.

Bright spot classification

Different types of bright spots have been identified. The classification is a measure of potential (ranking):

- A12-FA type BS
- F02a-Pliocene type BS
- Flat medium size BS
- Foreset BS
- Elongated BS
- Very shallow BS
- Flat small size BS

The traps are generally low relief anticlines related to salt domes. Shales act as partial seal; only limited gas columns can exist. Venting to shallower units often creates a stacked pattern of bright spots containing separate gas columns.

From Bright Spot to Volume

In the northern part of the Dutch offshore, many amplitude anomalies can be identified on seismic. These so-called bright spots indicate the presence of shallow gas. The traps are generally low relief anticlines related to salt domes. Shales act as partial seals; only limited gas columns can exist. Venting to shallower units often creates a stacked pattern of bright spots containing separate gas columns.

Joint Industry Project Shallow Gas TNO (2011)

Rock and reservoir properties of bright spots are poorly constrained, hampering effective exploration, production and hazard assessment. The relation with depositional setting (i.e. reservoir type) is unclear. TNO is developing:
- A 3D basin scale reservoir model of the shallow gas occurrences where key external controls can be linked directly to depositional elements (fans, clinoforms, topsets, etc.) calibrated by extensive existing and new well data.
- A migration and charging model for the shallow gas reservoirs based on present-day fluid dynamic data and basin modelling to predict (economically profitable or hazardous) shallow gas occurrences.

Joint Industry Project Shallow Gas TNO (2011)

For information on Exploration and Production issues and E&P data see the Netherlands Oil and Gas Portal www.nlog.nl & www.ebn.nl

Southern offshore will be investigated in 2012

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For more information, visit the TNO website www.tno.nl