Shallow Gas
Bright opportunities in the northern Dutch offshore

Explore for shallow gas

Gas reservoirs in the northern Dutch offshore have shallow marine sediments on a high topography of the continental rise and on uplift, of which shallow areas appear to be related to the presence of hydrocarbons. Toppings are generally provided by the drilling of exploration wells followed by full-scale appraisal of prospects identified, after wave-sculpting (south) or salt-up (north) that has led to successful reservoirs. Many shallow gas shows are found in the same area, and more fields will come on stream in the coming years.

The shallow gas plays have promise to be a viable resource and technical limits of shallow gas leads, which are connected to 3D seismic data, is needed to further evaluate the development potential of these plays.

Key factors for a successful development of shallow gas accumulations are:
- Distance to existing infrastructure
- Flow and storage capacity

A challenge remains in the presence of mobile gas and estimating gas saturation prior to drilling. Seismic attributes do not distinguish between high and low saturation or even lithological effects.

Reservoir properties

Based on fields currently in production
- Gas saturation: >25%
- Porosity: >20-25%
- Permeability: good to excellent

Typical reservoirs have a fluvial origin. Their quality is strongly controlled by the level of compaction, which has both a positive and negative effect on reservoir properties.

- Positive effect: higher pore volume due to the preservation of the original porosity
- Negative effect: reduction in permeability due to compaction

Under evaluation of compaction leads to an initial and production of the ultimate recovery.

Expected recovery factor: ~70% for a reservoir with high production rates despite modest pressures.

The Dutch shallow gas reservoirs produce quicker than initially expected. The A12-FA field started operations in 2011 with production rates of 100-500 mD.

GIIP calculated by means of Monte Carlo simulation using net-to-gross, porosity and saturation ranges similar to base case.

Seismic survey: High quality 3D seismic spec survey (2011)
- Velocity push-down, attenuation and a gas chimney can be observed.

For questions contact: info@nlog.nl or exploration@ebn.nl

High production rates despite modest pressures

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The positive effect of production-induced reservoir compaction (low porosity)

- The recovery from shallow gas reservoirs is potentially enhanced by production-induced compaction of the unconsolidated sedimentary reservoir.

The reduction of pore volume as a result of compaction has a positive impact on the reservoir permeability and therefore on the recovery. The potentially negative effect of compaction (reduction in permeability) is negligible.

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