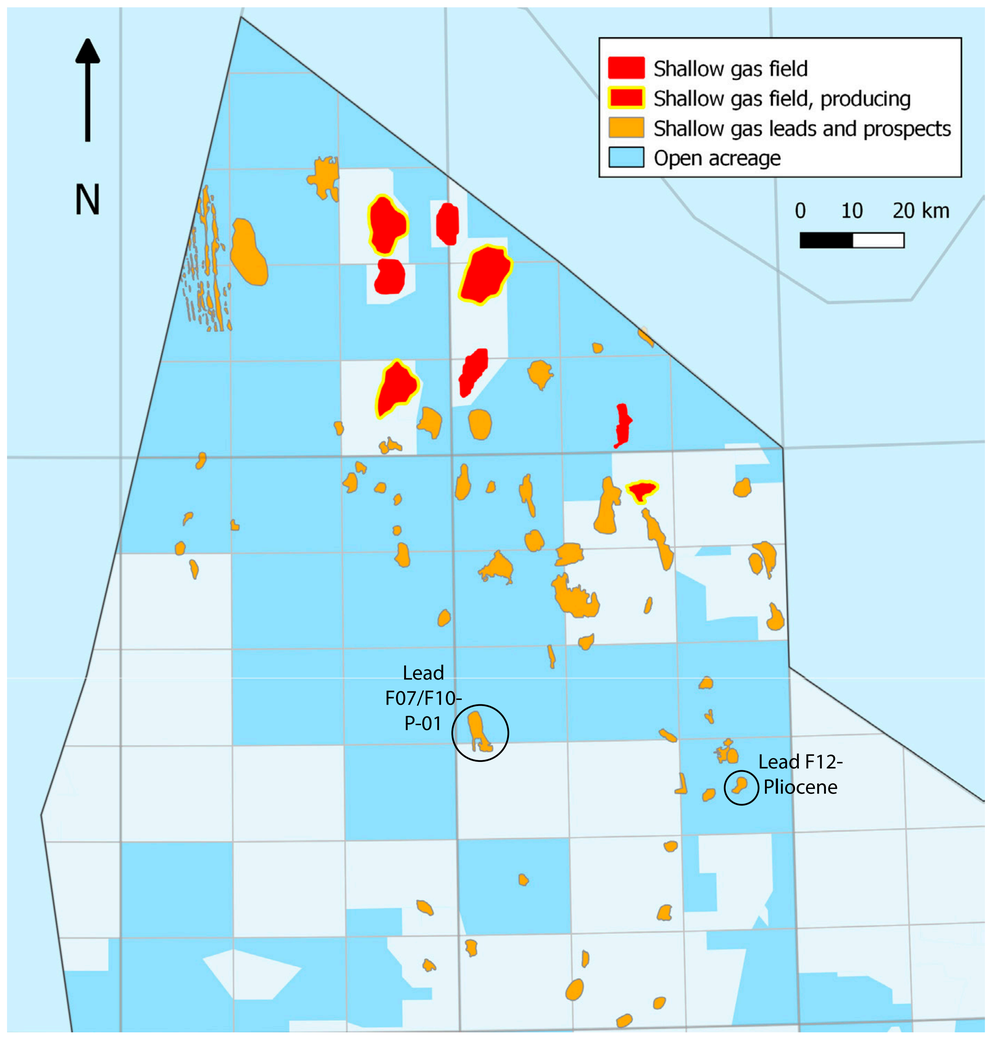
Ministry of Economic Affairs and Climate Policy

Shallow gas

Bright opportunities in the Dutch offshore

Seismic data in the northern Dutch offshore shows many shallow amplitude anomalies, often indicating the presence of gas.

Miocene-Pleistocene unconsolidated sands form reservoirs (300-800 m depth), sealed by intercalating clays. Traps are generally low relief anticlines formed by underlying salt domes.



Reservoir properties*

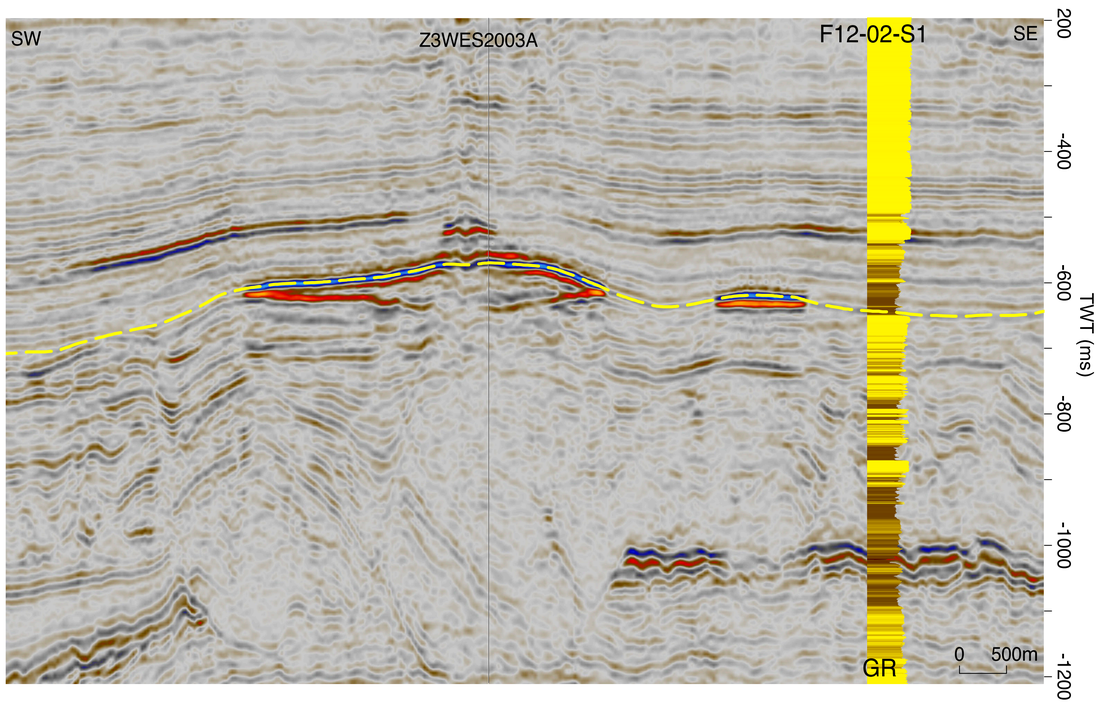
* *Based on fields currently in production*

- Expected ultimate recovery around 70 %
- Porosities range between 20-25 %
- Good to excellent permeability (100-500 mD)

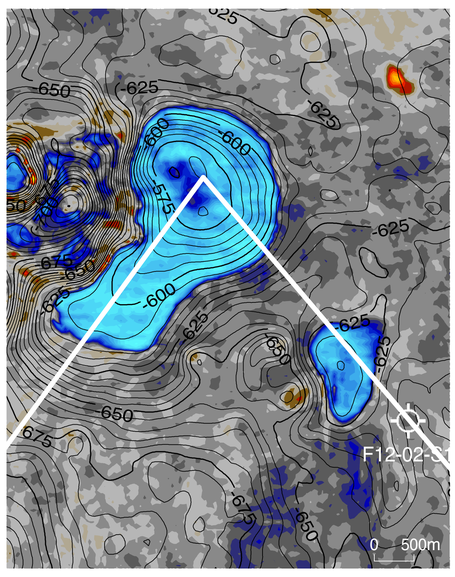
Why explore for shallow gas?

- 8 discovered fields of which 4 are currently successfully producing.
- Production rates of 3 million Nm^3/day have been achieved in the A12-FA field, making it one of the best producing gas fields in the Netherlands.
- Significant additional potential: many shallow leads identified.

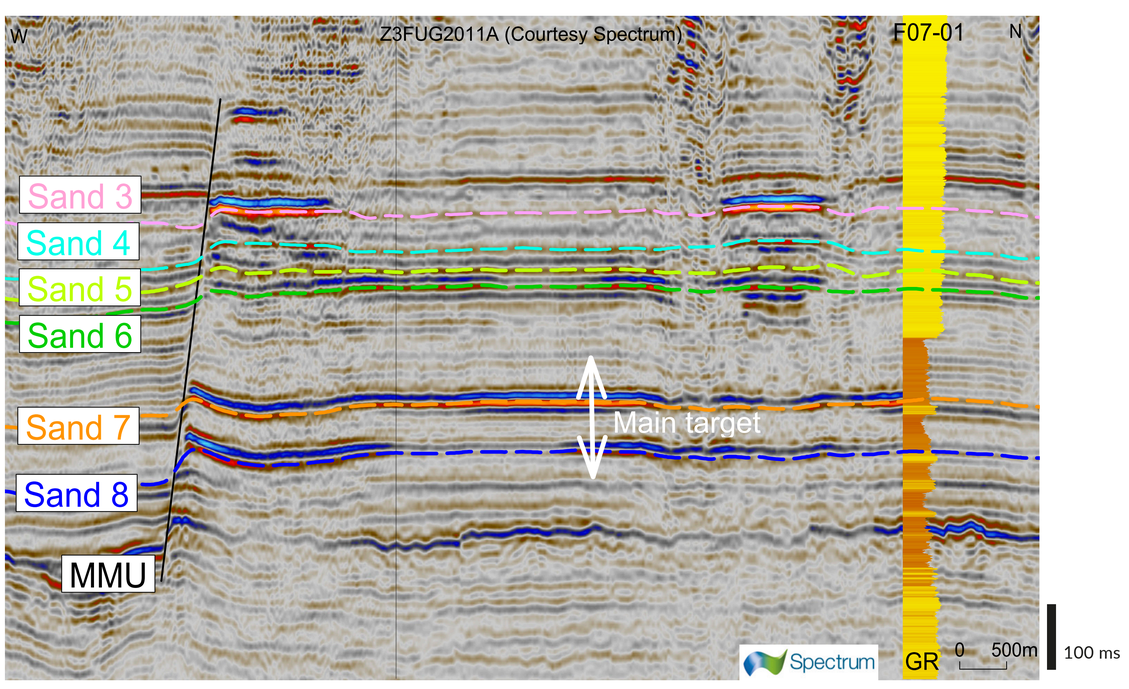
Lead F12-Pliocene



Licence	Open acreage
Seismic data	3D coverage, seismic data in public domain
Seismic response	Amplitude anomaly conformable to structure, flat-spot, push-down effect and attenuation
Structure	4-way dip closure
Thickness	~ 50 m (net-to-gross: 85 %)
Porosity	> 25 %
Gas saturation	60 %
GIIP	0.5 – 0.8 – 1.1 bcm (P90-P50-P10)

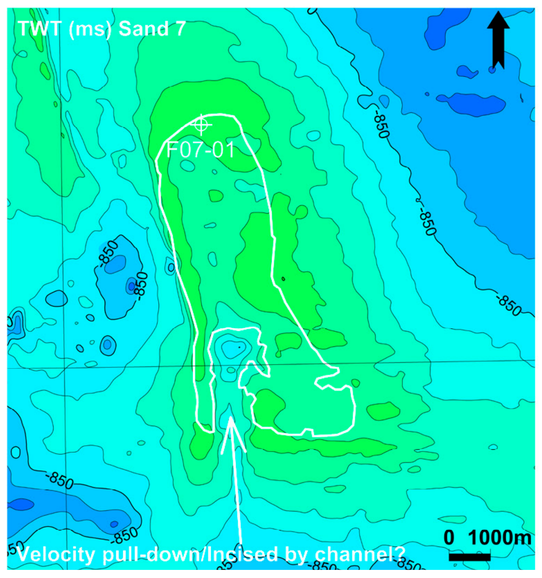


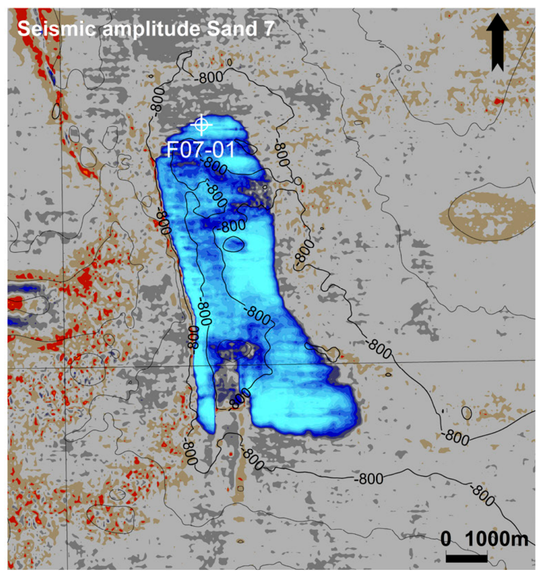
Lead F07/F10-P1



Licence	Mainly open acreage
Seismic data	3D multiclient survey (Spectrum, 2011)
Seismic response	8 stacked amplitude anomalies of which 2 major bright spots and velocity push-down
Structure	Fault-dip closure
Thickness	2 layers, 10 – 20 m each
GIIP	1.0 - 2.5 - 5 bcm (P90-P50-P10)

Information from neighbouring wells: F07-01 drilled the edge of the lead – it has gas shows between 300-1000 m





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