E&P in the Netherlands; challenges and opportunities

facts, figures and futures.

Harmen Mijnlieff / Berend Scheffers

ebn

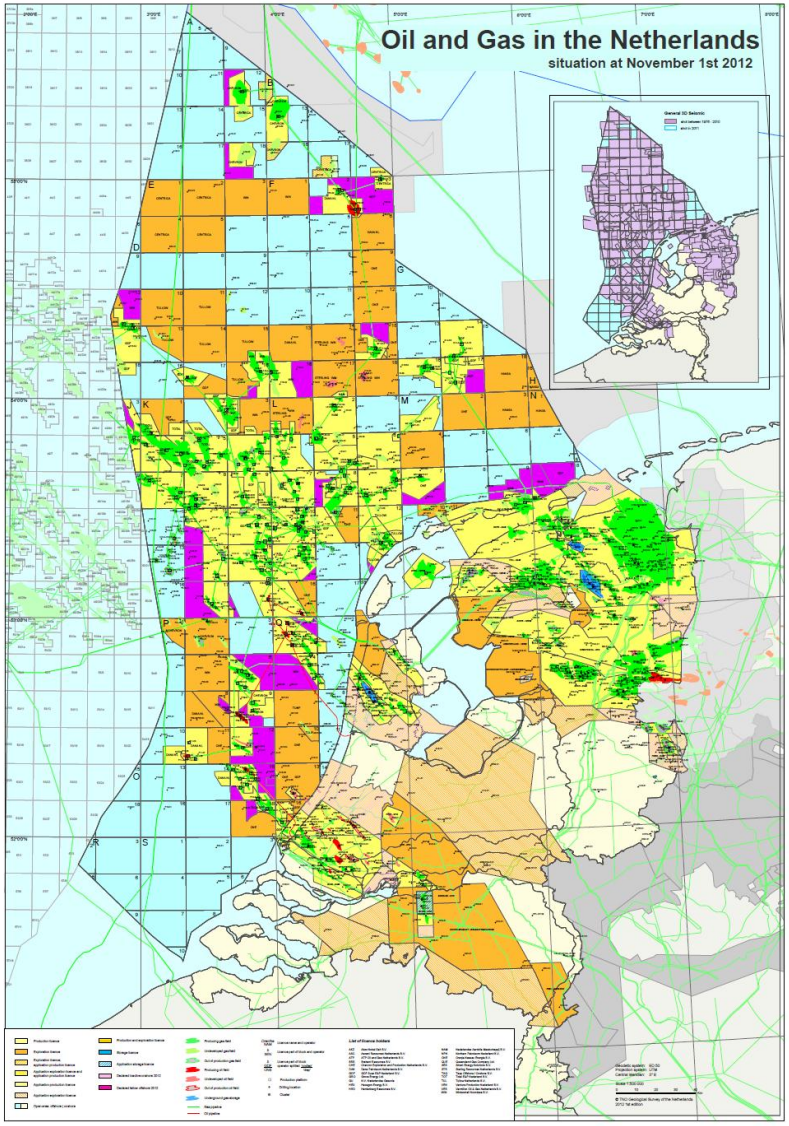
Ministry of Economic Affairs

TNO innovation for life

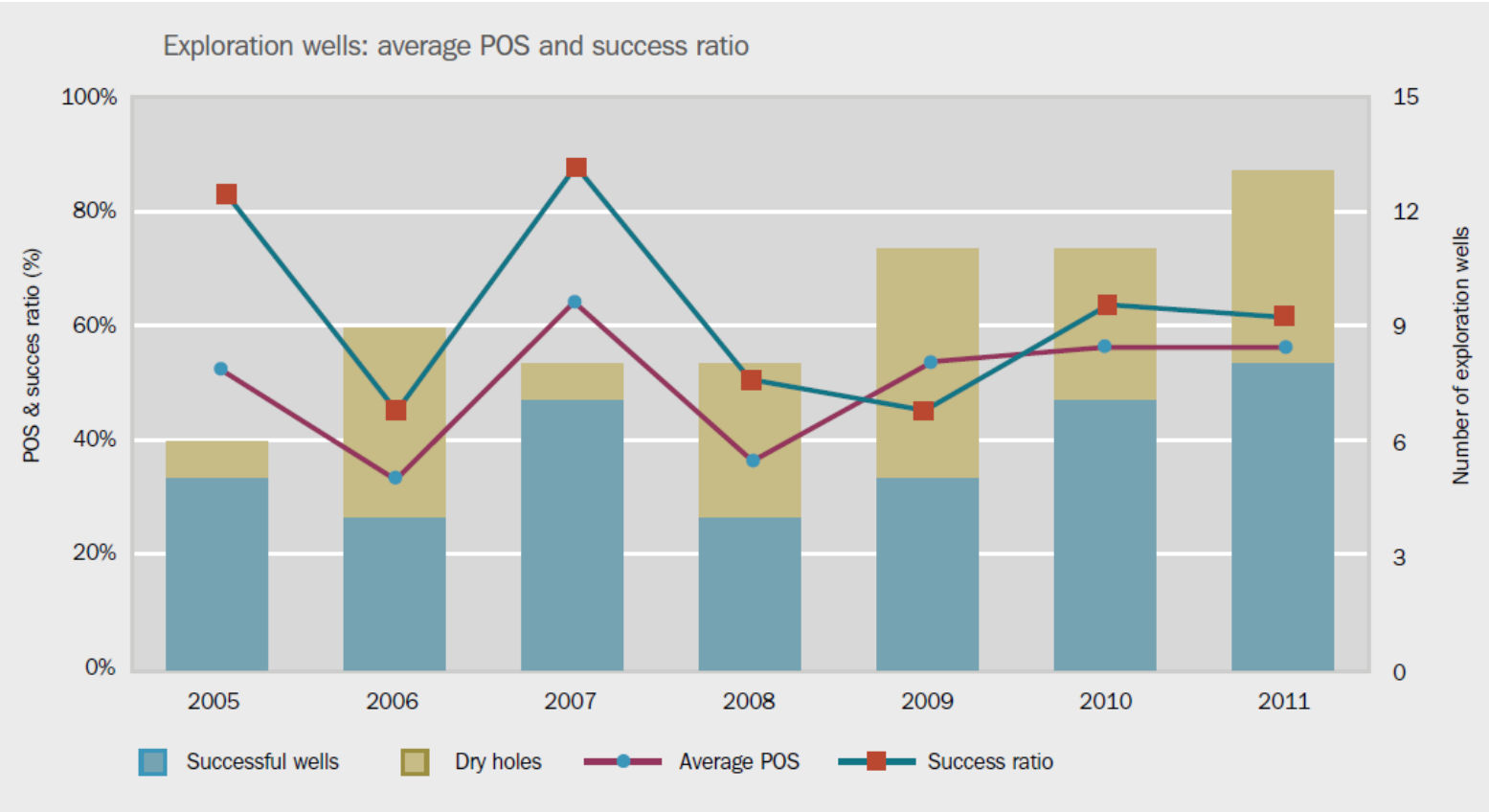
This presentation

- Dutch oil and gas fields
- Hydrocarbon Reserves
- Tax relief for E&P projects
- Fallow acreage
- Stranded fields
- Prospectivity & Exploration
- Shallow Gas Leads
- Dinantian Carbonates play
- Drilling Hazards
- Easy access to E&P data

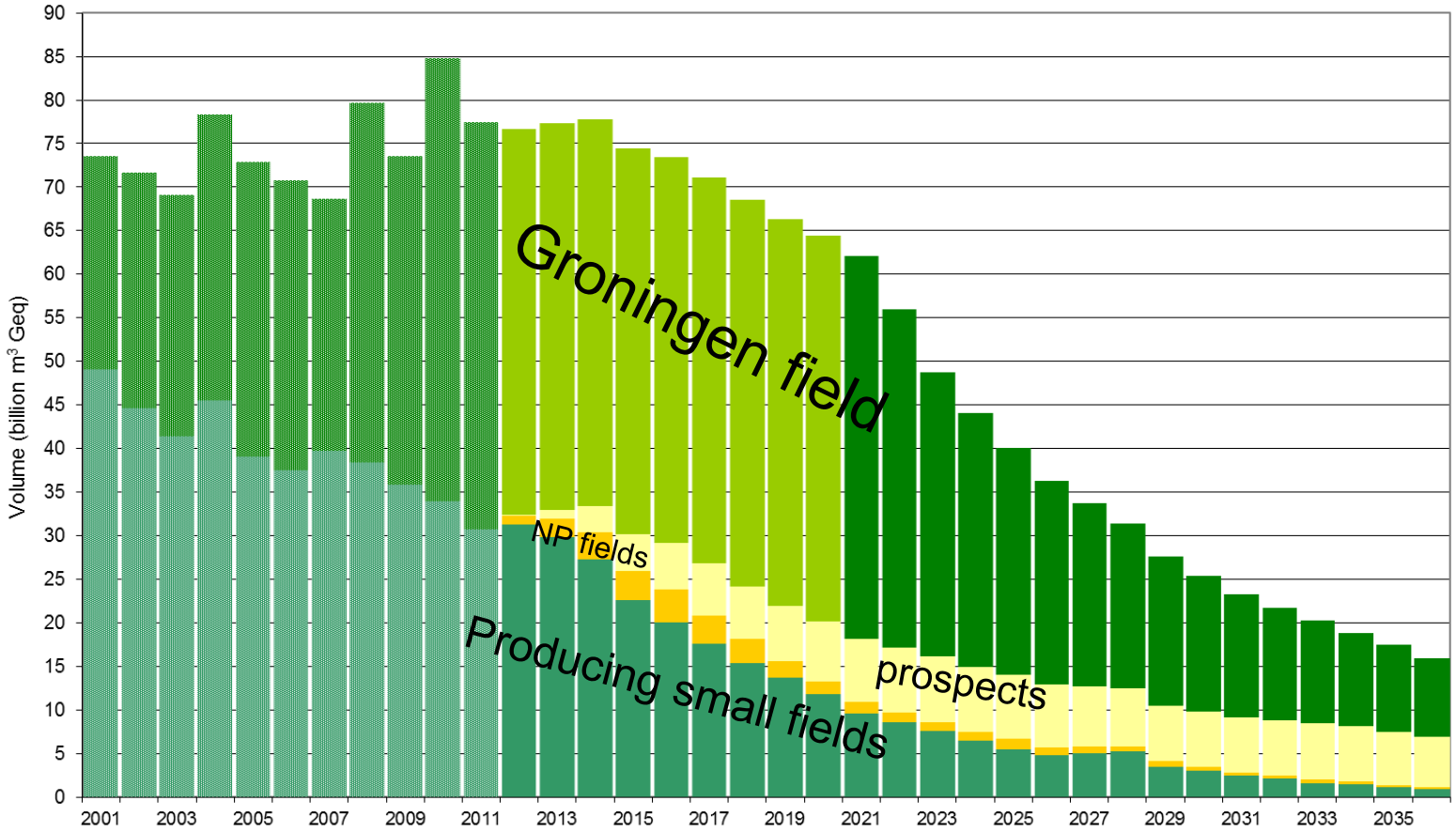
  www.nlog.nl



E&A wells 2005-2011

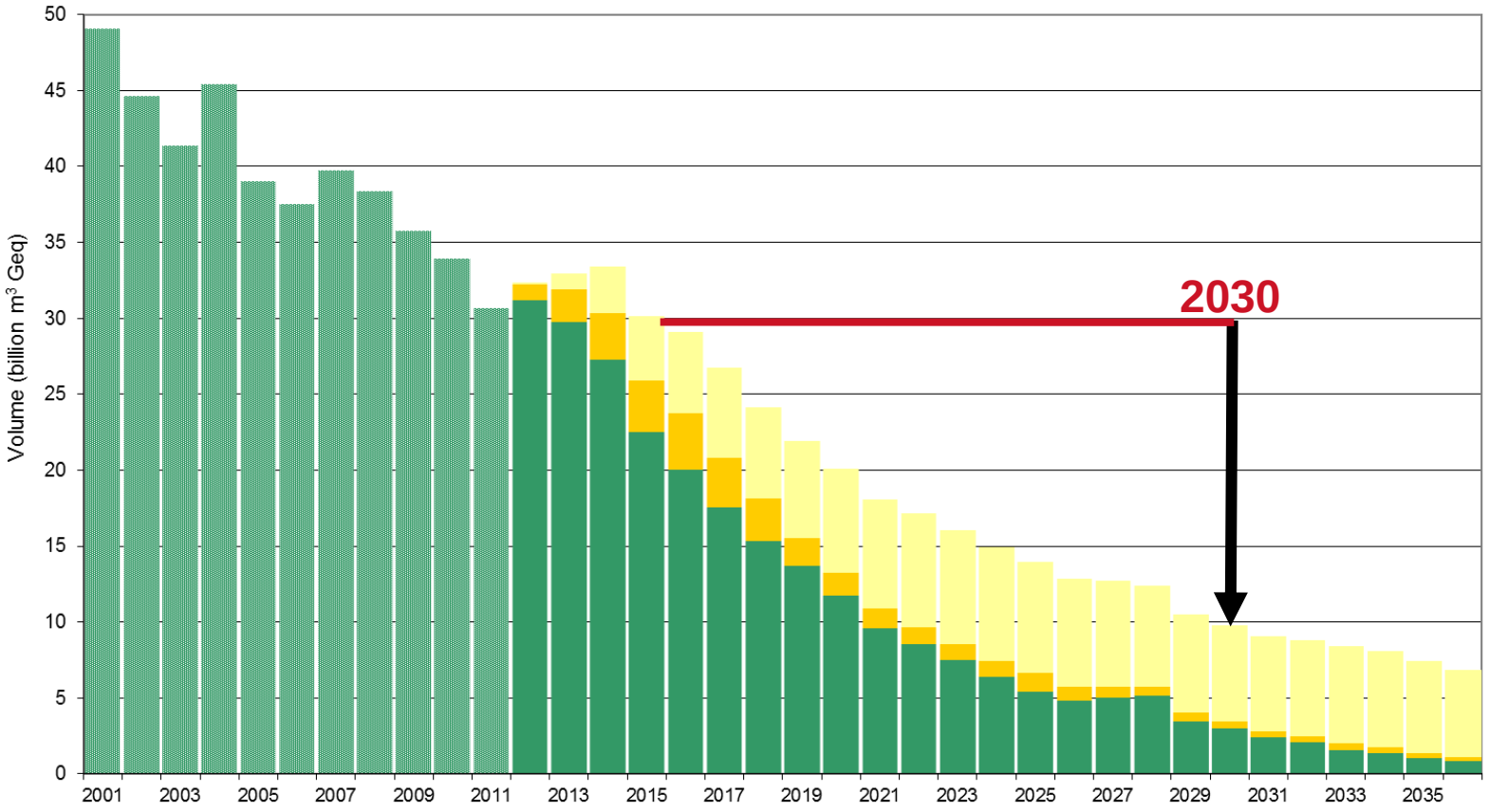


Documented Dutch resources



Ambition for small field production:

Maintain yearly production @ 30bcm till 2030



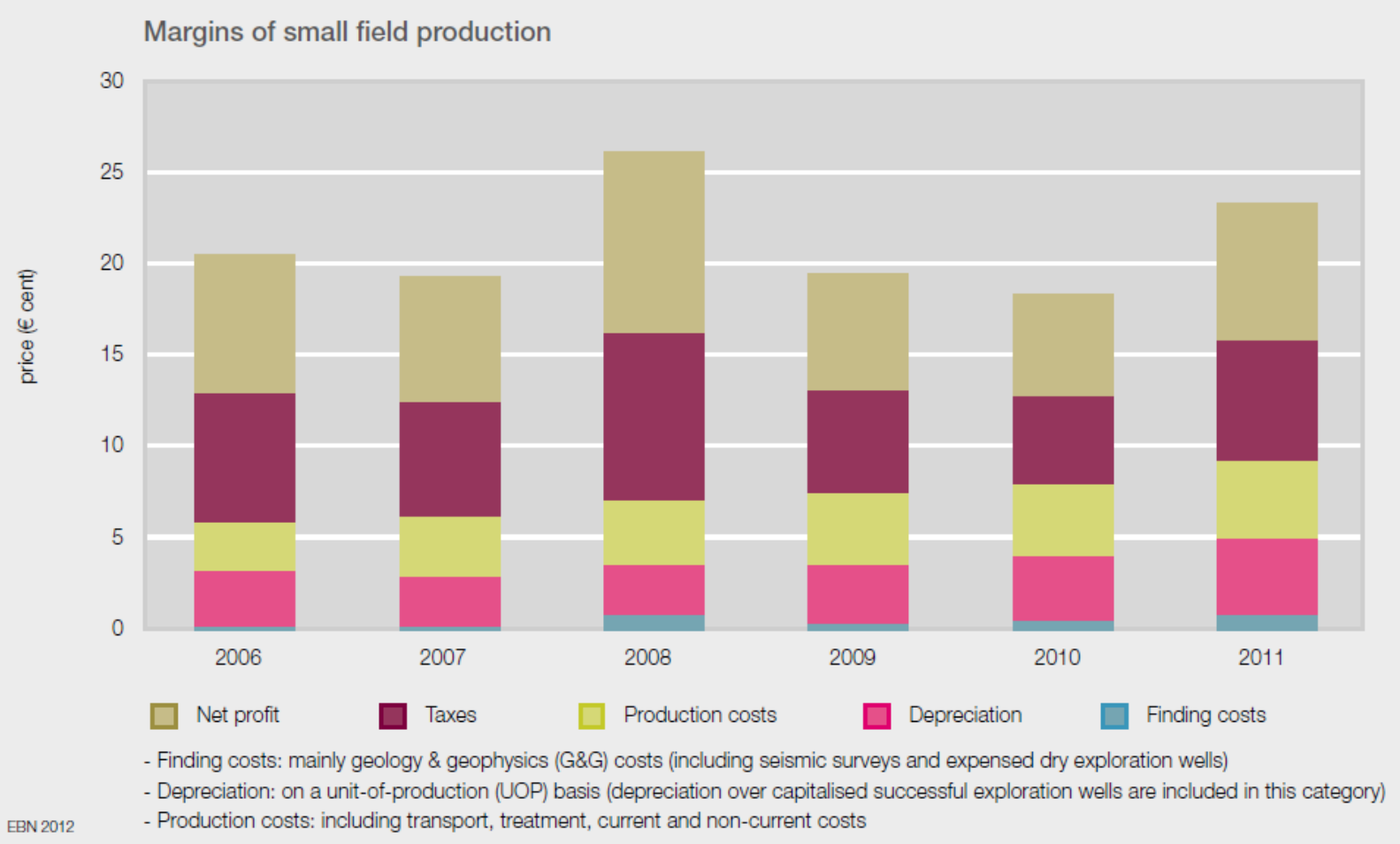

How to reach the ambition

- Tax incentives
- Gas in under-explored areas
- Gas in new plays
- Challenging reservoirs
  - Tight reservoirs
  - Shallow gasreservoirs
- Unconventional reservoirs
  - Shale gas
  - CBM
- Tail end production

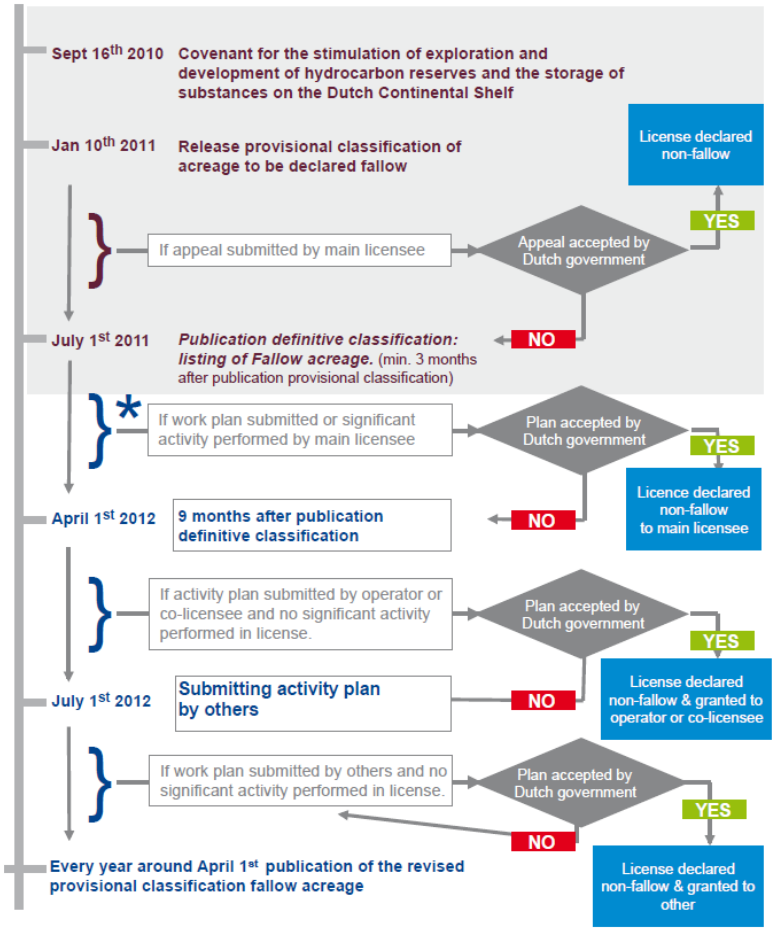

Fiscal and regulatory incentives and framework

- Marginal fields and prospects incentive (2011)
- Research & development incentive (2012)
- Small fields policy (long standing successful strategy)
  - Guaranteed off-take (GasTerra)
  - Guaranteed transport (Gas-Transport-Services)
- 40% Participation of EBN in exploration (2000) and production (1973)
- New mining act (2003)
- Fallow acreage incentive (2011)

Margins of small field production

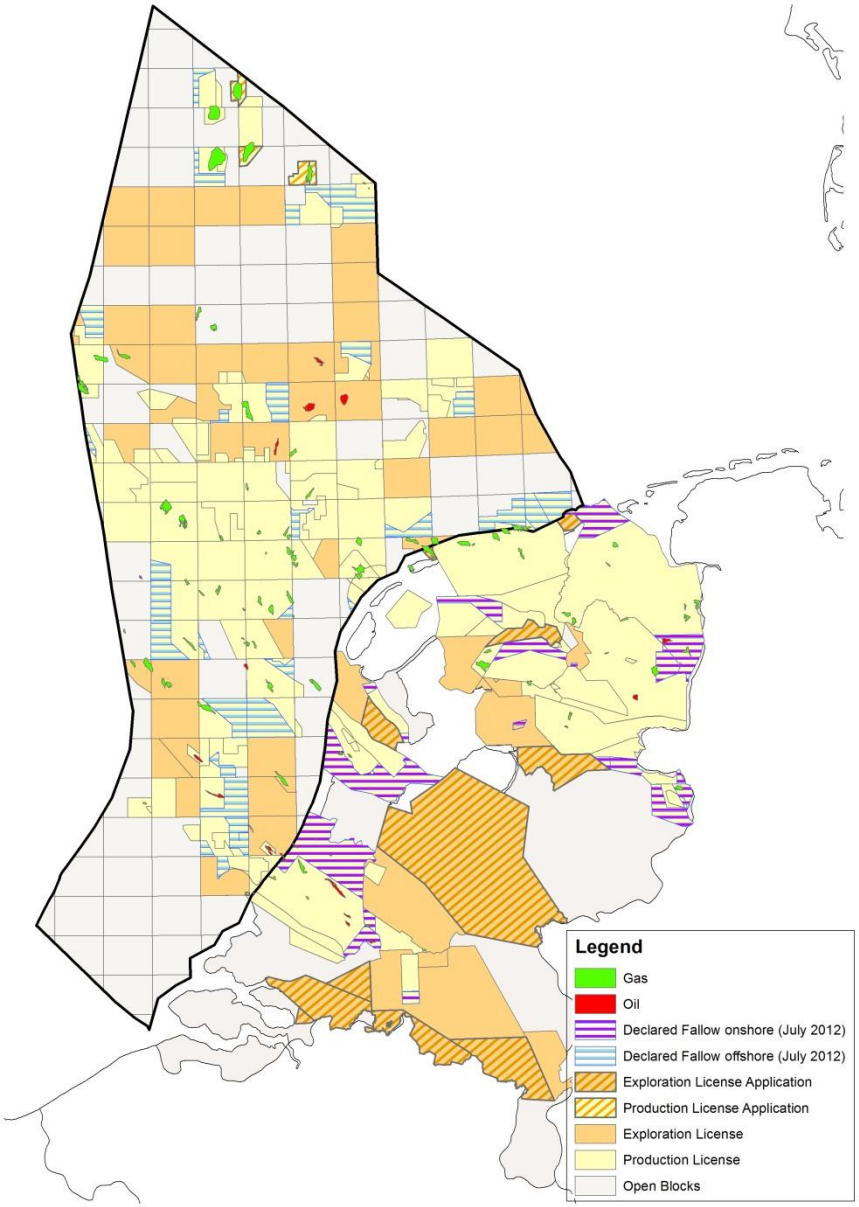


Fallow acreage incentive

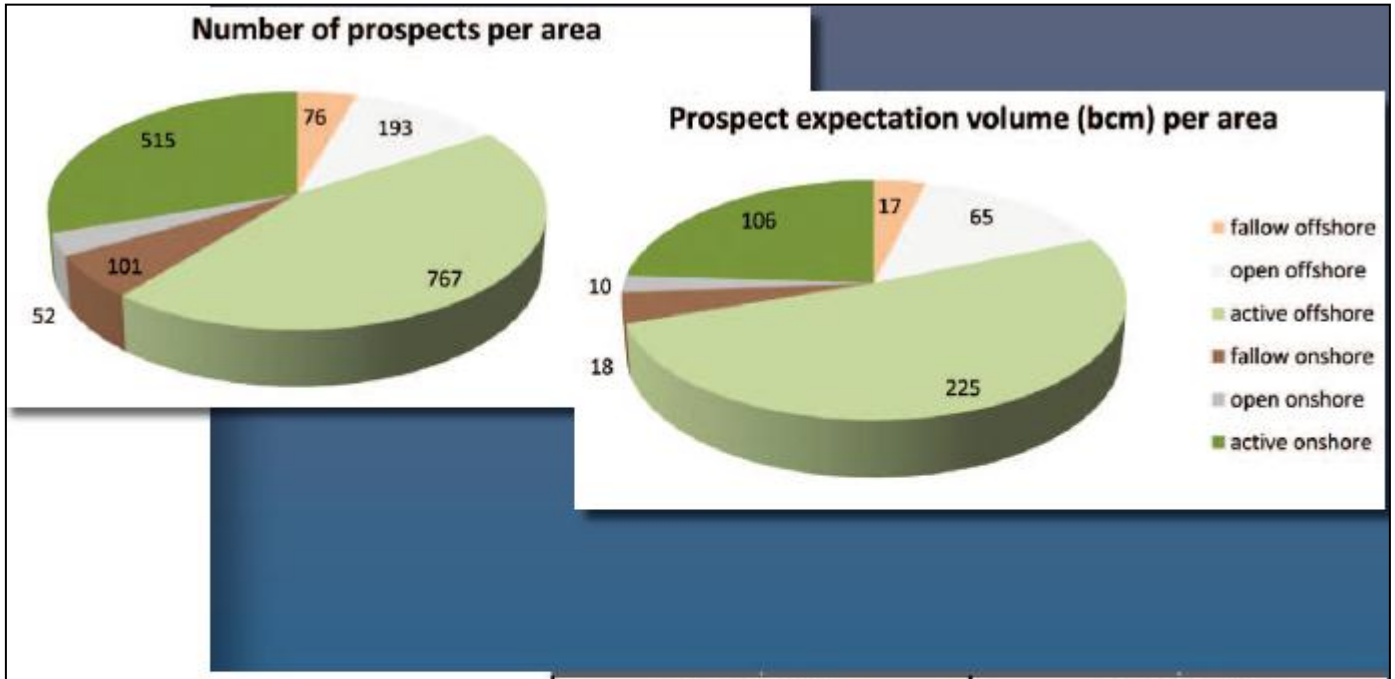


If "NO" then it means that the license remains with the current main licensee

* If license is transferred in this period then a 3 month extension is granted for submission work plan all subsequent terms are postponed accordingly.



Fallow acreage incentive



		No. Gasfields		No. Oilfields	
		Abandoned	Undeveloped	Abandoned	Undeveloped
Fallow Acreage	Offshore	1			1
	Onshore	3	11	1	2
Open Acreage	Offshore	11	6		1
	Onshore		2		

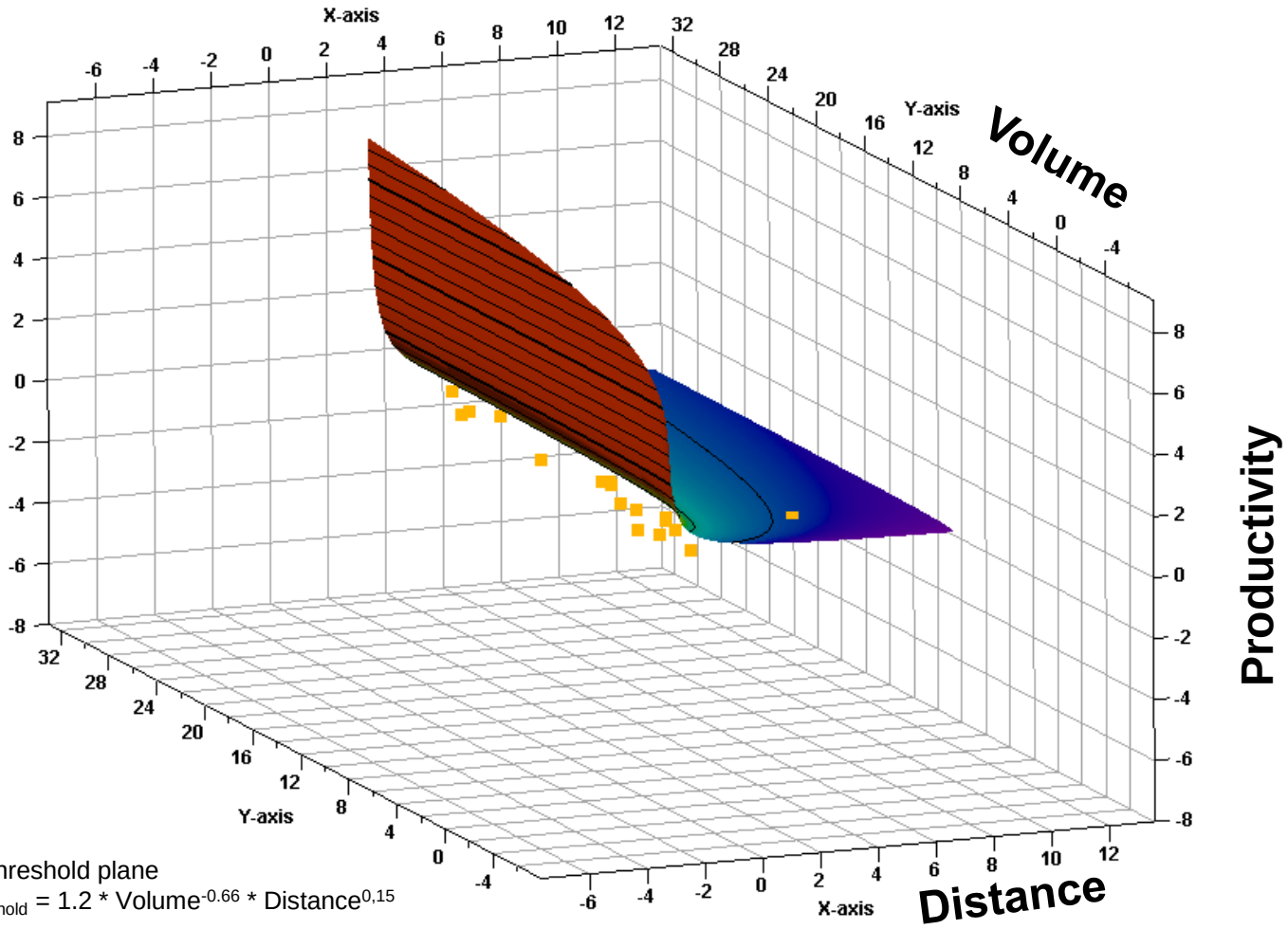

Marginal fields/prospect incentive

- A gas field or prospect is marginal when:
  - Volume,
  - Productivity and
  - Distance to infra structure

  are below a threshold.

- Then project screens for tax deduction of **25%** of the investment.

This years results of the marginal fields/prospect incentive



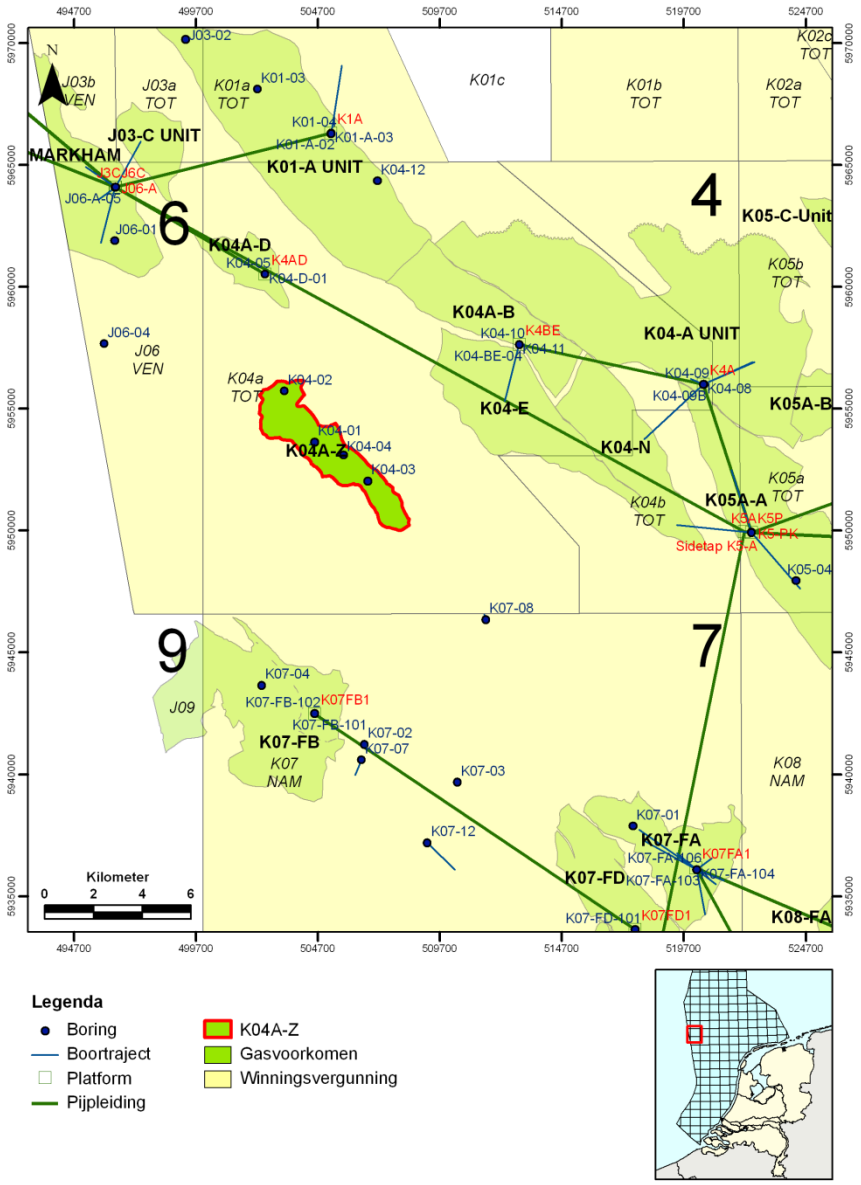
Definition of threshold plane

$Q_{threshold} = 1.2 * Volume^{-0.66} * Distance^{0,15}$

Example

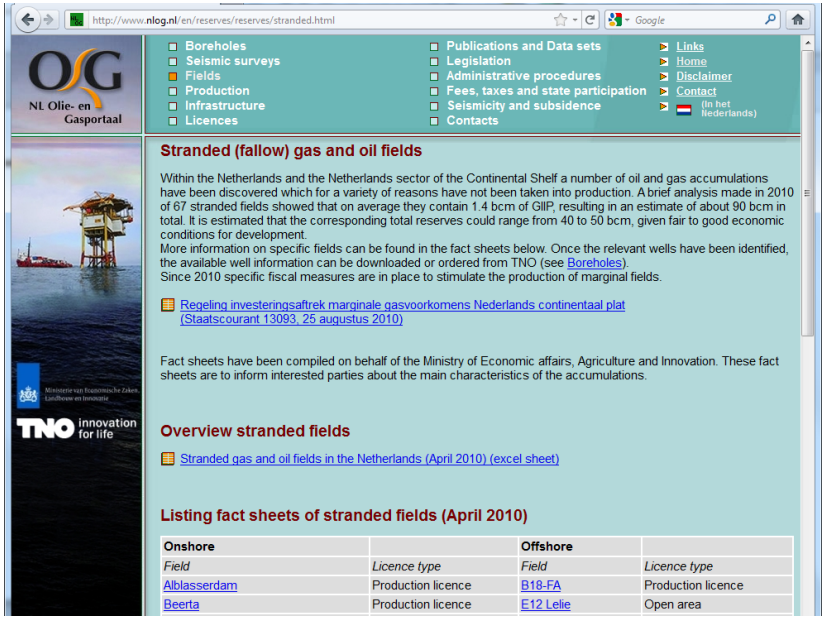
- Stranded field K4-Z
  - Discovered in 1974
  - 1 discovery well
  - 3 appraisal wells
  - Stranded for 37 yr

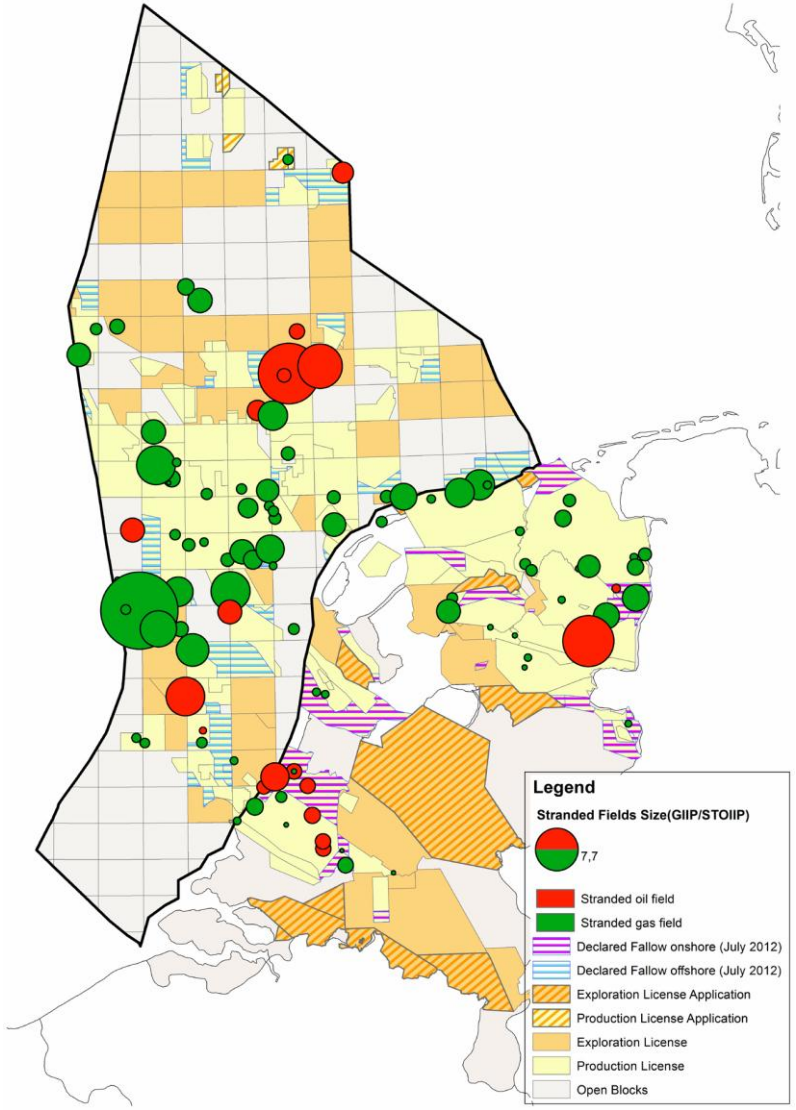
- **Now being developed aided by the marginal field incentive**



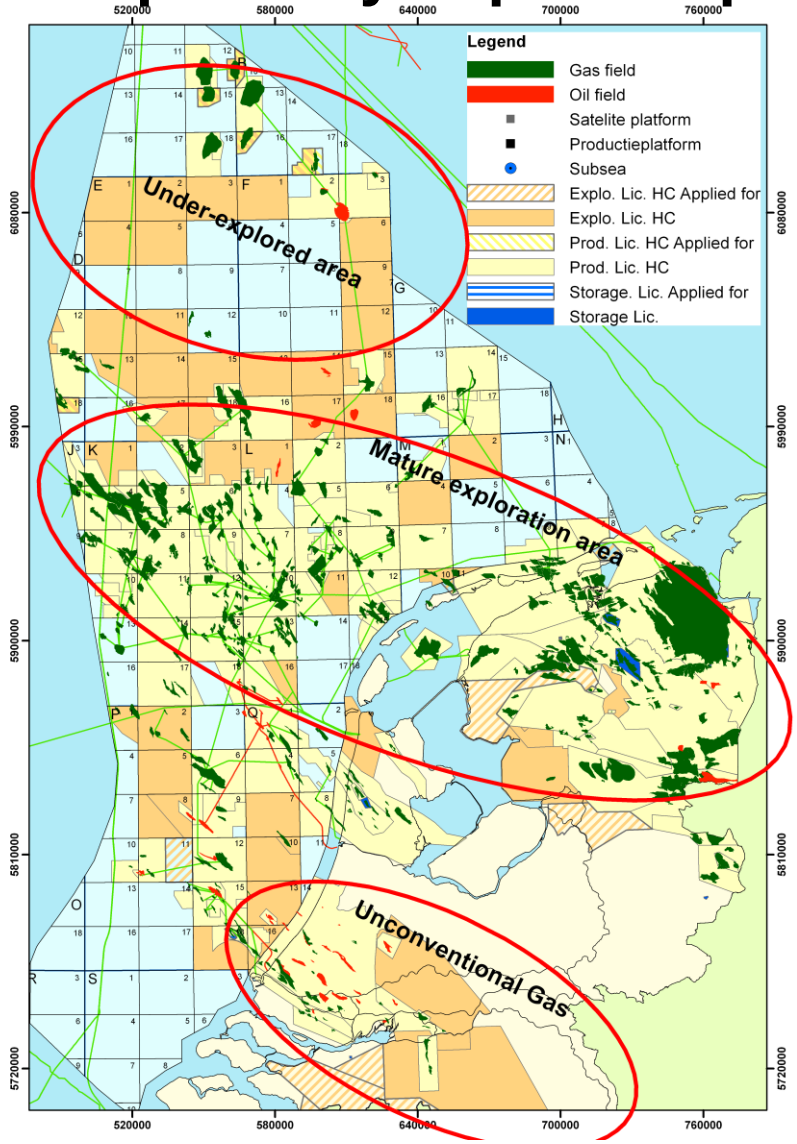
Stranded Gas

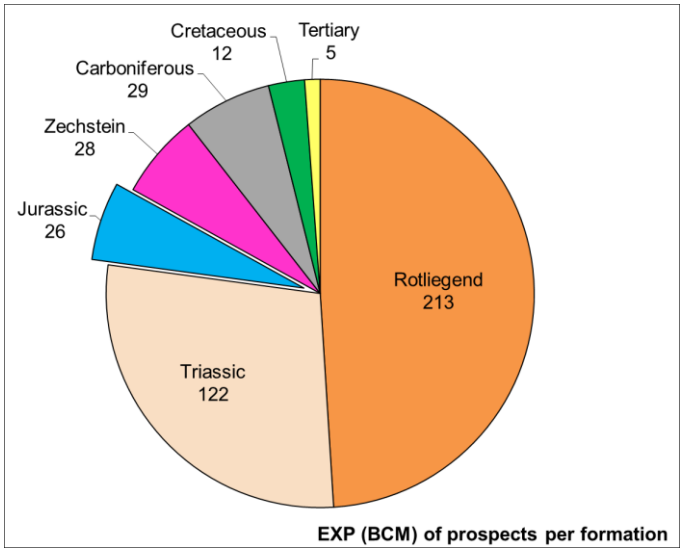
	Number	GIIP (bcm)
Stranded Gas Fields	~80	~130

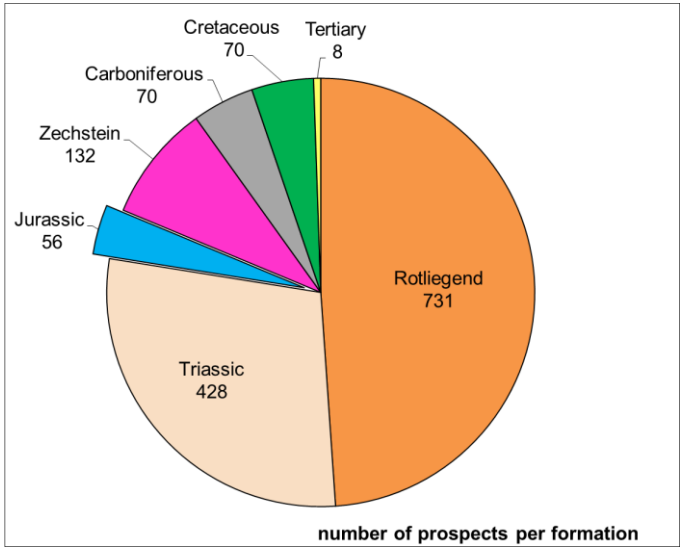




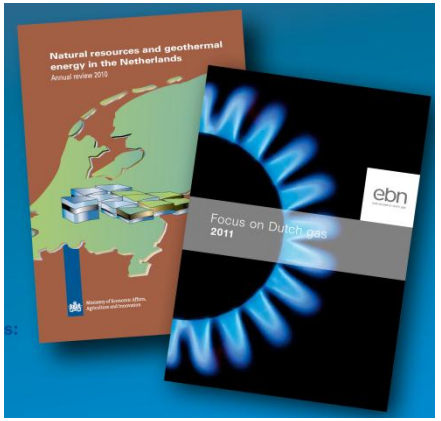
Prospectivity in proven plays



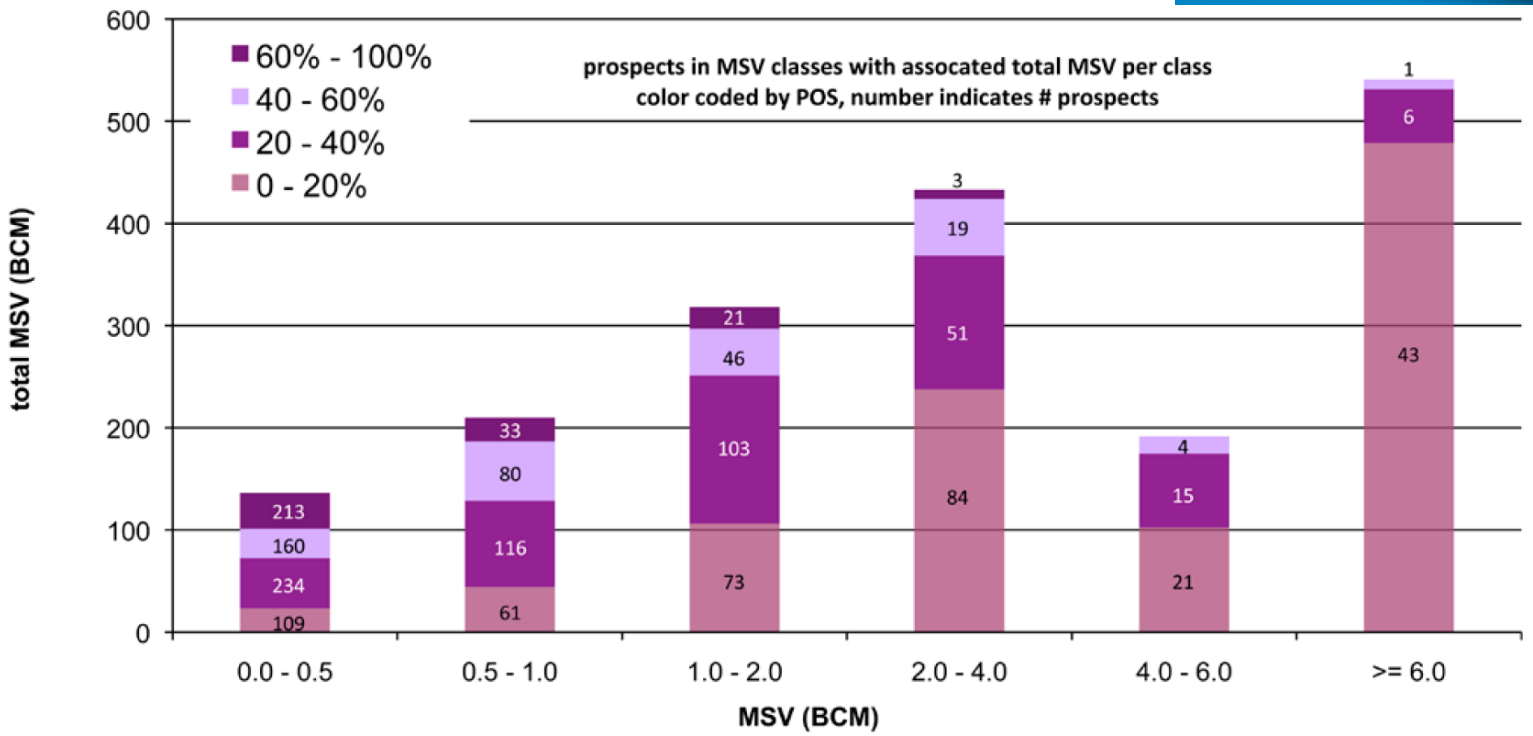




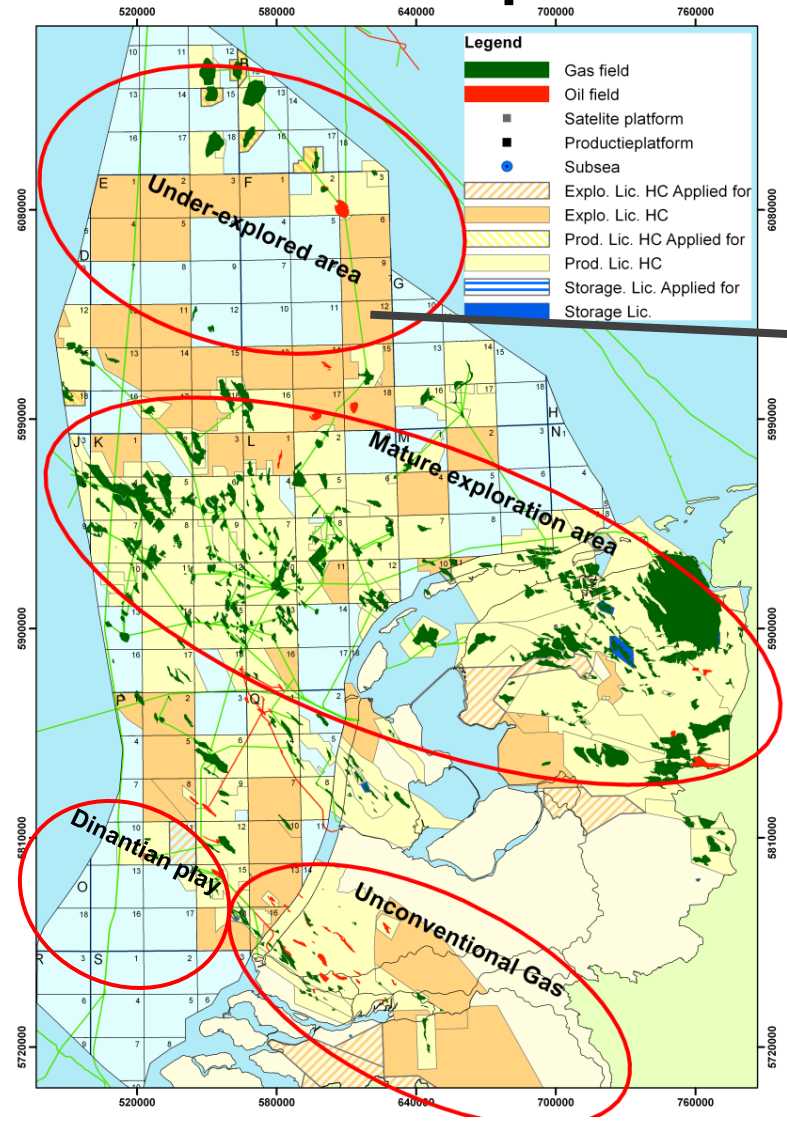
Prospectivity in proven plays

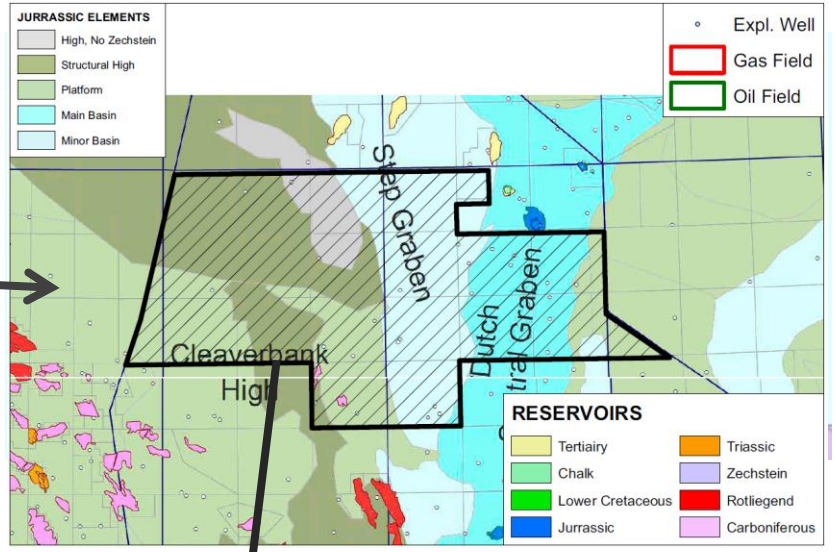


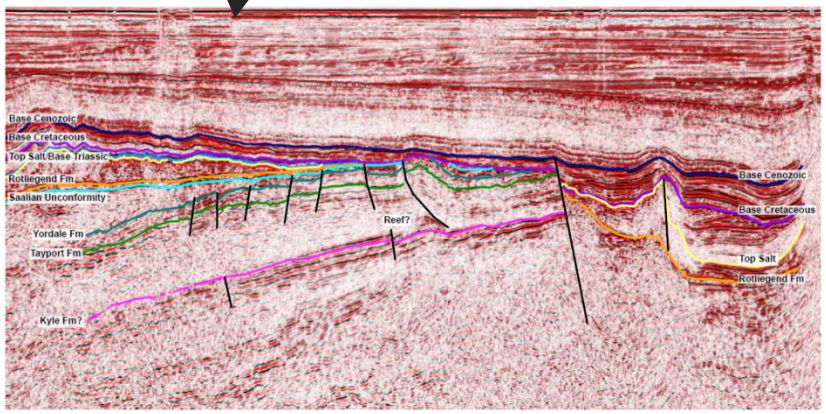
- Prospect portfolio fingerprint as reported =>



Gas in under-explored areas & new plays





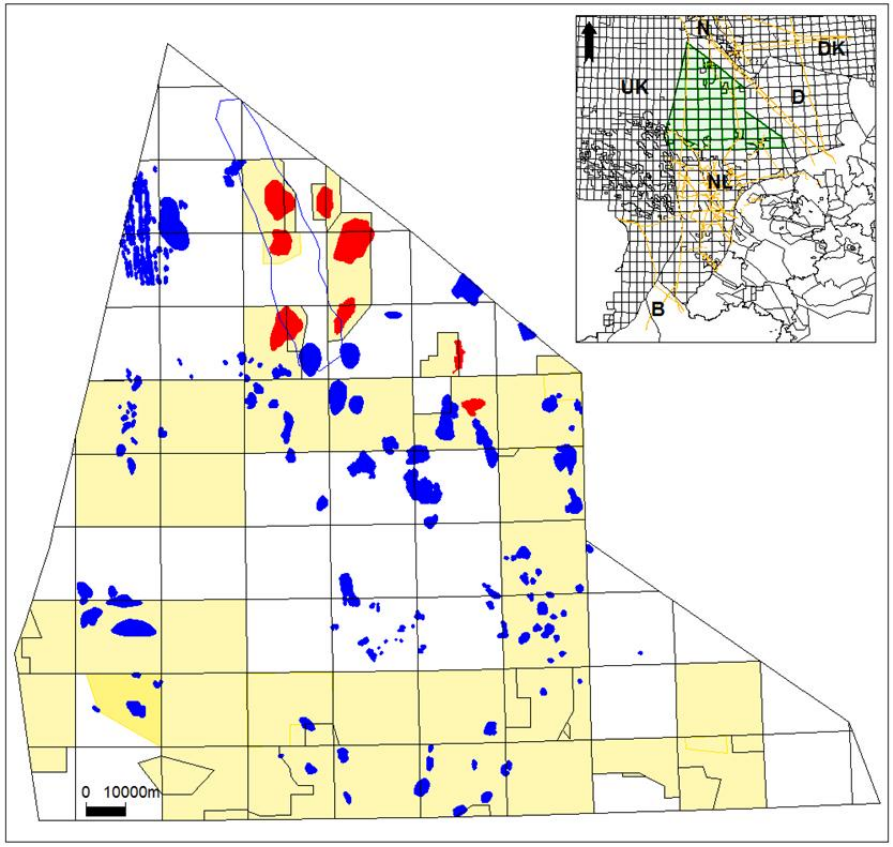


Shallow Gas

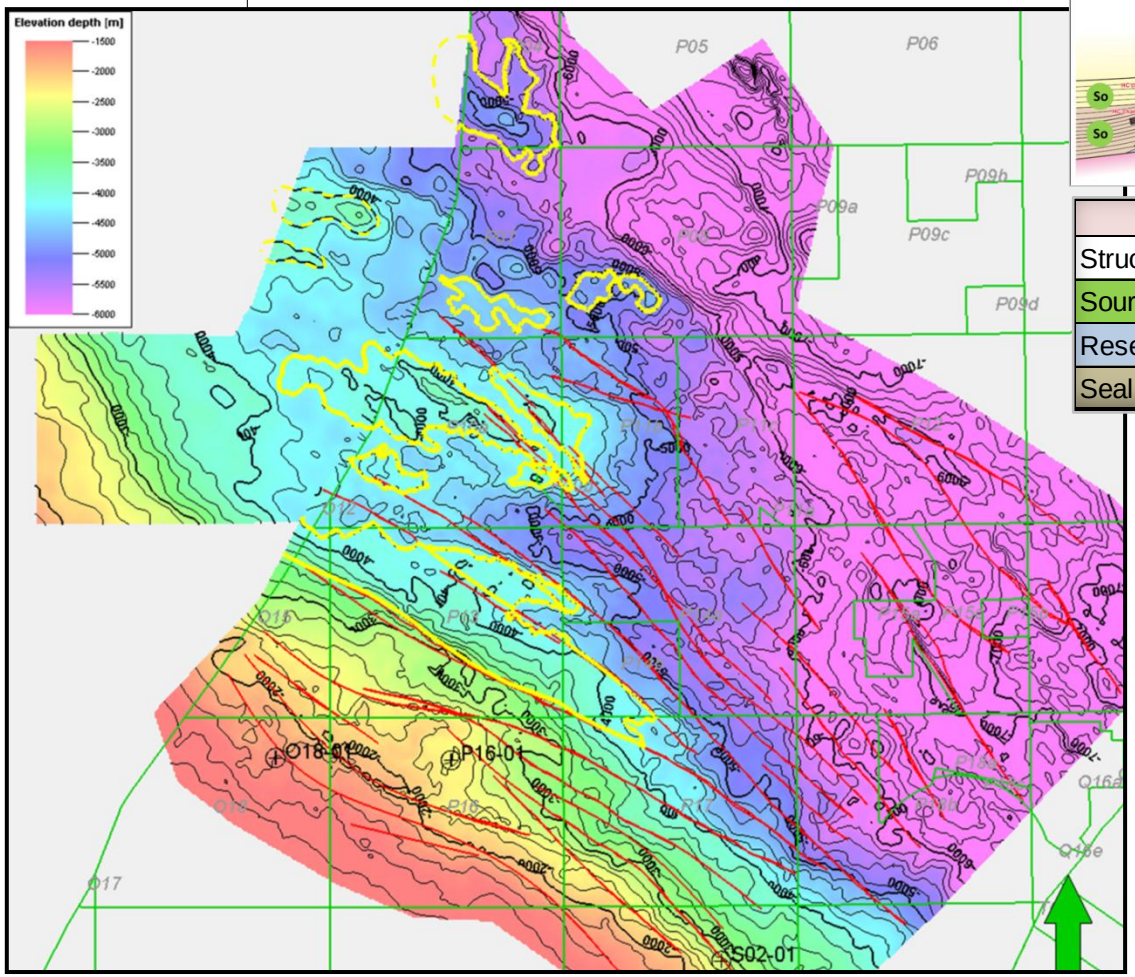
Shallow Gas: gas in Tertiairy unconsolidated strata at max 1000m depth

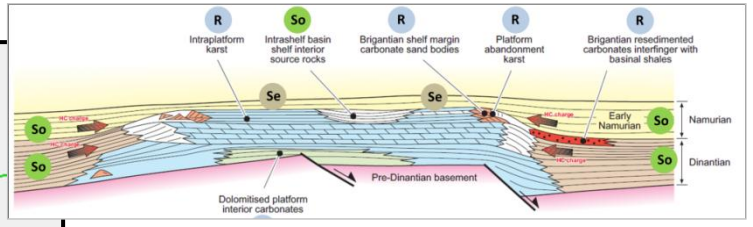
Why now?

- First shallow gas fields in production
- New 3D seismic 2012
- Marginal field tax incentive always applicable
- Significant shallow gas potential in northern offshore

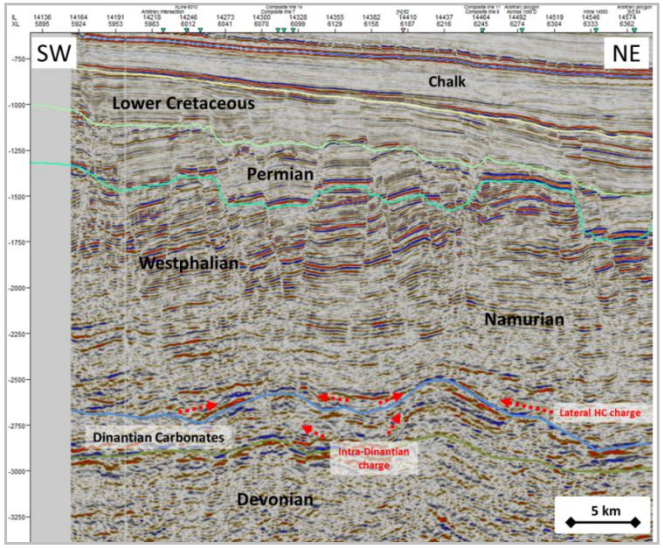


Dinantian Carbonate play review NL



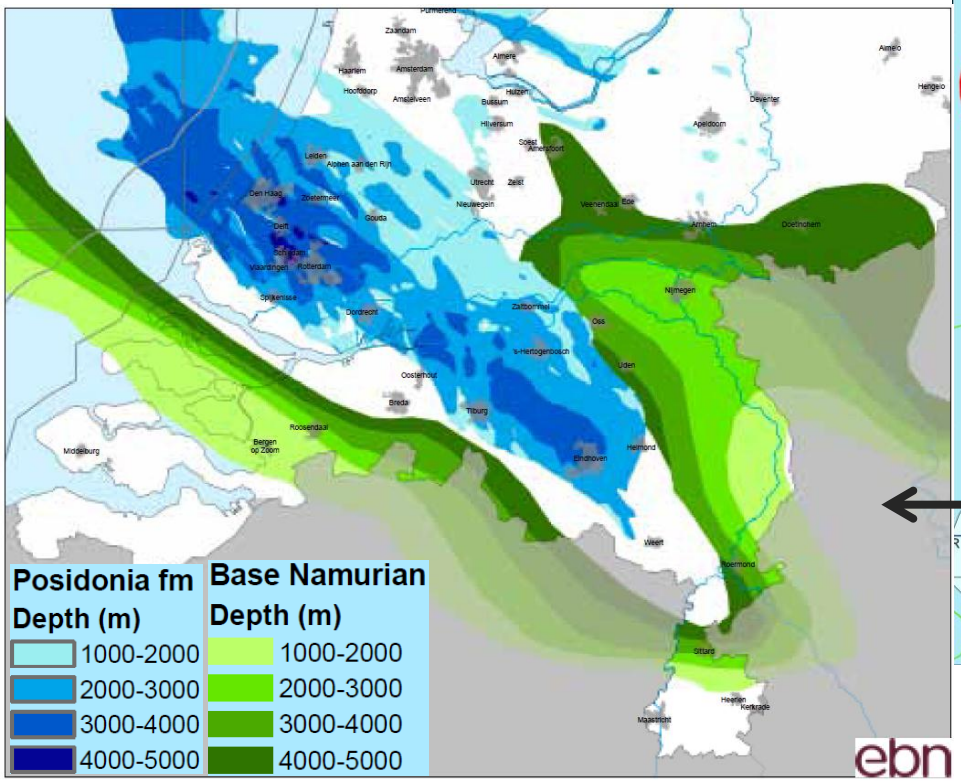


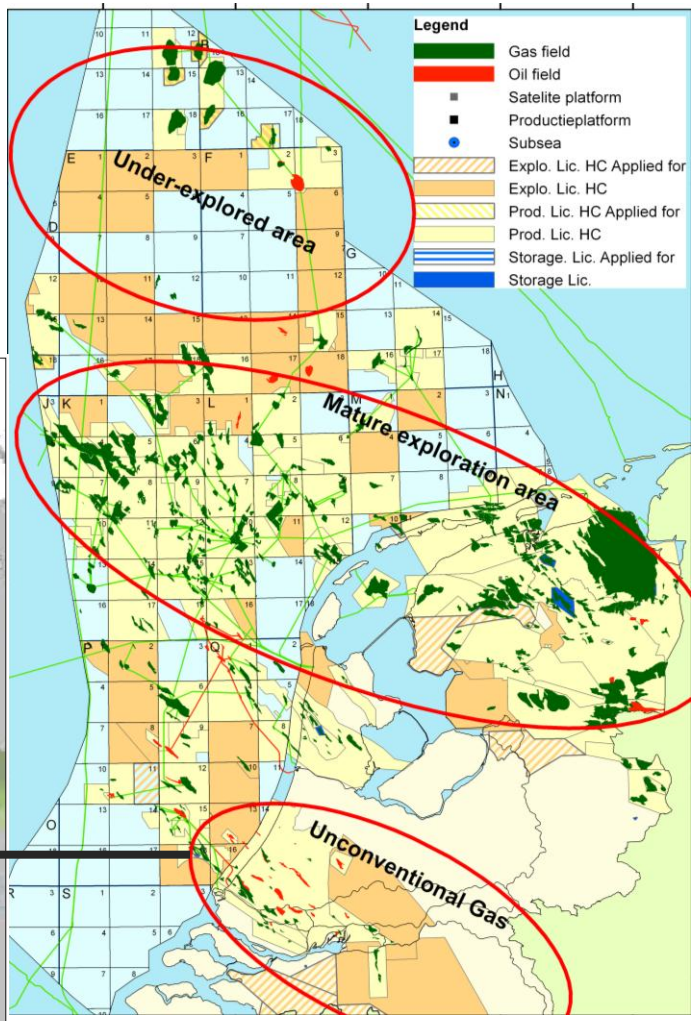
Play elements of the Dinantian carbonate play	
Structure	(faulted) carbonate platform
Source	Namurian / Dinantian shales (lateral migration)
Reservoir	karstified / fractured (Visean) limestone
Seal	Namurian shales (top / side seal)



Unconventional reservoirs

- Shale gas in:
  - Posidonia
  - Basal Namurian hot shales

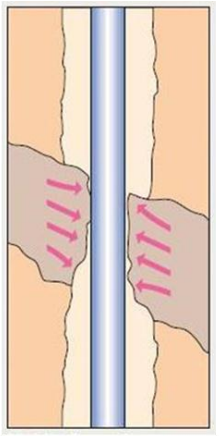




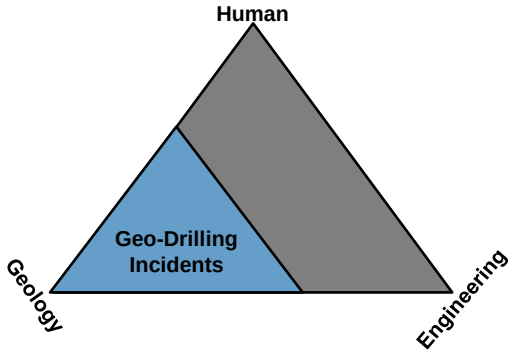
Drilling Hazards JIP – Pilot Project

- To provide a pilot proof of concept for an **integrated Drilling Hazards Information System (DHIS)** for the onshore and offshore Netherlands.

- The establishment of such an information system will enable oil & gas (and e.g. geothermal) drilling Operators to be aware of significant geological drilling incidents which have occurred in the past, and thereby lead to **safer and cheaper drilling operations** in the future.



Example of drilling hazard: mobile formation



Research & development incentive (2012)
Upstream Innovation Programme

To find innovative solutions to get maximal recovery of gas from the Dutch subsurface.

Total Budget 2013:
6.2 Million Euro, of which 50% is private funding


E&P and Geothermy

- 5 doublets drilled in the Netherlands
- 4 have seen hydrocarbons=> very low saturations
  - 3 gas
  - 1 oil
- Anticipated flow 150m^3/h
  - Solution gas: 1 -1.5 Nm^3/m^3 of gas => 3600m^3 gas/d
  - Traces of oil: 0.00005m^3/m^3 of oil => 0.18m^3 oil/d ≈barrel/day

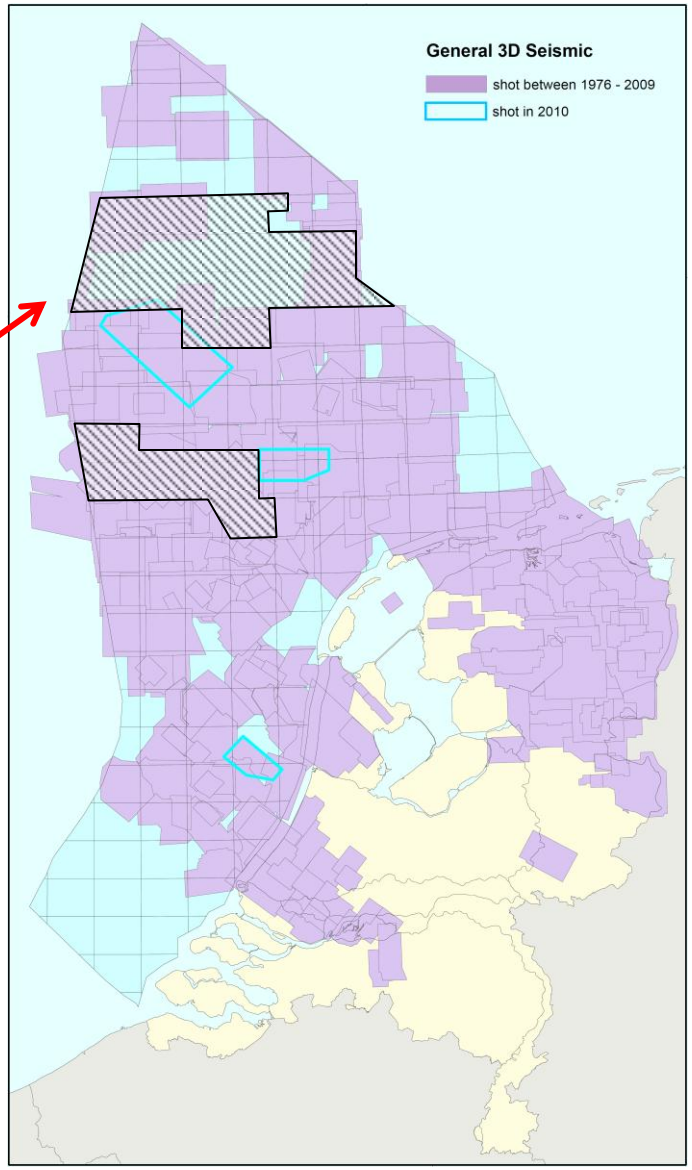
- Interesting opportunity for win-win situation
  - Economic project evaluation with upfront risk-integration
  - One system two energy carriers
  - Shared investors
  - Tail-end production from the start


TNO innovation for life

Subsurface Data

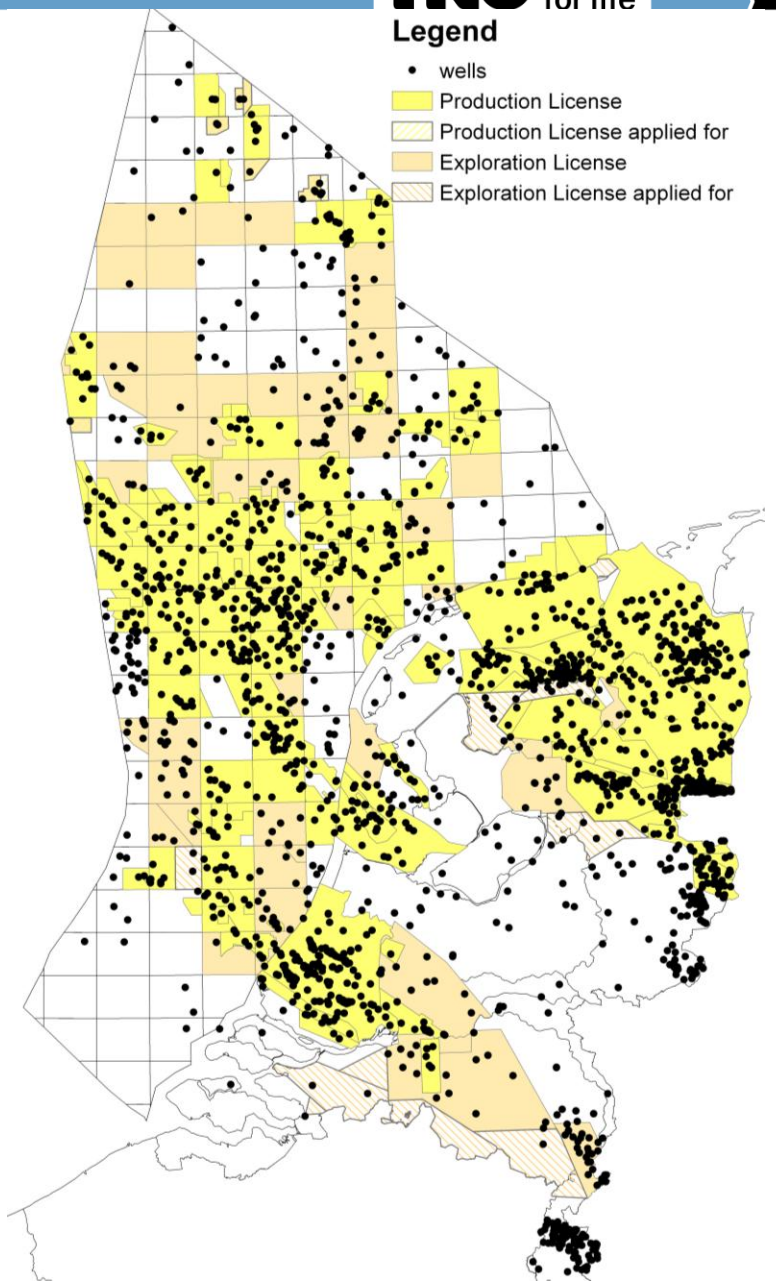
Seismic Data

- 3D-seismic coverage
  - 75% of the offshore
  - 40% of the onshore
- Still improving
  - eg DEF spec survey of FUGRO



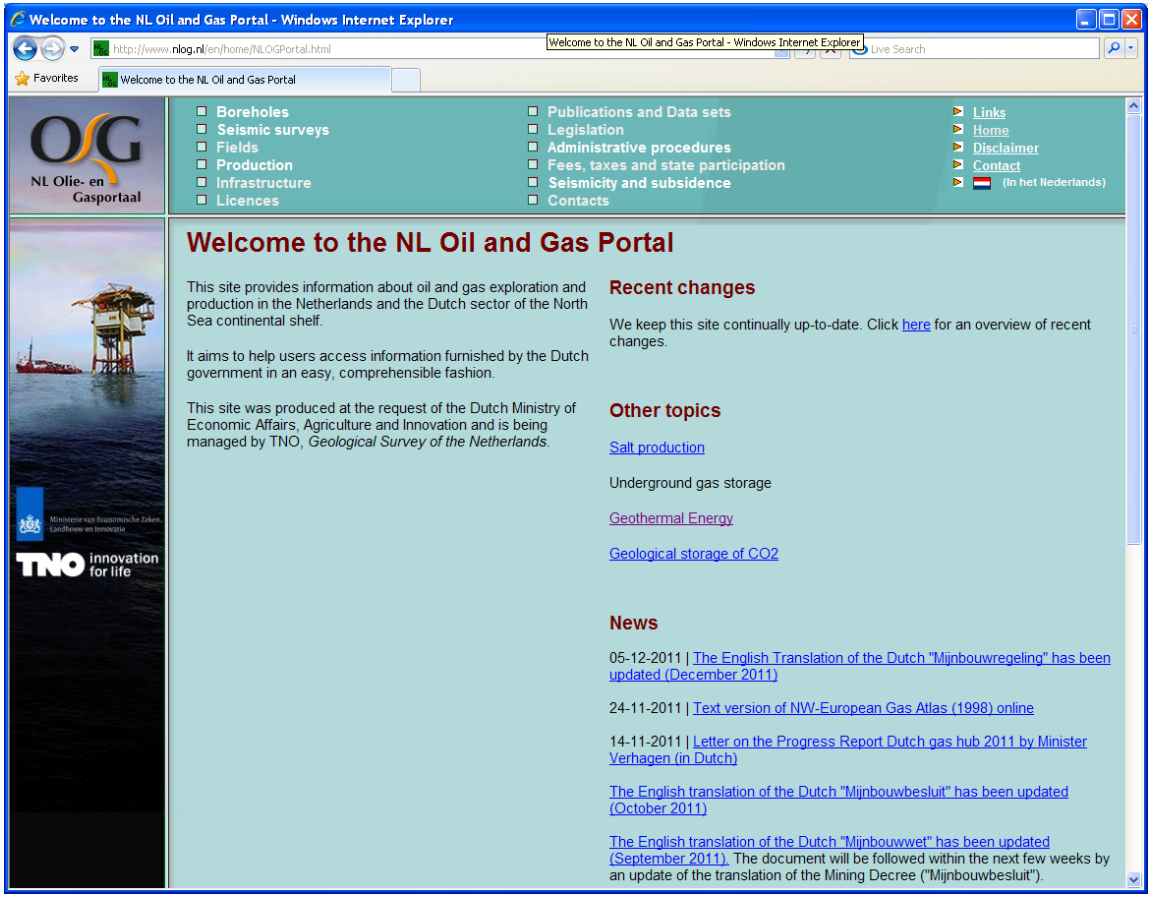
Well Data position

- Some 4500 wells
  - of which 1452 exploration wells



Data availability

- All public domain data freely available through:
  - The Dutch (NL) Oil & Gas Portal
  - **www.nlog.nl**




Conclusion

- Lot of exploration and production potential in the Netherlands
- Stable fiscal and regulatory environment
- Fit for purpose tax incentives
- Extraordinary data-position

- Visit us in booth 10