A New Upper Rotliegend Play
Opportunities in the Dutch offshore

Unlocked potential
The presence of a Lower Slochteren (‘Lower Leman’) reservoir equivalent on the northern edge of the Southern Permian Basin is expected. The recent Cygnus discovery in the UK is a very significant gap filler as it confirms the presence of a stable northern shelf sandstone play. The northern end of the Rotliegend play basin is expected to extend into the northern offshore area, and the recent Cygnus discovery in the UK is a very significant gap filler as it confirms the presence of a robust northern shelf sandstone play.

Cygnus field
- In the Mijnlieff & Pezatti (2009) analysis to define and mature a prospect portfolio.
- Tectonostratigraphic review has been carried out (TNO, 2015) with the following conclusions:
  - Sand-prone Upper Rotliegend reservoir facies are present along the northern edge.
  - Sand-prone Lower Rotliegend strata are proven to be present in the north-eastern part of the study area (fig. 3).
- Petroleum system modelling has been carried out and provided better insights into the thermal maturity and timing of hydrocarbon generation and expulsion. Combination of the distribution of thermally mature source rock and the presence of Permian-aged reservoirs has allowed definition of prospective areas, which require further analysis to define and mature a prospect portfolio.

Reservoir
The presence of commercial sand depends on the transport of sand from the north into local depressions. A varied landscape of depressions and segmented highs (‘cuestas’) was created as a result of differential erosion after the Variscan orogeny. This varied type landscape is expected to have controlled the distribution of the Lower Leman sandstone, thus a proven concept elsewhere in the Dutch and UK offshore.

Prospectivity
Petroleum system modelling has been carried out and provided better insights into the thermal maturity and timing of hydrocarbon generation and expulsion. Combination of the distribution of thermally mature source rock and the presence of Permian-aged reservoirs has allowed definition of prospective areas, which require further analysis to define and mature a prospect portfolio.

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

Figure 1. Facies distribution in the Upper Slochteren (modified after Doornenbal & Stevenson (SPBA), 2010).

Figure 2. Cuesta model applied to the Feather-edge area (modified after Mijnlieff & Pezatti, 2009).

Figure 3a. Facies distribution of the basal sequence of the Lower Rotliegend Group, b. Cycle 2 (of 5) of the Upper Rotliegend.

Figure 4. NE-SW trending cross section through the Step Graben and Elbow Spit High.

Panoramic Lithological Map.

Figure 5. Tectonostratigraphic setting

Figure 6. Potential Rotliegend sand distribution (RO & RV).