

**PALAEOZOIC SOURCE ROCKS IN THE BARENTS SEA – NEW GEOCHEMICAL EVIDENCES FROM THE NOVAYA ZEMLYA AND THE FINNMARK PLATFORM REGION**

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Over most areas of the Norwegian Continental Shelf the Upper Jurassic, in its variable organo facies development, provides the main petroleum source rocks, with additional sourcing from Mid- and Lower Jurassic sequences. These are the *Kimmeridge Clay Formation* and the *Draupne Formation* in the North Sea, the *Spekk Formation* in the Haltenbanken Area, offshore Mid-Norway and the *Hekkingen Formation* in the Barents Sea with secondary sources being the *Heather/Melke Formation* and *Statfjord/Brent/Åre Formation*.

While most of the petroleum found in the Hammerfest Basin is sourced from the Hekkingen Formation, clear evidences for sourcing of hydrocarbons from alternative sequences also exist in this basin. Due to Cenozoic uplift in southern and western parts of the Barents Sea, Gussov/Silverman type remigration associated with phase fractionation has influenced trap filling in this region. To the east the Upper Jurassic is less mature to immature or even absent and play scenarios are based on Triassic and Palaeozoic sequences. This model may also be relevant for other, until present non-drilled, circum-polar sedimentary basins.

In this study we present the initial geochemical data from selected Palaeozoic source rocks from the Finnmark Platform, the Nordkapp Basin, the Loppa High and from onshore Novaya Zemlya (from the now radioactive forbidden zone) in the Barents Sea which have been analysed with regard to organo facies, maturity and generation potential.

The Lower Carboniferous mudstones, siltstones and coals of the *Tettegras Formation* show promising potential for hydrocarbon generation with petroleum in intercalated sandstones, as well as the clay- and siltstone intervals of the Upper Permian *Ørret Formation*, but also Devonian source rock intervals have been identified, providing new insight into the Palaeozoic source potential of the today, circum-polar Palaeozoic sedimentary basins, which may represent new and unexplored petroleum systems.