



## **The Shale Gas potential of Lower Carboniferous Sediments in Germany**

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Organic-rich Carboniferous sediments are proven source rocks for conventional gas systems in NW Europe and are likely gas shale candidates. Within the framework of GeoEnergie, an initiative to strengthen scientific excellence, funded by the German Ministry of Education and Research (BMBF), the influence of palaeogeography and basin dynamics on sedimentology and diagenesis is being investigated. Our aim is to unravel the evolution of shale gas-relevant properties which control gas prospectivity and production parameters like porosity, brittleness, etc. for the Lower Carboniferous in Germany.

Northern Germany is underlain by thick, mudstone-bearing Carboniferous successions with a wide range of thermal maturities. Some of these mudstone horizons are rich in organic carbon which is either of marine and/or terrigenous origin. During the Carboniferous deposition of fine-grained, TOC-rich basinal sediments changed into shallow marine to paralic siliciclastic sediments (carbonates during the Lower Carboniferous) in the north, and grade into coarse-grained sediments close to the uprising Variscan mountains in the south. As a result different architectural elements including TOC-rich fine-grained sediments like basinal shales, fine-grained parts of turbidites, and shallow marine mudstones occur in both the Lower and the Upper Carboniferous section. A high shale gas potential occurs in basinal shales of Namurian age with marine organic material and TOC contents of up to 8 % (Rhenish Alum Shales). Such sediments with thermal maturities between 1.3 to 3.0 % vitrinite reflectance and sufficient quartz contents occur in wide areas of present-day Central European Basins System (CEBS), and are at favourable depth for shale gas exploration predominantly along the southern CEBS margin.