

# SEG 2023 Conference: Resourcing the Green Transition

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## Discover the Un-Discovered: New Exploration Concept for the European Kupferschiefer Copper Belt from Rudna (Poland) to Richelsdorf (Germany)

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An assessment by the USGS of the European Kupferschiefer Copper Belt estimates in the permissible tracts a discovery potential of 31 deposits with 50% probability, including 14 deposits with 90% probability. Current Polish and German exploration shows positive results confirming the literature and expert-based USGS predictions.

Geological, mineralogical, and geochemical observations have shown in Spremberg, Sangerhausen, and Rudna that metal concentrations are associated with Zechstein hot hydrothermal volcanic brine mud slurries that surfaced onto a shallow marine Weissliegend silica extrudite paleosurface. Rich copper-silver-gold-polymetallic mineralization is present. The deep-seated origin of the Zechstein-Kupferschiefer-Weissliegend mud brine and mud volcanic system is manifested by exotic element chemistry (PGE, Co, Ni, Cr, V, Li) and exotic minerals such as talc, serpentine, and clinocllore.

The dynamic origin of the European Copper Belt is the continent-sized area of the Permian-aged, W-E-directional failed rifting in the Saxo-Thuringian Zone bordered in the north by the Rheno-Hercynian Zone and in the north-east by the Variscan Front. This zone shows the typical multi-layered metal deposits that were mined in Richelsdorf and Mansfeld, have been discovered in Spremberg, and are in production as world-class deposits in the Lubin-Rudna district.

The sulfide-metal-rich mineralized Weissliegend sand extrudites cover km-sized large areas and can be used as exploration targets. They can be located by geophysical methods and are known from previous geological survey assessment programs. The targets are flat lying and can easily be drilled. Successful drill holes can be expanded horizontally at low cost with oil- and gas-field drilling technology. The exploration concept components can be demonstrated. The successful exploration discovering the deposit at Spremberg is the proof. The predictions of the USGS from 2010 could become reality in the European Kupferschiefer Copper Belt.