

HYDROCARBON POTENTIAL OF THE WEST CARPATHIAN THRUST BELT AND THE UNDERLYING EUROPEAN PLATFORM, CZECHOSLOVAKIA

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Oil was first discovered in what is now Czechoslovakia in 1914. Most of the production to date has come from the Neogene Vienna basin. During the past few decades, exploration has expanded into more complex terrains. Of these, the broad suture zone between the North European platform and the West Carpathian thrust belt has proven to be the most promising.

The external zone of the Carpathians is represented by highly deformed Jurassic to Lower Miocene flysch deposits thrust over a relatively shallow Neogene foredeep. Based upon drilling estimates and reflection seismic data, the length of the overthrusting ranges from 10 to 50 km, but the actual shortening is probably much larger. The Carpathian flysch belt is a thin-skinned thrust belt consisting of several rootless tectonostratigraphic units. Superimposed on the Carpathian belt is the successor Vienna basin of Neogene age.

Buried below the allochthonous flysch belt and the Neogene foredeep are various formations of the European platform. These include Paleogene, Cretaceous, and Jurassic sequences of the Tethyan margins; Variscan-consolidated Carboniferous and Devonian carbonate and clastic deposits; and the Cadomian crystalline basement.

The structure of the European platform is complex. It involves Late Paleozoic Variscan compression, Jurassic rift-related extension and Late Cretaceous/Early Paleogene Laramide uplifting. Some of the anticlinal features evident in the deeper part of the platform may have formed during the Alpine orogeny. These structures may represent a deeper structural level of the Carpathian belt which evolved below the thin-skinned structure.

Sedimentary sequences of the European platform represent the main exploration target in the region. Several oil and gas fields have been found in the shallower part of the platform down to depths of 3 km. Reservoirs consist of Neogene and Paleogene clastics, Devonian carbonates, and the weathered surface of the crystalline basement. Organic-rich source rocks are present in Neogene, Paleogene, Jurassic and Devonian sequences.

The deeper part of the platform has been little explored. Regional seismic sections show a continuation of sedimentary sequences of the platform down to 10 km below the Carpathian thrust belt.