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### **Conventional and unconventional hydrocarbon fields exploration-in historical and recent aspects in Poland, Europe**

Hydrocarbon exploration has had a long tradition in Poland, Europe. Already in the 16th century there were Polish-written mentions on practical use of crude oil in the Flysch Carpathians. In 1815 “the Father of Polish Geology” Stanisław Staszic described geological conditions of crude oil and native paraffin. He related exploitation and application methods as well. In the Carpathians, the mountains placed in the S and SE part of Poland, in the Gorlice vicinity, the first oil production took place in the fifties of the 19<sup>th</sup> century. Of high importance for the world’s hydrocarbon development is the year 1853 when Ignacy Łukasiewicz and Jan Zeh were granted the patent for petroleum distillation method to obtain kerosene for lighting purposes in the kerosene lamps. The next year has brought the first in the world commercially organized oil well in the Bóbrka village in the Polish Carpathians, being followed by the world’s first kerosene street lamp in Gorlice and the first oil refinery built by Ignacy Łukasiewicz near Jasło. To Ignacy Łukasiewicz, visitors from US were coming to learn his secrets of the distillation processes used in his refinery near Krosno. At the end of the 19<sup>th</sup> century the Drilling Machinery and Equipment Factory was built as well as the refinery in the Gorlice region. The Carpathians and their Foredeep represent the area of the early discoveries of oil reservoirs – in the Tertiary rocks near Borislavand of natural gas in the Miocene strata (“the Przemyśl” field). Other discoveries concern diversified geological basins. The first Polish conventional natural gas field lies in the Rotliegend platform. The first Polish onshore oil field is in the Zechstein Main Dolomite in the Polish Lowlands, whereas the offshore oil field B3 in the Polish Economic Zone of the Baltic Sea occurs in the Cambrian sandstones. Tight gas discovery took place in 2007 in the Rotliegend deposits. The alum shales, which represent the source rocks for conventional oil and gas fields in the Middle Cambrian deposits, are the potential unconventional exploration target.

#### **Biography**

Katarzyna Jarmolowicz-Szulc has been a Scientific Worker in Polish Geological Institute-National Research Institute in Warsaw, Poland, Europe. In her career she was the Head of the Petrological, Mineral Deposits Departments, the Group of Rocks and Mineral Collections, the Centre of Excellence. She has coordinated many projects. She is the author of over 120 papers, a Reviewer and an Editor. She has experience in the fields of isotope studies, fluid inclusions and hydrocarbon migration in the Carpathians in the marine deposits from the Baltic Sea, other hydrocarbon-bearing regions as well. Presently she has been the Head of the National Geological Archives in PGI-NRI, Poland.

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