# Outcrops as One of the Keys in Reconstruction of Petroleum System in the Carpathian Flysch

**G. Lesniak[1], I. Matyasik[1], P. Such[1], and L. Jankowski[2]**
[1] Oil & Gas Institute, Poland
[2] Polish Geological Institute

Petroleum system was recognized in Gorlice – Bóbrka region of the Outer Carpathians in Poland. Three tectonic units (Dukla, Silesian and Magura) in the area of study are the most important for petroleum industry. There are several types of potentially reservoir sandstones here belonging to these units but only the Istebna and the Ci??kowice sandstones from the Silesian unit were investigated in boreholes. Carefully chosen outcrops sandstones as well as new samples from existed boreholes were gathered in database (tab.1). Porosity, permeability capillary pressure investigations, petrography and computer analyses of microscopic images were performed for outcrops and borehole samples. ANN simulation using the whole database gave very good permeability fit for all kinds of sandstones (also from outcrops). It means that all types of sandstones are petrophysically very similar. Detailed investigations show only a little bit higher porosity for outcrop samples. Petrography investigation allows explaining this fact. Circulations of meteoric waters dissolute sand grains but pore throat are not changed. Correlation matrix method was applied to share factors steering petrophysical properties in sandstones from investigated region. There are number of cement and content of carbonate cement.

Source rocks responsible for generation of hydrocarbons in area of stud have been identified. Outcrop samples (60) were taken from sediments of the Dukla and the Silesian unit. Generally outcrops samples originated from the Menilite beds located along anticlines in analyzed area. Finally hydrocarbon potential of region was estimated. Effect weathering was taken into considerations particularly due to samples showing high level of thermal maturity.

Tab.1. Investigated sandstones from boreholes and outcrops

| Type | Numer of samples | Type | Numer of samples |
|---|---|---|---|
| the Istebna | 111 | the Cergowskie | 7 |
| the Krosno | 9 | the Menilite | 15 |
| the Ciezkowice | 27 | the Magura | 2 |
| the Inoceramus | 1 | the Overmagura | 2 |