

From Geophysics to Petroleum Systems within Geological Frame of Romania

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Abstract

Choosing a perfectly adapted to structural-stratigraphic conditions exploration program will reduce geological and economical risk in hydrocarbon discovery.

It is a chain of necessary steps in approaching a new area for this objective: Regional structural and stratigraphic study in area of interest; Potential Petroleum Systems definition (main elements, geographic extension); Analysis of existing fields (active reservoirs age and depth); Interpretation of reservoirs distribution laws in area; and Establishing of the best investigation methodology for the next exploration.

We will describe these steps in Romanian Petroleum Systems using the most suggestive images and examples for each major hydrocarbon-bearing unit.

Geological sections at regional scale over Romanian territory, from West to East and from North to South (based also on the geophysical results) will be accompanied by all specific elements of every petroliferous units.

An interpretation of active hydrocarbon reservoirs distribution laws will be made in Central-Eastern part of the Romanian Foreland, where thermogenic (Scythian, Carpathian, Moesian) or biogenic (Mio/Pliocene) petroleum systems overlap in their geographic extension. The detailed examination of the hydrocarbons distribution leads to the conclusion that within certain formations, areas with preferential accumulations and migration pathways are connected with the general configuration of the basin. They are strictly controlled by the tectonic evolution that, in certain cases, caused a redistribution of the hydrocarbons towards higher sectors.

A special attention will be dedicated to the key elements and the future targets of Romanian petroleum systems. Geophysical information, especially seismic one was used.

The study of the "trace attributes" demonstrating changes in polarity and amplitude, helped us to distinguish the "fluid" and "lithological" effect. "Map Analysis" interpretation results proved the structural evolution and its influence on the faults and their tightness, on depositional environments and trapping mechanisms.

We defined in this way the most important areas to be explored in the future and their main characteristics, (expected reservoir age and depth, structural-stratigraphic features).

An adequate prospecting methodology can be established in this way. Romania still has a good exploration potential.