Derisking an Emerging Slope Carbonate Play Using Basin Modeling Techniques, Central Adriatic, Offshore Italy

Paul Ryan[1], Peter Shiner[2], Barbara Bosica[2], and Claudio Turrini[3]

[1]Petroceltic International
[2]Petroceltic Italia
[3]CT GeolConsulting

Abstract

The Italian Central Adriatic area consists of the Apulian Platform in the southwest and the Umbria Marche-Adriatic Basin to the northeast. The area has experienced a complex tectonic history, with extension and rifting in the Early Mesozoic followed by Cenozoic inversion and thrusting, associated with development of a foredeep-foreland basin system in response to Apenninic compression.

The Italian Central Adriatic is a proven hydrocarbon province. Multiple hydrocarbon plays are present with significant early successes in well-defined structural traps: shallow marine Mesozoic Apulian Platform carbonates (e.g. the Rospo Mare Oil Field), basinal carbonates in the Umbria Marche Basin (e.g. the Sarago Mare Oil Field), and biogenic gas in Plio-Pleistocene clastics (e.g. the San Stefano Field). More recently, a play within subtle structural traps and reservoired in high quality Jurassic and Cretaceous-aged slope carbonates on the Apulian Platform margin has been identified. Two out of three tests within this emerging play have been successful (the Elsa and Miglianico oil discoveries), and a number of additional exploration leads have been identified along the platform margin.

Source rocks for the oil plays are accepted to be Triassic-Early Jurassic carbonates deposited in anoxic, intra-platformal basins. Oils in the platform and basinal plays are generally heavy, having being generated from early mature source rocks. However, the nature of the oil present in the Elsa and Miglianico discoveries varies considerably (15-34 deg API) and understanding this distribution is a key component to determining the viability of the slope carbonate play.

This study uses basin modeling techniques to explore the generation and migration history of the Central Adriatic area in the context of its overall complex geological history, with a view to predicting the likely presence, nature and quality of hydrocarbon accumulations in the area, with particular emphasis on derisking exploration targets in the emerging slope carbonate play. Planning of 3D seismic over the prospects and leads high-graded as a result of the basin modelling is underway, with the aim of better defining the subtle structural traps that characterize this play.