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### **Gas Systems in the Central Region of Neuquen Basin, Argentina**

The most significant accumulations of gas in the Southern Cone are located in the central region of the Neuquén Basin. The Sierras Blancas Formation, a Late Jurassic eolian sandstone, is the main producing reservoir. Other gas reservoirs are fluvial and marine clastics, carbonates, volcanoclastics, and igneous intrusive bodies. Most of the traps are combined structural-stratigraphic. Compressional and transpressional Late Jurassic reactivation of earlier extensional structures resulted in tectonic inversion that controlled the formation of main traps and the distribution of reservoir facies.

Analysis of produced gas and associated liquids establishes that there are multiple source rocks for gas in the central basin. The gases correlate to source rocks in the Vaca Muerta, Los Molles, and pre-Cuyo sedimentary sequences. Results also show that the Vaca Muerta and Los Molles source rocks generate a wet gas from primary cracking mechanisms, and that the dry gases associated with these source rock intervals are the by-product of secondary alteration by microbial processes (i.e., selective metabolism of wet gas components). The pre-Cuyo gas source rock remains a topic of investigation. The isotopic analysis of the associated carbon dioxide identifies the various genetic origins of this inorganic gas component. All these data enable migration vectors (vertical and lateral) to be established, and the results used to explain reserve size distributions. Identification of key elements that control the gas distribution of alternative gas source systems provide new opportunities for future exploration in the deeper portions of the sedimentary column.