

Shale Gas Potential in the Eastern Cordillera of Colombia

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A preliminary estimation of the Gas Shale Potential of the Eastern Cordillera reveals a gas resource of 37 TCF which was calculated on the basis of organic-rich shales, vitrinite reflectance, formation thickness and size of the large structures in the Cordillera. The Eastern Cordillera of Colombia contains a thick sedimentary sequence that ranges from Late Paleozoic to Middle Miocene in age, where the Cretaceous sequence presents siltstones, shales and mudstones with two organic rich levels that present excellent shale gas potential.

The main shale gas reservoirs are the Turonian -Coniacian sequence, that corresponds to the Luna, and Chipaque Formations. Gas potential of these formations is indicated by high TOC content that ranges from 1 to 8% with mean TOC value of 4.5% in the La Luna Formation and 2% in the Chipaque formation. A predominance of Kerogen type II has been identified in the La Luna Formation, and a mixture of Kerogen II and III dominates in the Chipaque Formation. Thermal maturation of the La Luna and Chipaque Formations changes regionally from 0.5% on the eastern and western boundaries of the Cordillera to 2% on the axis of the Eastern Cordillera.

Lateral facies changes are observed from east to west, exhibiting toward the east siltstone and sandy shales in the Chipaque formation that change to mudstone. The La Luna formation presents siltstone and mudstone facies and outcrop mostly toward the west side of the Eastern Cordillera. The Villeta Formation of Albian to Cenomanian age also presents shale gas potential, which is indicated by high TOC values from 1 to 2%. The main shale gas potential is related to the relatively high vitrinite reflectance values that can reach up to 2.5% in the axis of the Cordillera, indicating that large quantities of thermal gas have been generated.

Major Anticline structures with Lower Cretaceous-organic rich shale have been identified. These anticlines present organic-rich rocks in the nucleus and are covered by upper Cretaceous shales that act as seals in these prospects. Other important structures for Cretaceous Shale Gas are monoclines associated to thrust faults, which are located in the axis and the west flank of the Cordillera.