Abstract: Argentina has world-class shale gas and shale oil potential – possibly the most prospective country outside of North America. Argentina has an estimated 802 Tcf of risked, shale gas in-placeout of 3,244 Tcf of risked, technically recoverable shale gas resources, ranked third in the world. In-placeisked shale gas resources are estimated at 480 billion barrels, of which about 27 billion barrels ofshale oil may be technically recoverable, ranked fourth in the world (EIA, 2013). Argentina has large and potentially high-quality shale gas and oil resources in four main sedimentary basins, including the Neuquen Basin, Golfo San Jorge Basin, Austral Basin and Paraná Basin, primarily in the Neuquen Basin with risked, technically recoverable shale gas at 583 Tcf and shale oil and condensate at 19.7 billion barrels. The Neuquen Basin is the main focus of shale exploration and development in Argentina, wells drilled since 2010 indicate good shale gas and shale oil production potential in the marine deposited Los Molles and especially Vaca Muerta shales of Jurassic age. The Vaca Muerta Formation of Neuquen Basin, thick, organic-rich, marine-deposited black shale formation, is the most important shale formation in Argentina. The thickness of the Vaca Muerta Formation varies from 30 to 450 meter and the TOC data ranges from 3% to 10% with reservoir pressure between 4500 and 9500 psi. Matrix porosity varies from 4% to 14% and the average is 9%. Matrix permeability varies from nanodarcies to micro-darcies and the presence of natural fractures contribute to the productive of the formation. The type of hydrocarbon expected in the Vaca Muerta Shale Formation generally depends on the location within the Neuquen Basin. The eastern and southern regions have potential for oil production, the western region is predominately dry gas and area between the oil and dry gas zones is wet gas and condensate prone.

Argentina is one of the four countries in the world, which are commercially developing unconventional resources. Significant exploration programs and commercial production are underway in the Neuquen Basin, especially in Vaca Muerta Formation. 884 wells have been drilled currently in Vaca Muerta Shale Formation (Secretaría de Gobierno de Energía Argentina, 2018). The shale oil and gas production of Argentina soared so fast in recent years. The shale gas production was 22 MMm³/d in September 2018 and rose 256% compared with the production in September 2017 (Secretaría de Gobierno de Energía Argentina, 2018). The data from Neuquen’s Ministry of Energy and Natural Resources show the shale gas production of Neuquen province rose 193% on the year in 2018. The shale oil output rose 52% year on year in 2018, reaching a peak of 78 kbbl/d in December and 60% of total oil production of that month (Ministerio de Energía y Recursos Naturales de Neuquén, 2019). Therefore, Argentina begins to recover the self-sufficiency lost in recent years by export natural gas to Chile with the record production of Vaca Muerta since October 2018. It is the first from the Neuquen basin (Secretaría de Gobierno de Energía Argentina, 2018).

The government of Neuquen Province granted 22 Unconventional Exploitation Concessions in the last three years, which authorized total 34 added to the previous and will reach 40 in 2019 (Ministerio de Energía y Recursos Naturales de Neuquen, 2019). This process allowed the increase of the previously mentioned production, while also allowing the increase in operators number. While in 2015 YPF, in association with Chevron, extracted practically all of the unconventional hydrocarbons, Exxon, Shell, Petronas, Pan American Energy, Tecpetrol and others have now joined. More than 30 big, independent and local companies are active in Vaca Muerta (Ministerio de Energía y Recursos Naturales de Neuquén, 2019).

Keywords: shale gas, shale oil, production, Argentina

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