

Challenges to Exploit Shale Gas in Pakistan

Nasir Ahmad¹ and Claudio Nicolai¹

¹Eni Pakistan, Karachi, Pakistan

Abstract

Due to increasing demand of energy and depleting resources the O&G industry is continuously trying to recover the hydrocarbons by reaching up to limits, this emerged as of unconventional resources. This paper will discuss the challenges to exploit the shale gas in Pakistan. In the United States, this is a young business that has been developed rapidly (about 10 years) but is extremely organized and successful. However, in Pakistan, as in many other countries, the process is just at the beginning. As of today in the United States, the shale gas has represented such a large change in the industry to be currently known as the “shale gas revolution”. The dimension of this new business is of such magnitude that the United States is rapidly becoming almost independent from the import of gas standpoint. Similar results are expected on the oil side as well.

For decades, the industry has always referred to black shales as source and seal rock only. With the introduction of game changing technologies like the long horizontal well drilling and the massive hydraulic fracturing it is nowadays possible to produce at economic rates from rocks with permeabilities in the order of nanodarcies – so low, in fact considered as impermeable top seal. Such coupled with an extremely efficient service market and incentivizing regulations has made the Shale gas the most remarkable change in the O&G industry, an industry known to be the slowest in adopting changes. All this has allowed the industry to start the tapping of huge gas reserves completely neglected until just ten years ago.

As being a new business and developed originally in the States there are many challenges to succeed in export such business and exploit the Shale Gas outside the United States, Pakistan makes no exception. We can divide these challenges in following groups: Exploration challenges, Operational challenges, and Business, Financial and Regulatory challenges.

From the exploration point of view, we need a better understanding in regards to the different nature of the shales of Pakistan as is considered that no two shales are alike. We need to understand the thickness, TOC, maturity, brittleness (fracturability), pressure history, the present-day depth of the shales and their extension such to establish their actual richness in the hydrocarbon content and delivery capability. During conventional exploration, very little data has been recorded particularly for shales. The operational challenges are mainly represented by the extremely high number of production wells (in the order of thousands) to be drilled and fractured in a relatively short period of time and impacts that such has in terms of the capability of the supply chain to sustain such effort at extremely low costs. The reduced productivity of each single well makes the continuous improvement of the operation a must, while from the financial point of view it is necessary to have an extremely sharp control of costs tailored on the effective remuneration of the produced gas. Being a new business with reduced margins but also the possibility of a modular approach to the investments frequently related to the oscillation of the final selling price (such for the United States experience) it demands of incentives and regulation able to cope with the specific needs of this business. Outside the United States this is particularly true because without adequate government support it will become extremely difficult to make any shale gas project an economical

reality. To exploit the shale gas properly in Pakistan, we need to face all these challenges and find a reliable solution to all of them. These will be discussed in detail in the paper.