UR08

Risks and Uncertainties of Shale Gas Plays at New Venture Scale

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Summary

As the name reflects, the Unconventional Resources are different and should be study in a different way. There is no clear “killing” factor like in the conventional world. It is important to take into account all the parameters together (one could compensate another one). Keeping that in mind never try to kill a project too soon. Most of the unconventional “reservoirs” will flow hydrocarbons if stimulated, the real killing factor is at what cost.

Introduction

As the name reflects, the Unconventional Resources are different and should be study in a different way. There is no clear "killing" factor like in the conventional world. It is important to take into account all the parameters together (one could compensate another one). Keeping that in mind never try to kill a project too soon. Most of the unconventional "reservoirs" will flow hydrocarbons if stimulated, the real killing factor is at what cost. Therefore, in the majority of the cases the main driver to kill a project is the economic factor (Pe) rather than the geological one (Pg).

On the other hand, the unconventional projects have an important advantage in terms of flexibility. The CAPEX is spread in the life of the field and if the market conditions are not favorable the expenditure can stop at any time and be reactivated at a more convenient moment.
The shale gas represent 27% of the worldwide gas resources while the shale and tight liquids represent the 13% of the worldwide resources and more has to be found (Figure 1).

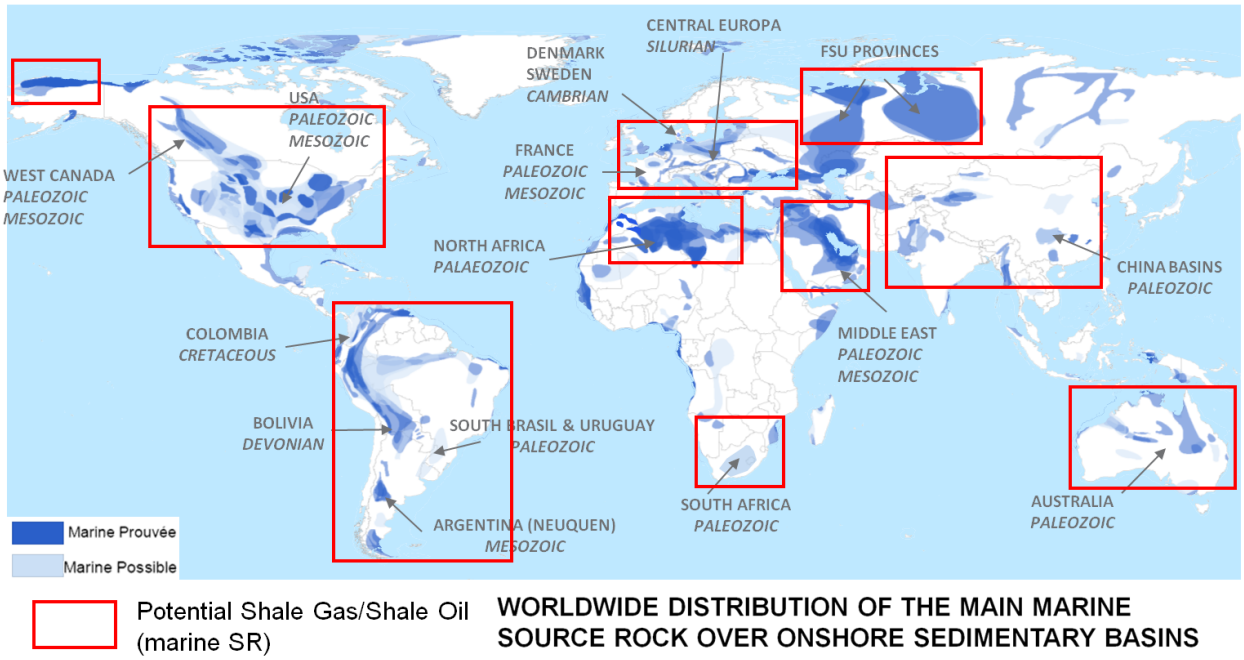

Figure 1 *Worldwide distribution of the main marine source rock over onshore sedimentary basins.*

Risk, Uncertainties and Evaluation

In the Shale Gas world, the Pg would vary depending on the maturity of the basin. Most of new ventures (NV) evaluations in Shale gas plays have been done in basins with a proven conventional petroleum system. Therefore, most of the Pgs are already high, even at NV level, with an order of magnitude of 0.5 up to 0.7 (depending on the existing data). This Pg will increase and the risk decrease through the maturation of the project (Figure 2) by reaching the different decisions steps (discovery, pilot, demonstration and development). There are methodologies already in place for computing the Pg in all these phases. However, it is not yet crystal clear how to evaluate a license in a screening phase before any discovery has been made.

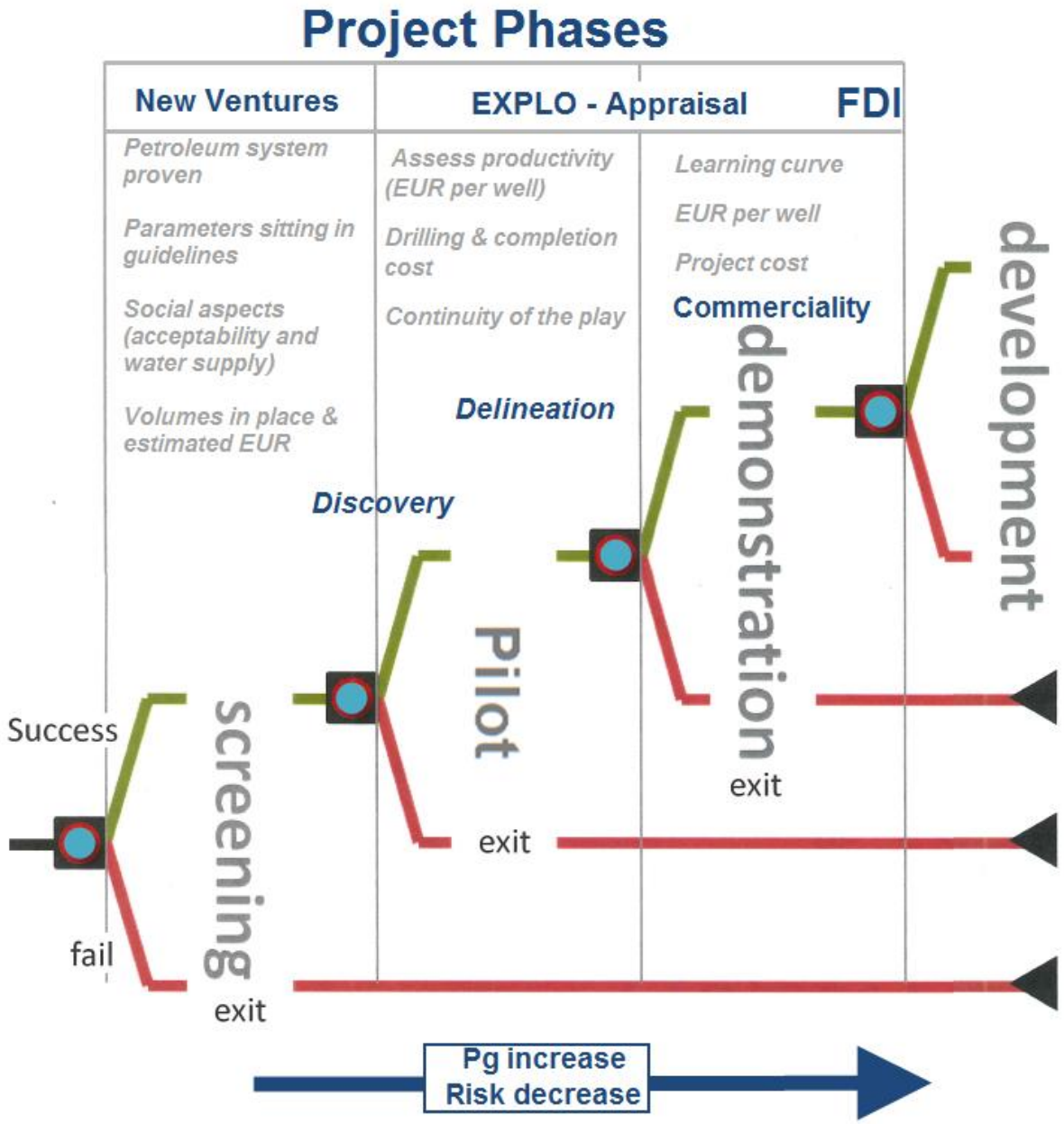

Figure 2 *Decision tree showing the different project phases.*

The methodology here presented to evaluate a NV opportunity consists in the analysis of all parameters related to both the GIP computation and the productivity of the play. There is no clear "killing" factor like in the conventional world. It is important to take into account all the parameters together as one could compensate another one.

The list of different parameters impacting directly the GIP evaluation for Shale Gas plays are several including: area, flow unit thickness, porosity, saturation, Bg and adsorption. While other parameters that impact in a non direct way are captured as well: fluid type, pressure gradient, geological setting, thermal gradient, TOC, maturity, brittleness/clay content, etc. It is important to mention that the average values are not always representative or meaningful as the heterogeneity may be lost. Nevertheless, when one of these parameters sits outside of the guidelines it raises the risk flag. A comparison of the guidelines used in the industry to evaluate NV opportunities based on these parameters will be presented.