

## **Establishing Minimum Economic Field Size and Analysing its Role in Exploration Project Risks Assessment: Few Examples**

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### **Abstract**

Upstream E&P industry is one of the most risky businesses to invest and is dominated by different type of uncertainties: political, economic, social and technical. There are many areas that can lead to optimistic or pessimistic risk assessment. Overestimation, underestimation, misidentifying critical risks, overselling and underselling projects are some of the common problems that are encountered. For consistent exploration projects risk analysis, a systematic approach has been used which includes geological risk, minimum economic field size (MEFS), resource size distribution, development cost, rate streams, commodity price, discount rate and cash flow estimation. This approach requires highly skilled geoscientists and engineers to estimate field development costs and generate the economic indicator, to rank the exploratory prospects potential success and to support the informed business investment decisions. The “exploration success” contains two main variables: (1) probability of geologic success ( $P_g$ ), and (2) probability of economic success ( $P_e$ ). To remove sub-economic volumes from the volumetric distribution, the industry uses the estimation of minimum required (break-even) resources for the full project life cycle considering the most likely development scenario in exploration projects. For appraisal and development projects, the minimum required resources are used to benchmark the confidence level of already discovered resources with their chance of success to be an economically viable project. Despite several contributions made in the past and available in the literature, to the best of authors’ knowledge, most often a deterministic MEFS value is being used for the exploration project risk assessment. This single MEFS value does not allow capturing the risks associated with the different input parameter uncertainties which are used for the MEFS estimation. In this paper, an effort has been made to review and systematically describe the appropriate MEFS estimation methodology. The influence of key parameters on MEFS estimation, including some illustrative examples, have been used to demonstrate the MEFS criticality and its impact on exploration projects risk assessment to achieve an overall economic success.