

## **A Decade Of Progress in Unlocking Tight and Unconventional Plays in the Middle East Region**

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### **ABSTRACT**

The success of unconventional plays in North America has changed the way the industry approaches the exploitation of tight reservoirs and source rocks (shale gas and oil) around the world. Innovations such as horizontal drilling and multistage hydraulic fracturing have enabled a step change in reservoir contact and resulted in significant improvements in economic performance. Efficiency approaches are often the main emphasis when trying to replicate the success in international plays. But, efficiency alone is not sufficient, and simply applying workflows from established plays may not work in different reservoir environments.

These shortcomings are of particular concern in the Middle East where regional challenges including basin complexity and active tectonics, carbonate source rocks with high TOC (over 10% in some plays), availability of fresh water, and offshore unconventional plays require new solutions to enable commercial viability. The solutions are coming from multi-disciplinary teams and operator-service provider collaborations focused on both efficiency and subsurface effectiveness. At the field scale, the application of unconventional workflows has enhanced the identification of sweet spots based on combining reservoir quality and completion quality. Mechanical earth models are helping to engineer well design solutions in complex basins, where tectonics and complicated geology can dramatically impact the success of hydraulic fracturing operations. At the well scale, characterization of reservoir heterogeneity and application of customized workflows are impacting strategies for drilling, completions and stimulation designs such as well placement, lateral landing, hydraulic fracture staging, and perforation strategy to maximize productivity. Developments in fracturing technologies reduce the resources requirements and enable the use of non-fresh water sources including brackish, formation, or sea water.

This presentation will highlight key solutions and lessons learned from activities in unconventional plays in the Middle East region over the past decade. Examples from several plays across multiple countries including Saudi Arabia, Oman, United Arab Emirates, and Kuwait will illustrate the region's progress along the learning curve. Technology and integration are already having an impact and will drive further improvements in the sustainability of unconventional plays in the region.