

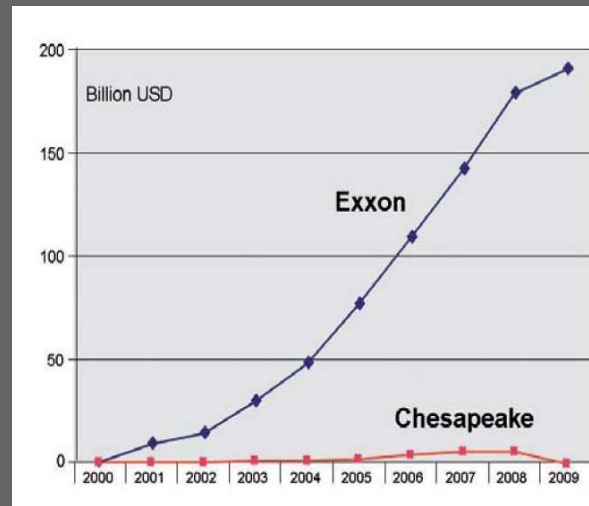
Energy Strategy Value Series



Unconventional Gas Resource Evaluation

Alboran conducts proprietary evaluations of your company's unconventional resource efforts from an exploration and production effectiveness perspective. Our evaluation is aimed at formulating recommendations to improve the effectiveness of your internal procedures and technological efforts. We believe such periodic evaluation and benchmarking are essential for emerging unconventional gas operations to enable your company to better predict and monitor the success and outcome of current and future unconventional gas projects.

Our evaluation analyzes your data and utilizes staff input, to determine how successful your recent unconventional oil and gas program has been in meeting technical and commercial benchmarks. We conduct a competitive analysis, which benchmarks your results against historical and public information from other companies. The evaluation comprehensively reviews your company's rigor in predicting resource and reserve volumes ahead of entering into commercial agreements. Your company's ongoing capabilities are also examined to correctly anticipate production rates and reserve outcomes.



We can further audit and analyze the detailed basis and methods for reporting reserves (Developed & Undeveloped) in specific unconventional gas plays in the US and elsewhere. We believe that the distinctions between reserves-reporting practices of conventional and unconventional gas producers will come to the forefront in the near future, either led by queries from concerned investors or by the SEC review panel, or both. This means external reserve auditing becomes more important to reduce your company's risk of overstating reserves due to internal bias.

Alboran's expertise is based on detailed benchmark studies parts of which have been published in the peer-reviewed scholarly domain.

1. Why untenable US natural gas boom may soon need wellhead price-floor regulation for industry survival

First Break, 2010, Vol. 28, Issue 9 (Sept), pages 33-38.

The unconventional natural gas business has ascended a steep three-stage learning curve. The first stage of the learning curve shows that natural gas production from unconventional source rock actually can replace the decline of conventional natural gas production, but that is only one step up the ladder. The second stage of the learning curve shows that many US natural gas production companies encounter serious difficulty in

meeting break-even cost. The third stage of the learning curve has just begun and can only become successful when investor confidence can be maintained. It remains critical for unconventional gas companies to restore profitability and provide shareholder returns. They must prove over time that shale gas can be produced at a reasonable profit. The development of unconventional gas reserves can only succeed if the financial returns that lured investors to unconventional gas companies in the first place, begin to materialize rather sooner than later.

2. Can technology R&D close the unconventional gas performance gap?

First Break, 2011, Vol. 29, Issue 5 (May), pages 89-93.

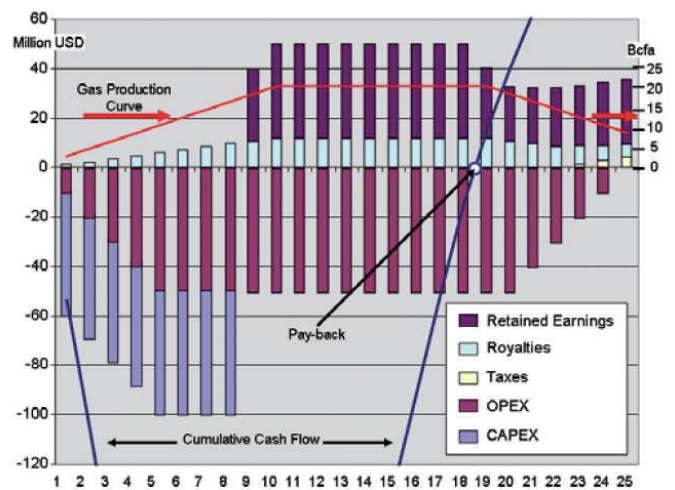
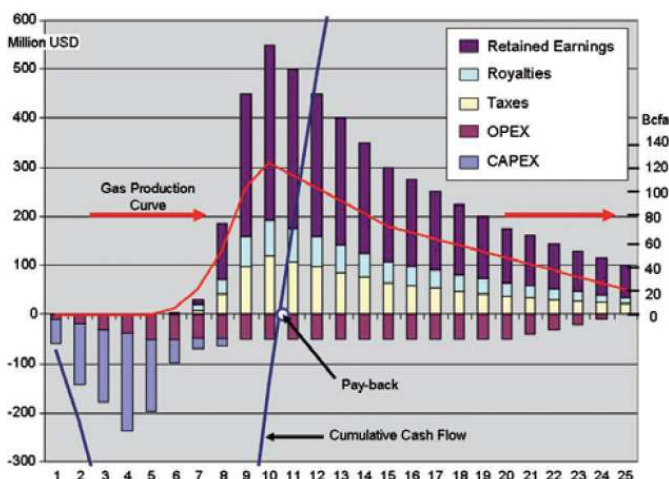
Conventional operators have profits high enough to pay for shareholder dividends and new assets for real business growth. In contrast, unconventional operators need to continually raise new cash (equity and debt) from the market to pay for ongoing projects; generally 50% or more of the annual cash flow originates from financing operations. Retained net profits are needed to acquire new assets and for investment in new and ongoing projects for generating future profits. When operational profits are absent – as endemic for a substantial portion of the North American unconventional gas business – cash flow can only be maintained by asset sales and new financing. Such a business model is not sustainable and increasingly volatile if investors lose confidence in the future potential of unconventional gas operations. Well productivity is poorly constrained and history matching is not widely publicized and mostly kept proprietary. We need better models to predict production potential prior to commercial development.

Examples of Unconventional Gas Industry Benchmarking

3. Unconventional Natural Gas Business: TSR Benchmark and Recommendations for Prudent Management of Shareholder Value

SPE Economics & Management, 2012, Vol. 3, Issue 4, pages 247-261, (SPE paper 154056).

Prudent management of shareholder value in unconventional gas businesses is essential for ensuring security of gas supply, not only in North America – but as well in other countries with emergent unconventional gas plays. This study analyzes and benchmarks the working capital cycles in unconventional gas companies. The working capital and cash flow cycles are compared to those of diversified oil & gas majors. The ability to accumulate retained earnings is generally much lower for unconventional gas producers than for integrated majors. Unconventional gas producers tend to grow their share capital by new issues and not from economic value added by profit from business operations. Although little or no asset value is built from economic profit, shareholder returns may still grow for unconventional gas companies as



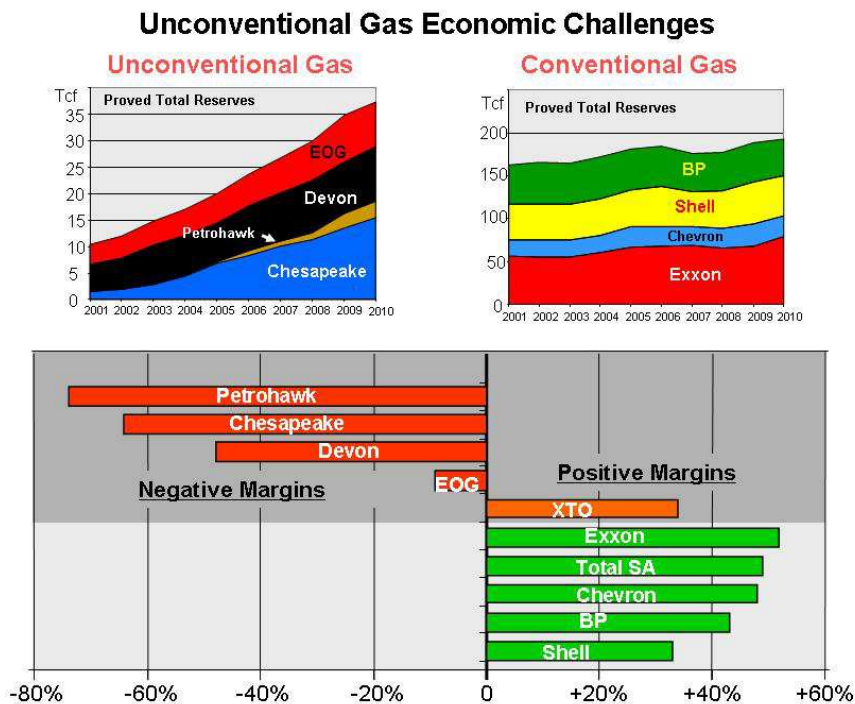
long as investor expectations remain positive about future earnings. In contrast, shareholder returns in conventional gas companies come from genuine economic value added in profitable business operations.

The root cause of the weakness or absence of operational profits in unconventional gas operations is a combination of low gas prices and well flow rates that are too modest to pay for the total cost of the unconventional gas production. The benchmarks provided here help to understand which parameters impact the financial performance of unconventional natural gas companies most significantly. Recommendations are formulated to avoid the destruction of shareholder value, and to instead maximize total shareholder returns (TSR).

4. Jumps in Proved Unconventional Gas Reserves Inventory Present Challenges to Reserves Auditing

SPE Economics & Management, 2012, Vol. 4, Issue 3, pages 131-146 (SPE 160927-PA)

This study analyzes the typical challenges and opportunities related to unconventional gas reserve maturation and asset performance. The risk of undue volatility and overly liberal application of reserve accounting methods is inherently high in unconventional gas plays. Volatility in natural gas prices may lead to downgrading of formerly proved reserves when the marginal cost of production cannot be sustained by the wellhead prices realized. The underlying causes are analyzed, categorized and benchmarked based on historic analysis of data for peer groups of representative companies. Undue volatility in reserve volumes must be avoided - arguments and guidelines to achieve that goal are outlined.



We are delighted to provide additional information on our services.

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