

Halliburton helped assess resource potential and optimize investment decision-making in shale plays

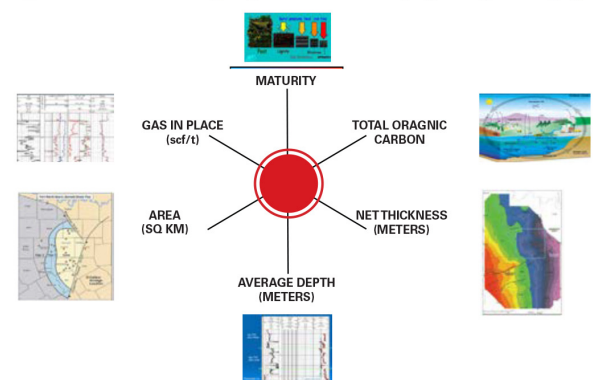
Halliburton's unique evaluation process and unmatched shale experience helped clients separate economical plays from cost-prohibitive ones

Overview

The marginal economics of shale are legendary. Decisions about whether or not to invest in a shale asset must incorporate all the potential risks and benefits involved. Not fully understanding just one variable could mean the difference between profit and loss.

Halliburton is the industry leader in developing shale plays and has created a method of evaluating the economics of these investments. The process helps clients understand when and where they can make money, both in the early stages of development and later in the life cycle of the asset. Halliburton Consulting recently helped two operators make critical decisions about potential shale plays, enabling both to make informed decisions about potential investments. One profited by acting quickly. The other profited by walking away. Both operators have already hired Halliburton for additional analysis.

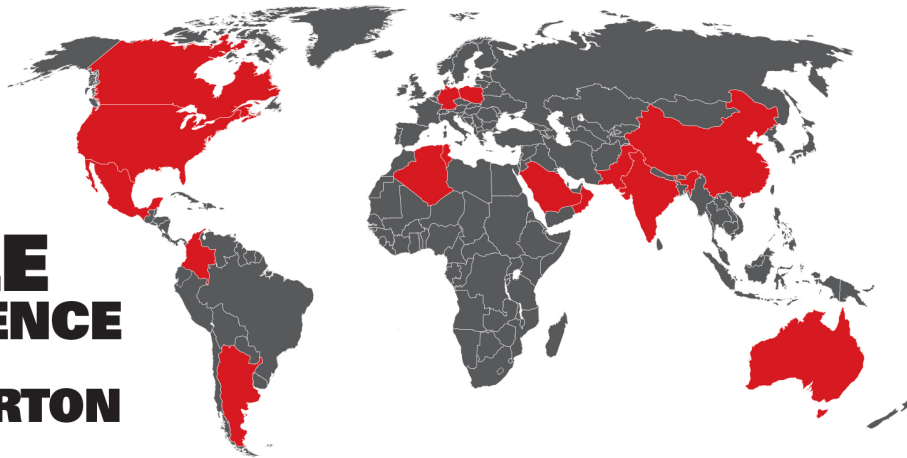
OPTIMIZING SHALE ECONOMICS



Properly evaluating the potential of a shale play requires thoroughly evaluating many critical success factors, such as those above.

CHALLENGE	SOLUTION
Knowing what data is necessary and sufficient When investing in a shale play, much time is spent acquiring and analyzing data. Operators need to trust that the data is reliable. They also need to ensure there is enough data to make an informed decision, without delaying the decision process by trying to acquire data they don't really need.	Understanding how shales produce differently No two shale plays produce alike. Halliburton has more than 500 years of combined industry experience, much of it in shale. Halliburton consultants understand which data is necessary and they helped collect sufficient data to make an informed investment recommendation.
Determining when and where to invest Before leasing acreage for potential development, an operator wanted to know what the area could produce. This operator preferred oil production to gas production due to the economics, and wanted help confirming that the area being considered would produce the desired hydrocarbons.	Proprietary modeling Experts worked with the operator to help ensure sufficient data was available. Then, Halliburton applied its unique modeling exercise to determine the potential hydrocarbons in the area. This modeling helped the operator decide to lease in one area, but walk away from others.
Avoiding investment in sub-economic assets Before investing millions of dollars, one operator with limited shale experience needed to understand the potential benefits and possible risks. The operator wanted to know the estimated ultimate recovery (EUR), net present value, and the price and production scenarios that make it economical.	Techno-economical analysis of shale play Halliburton performed a full techno-economic analysis. The analysis looked at the depth of the reservoir, hydrocarbon saturation, mineralogy of the shale, net thickness and well performance histories in the acquisition area. The operator used this analysis to help determine how to bid for the asset.

**NO ONE
HAS
MORE
SHALE
EXPERIENCE
THAN
HALLIBURTON**



Halliburton Consulting has over 500 years of cumulative industry experience and has worked in shale plays around the world.

**RED =
HALLIBURTON
INVOLVED
IN SHALE PLAY**

Optimizing investments in unconventional resources

Shale plays can be risky investments. Operators want to know ahead of time the size of the resource, potential risks, the net present value, and the projected rate of return. That requires understanding the potential mineralogy of the shale, the total hydrocarbons in place and other critical factors such as pay depth, thickness and brittleness. Halliburton Consulting has both the knowledge and the tools to help find and filter data that help ensure the operator can make informed, actionable investment decisions that meet their financial objectives and risk profile. Global experience, extensive databases, and workflows designed for unconventional resources help answer the operators' questions.

Technical experience essential for any unconventional resource

Shale production is notoriously difficult to predict. No two shale plays are alike. Shale also produces by a different mechanism than conventional assets. Halliburton has more shale experience than any other company, and is among the largest oil and gas consulting firms in the world. Halliburton uses that knowledge in a way no other consultant can, while also providing independent, impartial advice.

Because Halliburton consultants work closely with the other parts of Halliburton, such as drilling and fracturing, Halliburton Consulting can make accurate predictions using experience-based metrics.

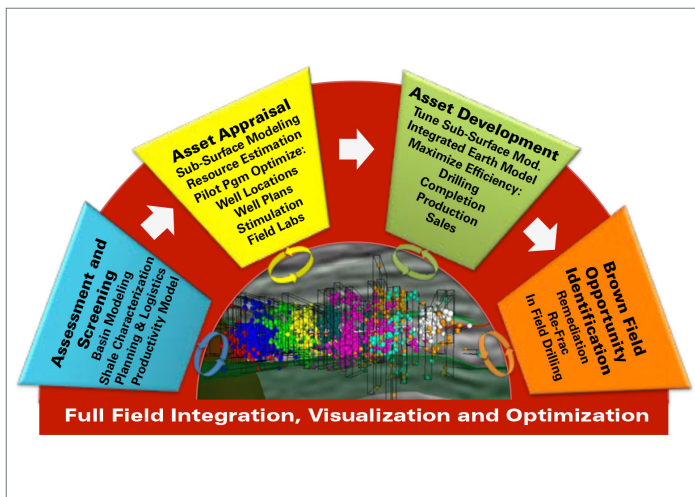
Consultants can assess well and stimulation designs and tell clients the projected cost per well. Actual field experience validates estimates of both investment costs and rates of return, giving clients higher confidence in their decisions.

Compressing the discovery period

By applying knowledge gained from shale plays in the United States and elsewhere, Halliburton can help operators compress the discovery period in newly developing areas. Halliburton helps clients understand the potential of a lease, environmental regulations that may apply, and the range of scenarios that affect asset value. By getting an unbiased picture of what a potential shale play will cost to develop and the cash flow it will return, operators can determine if the potential investment is worth their time and money.

"Halliburton consultants understood the practical realities and real costs of unconventional development. Our investors trusted their numbers."

VP of E&P
Canadian Oil & Gas Company



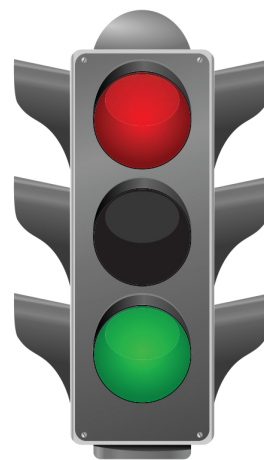
Halliburton analysis enabled operator to make investment decision

There are investment opportunities at various stages of a shale asset's lifecycle. One operator was considering acquiring mineral leases early in the lifecycle of a shale asset in Ohio. The operator sought oil-producing leases. Halliburton Consulting worked closely with the operator to analyze this potential investment.

Extensive analysis included a series of modeling exercises to determine the hydrocarbon distribution across several areas within the shale play. Halliburton experts analyzed three areas with respect to the operator's investment criteria. With the information Halliburton provided, the operator was able to make decisions about whether and where to invest.

Analysis provided operator information to help maximize return

Another operator, with limited experience in unconventional plays, asked Halliburton to analyze a potential investment in a proven shale play approaching full development. Halliburton conducted a technical analysis of the field, economic assessments and the expected ultimate recoveries from the field. Halliburton consultants looked at historical analogs and other key factors in making recommendations. The techno-economic analysis also considered the depth of the reservoir, the hydrocarbon saturation, the mineralogy of the shale, the thickness of the pay zone and the likelihood a natural fracture network existed.



UNIQUE TECHNO-ECONOMIC ANALYSIS

Halliburton's unique techno-economic analysis provides operators the information they need to make a decision about whether an asset has the economic potential that meets their investment requirements.

Halliburton reported the potential risks of investing in the play and the floor value of the assets. Halliburton also recommended development scenarios that could provide the highest rates of return. During the engagement, Halliburton consultants also mentored the management team about the key issues involved with shale, from both technical and business perspectives.

Impressive results leads to other consulting opportunities

Both operators were impressed with the information provided by Halliburton Consulting, as well as the speed and thoroughness of the analysis. The operators used the information from Halliburton to make decisions about potential investments. Both operators hired Halliburton for additional analyses of other potential shale plays elsewhere in the world.

"Halliburton Consulting simplified all the complex issues surrounding shale for us. They presented the information in a way that was both easy to understand and actionable."

CEO
E&P Company from India

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