

Oil & Gas Spotlight

Impairment and Valuation Considerations Related to Oil and Gas Assets

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The Bottom Line

When using the income approach, E&P companies generally apply a DCF model that is based on assumptions such as those related to cash flow projections, pricing and price differentials, discount rate, risk factors, and the tax effect.

- Exploration and production (E&P) companies that use the successful-efforts method to account for impairment of their oil and gas (O&G) assets should apply the guidance in ASC 932-360-35¹ and ASC 360-10-35. E&P companies that use the full-cost method of accounting should apply the guidance in Regulation S-X, Rule 4-10;² SAB Topic 12.D;³ and FRC Section 406.01.c.⁴
- Under the successful-efforts method, proved properties in an asset group should be tested for recoverability whenever events or changes in circumstances indicate that the asset group's carrying amount may not be recoverable. In contrast, unproved properties are subject to periodic assessment (at least annually) to determine whether they have been impaired; such an assessment is based mostly on qualitative factors.
- Companies that apply the full-cost method are required to perform a full-cost ceiling test on proved properties each reporting period. Unproved properties must be assessed at least annually for inclusion in the full-cost pool, subject to amortization.
- To determine the fair value of O&G assets, valuation specialists primarily use the income approach, the market approach, and the asset approach.
- When using the income approach, E&P companies generally apply a discounted cash flow (DCF) model that is based on assumptions such as those related to cash flow projections, pricing and price differentials, discount rate, risk factors, and the tax effect.
- Under both the income approach and the market approach, E&P companies need to consider the market participant concept when determining the fair value of their O&G assets.

¹ For titles of *FASB Accounting Standards Codification* (ASC) references, see Deloitte's "Titles of Topics and Subtopics in the *FASB Accounting Standards Codification*."

² SEC Regulation S-X, Rule 4-10, "Financial Accounting and Reporting for Oil and Gas Producing Activities Pursuant to the Federal Securities Laws and the Energy Policy and Conservation Act of 1975."

³ SEC Staff Accounting Bulletin Topic 12.D, "Application of Full Cost Method of Accounting."

⁴ SEC *Codification of Financial Reporting Policies*, Section 406.01.c, "Full Cost Method."

Beyond the Bottom Line

This *Oil & Gas Spotlight* discusses the factors an E&P company should consider in assessing and accounting for impairment of its O&G assets under either the successful-efforts method or the full-cost method. In addition, it gives an overview of the approaches that are commonly used in the valuation of O&G assets.

Impairment Considerations Related to O&G Assets

Companies that engage in O&G exploration and development can account for their operations by using either the successful-efforts method or the full-cost method. The fundamental difference between these two methods lies in their treatment of expenses related to the exploration of new O&G reserves. The accounting method used will directly affect how net income and cash flows are reported.

Under the successful-efforts method, costs related to the successful identification of new O&G reserves may be capitalized while costs related to unsuccessful exploration efforts (i.e., drill efforts that result in a dry hole) would be immediately recorded on the income statement. Conversely, the full-cost method allows E&P companies to capitalize nearly all costs related to the exploration and location of new O&G reserves regardless of whether their efforts were successful.

Successful-Efforts Method

E&P companies that use the successful-efforts method apply the guidance in ASC 932-360-35 and ASC 360-10-35 to account for the impairment of their O&G assets. Such guidance addresses (1) the timing of impairment testing and impairment indicators, (2) measurement of an impairment loss, (3) the level at which an impairment is assessed, and (4) recognition of an impairment loss.

Timing of Impairment Testing and Impairment Indicators

Under the successful-efforts method, an E&P company generally performs a traditional two-step impairment analysis in accordance with ASC 360 when considering whether to assess proved oil and gas properties for indications of impairment. Generally, this analysis consists of determining when events or circumstances indicate that the carrying value of the company's O&G properties may not be recoverable.

Proved properties in an asset group should be tested for recoverability whenever events or changes in circumstances indicate that the asset group's carrying amount may not be recoverable. Generally, companies that apply the successful-efforts method will perform an annual impairment assessment upon receiving their annual reserve report by preparing a cash flow analysis as the necessary information becomes readily available. When performing an impairment analysis, such companies typically do not apply a risk factor to the proved reserves. Companies can consider proved (P1), probable (P2), and possible (P3) reserves and other resources since these are all included in the value of the assets.

E&P companies should assess unproved properties periodically (i.e., at least annually) to determine whether they have been impaired. The assessment of these properties is based mostly on qualitative factors. For example, an exploratory well or an exploratory-type stratigraphic well is presumed to be impaired if the "sufficient progress" criteria as defined in ASC 932-360-35 are not met or an entity obtains information that raises substantial doubt about the economic or operational viability of the project.

Measurement of Impairment Loss

A company that applies the successful-efforts method will test an asset group for impairment by using the two-step process detailed in ASC 360. Under step 1, the company will perform a cash flow recoverability test by comparing the asset group's undiscounted cash flows with the asset group's carrying value. The carrying amount of the asset group is not recoverable if it exceeds the sum of the undiscounted cash flows that are expected to result from the use and eventual disposition of the asset group.

Under the successful-efforts method, an E&P company generally performs a traditional two-step impairment analysis in accordance with ASC 360 when considering whether to assess proved oil and gas properties for indications of impairment.

Under the full-cost method, a full-cost ceiling test must be performed on proved properties each reporting period. Further, unproved properties must be assessed periodically (at least annually) for inclusion in the full-cost pool, subject to amortization.

If the asset group fails the cash flow recoverability test, the company will perform a fair value assessment under step 2 to compare the asset group's fair value with its carrying amount. An impairment loss would be recorded and measured as the amount by which the asset group's carrying amount exceeds its fair value.

Level at Which Impairment Is Assessed

When determining the level at which an impairment should be assessed, a company that applies the successful-efforts method should consider whether the property is proved or unproved. Proved properties must be grouped at the lowest level for which there are identifiable cash flows that are largely independent of the cash flows of other groups of assets. Typically, the impairment evaluation of O&G-producing properties is performed on a field-by-field basis or, if there is a significant shared infrastructure (e.g., platform), by logical grouping of assets. Unproved properties should be assessed on a property-by-property basis or, if acquisition costs are not significant, by an appropriate grouping.

Recognition of Impairment Loss

An impairment loss for a proved property asset group will reduce only the carrying amounts of the group's long-lived assets. The loss should be allocated to the long-lived assets of the group on a pro rata basis by using the relative carrying amounts of those assets; however, the loss allocated to an individual long-lived asset of the group should not reduce the asset's carrying amount to less than its fair value if that fair value is determinable without undue cost and effort. For unproved properties, if the results of the assessment indicate impairment, a loss should be recognized by providing a valuation allowance. Under the successful-efforts method, companies are prohibited from reversing write-downs.

Full-Cost Method

To assess whether their O&G assets are impaired, EGP companies that use the full-cost method of accounting should apply the guidance in Regulation S-X, Rule 4-10; SAB Topic 12.D; and FRC Section 406.01.c. Like successful-efforts accounting guidance, this guidance addresses (1) the timing of impairment testing and impairment indicators, (2) measurement of an impairment loss, (3) the level at which an impairment is assessed, and (4) recognition of an impairment loss.

Timing of Impairment Testing and Impairment Indicators

Under the full-cost method, a full-cost ceiling test must be performed on proved properties each reporting period. Further, unproved properties must be assessed periodically (at least annually) for inclusion in the full-cost pool, subject to amortization.

Measurement of Impairment Loss

The full-cost accounting approach requires a write-down of the full-cost asset pool when net unamortized cost less related deferred income taxes exceeds (1) the discounted cash flows from proved properties (i.e., estimated future net revenues less estimated future expenditures to develop and produce proved reserves), (2) the cost of unproved properties not included in the costs being amortized, and (3) the cost of unproved properties included in the costs being amortized. The write-down would be reduced by the income tax effects⁵ related to the difference between the book basis and the tax basis of the properties involved.

Level at Which Impairment Is Assessed

Companies that apply the full-cost method generally establish cost centers on a country-by-country basis and assess impairment at the cost-center level.

⁵ For purposes of this calculation, the tax effects cannot result in a net tax benefit.

Recognition of Impairment Loss

When recognizing an impairment loss, companies that apply the full-cost method should reduce the carrying value of the full-cost asset pool and record the excess above the ceiling as a charge to expense in continuing operations. Like the successful-efforts method, the full-cost method precludes companies from reversing write-downs.

Valuation of O&G Assets

Valuation Approaches

To determine the fair value of assets, valuation specialists primarily rely on three approaches:

- *Income approach* — Under this approach, valuation techniques are used to convert future amounts (e.g., cash flows or earnings) to a single present amount (discounted). The measurement is based on the value indicated by current market expectations about those future amounts.
- *Market approach* — This approach requires entities to consider prices and other relevant information in market transactions that involve identical or comparable assets or liabilities, including a business. Valuation techniques commonly used under the market approach include the guideline public company method⁶ and the guideline transaction method.⁷
- *Asset approach* — Under this approach, which is also known as the cost approach, the value of a business, business ownership interest, or tangible or intangible asset is estimated by determining the sum required to replace the investment or asset with another of equivalent utility (sometimes described as future service capability).

When determining the fair value of O&G reserves, E&P companies use various methods and approaches. Approximately 90 percent of them use a DCF model to estimate the fair value of O&G reserves. Another accepted method of determining these reserves' fair value, although not originally intended for that purpose, is the SEC's "PV-10," under which fair value is defined as the present value of the estimated future O&G revenues, reduced by direct expenses and discounted at an annual rate of 10 percent. While the SEC's overall goal in requiring registrants to use this metric was to make amounts reported by companies comparable, it is now frequently used to measure the fair value of E&P companies' proved O&G reserves.

The 10 percent discount rate can serve as the starting point for discounting projected cash flows from proved O&G reserves in an investor case reserve report. Further analysis should then be conducted to determine the appropriate rate to be applied to the amounts in the report. This analysis, which may vary by reserve category, will involve judgment and should be based on the company's specific facts and circumstances.

In certain situations, valuation specialists may employ multiple valuation approaches when performing a fair value analysis to explore different scenarios and confirm the reasonableness of an estimate. The usefulness of a particular valuation approach may vary from year to year.

The 10 percent discount rate can serve as the starting point for discounting projected cash flows from proved O&G reserves in an investor case reserve report.

⁶ The guideline public company method employs market multiples derived from stock prices of companies engaged in the same or similar lines of business whose shares are actively traded in a free and open market. The application of the selected multiples to the corresponding measure of financial performance for the subject company produces estimates of value at the marketable minority level.

⁷ The guideline transaction method, also referred to as the transaction method or the merger and acquisition method, relies on pricing multiples derived from transactions of significant interests in companies engaged in the same or similar lines of business. The application of the selected multiples to the corresponding measure of financial performance for the subject company produces estimates of value at the marketable control level.

Although companies in the industry most commonly apply the income approach (by using the DCF model), other approaches may be more appropriate in certain circumstances. Further, an alternative such as the market approach is often used to confirm the reasonableness of the DCF model.

Generally, Deloitte valuation specialists use the market approach to confirm reasonableness when a valuation was not primarily based on a DCF estimate. Regulators have indicated that multiple approaches may be used to measure the value of assets and liabilities. When using the market approach, a company should ensure that it is “comparing apples to apples” because there could be significant differences among market transactions and among peer companies. For example, transactions that are seemingly similar can differ significantly, especially if they involve different resource plays.

In determining the fair value of their O&G assets, E&P companies must ensure that the valuation approach and related model they use are based on appropriate and accurate assumptions that are consistent with the market participant concept.

Key Assumptions Under the Income Approach

In determining the fair value of their O&G assets, E&P companies must ensure that the valuation approach and related model they use are based on appropriate and accurate assumptions that are consistent with the market participant concept (i.e., they must use factors and assumptions that would be used by buyers and sellers in the principal or most advantageous market for the asset or liability). Assumptions that companies should consider incorporating in the DCF model include those related to (1) cash flow projections, (2) pricing and price differentials, (3) discount rate, (4) risk factors, and (5) the tax effect. Understanding the basis for those assumptions is just as important as understanding their nature.

Cash Flow Projections

E&P companies need to determine the cash flow projections that will be incorporated in their DCF model. Generally, these projections are based on a production profile that is developed by a third-party engineering firm or prepared internally by company engineers.

Pricing and Price Differentials

Generally, E&P companies use forward strip pricing as determined by the New York Mercantile Exchange (NYMEX) or other pricing benchmarks (e.g., Brent, WTI) in their DCF model. Forward strip pricing over a period of up to five years is useful for valuation purposes since there is active futures trading activity within that time horizon. Beyond year 5, a company should estimate prices by using more subjective judgments that typically involve applying an inflation factor to the year-5 NYMEX futures price. Pricing benchmarks can vary greatly depending on location.

Commodity price differentials are another key metric that could affect the assumptions used in the DCF model. Oil prices can vary as a result of multiple factors, including (1) oil quality, (2) transportation costs, and (3) proximity to market. Similarly, natural gas prices can vary widely by delivery point since transportation is a large component of cost.

Discount Rate

E&P companies should consider various factors when determining the discount rate to use in their valuation models. One consideration is the basis for the discount rate (e.g., whether to use a weighted average cost of capital (WACC)⁸ rate or rates detailed in the SPEE⁹ annual survey). Also, companies need to consider whether to use an after-tax discount rate or after-tax undiscounted cash flows in their fair value calculations.

⁸ The WACC is the rate that a company is expected to pay on average to all of its securityholders to finance its assets.

⁹ The Society of Petroleum Evaluation Engineers (SPEE) conducts an annual survey of industry executives, consultants, and other energy industry stakeholders to develop insights about the risk factors and discount rates commonly used in analyzing property values throughout the O&G sector. This survey could serve as a good reference point for determining the appropriateness of the assumptions used to measure the fair value of proved reserves.

As they would under the income approach, E&P companies should apply the market participant concept when determining the fair value of their O&G assets under the market approach.

Risk Factors

Since unproved reserves are inherently more uncertain than proved reserves, risk factors related to unproved reserves are much more significant than those related to proved reserves. Therefore, risk factors are applied to the valuation of unproved (i.e., P2 and P3) reserves.

When E&P companies perform an impairment analysis under the successful-efforts method, they typically use a zero percent risk factor for proved properties. When these companies perform purchase accounting, however, they apply a variety of risk factors to different categories of proved reserves. This seeming inconsistency in practice could prompt auditors and regulators to raise questions about how the risk factors are being applied. Further, when E&P companies perform a valuation of O&G assets, they either (1) incorporate the risk factors in the discount rate or (2) apply the risk factors to discounted cash flows.

Tax Effect

E&P companies should also consider whether to incorporate assumptions about the tax effect in the DCF models. This consideration is critical since results may vary depending on whether pretax or post-tax amounts are used. Generally, pretax models are more commonly used in the valuation of O&G assets outside the United States.

Key Assumptions Under the Market Approach

As they would under the income approach, E&P companies should apply the market participant concept when determining the fair value of their O&G assets under the market approach. For example, discount rates should be estimated from the standpoint of other buyers and sellers. Although fair value from the market participant's point of view is often the same as it is from an E&P company's standpoint, the company should ensure that it is considering the same factors and assumptions that the market participant would take into account.

Selecting Appropriate Method

When applying the market approach, the company must first determine the appropriate method to use (i.e., either the guideline public company method or the guideline transaction method). This determination should be based on numerous considerations, including:

- Size (market capitalization or reserve volumes).
- Natural gas versus oil mix (i.e., the percentage of reserves or production represented by natural gas versus oil).
- Reserve life.
- Areas or basins of operation.

Generally, the guideline transaction method is challenging for E&P companies to use because (1) finding new resource plays is difficult, (2) multiples in the same play can vary greatly, and (3) undeveloped acreage multiples from market transactions are rarely published.

Thinking Ahead

Deloitte's O&G practice will continue to monitor current and future activities related to (1) accounting standard setting, (2) SEC rulemaking, and (3) regulatory compliance requirements. Periodically as warranted, it will provide updates that detail the potential effects of these activities on your business or the industry as a whole. The periodic communications will consist of (1) multiday industry seminars, (2) *Dbriefs* webcasts, (3) *O&G Spotlight* communications, and (4) roundtable discussions.

Contacts

If you have questions about this publication, please contact the following Deloitte industry professionals:

Paul Horak

Partner
U.S. AERS Oil & Gas Audit Leader
Deloitte & Touche LLP
+1 713 982 2535
phorak@deloitte.com

Phillip Hilsher

Partner
Industry Professional Practice
Director, Oil & Gas
Deloitte & Touche LLP
+1 713 982 4644
philsher@deloitte.com

Jed Shreve

Principal
U.S. FAS Sector Leader, Oil & Gas
Deloitte Financial Advisory
Services LLP
+1 713 982 4393
jshreve@deloitte.com

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