

Rental Valuation of Onshore Oil Fields in the UK: Traditional Approaches and Modern Insights



Valuing onshore oil fields in the UK is a complex process that requires careful consideration of multiple factors, including regulatory requirements, site-specific characteristics, and market dynamics. Traditional approaches often fall short in capturing these nuances, necessitating the use of modern valuation techniques. This article explores these methodologies, comparing established methods with innovative insights and provides a comprehensive framework for determining the rental value of onshore oil fields in the UK.

REGULATORY ENVIRONMENT

The UK's onshore oil and gas industry operates within a complex and multifaceted regulatory framework, with various government agencies and local authorities playing pivotal roles in shaping the operational and economic landscape of the sector. This intricate regulatory environment has a profound influence on the valuation of onshore oil fields, as it establishes the parameters, constraints, and incentives that must be carefully considered when determining the appropriate rental value for these specialised assets.

The North Sea Transition Authority (NSTA), formerly the Oil and Gas Authority, serves as the primary regulatory body for oil and gas activities in the UK. It is responsible for issuing exploration and production licences, approving development plans, and monitoring production activities to maximise the economic recovery of UK petroleum resources. Additionally, the NSTA integrates the UK's net-zero goals into its regulatory oversight, ensuring that operators align with national decarbonisation objectives.

The Department for Energy Security and Net Zero (DESNZ) oversees broader energy policies that influence the onshore oil and gas industry. These include the taxation regimes, environmental standards and safety protocols that underpin the economic and operational viability of these projects. Meanwhile, County Councils (or Unitary Authorities, where applicable) are responsible for oil and gas planning permissions, overseeing mineral extraction policies within their jurisdiction. Local authorities may still play a role in addressing community concerns and managing supporting infrastructure development within their planning remit.

This multilayered regulatory framework shapes the economic and operational factors that must be meticulously analysed when assessing the rental value of onshore oil fields. Factors such as licensing terms, production quotas, capital expenditure requirements, environmental compliance costs and local community considerations all directly impact the profitability and long-term viability of these assets. Incorporating these factors into the valuation process is essential to ensure a comprehensive and accurate assessment of their rental market potential.



SITE SPECIFIC FACTORS

The rental valuation of onshore oil fields in the UK is heavily influenced by a range of site-specific factors that vary significantly across locations. These factors play a pivotal role in determining the economic viability and rental value of each asset.

One of the most critical considerations is the nature and quality of the oil reserves. The quantity, depth, and composition of reserves directly impact expected production levels and the overall profitability of the asset. In the UK, sedimentary basins such as those in the East Midlands or the Wessex Basin often host smaller, more geologically complex reserves compared to offshore fields. Deeper formations and unconventional reservoirs, while potentially more resource-rich, frequently require advanced and costly extraction techniques, such as horizontal drilling, multi-stage hydraulic fracturing, or enhanced oil recovery methods. These techniques significantly increase capital and operating expenditures, which must be carefully incorporated into the valuation.

The accessibility and infrastructure surrounding a site are equally crucial. Remote or poorly connected fields may face higher logistical costs, requiring dedicated roadways, pipelines, or storage facilities to support development and operation.

Conversely, proximity to established transportation networks, processing facilities and ports can significantly enhance a site's rental value by reducing infrastructure investment. For instance, a field located near a pipeline network or refinery could avoid millions in upfront development costs.

The availability and reliability of essential utilities, such as electricity and water, also have a major influence on valuation. Where such infrastructure is lacking, the cost of alternative solutions—such as on-site power generation or water transport—must be accounted for. For example, fields in isolated regions may require diesel generators, leading to higher ongoing operational costs.

Finally, the local workforce and community engagement can impact valuation. Access to a skilled labour force capable of operating specialised equipment improves operational efficiency and reduces recruitment and training expenses. At the same time, engaging with local communities to address concerns around noise, emissions and environmental impacts is often a necessary cost in the UK's regulatory environment. Fields that require significant community engagement or mitigation measures may see increased operational costs, which should be reflected in the rental valuation.

By carefully analysing these site-specific factors, stakeholders can ensure a more accurate and comprehensive assessment of an oil field's rental value, tailored to its unique characteristics and operating environment.

TRADITIONAL VALUATION APPROACHES

Traditional approaches to valuing the market rent of onshore oil fields in the UK have long relied on established methods such as comparative analysis, income capitalisation and cost-based evaluation. While these techniques provide a solid foundation, they often struggle to account for the unique characteristics, complexities and inherent uncertainties that are inherent in this specialised market.

Comparative analysis, for instance, may fail to capture the nuanced differences between individual oil fields, leading to imprecise and potentially misleading valuations. This approach heavily depends on the availability of relevant market data and comparable transaction records, which can be scarce in the relatively small and specialised onshore oil and gas segment. Additionally, the risk profiles, geological characteristics and growth potentials of each oil field can vary significantly, making direct comparisons and extrapolations challenging and prone to inaccuracies.

Income capitalisation, on the other hand, presents its own set of formidable challenges. Accurately forecasting the future cash flows of an oil field requires making a multitude of assumptions about a wide range of volatile factors, including commodity prices, production rates, operating costs, capital expenditures and the estimated productive lifetime of the asset. These projections can be highly sensitive to changes in macroeconomic conditions, technological advancements and regulatory environments, potentially leading to substantial valuation errors that undermine the reliability of this approach.

Similarly, cost-based approaches, while providing a measure of an asset's intrinsic value, may struggle to fully capture the nuanced potential upside and downside risks associated with onshore oil fields. These traditional methods often fail to account for the unique geological factors, market dynamics and operational complexities that can significantly impact the future profitability and value of an oil field.



Without a more comprehensive assessment of these critical variables, cost-based valuations may overlook important considerations that could ultimately affect the rental value of the asset.

The profits method, another traditional approach, seeks to determine the market rent by estimating the profit that a hypothetical tenant could generate from operating the oil field. Rather than capitalising this into a capital value, the method can also be applied to derive rental value by assessing what proportion of expected profit a tenant would be willing to allocate toward rent. Discount rates applied to oil field profits vary depending on production risk, commodity price volatility, and regulatory conditions, typically ranging between 8% and 15%. To determine a rental value from profit, a percentage of the anticipated net operating profit (often between 10% and 25%, depending on market conditions) is used to estimate a fair rental payment. This ensures that the rental figure remains viable for both the tenant and the landowner while reflecting the economic potential of the asset.



MODERN VALUATION INSIGHTS

In recent years, the emergence of more sophisticated valuation techniques has offered new and innovative approaches for assessing the rental value of onshore oil fields in the UK. These advanced methodologies go beyond the limitations of traditional valuation methods by leveraging cutting-edge data analysis, probabilistic modelling and optimisation algorithms to deliver a more comprehensive, dynamic and nuanced evaluation of an asset's potential.

One such innovative approach is the application of real options analysis. This technique acknowledges the inherent uncertainty and flexibility associated with oil field development, allowing for the incorporation of key factors such as the probability of project success, the value of information gained through further exploration and appraisal and the ability to defer or abandon projects. By accounting for these dynamic factors, real options analysis can provide a more accurate and robust assessment of the rental value of an onshore oil field's overall economic value, capturing the potential upside and downside risks more effectively than traditional valuation methods. While real options analysis is widely used in oil, gas, and mining industries to evaluate investment flexibility, its direct application in rental valuation is limited. However, understanding the field's economic potential through real options analysis can inform lease structuring and rental negotiations, ensuring that agreements reflect the asset's long-term profitability and risk exposure. Unlike traditional valuation methods, which often assume static cash flows, real options analysis recognises that the development and operation of an oil field is not a one-time decision but a series of interlinked choices that evolve based on market conditions, technological advancements, and geological assessments. By quantifying the value of this operational flexibility, real options analysis offers a more realistic and comprehensive representation of the asset's rental potential, allowing for better-informed investment and leasing decisions.

Another modern insight comes in the form of probabilistic economic forecasting, which combines advanced reservoir modelling, uncertainty quantification and comprehensive economic analysis to generate a robust, data-driven assessment of an oil field's potential value. By incorporating the various sources of uncertainty, such as volatile commodity prices, production fluctuations and changing regulatory environments, this approach can provide a more realistic and nuanced understanding of the range of possible outcomes. This enables more informed decision-making and a more accurate valuation of the rental market, as it accounts for the inherent volatility and complexity associated with onshore oil field operations.

In contrast to traditional discounted cash flow analysis, which may overlook or underestimate these key risk factors, probabilistic economic forecasting delivers a more holistic and reliable evaluation of the asset's rental value, better reflecting the dynamic and uncertain nature of the industry.

The integration of these modern valuation insights, such as real options analysis and probabilistic economic forecasting, can provide a more comprehensive and accurate assessment of the rental value of onshore oil fields in the UK. By incorporating the unique characteristics, risks, and growth opportunities associated with these assets, these advanced techniques can help property owners, investors and regulatory bodies make more informed decisions regarding the rental market and the long-term viability of onshore oil and gas operations.



HYPOTHETICAL CASE STUDY: VALUATION OF AN ONSHORE OIL FIELD IN THE UK

The hypothetical case of an onshore oil field in the UK provides a compelling example of the application of integrated valuation methodologies, highlighting their advantages over traditional approaches. The oil field is situated in a mature basin with a well-documented history of production and a well-understood geological profile, which serves as a solid foundation for the evaluation.

Preliminary resource assessments suggest recoverable reserves of 20 million barrels of oil, indicating the field's substantial potential. The valuation team employs a combination of traditional discounted cash flow analysis and the innovative Real Options Approach to determine the asset's rental value, delivering a more comprehensive and nuanced assessment. Using the DCF method, the team estimates the baseline capital value (NPV) of the field by projecting future cash flows based on anticipated production rates, commodity prices, operating costs and capital expenditures. These projections are discounted at a rate reflective of the field's risk profile^[1], yielding an initial valuation of £100 million over the production life of the field.

To capture the inherent flexibility of the project, the valuation team integrates the Real Options Approach. This involves developing a decision tree that models the key operational options available to the operator, such as deferring production in response to low oil prices, expanding operations if reserves exceed expectations, or abandoning the project if it becomes uneconomical. These options are quantified using probabilistic modelling, assigning financial value to each potential outcome.

For instance, the deferral option, which accounts for the ability to delay production until market conditions improve, adds £5 million to the estimated capital value of the field. Similarly, the expansion option adds £3 million to the capital valuation, reflecting the potential for increased profitability from reserve upgrades. The final ROA-adjusted valuation of the field is £108 million, which includes an £8 million premium for operational flexibility. These figures represent capital adjustments rather than annual rental values. Rental valuation is determined separately, based on market yields applied to the adjusted capital value.

To further refine this assessment, the team employs probabilistic economic forecasting. This approach simulates a wide range of potential scenarios, capturing both upside and downside risks. By incorporating uncertainties such as fluctuating commodity prices, regulatory changes, and variations in production rates, the team can provide a comprehensive analysis of the field's economic potential. The probabilistic forecasts reveal a range of potential rental values, with the most likely outcome supporting an annual rental rate of £8.6 million. The implied rental yield, based on an annual rent of £8.6 million and a capital value of £100 million, is 8.6% per year^[1]. This aligns with typical industry expectations, where rental yields for onshore oil fields generally range from 8-12%, depending on risk factors, lease structure, and operational flexibility.

The integration of these advanced valuation methodologies, combining traditional DCF analysis with Real Options Approach and probabilistic forecasting, provides a more holistic and robust assessment of the rental value for the onshore oil field in the UK.

This comprehensive analysis offers valuable insights for both the asset owner and the regulatory authorities responsible for determining appropriate rental rates for the onshore oil field. By considering a range of potential outcomes and accounting for operational flexibility, the integrated valuation approach can inform more informed and balanced negotiations, ultimately leading to a fair and sustainable rental arrangement that balances the interests of all stakeholders.

The integrated valuation approach provides a holistic and robust assessment of rental value by considering a range of potential outcomes and accounting for operational flexibility. This ensures that lease negotiations are well-informed and lead to fair, sustainable rental agreements that balance the interests of all stakeholders. The application of advanced techniques like real options analysis and probabilistic economic forecasting provides valuable insights for both the asset owner and the regulatory authorities responsible for determining appropriate rental rates.

[1] The discount rate is assessed based on a combination of factors, including the field's production risk, expected commodity price volatility, regulatory uncertainty, and prevailing market conditions. In the oil and gas sector, discount rates typically range from 8-15%, reflecting these risks. In many cases, the rate is aligned with the operator's weighted average cost of capital, adjusted for project-specific risks such as exploration uncertainty and operational costs. Investors and valuers may also refer to industry benchmarks and expected return rates when determining an appropriate discount rate.

[1] The 8.6% yield assumes a stable annual rent over the productive life of the field. However, lease structures may include declining or performance-linked rent adjustments to account for resource depletion.



CONCLUSION

Assessing the rental value of onshore oil fields in the UK requires a dynamic and flexible approach that balances traditional valuation methods with modern analytical insights. By integrating advanced methodologies such as the Real Options Approach and probabilistic economic forecasting, stakeholders can gain a more comprehensive understanding of the asset's inherent potential, associated risks and available growth opportunities.

The hypothetical case study demonstrates the value of this integrated valuation approach, highlighting how it can enhance decision-making, inform fair rental negotiations and contribute to the long-term sustainability of the onshore oil and gas industry in the UK.

This integrated valuation approach enables landowners, operators and regulatory authorities to make informed, data-driven decisions that more accurately reflect the complexities and uncertainties inherent in onshore oil field operations. In doing so, it fosters the development of fair and sustainable rental agreements that balance the interests of all stakeholders.

Adopting these nuanced valuation frameworks can help the UK's onshore oil and gas industry maintain a competitive edge. These frameworks consider market volatility, regulatory impacts and the inherent operational flexibility of these assets. By accounting for these multifaceted factors, stakeholders can make more informed and strategic decisions regarding lease terms, investment and project viability.

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