Lease Analytics

White Paper

Upstream Oil & Gas 2024: Navigating Complex Volatility

E&Ps proved resilient in 2023, but the new year will bring both novel and fundamental risks and opportunities as everything from geoeconomics to artificial intelligence becomes relevant to upstream decision makers.

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Introduction

The upstream oil and gas sector is set to face a continuation of post-covid change in 2024. With by a confluence of factors that include groundbreaking technological advances, evolving geopolitical narratives, and dynamic market shifts, E&Ps can expect increasing complexity on all fronts.

This Lease Analytics analysis examines the pivotal trends shaping the strategic, operational and risk landscape in the upstream oil and gas sector.

Central to understanding this overwhelming change is the VUCA (Volatility, Uncertainty, Complexity, and Ambiguity) framework, which helps understanding rapid, interwoven, and ambiguous changes. (1)

By applying this framework, we can better anticipate key issues, understand the implications of their actions, appreciate interrelated variables, and prepare for diverse scenarios, ultimately enhancing situational awareness, decision-making and strategic planning capabilities.

In the face of economic, geopolitical, and regulatory uncertainties, we It provides a roadmap for industry players to understand and address the strategic complexities and uncertainties of 2024 and beyond. Despite continued challenges, E&Ps can thrive amidst this uncertainty with resilience, digitalization, and strategic flexibility.

FIGURE 1: VUCA Definition and Upstream Examples
Source: US Army War College Framework and Lease Analytics Analysis

Volatility Rapid and unpredictable change 1. Sanctions relief allows Libyan, Venezuelan, Iranian reentry to market, depressing prices 2. Global plastics ban hits petrochem demand 3. Surprise legal wins for climate activists	**Uncertainty** Unpredictability of events and issues 1. OPEC looses more members 2. Stronger than expected EV adoption in the US 3. AI durastically lower lift costs
Complexity Intertwined forces make causal relationships unclear 1. Fragmented four-tier regulatory landscape 2. Concurrent ESG and energy security pushes 3. Consolidation-led divestment opportunities amid continued capital discipline focus	**Ambiguity** Mixed messages create contrasting signals, unclear realities, and misunderstandings 1. Variance in Chinese demand outlook 2. Falling shale output during record production 3. Lack of demand concesus among forecasters

1. U.S. Army Heritage and Education Center (February 16, 2018). "Who first originated the term VUCA (Volatility, Uncertainty, Complexity and Ambiguity)?

Demand Outlook

Global oil and gas demand patterns are sending mixed signals that introduce planning challenges for upstream companies. On one hand, emerging Asian economies led by China and India will remain the key engine of energy demand growth over the next two decades. However, near-term headwinds have emerged that complicate demand projections. This dichotomous demand scenario presents a challenging planning landscape as non-fundamental noise from political sources and secularly complex dynamics make projections less reliable.

China's oil demand contracted in 2022 for the first time in 20 years due to its recurring Covid lockdowns. Experts estimate each lockdown shaved 0.5-1 million barrels per day from its oil consumption.(2) While China will eventually resume its long-term demand growth trajectory, the scale and duration of Covid-related disruptions create significant forecast uncertainty. India's demand is more resilient but its imports remain vulnerable to price fluctuations.

Overall, developing Asian economies are still forecast to drive global energy demand higher by 30% by 2040. But their near-term consumption will be dictated by macro conditions including economic growth, infrastructure investment, and business regulations. Analysts agree market volatility is likely the new norm. (3)

In the US, gasoline demand has yet to rebound to pre-pandemic levels and increasingly hinges on macro conditions.

EV adoption is accelerating rapidly in coastal states like California which have vehicle electrification mandates.

Consumer preferences for SUVs have also muted efficiency gains. While EVs still comprise just 5% of US car sales, their market share could plausibly reach 50% by 2030-disrupting gasoline demand growth projections. (4)

Natural gas demand for power generation continues its displacement of coal but its trajectory will be dictated by the speed of renewables scaling. Gas demand growth for LNG exports slowed in 2022 with Europe diversifying supplies. The global LNG market faces increasing competition and uncertainty. For oil, "peak demand" estimates remain decades away as broader global transportation demand still has room for growth.

NGLs and petrochemical feedstocks remain bright spots tied to consumer demand and manufacturing. (5) However, the macro environment poses risks, as a concerted global push for plastics sustainability regulations may curb growth.

Slowing Chinese growth, substantial global economic headwinds, and rising energy efficiency in developed markets suggests a plateauing of demand is likely, a daunting prospects for sagging oil prices as emerging producing giants like Guyana and Brazil raise output.

2. Asia's oil demand revival bears the brunt of China's endless lockdowns (April 22, 2022). S&P Commodity Intelligence
3. Volatility In Energy Business Is the New Normal (December 12, 2023). Hart Energy and East Daley Analytics
4. Global EV Outlook 2023 (April 2023). International Energy Agency
5. Will Petrochemicals Continue To Drive Oil Demand? (November 3, 2023). Oilprice.com

With mixed signals across both geographic markets and fuel types, volatility and uncertainty prevail on the oil and gas demand outlook. Upstream companies need resilience and flexibility to navigate this turbulence. Portfolio planning, selective investments, supply chain control and enterprise agility will be key differentiators.

Supply Outlook

Global Supply: Expect Turbulence

OPEC+ countries, led by regional partners-cum-rivals, Saudi Arabia and the UAE, control less than 50% of global oil output for the first time amid eroding output discipline. (6) This comes despite millions of barrels of unilateral production cuts by Saudi Arabia and runaway production by Russia. Meanwhile non-OPEC emerging producers coming on-line in Africa and Latin America combine with record US output to subdue oil prices.

Continued dysfunction within OPEC+ is likely as smaller members like outbound Angola bristle against Riyad-led production quotas. If coordination falters, countries could pump higher volumes and roil prices like during the 2020 Russia-Saudi Arabia price war.

Amid geopolitically risky producers, the Iran nuclear deal talks also remain stalled, keeping over 1 million bpd of oil off the market. An eventual deal restarting sanction reliefs could significantly impact prices depending on the timing, scale and pace of Iran's export ramp up.

Other supply disruptions from unstable producers like Libya and Venezuela continue to periodically impact markets as well.

New development is another uncertainty. LNG and offshore projects worldwide are facing substantial budget overruns and multi-year delays due to cost inflation, supply chain disruptions and local permitting/regulatory issues. (7) Expanding global gas infrastructure faces greater sociopolitical hurdles, especially pipelines crossing sensitive habitats or communities.

With geopolitical risks, infrastructure constraints and demand variability in play, global supplies appear vulnerable to further volatility spikes in 2024. Upstream firms need contingency plans and capital flexibility to mitigate potential global turbulence.

Domestic Supply: Managing Expansion

The US shale revolution has transformed domestic oil and gas production over the past decade. Prolific shale basins like the Permian and Bakken are poised for further output growth while provide low breakeven production that can rapidly scale up at higher prices.

However, the industry continues to face an investor focus on capital discipline despite strong earnings over the past two years. While supply surges are technically possible still occur if oil prices spike materially, restraint now prevails.

6. OPEC's 2024 Crude Oil Production Cuts, Explained (December 20, 2023) Oilprice.com
7. 2024 oil and gas industry outlook. (November 2023) Deloitte Insights

Upstream operators continue to face inflationary pressures, supply chain disruptions, infrastructure constraints and labor availability challenges through 2024. Cost inflation for materials, equipment and services surpassed 30% in 2022. Supply chain disruptions continue to significantly impact project schedules and budgets with critical long-lead item delays still exceeding 6 months in some cases.(8)

Even routine shale drilling/completion costs have remained elevated after an over 50% climb from 2020-2022. While costs have begun receding, LNG and offshore projects are also facing substantial budget overruns and multi-year delays due to these issues. (9)

Infrastructure like pipelines and export facilities also faces greater local opposition, contributing to permitting delays. Production growth could outpace takeaway capacity in key basins like the Permian, with more regional price discounts are likely if constraints worsen.

While booming shale output provides a buffer, rising volatility from shifting global factors requires flexibility. Scenario planning, infrastructure resilience and responsive capital allocation will be key capabilities for firms to optimize opportunities and navigate the myriad risks facing the E&Ps.

Risks

Energy Security Ascending

The Russia-Ukraine conflict has reshaped the global energy narrative, spurring renewed focus on energy security, affordability, an supply chain resilience. There's an increasing impetus in Washington on bolstering energy security and reducing reliance on foreign oil and gas sources.

This geopolitical shift is likely to stimulate more investments in domestic production capabilities, particularly in regions with substantial untapped reserves. The current administration's restrictions on federal acreage and project permitting face mounting criticism as security concerns grow.

As ESG initiatives face economic and policy headwinds, the US is increasing its footprint in the global energy supply chain via increased export of refined products and LNG. However, companies still face growing pressure from investors on emissions reductions and energy transition planning. Most public operators have pre-existing comprehensive net-zero commitments. But these still appear largely disconnected from aggressive near-term growth strategies.

If energy security concerns override climate focus in the US and other major economies, many operators may temper ambitions given oil and gas' vital role through the remainder of the century.

8. 2024 oil and gas industry outlook. (November 2023) Deloitte Insights
9. IBID

Green Pressure Will Continue Despite Late-2023 Retreat

The upstream sector faces escalating pressure from investors, policymakers and the public to address climate change through tangible emissions reductions and viable long-term transition plans. Areas garnering focus include methane abatement, carbon capture and storage (CCUS), low carbon hydrogen, biofuels, and synthetic fuels. Pilot projects and industry partnerships are emerging across these domains and see some opportunity in adding CCUS and hydrogen projects to upstream portfolios

However, the trajectory and implications of the broader energy transition remain unclear. Fundamental disagreement persists on the appropriate pace of change, future role of oil and gas, commercial scale-up challenges for alternatives, and policy directions needed.

Smaller independents face structural challenges in embracing capital-intensive transition technologies. Gaining access to CO2 transport and storage infrastructure will be crucial to avoid fragmentation. Many lack the balance sheet to invest heavily while remaining cash flow positive.

Policy support through incentives for carbon capture and underground storage (CCUS), hydrogen and biofuels along with regulation that recognizes oil and gas as essential through 2050 looks likely to defuse some of the more pressing policy risks the energy transition rhetoric has generated.

Interim targets that balance energy security, affordability and emissions progress are more likely than blanket bans on development.

While preparing for plateauing long-term demand is prudent, most forecasts see oil and gas remaining vital through 2050 and beyond. Reshaping portfolios and operating models to thrive in a changing marketplace will distinguish strategic leaders.

Policy Changes Risk Profiles

Regulatory and policy developments continue to have a significant impact on the sector. In the US, state-level actions and federal policies are shaping the operating environment for oil and gas companies. Executive action on leasing and project reviews has stalled major projects but legislative movement remains elusive.

Developments like the new methane fees, restrictions on drilling permitting, and antitrust review of recent M&A activity reflect a broader trend towards more stringent environmental regulations and a focus on reducing carbon emissions.

However, Congressional gridlock and an inconsistent Executive policy toward the sector has pushed much of the regulatory action to the court system and state legislatures. Therefore, four concurrent levels of legal and regulatory makes an unpredictable regulatory landscape and complex legal operating environment. (10)

10. Why oil companies are worried about climate lawsuits from gas states. (November 7, 2023) E&E News

Federal Policy Fragments

The divided federal government ensures executive energy policy will remain a heterodox mix of climate restrictions and natural gas industry promotion. The Inflation Reduction Act offered some changes to carbon capture incentives and federal agencies including EPA, and Department of Interior have launched a regulatory blitz against the sector, but offer no definitive trajectory for the Biden Administration's mixed policy. (11)

Meanwhile, moments of pro-energy sector support from FERC, Congress, and the White House undermine any clear narrative about federal policy.

While major legislative outcomes are unlikely soon, piecemeal action on leasing, royalties, permitting, and emissions via executive authority will continue to impact the sector. Moderate reforms appear more likely as industry advocates push measured change but risks remain. Producers must closely monitor key rulemaking by EPA, Interior, and BLM.

States Step Up on Regulation

At the state level, growing bans on fracking and fossil fuel infrastructure have created a complex web of regulations. New York and California lead this vanguard, exerting outsized influence on capital flows and board composition.

However, progressive states are just one part of the picture as operating environments are diverging between progressive and traditional energy states.

Hydrocarbon production has surged in Gulf Coast states like Texas and New Mexico, aided by friendly policies.

Even when states are moving to undermine overly-burdensome regulation and support energy production, the patchwork of regulations adds another layer of complexity and pressures companies to tailor strategies.

Courts Take Center Stage

As energy policy gets held up in DC, states, cities and activists are turning to the courts to go after energy producers. Climate lawsuits have begun to invoke novel legal theories of liability, with plaintiffs alleging energy producers have culpability for emissions, land erosion, floods, fires and more. Courts are increasingly receptive to climate accountability arguments, exposing organizations to significant liability. This expanding litigation exposure will likely impact project development and operations.

Overall, policymakers might have refocused on energy affordability and security, but industry critics are still pushing for fundamental overhauls on leasing, royalties, permitting and more. Outcomes are uncertain as executive agencies move to rewrite decades-old regulations. However, industry advocates are pushing to moderate any changes, with major legislation remaining stalled and new administrative action being successfully challenged in the courts and legislatures of oil-friendly states. (12)

11. Biden regulatory plan set to shake up energy sector (December 7, 2023) E&E News
12. EPA's methane rule is dividing the state agencies needed for enforcement (December 13th 2023) E&E News

Opportunities

Market Consolidation Brings A New Era of M&A

The shale revolution has made the US the world's largest oil and gas producer. Permian, Bakken, Eagle Ford and other prolific shale plays can deliver further growth and continued American output dominance. However, investors now prioritize returns over production growth, as a result of decreasing land availability and greater pressure for efficiency.

Large-scale shale consolidation is underway as supermajors acquire shale pure-plays, absorbing the prime acreage and lowest cost inventory. (13) This consolidation trend, especially evident in the U.S. shale sector, is indicative of the sector's maturity and the emergence of larger, financially robust majors like Exxon and Chevron. This trend is expected to continue as companies seek to strengthen their portfolios and enhance their competitive advantage in a rapidly evolving market.

These entities are better equipped to navigate market volatility and regulatory shifts, representing a significant realignment in the market dynamics. While this could accelerate development and unlock synergies, it crowds out smaller firms unable to compete on scale or take on more drilling risk. Smaller upstream players still bear scars and strict capital conservation tendencies from the post-2014 downturn.

Leveraging Data to Thrive Amid Uncertainty

Pipeline bottlenecks, labor shortages, and inflated input costs will likely persist through 2024. Supply chain disruptions and infrastructure lag have pushed schedules and budgets for megaprojects like LNG export facilities. To manage this growing operational complexity, geospatial data analytics, machine learning, and process digitization will be critical to unlock efficiency gains and provide intelligence to aid planning. (14)

The adoption of AI and advanced data analytics is transforming the way the upstream sector operates. These technologies are enabling companies to optimize exploration and production activities, improve decision-making, and enhance operational efficiencies. Automating manual processes using AI, RPA, IoT and other technologies can help curb cost inflation and free up human capital. Remote operations capabilities are also vital to ensure continuity.

However, the full potential of these technologies is yet to be realized without robust data collection and integration capabilities. Companies are now racing to build enterprise-wide visibility and a single source of truth. This is crucial for resilient decision making amid strategic ambiguity and multifaceted volatility.

As the sector experiences transformation, having the ability to harness data for real-time operational agility, increased yield, and competitive advantages will differentiate leading companies and secure smaller players' market positions.

13. Shale E&Ps In High-Gear Consolidation: Big Fish Seize Top-Tier Acreage (August 23, 2023) Oilprice.com
14. 2024 oil and gas industry outlook. (November 2023) Deloitte Insights

Preparing for a Dynamic Future

The oil and gas sector is no stranger to commodity cycles and disruptive forces. However, unlike past bouts of volatility which were largely linear, the sector faces the combination of macroeconomic, geopolitical technological, financial, and regulatory disruption.

Near-term fundamentals point to further upstream growth in 2024, with expected loosening of monetary policy and strong demand picture continuing the high prices and industry buoyancy of the past years. However on the edges of the frame, the landscape is growing progressively more volatile. How companies navigate this turbulence could define their competitive positioning for the next decade.

Continuously monitoring and responding to evolving market and regulatory conditions will be key to success in the coming years. Engage stakeholders on the essential, irreplaceable role of oil and gas through at least mid-century based on expert projections. And exploring selective low-carbon ventures like hydrogen, biofuels and synfuels. Small test pilots to test viability can provide high ROI hedges against extreme regulatory scenarios and continued public pressure.

Successful upstream leaders will be those who avoid fixation on a single planning scenario. Instead, they will build resilience across a range of potential futures, preserving flexibility to pivot strategically. balancing short-term growth with long-term strategic positioning.

Preparing action-plans for a wide variety of possible future demand, regulatory, and market scenarios can create the agility needed to quickly respond to policy shifts, geopolitics, demand swings and supply chain issues.

Beyond a nimble footing, prudent E&Ps will will continue optimizing portfolios to manage risk amidst shifting demand trajectories, divesting non-core assets using proceeds to fund attractive projects or buybacks.

However, despite improving capital access, divestiture proceeds, and higher profits, continued capital discipline and sustaining strong balance sheets will offer a foundational hedge against future demand volatility. Moderating growth rates can also establish resilience across price cycles and help prepare for oversupply situations.

In the quest to prepare for the demonstrable potential and pitfalls in the coming year, savvy executives will rely on the wave of data-driven innovation to guide them. From improving situational awareness and assisting decision hygiene to generating operational efficiencies, AI has reached a level of enterprise-readiness.

The new class of powerful technologies offers the higher ROI path to boost productivity while maintaining capital discipline, clarify a complex and volatile operating environment, and equalize the industry for small and medium size players in a consolidating world.

Lease Analytics

About Lease Analytics

Few understand the complexities and frustrations of unstructured land data. Whether you're IT or Land, your data matters. It all starts with Land. Usable and reliable land data creates value. Get the most out of your land data. Lease Analytics is the only consultancy that makes your land data truly usable, truly reliable, and truly valuable.

Lease offers best-in-class Land System Conversion, Land Data Integrity Revenue Recovery, Document Management Solutions, Managed Data Services, Staff Augmentation, Digital Lease Review, Error & Omission Discovery, and Acquisition Onboarding

Non-op revenue recovered

Leases and contracts analyzed

Net acres discovered

About the Authors

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