ENERGY

Tackling Challenges in Exploration

Driving Fundamental Change in Strategy and Execution

The exploration sector within oil and gas is at an inflection point. While global demand for hydrocarbons remains resilient—even under aggressive climate change scenario—supply is falling behind. Proven reserves (1P) have declined by 35% over the past 15 years, and exploration capital remains stuck at ~50% of pre-2015 levels.[1] Alarmingly, commercial success rates are deteriorating while discovery cost increases continue to outpace inflation, eroding returns and confidence in upstream reinvestment.

To reverse these trends, the industry must take bold, structural steps to reframe how exploration is conceived, structured, and executed. A new playbook must:

Reevaluate strategy

Update "where to play" and "how to win" choices, grounded in realistic capital allocation and strategic positioning.

Redesign the exploration stage-gate

Adopt lessons learned from other industries (e.g., Pharma's R&D model) to streamline decisions, incorporate AI, and minimize waste.

Leverage AI to widen the opportunity funnel

Aggregate and structure vast datasets to enable high-throughput screening and smarter prioritization.

Accelerate decisions and improve agility

Shift to sprint-based screening and play evaluation processes to drive faster, better-informed choices.

Be decisive earlier

Enforce clear gate criteria and delegate authority to empowered teams to drive sharp, early decisions with minimal drag.

Exploration rooted simply in geologic evaluation is no longer sufficient. Effective strategies are underpinned by decision science, digital enablement, and organizational alignment. Leaders who embrace this transformation will outperform; those who cling to legacy approaches will be left behind.

1 Rystad Energy

Exploration in Decline: The Strategy and Capital Disconnect

Over the past decade and a half, global oil and gas companies have grappled with an unsustainable decline in proven reserves (1P), which have fallen by 35% since 2010.[2] This trend reflects not only the natural depletion of legacy assets but also systemic weaknesses in exploration strategy and execution. Compounding the issue, industry exploration budgets have been cut in half since the 2015 price crash, leaving little room to pursue new frontiers or test high-potential plays. Major discoveries greater than 500 million BOE of resource make up 53% of resource adds but only represent 18% of total exploration spend since 2010,[3,4] underpinning industry's reliance on risk/reward success. Even as many companies shift toward lower-risk, infrastructure-led exploration, the paradox remains that commercial success rates are falling—down by 15 percentage points in the last five years, highlighting inefficiencies in opportunity screening and decision-making.

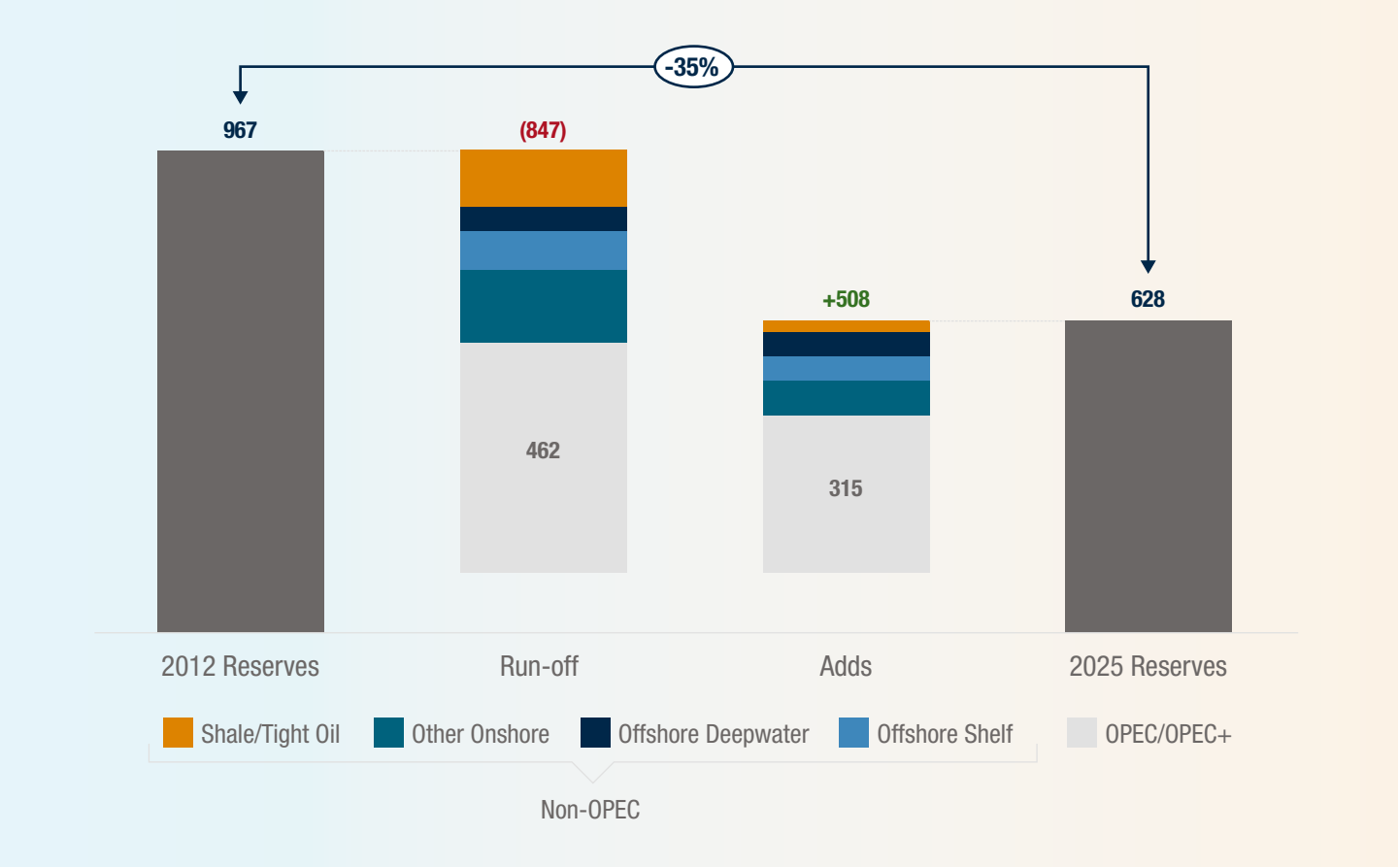

Figure 1: Global 1P Reserves Replacement since 2010 (Billion BOE)
Source: Rystad UCube, A&M Analysis

2 Ibid.

3 Ibid.

4 A&M Analysis, based on publicly available information and/or client data used with permission. Please contact A&M directly for further details on specific reports used.

Demand Is Holding Steady, but Supply Is Faltering

The need for a renewed focus on reserve replacement is underscored by long-term energy outlooks, which consistently project strong hydrocarbon demand through 2050—even in scenarios aligned with announced climate pledges.[5,6,7,8,9] However, the current exploration landscape is misaligned with this demand trajectory, with global spending still languishing at half its historical levels. The disparity in performance between OPEC+ and non-OPEC countries is also stark, with the former replacing 68% of reserves compared to 50% for their non-OPEC counterparts.[10] Meanwhile, offshore deepwater—once the engine of large-scale discoveries—has seen its annual spend plummet from ~$51 billion in 2010–2015 to less than $20 billion today, resulting in a depleted funnel of opportunities.[11]

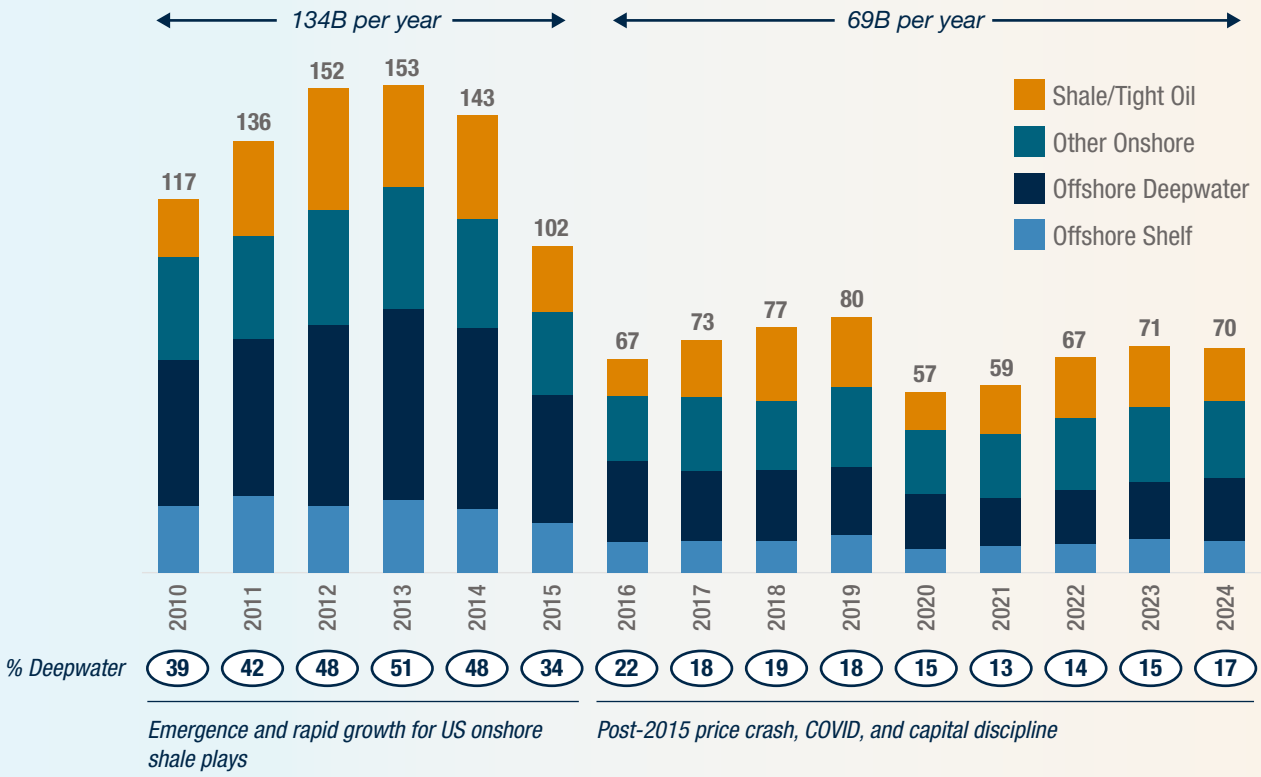

Figure 2: Global Exploration Spend by Segment (Billion USD)

Source: Rystad UCube, A&M Analysis

5 U.S. Energy Information Administation, *US EIA Energy Outlook 2023, https://www.eia.gov/outlooks/aeo/*pdf/aeo2023_narrative.pdf

6 International Energy Agency, *IEA World Energy Outlook 2024, October 2024, https://www.iea.org/reports/*world-energy-outlook-2024

7 BP, *BP Energy Outlook 2025, July 10, 2024, https://www.bp.com/en/global/corporate/energy-economics/*energy-outlook.html

8 ExxonMobil, *ExxonMobil Global Energy Outlook: Our view to 2050, 2024. https://corporate.exxonmobil.com/*sustainability-and-reports/global-outlook#Keytakeaways

9 Shell Global, *Shell Energy Security Scenarios, https://www.shell.com/news-and-insights/scenarios/the-energy-security-scenarios.html; Shell 2025 Energy Security Scenarios, https://www.shell.com/news-and-insights/scenarios/the-2025-energy-security-scenarios.html*

10 Rystad Energy

11 Rystad Energy UCube

Offshore Struggles: High Stakes, Low Returns

Offshore exploration, historically a key growth driver, has experienced sharp declines in performance. Commercial success rates in deepwater and shelf plays have dropped by 30–40% since their early 2010s peak, driven by increasingly challenging geologies, logistical complexities, and reduced investment in seismic and wildcat programs.[12] Although commercial success rates increased in 2019 to 2021, discovered resources were below historical averages, highlighting a strategic focus on Infrastructure Led Exploration (ILX) and short-cycle projects. Historically prolific offshore basins such as the North Sea and Gulf of America have matured, and remaining prospects are deeper, smaller, or in frontier regions. While majors and national oil companies (NOCs) have maintained activity levels, they too are seeing mixed results, suggesting that consolidation has not necessarily led to improved outcomes. At the same time, discovery costs have surged, far outpacing inflation and reflecting the growing technical difficulty of finding and appraising new resources with continued volatility in commodity prices and geopolitical environments.[13] The cumulative impact of these trends is a weakening value proposition for offshore exploration, even among historically successful operators.

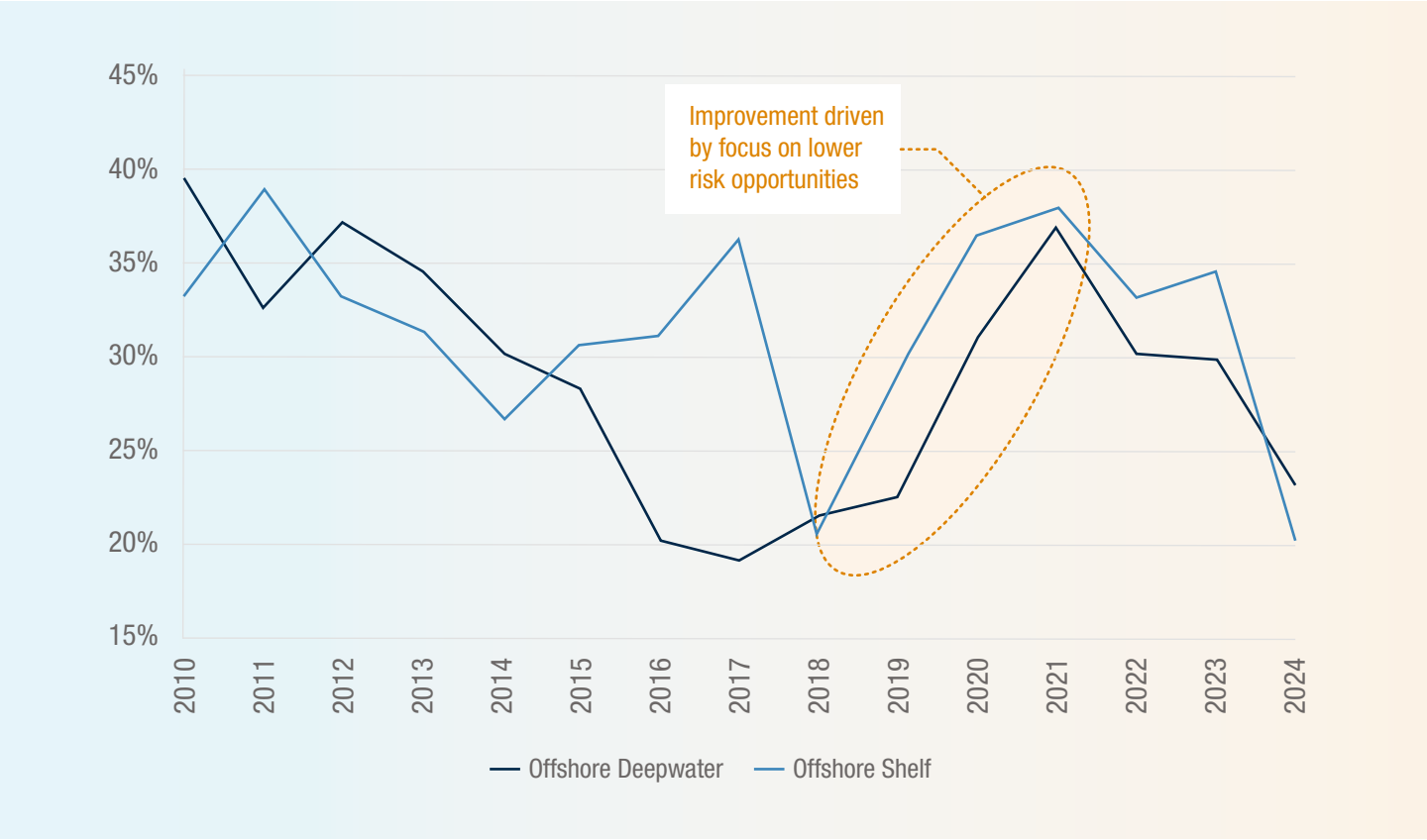

Figure 3: Offshore Exploration Commercial Success Rate by Segment (%)
Source: Rystad UCube, A&M Analysis

12 Ibid.

13 "Consumer Price Index News Release," U.S. Bureau of Labor Statistics, Economic Releases, August 12, 2025, https://www.bls.gov/news.release/cpi.htm#:~:text=fell%200.3%20percent.-,The%20index%20for%20all%20items%20less%20food%20and%20energy%20rose,months%20are%20subject%20to%20revision.

What's Broken? Diagnosing the Root Causes of Exploration Underperformance

Several interrelated factors are driving the erosion of exploration performance. Macroeconomic shocks, including the 2015 price crash and COVID-19 pandemic, have significantly reduced risk tolerance, while energy transition narratives have shifted capital allocation away from long-cycle, higher-risk projects. Strategically, companies have leaned on M&A rather than organic growth, often sidelining exploration as a core function. On the execution front, many organizations lack robust stage-gate processes, leading to poor filtering of marginal prospects and inefficient use of capital. Moreover, risk assessments remain underdeveloped, with geopolitical, technical, and economic uncertainties frequently underestimated. These strategic and operational gaps underscore the urgent need for structural reform.[14]

R&D Lessons from Pharma: Smarter, Faster, Leaner

In contrast to oil and gas, the pharmaceutical industry has dramatically improved its R&D funnel by embracing digital tools, structured gating, and continuous feedback. Drug development, like exploration, is a high-risk process of narrowing a broad universe of options to a few viable candidates. Pharma companies now deploy AI-driven screening to prioritize prospects, adopt early-stage validation checkpoints to reduce investment in extremely high-risk candidates and integrate learnings across the R&D lifecycle to improve prediction accuracy.[15] These principles offer a roadmap for oil and gas: leveraging AI for prospect evaluation, enforcing strict technical and economic thresholds before capital deployment, and creating self-improving feedback systems that loop learnings from drilling and development back into exploration planning.

14 A&M Analysis, based on publicly available information and/or client data used with permission.
15 Ibid.

Exploration Performance by Company: Who's Winning, Who's Falling Behind

Exploration performance varies widely across the industry, with a distinct divide between agile, focused operators and larger, more complex organizations. High performers such as Hess, Eni, ExxonMobil, and Kosmos Energy consistently achieve strong commercial success rates at below-average finding costs, driven by disciplined capital allocation, targeted portfolios, and streamlined decision-making.[16] In contrast, many Majors and NOCs—despite their scale and spending—are approaching or exceeding the industry average discovery cost, signaling diminishing returns. This underperformance stems from slower processes, fragmented accountability, and legacy exploration models ill-suited for today's complex environments. The data makes clear that success is not about size, but about strategic clarity, execution agility, and the willingness to evolve.

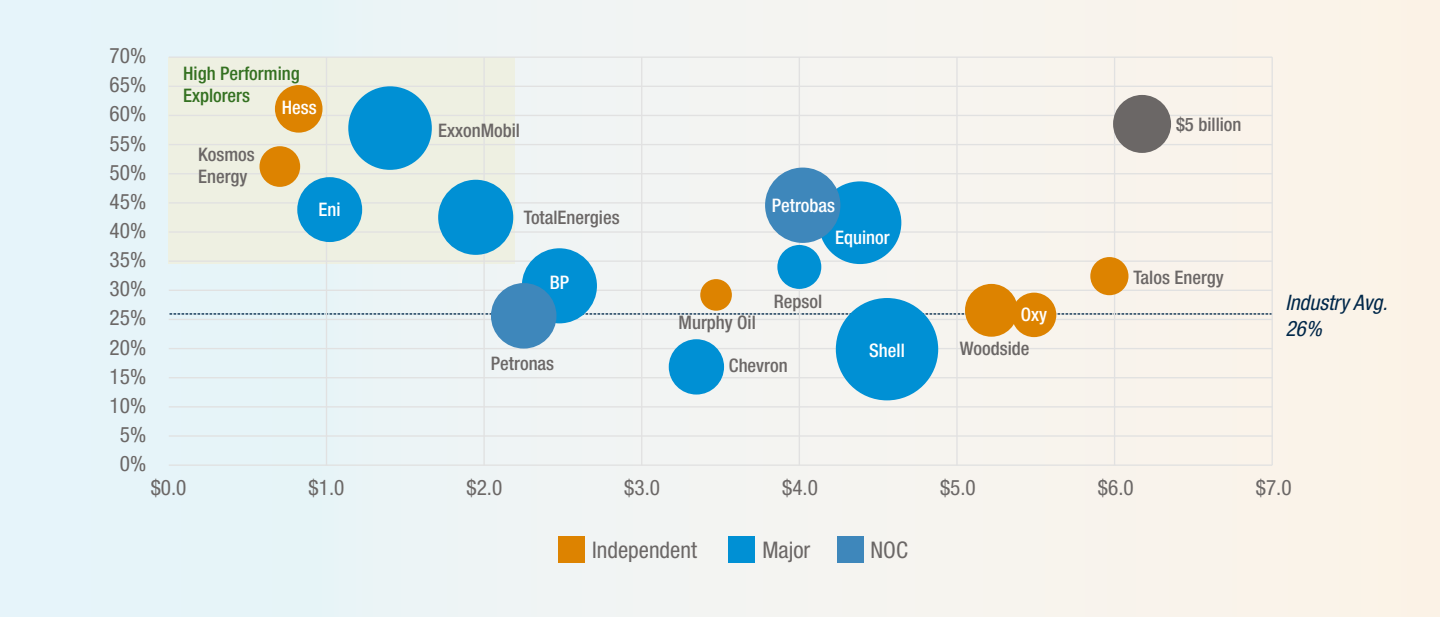

Figure 4: Offshore 10-Year Finding-Cost ($/BOE) vs. Commercial Success Rate (%)
Source: Rystad UCube, A&M Analysis

16 Ibid.

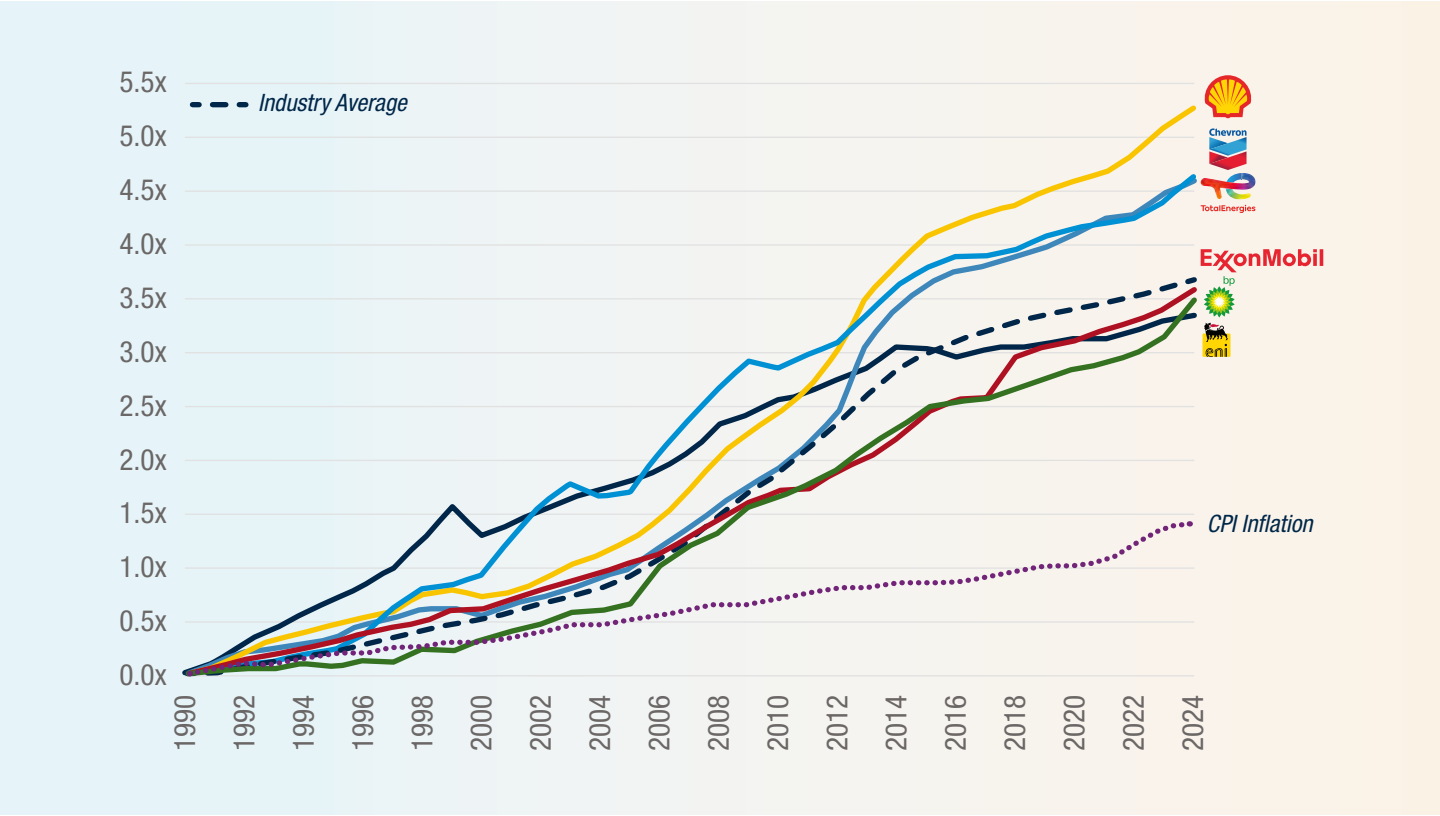

Figure 5: Change in Global Offshore Discovery Cost since 1990 (Multiple)
Source: Rystad UCube, A&M Analysis, U.S. Bureau of Labor Statistics

Resetting the Playbook: How to Rethink Strategy and Execution

To address current challenges, exploration strategy must begin with a clear definition of role—whether to lead, partner, or observe—supported by a capital allocation model that prioritizes long-term reserve and margin objectives over short-term cash flow. Execution must evolve in parallel, with empowered teams using advanced tools like AI and predictive modeling to assess and high-grade opportunities. Organizations should streamline their stage-gate processes to enable faster, more informed decisions and ensure that incentives align with strategic reserve growth. Lastly, portfolio balance across play type, geography, and risk— preventing overreliance on mature, low-growth assets—is essential to unlocking sustainable success.

KEY CONTACTS

John Norton
Managing Director
jnorton@alvarezandmarsal.com

Joseph Halverson
Managing Director
jhalverson@alvarezandmarsal.com

Andy Zagoren
Senior Director
azagoren@alvarezandmarsal.com

Billy Pecue
Manager
bpecue@alvarezandmarsal.com

ABOUT ALVAREZ & MARSAL

Founded in 1983, Alvarez & Marsal is a leading global professional services firm. Renowned for its leadership, action and results, Alvarez & Marsal provides advisory, business performance improvement and turnaround management services, delivering practical solutions to address clients' unique challenges. With a world-wide network of experienced operators, world-class consultants, former regulators and industry authorities, Alvarez & Marsal helps corporates, boards, private equity firms, law firms and government agencies drive transformation, mitigate risk and unlock value at every stage of growth.

To learn more, visit: **AlvarezandMarsal.com**

Follow A&M on:

471588-52783/January 26
9803_Stg03

ALVAREZ & MARSAL
LEADERSHIP. ACTION. RESULTS.℠