

Scientific Portfolio Market Review

May 2026



SciX
An EDHEC Venture



Can Climate Equity Investors Cope with Oil Price Volatility?

Key Takeaways

- **Oil price volatility is back, but how vulnerable are climate equity investors this time around?**

In 2022, after the onset of the war in Ukraine, Paris Aligned Benchmarks (PAB) markedly underperformed market cap-weighted indices; this was largely driven by short risk bias in the Energy sector. Now, with record levels of implied volatility in the oil futures market, will climate equity strategies demonstrate greater resilience?

- **Investors should stress test portfolios.** Forward-looking factor-based out-of-sample simulations can help to indicate how portfolios could perform under extreme oil price scenarios, revealing hidden sensitivities that go beyond Energy sector exposure.

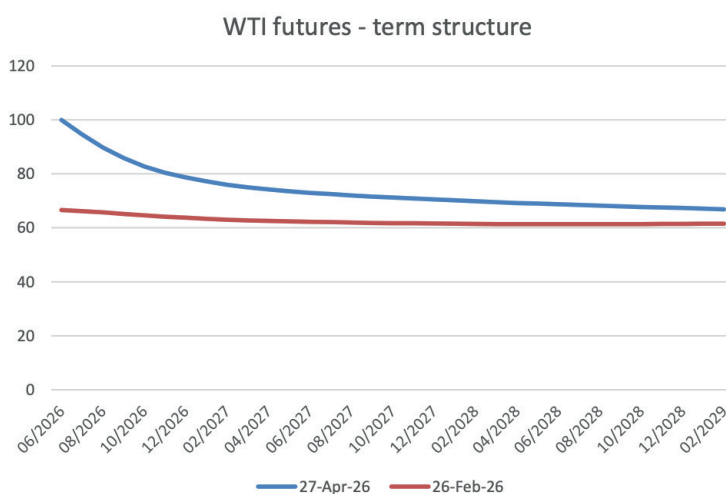
- **Energy market disruption adds new fuel to the ongoing debate about what ‘climate alignment’ should look like** in equity portfolios. Strategies that focus on real-economy decarbonization, rather than a low-carbon portfolio, may be increasingly attractive in an environment where Energy sector positioning has a large impact on relative performance.

Oil Price and Oil Price Volatility Hit Record Highs

The war in the Middle East has hugely disrupted the oil market. As shown in Exhibit 1, the crude oil (WTI) futures’ term structure moved into significant **backwardation** between February 2026 (pre-war) and the end of April 2026, meaning prices for near-term delivery exceeded prices for delivery further out in the future. Backwardation typically happens in situations of limited supply and scarcity, when the “convenience” value of having oil on hand exceeds the “cost of carrying” it. Based on the curve shown in Exhibit 1, the market appears to expect the current disruptions caused by war to gradually dissipate in 2027, with December 2026 contracts trading \$20 below the current front-month futures, though the outlook is—of course—hotly debated.

View risk, performance and climate analytics for your equity portfolio and a wide range of equity strategies on the Scientific Portfolio platform.

Exhibit 1: Evolution of the WTI futures term structure, Apr 2026 vs. Feb 2026



Source: CME Group

Academic research shows that backwardation in oil futures markets is positively related to the **implied volatility of crude oil options**¹. This is confirmed in Exhibit 2: the 30-day implied crude oil annualized volatility spiked all the way to 120% in early March compared to approximately 40% before the war. In practical terms, this means the market's expectation of a standard daily return in oil prices went from +/- 2.5% to +/- 7.5%.

Exhibit 2: Historical values of the Cboe Crude Oil ETF Volatility Index (OVX)

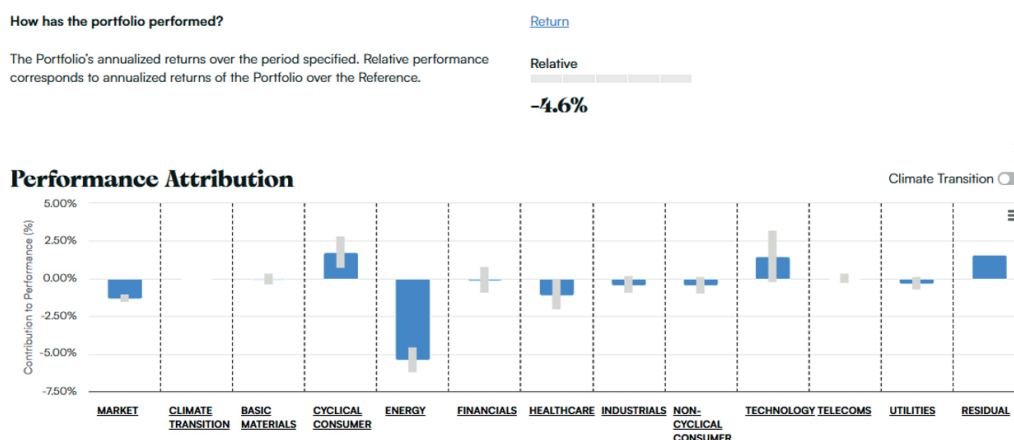


Source: Cboe and Federal Reserve Bank of St. Louis. The Index represents the estimated volatility implied by 30-day crude oil (WTI) futures options.

Are Climate Equity Investors More Exposed to Oil Price Volatility?

In this context, market participants are actively considering their potential sensitivity to developments in energy markets. This is true for all investors but may be particularly pressing for those using climate strategies: allocators sorely remember the **underperformance of Paris Aligned benchmarks (PAB) and strategies after the Ukraine invasion in 2022** — the last time when crude oil prices and implied crude oil volatility reached similar levels. The performance attribution reported in Exhibit 3 is an unpleasant reminder of how the Energy (short) bias explained the underperformance of climate equity strategies relative to market cap-weighted benchmarks in that period.

Exhibit 3: Relative performance in 2022 of an S&P 500 Climate Paris-Aligned strategy vs the cap-weighted benchmark.



Source: Scientific Portfolio platform.

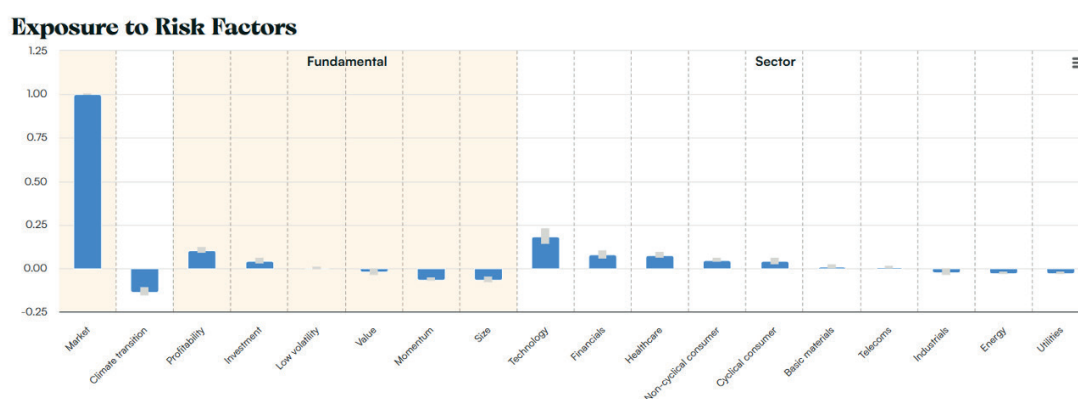
1 - See Litzenberger and Rabinowitz (1995)

Arguably, the fundamental lesson learnt from this period was that Energy sector deviations versus the cap-weighted benchmark in climate funds should be avoided whenever possible. The industry now watches and asks: will climate-branded funds exhibit greater resilience in 2026 or, once again, suffer from risk biases?

Examining Exposures and Conducting Simulations

Investors wanting to anticipate and plan for adverse market events related to oil may wish to identify exposures that create an indirect sensitivity to oil prices. A starting point would be a comprehensive factor risk profile, such as the example from the Scientific Portfolio platform in Exhibit 4: this shows a particular strategy's betas to seven fundamental risk factors² and ten sector-based risk factors. In this case, the strategy (a US Paris-aligned fund) has only a slight underweight to the Energy sector.

Exhibit 4: Factor risk profile of a US Climate Paris Aligned equity strategy



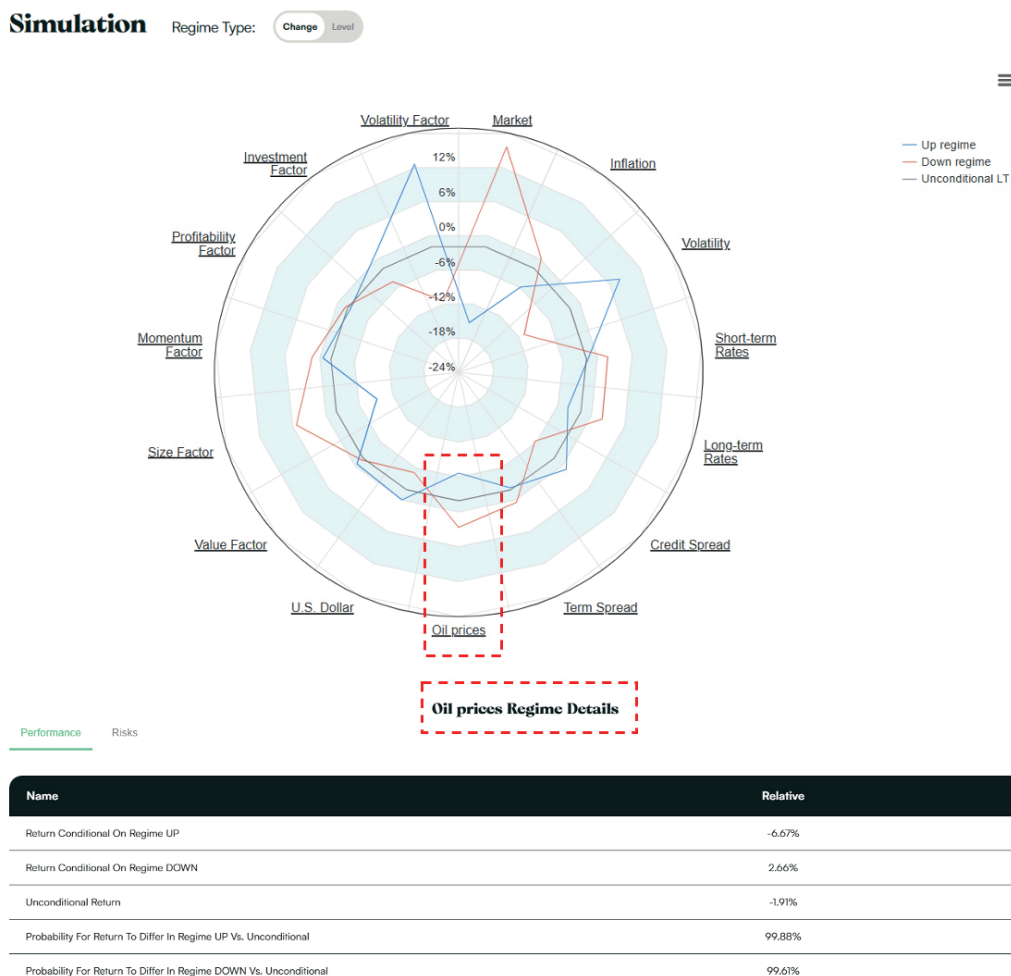
However, aside from Energy, the relationship between oil prices and other sectors is known to be **volatile and unstable over time**. For example, a review of sector performance between February and September 2022 and the more recent period between February and April 2026 shows that only two sectors (Energy and Telecoms) exhibited a *stable* and *meaningful* behavior (i.e., a performance relative to the cap-weighted benchmark that carries the same sign and is significant in both periods).

As such, the next step may be to **create out-of-sample historical conditional simulations** in order to produce a portfolio's estimated exposure to large oil price shocks. The methodology involves constructing a hypothetical strategy that mimics the fundamental factor exposures of the current portfolio and considering the long-term behaviors of those fundamental equity factors.³ The long-term track record of such a hypothetical strategy (going back to the 1970s) can then be used to estimate the behavior of the portfolio during historical periods of oil price shock. While there is no guarantee this behavior will precisely repeat if oil prices were to significantly increase or decrease tomorrow, the estimated out- or under-performance figure obtained is a meaningful out-of-sample (but still realistic) data point, representing how the portfolio could perform in a stressed oil regime. As a result, this type of analysis can function as a substitute for a "what-if" **stress test**.

2 - Market, Size, Value, Momentum, Investment, Profitability, Low Volatility

3 - See Baucher and Bagnara (2025) for details

Exhibit 5: Out-of-sample conditional simulations for a Healthcare sector ETF



Source: Scientific Portfolio platform.

The practical benefits of conditional simulations are clear: an oil regime-linked stressed performance can be computed i) without having to manually select a historically stressed period, ii) without even requiring the portfolio's track record to contain a historically stressed period, iii) by accounting for the realistic joint behavior of all the fundamental factors rather than stressing each factor independently.

For illustration purposes we computed the results of conditional simulations for a Healthcare sector ETF and report them in Exhibit 5. We find that the current fundamental factor exposures of the ETF would have, on average, generated -4.76% of annualized underperformance versus the market in those environments where oil prices are significantly increasing and +4.57% of annualized outperformance in environments where oil prices are decreasing. We also computed the probability that these two relative performance estimates are statistically significant and found it to be greater than 99% in both cases.

Staying Climate-Aligned while Holding Energy Stocks

Above, we noted the importance of obtaining appropriate Energy sector exposure in climate-aligned investment.

Where strategies primarily seek to minimize the portfolio's reported carbon footprint, the natural thing to do is to simply exclude stocks with the highest carbon intensities, resulting in the near-exclusion of Energy stocks and low exposure to geographies with high emissions relative to the rest of the economy. However, investors are well aware of the difference between improving reported carbon metrics and contributing to real world decarbonization. Scientific Portfolio's latest research⁴ calls for humility and pragmatism in this regard but implies that a climate aligned strategy may retain some exposure to Energy stocks.

For example, rather than excluding Energy stocks based on their emissions metrics, investors could decide to exclude or retain Energy stocks based on how aligned they are compared to their peers and the sector as a whole. Not all Energy stocks are misaligned. For instance, Exhibit 6 reports that approximately 21% (respectively 16%) of the portfolio of a US Energy ETF (a US Oil & Gas Exploration & Production ETF) is allocated to companies with ambitious decarbonization targets.

Exhibit 6: Review of GHG Emissions Reduction Targets for a US Energy ETF and a US Oil & Gas Exploration & Production ETF

Intensity based on: Weight Stock Number		
Name	Portfolio	Reference
Science-based or ambitious targets	21.3%	15.7%
Target missing	0.0%	1.0%

Source: Scientific Portfolio platform.

Indeed, one can argue that a contribution to real world decarbonization implies staying somewhat invested in those high impact sectors (such as Energy)⁵ that will largely determine the pace of transition. Staying invested there allows to either exercise influence on corporations through stewardship and engagement, or to create intra-sector incentives through an allocation to the most aligned companies in the sector.

According to Scientific Portfolio's latest research⁶, the Oil & Gas industry (O&G) is one where the gap between stated intentions (targeted emissions) and real-world actions (historical emissions and forward-looking capital expenditure plans) is very large: this is a characteristic that we call the Ambition-Credibility gap. This in turn creates an opportunity for investors to focus and dedicate their (scarce) **stewardship and engagement** resources to address visible and quantifiable inconsistencies between O&G companies' decarbonization targets and their CapEx activity.

4 - See Bouchet and Clark (2025)

5 - A possible exception: those specific segments where a strong consensus exists, e.g., the need to stop and exit coal-related activities.

6 - See our webinar dedicated to Portfolio Emissions and the Ambition-Credibility Gap

Conclusion: Stay Tuned

Scientific Portfolio's research and development teams are continuing to actively develop a suite of indicators and methodologies to help investors analyze and assess their portfolios, as well as to construct and design more effective climate-aligned equity strategies. Please get in touch if you wish to learn more.

*This article contains data from the **Scientific Portfolio** platform. Users can access analytics to conduct analyses of available funds and/or upload their own equity portfolios to examine performance and exposures.*

Access the Scientific Portfolio Platform

About Scientific Portfolio

Scientific Portfolio is the latest commercial venture incubated within the research ecosystem of EDHEC Business School (EDHEC), one of the world's leading business schools.

Scientific Portfolio has assembled a team with a broad range of expertise and backgrounds, including financial engineering, computer science, sustainable and climate finance, and institutional portfolio and risk management. It proudly carries EDHEC's impactful academic heritage and aspires to provide investors with the technology they need to independently analyse and construct equity portfolios from both a financial and extra-financial perspective.

To achieve this, it offers investors three sources of value through its portfolio analysis & construction platform:

- Helping investors to analyse their equity portfolios, identify actionable insights and enhance portfolios with allocation functionalities. Indeed, Scientific Portfolio likes to promote portfolio analysis as a means to the concrete goal of building portfolios that are both more efficient and better aligned with their investment objectives.
- Providing investors with an integrated framework where financial and extra-financial (ESG) considerations are jointly captured in analysis and portfolio construction. The ability to incorporate ESG-related insights in the portfolio allocation process is now a common requirement among many investors.
- Giving investors access to a Knowledge Centre catering to all types of learners and providing guidance through the portfolio analysis and construction process. This aligns with Scientific Portfolio's commitment to remaining connected with its academic roots and bridging the gap between investors and academia.

<https://scientificportfolio.com/>

