Quinn & Barley Investment Fund

Reilly Hammond

MSDS 451: Finance Machine Learning

Dr. Thomas Miller

August 31, 2025

General Investment Philosophy

The Quinn & Barley Investment Fund is centered on the energy sector, leveraging its long-established role in global markets and the extensive history of price and volume data available for robust technical modeling. The portfolio integrates individual stocks and exchange-traded funds (ETFs) across both traditional and renewable subsectors, providing diversified exposure to energy technologies and sources.

Our investment philosophy is rooted in technical analysis, guided by systematic trading rules for security selection, entry points, and exit timing. The objective is to deliver above-average income and long-term wealth creation through disciplined, data-driven decision-making, pursued independently or in collaboration with institutions. Unlike a pure buy-and-hold approach, this strategy employs trend-following and momentum indicators to identify medium- to long-term opportunities. Rebalancing occurs monthly, using multi-signal confirmation to filter market noise while remaining responsive to changing conditions. This frequency promotes consistency and reduces behavioral bias. While initially launched as a long-only strategy, shorting and hedging were tested and including shorting was more effective in supporting a growth-focused mandate under periods of heightened volatility.

Ultimately, the fund is designed for investors seeking targeted energy exposure through a tactical, ESG-aware, and technically disciplined lens, positioned to navigate a complex, fast-evolving sector with both positive intention and accuracy.

Investment Methods

The fund leverages Yahoo Finance (via *yfinance*) to retrieve daily stock prices. Unlike ETFs concentrated in a single theme, the portfolio blends non-renewable and renewable energy exposures. This design reflects the differentiated sensitivities of each subsector:

- Renewables tend to be more sensitive to monetary policy shifts, including changes in money supply and interest rates, due to their reliance on capital investment and subsidies.
- Non-renewables (oil, natural gas, coal) are primarily influenced by macroeconomic demand cycles and commodity price dynamics, given their role as industrial inputs and global supply chain anchors.

This balance enhances portfolio resilience given that traditional energy assets can mitigate drawdowns in renewable holdings during volatility, while renewables provide long-term growth potential aligned with the energy transition. In combining both, the fund captures stability from legacy infrastructure and opportunity from emerging technologies.

Securities Selection

The Energy Select Sector SPDR (XLE) is used as the fund's benchmark, reflecting its strong historical performance and attractive dividend yield relative to the S&P 500 (SPX). Benchmarking against XLE provides clear context on expected returns across short-, medium-, and long-term horizons.

While XLE includes 34 holdings, our fund builds on its framework by selecting the top 10 constituents to establish a risk-averse foundation:

ExxonMobil (XOM), Chevron (CVX), ConocoPhillips (COP), The Williams Companies

(WMB), EOG Resources (EOG), Kinder Morgan (KMI), Marathon Petroleum (MPC), ONEOK (OKE), Schlumberger (SLB), and Phillips 66 (PSX).

To strengthen diversification beyond these core positions, additional securities were incorporated through Monte Carlo simulations and comparative weighting analysis. Specifically:

- Brookfield Renewable (BEP), NextEra Energy (NEE), and Enbridge (ENB): Selected based on external recommendations from *The Motley Fool*.
- Clearway Energy (CWEN): Identified through independent research, particularly for its strong performance in Q2 2025.

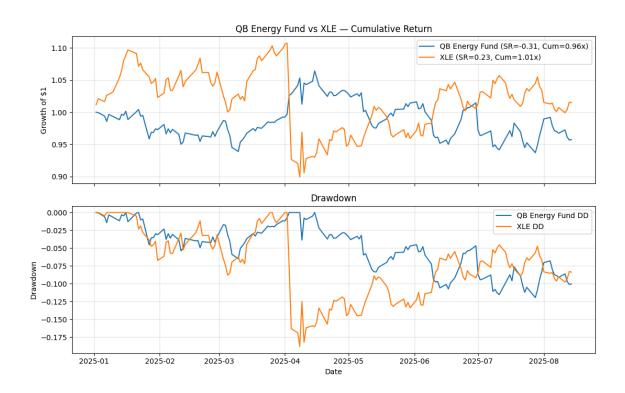
Performance Evaluation

Monte Carlo simulations were conducted using historical data from 2001 onward, encompassing stress periods such as the 2008 financial crisis and the 2020 COVID-19 market peak. While annualized returns appear strong, the simulations underscore the high volatility inherent in energy markets.

Further backtesting was performed from January through August 2025, comparing the QB Energy Fund against XLE. Results indicate underperformance as the the QB Energy Fund returned –6.0% versus XLE's 1.48%. Risk-adjusted metrics were also unfavorable, with a Sharpe ratio of –0.86 versus XLE's 0.23. This highlights significant downside exposure and insufficient compensation for risk during the test interval.

ETF	Cumulative Return	Sharpe Ratio
QB Energy Fund	94.04%	-0.86
XLE	101.48%	0.23

Notably, the QB Energy Fund demonstrated greater resilience than XLE during April—June 2025, when the benchmark experienced heightened volatility. While current model specifications have not yet produced consistent outperformance, the evidence suggests opportunities for refinement through enhanced factor integration, momentum filters, and portfolio weighting strategies.



Management Recommendation

At this stage, I do not intend to launch a financial services firm. If I were to pursue one in the future, I would focus on the role of researcher rather than CEO or fund manager, while also serving as an investor to demonstrate alignment with the fund's philosophy and methodology.

The fund presents an attractive opportunity for long-term personal wealth accumulation, though I

acknowledge the existence of proven institutional researchers, such as Renaissance Technologies' Medallion Fund, from which further methodological insights can be drawn.

For a potential fee structure, I propose:

- Fixed Management Fee: 1%
- **Performance-Based Fee:** 0–10%, applied only on returns exceeding the XLE benchmark (alpha).

This structure balances predictable operating costs with investor alignment through performance-contingent compensation.

Base Fee = Based on Total Assets Under Management (AUM)		Based on Per	<u>Variable Fee</u> = Based on Performance & Benchmarked against XLE		
AUM	Base Annual Mgmt Fee	Scenario	Benchmark Variance	Performance Fee	
\$0 - \$250M	1.25%	Under	-2%	-2%	
\$250M - \$500B	1.00%	Matches	0%	0%	
\$500M - \$1B	0.85%	Moderate	+1%	4%	
\$1B+	0.75%	Strong	+2%	10%	