

Fossil Fuel Divestment: Perspectives After the Oil Bust

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By Daniel Kern, CFA and Gerard Cronin, CFA

Summary

Fossil fuel divestment has been a dominant topic for socially responsible investors for the last few years, and a hotly debated topic for universities, cities and major endowments. In 2013, Advisor Partners completed research into the investment implications of divestment, evaluating different divestment alternatives from a historical and forward-looking perspective. We revisit our work from 2013 to update our analysis and review emerging issues, including the implications of the oil bust for proponents of divestment.

Setting aside social considerations, our investment analysis suggests that removing these energy stocks from a well-diversified portfolio has limited impact on investment risk; however, the evaluation of the impact on portfolio performance will depend on an investor's perspective. We also explore the topic of reinvestment, seeing the investment success or failure as tied to the approach taken to reinvest proceeds of divestment activities.

Overview

The divestment campaign started by writer and environmental advocate Bill McKibben continues to have strong momentum, supported by efforts from the organization he started, 350.org. Prominent commitments to divest fossil fuels have been announced by the Rockefeller Brothers Fund; cities including Portland, San Francisco and Seattle; and colleges such as Stanford, Hampshire and Pitzer.

This study extends our framework for analyzing the investment implications of divestment, refining it to address the emerging consensus about what "fossil fuel divestment" means. We extend our historical framework through the end of 2014, covering a 25 year simulation period. We simulate backward-looking returns to develop a hypothesis about how an index portfolio divested of fossil fuels would have performed over prior years. We calculate forward-looking estimates of risk to forecast whether a fossil fuel free portfolio would present risks materially different from the unconstrained portfolio. We investigate the composition of the portfolios to anticipate sources of risk and return differences. Lastly, we consider a key consideration emerging among investors considering divestment, which is what to do with the proceeds from divesting fossil fuels. Recent experience in a declining oil price environment has provided some surprising results for some investors. We use financial modeling tools provided by FactSet Research Systems and Northfield Information Services to simulate the portfolios.

Divestment analysis

Our prior research took shape in the early days of the divestment movement, at a time of vigorous debate about the definition of divestment. We see greater consensus among divestment proponents today, with most discussion centering on divestment of companies from the Energy sector, including oil, gas and consumable fluids, energy equipment and services companies. Consequently, we've created a simulated portfolio that excludes the Energy sector within the S&P 500 Index to represent the "*divestment*" portfolio. The

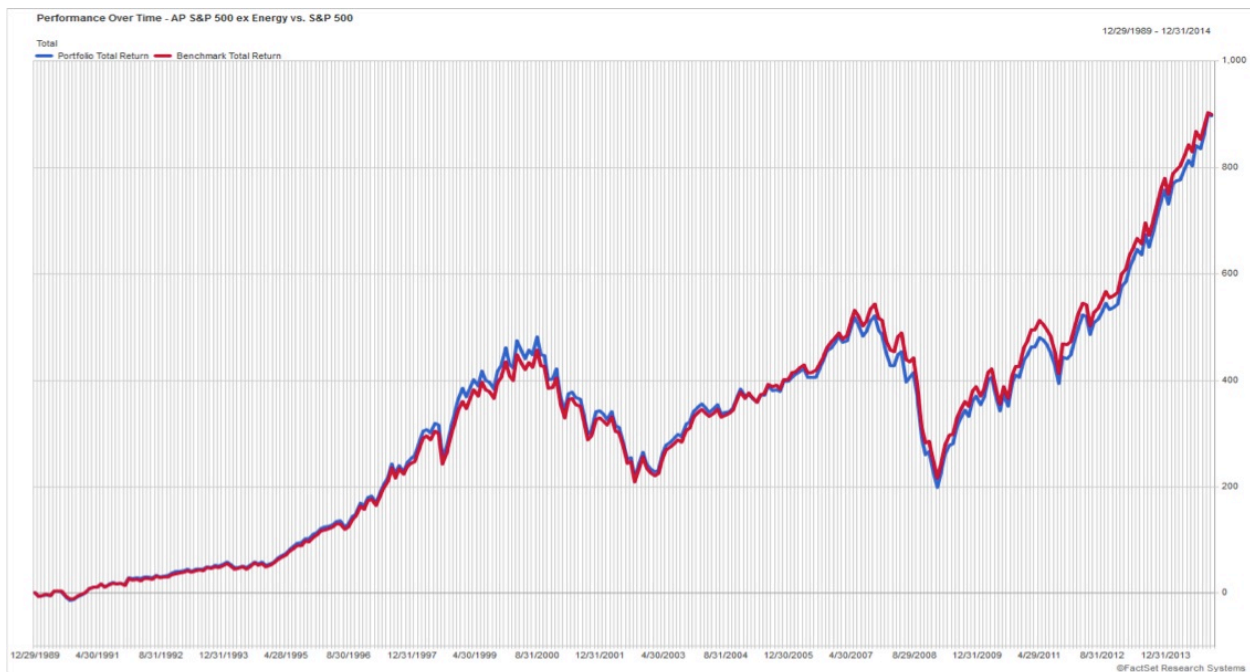
divestment portfolio excludes energy stocks, while increasing the weights of the remaining index constituents on a pro rata basis. We compare the divestment portfolio to the "no divestment" policy alternative, represented in our study by the S&P 500 index.

Simulated Performance Results

The study simulated historical performance by creating a full divestment portfolio as of the end of 1989. Simulated performance over the 25-year period provides support to both advocates and skeptics of fossil fuel divestment.

Simulated performance of the full divestment portfolio was virtually indistinguishable from that of the S&P 500 index, as shown in Chart 1.

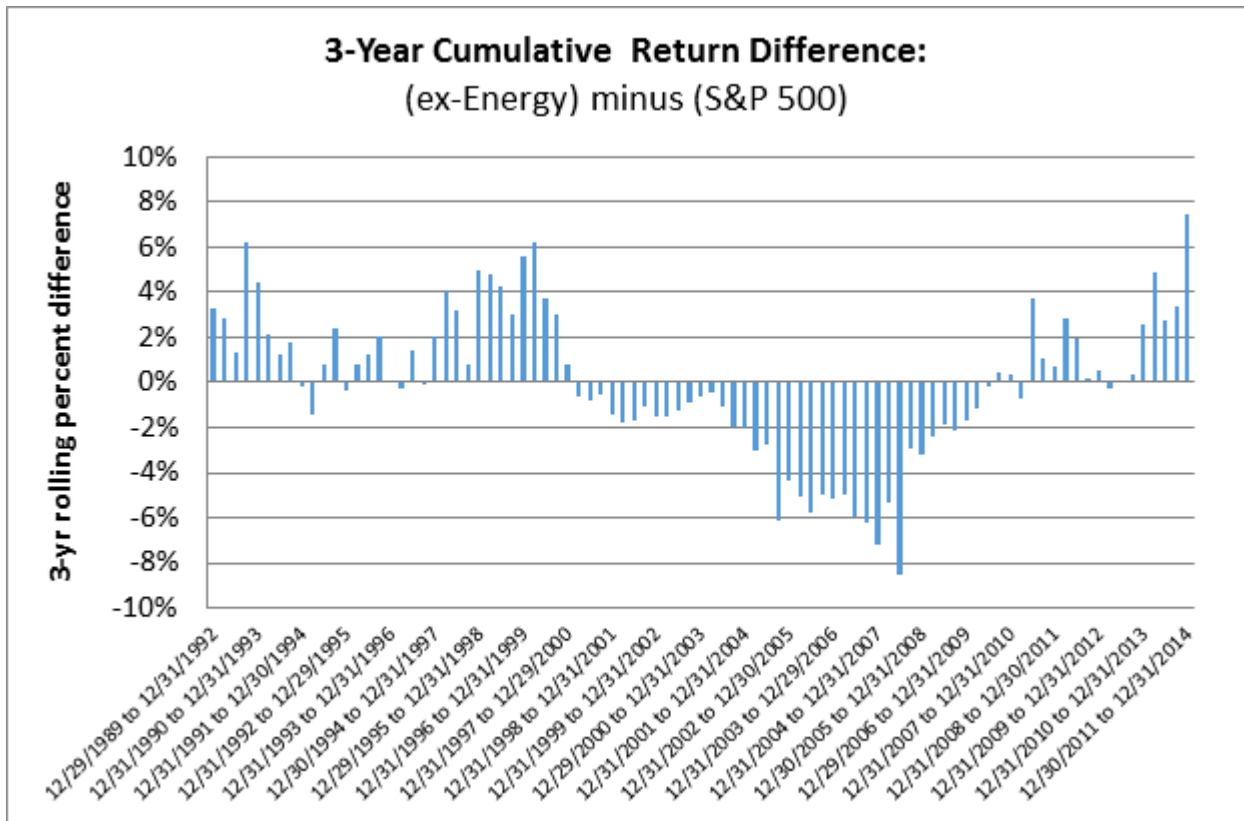
Chart 1: Divestment Appears to Have Limited Overall Impact



Returns are virtually identical for the 25 year period ending December 31, 2014, implying no trade-off between values and performance for divestment proponents. Investors with long time horizons may be comforted by these results.

However, the study went beyond a point to point analysis to examine the pattern of returns over three-year rolling periods. Over long periods of time, performance differences canceled out. Over shorter time horizons, there are significant periods in which divestment falls out of favor. The full divestment portfolio has a significant performance advantage in the early years of the simulation and in recent years, while the S&P 500 index had a significant performance advantage during several years in the second decade of analysis, as seen in Chart 2.

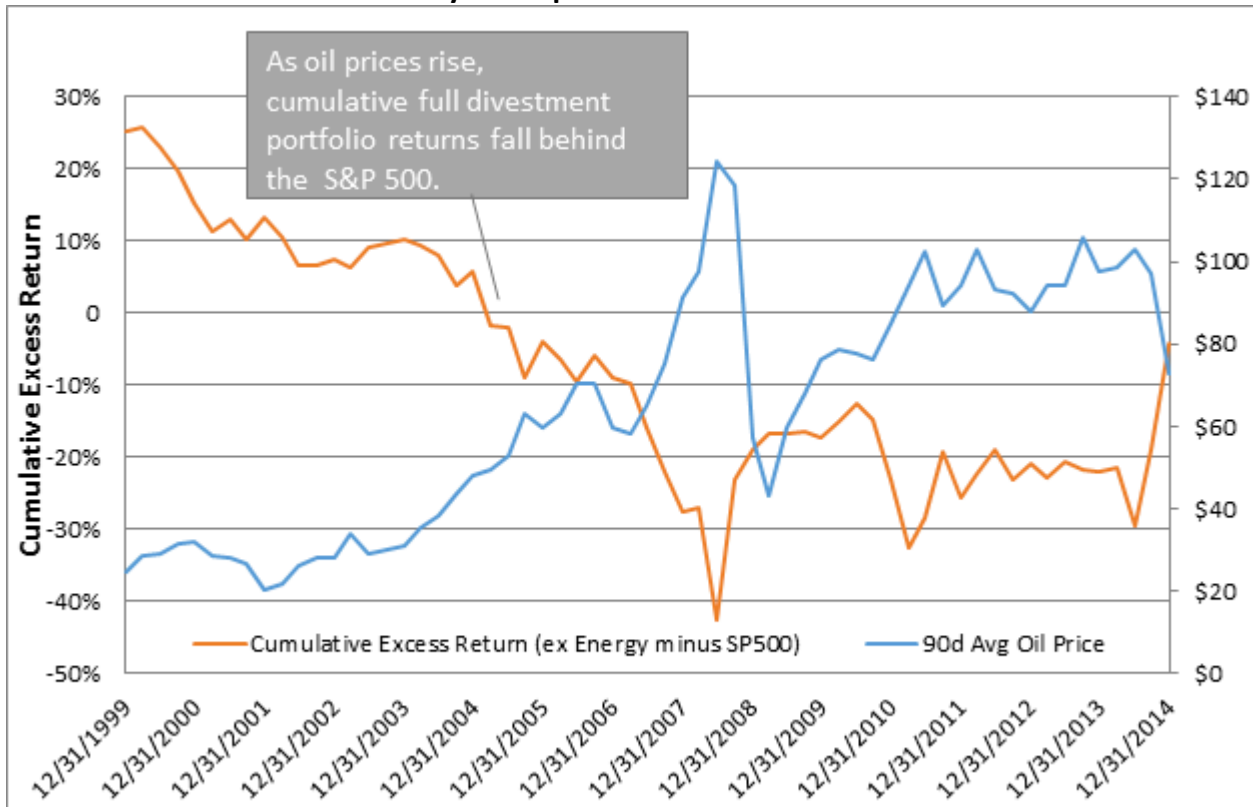
Chart 2: Simulated 3-Year Rolling Excess Performance: Timing Matters



The wide variations in performance may be easier for an institution to weather than an individual investor.

Given the minimal exposure of the full divestment portfolio to energy stocks, the study compared performance of the full divestment portfolio to the trend in oil prices during the simulation. Chart 3 illustrates that the doubling of oil prices from 2002 to 2004 coincides with the performance deterioration of the full divestment portfolio relative to the S&P 500 index. The subsequent doubling of oil prices in 2007 had a similar impact to performance.

Chart 3: Divestment Portfolio May Underperform When Oil Prices Rise



Evaluating the risk of divestment

In addition to simulating performance retrospectively, the study examined prospective risk of the divestment portfolio relative to the S&P 500 Index. The study used standard deviation to measure projected risk in absolute terms, determining the projected variability of each portfolio. As shown in Table 1, the divestment portfolio has a slightly higher simulated (backward-looking) and projected standard deviation, but the differences are small.

Table 1: Absolute and Relative Risk Measures: Similar Risks

	S&P 500 Index	Divestment Portfolio
Standard Deviation (simulated)	14.64%	15.04%
Standard Deviation (projected)	15.65%	15.80%
Predicted Tracking Error (relative to S&P 500)	0.00%	1.07%
Number of holdings	500	459

Examining risk in relative terms, the study also examined predicted tracking error, which is a statistic that measures deviation from a target benchmark. The divestment portfolio has a predicted tracking error of 1.07%. In statistical terms, a portfolio with predicted tracking error of 1.07% is expected to have annual returns within plus or minus 1.07% of S&P 500 returns,

two-thirds of the time. Placing these statistics in context, a typical index fund has tracking error of less than 0.50%. It's reasonable to point out that the divestment portfolio presents higher risk than a typical index fund; however predicted tracking error of 1.07% is considerably lower than the typical actively managed portfolio.

Portfolio Characteristics

The study examined portfolio characteristics to assess underlying risks that may not be as evident when focusing on portfolio-level risk measures. Sector positioning is an important characteristic, as it can be an indicator of future sources of performance deviation relative to a benchmark. The divestment portfolio featured a pro rata redistribution of assets, smoothing the impact of the reinvestment of proceeds from the avoidance of energy stocks. Table 2 illustrates the sector breakdown.

Table 2: Sector Weights:

Sector Weights	S&P 500 Index	Divestment Portfolio
Consumer Discretionary	12.05%	13.16%
Consumer Staples	9.82%	10.72%
Energy	8.42%	0.00%
Financials	16.68%	18.21%
Health Care	14.21%	15.51%
Industrials	10.41%	11.37%
Information Technology	19.69%	21.50%
Materials	3.17%	3.47%
Telecommunications	2.29%	2.50%
Utilities	3.26%	3.56%

Reinvestment Implications

Energy stocks were poor performers in 2014, suffering through an unexpected collapse of oil prices during the second half of the year. Many observers expected declining oil prices to be a positive development for portfolios that divested their energy stocks, but some investors experienced unexpected consequences. A key consideration influencing investment results is the decision about how to reinvest the proceeds from divesting fossil fuels. There are a few distinct approaches that carry different advantages and disadvantages. The approaches we see most frequently include:

- *Pro-rata reallocation:* The approach we used for this study, using the proceeds from divestment to increase the weights of the remaining index constituents on a pro rata basis. This is the easiest approach to implement, though it may not be the optimal approach from a risk perspective.

- *Risk-based reallocation:* The approach we often recommend for clients, in which divestment proceeds are redeployed into companies that may be statistically correlated but are not directly involved with energy activities. For example, industry groups such as construction and engineering, aerospace and defense, and machinery have high historic correlations with oil companies. Another option for investors with a global perspective is investing in the currencies or non-energy equities of countries that are major energy producers, such as Canada, Norway and Russia. The broader economy in these countries tends to do well when oil prices rise, so investing in them could be a way to benefit from rising oil prices without providing direct funding to fossil fuel companies.
- *Reinvest in clean energy-related stocks:* The approach that is likely to be the most satisfying from a social value-driven perspective, but which carries risks that aren't always apparent to clients. 2014 provides a good illustration, as oil industry leaders Exxon and Chevron experienced stock market declines of about 6% for the year. As a comparison, the Powershares Clean Energy ETF declined about 16%, First Solar about 18% and Yingli Green Energy more than 50%. The other side of the spectrum is represented by Vestas Wind Systems, which gained more than 20% in 2014 after being up more than 400% in 2013. The booming stock price of Vestas, however came after a 3 year period in which it lost about 48% in 2010, 66% in 2011, and 46% in 2012!

Consequences of the rapid fall in oil prices included reduced demand for alternative sources of energy and a period of heightened risk aversion for investors, creating the dramatic performance results discussed anecdotally above. As a result, “old” energy companies such as Exxon and Chevron delivered better stock market performance than many “new” energy companies. Clean energy companies often have more volatile business models than the established companies targeted in divestment campaigns, featuring steeper adoption curves, a higher degree of technological and regulatory uncertainty, and less financial cushion. Clean energy companies may offer attractive long-term prospects, but it’s important to recognize the higher near-term volatility they exhibit.

Closing Thoughts

Risk models and optimizers have inherent limitations; past performance and simulated results are no guarantee of future results. The study doesn’t account for potential changes in company behavior resulting from engagement efforts, nor does it consider potential regulatory changes that could restrict the ability of companies to extract carbon.

Our investment analysis suggests that removing energy stocks from a well-diversified portfolio may have a small to moderate impact on investment risk; however, the magnitude of the impact is very much a function of the investor's time horizon. Endowments with a multi-decade time horizon are likely to be much better equipped to weather near-term volatility than an individual investor nearing retirement. The question of reinvestment is equally important, and risk and reward associated with divestment are intricately linked to the decision about how to reinvest. As with the original divestment question, time horizon plays a critical role influencing the success or failure of a given strategy.

We're fascinated by the debate over fossil fuel divestment, finding it an important debate in social terms but also challenging in intellectual terms. We've tried to leave our personal biases out of this study, to present as reasoned and objective an analysis as possible. We've reviewed other studies that we think fall short of our intentions, appearing to tilt arguments in a certain preconceived direction by using stale data, unrealistic assumptions or exaggerated arguments in support of one side or the other. We encourage readers to look at both the conclusions and the assumptions in published studies (including our own!) and to maintain a critical point of view towards the published findings.

About the Authors

Daniel Kern, CFA, President, Chief Investment Officer, Advisor Partners

Dan drives the vision and strategy for Advisor Partners and oversees all aspects of company operations. As CIO, he establishes the investment philosophy and process for Advisor Partners. Prior to joining the firm in 2011, Dan was Managing Director and Portfolio Manager for Charles Schwab Investment Management. He managed asset allocation funds, including target funds, from October 2008 to July 2011. Prior to 2009, headed Schwab's product development and served as CFO of a fund company. Before Schwab, he was Managing Director and Principal for Montgomery Asset Management.

Dan is a graduate of Brandeis University and earned his MBA in Finance from the University of California, Berkeley. He is a CFA Charterholder and a former president of the CFA Society of San Francisco.

Gerard Cronin, CFA, Portfolio Manager, Advisor Partners

Gerard is responsible for asset allocation models and for the selection of ETFs and mutual funds for multi-manager products at Advisor Partners. He also assists in the ongoing oversight of portfolios, including construction, risk management and cash management. Previously, Gerard was a research analyst at Charles Schwab Investment Advisory, where he performed manager due diligence for separately managed accounts and mutual funds. He covered alternative investment strategies, specialty sector strategies and asset allocation investment strategies. Prior to his investment career, Gerard worked in the computer hardware and environmental services industries.

Gerard holds a BS in Civil Engineering from Carnegie Mellon University (CMU) and an MBA from CMU's Tepper School of Business. He is a CFA Charterholder and teaches in the CFA Society of San Francisco's exam review program.