The Nelson A. Rockefeller Center at Dartmouth College
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Policy Research Shop

DIVESTMENT FROM FOSSIL FUEL INVESTMENTS

An Analysis of Potential Impacts and Strategies

Presented to the Vermont Senate Government Operations Committee

PRS Policy Brief 1314-01
February 27, 2014

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This report was written by undergraduate students at Dartmouth College under the direction of professors in the Rockefeller Center. The Policy Research Shop is supported by a grant from the Fund for the Improvement of Postsecondary Education (FIPSE). The PRS reports were developed under FIPSE grant P116B100070 from the U.S. Department of Education. However, the contents of the PRS reports do not necessarily represent the policy of the U.S. Department of Education, and you should not assume endorsement by the Federal Government.

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EXECUTIVE SUMMARY

Vermont is currently evaluating whether or not to divest its pension plan from holdings in the fossil fuels industry. This report reviews the crucial elements behind the decision to divest. It addresses the legal and fiduciary impacts that frame the decision to divest, as well as the possible effects on CO_2 emissions and fossil fuel industries. Following these considerations, it concludes with a discussion of divestment strategies. Ultimately we find that the decision to divest is heavily constrained by laws governing fiduciary duty. For divestment to proceed, current law states that any pension changes must have a positive or neutral effect on the financial health of the pension portfolio.

After a brief review of the history of the divestment movement, the report considers the importance of fiduciary duty and its implications for the divestment movement. The report then outlines the three major possible financial impacts of divestment: the diversity penalty, transaction costs, and avoidance of the carbon bubble. The first two will likely have a negative impact on the portfolio while the latter will likely have a positive impact. The range of academic research on these implications is presented to help lawmakers make informed decisions on the relative weight of each. Divestment efficacy is then addressed after considering the financial impacts in the decision-making process. Divestment is determined to be most efficacious in its ability to stigmatize the fossil fuel industry by generating considerable media attention. The report concludes with a discussion of divestment strategies.

1. BACKGROUND

Fossil fuel divestment is a climate change initiative that urges university systems, companies, municipalities, and other entities to divest from the world's largest coal, oil, and gas companies. This environmental initiative hopes to reduce CO_2 emissions while avoiding other potential economic impacts.

Fossil fuel divestment is a direct activist response to climate change, a phenomenon that is nearly universally accepted by the international scientific community. Rising concentrations of CO_2 pose a significant risk to the earth's climate by trapping heat from the sun into the earth's atmosphere resulting in a warmer global climate. Burning fossil fuels releases carbon into the atmosphere, accelerating this effect. The logic behind divestment is that minimizing financial support of fossil fuel industries will draw attention to this issue, and slow the global output of CO_2.

In the past decade, the fossil fuel divestment campaign has gained traction and popularity. Representatives from Seattle and San Francisco (both considering divestment) cited the average pension portfolio being comprised of 2 percent to10 percent fossil fuel stocks. Both cities were at the low end of this range (San Francisco 3.2 percent; [1] Seattle 4.44 percent).[2]According to 350.org, $39.7 million of Vermont's $3.8 billion pension

plan is invested in fossil fuels (in Carbon Tracker's top 200 fossil fuel companies).[3] This amounts to only 1.04 percent of the portfolio.[*]

Historically, divestment is not an uncommon form of social activism. Two prominent social activist campaigns, the South African anti-apartheid movement and the anti-big tobacco campaign, used divestment extensively. The South African anti-apartheid campaign spawned federal and statewide legislative action. Scores of states and cities divested or levied economic sanctions against companies that did business in South Africa. The tobacco divestment campaign was far more limited. Beginning in the early 1990s, activist health groups and social welfare foundations began lobbying state and federal governments to divest their holdings in tobacco companies, principally Philip Morris. This campaign began at colleges and universities. Trustees and students advocated that supporting big tobacco was immoral because it was funding an industry that claimed thousands of lives each year. On the whole, divestment ebbs and flows in the public discourse, and consequently has been used to varying degrees of success.

2. FIDUCIARY RESPONSIBILITY

Any discussion about divestment should stress fiduciary responsibility: the responsibility of a pension manager to his or her beneficiaries. Fiduciary duty provides an important moral and legal framework for investing the money of others. V.S.A. Title 3, Ch.17 reads:

> "The Vermont pension investment committee shall be responsible for the investment of the assets of the state teachers' retirement system of Vermont, the Vermont state employees' retirement system, and the Vermont municipal employees' retirement system pursuant to section 472 of this title, 16 V.S.A. § 1943, and 24 V.S.A. § 5063. *The committee shall strive to maximize total return on investment, within acceptable levels of risk for public retirement systems, in accordance with the standards of care established by the prudent investor rule* under 14A V.S.A. § 902"[4] (emphasis added).

There has been considerable discussion surrounding the implications of fiduciary duty for divestment movements. Fiduciary responsibility does not necessarily preclude socially responsible investment, but it does prohibit the sacrifice of financial returns for social reasons. Nevertheless, there is considerable leeway for the investor to make private investments. This includes a mandate to judge the value of an investment at the present time rather than looking solely at historic performance (which becomes important in considerations of the Carbon Bubble). Furthermore, Modern Portfolio Theory (and V.S.A. § 902) takes a holistic approach, one that sees risk as more than a simple sum of

[*] VPIRG presents a even lower number.

each investment. This allows the investor the ability to minimize the effects of diversity lost through divestment.

As Vermont's laws currently stand, the pension board can only divest fossil fuel funds if there is a reasonable argument that returns will not be adversely affected. This could be changed by the legislature, but Vermont has adopted the Uniform Prudent Investor Act (UIPA).[5] UPIA is a national framework, adopted by 44 states, that standardizes fiduciary responsibility. Standardization of responsibility is key, as deviating from the act would likely decrease the probability of passing a divestment bill and create unnecessary complications to the legal system.

3. FINANCIAL IMPACTS ON PORTFOLIO

As discussed above, the laws surrounding fiduciary duty confine Vermont's pension plan so that socially-responsible investing should be undertaken only if it can reasonably be assumed to have a neutral or beneficial effect on future returns. Consequently, it is important that all decisions regarding fossil fuel divestment are made with the financial health of the fund in mind. While these laws require that the decision whether or not to divest must be argued on purely financial grounds, there are still valid arguments both for and against divestment. There will be many financial impacts associated with divestment, some larger than others. The direction of these impacts is contradictory; some will be positive while others will be negative. The argument comes down to the relative weight of each impact.

3.1 Financial Impacts Overview

The following section gives a *brief* introduction to the scope of potential impacts of divestment on an actively-managed pension portfolio as well as any general consensus that has emerged from literature on the topic. It is followed by sub-sections which elaborate on each element.

Early discussions of divestment generally focused on the loss of a "sin stock premium." This theory centered on the idea that immoral companies cut costs associated with moral practices and are more profitable. Most studies suggest that this impact is nonexistent because moral practices also bring financial benefits (like increased worker retention and better brand image) that balances any lost revenue.[6] Other fossil fuel asset effects, based on specific tracking patterns of fossil fuel stocks (relative to inflation and oil prices), have been a concern of many pension boards considering divestment.[7] Consensus suggests that these can be canceled out through smart new investments and have a negligible impact on the portfolio. In light of this, there remain three relevant effects on the decision to divest. Two have negative impacts on the portfolio, and one has a positive effect.

The diversity penalty and transaction costs will have negative financial implications for the pension portfolio. The diversity penalty relates to the fact that removing fossil fuel

stocks shrinks the investable universe, decreasing potential diversity and therefore increasing risk. Estimates of the cost of this effect range from $270 million over 20 years for a $1 billion pension plan[8] to only 0.0002 percent.[9] The methodology used to create the higher end of these estimates has been questioned academically, but the true cost is likely to be somewhere between these extremes. The other negative effect is transaction costs. Transaction costs are the brokerage, research, and managerial fees associated with transitioning an account from fossil fuels. A study commissioned by Seattle estimated these to be approximately $1 million for Seattle's $2.2 billion dollar pension plan.[10] How this scales to Vermont's accounts is unclear, but $400,000 is a reasonable estimate of Vermont's transaction costs. [†] To place these numbers in the overall context of how much Vermont currently spends on portfolio maintenance, see the transaction costs section (3.2.4).

On the other side of the argument is the carbon bubble. The carbon bubble attempts to predict the market effects of climate change. Climate change will have significant impacts on portfolios. Fossil fuel stocks are likely to lose significant value because of climate change, especially if legislation is passed.[11] Exact estimates of the benefits of avoiding the carbon bubble's impact of fossil fuel stocks are not available, but the magnitude is likely to be large (oil and gas portfolios have been projected to lose between 40 to 60 percent of their value). The argument essentially hinges on the magnitude of the beneficial effects of divestment in a carbon bubble context versus the combined magnitude of the diversity penalty and transaction costs. Divestment can be responsibly considered only if the positive is found to balance or outweigh the negative.

3.2 In Depth Analysis

Below is a more thorough review of the literature surrounding each impact of divestment, offered to aid lawmakers in their assessment of relative value.

3.2.1 Sin Stock Premium

The sin stock premium is the idea that morally bad companies tend to have higher returns. The idea is that, by foregoing morally responsible activities such as community cooperation and environmental protection projects, companies cut costs that do not contribute to increased revenue. Numerous studies have attempted to determine the validity of this idea. A report, issued in 2007 by the United Nations Environment Programme's Finance Initiative and Mercer, conducted a thorough literature review and concluded that that there was no penalty or benefit to creating a socially responsible portfolio.[12] A table summarizing their results can be found in Appendix A. Different studies returned different results (both positive and negative) based on what time period and subset of stocks they reviewed. The variability of results supports the conclusion of

[†] Calculated from 350.org's estimate of Vermont fossil fuel holdings and a 50 basis point loss on the buy and sell side calculated in the Seattle City Employee's Retirement System's study.

most studies: that portfolios including sin stocks have returns no better or worse than portfolios excluding them. A number of reasons are suggested for the similarity of returns. All condense to the same general reason: the cost of morally responsible projects is offset by the benefits they bring. Increased worker retention, fewer litigation costs, more favorable government treatment, and increased sales are just a few examples. Overall, the literature discredits the idea of a sin stock premium.

3.2.2 Fossil Fuel Asset Effects

In our investigation of the risks of fossil fuel divestment, we uncovered that the specific nature of fossil fuel stocks raises additional concerns. Fossil fuel stocks are highly sensitive to oil prices. This is one of the reasons the carbon bubble makes them particularly risky. However, it also means that they perform particularly well when oil prices are rising. Advisor Partners notes that when oil prices are rising quickly (from 2007 to 2009) a back-tested fossil fuel-free portfolio loses returns relative to the S&P 500.[13] However, they note that a divested portfolio can mitigate this risk by investing in companies that do well in rising oil price environments, Treasury Inflation Protected Securities (TIPS), and companies in commodity-producing countries. All of these assets will perform well with rising oil prices, so exposure to them will compensate for the lack of exposure to the oil and gas industry.[14] TIPS will be resistant to the effects of the carbon bubble because they are linked to fossil fuel performance only through inflation. Commodity-producing countries might also suffer from the carbon bubble, but likely not as much as fossil fuel assets.

Jeremy Pollock, an aide to John Avalos,[‡] said that, in the initial meeting of the pension board to consider divestment, one of the main concerns of the board members was the effect on inflation protection. They were worried that, because fossil fuel stocks track closely with inflation, removing them might expose the portfolio to increased risk in times of high inflation.[15] This is especially concerning because one of the likely long-term market effects of global warming is inflation. Fossil fuel assets track well with inflation because they are upstream commodities, which are highly sensitive to the commodities market and therefore positively correlated with inflation. Many Master Limited Partnerships (MLPs), another common inflation protection asset, are also fossil fuel related. Moreover, many MLPs are highly fossil fuel derivative and are likely to suffer from carbon bubble effects. Pollock noted that later talks with financial professionals led him to believe that it was possible to hedge against the increased risk with other assets. Our research found that TIPS and Real Estate Investment Trusts (REITs) also track well with inflation. Furthermore, there are other upstream commodities that behave similarly to fossil fuel stocks. Agriculture, steel, utilities, and chemicals are a few examples.[16] In short, there seems to be other assets to cover inflation risk, though there will be a diversity loss in the portfolio's inflation protection.

[‡]Avalos is on San Francisco's Board of Supervisors, which made the decision to commit San Francisco to divestment.

3.2.3 Diversity Penalty

The diversity penalty is the financial impact most often discussed in divestment debates. By diversifying a portfolio, the investor is able to minimize risk because investments often respond in different ways to different market events. Conversely, by decreasing diversity, it makes it more difficult for to reduce asset-specific (unsystematic) risk. Divestment will increase portfolio risk because it will limit the available universe of stocks, confining investors' ability to hedge risk. Every report on the financial effects of divestment acknowledges that it will increase the risk associated with portfolio diversity. They only differ on the *amount* of risk this entails. It is important to note that some studies have shown that fossil fuel stocks pose unreasonably high risk due to climate change that is not demonstrated in past performance, which could outweigh the increased diversity risk (see Carbon Bubble for more details).

Estimates of divestment risk have been wide-ranging. Unsurprisingly in this politicized debate, the two most cited articles have represented the high and low ends of the range of estimates. MIT economists Timothy Adler and Mark Kritzman make the high end of diversity cost estimates in their paper *The Cost of Socially Responsible Investing* published in 2008.[17] Additionally, Mark Kritzman published an op-ed in The Chronicle of Higher Education in which he posited that a $1 billion endowment would lose $270 million over 20 years from divestment (which represents 1.04 percent).[18] Swarthmore College used these numbers to calculate a cost of divestment before ultimately deciding not to divest.

Since its publication, the results of the Adler-Kritzman paper has come under serious scrutiny. Paul A. Ruud, a professor of economics at Vassar College, published a paper in July 2013 that points to holes in their methodology.[19] Ruud questions the fact that Adler and Kritzman fail to report risk-adjusted returns, and the fact that none of the inputs into the mathematical model are supported with real world data. In short, though Adler and Kritzman forecast dire results because of a constrained market, the investment community questions their methodology.

On the opposite end of cost estimates is a study by the Aperio Group.[§] They use a proprietary model to predict a small increase in risk. Noting that increased risk ought to be compensated with higher returns, they were able to forecast the monetary value lost from the diversity penalty. Aperio estimates that removing the "Filthy Fifteen" from a portfolio would cost the investor returns of 0.0002 percent.[20] Removing the entire oil and gas industry would cost the investor returns of 0.0034 percent.[21] The study also runs a historical back test of the results. Removing the entire oil and gas portfolio, they find that

[§] The Aperio Group is an investment group focused on maximizing post-tax returns and incorporating client values. It has $2.1 billion in assets under management as of 2011, a relatively modest amount.

over the past 25 years there was a tracking error** of 0.78 percent, slightly higher than the predicted 0.60 percent.[22] Overall, by using industry standard risk modeling, the Aperio Group study calls the significance of the diversity penalty into question .

A similar but less cited study by Advisor Partners also calculated the increased risk associated with divestment. They found that divesting from the entire Fossil Fuel industry (removing 15 percent of the investible universe) would result in a 1.57 percent increase in tracking error. They conclude that this incremental increase in risk is relatively low.[23] Using the Aperio method of calculating return penalties, we calculated the return penalty from the Advisor Partners' tracking error to be 0.02301 percent.†† This is slightly higher than the Aperio group study but still significantly lower than the Adler-Kritzman predictions.

Clearly there is a wide range of literature estimates on the cost of the diversity penalty for a portfolio divesting from fossil fuels. However, the nature of the studies seems to suggest that the actual penalty will be toward the lower end of the range. The Arpaio Group and Advisor Partners models are considered industry standards and are far more complex than the Adler-Kritzman model. Their use in the industry and fact that their returns are risk-adjusted leads us to lend more credibility to the latter two papers. The relatively low percentage of Vermont's pension portfolio invested in fossil fuels only further decreases the effects of the diversity penalty. This suggests that the diversity penalty may not be that large of an issue because of the relatively small losses it generates.

3.2.4 Transaction Costs

There is a material cost associated with transferring stocks in terms of brokerage, advisor, and research fees. The Seattle City Employee's Retirement System (SCERS) commissioned a report from its financial advisor on the costs of divestment. The report calculated that the transaction cost of moving stocks out of the energy sector to be 0.5 percent on both the buy and sell side. This amounted to a transaction cost of close to $1 million for the $2.2 billion Seattle pension plan.[24] Though Seattle's pension plan is smaller than Vermont's, it has more value invested in fossil fuels ($97.7 million as compared to Vermont's $39.7 million). It is not entirely clear how this cost would scale to Vermont's $3.3 billion pension plan. Using the 50 basis point estimate from the SCERS memo, Vermont could expect to lose $400,000 in transaction costs. The 50 basis point estimate might not directly apply to Vermont. If some of the costs are due to baseline research or if Vermont's larger total pension size makes it more difficult to extricate fossil fuel stocks, the total transaction cost could be more substantial. Also, the SCERS report looked at the effects of divesting entirely from the energy sector, which

** A measure of predicted variability from a target benchmark, used to assess risk.

†† From the tracking error of 1.57 percent we calculated an incremental risk of 0.06971 percent. Multiplying this number by Aperio's calculated market Sharpe Ratio of 0.33 gave us our estimated returns.

could have artificially inflated the cost. What is clear is that there will be a material cost to selling and replacing fossil fuel stocks. In light of the possible carbon bubble, some policy makers (including the San Francisco Board of Supervisors) see this as a simple cost of prudent investment.

To put the transaction costs in context, we researched typical pension fund administrative costs. Below are displayed median percent costs for different types of accounts.

Figure 1: Callan Median Expense Ratios[25]

Though we cannot speak to the exact nature of Vermont's fund, Vermont has a diversified portfolio that is likely comprised of some mixture of these types of accounts. For a $3.8 billion fund, these percentages translate to somewhere between $19 million and $52.8 million a year in administrative costs. It is unclear whether these transaction costs will be in addition to, or included in, the standard administrative costs of the fund. In other words, it is possible that some portion of the transaction costs is already included in the typical administrative costs of the fund.

3.2.5 The Carbon Bubble

Though poorly understood, the Carbon Bubble potentially poses huge risks to investment portfolios. The theory behind the Carbon Bubble suggests that the stocks of fossil fuel companies are currently significantly inflated because of the assumption that proven reserves will be sold (and burned). The term "Carbon Bubble" comes from a 2011 report by the Carbon Tracker Initiative, which tracked the amount of carbon currently owned by fossil fuel companies. The report derived a global carbon budget from the 2010 Cancun Agreement, in which member countries of the United Nations Climate Change Conference agreed that global warming must be limited to 2°C of preindustrial levels. Carbon Tracker estimated that only 20 percent of the world's proven carbon reserves can be burned to stay below 2°C of global warming.[26] This could result in fossil fuel stocks losing 40 percent of their value.[27]

From a divestment standpoint, most other published research echoes the Carbon Tracker Initiative's report. Mercer, a global financial services company also published a report in 2011 entitled *Climate Change Scenarios: Implications for Strategic Asset Allocation*. The report looks at the impacts of climate change on all investments. The combination of future carbon costs and increasingly competitive technology leads Mercer to conclude that equities in the fossil fuel industry are the least resilient to climate change (along with utility equities). Investments in fossil fuels significantly add to portfolio risk and are

likely to suffer if any climate policy is enacted.[28] Lehman Brothers published a report in 2007 that attempted to gauge the impacts of climate change by sector. They too concluded that the integrated oil and gas sector would suffer future losses. Though they expressed considerable faith in the oil and gas sector's ability to adapt (we discuss this aspect under divestment efficacy), they noted that they would face a number forces that could negatively impact stock prices. These included decreased demand and increased competition from subsidized technologies, largely as a result of policy. They also noted that reputational effects could further decrease demand and increase litigation costs.[29] In January of 2013 HSBC, a British multinational bank, produced a report assessing the risk to the oil and gas sector from the possibility of unburnable reserves. They calculate that the effects of a low carbon future will drive oil prices to $50 a barrel and amount to a loss of 40-60 percent of market capitalization for a viable oil and gas portfolio.[30]

The important implication of these findings for divestment is the strong possibility that markets are currently carrying a carbon bubble. For example, when Shell reduced its estimated reserves 20 percent in 2004, its stock price dropped 10 percent within the week. Furthermore the possibility exists that a successful divestment campaign will increase uncertainty around fossil fuel stocks for neutral investors, increasing the discount rate and lowering their current value. Tom Steyer, founder of Farallon Capital Management (which manages $21.5bn in assets) and environmental activist, encapsulates this carbon bubble argument by saying, "good investors rarely look backward."[31] The carbon bubble cannot be quantified because we have yet to experience climate change, but it will certainly affect market structures. It is important, as a fiduciary, to take this observation into account.

Climate change will have a significant effect on financial markets. Fossil fuel companies will suffer decreased demand because of new policy and technologies, and will therefore feel these effects most acutely. Decreased demand will lower prices and force the cancelation of some projects, shrinking reserves. From a fiduciary standpoint, the reports point to a market failure to correctly price fossil fuel stocks. A prudent investor who believes there will be policy to address climate change will take into account the strong possibility that fossil fuel stocks are overvalued. Divestment, in this sense, could be a financially responsible strategy to avoid future losses when the carbon bubble pops. From this standpoint, it would be prudent to divest from fossil fuels to avoid the collapse in value associated with the market realizing that they are overvalued.

4. DIVESTMENT EFFICACY

4.1 Direct Financial Impacts

Critics of divestment criticize the notion that it will hurt the fossil fuel industry's bottom line. 350.org's website professes that the divestment movement can "hit the fossil fuel industry where it hurts – their bottom line." But even Bill McKibben, one of the

movement's most prominent leaders, has questioned this notion.[‡‡] Additionally, the Smith School of Enterprise and the Environment at the University of Oxford issued the most comprehensive investigation of divestment efficacy yet written. In the report, they state that divestment is likely to have only limited effects on fossil fuel equity and debt. Looking at the divestible universe of university endowments and public pension funds, they estimate that the upper limit of divestment is $240-$600 billion. This, they determine, is relatively small compared to fossil fuel companies' value. The report also notes that it is unlikely that anywhere near the entire divestible universe would get divested. They cite the fact that only 80 out of 1000 surveyed organizations have substantially divested from tobacco. Furthermore, the report emphasizes that neutral (non-divesting) investors would quickly pick up the divested stocks so there would be minimal effect on stock prices. The effect might be slightly higher for coal stocks, because they are less liquid, but it is still likely to be minimal.[32]

It is also important to realize that fossil fuel profits are not generated from stock prices. For companies like Exxon-Mobil profits are derived from selling oil, stocks are used to raise capital and distribute risk. Most oil companies have large enough profits to fund capital improvements and enough cash-on-hand to stay liquid without stock sales. In fact, many of the largest oil companies are privately owned (like Koch Industries), and the others have been buying back large amounts of stock over the past five years. Outside of unlikely precipitous declines, oil companies are unlikely to suffer direct losses of profit or have to change their business models.

4.2 Indirect Impacts

The Oxford report found that most of divestment's effect would come from indirect impacts. The most likely way the real market value of the firm would decline as a result of divestment is through stigmatization. The report defines organizational stigma as, "a label that evokes a public perception from a social audience that a target organization, 'possesses a fundamental, deep seated flaw that de-individuates and discredits the organization'"[§§] The Oxford report notes that a divestment process would be most effective if it were to substantially change the public perception of the fossil fuel industry.[33]

Stigmatization can have far reaching negative indirect impacts on companies, impacts that the Oxford report claims could dwarf potential direct impacts. A bad media image, brought on by the divestment movement, could significantly increase operating costs for fossil fuel companies. A bad image can drive away suppliers, subcontractors, and potential employees. Politicians are also less likely to work with stigmatized companies, thereby decreasing government contracts and subsidies. The combined effect of these increased operating costs will be an increase in energy prices. Stigma could also directly

[‡‡] In a 2013 interview McKibben said, "…not that we can bankrupt Exxon---we can't."
[§§] The definition was taken from "A General Theory of Organizational Stigma" (Belsito et al, 2009).

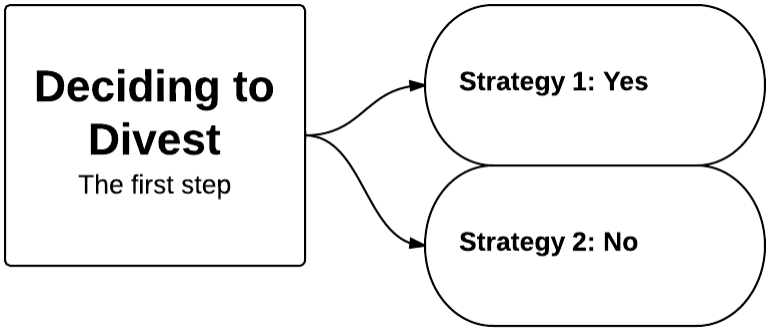
dissuade customers and drive them to more sustainable energy sources, though this effect is likely to be small. The combined effect of higher prices and slightly lower demand is less oil consumption (the desired effect of divestment).The Oxford report found that the larger effect of stigmatization was its ability to drive government action. It states, "in almost every divestment campaign we reviewed from adult services to Darfur, from tobacco to South Africa, divestment campaigns were successful in lobbying for restrictive legislation affecting stigmatized firms." The fossil fuel campaign has the possibility to drive public opinion and force legislation on the issue.

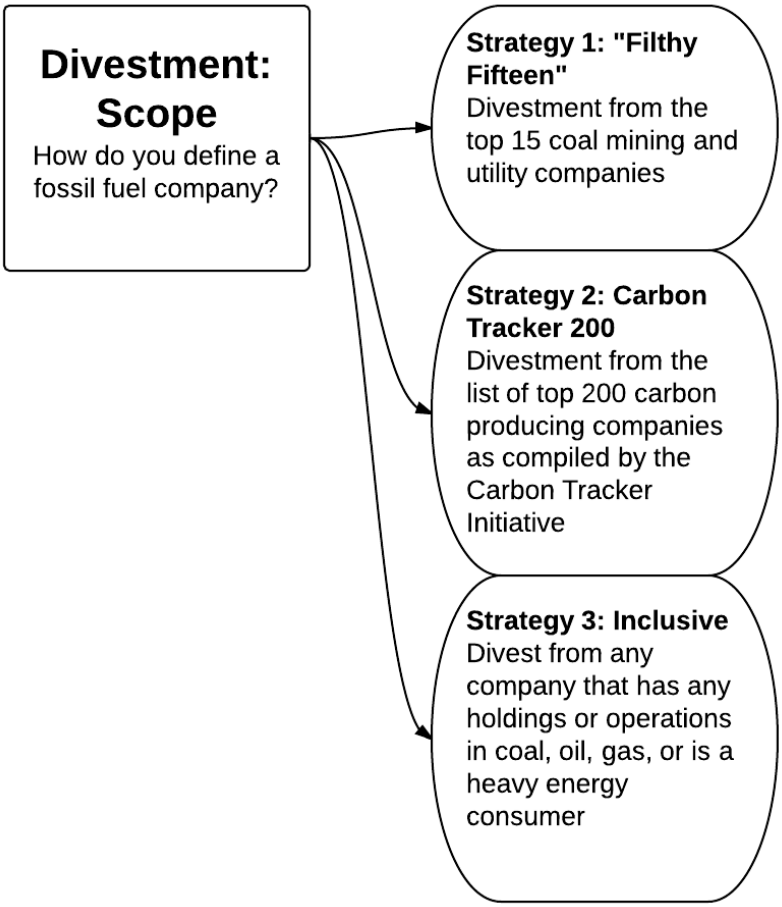
In short, divestment itself is unlikely to autonomously lower CO_2 emissions. The indirect impacts of divestment are much more likely to have effects on fossil fuel companies than are the direct impacts. It is in this capacity that the divestment campaign has the greatest chance of affecting fossil fuel consumption. Divestment has the potential to be effective by stigmatizing fossil fuel companies and driving public opinion in order to create policy action. Christian Parenti, in an interview on Democracy Now, expressed concern that though the divestment campaign is creating a "political spectacle," it has so far failed to create "political action" and might be distracting from the real issue (government action).[34] Should Vermont decide to divest its pension accounts, it has the possibility to create substantial media attention. If the media spotlight generated by Vermont's divestment leads to global warming policy from Washington and decreased fossil fuel use from citizens, divestment is more likely to have a lasting impact. But much of this is beyond the purview of the Vermont legislature alone.

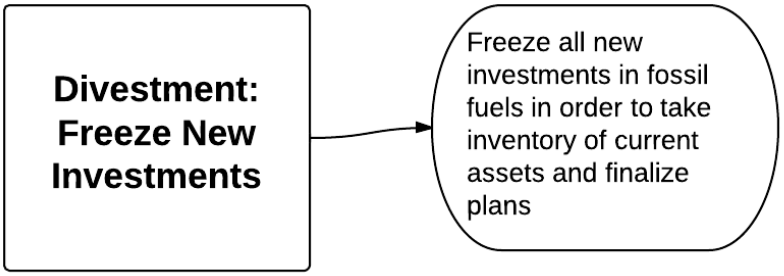
5. STEPS TOWARD DIVESTMENT

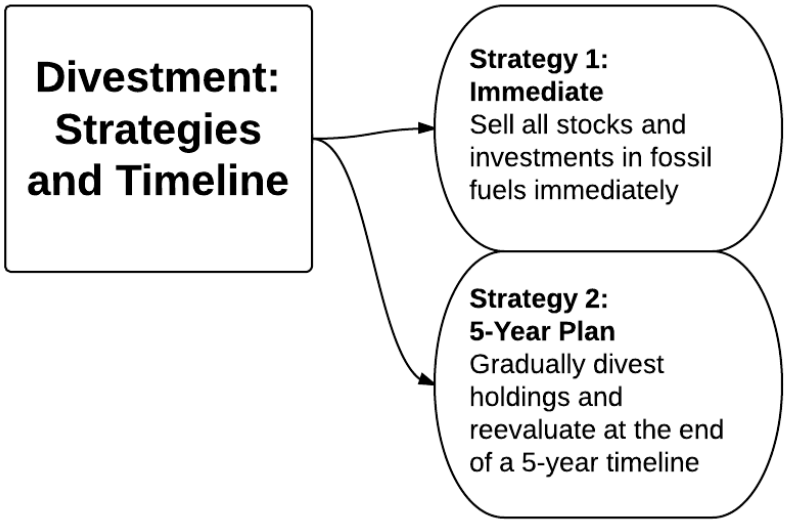
After analyzing financial implications, it is equally important to consider the manner in which any institution would divest their holdings. Fossil fuel divestment can occur through numerous different strategies, all of which affect how portfolios are rebalanced, how the public responds, and how the act of divestment will influence the future choices of major fossil fuel companies.

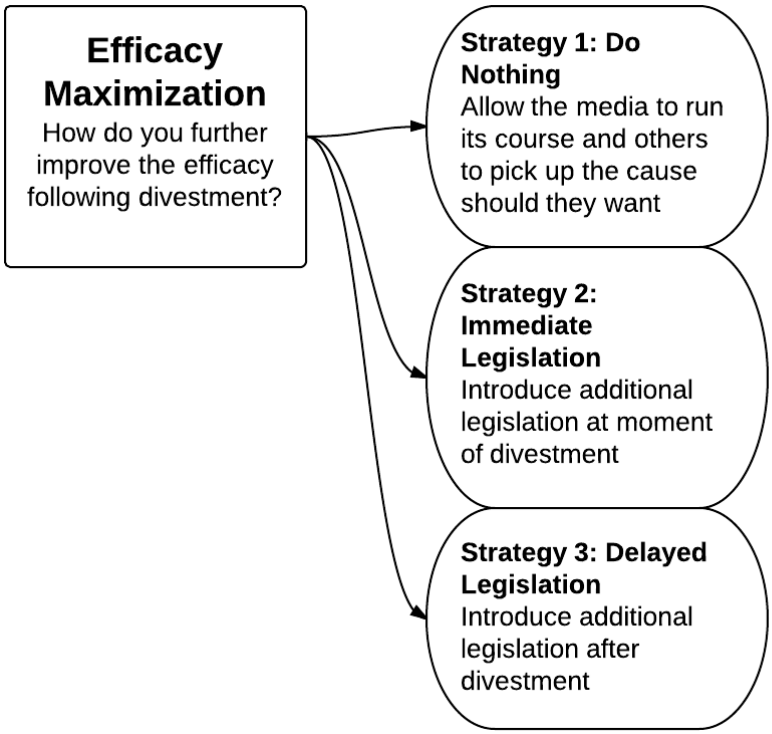
Included below are graphics exploring potential divestment options. These plans should be made prior to beginning the divestment process. They address the main stages of divestment: deciding to divest, divestment, maximizing efficacy, and reinvestment. Furthermore, we have included three main steps within divestment (deciding the scope, freezing new investments, and setting a timeline) that are also depicted in the illustrations below. Following interviews and research, these graphics include stages, steps, and strategies for the divestment process that are common among current participants and players in the fossil fuel divestment movement.

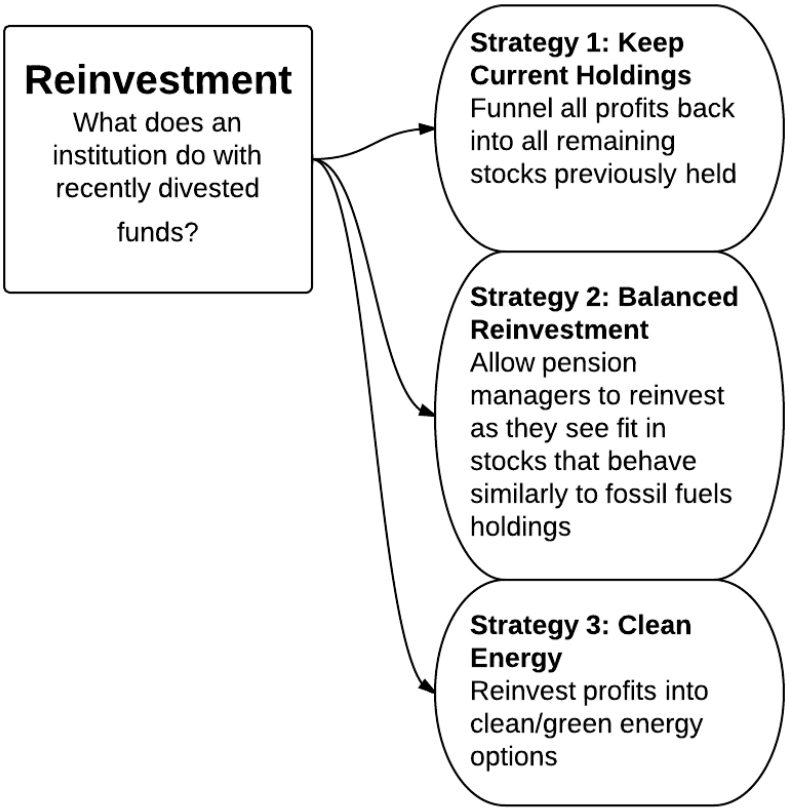

Deciding to Divest
The first step
Strategy 1: Yes
Strategy 2: No


Divestment: Scope
How do you define a fossil fuel company?
Strategy 1: "Filthy Fifteen"
Divestment from the top 15 coal mining and utility companies
Strategy 2: Carbon Tracker 200
Divestment from the list of top 200 carbon producing companies as compiled by the Carbon Tracker Initiative
Strategy 3: Inclusive
Divest from any company that has any holdings or operations in coal, oil, gas, or is a heavy energy consumer


Divestment: Freeze New Investments
Freeze all new investments in fossil fuels in order to take inventory of current assets and finalize plans


Divestment: Strategies and Timeline
Strategy 1: Immediate
Sell all stocks and investments in fossil fuels immediately
Strategy 2: 5-Year Plan
Gradually divest holdings and reevaluate at the end of a 5-year timeline


Efficacy Maximization
How do you further improve the efficacy following divestment?
Strategy 1: Do Nothing
Allow the media to run its course and others to pick up the cause should they want
Strategy 2: Immediate Legislation
Introduce additional legislation at moment of divestment
Strategy 3: Delayed Legislation
Introduce additional legislation after divestment



The above stages include numerous intricacies to consider and discuss when preparing to move forward with divestment. Each financial move will impact the social efficacy and financial profitability of divestment. The following subsections will detail the overview from the graphics above.

5.1 Deciding to Divest

Though this section chronicles the stages through which one would divest, it is important to acknowledge that choosing not to divest is still an option. Fossil fuel divestment calls attention to climate change, but numerous institutions have also garnered significant attention by considering (but not going through with) divesting. Either decision will have significant impacts on a national divestment movement. Following this section are the details on how to proceed with divestment. The decisions that will arise through this outlined process are important to consider, as they should be part of the decision to divest and will have to be discussed and explained irrespective of the outcome of one's divestment process.

5.2 Divestment

If the decision to divest is then made, divestment itself requires three steps. They are: 1) determining the scope of divestment, 2) freezing new investments, and 3) setting a timeline for shedding fossil fuel assets.

5.2.1 Scope of Divestment

One of the most crucial details is how to define a fossil fuel company. Most organizations follow the Carbon Tracker Initiative's top 200 list. These are the coal, oil and gas companies that have the greatest estimated carbon reserves, measured in GtCO2. The question for institutions considering divestment is to what extent they want to divest from these top 200 companies. Those most engaged in the fossil fuel divestment movement argue for complete divestment from all Carbon Tracker top 200 companies in addition to a continuous "unwinding of commingled holdings."[35] Divesting all 200 would cause a significant overhaul of their investment portfolios (both strategically and in terms of administrative costs) and cut diversification (due to the sheer number of companies being phased out). Others consider the "filthy fifteen" as a suitable alternative that does not have as significant financial implications but still sends a firm message against carbon emissions and the burning of fossil fuels. The difference in media coverage between these two alternatives is also likely to be minimal. As stated in previous sections, the "filthy fifteen" have an increased tracking error of only 0.14 percent compared to a 0.5978 percent increase if one were to divest from all 200.[36] Increased tracking error corresponds with increased portfolio risk, but leaving some fossil fuel companies can also leave the portfolio exposed to risk from the carbon bubble.

Pax World Management, a firm committed to Sustainable Investing strategies and one of the first to implement environmental social and governance (ESG) factors into its decision-making, advances a different argument. Managing $2.8 billion in assets, Pax World advocates a hybrid approach that they call "partial avoidance" or "best-of-class."[37] This approach "avoids investing in fossil fuel companies that contribute the most to environmental problems and climate change while favoring investment in those (as well as companies in other sectors with significant environmental impacts) with stronger commitments to renewable energy, energy efficiency and the transition to a sustainable economy."[38] Though this practice is generally not seen as divestment, because it retains stocks in the most environmentally-responsible fossil fuel companies, it does provide a viable alternative should the legislature decide not to divest. However, given that the primary effect of divestment is through industry stigmatization, this approach might lessen that effect.

Pax World argues that institutions should not give up their "seats at the table." Once you have sold your stock, you are no longer a shareholder and therefore no longer have a say in company policy of future decisions. Shareholder advocacy is an often effective (though long and grueling) process to facilitate change. Remaining a part of some

companies could help ensure that fossil fuel companies stay mindful of environmental issues and continue to pursue and invest in alternative energies for the time being. Fortunately, divestment does not necessarily preclude shareholder advocacy. Divesting shareholders can undergo shareholder advocacy over the course of the five years it typically takes to divest fossil fuel stocks. More importantly, retaining $2,000 of assets in each fossil fuel company allows the pension plan to continue to file shareholder resolutions.[39] Retaining $2,000 is unlikely to diminish media impact, but allows shareholder advocacy to continue indefinitely.

5.2.2 Freeze Investments

Should the legislature decide to divest, the first step is typically to freeze all further investment in fossil fuels. This gives the pension board time to consider what assets contain fossil fuel holdings. More importantly, it gives the pension board time to research reinvestment strategies. Most proposed divestment plans agree that the most responsible course of reinvestment for the legislature involves delegating reinvestment duties to the financial experts on the pension board; therefore, the pension board requires time to formulate a reinvestment strategy. During this time period, it is counterproductive to invest in new fossil fuel assets. Most plans for divestment also reaffirm their commitment to shareholder advocacy immediately.

5.2.3 Divestment Timeline and Strategies

Once decision-makers have established their scope of divestment, they must determine a timeline. Many continue with a stepwise approach that works within a five-year time frame. One detailed timeline that has been put forth states that by the end of year one, 50 percent of holdings will be divested, and by year three, the second 50 percent. Year five includes evaluating any remaining funds or assets that contain fossil fuels and creating a timeline for their divestment as soon as possible.[40] There is some variation but firms, universities, and all other institutions typically freeze all new investments then make decisions regarding from which companies to divest and then proceed with divestment from those selected within the next five years. For example, San Francisco State University has given itself a five-year divestment timeline but immediately divested from coal and fracking.[41] Any transition will take time and administrative resources. Those administrative costs are something to keep in mind for those institutions on strict budgets or those that would have to use taxpayer dollars to cover them.

5.3 Maximizing Efficacy

Should the legislature conclude that divestment is fiscally responsible, they may then choose to weigh the potential impacts of divestment on CO_2 emissions. But, as shown above, divestment alone has negligible effect toward this end. Therefore, if one of the goals of divestment is combatting climate change, then legislators may wish to think about following divestment with other actions.

If change is the goal, then one of the biggest areas of opportunity is the media. Divestment is a "hot topic" that will draw enormous media attention. Vermont might use this momentum to pass additional legislation at the time of divestment that would address this policy arena. Legislation could always also be introduced following divestment, in a different media context.

5.4 Reinvestment

An additional, critical consideration is what to do with the divested funds. Instead of merely channeling the funds into already held stocks and securities, many divestment advocacy groups advocate the reinvestment of funds into sustainable energy. Joshua Humphreys, a fellow at the Tellus Institute, was commissioned by several organizations (including 350.org) to write a paper about the possibilities of divestment and the options for such a move. After divestment, he sees two options: five percent reinvestment or total portfolio activation.[42] The first would simply insure that five percent of total funds are reinvested in sustainable solutions whereas the latter would activate the entire portfolio into being carbon- and climate-conscious.

Reinvestment in green stocks certainly sends a message to the public and throws support behind clean energy. A recent Aperio Group study (see Appendix B), however, shows that implementing positive screens such as renewable energy or other sustainable industries on top of fossil fuel divestment further increases tracking error.[43] This can lead to negative financial impacts on, and possible losses for, portfolios. Such losses could reflect negatively on the divestment campaign and make the institution appear as though it is more concerned with environmental issues than making prudent investments for its beneficiaries.

The representatives we spoke to from both Seattle and San Francisco noted that they anticipated leaving reinvestment up to the pension board. Modern Portfolio Theory allows significant ability to balance out new risks developed by divesting from fossil fuels, but the process is complex. As noted in the financial implications section, a well-researched mix of new investments can be used to balance out increased inflation risk. Reinvesting to best minimize divestment risk impacts is complex, but the pension board is made up of financial professionals well suited for the task. For this reason most divestment plans leave reinvestment up to them.

6. MEDIA IMPACTS

As a speculative calculation, should the state of Vermont chose to divest its pension fund it would garner significant media attention. As of writing, no U.S. state or sovereign body has opted to divest, either partially or fully. Given the attention that was accorded Unity College, (a small institution in Maine) when it divested from fossil fuels, the potential for

Vermont is enormous.[44] Keeping this in mind, framing and contextualizing Vermont's decision is crucial for sustaining and accurately reporting divestment.

CONCLUSION

In summation, divestment has had a long and varied history. Having been applied to political, health, and environmental arenas, divestment has demonstrated its tactical versatility. Despite its adaptability, divestment has its limits when applied to fossil fuel shares in pensions. Principally, pension divestment is limited by fiduciary responsibility. Given the legal requirements, divestment cannot be carried out if it negatively impacts returns. Although shifting towards investments in "socially responsible funds" which produce positive or even neutral returns is acceptable, adverse decisions are explicitly illegal without changes to existing legislation. Therefore, the decision of whether or not to divest needs to be framed through a financial lens before social arguments can even be taken into consideration.

In this vein, there are three main impacts of divestment that have been identified, each of which differs in terms of impact and time frame. The diversity penalty and transaction costs associated with divestment would negatively impact state holdings, as they increase risk and expenses in the short term. In contrast, the expected long term effect of the carbon bubble demonstrates that carbon has been overvalued and is likely to fall in price as climate change becomes more severe.

Moreover, not every divestment plan is created equal. There are several definitions and methods that can be applied when carrying out this goal. It is critical to assess how large divestment will be in terms of how many companies or shares it will address, as well as the time frame for its execution. In some instances, immediate freezing or selling of these assets could be construed as beneficial. In many others, a gradual phase-out may be more nuanced. In all, fossil fuel divestment is an intricate and complicated issue, and regardless of how the legislature decides to carry it out, there will be significant media attention following any legislative decision.

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APPENDICES

Appendix A: Summary of Additional Studies

Academic Studies

	Authors	Title of study	Time period of study	E, S or G	RI approach	Findings on ESG factors
1	Abramson, L. & Chung, D. (2000)	Socially responsible investing: Viable for value investors?	Sep 1990 - Mar 2000	ESG	Screening	positive
2	Barnett, M. & Salomon, R. (2006)	Beyond dichotomy: The curvilinear relationship between social responsibility and financial performance.	Jan 1972 - Dec 2000	E and S	Screening	neutral-positive
3	Bauer, R., Otten, R. & Rad, A. (2006)	Ethical investing in Australia: Is there a financial penalty?	Nov 1992 - Apr 2003	ESG	Screening	neutral
4	Bello, Z. (2005)	Socially responsible investing and portfolio diversification.	Jan 1994 - Mar 2001	Mainly S	Screening	neutral
5	Benson, K.L., Brailsford, T.J. & Humphrey, J.E. (2006)	Do socially responsible fund managers really invest differently?	Jan 1994 - Dec 2003	Mainly S	Screening	neutral
6	Brammer, S., Brooks, C. & Pavelin, S. (2006)	Corporate social performance and stock returns: UK evidence from disaggregate measures.	Jun 1997 - Jun 2002	E and S	Screening	neutral-negative
7	Chong, J., Her, M. & Phillips, G.M. (2006)	To sin or not to sin? Now that's the question.	Sep 2002 - Sep 2005	Mainly S	Screening	negative
8	Core, J., Guay, W. & Rusticus, T. (2006)	Does weak governance cause weak stock returns? An examination of firm operating performance and investors' expectations.	Sep 1990 - Dec1999	G	Activism	neutral
9	Derwall, J., Guenster, N., Bauer, R. & Koedijk, K. (2005)	The eco-efficiency premium puzzle. [1]	Jul 1995 - Dec 2003	E	ESG integration	positive
10	Geczy, C., Stambaugh, R. & Levin, D. (2005).	Investing in socially responsible mutual funds (working paper).[2]	Jul 1963 - Dec 2001	S	Screening	negative
11	Gompers, P., Ishii, J. & Metrick, A. (2003)	Corporate governance and equity prices.	Jan 1990 - Dec 1999	G	Activism	positive
12	Hong, H. & Kacperczyk, M. (2006)	The price of sin: The effects of social norms on markets (working paper).	Jan 1965 - Dec 2004	S	Screening	negative
13	Opler, T.C. & Sokobin, Jo. (1995)	Does coordinated institutional activism work? An analysis of the activities of the Council of Institutional Investors.	Jan 1991 - Dec 1993	G	Activism	positive
14	Orlitzky, M., Schmidt, F.L. & Rynes, S.L. (2003)	Corporate social and financial performance: A meta-analysis.[3]	Jan 1972 - Dec 1997	S, and E to a lesser extent	Screening	positive
15	Schröder, M. (2004)	The performance of socially responsible investments: Investment funds and indices.	Varied start date: mid-1990s - Sep 2002	ESG	Screening	neutral-positive
16	Shank, T. M., Manullang, D.K. & Hill, R.P. (2005)	Is it better to be naughty or nice?	Dec 1993 - Dec 2003	ESG, with more S than E and G	Screening	positive

17	Smith, M.P. (1996)	Shareholder activism by institutional investors: Evidence from CalPERS.	Jan 1987 - Dec 1993	G	Activism	positive
18	Statman, M. (2000)	Socially responsible mutual funds.	May 1990 - Sep 1998	Mainly S	Screening	positive
19	Statman, M. (2006)	Socially responsible indexes: Composition, performance, and tracking error.	May 1990 - Apr 2004	Mainly S	Screening	positive
20	Van de Velde, E., Vermeir, W. & Corten, F. (2005)	Corporate social responsibility and financial performance.	Jan 2000 - Nov 2003	ESG	ESG integration /Screening	positive

Broker Studies

	Authors	Title of study	Time period of study	E, S or G	RI approach	Findings on ESG factors
1	Dell, B., McMahon, N., Goller, A., & Gruber, S. (2007), Berstein Research	Berstein energy: An energy or environmental problem? The impact of CO_2 regulation on oil demand and alternative plays	Feb 2007	Mainly E	Thematic	neutral*
2	Bumm, P., Carballo, I., Halden, D., Lambert, P., Lamotte, C., Ocina, J.R., Patrick, D., Sikorsky, M. & Voisin, S. (2007), Cheuvreux	Biofuel challenges: A shift in leadership?	1990-2005	E	Thematic	neutral*
3	Tyrrell, M. & Brown, M. (2006), Citigroup Global Markets	Sustainability compendium: Updating our sustainable investable themes	Feb 2006	ESG	Thematic/ ESG integration	neutral*
4	Forrest, S., Ling, A., Lanstone M. & Waghorn, J. (2006), Goldman Sachs	Enhanced energy ESG framework	2004-2006	ESG	ESG integration	positive
5	Fox, M., Forrest, S., Ling, A. & Lynch, M. (2007), Goldman Sachs	Global food & beverages: Integrating ESG	1992-2006	ESG	ESG integration	neutral
6	Ling, A., Forrest, S., Mallin-Jones, P. & Feilhauer, S. (2006), Goldman Sachs	Global mining and steel: Integrating ESG	2002-2005	ESG	ESG integration	positive
7	Llewellyn, J. (2007), Lehman Brothers	The business of climate change: Challenges and opportunities	Feb 2007	Mainly E	Thematic	neutral*
8	Palmier, H. & Desmartin, J.P. (2006), Oddo Securities	Nanotechnologies: There are still plenty of opportunities and uncertainties at the bottom	2004-2015	E and S	Thematic	neutral*
9	Hudson, J. & Knott, S. (2006), UBS Investment Research	Alternative alpha: Infrastructure - The long view	Nov 2006	ESG	Screening	neutral
10	Garz, H. & Volk, C. (2007), WestLB Extra-Financial Research	What really counts. The materiality of extra-financial factors	2000-2005	ESG	ESG integration	positive

From The Asset Management Working Group of the United Nations Environment Programme Finance Initiative and Mercer. "Demystifying Responsible Investment Performance"

Appendix B: Effects of Environmental Screens or Engagement

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Carbon Divestment: What Are My Choices?

Investors such as endowments, pensions or individuals interested in introducing environmental screens or engagement can avail themselves of a very wide range of different ways to have their portfolios reflect their environmental values. The matrix below shows different choices, from doing nothing on the far left of the table, to implementing highly involved portfolios across negative screens, positive screens, private equity, proxy voting and shareholder engagement. Investors can incorporate their values in their portfolios across multiple gradations of strictness of screens.

Less Impact on Both ⟷ More Impact on Both

	No Env. Values in Portfolio	No Screening; Engagement & Proxies Only	Mild Negative Screens	Full Carbon Divestment	Divestment with Positive Screens	Divestment; Include Energy Private Equity
Negative Screens	*None*	*None*	*Limited, e.g. "Filthy Fifteen"*	*Exclude Main Carbon Industries*	*Exclude Main Carbon Industries*	*Exclude Main Carbon Industries*
Positive Screens (Renewable Energy or Other Investments in Sustainable Industries)	*None; renewable industries held at same weightings as public equity benchmarks*	*None; renewable industries held at same weightings as public equity benchmarks*	*None; renewable industries held at same weightings as public equity benchmarks*	*None; renewable industries held at same weightings as public equity benchmarks*	*Over-weight positive companies, but only public equities*	*Reinvest funds from divestment into both public and private equity*
Focused Proxy Voting	*None*	*Yes, if desired*	*Yes, if desired*	*Yes, if desired*	*Yes, if desired*	*Yes, if desired*
Shareholder Engagement	*None*	*Yes, if desired*	*Yes, if desired*	*Yes, if desired*	*Yes, if desired*	*Yes, if desired*
Environmental Advocacy	*None*	*Any positive impact from proxy voting or engagement*	*Any positive impact from proxy voting or engagement*	*Any positive impact from proxy voting or engagement*	*Proxy or engagement plus steering more public capital to impact firms*	*Proxy or engagement plus steering more public and private capital to impact firms*
Impact on Portfolio Risk and Return	*None*	*None*	*Extremely low tracking error, e.g. 0.14%*	*Moderate tracking error, e.g. 0.69%*	*Slightly higher tracking error, e.g. 0.98%*	*Potentially more significant impact on risk from over-weighting*

REFERENCES

[1] Interview Pollock, Jeremy. 03 December 2013.
[2] Interview Van Gorp, Allison. 04 December 2013.
[3] 350.org. "Divest Vermont From Fossil Fuels". Online. http://world.350.org/vermont/current-campaigns/divestment/
[4] Vt. Stat. Ann. tit. 3, § 522 http://www.leg.state.vt.us/statutes/fullchapter.cfm?Title=03&Chapter=017
[5] Vt. Stat. Ann. tit. 14A, § 902 http://www.leg.state.vt.us/statutes/fullsection.cfm?Title=14A&Chapter=009&Section=00902
[6] The Asset Management Working Group of the United Nations Environment Programme Finance Initiative and Mercer. "Demystifying Responsible Investment Performance" pp. 13-14. Online. http://www.unepfi.org/fileadmin/documents/Demystifying_Responsible_Investment_Performance_01.pdf
[7] Interview Pollock, Jeremy. 03 December 2013
[8] Adler, Timothy and Kritzman Mark. "The Cost of Socially Responsible Investing" in *The Journal of Portfolio Management*. Fall 2008. Pp. 52-56. Online. http://www.iijournals.com/doi/abs/10.3905/JPM.2008.35.1.52#sthash.CVLwrSkm.dpbs
[9] Geddes, Patrick. "Do the Investment Math: Building a Carbon-Free Portfolio". 2013. Pp. 3. Online. https://www.aperiogroup.com/system/files/documents/building_a_carbon_free_portfolio.pdf
[10] Pension Consulting Alliance, Inc. "Discussion of Potential Divestment Issues: Fossil Fuel Companies and Assault Weapons" pp 11. Online. http://mayormcginn.wpengine.netdna-cdn.com/wp-content/uploads/2013/10/2013-01-SCERS-Divestment-Memo.pdf
[11] Carbon Track Initiative. "Unburnable Carbon–Are the world's financial markets carrying a carbon bubble?". Online. http://www.carbontracker.org/carbonbubble
[12] The Asset Management Working Group of the United Nations Environment Programme Finance Initiative and Mercer. "Demystifying Responsible Investment Performance" pp. 13-14.
[13] Kern, Daniel. "Seattle Divestment Forum" pp.7
[14] ibid pp. 9
[15] Interview Pollock, Jeremy. 03 December 2013
[16] Punglia, Vikash and Kaplan, Paul. "Keeping Ahead of Inflation with the Morningstar Real Asset Index". 23 January 2013. Online. https://corporate.morningstar.com/US/documents/Indexes/KeepingAheadofInflation.pdf
[17] Adler, Timothy and Kritzman Mark. "The Cost of Socially Responsible Investing"
[18] Kritzman, Mark. "What Fossil-Fuel Divestment Would Cost". In *The Chronicle of Higher Education*. 13 March 2013. Online. http://chronicle.com/article/What-Fossil-Fuel-Divestment/137941/

[19] Ruud, Paul. "The Inarguable Truth of Mark Kritzman". 3 July 2013. Pp 2-3. Online. https://vspace.vassar.edu/paruud/pub/kritzman/Ruud percent20- percent20The percent20Inarguable percent20Truth percent20of percent20Mark percent20Kritzman.pdf
[20] Ibid pp.3.
[21] ibid pp.4.
[22] ibid pp. 5.
[23] Kern, Daniel. "Seattle Divestment Forum" 18 October 2013. Pp. 4. Online. http://www.mayorsinnovation.org/pdf/Divestment percent20Campaign/Kern, percent20Daniel.pdf
[24] Pension Consulting Alliance, Inc. "Discussion of Potential Divestment Issues: Fossil Fuel Companies and Assault Weapons" pp 11. Online. http://mayormcginn.wpengine.netdna-cdn.com/wp-content/uploads/2013/10/2013-01-SCERS-Divestment-Memo.pdf
[25] Dominguez, Wendy. "Retirement Plan Expenses Uncovered". *National Association of Government Defined Contribution Administrators, Inc*. October 2005. pp. 2. Online. http://www.nagdca.org/documents/retirementPlanExpenses.pdf
[26] Carbon Tracker Initiative. "Unburnable Carbon–Are the world's financial markets carrying a carbon bubble?". Pp. 2 Online. http://www.carbontracker.org/carbonbubble
[27] ibid pp. 19
[28] Guyatte, Danyelle et all. "Climate Change Scenarios – Implications for Strategic Asset Allocation" 2011. pp. 13-105. Online. http://www.mercer.com/climatechange
[29] Llewellyn, John. "The Business of Climate Change". February 2011. Online. http://www.lehman.com/press/pdf_2007/TheBusinessOfClimateChange.pdf
[30] Spedding, Paul et all. "Oil & carbon revisited: Value at risk from unburnable reserves" 25 January 2013. pp. 14-17. Online. http://gofossilfree.org/files/2013/02/HSBCOilJan13.pdf
[31] Steyer, Tom. "Statement of Tom Steyer: To the Middlebury College Board of Trustees". 22 January 2013. Online. http://middleburycampus.com/wp-content/uploads/2013/01/SteyerLetter.pdf
[32] Atif, Ansar et all. "Stranded assets and the fossil fuel divestment campaign: what does divestment mean for the valuation of fossil fuel assets?". *Smith School of Enterprise and the Environment, Oxford College*. Pp.12. Online. http://www.smithschool.ox.ac.uk/research/stranded-assets/SAP-divestment-report-final.pdf
[33] ibid pp. 19
[34] Shaikh, Nereem. "Will 350.org Fossil Fuel Divestment Campaign Be Key Tactic in 2013 Battle over Climate Change?" *Democracy Now*. 2 January 2013. Interview. Online. http://www.democracynow.org/2013/1/2/will_350org_fossil_fuel_divestment_campaign
[35] Humphreys, Joshua. "Institutional Pathways to Fossil-Free Investing: Endowment Management in a Warming World." May 2013. Online. Pp. 8 http://631nj1ki9k11gbkhx39b3qpzua.wpengine.netdna-cdn.com/files/2013/06/institutional-pathways-final-061813.pdf
[36] Geddes, Patrick. "Do the Investment Math: Building a Carbon-Free Portfolio". Pp. 3-4.

[37] Pax World Investments "Investment Approach: Fossil Fuels." Online. http://www.paxworld.com/advisors/approach/sustainability-research/key-issues-briefs/fossil-fuels
[38] Ibid.
[39] McGuire, Craig. "Can Anyone File a Shareholder Proposal". On *The Shareholder Activist*. Online. http://theshareholderactivist.com/shareholder-activism-spotlight/can-anyone-file-a-shareholder-proposal/
[40] HIP Investor, and GoFossilFree.org. "Resilient Portfolios & Fossil-Free Pensions." Online. Pp. 14 https://s3.amazonaws.com/s3.350.org/images/Resilient-Portfolios-and-Fossil-Free-Pensions-ByHIPinvestor-GoFossilFree-vFinal-2013Oct31.pdf
[41] Interview Pollock, Jeremy. 03 December 2013
[42] Humphreys, Joshua. "Institutional Pathways to Fossil-Free Investing: Endowment Management in a Warming World."
[43] Aperio Group. "Carbon Divestment: What Are My Choices?" Online http://www.aperiogroup.com/system/files/documents/carbon_free_series_matrix_of_choices.pdf
[44] Smith, Randall. "A New Divestment Focus on Campus: Fossil Fuels." *DealBook A New Divestment Focus on Campus Fossil Fuels Comments*. The New York Times, 5 Sept. 2013. Online. http://dealbook.nytimes.com/2013/09/05/a-new-divestment-focus-fossil-fuels/