

Shareholder Activism for Stranded Asset Risk:
An Analysis of Investor Reactions for Fossil Fuel Companies

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Abstract

Environmental shareholder activists engage in corporate governance activities including divestment campaigns and shareholder resolutions to get companies to change harmful practices. During 2011 to 2015, activists engaged in both activities to compel major fossil fuel companies to acknowledge unburnable reserves (i.e., *stranded assets*) with their burning associated with rising global temperatures and catastrophic climate change. We examine stock market reactions to key news events for activist activities during 2011 to 2015.

Consistent with investors reevaluating stranded asset risk, we find significant negative mean abnormal returns for major U.S. coal company shares on event dates for both divestment and carbon asset risk shareholder resolutions. Oil and gas company investors showed little reaction to divestment events.

However, oil and gas stocks had significant negative abnormal returns on several event dates for non-management supported carbon asset resolutions, but positive returns for two management-supported resolution events.

JEL: G34, Q51, Q54

Keywords: shareholder activism, divestment, stranded assets, climate change, shareholder resolutions

1. Introduction

To avoid temperatures rising by 2°C associated with disastrous climate change, climate scientists have pointed out that no more than one third of large reserves of fossil fuel companies can be burned (Meinhausen, et al. 2009), which in more recent studies is estimated to represent 82 percent of coal company reserves, 50 percent of gas, and 33 percent of oil reserves that cannot be burned. NOAA (2015) reports that only about 565 GtCO₂ remains of a maximum carbon budget of less than 1,000 billion tons of CO₂ to avoid such a temperature rise.

In response to this threat, the Carbon Tracker Initiative in 2011 and 2013 presented reports on unburnable carbon and reserves for fossil fuel companies that were unburnable, *stranded assets*, suggesting much lower valuations for fossil fuel companies and the possibility of a carbon bubble, with overvaluation for fossil fuel stocks. In 2012 Bill McKibben and 350.org started a nationwide “Do the Math” tour” across the U.S., which transformed into a global fossil fuel divestment movement.

Accompanying the divestment movement in 2013, major institutional investors with the assistance of As You Sow sent letters to the largest fossil fuel companies carbon emitters requesting that they address their carbon asset risk in early 2013. With responses of major fossil fuel companies failing to fully address this issue, major investors facilitated by As You Sow issued the first “carbon bubble” shareholder resolutions” mandating that climate change issues and particularly carbon asset risk be addressed. In late 2014 and 2015, for the

first time shareholder resolutions asked major fossil fuel companies to return capital to investors for their failure to address this risk and for continuing to make major expenditures to find new reserves.

Whether investors receive new information, and reevaluate the risk of their investments in response to divestment and shareholder resolutions is an interesting question. This study sheds light on this issue by examining how investors in 25 of the largest publicly traded U.S. coal and gas and oil companies react to 17 major divestment and 17 climate change news events for during 2011 to 2015. We document significant abnormal negative stock returns for coal companies to divestment events, and significant negative abnormal returns for all firms to several shareholder resolution events. Significant positive abnormal returns also appear in response to respectively manager and majority shareholder support given to two carbon-asset risk resolutions targeting two major oil and gas companies in 2015. The results overall are consistent with a signaling hypothesis and the embedding of stranded asset risk for coal company investors in response.

The paper is organized as follows. Section 2 presents a brief overview of previous literature on the effects of divestment and shareholder resolution events. Section 3 provides an overview of the fossil fuel divestment and shareholder resolutions events that we examine and hypotheses. Section 4 provides the data and empirical procedures, followed by the empirical results in Section 5, and Section 6, a summary and conclusion.

2. Previous Literature on the Effects of Divestment and Shareholder Resolutions as Social Movements

In the previous literature on social movements, goals include providing:

(1) political and economic pressure on firms to change their behavior, such as in the anti-apartheid divestment campaign in the 1960s and 1970s, (Kaempfer, Lehman and Lowenberg, 1987);

(2) a public debate and *voice* creating a dialog with managers to gain legitimacy for initiating new policies, such as the anti-apartheid shareholder resolutions in the 1970s (Gamson, 1990; Broyles, 1998; Goodman, et al., 2013);

(3) change in public opinion, creating political pressure on corporations and eventually governments to enact new policy changes and regulations, such as eventual mandates for U.S. companies to divest operations in South Africa in the mid-1980's (Domonell, 2013; Rose-Smith, 2014; Kaempfer, et al., 1987; Ansar, et al. 2013).

Similarly, Lee and Lounsbury (2011, p. 156) theorize that social movements act to disrupt routines, reframe issues, and mobilize relevant change. Over time ideals that seemed improbable become possible and even inevitable.

Whether social activist divestment and shareholder resolutions have valuation effects for targeted corporations is subject to debate. Ansar, et al. (2013) and Kaempfer, et al. (1987) point out that divestments will be unlikely to affect a corporation's share value, since with substitutability, new investors will snap up shares that are sold.

Kaempfer, et al. (1985), suggests, however, that the threat of divestment by a large billion-dollar pension fund can provide a viable economic threat to a corporation. Although an examination of the effect of the anti-apartheid movement on U.S. firms operating in South Africa showed little difference in returns to the overall S&P 500, the threat of large billion-dollar pension funds of selling shares may have had a significant economic effect on policy changes that affect corporate future cash flows.

Ansar, et al. (2013) also observes that information revealed with divestments may have a signaling effect, which could cause investors to reevaluate the risk or expected future cash flows for their shares in semi-efficient markets. Gilbert (2015) and Bloomberg (2015) point out that this could particularly be the case for smaller asset classes that maintain only a small portion of most portfolios, such as coal company shares.

Broyles (1998) points out the effect of shareholder resolutions submitted in the early 1970's (under the auspices of the Interfaith Committee on corporate responsibility and investments) to corporations resulted in greater public debate and the appointment of the first African American Director to GM's board and greater engagement and with managers and public discourse that contributed to changes in public policy.

It is often argued that having a dialog with managers with shareholder resolutions can be a stronger corporate control device, since stockholders maintain ownership allowing continued dialog with management versus walking away by divesting. However, studies examining the effect of

shareholder resolutions on valuations have shown mixed results. Ertimur, Ferri, and Stubben (2010) find little effects on changes in corporate governance of shareholder resolutions. Byrd and Cooperman (2014) find a negative effect associated with non-management supported environmental health shareholder resolutions taken to annual meetings for a vote. Rebbein, Waddock, and Graves (2004) in a review of the literature on CSR engagement find some evidence of positive financial performance associated with positive engagement by managers with key stakeholders. Renneboog and Szilagy (2009) found little evidence for CSR resolutions affecting shareholder value; and Parthiban, Bloom and Hillman (2007) suggest that shareholder resolutions cause companies to spend money to resist social activists, leading to a reduction in profitability that could reduce valuations.

3. Overview of the Fossil Fuel Divestment and Carbon Asset Risk

Shareholder Resolution Events and Hypotheses

The Divest-Invest Fossil Free Movement

The Divest-Invest Fossil Free movement began in 2011 with concerned students demonstrating at about six universities. In 2012, it became a full movement, with a 21 U.S. city climate-change educational tour initiated by Bill McKibben, with his 350.org organization, named for the safe level of atmospheric CO₂ concentrations of 350 parts per million. The non-profit 350.org grew to include *Go Fossil Free*, a global divestment movement, encouraging investors to sell their holdings in fossil fuel corporations.

This movement was joined by other non-profit organizations including Divest-Invest Philanthropy and Individual, the Wallace Global Fund, the California Student Sustainability Coalition, among many others, as well as the United Nations Divest-Invest Catalyst plan to encourage fossil fuel divestments and reinvestment in alternative energy sources globally. By the end of 2014, 181 institutions and local governments and 656 individuals managing over \$50 billion in assets pledged to divest from fossil fuels including divestments (UN 2014; Arabella Advisors, 2014; Rose-Smith 2014; Fossil Free, 2014; Flood, 2015).¹ A list of events and major divestments by institutional investors that took place in 2011 to 2013 are shown in Table 1, labeled D for divestment events. The majority of the divestments by institutional investors targeted coal companies.

The Carbon Asset Risk Shareholder Resolution Movement

Under the auspices of non-profit groups that facilitate shareholder resolutions, including CERES, As You Sow, the Carbon Tracker Initiative, among other NGOs, climate change shareholder resolutions have been submitted for over a decade.

However, in 2013, a more focused carbon risk initiative. This initiative also encompassed 70 major institutional investors managing over \$3 trillion in

¹ Of total assets divested, 48% were by governments and 38% educational organizations, and 8% philanthropic organizations, and smaller percentages by religious group, non-profits, individuals, and health care institutions (Arabella Advisors, 2014; gofossilfree.org). A Clean Tech Syndicate of billionaires was also formed to divest and hedge against stranded asset risk with investment in alternative energy technologies that could potentially displace fossil fuels (Dumaine, 2015).

assets. Assisted by CERES, the major investor group delivered letters to the 45 major fossil fuel companies as the world's top CO2 emitters, asking them to address new business models for a world moving away from carbon (Carbon Tracker, 2014).

Receiving minimal responses from the letter campaign, a carbon-asset risk shareholder resolution campaign was initiated by As You Sow and Arjuna Capital, among other investors to the top 10 global fossil fuel companies. Carbon-Asset Risk shareholder resolutions demanded that companies not only address their stranded asset risks, but also release their strategies for a future low carbon world. Responses were minimal. However, several resolutions, including one for Exxon Mobil Corporation, were negotiated and withdrawn, in return for the promise of a report to shareholders on these issues (Arjuna Capital and As You Sow, 2015; Carbon Tracker Initiative, 2014; Cardwell, 2014; CSRWire,, 2014; Ceres, 2014).

Despite the withdrawal and negotiations, reports published were unsatisfactory, such as the report by Exxon Mobil assumed continuing business as usual without mentioning stranded asset risk or climate change. As Exxon Mobil noted in its report, although global warming is happening, its oil and gas reserves would not lose its value as the world adapts to rising temperatures, with the company continuing to produce and sell fossil fuels in the future with increasing energy demands in the future (BBC News 2014).

This unsatisfactory responses drove Arjuna Capital and As You Sow to initiate a new, unique shareholder resolution campaign to major fossil fuel

companies in early 2015, requesting a return of capital to stockholders as compensation for stranded assets and the wasting of shareholder funds by continuing to make large capital expenditures to seek out new reserves on a massive scale at the expense of shareholders (Arjuna Capital and As You Sow, 2015; Fahey, 2014; Douglas, 2015; PR Newswire, 2014; Proxy Preview, 2015).

In April 2015, the British investor coalition, Aiming for A led by a major British charity fund manager, CCLA (including religious investor groups, wealth managers and pension funds managing 170 billion pounds) submitted similar carbon-asset resolutions to ten of the largest extractive and utility companies on the FTSE 100 (The Church of England, 2015).

In the Spring of 2015, the U.S. Security and Exchange Commission (SEC) reviewed the unique return of capital carbon asset resolutions submitted by Arjuna Capital and As You Sow and ruled to exempt the resolution targeting Exxon Mobil, but ruled the opposite for the same resolution submitted to Chevron.

Success occurred for resolutions with larger than usual votes by shareholders at meetings in Spring 2014, including Anadarko (30% support) and Consol Energy (18%). A particularly stunning victory for investor advocates occurred in Spring 2015, with two manager supporting carbon risk resolutions at Shell and BP receiving majority shareholder votes, with the vote at BP, a 98 percent shareholder vote in favor of the carbon asset risk resolution in April 2015 (As You Sow, 2015; Cheeseman, 2015; Larsen, 2015).

Table 1 shows the major shareholder resolution (labeled SR) events.

Hypotheses

Based on the background and previous literature, we examine a key question: Are there wealth effects associated with respectively divestment and carbon-asset shareholder resolution events? We examine the following hypotheses:

Hypothesis 1: Signaling Hypothesis: Investors in fossil fuel companies will react negatively to news events associated with public policy debate on stranded assets and potential risks associated with carbon-asset shareholder resolution events.

As noted by the Lee and Lounsbury (2011) shareholder advocates who are more traditional shareholders, such as large pension funds and other institutional investors are more likely to be seen as acting in the best interests of shareholders as a whole. If new information is brought out by shareholder resolutions by large institutional investors including public debate on the potential devaluation of stranded assets, investors may take heed and sell their shares in response to new information. From this respect, we would expect larger negative abnormal returns for both coal and oil and gas companies in response to carbon-risk shareholder resolution related events.

From this perspective social activists, as noted by Lee and Lounsbury (2011) may be viewed by other shareholders as outsiders, and as suggested by Byrd and Cooperman (2014) that find shareholder resolutions opposed by

management may result in a loss of firm value, it may be that fossil fuel companies may also be negatively affected by unsupported shareholder resolution activities. Similarly, Parthiban, et al. (2007) observe that shareholder resolutions may consume corporate resources in diversion of firm resources away from other activities, resulting in lower financial performance, which would suggest negative abnormal returns in response to resolutions as well.

Hypothesis 2: Divestment Valuation Hypothesis: If markets are semi-inefficient, negative valuation effects will occur with divestments, particularly for smaller asset class investments, such as coal companies.

As Ansar, et al. (2013) point out under conditions of semi-efficient markets it may be that investors receive new information from divestment and carbon asset risk shareholder resolution events, and small asset classes, such as coal companies are more likely to be affected by divestment news. Divestments also may relay greater concerns about stranded asset risks and potential new regulations that governments may be imposing in the future that could increase the risk premium for the discount rate for fossil fuel stocks, as well as reduce the expected value of future cash flows. From this perspective, we would expect negative abnormal returns surrounding event dates for divestments, particularly for coal companies, as a smaller asset class.

Alternatively, if markets are more efficient, large asset classes will be unlikely to be affected by divestments and shareholder resolution events, since diversified portfolios will be unlikely to further divest and new shareholders will likely snap up shares, as suggested by Kaempfer, et al. (1987) who found little difference in performance for U.S. firms operating in South Africa compared to other firms in the S&P 500. As Kaempfer, et al. (1987) point out it may be the threat of divestment by large pension funds that affects corporation behavior versus actual divestments that take place. Ansar, et al. (2013) similarly point out that endowments and pension funds have relatively low asset holdings of fossil fuel shares, relative to total holdings, suggesting little reaction to divestment or shareholder resolution events.

4. Events, Data, and Methodology

4.1 Events

The 34 divestment and carbon-asset risk shareholder related events that we examine are shown in Table 1. We collected these news announcements by searching for items with the key words, ‘carbon-asset risk’, ‘stranded assets’, ‘unburnable carbon’ and ‘fossil fuel divestment’ and ‘carbon-asset risk shareholder resolutions.’

We began with 39 events but deleted five because on the announcement date oil prices fell by more than 2%. The 2% fall in oil prices was an arbitrary cut-off, but we felt that it would be impossible to distinguish the effect for the news announcement from the effect of a drop in oil prices, so these observation

were better eliminated. The remaining 34 announcement events, listed in Table 1, include 17 divestment events and 17 shareholder-resolution related events. Announcement dates include the earliest publication date by major news sources including *Bloomberg*, *S&P*, *the Wall Street Journal*, *New York Times*, and other major news sources. Table 1 also gives a brief description of each news announcement and how we categorized it (Divestment (D) or Shareholder Resolution (SR)).

4.2 Data

Table 2 lists the companies in the sample, categorized by coal or oil and gas, and their total assets and market capitalization at the end of 2013. For BHP Billiton that has some oil exploration as well as coal activities, we characterized it in the coal industry since it has greater coal exploration activities. Also included in Table 2 is each company's years of reserves computed as total reserves, as reported at the end of 2013, divided by its average yearly production for 2011 to 2013. The sample includes major fossil fuel companies that are publicly traded in the U.S. with available data on CRSP-Daily returns tapes for AMEX, NYSE, and NASDAQ securities. The sample firms include 25 very large corporations with an average market value of \$75.4 billion and mean total assets of 93.2 billion. These include 18 major oil and 7 major coal companies that are publicly traded in the U.S. The coal companies in the sample have the largest years of reserve ratios, averaging 39.70 years

compared to 13.50 years of reserves for the oil companies, with greater reserves relative to annual average production.

4.3 Methodology

To investigate the reaction of the oil and gas and coal companies in our sample we use a standard event study methodology. We calculate abnormal stock returns for each firm for each event date by comparing the actual returns over the three trading days from 1 day before the news announcement to one day after. We designate these as days -1, 0, and 1. We compute the expected stock return using the Capital Asset Pricing Model with betas being computed using daily stock returns from July 1, 2009 through June 30. The expected stock return is a company's beta times the market returns over the event period. Abnormal stock returns are calculated by subtracting the expected return from the actual return. Any excess return (actual less expected) is considered due to the news announced during that period.

The significance of the cumulative average abnormal returns (CARs) surrounding each event date are tested using t-tests, and mean CARs are calculated for all events for the entire sample as well as for announcements that specifically related to divestments or carbon-asset risk shareholder resolutions. In addition average abnormal returns are calculated separately for oil and gas versus coal companies.

5. Empirical Results

Table 3 shows the average event date abnormal returns for the 17 announcement dates associated with divestment, with the t-statistics highlighted for significant negative CARs, in yellow and significant positive CARs in blue. For the entire sample, the mean CAR is small and insignificant. However, for the coal company subsample, the mean CAR is -1.27%, significant at a .10 level (t-statistic = 1.90), and the mean CAR for the oil and gas company sample is 0.66%, significant at a .05 level (t-statistic = 2.34). This result is consistent with coal companies being more likely to be targeted when divestments from fossil fuels are announced, and as a small asset class, divestments having an effect on coal company valuations. While a -1.27% CAR doesn't seem large, it would be roughly equivalent to a loss of \$ 221 billion of aggregate market value for the seven coal companies in the sample, or about \$ 315.5 million per company based on year-end 2013 market capitalization.

For specific divestment events, CARs for five event dates were negative and significant at a .05 level or higher for the entire sample. These CARs ranged from -0.86% to -2.08% in response to the 350.org divestment movement kick-off and dates for specific divestment announcements. For the oil and gas company subsample CARs were significant and negative only for one divestment date with a -1.06% CAR, significant at a .05 level. For the coal company subsample CARs were negative and significant, at a .05 level for four event dates, and at a .10 level for a fifth event date, ranging from -1.98% to -7.33%. The results are consistent with hypothesis 2 whereby coal companies

as a smaller asset class with larger carbon emissions would be more likely to have significant negative valuation effects, and oil and gas companies would not be significantly affected. For two event dates for the entire sample and the oil and gas subsample, CARs were significant and positive, and for one event date for coal and gas companies in 2015, which may reflect other coincidental events to exam more carefully.

We tested the robustness of these results by removing the most extreme abnormal returns and re-computing the results. There is little qualitative difference between those results and the results we report (not shown for the sake of brevity).

Table 4 presents the CAR for each announcement for the entire sample and the oil companies and coal companies separately in response to shareholder resolution event dates, similarly with significant t-statistics highlighted in yellow for negative significant CARs and in blue for positive significant CARs. The mean CARs for the sample and each subsample are negative, but insignificant. For individual event dates, for the entire sample there are significant, negative CARs surrounding seven event dates, at a .01 level for three dates, at a .05 level for three dates and at a .10 level for one date. Negative, significant CARs range from -0.78% to -4.33%. For the coal subsample, significant negative CARs appear on six of these event dates at a .05 significance level or higher, ranging from -1.90% to -5.59%. For the oil and gas company subsample significant negative CARs appear on five event dates (with four at a .01 significance level and one at a .10 significance level). These

negative CARs range from -1.22% to -3.81%. The larger negative CARs on several event dates for both the coal and oil and gas subsamples support hypothesis 1, that shareholder resolutions have a signaling effect, resulting in a negative effect on the valuation of both oil and gas and coal companies.

It is interesting that CARs are positive and significant on two dates when oil and gas companies respectively endorsed the carbon risk shareholder resolution initiated to Shell Oil Corporation, with a significant, positive 4.26% CAR and to the 98% vote for the carbon risk shareholder resolution, with a significant positive CAR of 2.21%. This suggests that oil and gas shareholders investors are concerned about carbon risk, and reacted positively to the companies agreeing to address these issues. In contrast, for Oil & Gas companies, the reaction of Exxon Mobil for business as usual in its report related to stranded assets showed a significant negative CAR of -1.22%.

These results are consistent with carbon-asset risk shareholder resolutions supported by managers and/or a majority of stockholders having a positive effect on valuations, with managers becoming engaged in dealing with carbon-asset risks. This suggests that investors have a positive view for fossil fuel companies dealing with and reporting their stranded asset risks.

6. Summary and Conclusion

In this study we examine investor reactions to respectively divestment and shareholder carbon-asset risk resolution related events during 2011 to 2015 for a sample of U.S. coal and oil and gas companies. We test alternative

hypotheses for the effect on the valuation of respectively oil and gas and coal subsamples to these events. Under a signaling hypothesis, if divestment and shareholder resolutions provide new information to investors about carbon asset risk, we would expect significant negative abnormal returns to both divestment and shareholder resolution events for both coal and oil and gas company stocks.

Under a divestment valuation hypothesis, however, since oil and gas stocks are in large, efficient markets with substitutability among investors, there should be little effect of either divestment or shareholder resolution events for oil and gas companies. However, coal company stocks as a small asset class and as more targeted investments by institutional investor divestments should have significant negative valuation effects.

In support of the divestment hypothesis, the empirical results show large, significant negative CARs for six event dates for the coal sample and for five event dates for the oil and gas sample. These results support the divestment hypothesis. For the coal company sample, the results also support information signaling with information revealed in divestment and shareholder resolution events indicating greater future carbon asset risks for the coal industry.

Although oil and gas companies did not generally experience negative abnormal returns in response to divestment event dates. For carbon asset risk resolution events, oil and gas company stocks experienced negative, significant returns for non-management supported carbon asset risk resolutions on their event dates, but positive significant CARs on two event dates for management

supported carbon asset risk resolutions. Investors in oil and gas companies appear to view expected future engagement by managers in assessing and dealing with stranded asset risk as a positive signal.

As a caveat, additional research is needed to examine the larger number of divestment and shareholder resolution events in 2015, as data becomes available, as well as including a sample of non-fossil fuel companies in the sample to examine differences in market reactions for these companies.

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Table 1: News announcements used in the study categorized as a Divestment Event or an Oil-Specific Event and with the corresponding oil price change over the announcement period. The announcement period includes three trading days with the event date at the center of the period. Events with an oil price decrease of more than 2% were deleted from the sample. Type identifies events for shareholder resolution (SR) or divestment (D).

Event Date	Type	Description
7/01/11	SR	Carbon Tracker Initiative Initial Report on Unburnable Carbon published
7/15/11	SR	Article on Carbon Initiative Report
11/06/12	D	Bill McKibben & 350.org Kick-Off Nationwide “Do the Math” Tour
3/07/13	SR	“Shareholders File 1 st Ever Carbon Bubble Resolutions” Article
4/19/13	SR	LSE & Carbon Tracker Updated Report on Financial Risk of Stranded Assets
5/16/13	SR	Results for the 1st “carbon bubble” shareholder resolutions
8/02/13	D	Article “Is it Time to Divest from Fossil Fuels?”
10/24/13	SR	Carbon Risk Initiative Letters on Unburnable Carbon to 45 Fossil Fuel Companies
1/28/14	D	Norwegian Sovereign Fund Halves Fossil Fuel Investments
1/29/14	D	17 of World’s Largest Philanthropic Foundations Pull Out of Fossil Fuels
2/12/14	SR	Resolutions Filed with 10 Fossil Fuel Companies for Carbon Asset Risks
3/20/14	SR	Negotiated Withdrawal by Exxon Mobil to Report on Carbon Asset Risks
3/31/14	SR	Exxon Mobil Reports on Climate Change Risks as Business as Usual
5/04/14	D	Stanford University to Divest from Coal Companies
5/06/14	D	Stanford University Divests from 100 Coal Companies
5/08/14	SR	Carbon Tracker Identifies Oil Projects Not Making Economic Sense
5/13/14	D	Dunedin, New Zealand Fossil Fuel Divestment
5/22/14	SR	30% Shareholder Vote for Carbon Risk Resolution at Anadarko Petroleum
6/17/14	D	Oakland California City Council Votes to Divest Fossil Fuels
6/23/14	D	University of Dayton Divests \$670 mil. in Fossil Fuel Stocks
7/08/14	SR	Carbon Tracker Initiative Responds to Shell on Stranded Assets
7/14/14	D	Oxford, UK City Council votes to Divest from Fossil Fuels
7/16/14	D	Eugene, Oregon votes to Divest from Fossil Fuels
9/18/14	SR	Carbon Tracker Issues Report Criticizing Exxon for Business as Usual Report
9/21/14	D	Rockefellers & Others Divestment of \$50 billion from Fossil Fuels
10/18/14	D	University of Glasgow, UK Divests from Fossil Fuels
11/25/14	D	New Proxy Resolutions asking Exxon Mobil & others to Return Capital to Shareholders given great Carbon Asset Risks
1/30/15	SR	Shell Endorses Shareholder Resolution on Climate Change Risks
3/13/15	SR	SEC Rules in favor of Resolutions for Return of Capital for Stranded Asset Risks
3/31/15	D	Syracuse University formalizes policy of no investments in Fossil Fuels
4/14/15	D	Sit-In Week Begins for Divestment from Fossil Fuels: Harvard Students & Alums
4/16/15	SR	98% vote by shareholders for Climate Change Resolution at BP’s Annual Meeting
4/24/15	D	University of London, UK Votes to Divest Fossil Fuels
4/25/15	D	Boulder, Seattle & San Francisco: 10 City Fossil Free City Divestment Campaign

Table 2: The sample of coal and oil companies with years of fossil fuel reserves shown. “Years of reserves” are computed as total reserves divided by production based on values reported for 2013. For CNOOC the data was from 2012. Financial data for total assets and market value (MV) are in millions and are as of the end of the 2013 fiscal year.

Company Name	Industry	Ticker	Years of reserves	Total Assets	MV Common Stock
Arch Coal	Coal	ACI	39.55	8,990.19	944.65
Alpha Natural Resources	Coal	ANR	49.48	11,799.26	1,578.03
Apache Corporation	Oil	APA	9.52	61,637.00	34,012.73
Anadarko Petroleum	Oil	APC	9.80	55,781.00	39,953.48
Alliance Resource Partners	Coal	ARLP	22.53	2,121.90	2,846.15
BHP Billiton	Coal/Oil	BHP	10.87	138,109.00	153,448.42
BP	Oil	BP	2.55	305,690.00	150,784.09
Peabody Energy	Coal	BTU	37.16	14,133.40	5,275.05
CNOOC	Oil	CEO	9.80	102,660.03	83,785.50
Chesapeake Energy Corp.	Oil	CHK	10.98	41,782.00	18,026.12
Cloud Peak Energy Inc.	Coal	CLD	13.32	2,357.43	1,096.13
Canadian Natural Resources	Oil	CNQ	32.62	51,754.00	39,078.35
CONSOL Energy	Coal	CNX	105.26	11,393.67	8,716.71
Conoco Phillips	Oil	COP	16.49	118,057.00	86,612.59
Chevron	Oil	CVX	34.62	253,753.00	239,028.15
Devon Energy Corporation	Oil	DVN	11.90	42,877.00	25,119.22
Eni S.p.A.	Oil	E	10.87	190,620.06	87,834.74
EOG Resources Inc.	Oil	EOG	11.39	30,574.24	45,834.75
Hess Corporation	Oil	HES	11.88	42,754.00	27,001.06
Occidental Petroleum	Oil	OXY	12.53	69,443.00	75,698.74
Sinopec Corp.	Oil	SHI	9.52	6,051.97	3,082.32
Statoil	Oil	STO	8.96	146,001.29	76,707.15
Suncor	Oil	SU	24.74	78,315.00	55,052.45
Total	Oil	TOT	5.01	239,053.25	138,988.79
Exxon Mobil	Oil	XOM	12.53	346,808.00	438,702.00

Table 3: The average 3-day abnormal returns (Days -1, 0 and +1) for various divestment event dates for a sample of coal and oil companies listed on US stock exchanges. Stock betas were computed using data from January 1, 2013 through June 30, 2014. Yellow shading indicates significant negative average abnormal returns and blue shading indicates significant positive average abnormal returns.

Date	All Average 3-day Abnormal Return	t-statistic	Coal Average 3-day Abnormal Return	t-statistic	Oil Average 3-day Abnormal Return	t-statistic	Divestment Events
11/6/12	-2.21%	-2.224	-5.97%	-2.437	-0.34%	-0.686	350.org Kick-Off
8/2/13	-0.74%	-1.072	-3.40%	-2.591	0.59%	0.957	Time to Divest from Fossil Fuels?
1/28/14	1.01%	2.644	2.28%	2.491	0.38%	1.449	Norwegian Sovereign Fund Divests
1/29/14	0.27%	0.816	1.16%	1.507	-0.18%	-0.642	17 of World's Largest Philanthropic Foundations Divests
5/4/14	0.77%	1.561	-0.91%	-1.100	1.52%	2.827	Stanford to Divest from Coal
5/6/14	0.13%	0.164	-3.67%	-2.685	1.81%	2.926	Stanford Divests from Coal
5/13/14	0.56%	1.601	0.71%	0.962	0.50%	1.235	Dunedin New Zealand Fossil Fuel Divestment
6/17/14	-0.37%	-1.189	-0.53%	-0.612	-0.30%	-1.132	Oakland California City Council Votes to Divest Fossil Fuels
6/23/14	-0.86%	-2.115	-1.98%	-1.980	-0.37%	-1.043	University of Dayton Divests \$670 in Fossil Fuel Stocks: Over Carbon Bubble
7/14/14	-0.89%	-2.521	-0.49%	-0.888	-1.06%	-2.370	Oxford city Council in UK votes to divest from fossil fuels
7/16/14	0.03%	0.076	-0.08%	-0.073	0.08%	0.192	Eugene Oregon vote to Divest & Urges Statewide funds to follow
9/21/14	-1.23%	-2.554	-3.21%	-2.654	-0.35%	-1.257	Rockefellers & Others Announce \$50 bil. Divestment from Fossil Fuels
10/18/14	-2.08%	-2.100	-7.33%	-3.289	0.25%	0.685	University of Glasgow Divests its Fossil Fuels-1st European University to Do So
3/31/15	1.28%	1.697	-0.58%	-0.292	1.80%	2.295	Syracuse University formalizes policy for no investments in Coal or Fossil Fuels
4/14/15	3.39%	4.599	3.23%	1.709	3.43%	4.214	Harvard Students & Alums Start Week-long Sit in for Divestment from Fossil Fuels
4/24/15	1.42%	1.190	-0.73%	-0.246	2.02%	1.555	University of London Votes to Divest 1.5 million pounds from fossil fuels for its endowment
4/25/15	1.14%	1.089	-0.11%	-0.075	1.49%	1.157	Boulder, Seattle, and San Francisco launch Fossil Free City Divestment Campaign for 10 cities
Column Average	0.10%		-1.27%		0.66%		
t-statistic	0.28		-1.90		2.34		

Table 4: The average 3-day abnormal returns (Days -1, 0 and +1) for various climate shareholder resolution event dates for a sample of coal and oil companies listed on US stock exchanges. Stock betas were computed using data from January 1, 2013 through June 30, 2014. Yellow shading indicates significant negative average abnormal returns and blue shading indicates significant positive average abnormal returns.

Date	All Average 3-day Abnormal Return	t-statistic	Coal Average 3-day Abnormal Return	t-statistic	Oil Average 3-day Abnormal Return	t-statistic	Shareholder Resolution Events
7/11/11	-1.72%	-4.918	-1.90%	-3.162	-1.63%	-3.698	Carbon Tracker Report Unburnable
7/15/11	2.60%	4.060	3.60%	2.742	2.10%	2.997	Article on Carbon Initiative Report
3/7/13	2.50%	2.910	5.53%	2.716	0.98%	1.765	Carbon Risk Resolutions Initiative
4/19/13	0.42%	0.772	0.81%	0.545	0.23%	0.574	Carbon Tracker: Update \$674 billion Spent to find new stranded assets Despite carbon asset risk
5/16/13	-0.70%	-1.275	0.44%	0.289	-1.27%	-3.916	The results of the first 'carbon Asset risk resolutions are in!
10/24/13	0.45%	0.798	1.61%	1.164	-0.14%	-0.302	Carbon Risk Initiative: Letters to 45 Large Fossil Fuel Companies on Carbon Asset Risks
2/12/14	-0.03%	-0.080	-0.51%	-0.738	0.21%	0.487	Shareholder Resolutions Files with 10 Large Fossil Fuel Companies
3/20/14	0.62%	0.661	1.20%	0.429	0.33%	0.820	Exxon Mobil to Report on its Carbon Asset Risks with negotiated withdrawal
3/31/14	-1.55%	-2.300	-2.22%	-1.405	-1.22%	-1.840	Exxon Mobil Releases Reports to Shareholders Business as Usual
5/8/14	-0.78%	-1.801	-1.99%	-2.749	-0.24%	-0.488	Carbon Tracker Identification of Oil Projects Not Making Economic or Climate Sense
5/22/14	-1.45%	-2.605	-4.71%	-4.853	-0.01%	-0.028	30% Shareholder Vote at Anadarko to report on Carbon Asset Risks
7/8/14	-1.70%	-2.355	-5.59%	-3.524	0.02%	0.076	Carbon Tracker Responds to Shell on Stranded Assets
9/18/14	-2.97%	-3.402	-6.67%	-2.886	-1.33%	-3.749	Carbon Tracker Issues Report Criticizing Exxon: Business as Normal
11/25/14	-4.33%	-7.554	-5.51%	-3.663	-3.81%	-7.911	New Proxy Resolution asking Exxon Mobil to Return Shareholders Capital Given Carbon Asset Risk
1/30/15	3.59%	5.309	1.15%	0.532	4.26%	7.465	Shell Endorses Shareholder Resolution
3/18/15	1.02%	1.836	2.98%	2.837	0.47%	0.791	SEC rules in favor of Return of Capital
4/16/15	2.85%	5.857	5.12%	3.394	2.21%	6.049	98% Vote for Climate Change Resolution at Stockholder Meeting
Column Average	-0.07%		-0.39%		0.07%		
t-statistic	-0.14		-0.43		0.16		