

CLIMATE CHANGE RISK DISCLOSURE: A SECTOR BY SECTOR ANALYSIS OF SEC 10-K FILINGS FROM 1995-2008

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I. Introduction

In the face of recent scientific, legal, and regulatory developments, business leaders are increasingly recognizing the economic and financial risks associated with climate change and the enormous opportunities presented by the shift to a carbon-constrained economy.¹ According to a recent survey conducted by the McKinsey Quarterly, eighty-two percent of global executives expect “some form of climate regulation in their companies’ home country within five years.”² In a survey by the Pew Center on Global Climate Change of U.S. business leaders, ninety percent of those surveyed indicated that they believe climate change regulation is forthcoming, and sixty-seven percent stated they

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¹ See *Petition for Interpretive Guidance on Climate Risk Disclosure* to the Securities and Exchange Commission [hereinafter EDF Petition], available at <http://www.sec.gov/rules/petitions/2007/petn4-547.pdf>.

² MCKINSEY QUARTERLY, HOW COMPANIES THINK ABOUT CLIMATE CHANGE: A MCKINSEY GLOBAL SURVEY 1–2 (McKinsey & Co. 2007), available at <http://www.mckinseyquarterly.com/PDFDownload.aspx?L2=3&L3=50&ar=2099>.

believe this regulation will occur within the next eight years.³ The survey also indicates that ninety-three percent of U.S. business leaders consider climate change related risks when making investment decisions.⁴

For many companies climate risk remains a “material” risk, and is subject to compulsory disclosure under U.S. Securities and Exchange Commission (SEC) regulations and under established doctrines of securities law.⁵ “Climate risk” has been defined to include “effects on a company’s performance and operations that range from physical damage to facilities, to new regulatory costs and incentives, to shifts in the market for products or services.”⁶ However, as established by this empirical study, despite the very real presence and possibility of these risks, disclosures of climate risks remain scarce and inconsistent.⁷

This study analyzes sectoral trends in the Standard & Poor’s 500 Index (S&P 500) with respect to disclosure of climate change risks and opportunities in 10-K filings. In this article we do not attempt to exhaustively cover the relevant legal landscape concerning such disclosures or the many prior advocacy and policy efforts to address the disclosure issue.⁸ To account for

³ ANDREW J. HOFFMAN, GETTING AHEAD OF THE CURVE: CORPORATE STRATEGIES THAT ADDRESS CLIMATE CHANGE 1 (Pew Center on Global Climate Change 2006), available at http://www.pewclimate.org/docUploads/Synthesis_Report_CorpStrategies.pdf.

⁴ *Id.* at 55.

⁵ See EDF Petition, *supra* note 1, at 7; see also Jean McCreary et al., *How Climate Change Issues Will Impact Corporate Disclosure*, N.Y.L.J., Sept. 18, 2008, available at <http://www.law.com/jsp/ihc/PubArticleIHC.jsp?id=1202424595605>.

⁶ EDF Petition, *supra* note 1, at 7. “The influence of climate change and greenhouse gas regulation on particular companies varies, but it is increasingly clear these developments have already had material effects on many companies’ performance and operations, and that those impacts will increase as the climate continues to change.” *Id.*

⁷ *Id.*

⁸ For further information regarding the development of disclosure practices and guidelines regarding climate change related risks, see:

Coyote 10-K Database: The database used for this study is available for public use at <http://coyote.climatepledges.org>. The Coyote 10-K Database includes 750 companies and 6354 10-K filings, covering reports filed between the beginning of calendar year 1995 and the end of the second quarter of 2008. The database facilitates analysis of climate risk disclosure by public U.S. companies, though the tool is not restricted to climate or environmental risk analysis. Users can search the database for key phrases

attrition and gain in the S&P 500 member list, the study included

such as “global warming” or “climate change.” The database also allows the use of search operators. For instance, users can query the database for 10-Ks that contain [(“climate change” OR “global warming”) AND litigation]. Once a user has retrieved a 10-K filing or exhibit, the browser can then be used to generate pinpoint searches of specific terms.

The Global Framework for Climate Risk Disclosure: The Global Framework was created by an international group of leading institutional investors as a statement on necessary and expected information companies should include in climate risk disclosures. CERES, GLOBAL FRAMEWORK FOR CLIMATE RISK DISCLOSURE: A STATEMENT OF INVESTOR EXPECTATIONS FOR COMPREHENSIVE CORPORATE DISCLOSURE 1 (Ceres 2008) (2006), available at <http://216.235.201.250/Document.Doc?id=73>. “The Framework outlines four elements of disclosure: historical, current, and projected greenhouse gas emissions; strategic analysis of climate risk and emissions management; assessment of physical risks of climate change; and analysis of risk related to the regulation of greenhouse gas emissions.” *Id.* Investors identified these elements as critical for analyzing “a company’s business risks and opportunities resulting from climate change, as well as the company’s efforts to address those risks and opportunities.” *Id.*

Investor Petition to the SEC on Climate Risk Disclosure: On September 18, 2007, investors representing over \$1.5 trillion in assets under management joined with state officials and non-profit organizations to request that the SEC issue guidance clarifying that corporations must disclose material climate risks under existing law. See EDF Petition, *supra* note 1, at 2. The Petition reviews relevant securities law, key developments in climate science and policy, the wide scope of investor efforts to acquire information on climate risks, and appropriate climate disclosure practices. *Id.*

New York Attorney General’s settlements with Xcel Energy and with Dynegy, Inc.: Recent settlements by the New York Attorney General’s Office with Xcel Energy and with Dynegy, Inc., provide useful insights into comprehensive, consistent disclosure practices for electric utilities. See New York Office of the Attorney General, Environmental Protection Bureau, Feature Fighting Global Warming, <http://www.oag.state.ny.us/bureaus/environmental/feature.html> (last visited Feb. 19, 2009). The agreements require the companies to disclose information on regulatory, physical and litigation risks stemming from climate change, including data on current and projected carbon emissions; company strategies for managing emissions and expected reductions from these actions; analyses of financial risks related to the present and probable climate policy; climate-change related litigation; physical impacts of climate change; and corporate governance actions related to climate change. See Press Release, New York Office of the Attorney General, Attorney General Cuomo, Joined by Vice President Gore, Announces Agreement with Major Energy Company, Dynegy Inc. (Oct. 23, 2008) [hereinafter Dynegy Agreement], available at http://www.oag.state.ny.us/media_center/2008/oct/oct23a_08.html (last visited Feb. 19, 2009); Press Release, New York Office of the Attorney General, Cuomo Reaches Landmark Agreement with Major Energy Company, Xcel Energy, to Require Disclosure of Financial Risks of Climate Change to Investors (Aug. 27, 2008) [hereinafter Xcel Energy Agreement], available at http://www.oag.state.ny.us/media_center/2008/aug/aug27a_08.html (last visited Feb. 19, 2009).

all companies that were listed as members of the S&P 500 at any point in time from 2000 to 2008. Thus, the actual number of companies examined was 742. For this corporate grouping, the study analyzed every 10-K filed from 1995 to 2008. The results therefore provide a comprehensive picture of the S&P 500 over an extended period of time.

The study shows that despite a growing awareness by corporate leaders regarding the strategic importance of climate change, corporate disclosures of the risks and opportunities created by climate change remain the exception rather than the norm. This troubling pattern of non-disclosure leaves investors with little or in some cases no useful information about corporate exposure to these risks.

[C]ompanies whose assets are expected to last for decades must deal with changes—such as sea-level rise, increasingly severe weather, greater incidence of floods, fires, and droughts, and expanded ranges of disease and pest vectors—that will very likely continue to intensify. The growing body of data about the physical changes associated with climate change similarly shows that significant physical changes, and resulting risks, are no longer remote possibilities, but present realities that are only going to become more consequential.⁹

The following are among the key findings of the study:

The vast majority of companies remain silent with respect to the risks and opportunities posed by climate change. In 2008, 76.3% of the S&P 500 failed to provide any mention of climate change in their 10-K filings (see Figure 1).

While there has been an increase in the quantity of 10-K filings that contain discussions of climate risks and opportunities, the quality of these discussions—assessed in terms of the informational value they provide to shareholders—is low. In 2008, only 5.5% of the S&P 500 identified at least one risk posed by climate change and articulated a strategy for managing

⁹ EDF Petition, *supra* note 1, at 7.

and mitigating that risk.¹⁰

In 2008, less than ten percent of companies in the financial sector discussed climate change in 10-K filings. This anemic reporting rate is particularly troubling given the enormous risks posed by climate change to the insurance industry, and the role of major banks in financing infrastructure projects. In 2008, the global advisory firm Ernst & Young announced that climate change “would be identified at the greatest strategic threat for the insurance industry in 2008.”¹¹

In 2008, the utilities sector led all other sectors in discussing climate change in 10-K filings. In 2008, only 3.2% of utilities sector companies failed to mention climate change in 10-K filings (see Table 1 and Figure 2). This low *failure-to-mention* rate, however, is not indicative of discussions with high informational value to investors. In 2008, only 25.8% of utility companies met the standard of identifying at least two climate change risks and articulating a management and mitigation strategy for addressing one of those risks. When discussions of voluntary reduction targets or membership in groups committed to voluntary reduction targets are added only one company (3.2% of utility companies) met this higher standard.

II. Methodology

This report describes the results of a comprehensive empirical study of 10-K filings by S&P 500 members from 1995 to the second quarter of 2008. The study analyzed 6354 10-K filings and 79,012 associated 10-K exhibits for references to climate change. For those 10-Ks submitted to the SEC in 2008 in which a reference to climate change occurred, the study assessed the informational value of the reference or references.

¹⁰ This number was determined by examining 2008 10-Ks filed through Q2 with the rubric included in Appendix A.

¹¹ ERNST & YOUNG, STRATEGIC BUSINESS RISK 2008: INSURANCE (2008) [hereinafter ERNST & YOUNG: INSURANCE], available at [http://www.ey.com/Global/assets.nsf/International/Industry_Insurance_StrategicBusinessRisk_2008/\\$file/Industry_Insurance_StrategicBusinessRisk_2008.pdf](http://www.ey.com/Global/assets.nsf/International/Industry_Insurance_StrategicBusinessRisk_2008/$file/Industry_Insurance_StrategicBusinessRisk_2008.pdf).

A. The Quantitative Component

The quantitative part of the study was comprised of five steps: [1] database population; [2] key phrase search; [3] context analysis; [4] iteration to refine phrase list; and [5] data tabulation and analysis.

1. Database Population

The results reported here are based on 10-K filings and their attached exhibit documents and are collected into a database that will be available for public search through the Center for Energy and Environmental Security's website.¹² S&P 500 index, a cross-economy index of high market-cap companies, was the company list of focus for our analysis. However, as the list of companies shifted with new companies added and others dropped out of the index, we expanded our review to all companies that were or had been listed in the S&P 500 any time from January 2000 to June 2008. The total number of companies whose filings were examined was 742. We then collected the 10-K filings for each of these companies for the years spanning 1995–2008 (Q1 & Q2) from the SEC's Electronic Data Gathering, Analysis, and Retrieval (EDGAR) online database.¹³ The complete company list was

¹² Center for Energy & Environmental Security, <http://cees.colorado.edu/> (last visited Feb. 12, 2009).

¹³ U.S. Securities and Exchange Commission, Filing and Forms, <http://sec.gov/edgar.shtml> (last visited Feb. 19, 2009). The URL provided here points to the "front door" of the EDGAR system, which allows online users to search companies to retrieve their filings one at a time. The SEC also hosts a File Transfer Protocol (FTP) site with indexes of filings by quarter filed. Information regarding the SEC's FTP server can be obtained at "Information for FTP Users," on the SEC website. U.S. Securities and Exchange Commission, Information for FTP Users, <http://sec.gov/edgar/searchedgar/ftpusers.htm> (last visited Feb. 19, 2009). In populating the CEES database, lists of filings were generated by electronically filtering through these index files, compiling the list of desired 10-K file paths, and then downloading the desired files through the FTP site in batches per quarter filed. This method was used to expedite the process so that the database did not have to be populated "by hand," one 10-K at a time. It also allowed for the development of a sustainable platform for the continued and automated updating of the database.

collated from lists then available freely on the S&P website.¹⁴

While the collection of 10-K filings is ongoing, for the purposes of this analysis the data-set was sealed after the first two quarters of filings in 2008. However, analysis performed on the first two quarters of filings provides far more than half a year's available data; 421 of the S&P 500 companies (84.2%) filed their 10-Ks with the SEC in quarters Q1 and Q2 of 2008.

2. Key Phrase Search

A simple Disk Operating System (DOS script) was composed to automatically search all collected 10-K filings and their attached exhibits for certain "key phrases" that would indicate a discussion of climate change within the documents. The phrases ultimately settled on for this study were "climate change," "global warming," and "greenhouse gas." The script was constructed to capture variations on each phrase, such as "climate changes," or "greenhouse gases."¹⁵ Each 10-K that mentioned one of the chosen key phrases was called a "hit." The script thus produced lists of discussion hits.

As it was run, the script had two blind spots. First, the script would not detect mentions that included some grammatical error. The second was somewhat more complicated. When the filings and attached exhibits were downloaded from the SEC's EDGAR File Transfer Protocol (FTP) server, the files arrived in the .txt format. This format has a maximum line length, so if a company's .html text had lines longer than that allowed for by the .txt format, the line was severed by the automatic insertion of a line break. This process created the possibility that one of the phrases we were searching for would be broken apart by a hard return, and so would go unseen by our search program.

Exxon Mobil's Fiscal Year (FY) 2007 10-K (filed February 28, 2008) was such an example. In what can only be described as one of the most cursory and insubstantial discussions concerning

¹⁴ See Standard and Poor's, <http://www.standardandpoors.com> (last visited Feb. 12, 2009) (follow "Indices" hyperlink; then follow "S&P 500 Learn More" hyperlink; then follow "Index Home" hyperlink; and then follow "Index Changes" hyperlink).

¹⁵ A discussion of the reasons for this choice follows in the subpart of this section concerning *Iteration to Refine Phrase List*. See *supra* Section II.A.4.

climate change risks, the company included the following in its 10-K:

Political and Legal Factors: The operations and earnings of the Corporation and its affiliates throughout the world have been, and may in the future be, affected from time to time in varying degree by political and legal factors including:

- political instability or lack of well-established and reliable legal systems in areas where the Corporation operates;
- other political developments and laws and regulations, such as expropriation or forced divestiture of assets, unilateral cancellation or modification of contract terms, and regulation of certain energy markets;
- laws and regulations related to environmental or energy security matters, including those addressing alternative energy sources and the risks of global climate change;
- restrictions on exploration, production, imports and exports;
- restrictions on the Corporation's ability to do business with certain countries, or to engage in certain areas of business within a country;
- price controls;
- tax or royalty increases, including retroactive claims;
- war or other international conflicts; and
- civil unrest.¹⁶

The underlined passage marks the whole of Exxon Mobil's discussion of climate change related risks for that year.¹⁷ Meager though it may be, this mention would nonetheless count as a "hit" for tabulating the study results. However, when converted to a .txt file, the discussion is formatted such that the phrase climate change runs over the end of the line, and so a line break is inserted

¹⁶ Exxon Mobil, Annual Report (Form 10-K), at 2-3 (Feb. 28, 2008) (underlining added; italics in original).

¹⁷ See *id.*

in the middle. The script was looking for a space between the words in the key phrase, not a hard return. As such, this meager entry was missed by the automated search.

While the existence of these blind spots means that the search program by itself may be slightly under-inclusive when constructing sets of “hits,” this does not undermine the integrity of the findings for two reasons. First, several spot checks were implemented at various stages as a quality check. More significantly though, both blind spots caused would-be hits to be passed over only if *every* phrase instance in the filing suffers from either a line-split or a misspelling. As it is very unlikely that a single 10-K would suffer from multiple such formatting or spelling oddities, only those 10-Ks in which the company mentioned a key phrase once *and* where that one instance happened to have either a line-split or a misspelling would be excluded from the hit list. Thus, neither blind spot was perceived to have a substantive impact on the validity of the results.

3. Context Analysis

The results of the key phrase search were then reviewed to protect against false positives. For example, the Cincinnati Financial Corporation stated in its 1996 10-K:

Guarantees are currently popular with policyholders who want absolute assurance, before they buy, that proposed costs, values and benefits will not change during the policy period, no matter how the interest rate *climate changes*.¹⁸

The search script returned not only the fact that a key phrase was used in a certain 10-K, but the line on which the phrase appeared. Thus, each hit was examined for contextual integrity to ensure that the phrase’s use pertained to the context of the study’s concern: discussion of greenhouse gas related global climate change. By examining the search script’s line returns, results such as the one given above were manually dispelled from the “hit” list before research results were tabulated.

¹⁸ Cincinnati Financial Corporation, Annual Report (Form 10-K), at 10–11 (Mar. 22, 1996) (emphasis added).

4. Iteration to Refine Phrase List:

The database was searched for several other key phrases before the list of three phrases used here was finalized. Phrases such as “carbon dioxide,” “GHG,” and “renewable energy” resulted in a large number of false positives. Though ideally they would have been captured by the context analysis step, this large number of returns raised concerns about data integrity. However, these phrase searches were abandoned upon discovering that the legitimate results flagged by these searches were wholly duplicative of those revealed by the three listed above.

5. Data Tabulation and Analysis:

Having determined which filings contained at least mentions of climate change, we proceeded to tabulate those results, many of which are presented here. The 10-Ks were categorized according to the year in which they were filed, as opposed to the financial year that they discussed. Since there was no general conformity among the companies of the start and end of their fiscal years, it was determined using the date of filing would be more intuitive. This method further allowed for easier correlation of 10-K climate change discussion rates with extrinsic influences such as the introduction of climate legislation, major elections, and the signing of international treaties. Once the results had been tabulated and organized, we began the qualitative analysis of the discussions in those filings.

B. The Qualitative Component

After populating the database of 10-K filings and flagging each entry that contained a climate change key phrase, we turned to the time-consuming process of assessing the quality of that discussion. A qualitative assessment rubric was constructed through an iterative process of examining hits for patterns in disclosure discussion, defining an assessment structure, and using the rubric in preliminary assessments of the 10-Ks. Once the rubric was constructed, student researchers were gathered for an introduction to and training in the application of the assessment tool. This process included validity checks to ensure that

individual assessors would independently apply the tool in a uniform way and come to the same final result. Having ensured the results were consistent, the 10-K hits were dispersed to researchers for the final assessment of each using the qualitative assessment rubric provided in an appendix to this article.¹⁹ Spot checks were instituted to ensure result reliability.

III. Sectoral Analyses

The following sections briefly describe the risks posed to various economic sectors by climate change or pending climate change regulation and then discuss the results of our analysis of each sector's risk disclosure in the constituent companies' 10-K filings. The economic sectors examined here were defined by Standard & Poor, as were the selection and delineation of companies in each sector. Each section includes a chart of overall sector reporting rates from 1995-2008,²⁰ a list of key findings from the quantitative and qualitative analyses, and a discussion of those results, which attempts merely to add some flesh to the skeletal structure provided by the numbers.

A. Economy-Wide Overview

A number of environmental and business groups, as well as academic commentators, have forcefully argued that climate change poses a number of risks to businesses across the economy.²¹ We will not belabor this point here, but it is important to note the great diversity and varying degree of risks different companies face. Some of the many kinds of risks and opportunities posed by climate change include:

- Regulatory Risks;
- Business Model or Competitive Risks/Opportunities;
- Physical Risks;

¹⁹ See *infra* Appendix A.

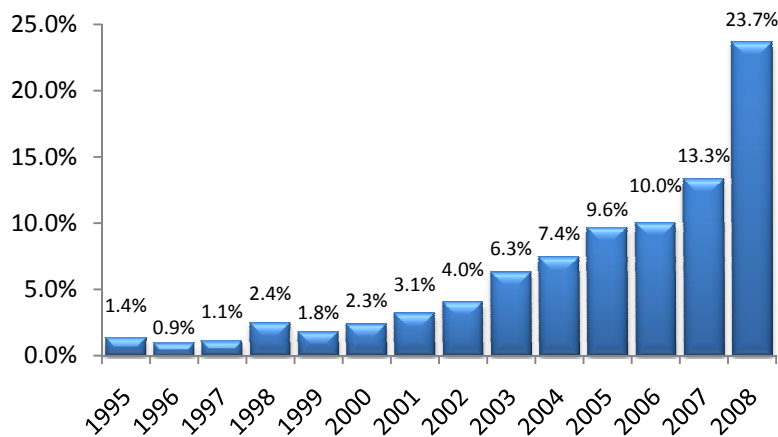
²⁰ See *supra* Part II.A regarding the scope of the data collected in 1998.

²¹ See, e.g., EDF Petition, *supra* note 1; see also Elise N. Rindfleisch, *Shareholder Proposals: A Catalyst for Climate Change-Related Disclosure, Analysis, and Action?*, 5 BERKELEY BUS. L.J. 45, 49-57 (2008).

- Litigation Risks;
- Reputational Risks/Opportunities; and
- Financial Opportunities.²²

While each company may only face a few of these risks—and those to varying degrees—many companies failed to even reference such risks in their SEC filings. In 2008, less than a quarter of the companies on the S&P 500 index mentioned climate change in their 10-Ks. While this is a marked increase from the previous year's filings, it is indicative of the sluggish growth in disclosure rates on the issue, and hints at the lackluster leadership that has guided disclosure practices thus far. The quantitative results of the study for all combined economic sectors are summarized in the table below:

Figure 1: Trends in Corporate Mentions of Climate Change in SEC 10-K Filings (All Sectors), 1995 – 2008²³



While certainly informative, the quantitative results are but a small part of the story. The quality of the discussions concerning

²² See Rindfleisch, *supra* note 21, at 47.

²³ All 6354 10-Ks were searched for the presence of one or more of the following climate key phrases: “climate change,” “global warming,” and “greenhouse gas.” The search was constructed to capture variations on each phrase. See Part II—Methodology, *supra*.

climate change-related risks further highlights the failure of current disclosure mechanisms to inform and protect interested investors. Table 1 outlines the percentage of companies in each economic sector that merely mentioned a climate change key phrase in their 10-Ks filed in 2008. The table also indicates the percentage of companies whose discussion met the low hurdle of identifying at least one specific kind of climate change-related risk and setting out a management or mitigation strategy that the company would implement in order to protect shareholders and investors.

Table 1. 2008 Mentions of Climate Change by Sector for Quarters 1 and 2

<i>Economic Sector</i>	<i>% of Companies that "Mentioned" Change in 2008</i>	<i>% Identifying 1 Risk and an Associated Management Strategy</i>
All Sectors	23.6%	5.5%
Utilities	96.8%	35.5%
Energy	62.9%	5.7%
Materials	56.0%	28.6%
Consumer Staples	19.2%	0.0%
Industrials	15.0%	2.1%
Financials	9.4%	0.0%
Consumer Discretionary	7.0%	2.8%
Information Technology	6.5%	0.0%
Health Care	4.5%	0.0%
Telecommunications Services	0.0%	0.0%

In the sections that follow, we briefly delineate the risks facing each sector, examine the research results regarding that sectors mentions of climate change key phrases, and discuss possible implications and interpretations of the results.

B. Utilities Sector

The utility sector comprises a number of industry groups, including electric utilities, gas utilities, multi-utilities, water utilities, and independent power producers and energy traders.²⁴ The lion's share of companies listed in the S&P 500 fall into the first category: electric utilities.²⁵ In mid-2008, the utilities sector contained thirty-one companies (6.2% of the S&P 500).²⁶

1. Sector Risks

Electric utilities are among the highest emitters of greenhouse gases. They are thus particularly vulnerable to the potential regulatory and legal impacts of a carbon constrained environment. As large emitters of greenhouse gases, electric utilities have been targeted for direct regulation by a number of regulatory regimes, both proposed and implemented.²⁷ Furthermore, internalizing carbon emissions into the cost of electricity production promises to shift the balance sheets for many electricity producers. Indeed, in 2008 Bank of America announced it would “factor the cost of carbon into its risk and underwriting process when evaluating the business models of utility sector companies.”²⁸

²⁴ See Standard and Poor, *GICS (Global Industry Classification Standard)* [hereinafter “GICS Framework”], available at http://www2.standardandpoors.com/spf/xls/index/GICS_English_083108.xls.

²⁵ See *id.*

²⁶ These figures are derived from the underlying data set of 6354 10-K filings. The figures represent the number of S&P 500 companies in 2008 that (1) were classified as “utility sector” companies and (2) which submitted a 10-K filing as of the second fiscal quarter of 2008.

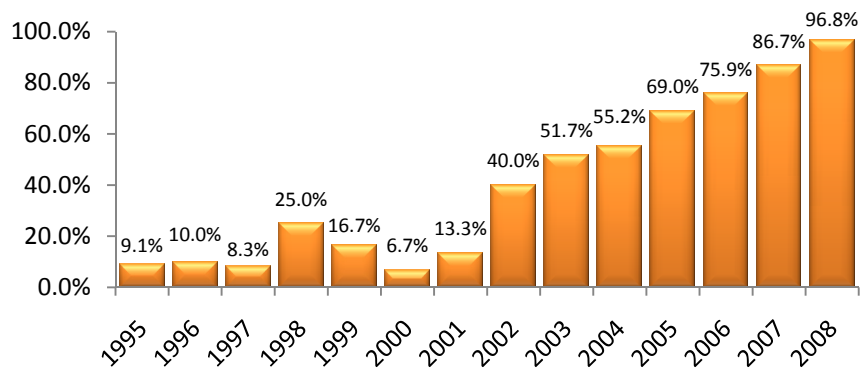
²⁷ Domestically, electricity generators in the Northeast are regulated under the Region Greenhouse Gas Initiative (RGGI). See About RGGI, <http://www.rggi.org/about> (last visited Feb. 19, 2009). Internationally, the European Union's Emissions Trading Scheme—the region's joint effort to meet Kyoto-imposed greenhouse gas emissions reductions—saddled the power sector with much of the burden of cutting emissions. Press Release, Europa, Questions & Answers on Emissions Trading and National Allocation Plans (June 20, 2005), available at <http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/05/84&format=HTML&aged=1&language=EN&guiLanguage=en>.

²⁸ Charles Franklin, *Banking Industry Leaders See Climate Change as Risk Factor in Underwriting Utilities*, U.S.L. AND POL'Y, Feb. 14, 2008, <http://climateintel.com/2008/02/14/banking-industry-leaders-see-climate-change-as-risk-factor-in-underwriting->

2. Analysis Results

The utility sector has in many ways spearheaded the disclosure of climate change related risks in SEC filings. The sector's rate of mentioning key climate phrases far outstrips any other sector. However, it is important at this juncture to emphasize just how low a bar this study imposed on the analyzed 10-Ks: mere mention of a term should in no way be confused with thoughtful risk analysis. That said, the quantitative results for the utility sector are as follows:

Figure 2: Trends in utilities sector mention of climate change “key phrases” in 10-K filings, 1995-2008.



The utility sector has the highest rate of reporting on climate change related issues in 10-K filings with the SEC, with 96.8% of utility companies in the S&P 500 mentioning climate change in their 2008 10-K filing.

Of those utility filings examined in 2008, only one failed to mention a climate change key phrase: Nicor, Inc.²⁹

Since 2001, the utility sector has out-performed every other economic sector in the percentage of companies at least mentioning climate key phrases in 10-Ks.

utilities/; see also DOUGLAS G. COGAN, CORPORATE GOVERNANCE AND CLIMATE CHANGE: THE BANKING SECTOR 26 (Ceres 2008).

²⁹ Nicor, Inc., Annual Report (Form 10-K) (Feb. 26, 2008). Nicor is principally a natural gas distributor based in the mid-west. See *id.* at 1.

3. *Qualitative Assessment and Discussion*

The high percentage of discussion “hits” in the utilities sector urged a more in-depth qualitative investigation. Unlike the sectors discussed later in which only one standard was applied, the utility sector was examined under three different standards.³⁰ The first standard was the same as that by which the other sectors were tested: how many companies in this sector identified at least one climate change associated risk in their 2008 10-K filings, and then went on to discuss a management or mitigation strategy for that risk? **Only 35.5% met this low standard.**

However, utility companies, unlike companies in other economic sectors, had reason to be particularly careful with their 10-K filings. In September of 2007, the New York Attorney General subpoenaed the internal records of five companies, including Xcel Energy, to investigate precisely the issue at hand: under-reporting of climate change related risks in public filings designed to inform interested investors.³¹ The letter sent to Xcel chastised the company for pushing forward with the construction of a new coal-fired power plant without contemplating potential risks related to the added greenhouse gas emissions. The Attorney General’s letter read:

In its [Financial Year] 2006 Form 10-K [filed in 2007], Xcel made no disclosure of projected CO₂ emissions from the proposed power plant or its current power plants. Further, Xcel did not attempt to evaluate or quantify the possible effects of future greenhouse gas regulations, or discuss their impact on the company. These omissions make it difficult for investors to make informed decisions.

Under federal and state laws and regulations, Xcel’s disclosures to investors must be complete and not

³⁰ Later sections provide information as to what percentage of companies in that sector identified at least one climate related risk and discussed a management and mitigation strategy for that risk.

³¹ The five companies subpoenaed were AES Corp., Dominion Resources, Xcel Energy, Dynegy, Inc., and Peabody Energy. See New York Attorney General, Energy Companies Subpoenaed: Letters from Attorney General Cuomo [hereinafter NY AG Subpoena Letters], available at http://www.oag.state.ny.us/media_center/2007/sep/sep17a_07.html.

misleading. Selective disclosure of favorable information or omission of unfavorable information concerning climate change is misleading. Xcel cannot excuse its failure to provide disclosure and analysis by claiming there is insufficient information concerning known climate change trends and uncertainties.³²

This letter stood as a warning to companies—especially electric utilities—facing climate change related risks. Specifically, the letter spelled out that Xcel’s 2007 10-K was not good enough.

Examining that 10-K under our qualitative assessment rubric, we determined that Xcel had identified two distinct types of risks it faced because of climate change, discussed a management and mitigation strategy for each of those risks, set out an aspirational emissions reduction goal, and described voluntary measures with which the company was involved that targeted the climate change problem.³³

³² Letter from Katherine Kennedy and Matthew Gaul, Office of the New York Attorney General to Mr. Richard C. Kelly, Chairman, President, and Executive Officer, Xcel Energy (Sept. 14, 2007) *available at* http://www.oag.state.ny.us/media_center/2007/sep/xcel%20energy.pdf.

³³ The whole of Xcel’s discussion of climate change in its 10-K filed in 2007 is included below. The bracketed comments correspond to bins on our qualitative assessment rubric (included in **Appendix A**), and so pinpoint the location of each identified statement.

The issue of global climate change is receiving increased attention. There is considerable debate regarding the public policy approach that the United States should follow to address the issue. Several members of Congress have also proposed legislation to regulate carbon dioxide, and several states are developing their own programs to address climate change.

While it is not possible to know the eventual outcome, Xcel Energy is taking prudent steps to address the risk of potential climate regulation [*RI: Regulatory Risk*]. Xcel Energy’s initiatives to prepare for potential carbon dioxide regulation include the following:

- Xcel Energy is participating in a voluntary carbon management program [*GHG Emissions Reduction Pledges: Membership in Group Initiatives*] and has established goals to reduce its volume of carbon dioxide emissions by 12 million tons by 2009, and to reduce carbon intensity by 7 percent by 2012. [*GHG Emissions Reduction Pledges: Aspirational Quantitative Reduction*]
- In certain regulatory jurisdictions, Xcel Energy uses an evaluation process for future generating resources that incorporates the risk of future carbon limits through the use of a carbon cost adder or externality costs. [Implicit

After examining this 2007 10-K form that did not provide enough disclosure, we turned to the 2008 10-K filings of utility companies. Then, after reviewing all 2008 utility 10-K filings in 2008, we first asked, “how many companies identified at least two distinct risks and went on to discuss a risk management and mitigation strategy for one of those risks?” Next we asked, “how many utility companies met the ‘not-good-enough’ standard as implicitly set out in Xcel’s 2007 10-K?” The results, which are not encouraging, are set out in Table 2 below.

– *RI: Business Model Risks; RM&M: Business Model Shifts*]

- PSCo is in the process of developing an IGCC plant that generates electricity using gasified coal and will be the first plant of its kind to capture and sequester a portion of the carbon dioxide generated by the plant.
- Xcel Energy is the largest retail provider of wind generated energy in the nation and continues to grow its wind portfolio.
- Xcel Energy is involved in initiatives to manage carbon dioxide, including the use of biosequestration and the study of geological sequestration. [*RM&M: Anticipating Regulatory Requirements*]
- Xcel Energy continues to develop and expand its customer conservation and demand side management programs.
- Xcel Energy is working with public policy makers to support the development of a national climate policy to require the deployment of electric generation technology that emits little or no carbon dioxide.

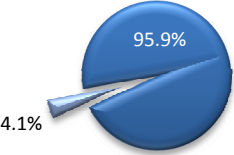
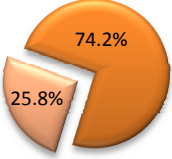
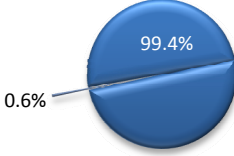
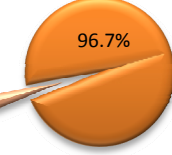
[General – *RM&M: Anticipating Regulatory Requirements* (efforts to manage CO₂ emissions through technological research, consciousness of generation portfolio, and demand-side management programs)]

Xcel Energy believes that it is well positioned for a variety of possible outcomes.

Xcel Energy, Inc., Annual Report (Form 10-K), at 55 (Feb. 23, 2007).

It is worth explaining here why the second bullet in this discussion was considered an implicit discussion of a business model risk: the inclusion of a carbon risk adder illustrates an effort to incorporate future costs into business planning to ensure that company projects will be profitable. It is an effort to protect the bottom line, as opposed to comply with or anticipate a regulatory burden (even though the business risk will likely be the result of regulatory action).

Table 2. Qualitative Assessment of Climate Risk Disclosure in SEC 10-K Filings³⁴

<p>2 Risks Identified; 1 Risk Mitigation Strategy Discussed</p> <p>Only 25.8% of 10-Ks filed by utilities in the first two quarters of 2008 identified two or more distinct climate change risks (e.g. regulatory and litigation), and went on to discuss the management or mitigation of at least one of those risks for shareholder protection. Across all sectors, only 4.1% of companies had this level of detail in their reporting.</p>	<p style="text-align: center;">All</p>  <p style="text-align: center;">Utilities</p> 
<p>The Xcel 2007 “Bad Example”</p> <p>Xcel’s 2007 10-K, <i>filed prior to being subpoenaed by the New York Attorney General</i>, identified two risks, discussed a management and mitigation solution for each, and described voluntary measures the company had implemented with respect to climate change. A year later, only one company (3.2%) in the utility sector met this standard: Xcel Energy. Across all sectors, less than 1% had this level of detail in their reporting.</p>	<p style="text-align: center;">All</p>  <p style="text-align: center;">Utilities</p> 

It is worth noting that the quality of the disclosure as assessed here does not capture just how utility disclosure related to climate change *did* change from 2007 to 2008: the discussions became longer. AES Corporation, another electric utility subpoenaed by

³⁴ See also Appendix B, *infra*.

the New York Attorney General along with Xcel, provides the perfect example. AES's 2008 10-K included an extensive eight page discussion of existing and proposed climate change legislation—both in the United States and abroad.³⁵ While detailed in some ways, it reads like a child's book report: a cold and thoughtless overview of things happening to the company. Tellingly, the corporation provides a laundry list of factors (essentially legislation characteristics) which may or may not have an influence on the company in the event that federal policy action on climate change is enacted.³⁶ With the exception of its discussion of RGGI,³⁷ nowhere in AES's disclosure is there a hard analysis of just what these policies mean (or would mean) for the corporation, nor is there an explicit statement of just how the policies would impact the company's operation.³⁸

This kind of disclosure illustrates that companies with significant risks are fumbling to understand them and disclose them in meaningful ways. Nevertheless, several efforts have been made to provide guidance to companies in order to give substance and direction to disclosure efforts. Notable among these are the New York Attorney General's Office settlement with Xcel Energy and Dynegy, which set out substantive areas of concern that should be fleshed out in risk assessment.³⁹ Additionally, Ceres has

³⁵ AES Corporation, Annual Report (Form 10-K), at 38–43, 63–65 (Mar. 17, 2008).

³⁶ *See id.* at 42–43.

³⁷ *See id.* at 64.

³⁸ The closest thing to a concrete climate change-related consequence put forward in its 10-K is the following:

[C]ertain financial institutions have recently expressed concern about providing financing for facilities which would emit GHGs, which can affect our ability to obtain capital, or if we can obtain capital, to receive it on commercially viable terms. In addition, rating agencies may decide to downgrade our credit ratings based on the emissions of the businesses operated by our subsidiaries or increased compliance costs which could make financing unattractive.

Id. at 64–65. Ultimately, AES cursorily identified four distinct risks (business model, regulatory, physical plant, and litigation) but failed to discuss a management and mitigation strategy for a single one. *Id.* at 5-6.

³⁹ *See* Xcel Energy Agreement, *supra* note 8 (setting out the basics of the settlement with Xcel Energy); *see also* Dynegy Agreement, *supra* note 8 (setting out the basics of the settlement with Dynegy, Inc.)

published its best practices guide, *Electric Utilities: Global Climate Disclosure Framework*.⁴⁰

The moral of the utility sector's story is that an apparently high rate of disclosure of climate change related risks belies the fact that such disclosures are—more often than not—cursory in their discussion and insubstantial in their analysis of risk.

C. Energy

The energy sector consists of companies whose businesses are dominated by one of the following activities: (1) companies engaged in the exploration, production, marketing, refining and/or transportation of oil and gas products, coal and other consumable fuels; and (2) the construction or provision of oil rigs, drilling equipment and other energy related service and equipment, including seismic data collection.⁴¹ In mid-2008, the S&P 500 energy sector consisted of thirty-six companies (7.2% of the S&P 500).⁴²

1. Sector Risks

As a major emitter of greenhouse gases, the energy sector is particularly vulnerable to the legal and regulatory risks posed by climate change. The sector is also vulnerable to the physical risks posed by climate change, including infrastructure damage and operational breakdown due to extreme weather events.⁴³ In addition, warming conditions could have a major impact on natural gas demand for winter heating and coal demand could decline as carbon caps reduce production of coal-fired power.

⁴⁰ CERES, *ELECTRIC UTILITIES: GLOBAL CLIMATE DISCLOSURE FRAMEWORK* (2008), available at <http://www.ceres.org//Document.Doc?id=278>.

⁴¹ See GICS Framework, *supra* note 24.

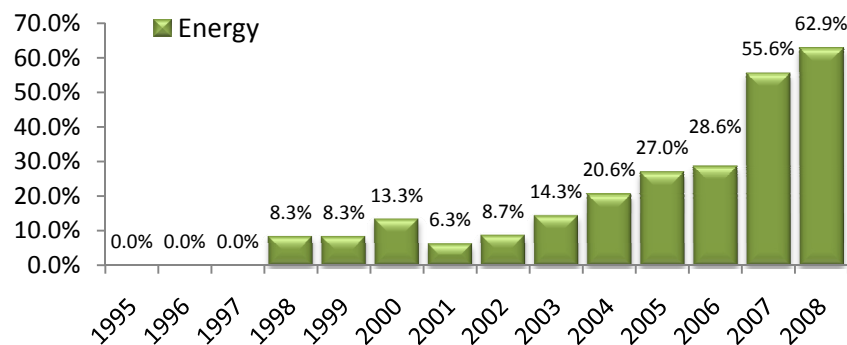
⁴² See discussion, *supra* note 26.

⁴³ FRANCES G. SUSSMAN & J. RANDALL FREED, *ADAPTING TO CLIMATE CHANGE: A BUSINESS APPROACH 8* (Pew Center on Global Climate Change 2008), available at <http://www.pewclimate.org/docUploads/Business-Adaptation.pdf>.

2. Analysis Results

For 2008 10-K filings, the energy sector had the second highest percentage of “climate change” mentions among all sectors. Approximately sixty-three percent of energy companies used one or more of the climate change “key phrases” in a 2008 10-K.

Figure 3: Trends in energy sector mention of climate change “key phrases” in 10-K filings, 1995-2008.



- » The overall quality of climate change discussions in this sector is very low, with only 5.7% of the sector meeting the standard of identifying at least one climate change risk and articulating a management or mitigation strategy for that risk.
- » 37.1% of energy companies failed to mention climate change in their 2008 10-K filing.
- » References to climate change by energy sector companies first occurred in 1998 with 8.3% of the sector providing some treatment of the issue.

3. Discussion

While more than half of all energy sector companies are providing some mention of climate change in their 10-K filings, less than six percent of energy sector companies are meeting the

relatively low standard of identifying at least one climate change risk and articulating a management or mitigation strategy for that risk. Given the significant climate-related legal, regulatory, physical, and market-based risks faced by this sector, the paucity of meaningful discussions of climate change related risks is cause for concern.

D. Materials

The materials sector includes a wide range of companies involved in commodity-related manufacturing. Included in this sector are companies that manufacture chemicals, construction materials, glass, paper, forest products and related packaging products, and metals, minerals and mining companies, including producers of steel.⁴⁴ In mid-2008, the S&P 500 materials sector consisted of twenty-eight companies (5.6% of the S&P 500).⁴⁵

1. Sector Risks

The risks presented by climate change to the materials sector include regulatory risks, rising fuel and power costs, emerging market competition, reduced supply of raw materials (some supply sources may be affected by climate-related physical and regulatory impacts), consumer concerns about environmental responsibility, and carbon regulation of sector entities. Cement companies alone account for five percent of global carbon dioxide emissions.⁴⁶ The chemical processes used throughout this sector rely on significant amounts of fuel and electricity.⁴⁷

⁴⁴ See GICS Framework, *supra* note 24.

⁴⁵ See discussion, *supra* note 26.

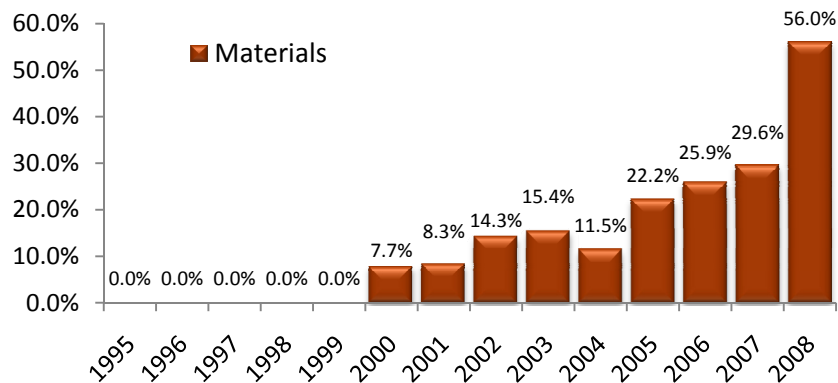
⁴⁶ Ernst Worrell, et al., *Carbon Dioxide Emissions from the Global Cement Industry*, 26 ANNUAL REVIEW OF ENERGY AND ENVIRONMENT 303, 304 (2001), available at <http://arjournals.annualreviews.org/doi/pdf/10.1146/annurev.energy.26.1.303?cookieSet=1>.

⁴⁷ See, e.g., Worrell, *supra* note 46, at 304.

2. Analysis Results

In terms of the percentage of companies within a sector that “mentioned” climate change in a 2008 10-K filing, the materials sector had the third highest percentage of mentions among all sectors. Approximately fifty-six percent of materials companies used one or more of the climate change “key phrases” in a 2008 10-K.

Figure 4: Trends in materials sector mention of climate change “key phrases” in 10-K filings, 1995-2008.



- » The overall quality of climate change discussions in this sector is low, with only 28.6% of the sector meeting the standard of identifying at least one climate change risk and articulating a management or mitigation strategy for that risk.
- » Forty-four percent of materials companies failed to mention climate change in their 2008 10-K filing.
- » References to climate change by materials sector companies first occurred in 2000 with 7.7% of the sector providing some treatment of the issue.
- » Between 2007 and 2008 the percentage of companies mentioning climate change in 10-Ks grew from 29.6% to fifty-six percent.

3. Discussion

In the past year the percentage of materials sector companies providing some “mention” of climate change in a 10-K filing has grown considerably. From 2007 through 2008 the percentage of climate change “mentions” by materials companies grew from 29.6% to fifty-six percent—a total increase of 89.2%. Almost thirty percent of materials sector companies meet the relatively low standard of identifying at least one climate change risk and articulating a management or mitigation strategy for that risk.

E. Industrials

The industrials sector includes companies whose businesses are dominated by one of the following activities: the provision of transportation services, including airlines, couriers, marine, road and rail infrastructure; the provision of commercial services and supplies, including printing, employment, environmental and office services; and the manufacture and distribution of capital goods, including aerospace and defense, construction, engineering and building products, electrical equipment and industrial machinery.⁴⁸ In mid-2008, the industrials sector consisted of fifty-six companies (11.2% of the S&P 500).⁴⁹

1. Sector Risks

The risks presented by climate change to the industrial sector include regulatory risks, rising fuel costs, emerging market competition, consumer concerns about environmental responsibility, and carbon regulation of sector entities such as airlines and trucking companies.

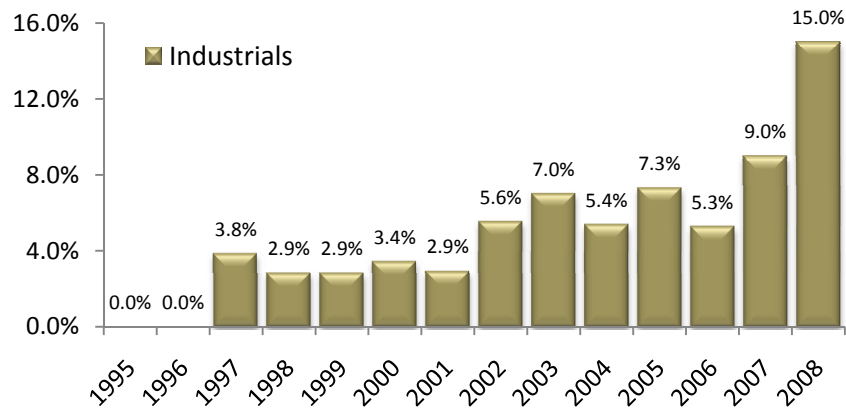
⁴⁸ See GICS Framework, *supra* note 24.

⁴⁹ See discussion, *supra* note 26.

2. Analysis Results

For 2008 10-K filings, the industrial sector had a relatively low percentage of climate change “mentions” among all sectors. Approximately fifteen percent of industrial companies used one or more of the climate change “key phrases” in a 2008 10-K.

Figure 5: Trends in industrial sector mention of climate change “key phrases” in 10-K filings, 1995-2008.



- » The overall quality of climate change discussions in this sector is very low, with only 2.1% of the sector meeting the standard of identifying at least one climate change risk and articulating a management or mitigation strategy for that risk.
- » Eighty-five percent of industrial companies failed to mention climate change in their 2008 10-K filing.
- » References to climate change by industrial sector companies first occurred in 1997 with 3.8% of the sector providing some treatment of the issue.
- » Between 2007 and 2008 the percentage of companies mentioning climate change in 10-Ks grew from nine percent to fifteen percent.

3. Discussion

Given the non-trivial climate-related legal, regulatory, physical, and market-based risks faced by this sector, the fact that only 2.1% of the sector is meeting the relatively low standard of identifying at least one climate change risk and articulating a management or mitigation strategy for that risk is troubling. From 2007 through 2008 the percentage of climate change “mentions” by industrial companies grew from nine to fifteen percent—a total increase of 66.7%.

F. Financials

The financial sector includes the following industries commercial banks, thrifts and mortgage finance, diversified financial services, consumer finance, capital markets, insurance, real estate, real estate investment trusts, and real estate management and development.⁵⁰ In mid-2008 the financial sector included ninety-one companies (18.2% of the S&P 500).⁵¹

1. Sector Risks

Climate change has clear and significant economic implications for insurance, banking, investment and other asset management companies. A complex web of financial and legal instruments directly connect the financial sector to all other sectors, making the sector highly vulnerable to the economic, legal, regulatory, and physical impacts of climate change on other sectors. Investment firms infuse money into industries and companies who may themselves be exposed to climate change risks.⁵² Insurance companies often hold policies on investments and physical structures that are vulnerable to the increasing number and intensity of severe weather events.⁵³ Shifts in the

⁵⁰ *Id.*

⁵¹ See discussion, *supra* note 26.

⁵² See, e.g., *infra* notes 59–61 and accompanying text regarding the Morgan Stanley case study.

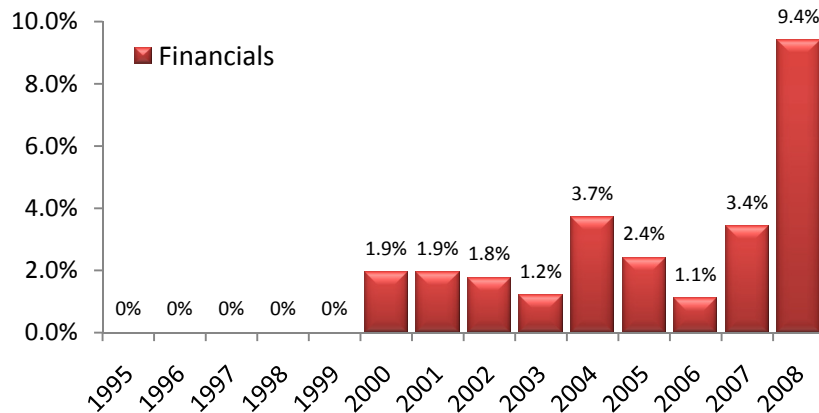
⁵³ For an in-depth discussion of insurance companies as they tackle their myriad climate change related risks, see Sean B. Hecht, *Climate Change and the Transformation*

profitability of these investments, or the exposure of the insured to physical and litigation risks, could potentially have a devastating impact on the integrity of financial institutions.

2. Analysis Results

The financial sector has had a worrisomely low rate of reporting on climate change related risks:

Figure 6: Trends in financial sector mention of climate change “key phrases” in 10-K filings, 1995-2008.



- » Companies in the financial sector first began reporting on climate change related issues in 2000, with 1.9% of companies mentioning a climate change key phrase.
- » In 2008, the financial sector was still a low-reporting sector concerning climate change risks with only 9.4% of financial companies mentioning a climate key phrase.

of Risk: Insurance Matters, 55 UCLA L. REV. 1559, 1568-83 (2008), and Christina Ross, Evan Mills, & Sean B. Hecht, *Limiting Liability in the Greenhouse: Insurance Risk-Management Strategies in the Context of Global Climate Change*, 43A STAN. J. INT'L L. 251, 305-16 (2007).

The overall quality of climate change discussions in this sector is extremely low. Not a single company meets the standard of identifying at least one climate change risk and articulating a management or mitigation strategy for that risk.

3. Discussion

In the wake of the economic disaster precipitated by the irresponsible use of sub-prime mortgage-backed securities—and the deliberate cloaking of related risks—the financial sector has taken a lot of heat for failing to protect investors and acting in its own self-interest.⁵⁴ As former Federal Reserve Chairman Alan Greenspan noted in testimony before Congress in October 2008, “Those of us who have looked to the self-interest of lending institutions to protect shareholders’ equity, myself included, are in a state of shocked disbelief.”⁵⁵

From our analysis, climate change seems like another of the financial sector’s blind spots and it provides the context for a disturbingly parallel story of risk oversight. In 2008, the global advisory firm of Ernst & Young announced that climate change is the greatest strategic risk currently facing the property/casualty insurance industry.⁵⁶ Several of the companies included within this sector have called for in-depth disclosures concerning climate change risks from companies in other sectors, but they have not yet disclosed their own risks while financially backing, trading, or investing in such companies.⁵⁷ These risks, while admittedly a step removed from those industries facing potential carbon

⁵⁴ See, e.g., Steven L. Schwarcz, *Protecting Financial Markets: Lessons from the Subprime Mortgage Meltdown 22-27* (Duke Law Sch. Legal Stud., Research Paper No. 175, 2007) (discussing the reasons for the subprime mortgage crisis).

⁵⁵ *The Financial Crisis and the Role of Federal Regulators: Hearing before the H. Comm. of Gov’t Oversight and Reform*, 110th Cong. 17 (2008) (testimony of Alan Greenspan, Former Chairman of the Fed. Reserve), available at <http://oversight.house.gov/documents/20081024163819.pdf>.

⁵⁶ ERNST & YOUNG: INSURANCE, *supra* note 11, at 6.

⁵⁷ EVAN MILLS, *FROM RISK TO OPPORTUNITY: 2007; INSURER RESPONSES TO CLIMATE CHANGE 29* (Ceres 2007), available at <http://www.ceres.org/Document.Doc?id=225>.

regulation, still have the potential to generate serious economic impacts on the financial companies.⁵⁸

Morgan Stanley provides a good example. The investment firm announced its own commitment to reducing emissions associated with its business, and even underscored the role markets and investment will play in leveraging movement on the climate change front.⁵⁹ Furthermore, the firm explicitly conceded the dangers and uncertainties regarding investing in industries plagued with climate change related risks.⁶⁰

Morgan Stanley's SEC filings are something of an enigma. The firm explicitly noted in its 2008 10-K filings that it owned five utilities. However they did not mention the impact climate change regulation may have on their profitability, or the financial burdens associated with that ownership, or what the company might do about such risks.⁶¹ Morgan Stanley's paltry discussion

⁵⁸ See WORLD WILDLIFE FUND FOR NATURE & ALLIANZ GROUP, CLIMATE CHANGE AND THE FINANCIAL SECTOR 6-10 (2005),

⁵⁹ Press Release, Morgan Stanley, Morgan Stanley Announces Creation of Carbon Bank (Aug. 14, 2007), available at <http://www.morganstanley.com/about/press/articles/5371.html>.

⁶⁰ Press Release, Morgan Stanley, Leading Wall Street Banks Establish the Carbon Principles (Feb. 28, 2008), available at <http://www.morganstanley.com/about/press/articles/6017.html> (discussing Morgan Stanley's role in the development of risk assessment principles when evaluating investment opportunities that may be affected by shifting climate regulation and myriad regulatory responses).

⁶¹ For the sake of completeness, the whole of Morgan Stanley's discussion on this matter is included here:

[W]e own five electricity generating facilities in the U.S. and Europe; TransMontaigne Inc. and its subsidiaries, a group of companies operating in the refined petroleum products marketing and distribution business; and the Heidmar Group of companies, which provide international marine transportation and U.S. marine logistics services. As a result of these activities, we are subject to extensive and evolving energy, commodities, environmental, health and safety, and other governmental laws and regulations. For example, liability may be incurred without regard to fault under certain environmental laws and regulations for the remediation of contaminated areas. Our commodities business also exposes us to the risk of unforeseen and catastrophic events, including natural disasters, leaks, spills, explosions, release of toxic substances, fires, accidents on land and at sea, wars, and terrorist attacks that could result in personal injuries, loss of life, property damage, and suspension of operations.

Although we have attempted to mitigate our pollution and other environmental risks by, among other measures, adopting appropriate policies

of risks in the forum dedicated to informing investors underscores the apparent feelings of many in the financial sector: climate-risks are real, but they're someone else's problem.

G. Information Technology

The information technology (IT) sector covers the following general areas: (1) technology software and services (including companies that primarily develop software in various fields such as the Internet, applications, systems, databases management and/or home entertainment, and companies that provide information technology consulting and services, as well as data processing and outsourced services); (2) technology hardware and equipment (including manufacturers and distributors of communications equipment, computers and peripherals, electronic equipment and related instruments) and (3) semiconductors and semiconductor equipment manufacturers.⁶² In mid-2008, the information technology sector consisted of seventy-one companies (14.2% of the S&P 500).⁶³

1. Sector Risks

According to one estimate, in 2005, total electricity usage by information technology equipment in data centers, including electricity for cooling and power distribution, was one percent of world's total electricity consumption.⁶⁴ In 2005 global data center

and procedures for power plant operations, monitoring the quality of petroleum storage facilities and transport vessels and implementing emergency response programs, these actions may not prove adequate to address every contingency. In addition, insurance covering some of these risks may not be available, and the proceeds, if any, from insurance recovery may not be adequate to cover liabilities with respect to particular incidents. As a result, our financial condition and results of operations may be adversely affected by these events.

Morgan Stanley, Annual Report (Form 10-K), at 18 (Jan. 28, 2008).

It is worth noting here, too, that Morgan Stanley's 10-K filed in 2009 did no better: it never once mentioned "climate change," "Kyoto," "carbon," "global warming," or "greenhouse." See Morgan Stanley, Annual Report (Form 10-K) (Jan. 29, 2009).

⁶² See GICS Framework, *supra* note 24.

⁶³ See discussion, *supra* note 26.

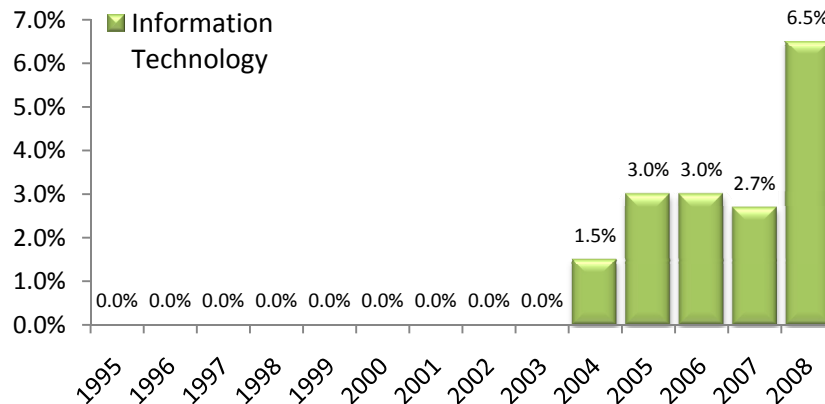
⁶⁴ Jonathan Koomey, *Worldwide Electricity Used in Data Centers*, 3 ENV'T RES.

power demand was “equivalent (in capacity terms) to about seventeen 1000 MW power plants.”⁶⁵ Power usage on this scale presents climate change related risks involving potential regulatory oversight and increases in electricity costs.

2. Analysis Results

For 2008 10-K filings, the IT sector had the third lowest percentage of “mentions” of climate change among all sectors. Approximately 6.5 percent of IT companies used one or more of the climate change “key phrases” in a 2008 10-K.

Figure 7: Trends in information technologies sector mention of climate change “key phrases” in 10-K filings, 1995-2008.



» The overall quality of climate change discussions in this sector is extremely low, with none of the sector

LETTERS 6 (2008), available at http://www.iop.org/EJ/article/1748-9326/3/3/034008/erl8_3_034008.pdf?request-id=65614ef3-efb4-4c2a-b1a86f0aec59548f.

⁶⁵ *Id.*

meeting the standard of identifying at least one climate change risk and articulating a management or mitigation strategy for that risk.

- » 93.5% of IT companies failed to mention climate change in their 2008 10-K filing.
- » References to climate change by IT sector companies first occurred in 2004 with 1.5% of the sector providing some treatment of the issue.
- » Between 2007 and 2008 the percentage of companies mentioning climate change in 10-Ks grew from 2.7% to 6.5%.

3. Discussion

In the past year, the percentage of IT sector companies providing some “mention” of climate change in a 10-K filing has grown considerably. From 2007 to 2008 the percentage of climate change “mentions” by IT companies grew from 2.7% to 6.5%—a total increase of 140.7%. However, the overall quality of climate change discussions in this sector is very low, with 0.0% of the sector meeting the standard of identifying at least one climate change risk and articulating a management or mitigation strategy for that risk.

H. Telecommunications Services

The telecommunications services sector includes diversified telecommunication services companies (alternative carriers, operators of primarily fixed line telecom. networks, etc.) and wireless telecommunication services companies.⁶⁶ In mid-2008, the telecommunications services sector consisted of nine companies (1.8% of the S&P 500).⁶⁷

⁶⁶ See GICS Framework, *supra* note 24.

⁶⁷ See discussion, *supra* note 26.

1. *Sector Risks*

The telecommunications industry is exposed to several risks connected with climate change. In 2003, the telecommunications network in the United States was estimated to draw between twenty-nine and thirty-four terawatt-hours per year (TWh/yr), or roughly a full one percent of the nation's electricity consumption.⁶⁸ The high consumption of electricity exposes many businesses to potential cost-of-business shifts. Indeed, many electric utilities, while acknowledging potential regulatory burdens of future regulation, state in their own 10-Ks that the business risk is minimal because any expected increases in production costs would be covered by passing those costs on to electric consumers.⁶⁹

Furthermore, cell towers and other network infrastructure are also vulnerable to extreme weather events, which induce not only maintenance and replacement costs, but also costs associated with new regulations that are aimed at protecting the telecommunication networks role in facilitating emergency response.⁷⁰ Finally, "through [their] extensive supplier chain purchases of manufactured goods and services from other sectors of the economy, telecommunications services are responsible for substantial environmental effects."⁷¹

⁶⁸ H. Scott Matthews et al., *Electricity Use of Wired and Wireless Telecommunications Networks in the United States*, ELECTRONICS AND THE ENV'T 131, 131 (2003).

⁶⁹ See, e.g., Xcel Energy Corp., Annual Report (Form 10-K), at 9 (Feb. 20, 2008) ("Although the impact of climate change policy on Xcel Energy will depend on the specifics of state and federal policies and legislation, we believe that, based on prior state commission practice, we would be granted the authority to recover the cost of these initiatives through rates."); Duke Energy Corp., Annual Report (Form 10-K), at 42 (Feb. 29, 2008) (summarizing Corporate initiatives responding to renewable energy mandates and pending climate change legislation by stating "Duke Energy is coordinating its future capital expenditure requirements with regulatory initiatives in order to ensure adequate and timely cost recovery while continuing to provide low cost energy to its customers").

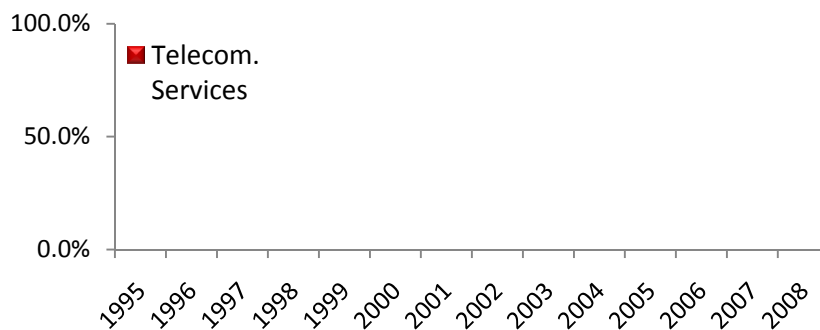
⁷⁰ See David Twiddy, *Regulators Hang Up on Cell Tower Backup Rules*, ASSOCIATE PRESS, Dec. 1, 2008, available at http://www.boston.com/business/technology/articles/2008/12/01/regulators_hang_up_on_cell_tower_backup_rules.

⁷¹ See Arpad Horvath, *Supply Chain Environmental Assessment of the Telecommunications Sectors*, ELECTRONICS AND THE ENV'T 146, 146 (1999) (discussing general environmental impacts of the telecommunications industry).

2. Analysis Results

The telecommunications services sector holds the dubious honor of the only sector with none reporting rates on climate change related risks for the years examined in this study:

Figure 8: Trends in telecommunications services sector mention of climate change “key phrases” in 10-K filings, 1995-2008.



- » Zero percent of companies mentioned a climate change key phrase in any year.
- » The telecommunications sector is the only economic sector whose constituent companies have never mentioned a climate change key phrase during the entire span of the study.

3. Discussion

The graph is illustrative of all the issues enclosed within the telecommunications sector. The risks posed to companies in this sector by climate change, while less direct and severe than the potential of direct regulation like that faced by utility sector, are real and non-trivial. The absence of *any* discussion of climate change related impacts in this sector underscores just how broken the disclosure mechanisms meant to drive forward-thinking risk disclosure to investors are in this area.

I. Consumer Staples

The consumer staples sector includes food and staples retailing; food, beverages, and tobacco companies; and household and personal products manufacturers.⁷² In mid-2008, the consumer staples sector consisted of forty companies (eight percent of the S&P 500).⁷³

I. Sector Risks

The climate change-related risks faced by the consumer staples sector are myriad. First, nearly every company in the sector relies on a vast distribution network—usually trucking—to distribute and sell wares. As transportation is a significant source of greenhouse gas emissions in the United States,⁷⁴ it may well be that distribution prices are adversely affected by climate legislation in an attempt to internalize the carbon cost within the activity. In the context of fresh food and dairy suppliers and distributors, this concern is particularly pointed as the distribution must be done in a timely fashion as to prevent the goods from spoiling before they can reach the shelves.

Distribution networks can be disrupted by severe weather events as well. Again, the temporal sensitivity of some items gives this concern (more) teeth as such a disruption could easily mean lost profits rather than delayed profits. Food connected industries also have the additional and fundamental climate change-risk of shifts in growing patterns and resource availability.⁷⁵

⁷² See GICS Framework, *supra* note 24.

⁷³ See discussion, *supra* note 26.

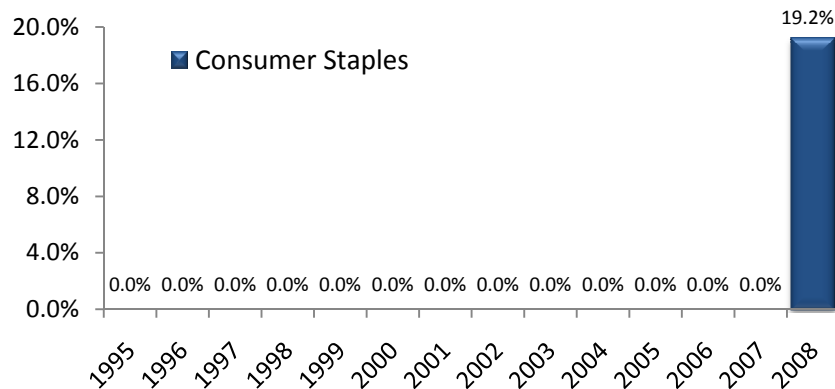
⁷⁴ See Jeffrey Ang-Olson and Will Schroeder, *Energy Efficiency Strategies for Freight Trucking: Potential Impact on Fuel Use and Greenhouse Gas Emissions*, 1815 *TRANSP. RES. REC.: J. OF THE TRANSP. RES. BOARD* 11 (2002), available at <http://trb.metapress.com/content/57024v26279332n5/fulltext.pdf> (noting that “ground freight produces 19.4% of total transportation carbon emissions . . . in the United States.” *Id.* at 11.); see also, Elisabeth Rosenthal, *Environmental Cost of Shipping Groceries Around the World*, *N.Y. TIMES*, April 26, 2008, available at <http://www.nytimes.com/2008/04/26/business/worldbusiness/26food.html?em> (noting that the “movable feast comes at a cost: pollution—especially carbon dioxide, the main global warming gas—from transporting the food”).

⁷⁵ See *infra* note 77 and accompanying text.

2. Analysis Results

As the graph shows, the consumer staples sector was a relative late-comer to the climate risk discussion:

Figure 9: Trends in consumer staples sector mention of climate change “key phrases” in 10-K filings, 1995-2008.



- » Consumer staples companies first mentioned climate change in their 10-K filings in 2008, when reporting rates jumped to 19.2%.
- » Despite the spike in mentions in 2008, the quality of climate change discussions in this sector is very low, with zero percent of the sector meeting the standard of identifying at least one climate change risk and articulating a management or mitigation strategy for that risk that year.

3. Discussion

This history of climate change risk disclosure in the consumer staples sector sharply illustrates the failure of existing disclosure mechanisms to handle the problem of climate change risk-analysis and discussion, and thus the need for SEC guidance on the issue.

Despite large distribution networks subject to the fluctuating costs of energy, temporal sensitivity easily disrupted

by extreme weather events, long-prophesied connection between food production and transit, and shifts in climate and regulation, consumer staple companies developed a pattern of silence on the issue matched only by the telecommunications and health care sectors.⁷⁶ Moreover, when the sector broke its silence in 2008, relatively few companies engaged in a discussion of climate change risk, and if they did, the disclosures were never quantitative or in depth. For example, SuperValu, a food wholesaler, briefly noted many of these concerns for the first time in 2008.⁷⁷ Also, Dean Foods, a food and beverage company specializing in the processing and distributing of dairy products, only cursorily mentioned potential regulatory burdens stemming from pending climate change legislation.⁷⁸

No other sector better illustrates the lack of forward-thinking and investor protection through analysis and disclosure—despite existing SEC regulations requiring exactly that⁷⁹—as the consumer staples sector.

⁷⁶ See *supra* Section III.H—Telecommunications and Section III.K—Health Care.

⁷⁷ SuperValu's 10-K filed in 2008, noted the following:

Severe weather, natural disasters and adverse climate changes could adversely affect the Company's financial condition and results of operations.

Severe weather conditions such as hurricanes, earthquakes or tornadoes, as well as other natural disasters, in areas in which the Company has stores or distribution facilities or from which the Company obtains products could adversely affect the Company's results of operations. Such conditions could cause physical damage to the Company's properties, closure of one or more of the Company's stores or distribution facilities, lack of an adequate work force in a market, temporary disruption in the supply of products, disruption in the transport of goods, delays in the delivery of goods to the Company's distribution centers or stores and a reduction in the availability of products in the Company's stores. In addition, adverse climate conditions and adverse weather patterns, such as drought or flood, that impact growing conditions and the quantity and quality of crops yielded by food producers may adversely affect the availability or cost of certain products within the grocery supply chain. Any of these factors could disrupt the Company's businesses and adversely affect the Company's financial condition and results of operations.

SuperValu Inc., Annual Report (Form 10-K), at 12–13 (Apr. 23, 2008).

⁷⁸ Dean Foods Co., Annual Report (Form 10-K), at 15 (Feb. 28, 2008).

⁷⁹ For an excellent review of the applicable law and SEC regulations and requirements, see EDF Petition, *supra* note 1.

J. Consumer Discretionary

The consumer discretionary sector is comprised of automobile and automobile component manufacturers; consumer durables and apparel; consumer services (such as hotel and leisure services); media; and retailing and retail distribution companies.⁸⁰ In mid-2008, the consumer discretionary sector consisted of eighty-six companies (17.2% of the S&P 500).⁸¹

1. Sector Risks

The regulatory impact on distribution costs is the principle risk facing many of these companies, whose business relies (like many in the consumer staples sector) on the massive distribution networks. While at first blush it would seem the distribution urgency is removed in this context, fast food restaurants, such as McDonald's and Wendy's, are members of the S&P 500 and also require dependable and inexpensive distribution similar to a dairy foods distributor. Also worthy of note is the special set of climate change-related risks posed to the automotive industry. As a significant contributor to greenhouse gas emissions, the automotive industry faces direct regulation as well as business pressures to make more efficient products for a climate-concerned public.

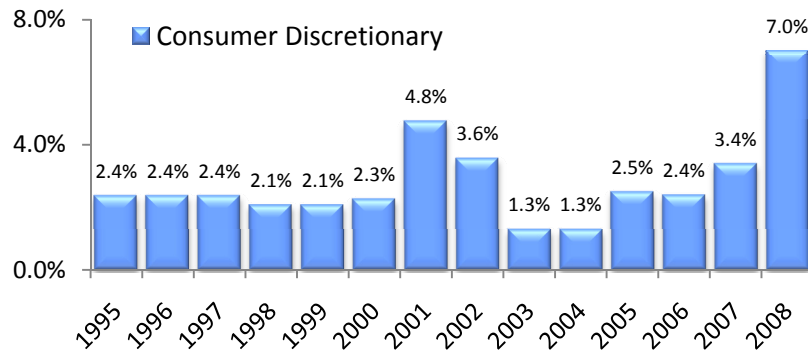
2. Analysis Results

The consumer discretionary sector has a long—though very low—history of discussing climate change risks in 10-K filings:

⁸⁰ See GICS Framework, *supra* note 24.

⁸¹ See discussion, *supra* note 26.

Figure 10: Trends in consumer discretionary sector mention of climate change “key phrases” in 10-K filings, 1995-2008.



- » The overall quality of climate change discussions in this sector is very low, with 2.8% of the sector meeting the standard of identifying at least one climate change risk and articulating a management or mitigation strategy for that risk.
- » The only consumer discretionary companies to mention climate change key phrases in their 10-K filings prior to 2008 were the auto manufacturers Ford and General Motors.⁸²
- » Even in 2008, the lion’s share of consumer discretionary companies’ discussion of climate change are directly connected to transportation, with Home Depot as the sole exception.⁸³

3. Discussion

The sector’s long history of having at least *some* companies thinking about potential climate change risks is due

⁸² The fluctuating percentage of hits across the years of the study is a result of the shifting size of the consumer discretionary portion of the S&P 500 as new additions and deletions were incorporated into the index.

⁸³ The other consumer discretionary companies to join the climate change-related risk discussion in 2008 were Carnival Corp. and Harley Davidson.

solely to its inclusion of the automotive sub-sector. This sector provides a small-scale peek into the rest of the economy's relationship with the issue of climate change risk disclosure. Those companies and sub-sectors likely to be directly impacted by climate-responsive legislation were the first to pick up the discussion. Other risks have for the most part been overlooked or under-disclosed by the remaining companies; the salience of the risks posed to them notwithstanding.

K. Health Care

The health care sector encompasses two main industry groups: (1) companies that manufacture health care equipment and supplies or provide health care related services, including distributors of health care products, providers of basic health-care services, and owners and operators of health care facilities and organizations; and (2) companies primarily involved in the research, development, production and marketing of pharmaceuticals and biotechnology products.⁸⁴ In mid-2008, the health care sector consisted of fifty-two companies (10.4% of the S&P 500).⁸⁵

1. Sector Risks

Climate change has the potential to profoundly alter infectious-disease vectors throughout the world. Rapid and unanticipated changes in the future spread of infectious diseases may potentially disrupt the operations of regulatory authorities, subsidiaries, manufacturing facilities, customers, suppliers, distributors, couriers, collaborative partners, licensees and clinical trial sites involved in health care industry activities.

2. Analysis Results

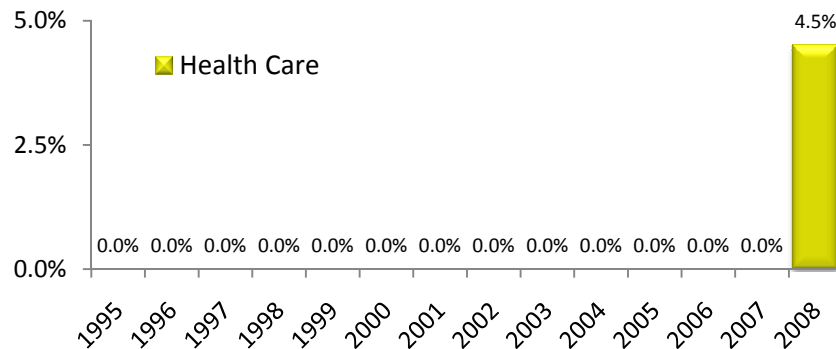
For 2008 10-K filings, the health care sector had the second lowest percentage of "mentions" of climate change among

⁸⁴ See GICS Framework, *supra* note 24.

⁸⁵ See discussion, *supra* note 26.

all sectors. Approximately 4.5% of health care companies used one or more of the climate change “key phrases” in a 2008 10-K.

Figure 11: Trends in health care sector mention of climate change “key phrases” in 10-K filings, 1995-2008.



- » The overall quality of climate change discussions in this sector is very low, with zero percent of the sector meeting the standard of identifying at least one climate change risk and articulating a management or mitigation strategy for that risk.
- » 95.5% of health care companies failed to mention climate change in their 2008 10-K filing.
- » References to climate change by health care sector companies first occurred in 2008 with 4.5% of the sector providing some treatment of the issue.

3. Discussion

From 1995 through 2007, no single company in the health care sector provided any discussion of climate change in a 10-K filing. This trend was broken in 2008 with 4.5% of the sector providing some mention of climate change.

IV. Conclusion

The current global economic crisis has underscored the crucial importance of transparency and accountability for corporate risk management and disclosure. Despite the clear imperative for prudent oversight, the SEC has failed to protect investors from enduring inadequacies in corporate disclosure about the profound risks and opportunities posed by climate change. As revealed by this analysis of nearly 6400 10-K filings by S&P 500 companies over the last thirteen years, there is an alarming pattern of non-disclosure by corporations regarding climate change risks.

Only about half of the executives believe climate change as the social issue most likely to impact shareholder value in the next five years.⁸⁶ However, the recent Fourth Assessment Report of the Intergovernmental Panel on Climate Change,⁸⁷ the Supreme Court's affirmation of the Environmental Protection Agency's authority to regulate carbon dioxide in *Massachusetts v. EPA*,⁸⁸ and the emergence of numerous state, regional and federal greenhouse gas policies⁸⁹ all underscore the growing certainty of significant physical and regulatory impacts from climate change.

Despite the growing evidence of climate change's broad range of impacts, our analysis demonstrates that last year, 76.3% of surveyed corporations failed to even mention climate change in the required SEC filings relied upon by investors. The true test of proper climate risk disclosure will be its quality, assessed using existing frameworks like the Global Framework for Climate Risk Disclosure.⁹⁰ Simply including a climate change keyword is not an

⁸⁶ See THE MCKINSEY QUARTERLY, FROM RISK TO OPPORTUNITY: HOW GLOBAL EXECUTIVES VIEW SOCIOPOLITICAL ISSUES: MCKINSEY GLOBAL SURVEY RESULTS 5 (McKinsey & Co. 2008), available at <http://www.mckinseyquarterly.com/PDFDownload.aspx?L2=21&L3=37&ar=2235>.

⁸⁷ INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, FOURTH ASSESSMENT REPORT, CLIMATE CHANGE 2007: SYNTHESIS REPORT, SUMMARY FOR POLICY MAKERS (2007), available at http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf.

⁸⁸ 549 U.S. 497 (2007).

⁸⁹ Kevin L. Doran, *U.S. Sub-Federal Climate Change Initiatives: An Irrational Means to a Rational End?*, 26 VA. ENVTL. L.J. 189, 189-92 (2008).

⁹⁰ See Ceres, *The Global Framework for Climate Risk Disclosure* (2006), available at <http://216.235.201.250//Document.Doc?id=73>.

adequate assessment of climate change risk. However, the fact that the large majority of S&P 500 companies neglect to even mention climate risk demonstrates the fundamental failure to implement securities law and protect investors.

In light of the lessons gleaned from the current financial crisis, the stark discrepancy between corporate awareness of the risks presented by climate change and the inadequate disclosures intended to inform investors about these risks is highly troubling. The SEC must provide standardized guidance on reporting requirements for climate risk disclosure.

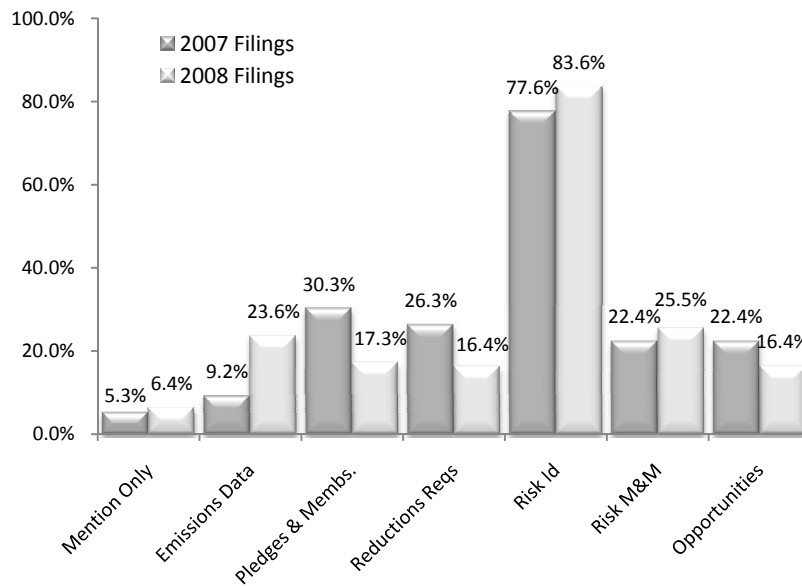
While some gains have been made, our analysis demonstrates that significant improvements in disclosure rates and disclosure quality are still urgently needed. Disclosure guidance is needed not only for many industrial companies with obvious direct risks, but also for many non-industrial companies that may interpret climate risks as too indirect. It is vital that the SEC reassert its appropriate leadership role and clarify climate risk disclosure guidelines.

APPENDIX A: 10-K Qualitative Assessment Rubric for Climate Change Risk Disclosure

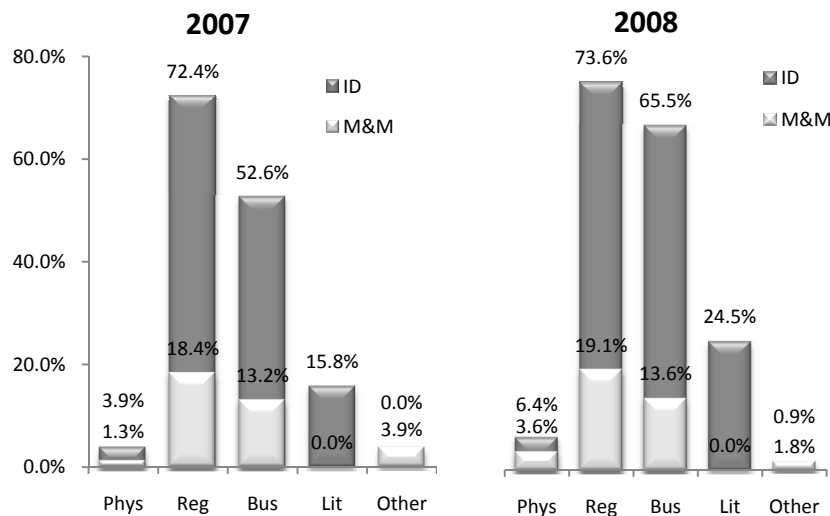
<p>Limited Mention</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Negative Climate Change Mention (e.g. Climate Change is a Myth) <input type="checkbox"/> Climate Change Mention Only <ul style="list-style-type: none"> <input type="checkbox"/> Climate Change is Happening <input type="checkbox"/> Climate Change is Anthropogenic
<p>Extended Discussion</p>	<ul style="list-style-type: none"> <input type="checkbox"/> GHG Emissions Data Reporting <ul style="list-style-type: none"> <input type="checkbox"/> Company Emissions Information <input type="checkbox"/> Industry / Sector Emissions Information <input type="checkbox"/> Other GHG Emissions Data <input type="checkbox"/> GHG Emissions Reduction Pledges <ul style="list-style-type: none"> <input type="checkbox"/> Aspirational Quantitative Reduction <input type="checkbox"/> Externally Imposed Reductions (Federal / Regional / State / International) <input type="checkbox"/> Membership in Group Initiatives <input type="checkbox"/> Risk Identification <ul style="list-style-type: none"> <input type="checkbox"/> Physical Plant Risks <input type="checkbox"/> Regulatory Risks (State/Regional/Federal) <input type="checkbox"/> Business Model Risks <input type="checkbox"/> Litigation Risks <input type="checkbox"/> Other RI <input type="checkbox"/> Risk Management & Mitigation <ul style="list-style-type: none"> <input type="checkbox"/> Physical Plant Security Measures <input type="checkbox"/> Anticipating Regulatory Requirements <input type="checkbox"/> Business Model Shifts <input type="checkbox"/> Other RM&M mentions <input type="checkbox"/> Opportunity Identification (new jobs / markets / investments)

APPENDIX B: Qualitative Assessment Results, 2007 *cf.* 2008 derived using Qualitative Assessment Rubric, Appendix A.

Percent of companies including at least one mention of climate change related risks by qualitative category:



Types of climate change related risks mentioned (ID) relative to management and mitigation strategies (M&M), 2007 v. 2008:



2009

CLIMATE CHANGE RISK DISCLOSURE

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