Providing institutional investors with a more robust ESG integration tool to help them mitigate risk and enhance long term value creation.

MSCI ESG Ratings helps investors identify environmental, social and governance (ESG) risks and opportunities within their portfolio. We research and rate companies on a ‘AAA’ to ‘CCC’ scale according to their exposure to industry-specific ESG risks and their ability to manage those risks relative to peers.

For more information visit msci.com/esg-ratings

©2017 MSCI Inc. All rights reserved
The Journal of Environmental Investing

State of ESG Data and Metrics
Volume 8, NO1, (2017)

Edited by Cary Krosinsky

Guest Editors, Prof. Dan Esty and Prof. Todd Cort
# TABLE OF CONTENTS

## INTRODUCTION

The Editor’s word
*Esty & Cort*

Cary Krosinsky

Guest Editors’ introduction
*Esty & Cort*

## THE ECOSYSTEM OF ESG DATA

Corporate Sustainability Metrics: What Investors Need and Don’t Get
*Esty & Cort*

The Value and Current Limitations of ESG Data for the Security Selector
*Bose & Springsteel*

ESG Indices and Corporate Sustainability Research from a Strategic Perspective: A Reflective Appraisal and Suggestions for Improvement
*Sankaranarayanan & Ray*

Responsible Investing: Guide to ESG Data Providers and Relevant Trends
*Douglas et al.*

## MAKING ESG DATA DELIVER MORE FOR INVESTORS

The Application of Machine Learning to Sustainable Finance
*Allen et al.*

A Geofinancial Engineering Initiative: Using Real-Time Environmental Data from Satellites to Move Financial Markets and Improve Climate Outcomes
*Kriss et al.*

A Methodology for Assessment of Corporate Responsibility on Climate Change: A Case Study of the Fossil Energy Industry
*Goldman et al.*

Proposing Constant Currency as a Revenue-Based Denominator to Measure Greenhouse Gas Intensity: A Case Study from the Industrial Gases Sector
*Krut et al.*

*Journal of Environmental Investing* 8, no 1 (2017)
Investor’s Guide to Understanding Corporate Sustainability Performance Metrics: Beware of Flawed Metrics
Bartley et al.

ESG INTEGRATION AND VALUE CREATION

The Missing Metrics that Matter to Investors: How Companies Can Develop ESG Financial Value Creation Metrics
Glassman et al.

Do Corporate Controversies Help or Hurt Performance? A Study of Three Portfolio Strategies
Lee et al.

Performance and Impact: Can ESG equity portfolios generate healthier financial returns?
Davis et al.

Measurement and the Circulation of Risk in Green Bonds
Bigger

ESG and the Stock-Picker’s Dilemma
Funk & Powell

Sustainable Investing and Bond Returns
Desclée et al.

The ESG Rating and Ranking Industry: Vice or Virtue in the Adoption of Responsible Investment?
Mooij

BOOK REVIEWS

Sustainable Investing: Revolutions in Theory and Practice
Cleveland

Resilience Thinking: Sustaining Ecosystems and People in a Changing World
Agarwal & Valauri

Doughnut Economics
Bernhardt
A Methodology for Assessment of Corporate Responsibility on Climate Change: A Case Study of the Fossil Energy Industry

Gretchen T. Goldman, PhD
Gretchen Goldman, PhD, is the research director for the Center for Science and Democracy at the Union of Concerned Scientists. Gretchen leads research efforts on the role of science in public policy, focusing on topics ranging from scientific integrity in government decision making, to political interference in science-based standards on topics including hydraulic fracturing, climate change, and chemical safety. Gretchen has authored pieces for Science, The New York Times, CNN, and The Guardian, and her work has been featured in Nature, NPR, Los Angeles Times, The Boston Globe, Reuters, Politico, and Bloomberg. She currently serves as the chair of the Air and Climate Public Advisory Committee for the Metropolitan Washington Council of Governments. She holds a PhD and MS in environmental engineering from the Georgia Institute of Technology, and a BS in atmospheric science from Cornell University.

Kathryn Mulvey, Union of Concerned Scientists
Kathryn (“Kathy”) Mulvey is the accountability campaign manager and advocate for the Climate & Energy team at the Union of Concerned Scientists. In her role, she leads strategic development of UCS’s work on fossil fuel producer accountability, guides corporate engagement, oversees research, authors reports, and engages experts and partners. She earned a BA in English and French from the University of North Carolina at Chapel Hill.

Peter C. Frumhoff, PhD
Peter C. Frumhoff, PhD, is director of science and policy at the Union of Concerned Scientists, and chief scientist of the UCS climate campaign. He was a lead author of the Intergovernmental Panel on Climate Change’s (IPCC’s) 2007 Fourth Assessment Report and the 2000 IPCC Special Report on Land Use, Land-Use Change, and Forestry, and served as chair of the 2007 Northeast Climate Impacts Assessment. He serves on the board of directors of the American Wind Wildlife Institute and the steering committee for the Center for Science and Democracy at UCS. He is an associate of the Harvard University Center for the Environment. He holds a PhD in ecology and an MA in zoology from the University of California, Davis, and a BA in psychology from the University of California, San Diego.

Stephanie Pfirman, PhD
Stephanie L. Pfirman, PhD, is professor of Environmental Science and Alena Wels Hirschorn ’58 and Martin Hirschorn Professor of Environmental and Applied Sciences, joined the faculty of Barnard College in 1993, and serves as co-Chair of Barnard’s Department of Environmental Science. At Columbia University. Her PhD is from the Massachusetts Institute of Technology.
Institute of Technology/Woods Hole Oceanographic Institution joint program in Oceanography and Oceanographic Engineering and she has AB with high honors in Geology from Colgate University.

**Rajiv Sethi, PhD**

Rajiv Sethi is a Professor of Economics at Barnard College and an External Professor at the Santa Fe Institute. His research areas include microeconomics and game theory, with applications to inequality, crime, and communication. He is on the editorial boards of the *American Economic Review* and *Economics and Philosophy*, and is a founding member of CORE (Curriculum Open-Access Resources for Economics), an organization dedicated to the production of high-quality resources for the teaching of economics, distributed free of charge worldwide under a Creative Commons license. Rajiv earned his PhD at the New School for Social Research.

**Hannah Commoss, Capital Partners**

Hannah Commoss is a Partner at Spruceview Capital Partners, where she is responsible for building and managing marketable securities portfolios and multi-asset class ESG solutions for clients. Hannah holds a BA in Economics from Northeastern University and an MBA from Suffolk University.
Abstract

Investors are increasingly interested in metrics to evaluate companies’ progress on environmental, social, and governance (ESG) initiatives, particularly around climate change, an issue closely tied to long-term global financial stability. We propose a new method to characterize and quantify corporate engagement with climate science and policy. This method builds on past work to define corporate social responsibility and assess corporate behavior specifically around climate change. The metric includes 30 indicators within four broad areas. These are used to measure companies’ execution and progress with respect to climate change. The four broad areas are (1) renouncing disinformation on climate science and policy; (2) planning for a carbon-constrained economy; (3) supporting fair and effective climate policies; and (4) fully disclosing climate-related risks. The metric was used to assess and distinguish eight leading fossil fuel companies, and in investor decision making around Barnard College’s endowment. The metric is presented in detail along with results for assessing fossil fuel companies. We also discuss the utility and materiality of the metric for asset owners and investment managers, as these groups are increasingly challenged to identify and integrate pertinent ESG data into their policies and processes. With the goal of broad-based application, we address current challenges around practical implementation of the metric, and include suggestions for future enhancements to ensure the continued relevance and replicability of the metric.

Acknowledgements

Introduction

Investors are increasingly interested in metrics to evaluate and compare companies' progress on environmental, social, and governance (ESG) initiatives, particularly around climate change, as such evaluation provides an important tool with which to manage their portfolios (Nelson, 2017; Proxy Preview, 2017; ISS, 2016; IFAC, 2012).

Currently, several voluntary climate-related disclosure mechanisms, along with guidance from the U.S. Securities and Exchange Commission (SEC) on climate-related risk reporting, aim to ensure that investors have the access to climate-related disclosures they need to make informed investment decisions. Many companies across sectors, however, provide limited disclosure of their climate-related financial risks and face increasing pressure from both investors and civil society organizations to improve (EIU, 2017; TCFD, 2017; Carlson, Goldman, and Dahl, 2016; Coburn, Salmon, and Grossman, 2012).

Previous metrics have been either broad, covering many ESG issues, or limited in scope and not applicable across different industries. As an example, the CPA-Zicklin Index of Corporate Political Disclosure and Accountability provides an annual ranking of company performance on a host of transparency measures related to political spending (CPA, 2016). Previous attempts to rank company performance on climate-related measures have been limited in scope (Goldman et al., 2014). For example, the Carbon Disclosure Project (CDP), representing over $100 trillion in managed assets, conducts annual questionnaires of companies on climate change and compiles results in its Climate Performance Leadership Index (CDP, 2017). The Science Based Targets Initiative, a collaboration between CDP, the World Resources Institute, the World Wide Fund for Nature, and the United Nations Global Compact, has laid out expectations for, and gathered commitments from, companies regarding reductions in their carbon emissions (Science Based Targets, 2017).

Historically, many companies in carbon-intensive industries have opted out of such voluntary reporting and commitment initiatives. The Oxford Martin Working Principles for Investment in Fossil Fuels provide a framework for engagement between investors and companies that are carbon-intensive or engaged in fossil fuel extraction (Allen et al., 2015). Investor Expectations for Oil and Gas Companies: Transition to a Lower Carbon Future provides a basis for investor engagement with the boards and management of oil and gas companies. The report focuses on how companies in this sector are managing risks and developing business strategies to align with the Paris Agreement commitment to keep the increase in global average temperatures well below 2°C above pre-industrial levels (IIGCC, 2016).
Given the far-reaching impact of climate change on long-term financial stability, investors need tools that provide a framework for assessing corporate behavior with regard to climate change. Companies increasingly face financial risks from climate change, including regulatory risk from carbon emission reduction laws, physical risk from the impacts of climate change, and reputational risks from changing public attitudes towards company behavior. Across all economic sectors, the transition to a lower-carbon economy has implications for the global financial system: Models project that climate change will place global financial assets at risk by anywhere from US$2.5 trillion to US$24.2 trillion (Dietz et al., 2016).

On regulatory risk, the international climate agreement reached in Paris in December 2015 has created additional pressure on companies to reduce their emissions in line with the agreement’s goal of keeping the increase in global average temperature well below 2°C above pre-industrial levels. Moody’s Investor Service warns that as robust carbon pricing policies gain traction they may impose deleterious demand-side costs on oil and gas companies (MIS, 2016). The potential for stranded assets in the form of carbon-intensive investments and reserves is also significant, especially in the fossil energy sector (CTI, 2017).

Left unaddressed, climate change is expected to cause significant physical impacts with serious implications for investors and businesses, including oil and gas companies (Grossman et al., 2012). The year 2016 was the costliest 12 months for natural catastrophes in the last four years, with losses totaling US$175 billion. Climate change is expected to exacerbate existing vulnerabilities to natural disasters (Munich Re, 2016). Extreme heat, sea level rise, and increasingly intense hurricanes affecting the U.S. Gulf Coast and Southeast are projected to pose substantial challenges for oil and gas companies that concentrate production, refining, and transportation infrastructure in these regions (RBP, 2014). Climate-related threats to critical water supplies also contribute material risks for mining, oil, and gas companies (Whelan and Fink, 2016). Company preparation for climate change is closely tied to long-term global financial and stability risk.

On reputational risk, all companies operate with a social license, and companies that fail to act responsibly can lose the public’s trust. The experiences of the tobacco and asbestos industries, though different in some respects, suggest that heightened societal awareness and growing public pressure create incentives for companies to accept and act in accordance with their responsibilities to investors and to society (Oreskes and Conway, 2011).

Major fossil energy producers are particularly vulnerable to the aforementioned risks, but their responses have varied. We aim to differentiate between companies in their responses
to climate-related risk. Not only do their products emit greenhouse gases (such as methane and carbon dioxide), but many of these companies have also been politically active on laws or regulations that would reduce emissions of greenhouse gases. In some cases, this involved downplaying or disparaging scientific evidence of the climate risks posed by their products (Mulvey et al., 2015; Goldman et al. 2014). Some fossil energy companies continue to encourage, plan for, and invest in expanded and unabated fossil fuel use – despite knowledge of the adverse climate impacts of their products, and despite having the technical and financial capacity to facilitate the transition to low-carbon energy (Frumhoff, Heede, and Oreskes, 2015).

A number of sources are now suggesting the core dimensions of a metric against which to assess company behavior with respect to climate change. These include previous demands from investors, especially those focused on ESG performance; prior academic literature and policy analyses laying out the responsibilities and performance of companies on climate change-related engagement; and the climate policy guidance established in the Paris Agreement (Frumhoff, Heede, and Oreskes, 2015, UNFCCC, 2015). Here, we aim to equip investors with tools to rigorously assess and compare companies’ current performance on climate change-related positions and actions in order to inform decision making.

Methods

We propose a new method to characterize and quantify corporate engagement on climate science and policy. This method builds on prior work to define corporate social responsibility and assess corporate behavior specifically around climate change. It draws on the recommendations of the Financial Stability Board’s Task Force on Climate-Related Financial Disclosures (TCFD), the CDP Climate Leadership Index, and the Center for Political Accountability’s CPA-Zicklin Index (TCFD, 2017; CDP, 2016; CPA, 2016; Frumhoff et al., 2014; Goldman et al., 2014; Goldman and Rogerson, 2014). It also takes account of the climate goals articulated in the Paris Climate Agreement (UNFCCC, 2015). While these goals reflect commitments by nation-states, they have fundamentally altered the policy and market landscape for businesses. This method may be of particular interest to ESG-oriented investors who are interested in companies that hold consistent, science-based positions on climate change and that engage constructively with the long-term goals of the Paris Agreement.

The metric includes the 30 specific indicators detailed in Table 1. These constitute four areas described below. While most of these indicators are broadly applicable to the assessment of corporate social responsibility on climate change, some are particularly relevant to the fossil fuel sector.

Renouncing Disinformation on Climate Science and Policy
In part, we adapted indicators in this area from consistency and transparency criteria outlined in the *Guide for Responsible Corporate Engagement in Climate Policy*. This was drafted by the United Nations Global Compact, the secretariat of the United Nations Framework Convention on Climate Change, and the United Nations Environment Program, in cooperation with the World Resources Institute (Karbassi et al., 2013). In this area, we assess the scientific accuracy and consistency of companies’ direct communications with the public about climate change. This includes both whether they affirm the need for swift and deep reductions in emissions from the burning of fossil fuels and whether they maintain membership or leadership positions in trade associations and industry groups that spread disinformation on climate science or misrepresent the possible effects of climate policies. We also evaluated whether companies have safeguards in place to prevent involvement in future disinformation, and whether they have supported climate-related shareholder resolutions put forward by established networks of socially responsible investors.

Companies affiliate with trade associations and other industry groups for many reasons, independent of their climate position; in some cases it is challenging for companies to sever ties with key associations (Goldman and Rogerson, 2013). The metric thus accounts for the possibility that companies might retain their affiliations but publicly distance themselves from climate disinformation and policy positions.

**Planning for a Carbon-constrained Economy**

The Science Based Targets Initiative, the Oxford Martin School’s Working Principles for Investment in Fossil Fuels, and the long-term temperature targets of the Paris Agreement informed this area (Allen et al., 2015; UNFCCC, 2015; Science Based Targets, n.d.a). We assessed companies’ plans through the steps that each one has taken to: (1) align its business model with a carbon-constrained future; (2) disclose long-term and short-term company-wide emissions reduction strategies along with data demonstrating progress towards those goals; and (3) execute reduction plans through concrete actions, thus bolstering the resilience of company business models in a carbon-constrained world.

**Supporting Fair and Effective Policies**

The indicators in this area incorporate the 2015 CPA-Zicklin Index and the criteria outlined in the *Guide for Responsible Corporate Engagement in Climate Policy* (Center for Political Accountability, 2015; Karbassi et al., 2013). Here we evaluated companies’ disclosure, governance of their political activity in general, and their support for specific U.S. federal policies that would address climate change.
Fully Disclosing Climate Risks

We adapted indicators in this area from Sustainable Extraction? An Analysis of SEC Disclosure by Major Oil and Gas Companies and Deepwater Drilling Risk by Ceres and Carbon Asset Risk: Discussion Framework from the World Resources Institute and United Nations Environment Program Finance Initiative Portfolio Carbon Initiative (Fulton and Weber, 2015; Coburn, Salmon, and Grossman, 2010). These indicators also note the process undertaken by the TCFD to develop voluntary, consistent, climate-related financial risk disclosures for use by companies in providing information to investors, lenders, insurers, and other stakeholders. In this area, we assessed company disclosure of regulatory risks, physical risks, market and other indirect risks and opportunities, and corporate governance by the board and senior management on climate-related risks.
Table 1 shows the full list of indicators included in the metric.

Table 1: The 30 indicators of the metric to characterize and quantify corporate engagement on climate science and policy

<table>
<thead>
<tr>
<th>Area</th>
<th>Specific Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renouncing disinformation on climate science and policy</td>
<td>Accuracy and consistency of public statements on climate science and the consequent need for swift and deep reductions in emissions from the burning of fossil fuels</td>
</tr>
<tr>
<td></td>
<td>Affiliations with trade associations and other industry groups that spread climate science disinformation and/or block climate action</td>
</tr>
<tr>
<td></td>
<td>Policy, governance systems, and oversight mechanisms to prevent disinformation</td>
</tr>
<tr>
<td></td>
<td>Support for climate-related shareholder resolutions</td>
</tr>
<tr>
<td>Planning for a carbon-constrained economy</td>
<td>Support for the Paris Climate Agreement</td>
</tr>
<tr>
<td></td>
<td>Company-wide commitments and targets to reduce greenhouse gas emissions</td>
</tr>
<tr>
<td></td>
<td>Use of an internal price on carbon in investment decisions</td>
</tr>
<tr>
<td></td>
<td>Commitment and mechanism to measure and reduce carbon intensity of supply chain</td>
</tr>
<tr>
<td></td>
<td>Disclosure of investments in low-carbon technology research and development</td>
</tr>
<tr>
<td></td>
<td>Disclosure of greenhouse gas emissions reduction plans</td>
</tr>
<tr>
<td></td>
<td>Disclosure of how company manages greenhouse gas emissions and associated risks</td>
</tr>
<tr>
<td></td>
<td>Disclosure of greenhouse gas emissions</td>
</tr>
<tr>
<td>Supporting fair and effective climate policies</td>
<td>CPA-Zicklin Index of Corporate Political Disclosure and Accountability: Disclosure</td>
</tr>
<tr>
<td></td>
<td>CPA-Zicklin Index of Corporate Political Disclosure and Accountability: Policy</td>
</tr>
<tr>
<td></td>
<td>CPA-Zicklin Index of Corporate Political Disclosure and Accountability: Oversight</td>
</tr>
<tr>
<td></td>
<td>Engagement with Congress on federal climate policies or legislation</td>
</tr>
<tr>
<td></td>
<td>Consistent support for US policy action to reduce emissions</td>
</tr>
<tr>
<td></td>
<td>Engagement with the US Environmental Protection Agency (EPA) on the Clean Power Plan</td>
</tr>
<tr>
<td></td>
<td>Engagement with the EPA on the methane rule</td>
</tr>
<tr>
<td></td>
<td>Company influence through international or national business alliances or initiatives that are supportive of specific climate policies</td>
</tr>
<tr>
<td>Fully disclosing climate risks</td>
<td>Disclosure of regulatory risks</td>
</tr>
<tr>
<td></td>
<td>Disclosure of physical risks</td>
</tr>
<tr>
<td></td>
<td>Disclosure of market and other indirect risks and opportunities</td>
</tr>
<tr>
<td></td>
<td>Disclosure of corporate governance on climate-related risks by board and senior management</td>
</tr>
</tbody>
</table>

The proposed metric can be employed using publicly available information, including:
- Company annual reports, proxy statements, sustainability reports, and CDP submissions;
- Company 10-K and 20-F filings with the SEC;
- Company websites and press releases;
- Transcripts and recordings of corporate annual meetings;
- Public statements by company executives;

57 The area of “Affiliations with trade associations and other industry groups that spread climate science disinformation and/or block climate action” included assessment of seven industry groups, each as their own indicator and scoring.
● The 2015 CPA-Zicklin Index of Corporate Political Disclosure and Accountability;
● Major news sources;
● Third-party websites, such as Sourcewatch from the Center for Media and Democracy, with verification of data.

Specific data sources for each area of the assessment are available online at http://www.ucsusa.org/sites/default/files/attach/2017/08/Goldman-et-al-2017-Supplementary-Information.pdf

**Scoring**

Most metrics work on a five-point scale ranging from “advanced” to “egregious.” For some metrics, the scale ranges from "good" to "poor". Scoring bands have been developed in order to determine a company’s aggregate score in each area of assessment (Table 2).

<table>
<thead>
<tr>
<th>Score</th>
<th>Definition</th>
<th>Points Assigned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced</td>
<td>Company is demonstrating best practices on this indicator</td>
<td>+2</td>
</tr>
<tr>
<td>Good</td>
<td>Company is meeting ESG investor expectations on this indicator</td>
<td>+1</td>
</tr>
<tr>
<td>Fair</td>
<td>Company's performance is neither positive nor negative on this indicator</td>
<td>0</td>
</tr>
<tr>
<td>Poor</td>
<td>Company is falling short of ESG investor expectations on this indicator</td>
<td>-1</td>
</tr>
<tr>
<td>Egregious</td>
<td>Company is acting very irresponsibly on this indicator</td>
<td>-2</td>
</tr>
</tbody>
</table>

**Initial Application**

The metric assessed and differentiated eight leading fossil fuel companies between January 2015 and May 2016 (Mulvey et al., 2016). Company policies and actions on climate change used to develop the metric fell within this time period; thus, company actions outside of this time period were not accounted for, except in limited cases where indicated when such data were not available.
We chose eight publicly traded fossil energy producing companies to assess the functionality and utility of the metric. The public availability of their data and the high level of investor interest in fossil energy companies’ governance around climate change made these a natural choice. The eight companies included the five largest investor-owned oil and gas companies in terms of cumulative emissions (Chevron, ExxonMobil, BP, Royal Dutch Shell, and ConocoPhillips) and the three largest investor-owned U.S.-based coal companies in terms of cumulative emissions (Peabody Energy, CONSOL Energy, and Arch Coal). These eight companies are among the top fifty investor-owned coal, oil, and natural gas companies. They alone are responsible for nearly 15% of industrial carbon emissions between 1850 and 2010 (Heede, 2014).

For the indicator “Company Affiliation with Trade Associations and Industry Groups Involved in Disinformation,” we included seven major US industry groups and trade associations: American Coalition for Clean Coal Electricity, American Legislative Exchange Council, American Petroleum Institute, National Association of Manufacturers, National Mining Association, U.S. Chamber of Commerce, and Western States Petroleum Association. These seven groups were chosen because they suit the eight sample companies and because of their past engagement around climate-related policies (Mulvey et al., 2015, Goldman and Rogerson, 2014; Brulle, 2013).

Leaders at all eight companies were given an opportunity to clarify their positions and actions on climate change. The authors had conversations with BP, Peabody Energy, and Shell. These companies provided relevant source material for consideration in the assessment. Arch Coal, ConocoPhillips, and CONSOL Energy acknowledged Mulvey et al. (2016)’s request for information and provided no substantive reply in advance of publication. ConocoPhillips subsequently commented in detail and has engaged in dialog with the authors regarding the findings. Chevron and ExxonMobil sent electronic messages confirming receipt of the questionnaire but did not respond despite several attempts on the part of the research team for follow-up communication.

**Results**

Results indicate that, in terms of engagement around climate change, the eight companies assessed here can do more to distance themselves from the spread of climate disinformation and to engage productively in policy discussions (Tables 3 and 4). However, some companies have made more progress than others, as detailed below.
Table 3. Metric Scores for Eight Fossil Energy Companies

<table>
<thead>
<tr>
<th>Metric</th>
<th>Description</th>
<th>Arc Coal</th>
<th>BP</th>
<th>Chevron</th>
<th>ConocoPhillips</th>
<th>CONSOL Energy</th>
<th>ExxonMobil</th>
<th>Peabody Energy</th>
<th>Royal Dutch Shell</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rumbling disinformation on climate science and policy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Affiliations with trade associations and other industry groups that spread climate science disinformation and/or block climate action</td>
<td>-3</td>
<td>-5</td>
<td>-7</td>
<td>-6</td>
<td>-9</td>
<td>-9</td>
<td>-5</td>
<td>-4</td>
<td></td>
</tr>
<tr>
<td>Policy, governance systems, and oversight mechanisms to prevent disinformation</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
</tr>
<tr>
<td>Support for climate-related shareholder resolutions</td>
<td>-1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-2</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>AREA SCORE</td>
<td>-8</td>
<td>-4</td>
<td>-4</td>
<td>-3</td>
<td>-9</td>
<td>-6</td>
<td>-14</td>
<td>-4</td>
<td>-2</td>
</tr>
<tr>
<td><strong>Planning for a carbon-constrained economy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Support for the Paris Climate Agreement</td>
<td>-1</td>
<td>0</td>
<td>-1</td>
<td>-1</td>
<td>1</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
</tr>
<tr>
<td>Company-wide commitments and targets to reduce greenhouse gas emissions</td>
<td>-2</td>
<td>0</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>-2</td>
<td>-2</td>
<td>-1</td>
<td>0</td>
</tr>
<tr>
<td>Use of an internal price on carbon in investment decisions</td>
<td>-1</td>
<td>0</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>-2</td>
<td>-1</td>
<td>0</td>
</tr>
<tr>
<td>Commitment and mechanisms to measure and reduce carbon intensity of supply chain</td>
<td>-1</td>
<td>0</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>0</td>
</tr>
<tr>
<td>Disclosure of investments in low-carbon technology research and development</td>
<td>-1</td>
<td>0</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>0</td>
</tr>
<tr>
<td>Disclosure of greenhouse gas emissions reductions plans</td>
<td>-1</td>
<td>1</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>0</td>
</tr>
<tr>
<td>Disclosure of how company manages greenhouse gas emissions and associated risks</td>
<td>-1</td>
<td>-1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Disclosure of greenhouse gas emissions reductions</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-1</td>
<td></td>
</tr>
<tr>
<td>AREA SCORE</td>
<td>-11</td>
<td>-4</td>
<td>-4</td>
<td>-5</td>
<td>-8</td>
<td>-7</td>
<td>-10</td>
<td>-1</td>
<td>0</td>
</tr>
<tr>
<td><strong>Supporting fair and effective climate policies</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CPA-DK1 in Index of Corporate Political Disclosure and Accountability: Disclosure</td>
<td>-2</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>-2</td>
<td>-1</td>
<td>-1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>CPA-DK2 in Index of Corporate Political Disclosure and Accountability: Policy</td>
<td>-2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>CPA-DK3 in Index of Corporate Political Disclosure and Accountability: Oversight</td>
<td>-2</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-2</td>
</tr>
<tr>
<td>Engagement with Congress in federal climate policy legislation</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Ongoing support for US policy actions to reduce emissions</td>
<td>-1</td>
<td>0</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>0</td>
</tr>
<tr>
<td>Engagement with the US Environmental Protection Agency (EPA) on the Clean Power Plan</td>
<td>-3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-3</td>
<td>-1</td>
<td>-2</td>
<td>-1</td>
<td>0</td>
</tr>
<tr>
<td>Engagement with the EPA on the methane rule</td>
<td>0</td>
<td>1</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Company influence through international or national business alliances or initiatives that are supportive of specific climate policies</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-1</td>
<td>1</td>
</tr>
<tr>
<td>AREA SCORE</td>
<td>-8</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>-5</td>
<td>0</td>
<td>-3</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td><strong>Fully disclosing climate risks</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disclosure of regulatory risks</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Disclosure of physical risks</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Disclosure of market and other indirect risks and opportunities</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
</tr>
<tr>
<td>AREA SCORE</td>
<td>-2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>
Table 4. Scoring Key

<table>
<thead>
<tr>
<th>Renouncing disinformation on climate science and policy</th>
<th>Advanced</th>
<th>Good</th>
<th>Fair</th>
<th>Poor</th>
<th>Egregious</th>
</tr>
</thead>
<tbody>
<tr>
<td>+10 to +15</td>
<td>+4 to +9</td>
<td>(-3) to +3</td>
<td>(-9) to (-4)</td>
<td>(-15) to (-10)</td>
<td></td>
</tr>
</tbody>
</table>

| Fully disclosing climate risks                         | +6 to +8 | +3 to +5 | (-2) to +2 | (-5) to (-3) | (-8) to (-6) |

| Supporting fair and effective climate policies          | +9 to +14 | +3 to +8 | (-2) to +2 | (-8) to (-3) | (-14) to (-9) |

| Planning for a carbon-constrained economy               | +8 to +12 | +3 to +7 | (-2) to +2 | (-7) to (-3) | (-12) to (-8) |

Companies scored from “egregious” to “fair” on “Renouncing disinformation on climate science and policy,” indicating that the eight companies assessed could do more to distance themselves from the spread of climate disinformation. Scores in this area came predominantly from one indicator: company membership in trade associations observed to misrepresent climate science and/or the implications of climate policies and the failure to publicly distance themselves from such messaging.

In the area of “Planning for a carbon-constrained economy,” the three coal companies assessed (Arch Coal, CONSOL Energy, and Peabody Energy) received a score of “egregious.” Among the oil and gas companies, only Shell scored a “fair.” The results indicate that companies can improve their planning for a carbon-free future by, for example, cutting emissions from their operations and ending the practice of flaring natural gas. To score higher in this area, companies can update their business models to reflect the risks of unabated fossil fuel burning and the importance – even necessity – of national and international policies limiting carbon emissions. Central to such a business plan, fossil fuel companies should map their 20-year plans to ensure that society achieves a carbon-free clean-energy future.

Currently, many fossil fuel companies promote business scenarios that would result in emissions far in excess of those allowed under the international climate goals (BP PLC, 2016; ExxonMobil Corporation, 2016c; Royal Dutch Shell PLC, 2016b). As both domestic
and international actors whose products and core businesses directly and substantially contribute to global climate change, fossil energy companies could demonstrate a level of ambition similar to that shown by countries in the Paris Climate Agreement. They could clarify the paths they plan to take to reduce emissions in service of the Paris global temperature goals; such steps would improve their scores in this metric.

BP and ConocoPhillips scored a “good” in the area of “Supporting fair and effective climate policies.” All other companies scored “fair” or “poor.” To improve scores in this area, fossil energy companies could identify and publicly support policies that will reduce emissions significantly enough to mitigate the worst effects of global warming. These policies include things like cap and trade, renewable energy standards, renewable fuel standards, and direct regulation of emissions. Such policy support is especially important for fossil fuel producers, as these companies have a unique responsibility and opportunity to engage constructively in conversations about policy solutions to limit carbon emissions. While companies may disagree on the merits of a specific policy proposal under discussion, the onus is on the company to present and advocate for a specific, viable alternative that would result in equivalent or greater emissions reductions.

Finally, in the area of “Fully disclosing climate risks,” companies scored from “poor” to “fair,” with all eight companies in positions to improve disclosure under existing climate risk disclosure requirements. By law, fossil fuel companies that are publicly traded in the United States are required in their annual SEC filings to discuss risks that might materially affect their business. However, compliance with this guidance is not consistent. While most of the companies in our sample reported on regulatory risks related to climate change, none were yet providing sufficient information to investors about physical and operational risks, or market risks and opportunities for their businesses. Only Shell included disclosures about corporate governance on climate-related issues in its SEC filings, mentioning climate change as one of the topics discussed by its board Committee on Corporate and Social Responsibility. But these disclosures provided no details on how the committee manages the company’s climate-related risks and opportunities.59

59 Detailed scoring results can be found online at http://www.ucsusa.org/sites/default/files/attach/2017/08/Goldman-et-al-2017-Supplementary-Information.pdf
Discussion

The metric presented here provides a quantitative baseline against which to measure company and industry-wide progress toward societal expectations on climate responsibility. Such assessments can be useful for investors, policymakers, the media, and the public.

Barnard College Endowment Decision

In 2016, Barnard College launched a Presidential Task Force to Examine Divestment. In its report, the Task Force recommended that Barnard establish meaningful distinctions among fossil fuel producers, with the goal of divesting from those that “deny climate science or otherwise seek to thwart efforts to mitigate the impact of climate change.” Partially motivating this recommendation was the view that such distinctions would provide “incentives for firms to bring their pronouncements and actions into better alignment with the available scientific evidence” (Sethi, Pfirman, and Goldmark, 2017). Furthermore, the approach was viewed as being closely connected with a fundamental component of Barnard’s academic mission – the principle of scientific integrity.

The Task Force recognized, however, that the College faces several challenges in implementing the proposal, including defining climate-denying behaviors and monitoring firms on an ongoing basis. A key turning point in the College’s consideration of alternative approaches was the publication of Mulvey et al. (2016), which provided a framework for differentiation and a proof-of-concept. A report from Columbia University’s Advisory Committee on Socially Responsible Investing that argued for an approach based on “standing up for science” also influenced the Task Force (ACSRI, 2015). In particular, the Committee advocated divestment from firms that have sought to obstruct honest debate on the causes and consequences of climate change through “word” or “deed.” Using these documents as a foundation, the Task Force developed possible criteria against which to screen fossil energy companies, recognizing that implementation required expanding analysis beyond the eight initial companies examined by Mulvey et al. (2016). Barnard’s Board of Trustees voted in March 2017 to accept the recommendations of the Task Force, noting that the college will “distinguish between companies based on their behavior and willingness to transition to a cleaner economy” (McDonald, 2017). Other colleges and universities have expressed interest in this approach to fossil fuel divestment, but the unavailability of a published, continually updated, expanded analysis of companies is a significant constraint on further adoption.
Future Applications

This metric enables asset owners and investment managers to make distinctions between companies along a continuum of behavior. The fiduciary requirement of returning value to shareholders does not absolve corporations of other legal and ethical responsibilities relating to their products (Shue, 2017). One could argue further that, in order to maximize shareholder value and minimize financial stability risk over the long-term, it is incumbent on company management to have in place a culture of corporate accountability and responsibility related to climate change. This is particularly important in the fossil fuel industry.

Metrics like the one presented here can also be useful in a legal context. One approach to holding corporations accountable for the harm of their products, when used as intended, is to pursue legal remedies. The attorneys general of New York and Massachusetts, for example, are investigating whether ExxonMobil violated any laws in misleading shareholders and consumers about the realities and risks of climate change. Other states or nations considering legal approaches to holding fossil fuel companies accountable for climate responsibilities might inform their investigation with metric-driven comparisons of company actions.

The research presented here could be replicated on a regular basis to encourage and assess improvements in companies’ climate-related performance. It could also be expanded so that investors can evaluate a broader list of companies. While eight companies were chosen for inclusion in Mulvey et al. (2016), this publicly available methodology could be used to assess additional fossil energy companies. It would take considerable effort, however, to compare all 200 fossil fuel companies that are currently the focus of divestment campaigns (350.org, 2017). Additional resources and capacity would be required to assess companies not listed on U.S. exchanges and companies that report in languages other than English. Furthermore, to support broad-based adoption of the metric, it may be necessary to refine some of the indicators to facilitate cross-border comparability, further emphasize materiality, and ensure the repeatability of evaluation.

In addition to potential application to divestment decisions, this research could inform investor behavior through shareholder engagement with companies about specific climate-related positions and actions. For instance, an investor may consider the metric when evaluating and analyzing certain proxy votes. As proxy voting and shareholder activism successes increase, we believe that they will become a more powerful tool for asset owners. Further downstream, publicity of the metric could also impact companies’ reputations, adversely affecting stock prices and profitability – both areas of keen focus for investors.
While most of these indicators are broadly applicable to the assessment of corporate social responsibility on climate change, some are specifically designed around the fossil fuel sector. With appropriate modification to some indicators, the metric could also be adapted to compare companies in other carbon-intensive industries. In addition, the area labeled “support fair and effective climate policies” in this methodology focuses primarily on companies’ actions to influence U.S. federal climate policies. Future analyses could assess major company support for or opposition to selected state climate policies, policies in other countries or regions, or international agreements.

Mulvey et al. (2016) focused on the responsibilities of fossil fuel producers with respect to climate change, and should not be construed as a rating of any company’s overall corporate responsibility. The operations of these eight corporations – most of them transnational – affect a host of issues, including human rights, worker rights, public health, and the environment. In many cases, other organizations and communities in the United States, and internationally, are engaging with these fossil fuel producers and working to hold them accountable for negative impacts on people and the planet (CHRB, 2017).

Further, this methodology is inhibited by a lack of corporate and political transparency. Limited and patchy disclosure requirements restrict the amount of information that is publicly available about companies’ political activities, particularly around payments to third-party groups like trade associations, think tanks, and research organizations. The eight companies assessed in Mulvey et al. (2016) reported spending more than $42 million on federal lobbying in 2015, and $7.5 million in campaign contributions in the 2015-2016 election cycle (Senate Office of Public Records, 2016; CRP, 2016). However, federal filings do not require disclosure of positions companies take on specific legislative proposals or the amount spent to lobby for or against them. Moreover, there is no requirement for companies to disclose their indirect political contributions or so-called “dark money” – funds given anonymously to nonprofit organizations that often spend significant amounts to influence elections.

Recent heightened monitoring of companies’ climate-related positions and actions by the public, investors, and policymakers is creating demand for greater transparency. We are witnessing significant amounts of pressure on companies as a result of increasing investor awareness of the effects of climate change on long-term profitability and stability. Disclosure of climate-related risks has become an expectation of mainstream investors. Such developments and increased demands could substantially improve future iterations of this study, or others, if more public information is available. For example, as overt

---

60 Consider the unprecedented majority shareholder votes calling on ExxonMobil and Occidental Petroleum to report annually on how they will ensure that their businesses remain resilient in (1) the face of climate change policies and (2) technological advances designed to limit global temperature increase to well below 2°C Celsius (Mufson, 2017).
disinformation on climate science by companies and their trade associations becomes less acceptable, criteria in the area of “Renouncing disinformation on climate science and policy” may evolve. In addition, the TCFD is now promulgating internationally developed and vetted standards for disclosure of climate-related financial risks; indicators in this study could be updated accordingly (TCFD, 2017).

**Conclusion**

The metric presented here is a model for assessing company positions and actions on climate science and policy. As a case study, we assessed eight fossil energy companies using 30 indicators. The companies did not meet the expectations laid out by this metric, indicating the potential for improvement across the fossil energy industry when it comes to climate science and policy engagement. Specifically, results of this study indicate that fossil energy companies could take the following actions to improve their climate responsibility:

- Renounce disinformation on climate science and policy;
- Plan for a carbon-free world, developing business models that are consistent with keeping warming well below a 2°C increase above pre-industrial levels;
- Support climate policies to reduce emissions of greenhouse gases;
- Fully disclose the financial and physical risks climate change poses to their business operations;
- Break from climate-denying trade associations and industry-affiliated groups, or publicly commit to work within these groups to change their climate-related policies and actions;
- Disclose all climate-relevant information, including greenhouse emissions, climate-related business risks, direct and indirect political spending, payments to trade associations and industry groups active on climate issues, and climate-related lobbying;
- Make company-specific commitments to contribute to global goals to limit warming; and
- Be consistent, specific, and transparent about the need for U.S. and international policies to reduce emissions of greenhouse gases.

Barnard College used this metric to inform responsible investment decisions in their endowment. The metric has potential to be used for other industries and expanded to include other indicators spanning different time periods. As investors become increasingly interested in company performance and risks related to climate change, demands for such a metric are likely to grow.


References


Appendix

An Appendix can be found at http://www.ucsusa.org/sites/default/files/attach/2017/08/Goldman-et-al-2017-Supplementary-Information.pdf