Stakeholders and Voluntary Climate Reduction Goals at Large U.S. Firms: An Institutional Analysis[1]

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Abstract

What leads firms to develop voluntary greenhouse gas reduction goals? This paper discusses the results of interviews conducted with vice presidents and managers responsible for environmental sustainability initiatives at large U.S. firms. To situate the analysis, it develops a theoretical framework that sees the firm as a socially embedded creation, where stakeholder groups exert varying levels of influence and provide the context in which the firm responds to outside information in the face of uncertainty. By understanding the firm as socially embedded, the influence and power of groups that have strong preferences for or against environmental protection can be understood. The interviews provide empirical support for this model. Subjects discuss the role of stakeholder groups such as activists, shareholders, consumers, and workers in the development of the firm's environmental policy. Groups can prompt the firm to set greenhouse gas or energy use reduction goals, and they encourage the firm to reexamine production processes to find new ways to both reduce costs and emissions. This suggests that policies to regulate industrial greenhouse gas emissions may be less costly than some projections indicate.

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Introduction

While economywide, mandatory limits on greenhouse gas emissions in the United States will not be introduced by the Trump Administration, voluntary actions by large firms to reduce emissions have received much publicity in recent years.[2] Such efforts can involve setting a goal for reducing direct emissions from or emissions from product use. Commitments to reductions by firms appear to be growing as a global consensus to mitigate climate change develops, with the United States a (recent) large exception. One early catalyst of voluntary action in this area was the U.S. Environmental Protection Agency's (EPA's) voluntary Climate Leaders program that operated from 2002 to 2010. The program provided assistance to member firms in developing a greenhouse gas inventory and voluntary reduction goals. By the end of the program, its 368 member companies were responsible for roughly 8% of US greenhouse gas emissions and earned combined revenues equivalent to 12% of US gross domestic product (U.S. Environmental Protection Agency, 2009). By 2016, 264 Fortune 500 companies had set either absolute or intensity-based emissions targets (211 companies) or renewable energy targets (53 companies) (World Wildlife Fund, Ceres, Calvert Investments, & CDP, 2017).

Standard economic assumptions of profit-maximization suggest that firms weigh the costs and benefits of setting and achieving a goal and choose the option that offers the greatest net benefits. However, if firms could have increased profits by improving efficiency or switching to renewable energy, why would they have not done so already? What explains the willingness of some firms to set greenhouse gas emissions targets, and how do they decide how stringent

[2] See, for example, Davenport (2014) and Tabuchi (2017).

those goals will be? Are emissions goals simply "greenwashing" designed to generate public goodwill, or are there other motives involved? This paper will investigate the motivations for firms to set voluntary goals for greenhouse gas emissions reduction by seeking to understand how stakeholder groups such as regulators, customers, activists, investors, or employees may prompt a firm to set a goal and subsequently reexamine its production process to identify emissions- and cost-reducing steps to take.

Interviews can be especially useful for this inquiry as they can capture greater and richer detail about the goal-setting process than surveys and quantitative data and are more generalizable than case studies. Results from 16 interviews conducted with officials at major firms with a presence in the United States in 2013 and 2014 are analyzed here, finding that rather than simply using greenhouse gas emission reduction goals as vehicles to establish goodwill among consumers, firms often set goals in response to pressure from stakeholder groups they consider important. They then discover that implementation of the goals can lower production costs. This suggests that at least some progress on voluntary emission reductions will continue to be made even as the Trump Administration signals its lack of interest in regulating such emissions. Additionally, as states like California and Washington regulate greenhouse gases, the pressure for firms to remain prepared for broader controls or higher carbon prices will remain.

The paper will be organized as follows. The next section discusses the economics literature on corporate social responsibility (CSR) and the intersection between this concept and stakeholder theory. This is used as a starting point to develop the theoretical framework that posits a firm socially embedded among stakeholders, including its own employees that can be used to understand the interviews. Next, the research design of the study is outlined in greater detail. Then, the results of the interviews are analyzed, discussing how stakeholder groups might

prompt firms to set goals and the subsequent process of achieving and setting those goals. The final section will detail conclusions and possible directions for future research.

Theoretical Background

The setting of voluntary environmental goals by firms can be considered a type of corporate social responsibility (CSR). The European Commission (2001) defines CSR as "a concept whereby companies integrate social and environmental concerns in their business operations and in their interaction with their stakeholders on a voluntary basis" (5). Similarly, Kitzmuller and Shimshack (2012) define it as "corporate social or environmental behavior that goes beyond the legal or regulatory requirements of the relevant market(s) and/or economy(s)" (53). CSR should be considered inseparable from the broader strategy and business operations of the firm (Elms, Johnson-Cramer, & Berman, 2011; Freeman, 2010/1984). In economics, it is often modeled as an additional component of output (Bagnoli & Watts, 2003; Baron, 2001), an externality (Calveras, Ganuza, & Llobet, 2007), or a modification of the production process (Baron, 2012; Fedderson & Gilligan, 2001).

The theoretical literature on the motivations of firms engaging in CSR activities suggests that it may be shaped by stakeholder preferences (Crifo & Forget, 2014; Kitzmuller & Shimshack, 2012), or, in the case of air pollution, it may simply be more profitable for the firm to reduce emissions (Busche & Pinkse, 2012; Lyon & Maxwell, 2002; Porter, 1991; Porter & van der Linde, 1995). Stakeholder groups that have been found to play an important role in determining the behavior of a firm include consumers (Bagnoli & Watts, 2003; Lyon & Maxwell, 2002), activists (Baron, 2001; Baron, 2012; Calveras, Ganuza, & Llobet, 2007; Fedderson & Gilligan, 2001), regulators (Kagan, Thornton, & Gunningham, 2003; Lyon & Maxwell, 2002; Lyon & Maxwell, 2004; McClusky & Winfree, 2009), shareholders (Baron,

2007; Cespa & Cestone, 2007), and managers (Baron, 2007; Cespa & Cestone, 2007; Wright & Nyberg, 2015). However, previous work discusses stakeholder groups largely in isolation from one another, and it does not examine how this might relate to the discovery of profitable CSR opportunities. Thus, it does not develop a complete understanding of the processes that determine the setting and extent of environmental goals.

Following these results and building on Freeman's (2010/1984) stakeholder theory of the firm, this paper sees the firm as socially embedded among a group of stakeholders that shape its strategic response to information. While this framework was originally developed to argue that those managing the firm have ethical obligations to the groups whose activities they impact (Freeman, Harrison, Wicks, Parmar, & de Colle, 2010), much of the literature on CSR discussed above uses some form of the stakeholder framework because it is thought (and this paper finds) that outside groups and firms believe and behave as though these groups matter. In the context of climate policy, the stakeholder framework has been applied to governments to analyze policy making at the local level (Fiack & Kamieniecki, 2017).

Within a firm, committees and key individuals in the firm work together to determine what will be produced and the technology to be used in that production.[3] Individuals within the firm, shaped by their social experiences, together choose from a set of possible actions which, in their understanding, maximizes profits for the firm over a given time horizon. The possible choice set is determined by (1) current market conditions, (2) perceived stakeholder preferences, weighted by the perceived importance of each group, and (3) past decisions and performance.

[3] This is roughly analogous to Galbraith's (1974) concept of the technostructure, but it maintains a greater role for upper management, which Galbraith found to be somewhat irrelevant to production decisions (see Dunn (2011), also).

Because of the path-dependent nature of the choice set, there are, over time, several actions that may be profit-maximizing for the firm.

Applying this understanding more specifically to decisions that ultimately shape environmental goals and emissions of greenhouse gasses, it is assumed that committees and key individuals located within the structure process information from a variety of sources and determine the appropriate response that can then be implemented by other units in the firm. Upper management may or may not play a role in determining how aggressive goals will be.

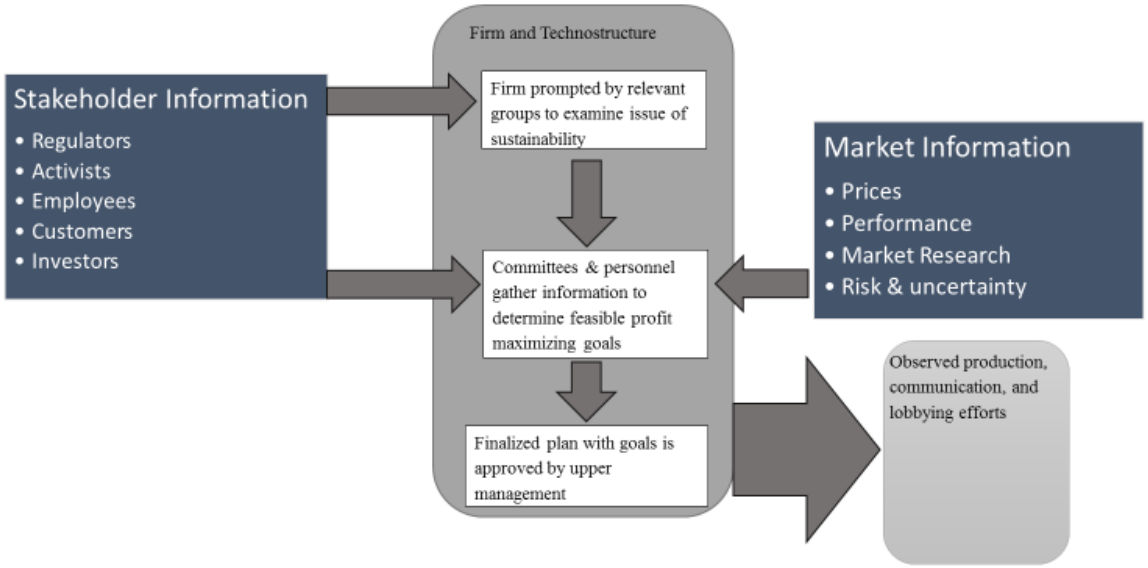

Figure 1: Decision making within the firm

The resulting framework showing the assumed decision-making process is presented in figure 1. Firms are prompted to examine the issue of climate change by stakeholder groups they consider important. From the literature and interview results, the stakeholder groups of customers, regulators, activists, investors, and employees were identified as those that may be

influential.[4] The process of prompting leads the firm to examine both information from relevant stakeholder groups as well as from markets relating to prices of goods, the firm's performance, beliefs about risk and uncertainty, and market research that they commission. That is, stakeholder groups can lead to new social representations of the firm and its relationship to the issue of climate change, where social representations "*conventionalize* the objects, persons, and events that we encounter" (Moscavici, 2001/1984, 22, emphasis in original). Stakeholder groups enable firms to see the issue of climate change as one that they must consider and engage with.

Possible actions are shaped by past performance and reputation. This information is then discussed by groups within sustainability offices and relevant cross-departmental committees so that the firm's strategic reaction can be formulated.[5] This may or may not involve setting a voluntary greenhouse gas reduction goal. One requirement for a goal to be set is a lack of opposition from upper management, especially the CEO. The CEO may choose to impose her preference for a goal on the rest of the firm, but opposition from the executive is impossible to overcome.[6] Once a goal is decided, it can then be implemented. This results in observable actions taken by the firm, such as changes to production, announcements of goals, joining voluntary environmental programs, and lobbying efforts that those within the firm determine will maximize profits.

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[4] While the literature on CSR discusses *consumers* as a stakeholder group, the broader group of *customers* is used here given results from the interviews that suggest business customers can also be an important group driving sustainability actions by firms.

[5] Engau and Hoffman (2011) also consider the choices firms make in response to regulatory uncertainty surrounding climate change, though their framework focuses on identifying patterns of particular strategies rather than exploring why firms might choose different strategies. Additionally, Wright and Nyberg (2015) interview sustainability managers at large firms, but they seek to understand the personal motivations of these employees. While such motivations may have an impact on the extent to which the interests of stakeholder groups are considered by the firms, this is not directly relevant to the structure of the model outlined here.

[6] An EPA official interviewed for this project said this about the influence of the CEO in relation to firms setting voluntary goals: "The CEO is everything to these companies. He or she is like a messiah -- they do talk about them in those terms. If there's a CEO who has a real say on this particular issue...and more do these days, they can go full board on [setting goals]." That is corroborated by comments made by several other subjects.

Research Design and Methodology

The interviews discussed here provide greater and richer details on the processes discussed in this framework. An initial version was developed before the interviews were conducted using the stakeholder theory of the firm and the idea that firms would process information from key groups and markets. The interviews then illuminated more clearly which stakeholder groups were most relevant to firms as well as firms' internal organization and processes for developing and implementing goals. That is, the interviews both highlight the validity of the framework and further develop it with rich detail about firm behavior.

The content of the interview questionnaire reflects the theoretical literature, the framework, and the few surveys conducted on voluntary sustainability goals (ACCO, 2013; Berns et al., 2009). The questionnaire was developed to address issues and questions not adequately discussed in this literature, revolving around three themes: the role of business in society and its legacy, climate change policy decisions by the firm, and politics and government policy.

The interviews were semi-structured, meaning that there was a list of predetermined questions. However, not all questions under each theme were necessarily asked of every subject, and they were not asked in the same order. Conducting interviews with less structure allows subjects greater freedom in their responses, which can be useful for uncovering new variables and providing different avenues of inquiry for the researcher (Bewley, 1999). While this qualitative approach cannot generate data for statistical inference, it can be helpful for building more robust theory and understanding the social processes that result in observable outcomes from the firms. As Starr (2014) notes, qualitative work in the field of industrial organization has revealed relationships that would have been difficult to "see" through other methods. The

research design and questionnaire development for this study draw from best practices outlined by Starr (2014) and the more detailed methodological guide of King and Horrocks (2010).

Interview subjects were recruited through attending conferences, meetings, or events on the subject of business and sustainability or referrals from climate policy experts.[7] This method undoubtedly produces bias in the sample, but to some extent this is unavoidable. Companies that are not as engaged with environmental sustainability would have been unlikely to participate in the study, and this is reflected in several subjects that were approached and declined interviews.[8] Such firms may not have an environmental sustainability office or staff concerned with greenhouse gas emissions. This leaves a sample of companies that claim to care about environmental sustainability for some reason, to the extent that they dedicate workers to improving sustainability or publicizing claims about such improvements. That is not to say that the subjects interviewed were all parts of companies that unabashedly support an aggressive price on carbon. Their views were much more nuanced, and, especially in the case where subjects were no longer with the company in question, resistance or retreat from climate policy commitments was discussed. This paper seeks to understand why *this group* of companies chooses to embark on environmental sustainability initiatives and how they make decisions about such investments.

Interviews took place between July 2013 and August 2014. Sixteen interviews were conducted with 17 subjects at 15 companies and 1 government agency (The U.S. Environmental

[7] When asked to provide referrals to other potential respondents, subjects said they could not. This seems largely to be because subjects know few sustainability professionals outside their very specific industry, or they felt that referring someone for the study would be asking that person for a favor that they may have been hesitant to use for this purpose. This should not necessarily be seen as detracting from the study though. Using snowball sampling may have led to less variation in the companies being sampled.

[8] Subjects that declined interviews were in the oil & gas, retail, and defense contracting industries.

Protection Agency).[9] While this sample is small, the subjects are very knowledgeable about the decision-making process in their own firm or across industries more broadly.[10] All interviews lasted for approximately one hour, and they were all audio recorded and later transcribed.

Twelve of the 15 private-sector employers of interview subjects are Fortune 500 companies; an additional company is in the Fortune 1000. Eleven of the companies are members of the S&P 500 index of major American firms. Three are members of the Dow Jones Industrial Average.[11] Table 1 provides a description of the sample interviewed by industry, position, background, and sex.

Seven firms at which subjects were interviewed are in the manufacturing industry, including wood, chemicals, automobiles, appliances, heavy manufacturing, and packaging; 3 firms are in finance and insurance. Other industries represented included waste disposal, aviation, electricity generation, mining, and renewable energy consulting. Five subjects had the title of vice president, 5 had the title of manager, 2 had the title of director, and other titles included a senior analyst, a senior consultant, a communications specialist, and an adviser. Four subjects have a background in law; 3 in engineering; 2 each in public policy, economics, business, communications; and 1 in environmental science. Nine of the subjects are female and 7 are male.

[9] In one case, 2 subjects from the same company were interviewed at the same time on a conference call, as the subjects worked in different parts of the company that were both relevant to the study. The U.S. EPA official interviewed provided perspective on the agency's voluntary programs and confirmed several themes found in the company interviews.

[10] Note that this sample size is consistent with some studies in the industrial organization literature in new areas of inquiry. For example, Feinberg (1985) analyzes responses from 24 lawyers regarding European competition policy, and Lerner and Tirole (2002) interview 4 experts on open-source software to understand economic issues in the industry.

[11] Of the two firms not listed on a major index, both are headquartered outside the United States.

Table 1 Salient Characteristics of Respondents

Characteristics		Number of Subjects	Percent of Total
Industry			
	Manufacturing*	7	44%
	FIRE (Finance, Insurance, Real Estate)	3	19%
	Waste Disposal	2	13%
	Aviation	1	6%
	Electric utility	1	6%
	Mining	1	6%
	Renewable Energy Consulting	1	6%
Position			
	Vice President	5	31%
	Manager	5	31%
	Director	2	13%
	Senior Analyst	1	6%
	Senior Consultant	1	6%
	Communications Specialist	1	6%
	Adviser	1	6%
Background**			
	Law	4	25%
	Engineering	3	19%
	Public policy	2	13%
	Economics	2	13%
	Business	2	13%
	Communications	2	13%
	Environmental Science	1	6%
Sex			
	Female	9	56%
	Male	7	44%

***** Including wood, chemicals, automobiles, appliances, heavy manufacturing, and packaging.
** Background refers to most advanced degree subject attained and where primary area of work has been.

After interviews were conducted, audio recordings were transcribed. Descriptive coding was then used to categorize responses by subject using NVivo software.[12] Next, interpretive coding was added to this group of descriptive codes to understand their meaning. Finally, the

[12] For example, descriptive codes would highlight portions of the interview that discussed specific stakeholder groups or the structure of the sustainability office. Interpretive coding then highlighted areas of the interview relevant to the research question, such as discussions of motivations for goal-setting or how internal structure shaped goals. Finally, the coded portions could be arranged within themes that are discussed within the results section of the paper.

interpretative codes were classified under broad themes that were identified across and within cases. The themes are more detailed than the ones used in the questionnaire, although the response themes can be broadly grouped within the questionnaire themes. Here, "themes are recurrent and distinctive features of participants' accounts, characterizing particular perceptions and/or experiences, which the researcher sees as relevant to the research question" (King & Horrocks, 2010, 53). The results discussed below were, to the extent possible, corroborated across sources without prompting from the researcher.[13] The data can be used to (1) provide a richer description of the institutions involved in decisions (that is, the process of goal-setting) and answer the questions of (2) why firms choose to set voluntary goals and (3) how they determine the aggressiveness of the goals.

Results

Environmental sustainability offices exist in many forms within the companies that subjects work for. In the case of 4 of the 15 firms interviewed, there is no dedicated office for environmental sustainability and goal setting. Instead, environmental sustainability policy is either made by a single official coordinating with the Chief Executive Officer (in 2 cases) or by a committee of key officials from various parts of the company who serve in a part-time capacity (in the other 2 cases). In the 2 cases of firms headquartered outside the United States, the sustainability office was also located overseas.

The remaining 9 firms have sustainability offices with responsibilities that typically include setting or proposing internal environmental sustainability goals for the company, overseeing the implementation of these goals, coordinating the development of products with reduced environmental impact, and both external and internal reporting of environmental

[13] Methods of assessing and controlling for bias follow practices outlined in Starr (2014)

sustainability efforts. There are no consistent patterns in whether these responsibilities are organized under the auspices of a single supervisor or whether it is divided. For example, a chemical company has separate teams in different physical locations for setting internal goals and developing goals regarding products.

There is no consistent pattern of who, exactly, the leaders of such offices report to. In several cases, the head of the sustainability office is a vice president who would report to either the CEO or a C-suite-level official.[14] In others, the office is located one step further down the corporate hierarchy, reporting to a vice president of sustainability, communications, or environment, health, and safety.

In 4 cases, environmental sustainability efforts are led by an official responsible for government affairs and policy engagement with the firm. In 3 other cases – all manufacturing firms -- the sustainability office is housed within the Environment, Health, and Safety (EHS) office. The presence of a dedicated office for environmental sustainability seems to depend both on the industry and the history of environmental regulatory compliance within the company. That is, companies in industries such as chemicals or other heavy manufacturing that have a long history of interacting with environmental regulators tend to have the structures in place to organize beyond-compliance environmental initiatives.

Types of Voluntary Goals

When discussing voluntary goals with subjects, several distinctions emerged in the types of initiatives that were undertaken. Questions posed primarily focused on goals to reduce greenhouse gas emissions specifically, but these were often closely associated with other initiatives for the firm like energy efficiency measures, renewable energy targets, or waste

[14] Such C-suite officials could include the Chief Science Officer or the Chief Sustainability Officer.

reduction goals. Such targets could be met through the replacement of capital with more efficient iterations, modifications to the production process, or using electricity generated from renewable energy. Additionally, firms rely on changes in employee behavior through engagement programs to help meet goals.[15] This could involve campaigns to encourage employees to do things like turning lights off when not using rooms, or it could be much more complex, such as discussions about changes in work process that would lead to fewer emissions.

Some firms acknowledged that the emissions from the use of their products contributed far more to climate change than their production processes. For example, greenhouse gas emissions from the use of an automobile over its life cycle dwarf emissions from the production of that automobile. In these cases, firms often set efficiency goals for these products in response to demands from regulators, activists, consumers, or business customers. Such targets are referred to as "market-facing goals." This explains the approach of companies who decide that climate change is a business opportunity for them to take advantage of by providing lower-impact products.

Finally, some goal-setting is undertaken on climate adaptation after companies conduct climate risk analyses of their assets.[16] Examples discussed by respondents include goals for reducing water use if facilities are thought to be in areas that may become more prone to drought or infrastructure investment to prevent flooding in the future. Other firms invest in renewable energy to hedge against future price increases in fossil fuels or potential unreliability in the energy supply.

Goal-Setting Process

[15] "Employee engagement program" is the term used by subjects to describe efforts to encourage environmentally friendly behavioral changes among employees or other programming designed to showcase the environmental commitments of the firm. This can also be thought of as a change in the production process.

[16] Such efforts are referred to as encouraging "business resilience."

Firms examined in this study have a variety of processes for setting greenhouse gas reduction goals. However, there was a consistency in the broad structure of what happened: stakeholders prompted the firm in some fashion to examine their emissions, and then an internal process determined a feasible goal (that is, one thought to be profitable). In the more elaborate cases, sustainability offices assessed potential targets and feasibility by meeting with different units in the company.

For example, the director at an industrial manufacturing conglomerate described their goal-setting process, which had recently been completed. They began, as he said, by looking "at a wide variety of potential issues of interest to the corporation, kind of a materiality assessment, probably through about six months of iterative back and forth through surveys and analysis and peer analysis and benchmarking."[17] This concluded with the identification of the material issues for the corporation by committees within the firm.[18]

Next, targets and goals were sent to other departments within the firm and to management for agreement.[19] Finally, the board of directors approved the goals, and the environmental sustainability office monitored progress toward implementation of the goal. The director at the manufacturing conglomerate explained that the firm does this "by tracking what in

[17] "Materiality assessment" is the term used for the process by which "material" or important issues for the firm related to social and environmental responsibility (i.e. possible externalities that the firm might face pressure to correct).

[18] "And we always do it in 5 year periods, and then we get work groups to work on each of the material issues, to define what would be, by our estimation, what would be aggressive targets that are both consistent with what we've done in the past and where we think we want to be in the future. We benchmark those against peers and leading corporations to make sure that others think we might be being aggressive too; we don't want to be self-congratulatory. And then we button those down."

[19] As the director noted, the goals are "presented to a variety of senior management organizations within [the company] including the presidents of our different businesses, our board of directors. We have a couple of different councils -- there's a technology council, for example, that's some of the senior scientists and engineers in the corporation…we run it by these guys to see what they think. So, for example, the new goals that we have for our product development went in front of the tech council on that to see if, you know, we were covering all the bases from their estimation.

some cases can be thousands of individual projects at our manufacturing facilities that are designed to help the facility or business unit reach its goals."

The vice president of a bank emphasized the identification of and conversations with internal and external stakeholders in their goal-setting process. The goals, she said,

> "were set through a number of conversations with our internal stakeholders and talking to our [properties division], looking at the work that they're doing and understanding what was realistic and what we could meet, but also aspirational and what we could strive for and do better -- so our greenhouse gas reduction goals, our LEED goal, *et cetera* were set with that in mind.[20] We've also taken on a continual process of looking at those goals and refreshing them as necessary… So it's a continual process of working with our internal stakeholders to make sure that we're on track to meet those goals but also resetting them if we have met them because we always want to be aspiring to that new target.

A waste management company used a similar process, though this was annual, according to their vice president. They began with an assessment of long-range (5-to-10-year) forecasts of customer priorities, such as sustainability goals that business customers have. Then, they formulated a response based on that information.[21] The vice president of a wood manufacturing firm described their process for setting goals, which was very similar:

> "As [the issue of climate change] started to develop more in Europe and we thought 'hmm, that seems to have some momentum.' So, in 2006, what we did was a fairly classic scenario planning process. We brought in experts from all over the company to look at the state of what we know about what's happening in this world of climate change, some science and probably more of an emphasis on policy and then we had our tax and economic people there… then we brought to them the current state of information. We had already started to do an analysis of our company's footprint… You cannot impact a pulp and paper mill without spending tens of millions of dollars typically to do something that big. So, we said 'let's get ahead of it' and so we mapped out -- that was when we made a GHG reduction commitment.

[20] LEED refers to Leadership in Energy and Environmental Design, a certification program established by the U.S. Green Building Council. Different levels of achievement, such as silver, gold, and platinum require building features or design to enhance sustainability to a certain degree.

[21] "We tracked that really carefully and did customer analysis to see what their goals are, how they change over time, what they do, and whether they're reported publicly -- so really we're very data intensive in terms of trying to test whether or not this was a sufficient driver, whether we could start putting some money behind it. It seemed to us that there was enough of a driver… we began to think that, eventually, people would want to continually re-use resources to the extent that they could rather than put them in holes in the ground."

Others, especially those employed by heavy industry, noted their longer history of concern with air pollution issues. For example, the manager of a chemical company had this to say about their goal-setting process:

> "If I think back to the origins of sustainability at [the company]…We were a big energy user, and we were a big polluter. And so, you know, in the late '80s and early '90s when attention was just starting to be focused, there was this idea that there's an obligation to set a target, and there was a lot of low-hanging fruit at that point.[22] And so you could make some pretty amazing reductions by just tightening up things and making some investments that really drove some steep reductions. And since then we've done more incremental progress but still a pretty steep reduction curve for a large energy-using company.

She also stressed the importance of company culture to the goal-setting process.[23]

The former vice president of the appliance maker indicated his company had a less-exhaustive process. He noted that if he had not acted his company likely would not have set a goal at all. As he explained, "the company would - and many parts of the manufacturing sector would - rather these sorts of issues just go away." Instead, he says that he attempted to justify the sustainability goal, using market and stakeholder information to formulate an alternative strategic response.

> "And so my challenge in the role that I played at the company was to look at the strategic objectives of the company and find out whether or not the role that I played in government relations and public policy could facilitate in our achieving our strategic objectives, which, in their simplest terms, are the creation of value for shareholders, the growth of the company, the acceptance and premium associated with our brand… I went in to the CEO's office and said 'we need to have one of these things and here's how we can do it…I've run some preliminary numbers and we can achieve an absolute reduction'... We had another meeting, I brought in some people to show him the data, and he said 'fine, go do it.'

[22] Low-hanging fruit refers to projects with relatively low costs. This concept is further discussed below.

[23] Corporate culture broadly refers to the role of social norms. This follows a similar discussion found in Kitzmuller and Shimshack (2012). In the case of the chemical firm, the subject noted that because it "is filled with engineers…people want to know, not exactly how you're going to meet the goal before you set it, but when you set a goal, the cultural vibe is 'we want to know that you can get there.' … and I think you'll see this with a lot of the things we do on sustainability. We want to be bold, and we want to have an impact. But being run by a lot of engineers means that you also have a plan."

It can therefore be seen that the types of companies that have these sorts of greenhouse gas reduction goals take a similar approach to determining what they should be. That is predicated on wider processes within the company about identifying potential concerns and developing plans and goals in an attempt to assuage those concerns.

Stakeholder Groups and Voluntary Goals

When asked directly why they set voluntary goals, most subjects mentioned at least one stakeholder group, detailed below in table 2. These included investors, regulators, employees, customers, activists and environmental groups. They also referred to broader concerns about reputation and credibility.[24] As a policy adviser at a mining company noted when asked about the motivation for goal-setting, "I think it was management, but they were internalizing the shareholder and stakeholder worries at the same time." Additionally, 9 firms (64% of those surveyed) mentioned a direct desire to reduce costs as a motivation.

Table 2: Motivating Groups for Voluntary Environmental Action

Motivating Group	Number Mentioning Factor (percent of total)
Investors	6 (43%)
Regulators	6 (43%)
Employees	5 (36%)
Broader reputation/credibility	5 (36%)
Customers	4 (29%)
Activists/NGOs	4 (29%)

Note: Most firms mentioned more than one factor.[25]

The form that stakeholder prompting takes seems to vary, but the result of firms reconsidering the social representation of the relationship between the issue of climate change

[24] This was interpreted as a concern about stakeholder groups, though it was often not articulated as such by the subjects.

[25] In some cases, it was possible to discern a clear primary motivation for companies to set voluntary environmental sustainability goals. For example, if a firm discussed their goals in terms of cost reductions, these tended to be the major factor in shaping them. However, in several cases, it was less clear. Even when pressed, subjects often had difficulty pinpointing what they believed was the primary motivator.

and the firm is universal, even if no action is taken by the firm. In the case of regulators, this process seems to stem from the belief among firms that greenhouse gases will be regulated seriously at some point in the future. This meant that they should set voluntary goals and participate in voluntary programs to earn verified credit for their early actions.

Investors prompting action by the firm often started with a request for information, though they did not seem to be pressing seriously for aggressive action. The vice president at a wood products manufacturing firm put it this way:

> "Now the area our shareholders cared about is: Were we taking steps? Did we recognize climate as a risk? And were we taking steps to mitigate the risk? So, we included a very thorough discussion of that in our sustainability report. Whenever we met with analysts or shareholders from those large funds, there would be a slide in there about what we were doing to manage all environmental risk, but climate change was always included in that. I would talk to the person who's the head of our investor relations, and I asked, 'do they actually care about it?' And she goes 'no, I mean they don't really care what your answer is, they just care that we know and that we're doing something about it.'

In the case of several companies though, it was their business customers who asked them to examine production processes. This suggests that other companies are seeking additional information for their own decision-making process. By understanding their emissions from suppliers, they can better calculate their exposure to potential cost increases associated with climate regulations. Additionally, customers may care not only about the environmental impact of the products that they buy, but also of the company that produces them. As the manager at a chemical company noted, she sees the internal goals for the firm as intimately connected to their market-facing goals. She explained:

> "I think there's some baseline good corporate citizen role to this, and I think especially as [the company] has a bigger portfolio that goes into renewable energy and goes into supporting energy storage, you know, that our products are helping drive reductions. I think it also means you need to have your own house in order before you go selling solutions to people that will help them reduce GHG emissions, too.

It appears that where firms consider activists to be important, they are mainly portrayed as a collaborative resource to provide advice on setting or implementing goals. Unfortunately, it is more difficult to ascertain the impact that these groups have since it may be reasonable to assume that this may be an area where, even when speaking confidentially, subjects would not have wished to discuss confrontations with activist groups. It is clear in the cases discussed in interviews, however, that firms in relatively polluting industries with larger carbon footprints worry more about activist impressions of the firm than other companies. Companies then attempt to improve their reputation by finding groups considered credible by other activists and working with them on some initiatives that may either be small or provide cost-savings to the firm. For example, in one case, a subject cited the assistance that groups provided the firm in negotiating renewable energy power purchasing agreements. These groups had expertise in the local area and with those sorts of agreements, and the firm could reduce its emissions, lower energy costs, and reduce energy price uncertainty.

Ultimately, the interviews find that stakeholder groups are a key to beginning the process of examining the firm's greenhouse gas emissions levels and any potential reduction goals. That is, the stakeholder groups create a new social representation of the relationship between the firm and the issue of climate change. The firm responds to this new linkage by using external and internal information to assess the desirability and feasibility of various goals.

Cost Reductions

The idea that firms facing environmental regulation would innovate and develop cost reduction strategies is known as the Porter hypothesis after Porter (1991) and Porter and van der Linde (1995). However, the hypothesis assumes that regulations are mandatory (Ambec, Cohen, Elgie, & Lanoie, 2011). In spite of this, one of the strongest results from the interviews is

apparent support of the Porter hypothesis with regard to the threat of climate regulations or the expectation among stakeholders of reduced emissions.

In only 1 case did a participant directly say that they were able to justify spending money on environmental initiatives without a "business case," (that is, an adequate return on the investment). However, the firm in question was in financial services, with relatively small projects, such as installing plug-in electric vehicle stations for employees to use. The subject claimed that the expense was justified on the grounds of both its small size in monetary terms and the importance of maintaining the company's reputation as a leader in the field of environmental sustainability.

In all other cases, subjects said that projects had to demonstrate an adequate return on investment. In the case of manufacturing firms, this involves showing that projects designed to reduce emissions have an appropriate payback period. As a sustainability manager at a chemical company said, "our CEO and CFO can direct that capital to high risk but potentially very high reward opportunities in our businesses, like a new product that could deliver high returns over time, but it's risky. And then you've got your energy efficiency investments which are extremely certain and might have good ROIs but maybe not quite as steep as some of these other major, sexier products." She framed the choice of projects to improve sustainability as part of the process of balancing the firm's portfolio of investment spending in terms of the time horizon of the payoffs.

A vice president of a packaging manufacturing firm agreed with the sustainability manger.

> "Now, there are always going to be projects that have shorter payback and longer payback, and we're always going to favor the shorter ones from a financial perspective, but we will pursue the other projects when they're strategic. But we always seem to have plenty of projects queued up -- we're more limited by cash flow than we are by financial

> attractiveness… So now cash-flow becomes more of a consideration than asking if we have a project with a 2-year payback. [26]

The vice president then elaborated on the options that his company has for greenhouse gas reduction projects.

> "From a financial attractiveness point of view, large companies should almost always have a wide range of opportunities in front of them. They come from different places. We have over a hundred facilities -- so at any given time, they can be doing re-lamping or HVAC or process improvement upgrades, or maybe we bring two facilities together where they were doing different parts of a conversion operations and now they're doing it as an integrated process.

In addition to capital investments such as improving energy efficiency, as the subject from the packaging firm noted, firms also engage in process improvements to save costs, which can contribute to voluntary goals and reduce uncertainty. The same subject elaborated on the idea of process improvements this way:

> "There's an interesting dynamic because within a plant environment or a production environment, there's always lean operations. There's continuous improvements, and that's driven by just looking at how people can be more efficient, improve yields, prevent leaks, things like that…That's where the sustainability group comes in. We serve as a catalyst sometimes to get groups to think outside their normal parameters on things that might be possible or things that they can do.

This example suggests innovation as a response to the issue of climate change not only to reduce uncertainty for the firm, but to enhance profitability. This is consistent with the idea of the Porter hypothesis in the context of voluntary environmental actions. The subject was then asked to discuss a specific project that highlighted how his group asks other parts of the firm to reconsider their traditional approach to the production process.

[26] The subject was not asked what they mean by "strategic" here, but one could assume from the context that a "strategic" project is one that has profit considerations that may not be encapsulated by a simple return on investment framework. A reduction in uncertainty, for example, could be seen as an additional benefit of investments that reduce emissions.

> "A few years ago, we had a lot of emissions of sulfur hexafluoride -- it's used in one of our processes. And the greenhouse gas number on it is really high.[27] So there's definitely a cost to it if it's leaking out, but it's got such a big GHG impact. So, we went around to all of the plants and taught them how to do turnaround on it and recover it and recycle it. And so they not only save cost, and we actually gave them the equipment to do that, but it had a huge impact on reducing our GHG emissions as a result. So, intuitively, they knew that there were some cost savings to be had there, but they didn't really have a sense of how big they were and they certainly didn't have a sense of how big the climate impact was. So, by coming in and helping educate them and showing them processes about recovery and recycling the material, it's now standard procedure in our plants.

However, large projects at firms were often not evaluated with the consideration of meeting environmental goals. As a sustainability analyst at an automobile manufacturer noted, "I hate talking in absolutes, but there has to be a business case for everything we do in sustainability -- at the end of the day, we're a business. Sustainability can't happen without profitability." In 2 other cases, subjects made clear that sustainability projects had to compete alongside others without any special treatment in terms of which project yielded the highest profit returns.

Conclusions

While the general theoretical framework developed above is supported in the interviews conducted, subjects discussed an interest in cost-savings that was greater than anticipated. However, many of those cost savings were not discovered until stakeholders prompted firms to examine their emissions and set goals. In most cases, subjects believed that some set of stakeholders (e.g. regulators, investors, customers, activists, or employees) expected them to set goals for reductions and report on progress towards those goals. Goals are, therefore, inherently reactive rather than proactive, though firms are setting goals in an attempt to forestall attempts by stakeholders to take actions that might harm the firm.

[27] The "greenhouse gas number" refers to the global warming potential (GWP) of the gas, which describes its impact on warming the atmosphere as a factor of the impact of carbon dioxide (with a GWP of 1). The GWP of sulfur hexafluoride is 16,300 times that of carbon dioxide.

The formality of the goal-setting process varied across firms, with some companies conducting rigorous inventories and cost-benefit analyses to determine the appropriate levels of commitment. Others calculated goals much more quickly, essentially guessing at a reasonable reduction that they could achieve. Most firms set absolute reduction goals for themselves, but subjects at several of the more growth-oriented firms said that they needed normalized targets to accommodate their expected enlargement. Some firms also set goals for emissions reductions from their products, seeing this as advantageous from a marketing perspective.

The process of meeting internal reduction targets was also different across companies. Some put projects with estimated reductions through the same approval process for capital expenditures that anything else would go through. Other subjects, especially at firms with relatively low emissions, said that the process was more informal, completed by committees or with projects undertaken on an *ad hoc* basis.

The interviews documented here constitute an important early step in understanding the structure of voluntary goal setting and the motivations of firms involved. They demonstrate the validity of the stakeholder framework for understanding how and why firms develop the emissions reduction targets that they do. However, as with many exploratory studies, the sample size involved here is relatively small, and subsequent interviews could build on this framework to further explore differences between firms that produce variation in outcomes for goals. Is this variation a result of differences in internal institutional structures or due to more fundamental characteristics such as the specialization within industries? What in the institutional history of a firm explains its decision to approach goal setting in a given way? Does such variation depend in any systematic way upon the background of those in management? What are effective strategies for stakeholder groups in changing the social representations of climate change that leads firms

to examine goal feasibility? What impact does the changing regulatory climate, especially at EPA, have on the willingness of firms to listen to other stakeholder groups? Future work should seek to answer such questions using qualitative or quantitative data. For example, future quantitative work could examine salient characteristics of firms such as size, industry, and links to stakeholders that might lead them to achieve goals.

Nonetheless, a number of policy recommendations flow from these results. When designing voluntary programs related to greenhouse gas emission reductions, public and private organizations (such as EPA or CDP) should consider the structure of companies that they wish to attract to the program. They should investigate companies' possible incentives for joining the program by appealing to different stakeholder groups and finding ways to reduce production costs. Voluntary programs could, perhaps, be designed to encourage greater participation by discussing methods of communicating success with stakeholder groups.[28] Further, these results suggest the importance of establishing institutional structures to set and implement goals.

Interestingly, while Fiack and Kamienieki (2017) apply the stakeholder model in the context of local government policy making in the United States, they find that jurisdictions that have designed and implemented climate action plans have integrated stakeholder participation into their planning process to some degree. This paper finds that stakeholders may have to use different tactics, but in some ways a similar dynamic is at work with large firms. From the perspective of activists, these results would suggest that creating some sort of dialog with the management of the firm. Either collaborative or adversarial approaches may be more effective, depending on the company and context. If firms believe that groups that can impact them feel strongly about the issue, they will be more likely to take some kind of action. That may be a

[28] Futran's (2011) evaluation of EPA's Climate Leaders program similarly highlights the need for different award levels for companies achieving greater reductions and public recognition for companies involved.

seemingly-obvious point, but this paper highlights the process of examining the production process that stakeholder engagement can begin.

Finally, the emphasis on cost savings should serve as a reminder of the limits of voluntary actions to reduce greenhouse gas emissions. While many firms have started to discuss environmental sustainability commitments at great length, and many have achieved significant reductions in emissions[29], this action will only continue for as long as it is still profitable for firms, even with pressure from stakeholder groups. Given the scope of emissions reductions that are recommended by the Intergovernmental Panel on Climate Change (IPCC) to limit global warming to 2 degrees Celsius, the marginal cost of reductions will eventually begin to rise for many firms. It is unrealistic to think that firms will achieve these reductions without additional government regulation such as carbon pricing, restrictions on fossil fuel extraction, or agreements with energy-intensive industries to help coordinate reductions. Firms that hope to operate and compete in much of the world economy including California, the European Union, China, and Japan must adapt to a world in which greenhouse gas emissions are regulated ever more stringently, and voluntary targets prepare them to do so. However, for much of the United States outside of California, voluntary goals will remain an important source of greenhouse gas emission reduction for the foreseeable future.

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[29] For examples, see the nonprofit organization CDP's (formerly the Carbon Disclosure Project) annual climate change grade given to large firms.

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APPENDIX A: INTERVIEW QUESTIONNAIRE

Asked to all participants:

Describe the role of your office or department in shaping the climate policy of your company.

Where else in the company have you worked? What is your previous experience outside the company?

Theme 1: The Role of Business in Society & its Legacy

Should business be effective agents, not just of meeting consumer needs and creating wealth and jobs, but also of addressing social problems? If so, how can they do this?

Do you believe that the planet's ecosystems will be radically changed in the next 100 years? What role does this play in your work now?

What are the roles of other stakeholders such as the government, the public and consumers in general in addressing social problems such as climate change?

Theme 2: Climate Change Policy Decisions by the Firm

What has made your firm pay attention to the issue of climate change?

Tell me about the process for assessing your company's options for climate change mitigation/adaptation strategies.

How do you present these options to other units within your company for approval? Which costs and benefits do they care about the most?

Possible follow-up question: *How do you view potential partners in civil society when assessing your options? What role do these stakeholders play?*

How does your firm evaluate these options and select a course of action? What sort of return is evaluated when your firm evaluates these options by calculating on return on investments? Are there tradeoffs?

What is the role of your company's sustainability strategy in your branding?

What is the role of your sustainability strategy in your firm's efforts to retain high-quality employees?

What is the role of your sustainability strategy in building relationships with regulators?

Tell me about the role of socially active investors in your company's sustainability strategies.

If not previously mentioned: *Do your company's sustainability efforts focus primarily on mitigating or adapting to the impacts of climate change?*

Theme 3: Politics and government policy

What sorts of public policies can enhance the positive impacts of your company's actions on social problems?

Would you like to see more voluntary programs?

Would you like to see a national carbon pricing scheme?

Tell me about the role that climate policy and environmental issues play in your political contributions and participation.

Tell me about the decision to join/not join the Climate Leaders program.

- If firm was not a member*: Does your firm make similar commitments to those made in the program?* (explain if necessary what this means)

Is your firm a member of any other voluntary environmental program at the federal level? If so, tell me about the process that led you to join the program.