Beyond the Dichotomy of Symbolic versus Substantive Actions: Evidence from Corporate Environmental Management

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Abstract

The symbolic management literature explores loose coupling between substantive and symbolic aspects of organizational activities. The prior literature, however, focuses on the benefits of symbolic management and tends to treat it as costless. If symbolic management is costless, presumably all firms should pursue it, yet in practice they do not. In this paper, we extend the theory of symbolic management to incorporate its costs as well as its benefits. We explore the gap between symbolic and substantive actions by creating a novel data set that combines information on claimed reductions with actual greenhouse gas emissions reductions calculated from fuel use data for the US electric utility industry. This approach goes beyond the implicit assumption of complete decoupling made in prior work on symbolic management.

Keywords: symbolic management, selective disclosure, extent of decoupling, environmental management, greenhouse gas emissions

Institutional theory suggests that organizations that conform to institutional rules in their external environment increase their legitimacy and their survival prospects (Meyer and Rowan, 1977; DiMaggio and Powell, 1983; Scott, 2001). Conformity to institutionalized rules brings a challenge, however, because it often conflicts sharply with efficiency criteria, and vice versa (Meyer and Rowan, 1977). To maintain institutional conformity, firms thus tend to decouple their formal structures and actual work activities (Meyer and Rowan, 1977). This decoupling phenomenon is more explicitly discussed in the literature on symbolic management (Pfeffer, 1981; Elsbach and Sutton, 1992; Westphal and Zajac, 1998; Zajac and Westphal, 2004). The crux of the argument is that what organizations purport to do may not be an accurate reflection of what they actually do, but may nevertheless be viewed favorably by external stakeholders and hence bring about positive outcomes.

Although intriguing, research on the substantive consequences of symbolic actions has left unanswered an important question. If firms can obtain substantive results—increased legitimacy—with merely symbolic gestures, why don't all firms engage in symbolic management? The fact that some firms do not do so suggests that there must be costs associated with such practices. As a result, symbolic management is useful for some firms under certain circumstances, but not for all firms nor in all circumstances. Furthermore, those firms that do engage in symbolic action may not undertake merely symbolic actions—completely decoupled from substantive actions—as is assumed in most of the recent literature. As pointed out by Pfeffer (1981), for example, firms may engage in the selective disclosure of truthful information that is favorable to them. The possibility of selective disclosure suggests that symbolic management may not be a dichotomous all-or-nothing choice. That is, the degree of decoupling between symbolic and substantive action may be a continuum rather than a binary choice.

Despite the appeal of selective disclosure as a device for understanding the degree of decoupling, most prior work on symbolic management focuses on a dichotomous definition of whether action is symbolic or substantive, for example, whether firms granted their chief executives the stock options they had signaled (Westphal and Zajac, 1998), whether firms initiated a stock repurchase plan they had announced (Zajac and Westphal, 2004), or whether firms participating in a government program reduced their greenhouse gas emissions more than non-participants (Delmas and Montes-Sancho, 2010). By making use of the possibility of selective disclosure, we go beyond the dichotomy of symbolic versus substantive action and explore the degree of decoupling between symbolic and substantive action.

Often, it is difficult or impossible to examine to what extent firms engage in selective disclosure. We overcome this challenge by using greenhouse gas emissions data from the US electric utility industry. Companies in this industry must truthfully report their detailed fuel use data to the Federal Energy Regulatory Commission (FERC) by filling out FERC Form 1. Because no end-of-pipe technology to reduce greenhouse gas emissions is yet in use, what goes in, comes out. Thus, by making use of data on the carbon content of each fuel source, actual greenhouse gas emissions and reductions can be calculated from fuel use data. Sources for self-reported data on emissions reductions abound, including companies' websites, annual reports, or sustainability reports. We use a more uniform channel through which companies voluntarily report their greenhouse gas reductions: the U.S. Department of Energy (DOE)'s voluntary program for reporting reductions of greenhouse gases (also known as the 1605(b) program after the section of the Energy Policy Act of 1992 that created it). As will be explained in more detail later, this program, although formalized through the DOE, provides ample room for flexibility.

Thus, by comparing firms' claimed and actual reductions in emissions, this paper is able to offer keen insights into the extent of decoupling between symbolic and substantive action.

Disclosure of greenhouse gas reductions by companies also allows us to study the costs of symbolic management. We argue that there are two types of potential costs: internal costs and external costs. Internal costs arise within the organization and external costs arise from outside the organization. Internally, firms may need to incur signaling costs (Spence, 1973), i.e., costs associated with reducing at least some amount of greenhouse gas emissions, in order to selectively publicize their achievement. Heterogeneous abatement costs across firms allow us to explore how the internal costs relate to the degree of decoupling between symbolic and substantive action. Externally, stakeholder groups whose incentives are not well-aligned with those of the firm may not be satisfied with ceremonial inspection (Meyer and Rowan, 1977) and thus symbolic management practices, i.e., selective disclosure of successful greenhouse gas reductions without full disclosure of overall greenhouse gas emissions, may backfire. Although Meyer and Rowan (1977) suggest that there is variation in the feasibility of decoupling across contexts depending on the degree of confidence and good faith among the firm's constituents, this boundary condition has not received much attention in subsequent literature.

BENEFITS AND COSTS OF SYMBOLIC MANAGEMENT

Institutional theorists have long argued that organizations that appear responsive to pressures from their external environment, which are often voiced by significant external stakeholders, increase their legitimacy and their survival prospects (Meyer and Rowan, 1977; DiMaggio and Powell, 1983; Scott, 2001).

The benefits of symbolic management in fashioning such responses have been well documented. For example, Westphal and Zajac (1998) find that corporate announcement of long-term incentive plans (LTIPs) for CEOs, a widely institutionalized practice, was valued positively by investors, even when a careful reading of a firm's proxy statement would have revealed that the firm did not actually announce the granting of any performance-related CEO compensation. Furthermore, Zajac and Westphal (2004) show that corporate announcement of the planned adoption of stock repurchase plans was greeted positively by investors, even as a growing number of firms failed to follow through on such announcements or on LTIP announcements, and even if the firm itself had a history of announcing stock repurchase plans or LTIPs that it had failed to act upon. In a similar vein, there is a growing body of evidence that firms participating in industry-led or government-sponsored environmental programs perform no better than non-participants (King and Lenox 2000; Rivera and DeLeon 2004; Delmas and Montes-Sancho, 2010). Thus, if firms can get away with merely symbolic (and hence costless) actions, they can appropriate the benefits that would properly accrue only to firms that took substantive action.

The costs of symbolic management have received much less attention. Emphasizing selective disclosure as an important and flexible tool for symbolic management (Pfeffer, 1981), we identify two types of potential costs of symbolic management. Specifically, we argue that symbolic actions involve costs that arise from both within organizations and outside organizations. Within organizations, there may be signaling costs associated with engaging in symbolic management (Spence, 1973) if at least a modicum of substantive action is required before a firm has any positive outcomes to disclose. Outside organizations, there may exist stakeholders who oppose the practice of symbolic management, and thus symbolic management may backfire. In this paper, we explore both possibilities.

From the internal perspective, signaling costs may be required if the firm is to credibly convey information about itself to the intended audience. In Spence (1973)'s job-market signaling example, a job market candidate sends a signal about her ability level to the potential employer by acquiring an educational credential. Its informational value comes from the fact that the employer assumes it is positively correlated with greater individual ability. The candidate thus incurs the cost of obtaining the credential. Similarly, we posit that to be able to engage in symbolic management in a credible manner, organizations may need to incur some costs. In the context of this paper, organizations may have to achieve some level of greenhouse gas reductions to convincingly publicize that they are reducing their carbon footprints.

From the external perspective, we theorize that as organizations come under increasing scrutiny, complete decoupling between symbolic and substantive action becomes increasingly risky, since symbolic actions with no basis may be exposed and punished by one or more stakeholder groups. In such circumstances, firms may prefer to make selective disclosures of favorable substantive actions, rather than making claims that lack any substantive foundation. However, when it becomes too risky to engage in symbolic management—even via truthful but selective disclosure—due to increased scrutiny by external stakeholders, firms may choose not to disclose any information at all (Lyon and Maxwell, 2011).

Indeed, the risks of selective disclosure are highlighted by the increasing denunciation by environmental activists and concerned citizens of corporate environmental efforts as PR campaigns. For example, Starbucks Corporation was recently accused of greenwashing for promoting recycling on its cups with the slogan "help us help the planet" on its cup holder sleeves.[1] Although Starbucks uses cups made of 10 percent recycled material, the cups

[1] More Corporate Greenwashing: Starbucks' Cups, Eco-Friend or Eco-Foe? http://www.organicconsumers.org/articles/article_7176.cfm

themselves are not recyclable in most cities due to their plastic coating. BP has been heavily criticized for misleading the public with its multimillion-dollar advertising campaign announcing its commitment to alternative energy sources.[2] BP allocates 93 percent of its total investment funds for the development and extraction of oil, gas and other fossil fuels and less than 5 percent for solar and wind power. The Coca-Cola Company came under attack when it announced that the company had cut back its water usage by about 4 percent annually in order to reduce its water footprint.[3] Coke was criticized because its bottlers do not generally disclose how much water they are taking, and hence it is impossible for outsiders to verify the company's claim.

Although the extent to which these campaigns have real negative consequences has not been studied much, these phenomena are consistent with Meyer and Rowan (1977), which suggest that there is variation in the feasibility of decoupling across contexts depending on the degree of ceremonial inspection and confidence and good faith among constituents. This boundary condition, however, has not been considered in much subsequent literature. We argue that when there is a presence of external stakeholders such as environmental NGOs whose incentives are not well-aligned with those of the organization, there is a greater probability that these stakeholders are not content with ceremonial inspection. This creates potential costs of symbolic management originating from the external environment.

EXTENT OF DECOUPLING

Although the prior literature typically treats symbolic management as dichotomous (actions are either symbolic or substantive), in practice firms often have important choices about the extent of symbolic management in which they engage. Selective disclosure, for example, is a useful tactic

[2] Activists ejected from BP office, Morning Star, 12/22/08
[3] http://www.polarisinstitute.org/coca_cola_company_wins_corporate_greenwashing_award, Polaris Institute

that allows a firm to choose exactly how much favorable and unfavorable information it releases. The accounting literature has long been concerned with the extent and accuracy of discretionary disclosure (Verrecchia 1983; Patten 1991; Patten 1992; Al-Tuwaijri et al. 2004). More recently, stakeholders concerned about corporate reporting flexibility have come together to create the Global Reporting Initiative (GRI), which attempts to standardize corporate reporting of environmental, social and governance practices.

Although Pfeffer (1981) noted that selective disclosure can be a useful tool for symbolic management, the subsequent literature has paid little attention to this possibility. Selective disclosure creates a natural coupling between symbolic and substantive action, since one can only disclose positive outcomes that actually exist. Nevertheless, the relationship between the two can still be loose, since a firm might withhold information about many negative outcomes for each positive outcome it chooses to disclose. Thus, selective disclosure provides a natural means of going beyond the dichotomy between symbolism and substance that has dominated the literature on symbolic management.

Interpreting selective disclosure requires much more sophistication from external stakeholders than does a simple dichotomous signal, such as whether a firm created a long-term incentive plan or joined a government program. Thus, firms may benefit from disclosure that incorporates both a binary decision to issue a corporate sustainability report and a more nuanced decision about exactly what information to include in it. Many stakeholders are likely to be satisfied with observing whether or not the firm issued a report at all because this is easy to monitor, while a minority of stakeholders with greater vested interests may probe further into its details. As we elaborate below, the logic of Meyer and Rowan (1977) suggests that the binary

participation decision is likely to be driven by external pressures while the details are likely to be shaped more by actual operational costs and efficiency considerations.

THE VOLUNTARY GREENHOUSE GAS REGISTRY

The Voluntary Reporting of Greenhouse Gases Program was established by section 1605(b) of the Energy Policy Act of 1992. The general features of the program align well with the proposals laid out in President Clinton and Vice President Gore's report titled, "Reinventing Environmental Regulation" (Clinton and Gore, 1995). One of the proposals is to make full use of the power of information (Delmas et al. 2007). The 1605(b) program allows public electronic access, so the public as well as government and firms can access the program's database.

Why should firms participate? According to the DOE's Voluntary Registry website, the benefits of participation are primarily in the form of publicity and improved relationships with regulators. A more strategic motivation, consultants advised, was that a "proactive stance that includes voluntary GHG emissions reduction efforts may delay regulatory action" (Trexler and McFall 1993). Should regulatory action be unavoidable, participation would also be advantageous because it could "establish a basis for requesting consideration of prior actions in a possible future "credit for early reductions" program" (US EIA 2006). These early reduction credits (ERCs) would have real economic value to 1605b participants if the U.S. established a system of tradable emissions permits, as they could be sold to other emitters at market prices (Michaelowa and Rolfe 2001, Kennedy 2002, Parry and Toman 2002). In particular, participants would benefit if the government adopted an allocation scheme for permits that would award them free permits for reductions in greenhouse gas emissions made prior to the beginning of the trading scheme. In fact, just such a proposal was introduced by Senators John Chafee (R-RI) and

Joseph Lieberman (D-CT) in the 105th and 106th Congresses.[4] Despite the failure of both bills to pass, these proposals made industry (and investors) keenly aware that early reduction credits might be awarded at some point in the future.

A critical aspect of the Voluntary Reporting Program is that it was designed with no hard and fast rules about how to report reductions. First of all, voluntary reporters could choose to report reductions at the "entity level" (entire firm) or at the "project level" (individual reduction project). Moreover, reporters could define the boundary of the entity or project.[5] Reporters were even allowed to report entity-level reductions just as the sum of project-level reductions. Second, voluntary reporters also had leeway in choosing baseline emissions against which to measure their reductions: historical or hypothetical. In the case of historical emissions, reporters could select any one year between 1987 and 1990 or use an average of any of those years. In the case of hypothetical emissions, reporters estimated what emissions would have been without entity- or project-level reductions. Third, reporters could report either reductions in absolute emissions or reductions in emissions intensity. Fourth, voluntary reporters could report indirect reductions or sequestration as well as direct reductions.[6]

In 2003, the latest year covered in this paper, the 1605(b) program received a total of 98 reports from the electric power sector, which provided information on 485 GHG emissions projects. The projects ranged from reducing emissions at the electric power generation,

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[4] In the 105th Congress, Senator Lieberman, along with Senators John Chafee (R-RI) and Connie Mack (R-FL) introduced S. 2617, the "Credit for Early Voluntary Action Act." In the 106th Congress, Senators Chafee, Lieberman, Mack, Warner (R-VA), Moynihan (D-NY), Reid (D-NV), Jeffords (R-VI), Wyden (D-OR), Biden (D-DE), Collins (R-ME), Baucus (D-MT), and Voinovich (R-OH) introduced S. 547, the "Credit for Voluntary Reductions Act."

[5] This information is based on personal correspondence with EIA's 1605(b) project manager, Mr. Stephen E. Calopedis (October 18, 2005).

[6] Direct reductions refer to reductions from sources owned by the reporter. Indirect reductions refer to reductions from sources not owned by the reporter but somehow affected by reporter actions. An example of indirect reductions is a decrease in power plant emissions due to a decrease in end-use electricity consumption, which in turn is at least partly attributable to electric utilities' demand side management programs. Sequestration refers to the removal and storage of carbon from the atmosphere in carbon sinks such as trees, plants, or underground reservoirs. See *Voluntary Reporting of Greenhouse Gases 2003*, EIA (2005).

transmission and distribution stages to demand-side management and carbon sequestration. Abatement strategies at the generation stage include switching from high- to low-carbon fuel sources, improving plant availability at low-carbon generators such as nuclear and hydro, plant efficiency improvement, increases in low- or zero-emitting generation capacity, decreases in high-emitting capacity, and retirement of high-emitting plants. Reductions at the transmission and distribution stages involve reduced losses in the delivery of electricity from power plants to end use through the use of high-efficiency transformers, transmission line improvements, etc. Demand side management projects aim to improve end-use energy efficiency of both stationary and mobile sources in the industrial, commercial, residential, agricultural, and transportation sectors. Carbon sequestration projects report carbon fixing through afforestation, reforestation, etc. Projects on other GHGs such as methane are also reported to the 1605(b) program.

DRIVERS OF SYMBOLIC MANAGEMENT AND DECOUPLING

The empirical context of this paper provides an excellent setting to explore the costs and the extent of symbolic management. Firms face both the decision whether to participate in the Voluntary Greenhouse Gas Registry, and if so, how extensively to report on their emissions. In developing hypotheses, we proceed in two steps. First, we develop hypotheses regarding the factors that drive a firm's participation in the 1605b program. Because external stakeholders such as NGOs face prohibitively high costs of verifying firms' specific disclosures to the program, participation in the program, which is readily verifiable, becomes important as a symbolic action. Our hypotheses focus on the costs to firms of engaging in symbolic action, which have largely been ignored in the literature, as well as its benefits. Second, we discuss what determines the extent of decoupling between symbolic and substantive actions, that is, the gap between reported

and actual emissions reductions. We develop an index to measure the extent of decoupling, and hypothesize regarding how internal firm characteristics affect the firm's extent of decoupling.

Program Participation as Symbolic Action

One of the most prominent trends in government regulation over the past two decades is a shift from mandatory rules to voluntary programs (Lyon and Maxwell, 2004; Prakash and Potoski, 2006; Short and Toffel, 2010). When there is no political consensus to enact traditional penalty-backed regulations, governments increasingly resort to voluntary programs that offer modest inducements for improved performance, or that invite companies to disclose information about their performance. Unfortunately, the literature on public voluntary programs has generally concluded that they have little or no impact on environmental performance; this includes such well-known programs as the EPA's 33/50 Program, Climate Challenge, Climate Wise, and Sustainable Slopes (Lyon and Maxwell, 2004). If voluntary programs do not have much impact in terms of participating firms' environmental performance, what is driving the participation decision appears to be more external than internal factors. For example, on the benefit side, firms may receive intangible benefits such as favorable publicity, improved relationships with regulators, or may receive more tangible benefits in the form of early reduction credits. On the cost side, firms may lose legitimacy if they do not appear to conform to external pressures to take environmentally-friendly actions. The impact of these potential benefits and costs are likely to be more pronounced for more visible firms. Indeed, prior studies find that more visible firms, in terms of size or pollution, are more likely to participate in voluntary programs (Arora and Cason, 1995; DeCanio and Watkins, 1998; Khanna and Damon, 1999; Videras and Alberini, 2000; Welch, Mazur, and Bretschneider, 2000, Rivera and de Leon, 2004, Sam and Innes, 2005).

Building on the symbolic management literature, we further identify under what circumstances firms' participation in voluntary programs is more likely to be observed. One reason why symbolic action is possible is that parties in contact with the organization may have unclear or unstable preferences for organizational actions or outcomes (Pfeffer, 1981). We argue that this condition is more likely to be met when there is no, or a weak, government mandate; in the context of our paper, this manifests as a lack of binding greenhouse gas regulations. In the US, there is no federal-level mandate to regulate greenhouse gas emissions from the electric utility industry. There are, however, state-level regulations that indirectly achieve a similar goal. Some states have adopted renewable portfolio standards, which typically require that a certain percentage of electricity generation comes from renewable sources. The stringency of this regulation varies. We contend that participation in government-initiated voluntary programs with regard to greenhouse gas emissions serves as a cooperative signal to government regulators and thus helps to preempt more stringent greenhouse gas regulations. Indeed, Maxwell et al. (2000) and Hoffman (2005) note that voluntary programs might facilitate preemption or delay of mandatory regulations, and Innes and Sam (2008) find that corporate participation in voluntary programs reduces the likelihood of regulatory enforcement. Thus, we posit that stringent government mandates reduce company incentives to participate in voluntary programs. Not only does an existing mandate reduce the value of preemption or delay, it may also reduce the opportunity for a firm to claim early reduction credits, since its emission reductions might be attributed to the existing mandate rather than the firm's own voluntary actions.

Hypothesis 1: The presence of more stringent regulation decreases the likelihood of program participation.

Whereas government as a stakeholder desires to see its own programs as successful, NGOs are more skeptical toward voluntary programs. NGO concerns arose with regard to the Voluntary Greenhouse Gas Registry in particular. The flexibility inherent in the Program was designed to make the program more attractive to industry, and simultaneously served the interests of government officials who desired to increase program participation. However, that very flexibility proved troubling to environmental NGOs. For example, the Natural Resources Defense Council (NRDC), an environmental NGO, condemned project-level reporting (the primary form of reporting used by program participants), arguing that it allows companies to "cherry pick" the projects they want to report:

> "Without full and transparent entity-wide emissions accounting, project-based reporting weakens the system and undermines the value of real reductions by providing opportunities for gaming the system and claiming hypothetical reductions while emissions are actually increasing." (NRDC, p.4)[3]

In the presence of skeptical NGOs, therefore, the misguided effort to decouple organizational activities from public inspection and evaluation may throw the organization's activities open to suspicion and reduce its ability to obtain resources, legitimacy, or social support (Oliver, 1991). The tension between the government and the NGO perspectives on voluntary programs meant that companies considering participating had to carefully weigh the benefits (in the form of improved regulatory relationships) against the costs (in the form of provoking negative reactions from NGOs). Conflicting institutional pressures for conformity and their impact on organizations have received increasing attention (Smith and Lewis, 2011; Purdy and Gray, 2009; Kraatz and Block, 2008; Marquis and Lounsbury, 2007; Seo and Creed, 2002; Oliver, 1991). If external constituents avoid inspecting and controlling institutionalized organizations, as Meyer and Rowan (1977) suggested, selective disclosure can be an acceptable

compromise on competing objectives and expectations (Oliver, 1991). Selective disclosure can be especially useful if organizations can choose a more amicable venue, in which otherwise dubious activities appear unusually desirable, proper, or appropriate (Suchman, 1995).

We argue, however, that in the presence of external stakeholders whose incentives are not well aligned with those of the organization (Dewatripont and Tirole, 2005), the probability of being monitored and inspected rises, and selective disclosure becomes a less useful tool to satisfy conflicting demands. Especially if there is no strong resource dependency (Pfeffer and Salancik, 1978) between the firm and its stakeholders, external stakeholders may choose to inspect and control institutionalized organizations. External monitoring by those who have only weak ties to organizations can be harsh, leaving a detrimental impact on organizations. With regard to participation in the Voluntary Greenhouse Gas Registry, because participation is easy to verify, environmental NGOs are likely to focus on this decision. Verifying the accuracy of reported reductions in detail required extensive data-gathering and analysis, and was prohibitively costly. Thus, environmental NGOs had good reason to focus on participation rather than the details of corporate reports. Since they viewed the Voluntary Registry as too flexible to be credible, they viewed firms' participation in it with deep suspicion. Thus, we posit that in the strong presence of environmental NGOs, firms are less likely to participate in this program.

Hypothesis 2: The greater presence of external stakeholders whose incentives are not well aligned with the organization decreases the likelihood of program participation.

Exaggerated Emissions Reductions as Decoupling

In addition to the participation decision, companies had a choice about the extent to which they would report their emissions footprints. The Voluntary Reporting Program gave companies

extraordinary flexibility in reporting mode, with the two most prominent options being project-level reporting and entity-level reporting. Project-level reporting allows for selective disclosure of successful emissions reductions projects, such as increasing the availability factor of a nuclear power plant, while remaining silent about projects that increase emissions including, for example, adding more power plants to meet growing electricity demand. Entity-level reporting, in contrast, requires disclosure of a firm's entire emissions footprint, which is affected not only by the firm's existing generation mix but also its rate of demand growth. Furthermore, companies had flexibility in how to calculate the reductions they attributed to specific projects, for example, by making hypothetical estimates of reductions or by choosing a hypothetical baseline against which to measure reductions. As mentioned above, environmental activists were concerned that the program's flexibility made it easy for a company to overstate its emissions reductions relative to changes in its actual emissions footprint.

We posit that the extent of disclosure was affected by a different set of factors than the participation decision, with external pressures less important and internal costs more important. This is because participation in the program is easy to verify, and hence external stakeholders are likely to focus on this decision. Indeed, environmental groups have brought more citizens' suits on water pollution than air pollution issues because the cost of monitoring is lower for water pollution (Naysnerski and Tietenberg, 1992). Furthermore, because the operational costs of participating in the program are low, internal costs are unlikely to play a critical role in the participation decision. In contrast, external stakeholders had a much harder time assessing the extent to which disclosure was complete, so were less likely to monitor it. Firms differed in what they stood to gain from decoupling, based on their levels of emissions, their rates of growth and the types of interactions they expected to have with their stakeholders. Furthermore,

achieving actual emissions reductions that can be disclosed to the Voluntary Greenhouse Gas Registry required real costs, which were increasing in the level of reductions.

We hypothesize that firms differed significantly in terms of the benefits of reporting reductions. It was widely thought that greater levels of reported voluntary reductions could preempt or delay the imposition of greenhouse gas regulations (Trexler and McFall, 1993). Such regulations, whether at the federal or the state level, would be more costly for firms with larger emissions, so these firms naturally had stronger incentives to report larger levels of voluntary reductions. Given the flexibility of the voluntary reporting program, firms had considerable latitude to report reductions from their internal activities, for example, selectively releasing information on successful reduction efforts or estimating hypothetical reductions instead of measuring actual reductions. Accordingly, we hypothesize that firms with larger emissions, which had more to gain from regulatory preemption, were more likely to take advantage of flexible program guidelines in ways that presented them in the best possible light, and hence were more likely to exaggerate their environmental performance.

Hypothesis 3: Firms with higher emissions of greenhouse gases are likely to exhibit greater decoupling between reported and actual reductions.

Growing firms may also have more to gain from decoupling. Growing firms could expect to have greater interaction with external stakeholders through regulatory proceedings, since they would be more likely to need approval for new generating units. Such approval processes create political risks for the firm, since stakeholders can use hearings as an opportunity to propose changes in regulated prices (Laffont and Tirole, 1990) or delay approvals for new units if firms

have blemishes on their environmental records (Decker, 2003). Growing firms thus had greater need of political strategies to ward off any such issues. In particular, for issues that are not salient to the general public, lobbying---provision of information, e.g. about their voluntary emissions reductions---is often an effective strategy (Keim and Zeithaml, 1986). Thus, growing firms had stronger incentives to claim to be taking effective action to reduce their emissions, information which could be presented in the political arena as needed. In addition, growing firms seeking to protect their accomplishments (Suchman, 1995) via early reduction credits had strong incentives to engage in selective disclosure, reporting successful emissions reduction projects but withholding information about their growing overall carbon footprints. For example, a firm that has just built a new coal-fired generating plant has no incentive to report that fact to the Voluntary Greenhouse Gas Registry; it prefers to focus on its emissions reduction projects in other aspects of its operations.

Hypothesis 4: Growing firms are likely to exhibit greater decoupling between reported and actual reductions.

Firms are heterogeneous in terms of their costs of addressing environmental sustainability issues (Darnall and Edwards, 2006). This in turn implies that they vary in their costs of engaging in symbolic action via selective disclosure of their environmental performance, since firms must achieve a positive outcome that can be selectively disclosed. As introduced earlier, we refer to this cost as "internal costs of symbolic action." This is distinct from "external costs of symbolic action" brought about by stakeholders whose incentives are not well-aligned with those of the firm. Firms with low internal costs, low-cost abatement opportunities in our context, can more readily engage in substantive action, i.e., reducing emissions, and therefore are likely to have a larger number of positive outcomes that can be disclosed. Firms without such low-cost options

may only be able to produce small successes, leaving them little to highlight in public relations releases. Thus, the extent of exaggeration is likely to be lower for firms with low internal costs of symbolic actions. In the context of this paper, firms with low-cost options for emissions reduction are likely to have more reductions, and for any growth rate this greater level of reductions implies a smaller normalized difference between reported and actual reductions.[7] Hence, we expect firms with low-cost reduction opportunities to have a lower normalized difference between reported and actual emissions.

Hypothesis 5: Firms with low-cost emission reduction opportunities are likely to exhibit less decoupling between reported and actual reductions.

METHOD

Data

We tested our hypotheses using 98 US investor-owned electric utilities' data over the period 1996-2003. The total number of firm-year observations in the sample is 837. The 1605(b) participation data were collected from the DOE's Voluntary Registry website.[8] Financial, operational and environmental performance-related data were obtained from Platts, a company specializing in energy industry data.[9] Table I provides a list of variables used in this paper and their definitions. Some of the variables are lagged by one year to avoid endogeneity concerns.

[Table 1 about here]

[7] From the definition of X, we obtain $dX/dR = -G/R^2$. Thus, as reported reductions R increase, the normalized difference X decreases.
[8] http://www.eia.doe.gov/oiaf/1605/frntvrgg.html
[9] Collecting financial and operational data for electric operating companies has become more difficult since the mid-1990s when the Energy Information Administration (EIA), the statistical agency of DOE, stopped organizing the raw data that electric operating companies report to FERC. More recently EPA has made publicly available an integrated database, eGRID, which provides emissions and generation data, but does not provide financial information.

We collected reported greenhouse gas emissions reductions for the program participants from the DOE's Voluntary Registry website. We calculated actual greenhouse gas emissions reductions for the participants and non-participants based on fuel consumption. We take this approach rather than using direct observations from the continuous emissions monitoring system (CEMS) for several reasons. First, there is no commercialized end-of-pipe technology to reduce carbon emissions for the electric power industry. What goes in comes out. Accordingly, as described in Table 1, by using data on how much carbon content each type of fuel has and how much each type of fuel was used, we can calculated actual carbon emissions. Second, the Natural Resources Defense Council (NRDC) reported that turbulent flow in the emissions stack could bias the CEMS estimates upward by 10-30 percent.[10] Third, NRDC also found cases where the CEMS data deviate from the emissions estimates from the Energy Information Administration (EIA) or the Federal Energy Regulatory Commission (FERC) when the latter two agreed for the most part. In these cases of discrepancies, NRDC used the FERC-based estimates. Fourth, this paper was able to obtain a more complete dataset using the fuel consumption data than would have been possible using the CEMS data alone. In cases where fuel consumption data were not available, this paper supplemented the fuel consumption-based estimates with adjusted CEMS estimates to increase the number of observations.

Dependent Variables

Program Participation as Symbolic Action. The dependent variable for the participation regressions is a dummy variable that indicates participation in the 1605(b) program. We use probit models to estimate the factors influencing firms' participation decisions.

[10] www.nrdc.org/air/energy/rbr/append.asp.

Exaggerated Emissions Reductions as Decoupling. To measure the extent of disclosure, we focus on the difference between reported and actual emissions reductions, normalized by the firm's level of reported reductions; that is, we focus on the extent of exaggeration by the firm. We define an Exaggeration Index by

$$X = \frac{R - A}{R}$$

where R is the reported level of reductions and A is the actual level of reductions. Compared to a simple measure of the gap between reported and actual emissions, which might be skewed by the presence of a few large firms, our measure is normalized by the size of the firm's emissions reductions. While we could have normalized by dividing through by actual emissions reductions, we chose to normalize by reported reductions because A can be negative if net emissions increased over time. Note that a firm may also understate its reductions, in which case the difference between reported and actual reductions is negative.

If the firm reports its full emissions footprint (i.e., by choosing to report on an entire entity basis) then the extent of exaggeration should be 0%. If the firm reports on a project basis, however, then matters are more complex. Suppose a firm reports reductions of 200 million tons, but the change in its emissions footprint is 100 million tons. Then the extent of exaggeration would be (200 – 100)/200, that is, 50% of its reported reductions are an exaggeration. On the other hand, if the firm reports reductions of 100 million tons but the change in its emissions footprint is actually 200 million tons, then the extent of exaggeration is (100 – 200)/100 = -100%, that is, it has understated its reductions by 100%.

This paper uses OLS models to test the hypotheses related to the extent of disclosure. We pool our dataset across years because the 1605(b) program does not require that the IOUs make any short- or long- term commitment. We use panel-corrected standard errors and t-

statistics for statistical inference. We lag independent variables by one year to avoid endogeneity issues.

As a robustness check, we also take into account the possibility that the extent of disclosure variable may be affected by a firm's endogenous decision about mode of participation in the program, that is, whether it reports on a project level or an entity level. Thus, we include a set of estimations of the extent of disclosure that use instrumental variables for participation mode. In these estimations, there is a first stage estimation of whether the firm reports at the project level or the entity level, and a second stage estimation of the extent of disclosure conditional on the firm's predicted participation mode. In selecting an instrumental variable, we observe that non-governmental organizations (NGOs) have been critical of the Voluntary Registry's credibility. Under this circumstance, following norms in their business networks may provide firms with protection against external criticism and thus lower the potential costs of symbolic management. Firms that mimic their peers are less likely to suffer public or financial sanctions because of the legitimacy that is often conferred when many players are engaged in the same practice (Bansal, 2005).

In the context of our paper, most large electric utilities are members of the Edison Electric Institute, an industry trade association, and members of one of the regional divisions of the North American Electric Reliability Council (NERC).[11] The primary goal of the NERC regional entities is to improve the reliability of the bulk power system, but they also share common goals with regard to the business environment, for example, proposed and actual

[11] The regions are the Florida Reliability Coordinating Council (FRCC), Midwest Reliability Organization (MRO), Northeast Power Coordinating Council (NPCC), Reliability First Corporation (RFC), SERC Reliability Corporation (SERC), Southwest Power Pool (SPP), Texas Reliability Entity (TRE), and Western Electricity Coordinating Council (WECC). We use the FRCC as the baseline group in our estimations.

changes in applicable laws and regulations including environmental and other issues.[12] Normative pressures for adopting business practices deemed to be legitimate may be transmitted through such professional organizations (DiMaggio and Powell, 1983). Under this circumstance, strategic choice may be important at the collective level, not at the level of single firm (Astley and Fombrun, 1983). Thus, we use the NERC region dummy variables to capture a tendency for firms in the same network to behave similarly towards environmental issues—more specifically, to use the same reporting modes in participating in the voluntary greenhouse gas registry.

In our two-stage estimations, our first stage uses linear probability models, and the second stage is estimated using OLS. The linear probability model has been justified from a rigorous theoretical perspective for some empirical settings (Heckman and Snyder 1997). Moreover, when dummy variables indicating group membership are important explanatory variables, as in our case, logit and probit models cannot estimate the effect of group membership if all members of some groups behave in the same way; linear probability models, however, can estimate group effects in such settings (Caudill 1988).

Independent Variables

Regulatory stringency. There is no federal mandate to reduce greenhouse gas emissions. For the electric power industry, the closest state-level regulatory restriction is Renewable Portfolio Standards (RPS). An RPS typically requires that a certain percentage of electric utilities' electricity generation come from renewable energy sources. We expect that an RPS will induce firms to shift toward less GHG-intensive generation. However, as discussed in the hypotheses development section, less stringent RPS can encourage firms to engage in selective disclosure of good news in the hope that positive news might preempt more stringent RPS. Regulatory

[12] NERC Business plans and budgets shared assumptions (http://www.nerc.com/filez/business_plan_2013.html)

stringency is calculated by dividing % goal stipulated in State Renewable Portfolio Standards by the difference between the goal year and the enacted or effective year, whichever comes first. State Renewable Portfolio Standards data are obtained from www.dsireusa.org.

Non-Aligned Stakeholders. We proxy for the presence of external stakeholders whose preferences are not aligned with the organization—what we will call "skeptical NGOs"—using the density of Sierra Club memberships in a given state. The Sierra Club is the largest and most influential grassroots environmental organization in the U.S. Its 1.4 million members work for a safe and healthy community and smart energy solutions to combat global warming among others.

This variable thus represents the strength of environmental groups in the state. Prior research has found that Sierra Club memberships have a significant impact on corporate voluntary environmental practice (Maxwell et al. 2000; Innes and Sam, 2008). In the context of the electric power industry, Sine and Lee (2009) find that Sierra Club membership had a significant effect on investment in renewables by independent power producers during the early years of renewable energy development. We further posit that Sierra Club members are appalled by corporate reputation building via symbolic management and penalize firms that pursue such practices. Indeed, some Sierra Club chapters run websites titled "Don't be duped by greenwashing."[13] Also, the Sierra Club, along with Greenpeace, recently attacked greenwash ads from the oil sands industry.[14]

[13] http://www.sangorgonio.sierraclub.org/mountains/greenwash.htm
[14] http://www.sierraclub.org/environmentallaw/tarsands/

CO_2 Emissions. Utilities with higher levels of carbon dioxide emissions had greater incentives to exaggerate their emissions reductions. We measure emissions in millions of tons of CO_2, based on fuel consumption data as explained in Table 1.

Growth in generation. Utilities with growing demand have several ways to reduce their carbon intensity, i.e., carbon emissions per unit of generation. For example, growing firms can increase their capacity factors, thereby making operations more efficient. Growing companies can also justify building new power plants, which during our sample period tended to be relatively low-emission gas-fired plants; adding new, clean capacity reduces a firm's overall carbon intensity. [15] The opportunity to reduce its carbon intensity, however, does not mean that a firm's carbon emissions will decline, because increased electricity generation will lead to increased emissions unless new and cleaner power plants replace old and dirty power plants. Accordingly, growing companies have several projects to pursue, but, holding everything else constant, their total carbon emissions are likely to increase over time. Growth in generation is calculated as growth at the utility level relative to year t-1.

Low-cost emissions reduction opportunities. Utilities with low-cost opportunities for emissions reductions are likely to pursue more projects. This paper includes several variables designed to capture the presence of low-cost opportunities. Firms with inefficient fossil fuel-burning plants that could benefit from a retrofit (proxied for by a high heat rate, or heat input per unit of electricity generated) may be able to lower emissions at low cost. Firms that are currently

[15] During most of our sample period, natural gas was the fuel of choice for new generating units because it was both clean and cheap. As of September 2002, the Energy Information Administration reported that the average wellhead price of natural gas remained below $3.00 per thousand cubic feet (MCF). Since that time, prices have risen sharply, with the price in December 2005 over $10 per MCF. Utilities now face much more difficult choices when they expand capacity than they did during our sample period.

operating at low capacity factors may be able to improve efficiency by better allocating generation across plants. Firms with hydro and nuclear plants may have low-cost opportunities to reduce emissions through uprating of power plants' capacity. Low-cost opportunities also include firms with high-cost oil-burning plants that could be displaced by cheaper and cleaner gas-fired generating units. We create a variable called "fuel switch saving" that measures the difference between the cost per kwh of the firm's most expensive fuel source and the cost per kwh of natural gas.

Control Variables

In addition to the foregoing variables, we include a set of control variables to reflect important dimensions of firm heterogeneity that may affect participation and the extent of disclosure. We control for firm size as measured by revenues, since larger companies are more visible, and hence likely to face greater pressure from a variety of stakeholders to take action. In addition, they may enjoy economies of scale in compliance, or have better access to capital markets and hence lower costs of new investments. We also control for the intensity of greenhouse gas emissions (CO_2 emissions divided by electricity generation), since it is possible that firms with relatively poor environmental performance compared to their peers may be more likely to face greater media scrutiny and pressure from external stakeholders. In addition, we control for voting records of congressional delegations in each state on environmental issues.

RESULTS

Table 2 provides summary statistics for the explanatory variables used in our analysis along the correlations between each of the variables.

[Table 2 about here]

Most correlations are relatively low. However, not surprisingly, there are significant positive correlations between operating revenues and CO_2 emissions and between House and Senate LCV scores. As shown in the result tables, using CO_2 emissions and CO_2 emissions intensity interchangeably does not change regression results significantly. Also, using the average of House and Senate LCV scores instead does not change the results qualitatively. Figure 1 shows the average firm-year reported and actual emissions reductions over the period 1995-2003 for participants in the 1605b program and actual emissions reductions for non-participants.

[Figure 1 about here]

There is a large gap between actual and reported reductions for participants in the 1605b program. They reported significant reductions in tons of greenhouse gases emitted while increasing their emissions. Ironically, firms that did not participate in the program actually reduced their emissions. The sharp disconnect between actual emissions and reported reductions suggests that on average 1605(b) participants took advantage of the program's loose reporting requirements, selectively reporting on successful projects while remaining silent about any actions that increased emissions. Indeed, environmental groups have decried the 1605(b) program because it "encourages firms to make filings not on their entire corporate emissions profile, but on cherry-picked emission reduction projects."[16]

The vast bulk of companies that participated in the 1605b program opt to report only at the project level (48%) or at both the project and the entity level (46%), with only 6% reporting at the entity level only. Selective disclosure is clearly an important mode of participating in the

[16] The quotes are taken from pages 3-4 of the comments on the 1605(b) program filed by a group of seven environmental groups led by the Natural Resources Defense Council on June 5, 2002, and available on the web at http://www.pi.energy.gov/enhancingGHGregistry/comments/documents/doniger.doc

1605(b) program. In our empirical analysis to follow, we focus on the firm's choice between reporting at the project level or at the entity level (either entity-only or both project- and entity-level). We turn now to examining the drivers of participation, participation mode, and the extent of disclosure.

Figure 2 shows the extent of decoupling for firms participating in the 1605b program.

[Figure 2 about here]

The mean of the distribution is 0.93% and the median is 5.59%. The majority of firm-year observations (230 of 338) involved over-reporting of greenhouse gas reductions, although the average percentage of exaggeration is small. Some firms engaged in much larger amounts of exaggeration, however, with the 75th percentile exaggerating by 21.38%. Surprisingly, some firms under-reported their greenhouse gas reductions, with the 25th percentile understating their reductions by 2.48%. Based solely on the economic motivation to pursue early reduction credits, it is impossible to understand why firms would ever under-report their greenhouse gas reductions. This behavior appears to be driven by firms' participation in common business networks, a phenomenon we explore further in the extent of decoupling section below. Although these under-reporters were not maximizing the benefits of early reduction credits, they were enjoying the greater legitimacy that may come with conformity to industry norms in their regional business networks.

Program Participation as Symbolic Action

Table 3 shows what factors motivate firms to participate in the 1605(b) program.

[Table 3 about here]

We find support for hypothesis 1 that the presence of stringent regulation played a role in influencing participation. Firms are less likely to participate in the voluntary greenhouse gas registry in states with an RPS. This is consistent with both the notion that firms may participate in 1605(b) in an attempt to preempt or delay the imposition of a state RPS, and the notion that firms might be less likely to receive early reduction credits if state law could be seen to have mandated some of their reported reductions. Since the RPS variable also captures the stringency of a state RPS, participation is also less likely the stronger is the RPS.

We also find that firms were less likely to participate in the program in states with strong Sierra Club membership, providing support for hypothesis 2. This finding suggests that environmental activists perceived 1605(b) participation as greenwash and attempted to penalize firms that participated. This finding also helps to explain why non-participants, who typically have declining emissions over time, elect not to join the program. Data on their aggregate emissions suggest that they are improving over time, so they have less need to use the 1605(b) program to prove their environmental credentials. At the same time, staying out of the program avoids the risk of being labeled a greenwasher.

Consistent with prior research, we find that firms with higher visibility (higher revenues or greater emissions) are more likely to participate in the voluntary greenhouse gas registry program. Highly visible firms are subject to greater external pressure, and hence have more incentive to burnish their reputations by participating in voluntary programs. Firms with higher emissions also have greater incentive to preempt or delay regulations that would restrict greenhouse gas emissions, although our data do not allow us to distinguish between these two motivations.

Exaggerated Emissions Reductions as Decoupling

Next we examine what drives the extent of decoupling between symbolic and substantive action. Table 4 shows regression results using OLS, and Table 5 shows regression results using NERC regions as instruments for participation mode. The results are qualitatively similar.

[Table 4 about here]

[Table 5 about here]

We find consistent support for hypothesis 3 that firms with higher CO_2 emissions are more likely to exaggerate their emission reductions. Even with year effects and carbon intensity included as controls, CO_2 emissions are significant at the 5% level in Table 4.

We also find strong support for hypothesis 4 that growing firms are likely to exhibit greater decoupling between reported and actual reductions, with the coefficient consistently significant at the 5% level in Table 4. Growing firms are likely to face more interactions with stakeholders in the regulatory arena, and to use lobbying---the provision of information, e.g. about their voluntary emissions reductions---as a method to deflect environmental regulatory pressures. They also are able to claim more early reductions credits through the use of selective disclosure, which obscures the fact that their overall carbon footprint is growing and emphasizes specific projects that reduced emissions.

We find limited support for hypothesis 5 that firms with low-cost emission reduction opportunities are likely to exhibit less decoupling between reported and actual reductions. Most variables we use to proxy for low-cost opportunities are not consistently significant across alternative models with the exception of the capacity factor variable. As expected, low (high) capacity factor is associated with a (smaller) larger Exaggeration Index. Firms with power plants operating at low capacity can increase their capacity factor, while more efficiently utilizing their

power plants. Contrary to our expectations, greater potential savings from fuel switching are positively associated with the Exaggeration Index in most cases. It appears that firms do not make much use of fuel switching to reduce greenhouse gas emissions. Thus, this variable may just capture the extent to which firms rely on more heavily polluting oil than cleaner natural gas as a fuel source.

Results from the two-stage estimations in Table 5 are qualitatively similar to those in Table 4. We note that in our first-stage estimations, our instrumental variables are significant, that is, firms in common business networks are indeed more likely to adopt similar reporting practices. The pressure to follow a normative practice in their business network apparently played a significant role, even going so far as to induce some firms to under-report their emissions reductions, a result inconsistent with the maximization of early reduction credits alone, but consistent with a desire to appear in conformity with regional business practices. Our second-stage estimations continue to suggest that firms with larger carbon footprints saw greater benefits from making exaggerated reports, in an effort to preempt or delay future regulations and to make larger claims for potential early reductions credits. Given the program's intentional flexibility, firms had reason to hope that the government might honor their reported reductions at face value. Nevertheless, stakeholders whose interests were not aligned with those of industry would be more skeptical of such difficult-to-verify claims, and might reject them all as unreliable, as the Sierra Club appears to have done.

Project or non-project level participation does not directly affect the extent of disclosure. This could be because of two factors. First, as discussed earlier, firms could choose the boundary of their entity when reporting their emissions at the entity level. For example, firms were allowed to report entity-level reductions just as the sum of project-level reductions. Second, firms tended

to choose their reporting mode based on what is considered a norm in their business network instead of making a strategic choice based, for example, on their emissions growth over time. Under the latter circumstances, the pressure to follow a normative practice might outweigh economic motivations to pursue early reduction credits, and it is possible that firms, especially shrinking ones, under report their emissions reductions.

DISCUSSION AND CONCLUSION

We have provided a close look at the mechanisms of symbolic management by providing an unusually sharp comparison of firms' symbolic actions (environmental disclosures) with their substantive actions (actual environmental performance). We reached two broad conclusions.

First, we show that decoupling between symbolic and substantive action is not a dichotomous choice, but rather a continuum. Most program participants exaggerate by a small percentage, with a much smaller group engaging in more significant decoupling. This strongly supports Pfeffer's (1981) contention that selective release of information is an important mechanism for the practice of symbolic management, although it has been ignored in most subsequent literature. Furthermore, we show that when close monitoring is prohibitively costly, e.g. when it comes to the detailed disclosures made by firms, growing firms and firms with large emissions are more likely to exaggerate their performance, in our context, emissions reductions.

Second, we extend the literature on symbolic management by showing that the costs of symbolic management matter. Potential external costs, i.e., that symbolic management via selective disclosure may be monitored and punished, discouraged firms from participating in the Voluntary Greenhouse Gas Registry Program. Technically, only those firms that exaggerate their environmental achievements should be thought of as engaging in the decoupling of symbolic

from substantive actions. Our results, however, suggest that skeptical external stakeholders may view participation in voluntary programs *per se* as indicative of symbolic management. Participation in a program is easy to monitor, whereas investigating the difference between symbolic and substantive actions is a very costly process, so it is not surprising that participation itself becomes an important symbolic action to which external stakeholders may object. In addition, the internal costs firms must incur to manage their greenhouse gas footprint also have significant effects on the extent of decoupling between reported and actual reductions. Firms with low-cost opportunities for emissions reductions engage in less exaggeration of their accomplishments. We also find that the practice of selective disclosure is influenced by the norms established by business networks of which firms are a part, conformity to which effectively lowers the external costs of symbolic actions. Similarly, we show that firms with more to gain from favorable regulatory treatment---in our case, firms with large or growing emissions---are more likely to participate in the voluntary reporting program, and to engage in greater exaggeration of their accomplishments. This indicates that greater potential net benefits of symbolic actions lead to greater decoupling.

Our findings also suggest how government, typically thought of as an enforcer of legal requirements upon organizations, might facilitate symbolic management by firms. When there is not a political majority to support legislation, governments often make use of voluntary programs instead. Such programs can achieve some improvements over the status quo without incurring significant costs either for government itself or for the participating firms. Governments may thus have incentives to adopt lax rules to encourage private sector participation and to demonstrate that their programs work. This in turn supports the notion that symbolic management practices may be facilitated by implicitly cooperative external stakeholders.

Interestingly, the Voluntary Reporting Program has been substantially revised since the period studied here. The comments filed by various interested parties in the revision process provide additional insight into when symbolic management can be successful. On April 15, 2002, the Department of Energy (DOE) issued a Notice of Inquiry requesting public comments on the 1605(b) program, with a goal to "enhance measurement accuracy, reliability and verifiability, working with and taking into account emerging domestic and international approaches."[17] Over one hundred sets of written comments were filed,[18] and six public workshops were held to discuss the program. After soliciting public comments, the DOE on April 21, 2006, published in the Federal Register the final revised General Guidelines governing the Voluntary Reporting of Greenhouse Gases (1605(b)).[19]

Perhaps the most significant change in the Voluntary Reporting Program is that the revised guidelines place greater emphasis on entity-wide reporting. Large emitters interested in not just "reporting" reductions, but also formally "registering" them must submit entity-wide emission inventories.[20] To the extent that "registered" reductions are more likely to be granted early reduction credits (ERCs), this change in reporting rules discourages companies from the selective reporting of good news.

Electric utility companies fought hard against requiring entity-wide inventories for registering reductions. The Edison Electric Institute (EEI), the trade association of investor-owned electric utility companies, argued that firms have many motives for participating, including (p. 7) "the recordation of transferable credit, baseline protection and credit for past

[17] U.S. Department of Energy, "Voluntary Reporting of Greenhouse Gas Emissions, Reductions, and Carbon Sequestration," Federal Register: May 6, 2002 (Volume 67, Number 87), pp. 30370-30373.
[18] The comments can be found at http://www.pi.energy.gov/enhancingGHGregistry/commentsspring2002.html.
[19] The revised General Guidelines referenced Technical Guidelines dated March 2006 that were made available on the internet.
[20] DOE, Guidelines for Voluntary Greenhouse Gas Reporting, General Guidelines Finalized 04/21/06.

actions" and "public relations material and releases and annual reports." The bulk of the EEI comments were oriented towards transferable credits, though, and EEI reluctantly admitted that (p. 7) "If the purpose is to obtain transferable credits…the reporting under the revised guidelines may need to be more rigorous in the criteria to be applied…" Even then, however, it maintained that (p. 7) "these criteria should not, and need not, be dependent on entity-wide reporting."

The EEI gives a hypothetical example (pp. 4-5) that crystallizes its views. It posits a predominantly nuclear-fueled utility whose sales grow over a decade from 32.6 terawatthours (TWH) to 35.7 TWH, and whose carbon emissions increase from 12.3 to 13.6 million tons. The utility meets the new demand with natural gas, and undertakes two other "projects": a decrease in the heat rate of a coal plant, and a demand-side management program to reduce peak demand; its overall carbon intensity is unchanged. The firm's aggregate GHG emissions have risen by about 10%, however. The EEI complains that "Under an approach where transferable credits could only be earned for absolute reductions in entity-wide emissions, this utility would receive no credits…However, in examining this utility's actions more closely, one sees that it provided real emissions reductions. As a result, it would need to be able to report at a project level in order to receive credit for the two actions that do make such contributions."

The EEI example perfectly mirrors our empirical results. The firm faces increasing demand, and increases its aggregate carbon emissions over time. Nevertheless, it wants to obtain early reduction credits, so it participates in 1605(b) in order to highlight two individual projects, while electing not to report on the 1.3 million ton increase in its overall GHG emissions.

In opposition to EEI, the Natural Resources Defense Council (NRDC), an environmental NGO, condemned project-level reporting, arguing that it is unnecessary if companies are required to disclose changes in their overall carbon footprint:

> "While companies report their entity-wide emissions, there is no reason to continue providing for a separate registry on a project basis, since any legitimate project-based activity is automatically incorporated in company-wide totals and will show up as part of the firm's changes in total emissions from year to year." (NRDC, p.4)[3]

After considering both points of view, DOE voiced a similar rationale for why it finally decided to require entity-wide registration under the revised guidelines:

> "…Because most large companies and institutions regularly take actions that have as one of their effects the reduction of greenhouse gas emissions, there are always many candidates for project-based emission reductions. But the net effect of such project-based reductions on an entity's total emissions is often questioned, because large entities may be taking actions that reduce emissions, while simultaneously taking other actions that increase emissions. Furthermore, it is impossible to evaluate the significance of a particular entity's actions to reduce emissions unless the total emissions of that entity are known." (DOE, p.19)[21]

In the end, the utilities lost in their bid to retain the extraordinary flexibility of the original reporting system. The resolution to this heated debate---entity-wide reporting for registering reductions---makes it much more difficult for 1605(b) participants to obtain early reduction credits while increasing their overall GHG emissions. It also reinforces the argument that the 1605(b) program, as originally created, served as a vehicle for corporate greenwash.

Overall, the findings of this paper illustrate potential opportunities in the domain of environmental policy for research on symbolic management. Decoupling tendencies can be manifested in various dimensions of firms' activities. Among them, environmental sustainability provides one of the best possible settings in which to further examine the issue. Growing concerns over environmental pollution put increasing institutional pressure on firms to take action (Bansal and Roth, 2000). As institutional theory predicts, many firms respond to institutional pressure by, for example, voluntarily reducing emissions or producing green goods designed for minimum environmental impact. As discussed in the paper, these seemingly

[21] DOE, Guidelines for Voluntary Greenhouse Gas Reporting, General Guidelines Finalized 04/21/06.

righteous actions are often criticized as greenwashing, and we find evidence in support of this claim. Corporate environmental practice then indeed presents an excellent setting to study and to contribute to the broader literature on symbolic management.

The findings of this study suggest some avenues for future research. First, the extraordinary flexibility of the Voluntary Reporting program allowed us to identify the extent of exaggeration in firms' reports, but it also somewhat limited our ability to identify precisely the mechanisms used to achieve exaggeration. Selective disclosure can certainly lead to exaggeration but so can other means such as manipulation of estimated reductions. Future work using data that can distinguish these mechanisms would be valuable for increasing our understanding of the usage of selective disclosure as a symbolic management tool. Second, our study shows that the extent to which various external stakeholders have incentives that align with those of the firm clearly influences the external costs of symbolic action. This finding suggests that paying greater attention to the boundary conditions in the firm's environment that facilitate symbolic management can help us better understand the motivations and consequences of symbolic action and decoupling. Third, our findings suggest that there may be internal signaling costs associated with symbolic management. We identified one such cost, i.e., tangible economic costs, such as the costs of abating greenhouse gas emissions. Future work may identify other types of costs, for example, more intangible costs of symbolic management arising from within organizations.

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Table 1. Explanatory variables and their definitions

Variables (proxy for)	Definition (unit of measurement)
CO_2 emissions	Total carbon dioxide (CO_2) emissions (10^9 lbs). This is calculated based on fuel consumption data. First, total carbon input is calculated using carbon coefficients 25.97 for Coal, 14.47 for Natural Gas, 17.51 for Refinery Gas, 19.95 for Distillate fuel (Oil-L), 21.49 for Residual fuel (Oil-H) and 27.85 for Petroleum Coke (The units for carbon coefficients are Million Metric Tons per Quadrillion Btu).* These estimates are then converted to CO_2 emissions by multiplying by 3.7, the molecular weight of CO_2 relative to carbon. When carbon input data is missing but Platts' emission data are non-missing, Platts' emission data are used instead.**
CO_2 emissions intensity	CO_2 emissions per net generation (lbs/MWh). Net generation (MWh) is defined as the amount of gross generation less the electrical energy consumed at generating stations.
Sierra Club membership per thousand population	Number of members of Sierra Club per thousand population at the state level in 2000.
Electric operating revenue	Revenue from sales of electricity (10^9 \$).
Heatrate	The ratio of heat input to net energy generated (Btu/kWh).
Capacity factor	The ratio of energy generated to the maximum that could have been generated. It is calculated by dividing net generation (MWh) by (nameplate capacity (MW)×8760(hours)).
Fraction of hydro and nuclear	The ratio of energy generated from hydro and nuclear units to total energy generated.
LCV scores	The League of Conservation Voters (LCV)'s scorecards for U.S. Senate and House.
RPS index	State Renewable Portfolio Standard index. It is calculated by dividing % goal by the difference between the goal year and the enacted or effective year, whichever comes first.***
Fuel switch saving	Low cost and low carbon fuel switching opportunity (10^6 \$). Estimated for the month with the highest generation for the year, this is calculated by ordering generators from lowest to highest cost, and multiplying the amount of oil-based generation times the difference in fuel costs between oil and natural gas if oil-based and natural gas-based generation are adjacent in the dispatch order and the cost of natural gas is lower.
Growth in generation (t-1)	Percentage growth relative to year t-1

* *Documentation for Emissions of Greenhouse Gases in the U.S. 2003*, EIA (2005), p. 189.

** An adjustment factor is calculated to convert Platts' CO_2 emissions data to fuel-based CO_2 estimates. The fuel-based estimates are regressed on Platts' reported emissions data and the inverse of the coefficient, 0.7527, is used as an adjustment factor. This aligns well with NRDC's report that continuous emissions monitoring data could be biased upward by 10-30 percent relative to fuel-based estimates. www.nrdc.org/air/energy/rbr/append.asp.

*** State Renewable Portfolio Standards data are obtained from www.dsireusa.org.

**** *Voluntary reporting of Greenhouse Gases 2003*, EIA (2005), p. 4.

Table 2. Variable Correlations

	Variable	Mean	Std. Dev.	1	2	3	4	5	6	7	8	9	10	11
1	CO_2 Emissions	15.78	16.87											
2	CO_2 Intensity	1.1	0.82	0.296										
3	Sierra Club Density	0.74	0.42	-0.097	0.004									
4	Electric Operating Revenue	1.28	1.53	0.508	-0.109	-0.145								
5	Heatrate	9.22	3.08	0.283	0.307	-0.201	0.085							
6	Capacity factor	0.51	0.15	0.121	-0.142	-0.112	0.054	0.211						
7	Fraction of hydro & nuke	0.22	0.37	-0.299	-0.445	0.191	0.135	-0.407	-0.204					
8	LCV score: Senate	40.17	31.5	-0.129	-0.052	0.177	0.114	-0.002	-0.061	0.127				
9	LCV score: House	40.83	20.8	-0.071	0.003	0.225	0.097	-0.078	-0.038	0.143	0.682			
10	RPS index	0.08	0.26	-0.001	0.067	-0.181	0.145	0.07	-0.007	-0.049	0.087	0.142		
11	Fuel Switch Saving	0.02	0.08	0.11	0.006	-0.019	0.167	0.034	-0.01	-0.005	0.051	0.026	0.125	
12	Growth in generation (t-1)	0.05	0.96	-0.038	-0.065	0.083	-0.048	0.018	0.063	0.07	0.014	0.019	-0.021	-0.006

(1) CO_2 emissions (2) CO_2 emissions intensity (3) Sierra Club membership per thousand population (4) Electric operating revenue (5) Heatrate (6) Capacity factor (7) Fraction of Hydro and Nuclear (8) LCV scores: Senate (9) LCV scores: House (10) RPS index (11) Fuel switch saving (12) Growth in net generation (t-1)

Table 3. Participation

VARIABLES	Participation in the 1605b program (probit)					
	(1)	(2)	(3)	(4)	(5)	(6)
CO_2 Emissions	0.0282*		0.0199	0.0285*		0.0207
	(0.0167)		(0.0179)	(0.0166)		(0.0177)
CO_2 Emissions Intensity		0.322**	0.207		0.314**	0.197
		(0.00016)	(0.00017)		(0.00016)	(0.00017)
Sierra Club Density	-1.010*	-1.103**	-1.068**	-0.999*	-1.087**	-1.054**
	(0.518)	(0.517)	(0.521)	(0.511)	(0.511)	(0.515)
Electric Operating Revenue	0.789***	1.080***	0.888***	0.773***	1.062***	0.863***
	(0.282)	(0.212)	(0.299)	(0.28)	(0.213)	(0.297)
Heatrate	-4.91e-02	-6.22e-02	-5.56e-02	-4.68e-02	-5.87e-02	-5.23e-02
	(4.57e-02)	(4.88e-02)	(4.63e-02)	(4.46e-02)	(4.80e-02)	(4.54e-02)
Capacity factor	-0.841	-0.402	-0.551	-0.824	-0.408	-0.556
	(0.914)	(0.86)	(0.879)	(0.902)	(0.848)	(0.864)
Fraction of hydro & nuclear	0.26	0.236	0.383	0.283	0.251	0.405
	(0.519)	(0.548)	(0.551)	(0.514)	(0.543)	(0.547)
LCV score: Senate	0.00387	0.00341	0.0041	0.00347	0.00288	0.00367
	(0.00505)	(0.00516)	(0.00506)	(0.00496)	(0.00505)	(0.00497)
LCV score: House	0.00992	0.00854	0.00885	0.0102	0.00903	0.00925
	(0.00877)	(0.0083)	(0.00873)	(0.00868)	(0.00819)	(0.00864)
RPS index	-0.978**	-1.038**	-1.022**	-0.992**	-1.062***	-1.042***
	(0.417)	(0.436)	(0.425)	(0.388)	(0.407)	(0.396)
Fuel Switch Saving	0.854	1.129	0.939	0.717	0.967	0.779
	(0.831)	(0.835)	(0.831)	(0.835)	(0.858)	(0.839)
Growth in net generation (t-1)	-0.00425	0.0114	0.00295	-0.00286	0.0138	0.00461
	(0.0412)	(0.0412)	(0.041)	(0.0404)	(0.0406)	(0.0403)
Year effect	No	No	No	Yes	Yes	Yes
Constant	-0.2	-0.694	-0.422	-0.211	-0.41	-0.453
	(0.747)	(0.858)	(0.817)	(0.731)	(0.817)	(0.804)
Observations	837	837	837	837	837	837
Pseudo R^2	0.3267	0.3247	0.3320	0.3240	0.3208	0.3289

Standard errors clustered at the firm level in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Table 4. Extent of disclosure

	Exaggeration Index: (reported reduction - actual reduction) / reported reduction (OLS)					
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
CO_2 Emissions	0.707**		0.644**	0.703*		0.651**
	(0.347)		(0.305)	(0.353)		(0.311)
CO_2 Emissions Intensity		11.20	8.31		9.87	6.70
		(11.1)	(10.6)		(11.3)	(10.9)
Sierra Club Density	-19.08	-8.419	-18.18	-17.13	-6.12	-16.14
	(21.28)	(18.76)	(20.96)	(22.27)	(19.44)	(21.72)
Heatrate	6.62	6.11	6.32	6.37	5.85	6.09
	(5.61)	(5.57)	(5.37)	(5.98)	(5.86)	(5.68)
Capacity factor	87.22**	118.1**	104.9*	82.38**	112.0*	97.60*
	(41.62)	(57.5)	(52.18)	(40.65)	(58.48)	(52.72)
Fraction of hydro & nuclear	68.93*	61.76	75.19*	69.45*	60.45	74.03*
	(34.54)	(36.81)	(39.25)	(36.07)	(37.77)	(40.35)
LCV score: Senate	-0.0677	-0.123	-0.084	-0.0605	-0.113	-0.0743
	(0.132)	(0.141)	(0.132)	(0.132)	(0.141)	(0.134)
LCV score: House	1.039	0.877	1.036	0.982	0.809	0.974
	(0.757)	(0.716)	(0.748)	(0.805)	(0.755)	(0.79)
RPS index	-10.71	-14.24	-12.39	-8.01	-10.72	-8.926
	(9.256)	(9.704)	(9.409)	(10.51)	(11.02)	(10.77)
Fuel Switch Saving	40.93*	43.66	41.16*	43.00*	43.94*	42.64*
	(22.86)	(27.72)	(23.59)	(21.47)	(25.92)	(22.21)
Electric Operating Revenue	-6.361**	-1.455	-5.391**	-6.509**	-1.587	-5.646**
	(2.975)	(2.37)	(2.497)	(3.168)	(2.486)	(2.697)
Growth in net generation (t-1)	70.72**	77.86**	74.93**	68.81**	74.12**	71.67**
	(29.63)	(32.42)	(32.1)	(30.1)	(32.17)	(32.06)
Project-level participation	2.124	-2.194	2.158	2.035	-2.347	2.014
	(12.17)	(13.05)	(12.31)	(12.09)	(13.07)	(12.26)
Year effect	No	No	No	Yes	Yes	Yes
Constant	-153.4	-166.4	-171.3	-140.9	-154.2	-159.1
	(93.76)	(111.9)	(109.7)	(96.78)	(117.4)	(115.2)
Observations	338	338	338	338	338	338
R-squared	0.177	0.161	0.183	0.192	0.174	0.196

Standard errors clustered at the firm level in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Table 5. Extent of disclosure (1st stage: project or non-project, 2nd stage: extent of disclosure)

VARIABLES	2nd stage	1st stage	2nd stage	1st stage	2nd stage	1st stage
	(1)		(2)		(3)	
CO_2 Emissions	0.721*	-0.0113***			0.658*	-0.0109***
	(0.392)	(0.00334)			(0.342)	(0.00329)
CO_2 Emissions Intensity			9.62	-9.67e-02	6.69	-4.66e-02
			(10.8)	(9.36e-02)	(10.4)	(8.45e-02)
Sierra Club Density	-17.23	0.161	-6.675	-0.149	-16.18	0.14
	(21.32)	(0.358)	(19.97)	(0.366)	(20.81)	(0.362)
Heatrate	6.61	-6.70e-02	5.13	-6.83e-02	6.18	-6.31e-02
	(6.53)	(5.12e-02)	(5.87)	(5.43e-02)	(6.11)	(5.20e-02)
Capacity factor	80.89**	0.858**	115.3**	0.436	97.01*	0.737
	(41.09)	(0.423)	(57.7)	(0.469)	(51.78)	(0.464)
Fraction of hydro & nuclear	70.74*	-0.402	57.69	-0.31	74.53*	-0.429
	(38.3)	(0.277)	(36.09)	(0.336)	(41.47)	(0.282)
LCV score: Senate	-0.0612	0.000343	-0.107	0.00037	-0.0745	0.000386
	(0.125)	(0.00203)	(0.139)	(0.00208)	(0.128)	(0.00199)
LCV score: House	0.995	-0.00326	0.782	0.000917	0.979	-0.00274
	(0.8)	(0.00759)	(0.711)	(0.00767)	(0.775)	(0.00772)
RPS index	-8.467	0.14	-9.178	0.204*	-9.104	0.145
	(9.919)	(0.098)	(10.61)	(0.115)	(10.44)	(0.0979)
Fuel Switch Saving	42.41**	0.119	45.61*	0.132	42.41**	0.122
	(20.71)	(0.28)	(25.94)	(0.315)	(21.55)	(0.283)
Electric Operating Revenue	-6.527**	0.0571	-1.876	-0.0308	-5.653**	0.0501
	(3.071)	(0.0423)	(2.441)	(0.0393)	(2.601)	(0.0419)
Growth in net generation (t-1)	68.92**	-0.0915	73.58**	-0.116	71.72**	-0.117
	(29.22)	(0.0953)	(30.04)	(0.115)	(30.89)	(0.105)
Project-level participation	4.478		-9.401		2.968	
	(18.33)		(22.2)		(19.07)	
NERC: WECC		0.108		0.321		0.12
		(0.24)		(0.247)		(0.253)
NERC: MRO		0.640*		0.698*		0.637
		(0.38)		(0.354)		(0.385)
NERC: NPCC		-0.0327		-0.0231		-0.0732
		(0.325)		(0.36)		(0.347)
NERC: RFC		0.568***		0.580***		0.580**
		(0.21)		(0.187)		(0.223)
NERC: SERC		0.484**		0.443**		0.489**
		(0.225)		(0.202)		(0.233)
NERC: SPP		0.611**		0.695**		0.621**
		(0.269)		(0.266)		(0.283)
NERC: TRE		0.697**		0.591**		0.690**
		(0.28)		(0.288)		(0.291)
Year effect	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-149.2	0.427	-143.2	0.68	-160.6	0.543
	(101.7)	(0.625)	(113.0)	(0.685)	(118.6)	(0.641)
Observations	338	338	338	338	338	338
R-squared	0.192	0.299	0.171	0.225	0.196	0.301

Standard errors clustered at the firm level in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Figure 1. Average firm-year reductions (Thousand Tons CO_2 equivalent)

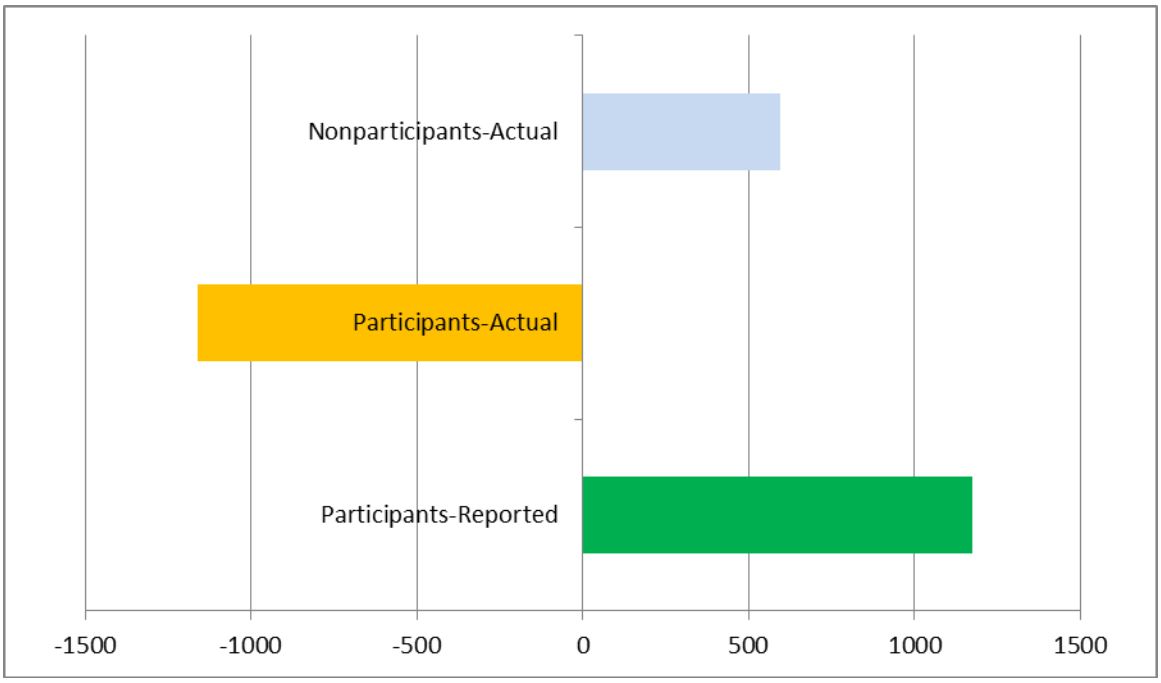

Figure 2. The Extent of Decoupling by Program Participants