

Sponsorship Matters: Assessing Business Participation in Government- and Industry-Sponsored Voluntary Environmental Programs

Nicole Darnall

George Mason University

Matthew Potoski

Iowa State University

Aseem Prakash

University of Washington, Seattle

ABSTRACT

Stakeholders who seek to reward or punish businesses for their environmental programs often cannot observe these organizations' internal policies and operations. To address these informational problems, and signal their beyond-compliance environmental commitments, some businesses are participating in voluntary environmental programs (VEPs). This article examines whether business managers associate the brand value of VEPs—due to their differing program sponsors—with the perceived preferences of their critical stakeholders. Drawing on a novel data set of nearly 300 organizations, we assess business' participation in 19 government- and industry-sponsored VEPs. We find that managers who recognize the importance of stakeholder influences on their business' environmental practices are more likely to participate in a VEP but that pressures from different stakeholders are associated with variations in organizations' participation in either government- or industry-sponsored VEPs.

INTRODUCTION

A central challenge for environmental governance is inducing organizations to incur private costs to produce positive environmental externalities, such as reducing the environmental impact of their activities. Command and control regulations are predicated on the belief that without state coercion, business organizations are not likely to voluntarily provide such non-excludable societal benefits. Although these traditional regulations have

This research was part of a larger study entitled *Environmental Policy Tools and Firm-Level Management and Practices: An International Survey*. The authors thank Nick Johnstone of the Organisation for Economic Co-operation and Development Environmental Directorate (OECD) and Alexei Pavlichev of North Carolina State University for their contributions to this larger study. Address correspondence to the author at ndarnall@gmu.edu.

doi:10.1093/jopart/mup014

Advance Access publication on July 20, 2009

© The Author 2009. Published by Oxford University Press on behalf of the Journal of Public Administration Research and Theory, Inc. All rights reserved. For permissions, please e-mail: journals.permissions@oxfordjournals.org

led to profound environmental benefits, they have been criticized for being inefficient, enforcement intensive, and less effective at combating the new generation of environmental problems (Fiorino 1999; Prakash and Potoski 2006). As complements to command and control regulations, a slew of new policy instruments, including voluntary environmental programs (VEPs), have been designed to induce organizations to voluntarily adopt progressive environmental policies.

VEPs can be conceptualized as programs, codes, agreements, and commitments that encourage private businesses to voluntarily reduce their environmental impacts *beyond* the requirements established by the environmental regulatory system (Carmin, Darnall, and Mil-Homens 2003). In return for incurring private costs for adopting such beyond-compliance policies, organizations can receive benefits such as goodwill from the external stakeholders, enhanced reputation, and improved external relations. The United States has more than 200 VEPs sponsored by government agencies, industry associations, and other entities (Carmin, Darnall, and Mil-Homens 2003). With so many VEPs, business managers may be anticipating their stakeholders' preferences in determining how joining a program can signal their business' superior environmental commitment.

In evaluating VEPs and their societal value, previous research typically has focused on assessing the requirements these programs impose on members (Darnall and Carmin 2005; Delmas and Keller 2005; Prakash and Potoski 2006). For instance, a VEP may require costly pollution prevention activities or environmental management systems that lead members to substantially improve their environmental performance.¹ VEPs may also submit members to strong monitoring and sanctioning regimes to dissuade members from shirking their program obligations. Instead of focusing on variations in program design as indicators of VEP credibility, this article examines how program sponsorship and stakeholder salience influence organizations' incentives to participate in VEPs sponsored by government agencies or industry associations.

We argue that managers who perceive that they are under pressure from stakeholders to improve their environmental practices are more likely to participate in a VEP to signal their commitment to proactive environmental management. Firms that chose to participate in government-sponsored (as opposed to industry-sponsored) VEPs do so to address perceived pressures from key stakeholders. For instance, some managers may believe that participation in an industry-sponsored VEP may be viewed by environmental and community stakeholders as creating a false appearance that the business is improving its environmental programs. These managers might also believe that participation in government-sponsored VEPs is more likely to address environmental and community stakeholder concerns since these programs include more stakeholders during their program design (Carmin, Darnall, and Mil-Homens 2003), and may be less prone to industry capture (Ayres and Braithwaite 1992).

However, variations in how managers perceive program sponsors may be unjustified since previous research shows that government- and industry-sponsored programs tend to have similar environmental, administrative, and conformance requirements (Darnall and Carmin 2005). Yet, to the extent that sponsorship shapes managers' anticipation of

¹ In some instances, government regulators are using environmental management systems (EMS) as a means to negotiate consent degrees. However, the vast majority of EMS are adopted in the absence of government coercion. Moreover, companies that are required to adopt an EMS as a consequence of an enforcement action generally are not required to do so within the purview of a VEP.

stakeholders' VEP preferences, it may also influence their decisions to join either government- or industry-sponsored VEPs.

Our theoretical perspective on VEPs is grounded in Buchanan's (1965) economic theory of clubs, and extended by Prakash and Potoski (2006). As "green clubs" VEPs establish rules for organizations' environmental programs and lead to the production of positive environmental externalities. In return, club members receive excludable and non-rivalrous (club) benefits, such as affiliation with the club's positive "brand name." In the case of VEPs, the excludable benefit is affiliation with the program's brand-like reputation that signals members' progressive environmental action, which, if credible, earns goodwill from external stakeholders. These benefits are excludable because organizations not participating in the program can be denied the goodwill and the reputational benefits derived from associating with the program. For example, corporate buyers can insist that they will only purchase products from organizations that participate in a specific VEP. By relying on incentives, successful clubs can induce members to voluntarily undertake progressive environmental action beyond what they would have achieved unilaterally, and beyond the legal requirements. Business organizations participate in VEPs because the costs of joining the club and adhering to its standards can be offset by the tangible or intangible benefits they accrue via the clubs' positive brand reputation.

Our article offers two contributions to the environmental governance literature. First, we highlight the importance of government and industry sponsorship in shaping VEP reputation among managers and the extent to which managers believe these programs can address environmental concerns of key stakeholders. Organizations that join government-sponsored programs may do so for different reasons than companies that join industry-sponsored programs, despite considerable commonality across these programs' features. If so, incentives to join a given VEP are dependent on how organizations relate to different stakeholders, and how their managers anticipate stakeholders' preferences about government- and industry-sponsored programs. Second, although previous empirical research has examined organizations' motivations to participate in VEPs (Arora and Cason 1996; Coglianese and Nash 2001; Darnall 2006; Potoski and Prakash 2005), these studies generally have considered the motivations to participate in a single program. This study takes a significant and much needed step in evaluating stakeholder influences across 19 VEPs. In so doing, we offer broader generalizations regarding how managers perceive stakeholder pressures for environmental consideration, and the extent to which sponsorship is related to organizations' VEP participation decisions.

STAKEHOLDERS AND VEPs

Organizations participate in VEPs for a variety of reasons, such as addressing stakeholder concerns and obtaining goodwill and standing with critical stakeholders. Stakeholders can be defined as "any group or individual who can affect or is affected by the achievement of an organization's objectives" (Freeman 1984, 46). Stakeholder theory asks which individuals and groups deserve attention from management and which do not (Mitchell, Agle, and Wood 1997). Managers think about stakeholders based on their perceptions (Donaldson and Preston 1995) and therefore serve as a critical interpreter of stakeholder influence (Fineman and Clarke 1996). After assessing which stakeholders are salient (Mitchell, Agle, and Wood 1997), managerial perceptions of stakeholders establish how an organization's strategy will be influenced (Donaldson and Preston 1995; Fineman and Clarke 1996). We

contend that managerial perceptions of stakeholder pressure for improved environmental practices is related to their organization's decision to participate in VEPs in general, in addition to specific types of VEPs.

Stakeholders can be classified into two groups—primary and secondary stakeholders (Donaldson and Preston 1995; Freeman 1984). In general, primary stakeholders have a direct economic stake in the organization (Donaldson and Preston 1995). They include external actors such as market participants that have an immediate impact on the organization's bottom line (e.g., shareholders) and value chain participants—from commercial buyers and suppliers to household consumers (Freeman 1984). Primary stakeholders also include internal stakeholders employed by the organization (Freeman 1984). By contrast, secondary stakeholders, are not involved directly in the organization's economic transactions, and do not have control over critical organizational resources (Mitchell, Agle, and Wood 1997; Sharma and Henriques 2005). However, they do have an indirect economic stake in the organization in that secondary stakeholders have the capacity to mobilize public opinion in favor of, or in opposition to, the organization's business performance (Freeman 1984). Secondary stakeholders are external to the organization and include environmental and community stakeholders and regulatory stakeholders (Henriques and Sadowsky 1999; Waddock and Graves 1997).

Most stakeholders, especially those external to the organization, have difficulty assessing organizations' environmental programs and activities. If external stakeholders wish to reward or punish organizations for their environmental behaviors, they need a low-transaction cost tool to differentiate environmental leaders from laggards. In a broad sense, by "branding" their participants, VEPs reduce external stakeholders' transaction costs of distinguishing environmental leaders (members) from non-leaders (nonmembers). External stakeholders can, in principle, reward participants' environmental stewardship and focus their retribution (punishments) toward environmental malfeasance on nonparticipating organizations. Such rewards and punishments may take various forms—from increased sales because products were produced in an environmentally progressive way to negative publicity from a community group protest of a business' environmental practices sections. The key conceptual point is that VEPs' excludable benefits are the rewards participants receive because membership in a VEP credibly signals organizations' progressive environmental action.

SPONSORSHIP AND VEP BRANDS

The institutional design of VEPs in terms of the environmental obligations they impose on participants can influence the VEP's brand reputation (Prakash and Potoski 2006). However, the program's sponsor may also have an important bearing on the VEP's reputation. A VEP sponsor is the entity that finances and administers the program (Carmin, Darnall, and Mil-Homens 2003). The most prevalent types of VEPs are financed and administered by either government agencies or industry associations (Carmin, Darnall, and Mil-Homens 2003). Managers may infer (correctly or incorrectly) that programs sponsored by one entity may attend to their stakeholders' concerns better than others.

Variations in the way managers view VEPs may be due to their perceptions that external stakeholders may regard government agencies and industry associations as having differing objectives in sponsoring their VEPs. For instance, some managers might believe that their stakeholders regard government-sponsored programs as mechanisms to reduce

the costs of monitoring and enforcing environmental regulations, whereas industry-sponsored VEPs may be regarded as mechanisms to enhance the environmental reputation of the businesses within an industry sector. Since government-sponsored VEPs tend to be designed with greater input from diverse stakeholders than industry-sponsored VEPs (Carmin, Darnall, and Mil-Homens 2003), managers may anticipate that their important stakeholders would perceive that government-sponsored programs will more strictly enforce their participation requirements. If so, then managers might believe that their external stakeholders would regard VEP sponsorship as a signal of the program's stringency, and the way in which its obligations are monitored and enforced. Thus, for managers wanting to convey their organization's commitment to superior environmental policies, VEP sponsorship may become an important variable shaping their organization's participation decisions.

One might argue that sponsorship is important because it is systematically associated with program design. However, as recent work suggests, government- and industry-sponsored VEPs tend to have similar designs and impose broadly comparable obligations on their participants. In their assessment of the environmental, administrative, and conformance requirements of 61 US-based VEPs, Darnall and Carmin (2005) show that there is little distinction among government- and industry-sponsored VEPs. With respect to VEPs' environmental requirements, three general categories of environmental requirements were identified for improving environmental performance through pollution reductions. The first category consisted of value and goal statements. Such statements require that participants express a basic level of commitment to environmental protection. The second environmental performance category takes into account whether a VEP required that participants create environmental plans or targets for pollution prevention/waste reduction/waste reuse. The third category considers whether a VEP required the implementation of a management system. The study also examined VEPs' administrative and conformance requirements since a program's environmental requirements need to be supported by these design features to ensure that environmental goals are met and achieved over time. Administrative requirements include whether VEP sponsors require participants to submit various forms of written agreements, such as memoranda of understanding and membership pledges. Conformance requirements include monitoring of VEP participants, and consist of self-monitoring (that sometimes requires participants to submit a progress report to program sponsors), sponsor monitoring, or independent third-party monitoring. Other conformance requirements involve sanctions that are imposed on non-conforming participants. VEP sanctions include notices of non-conformance plans that non-conforming organizations must submit to achieve VEP goals, evidence of actions bringing non-conforming organizations within program guidelines, or removal of non-conforming companies from the VEP.

Across all VEP design requirements, Darnall and Carmin (2005) found no statistically significant evidence that VEP design features differ by program sponsor.² Although variations existed in how VEPs are designed more generally—some do not ask participants to undergo third-party monitoring, whereas other VEPs do, or some VEPs require

² For instance, 58% of government-sponsored VEPs and 67% of industry-sponsored VEPs required that participants establish specific environmental targets, and 68% of government-sponsored VEPs and 67% of industry-sponsored VEPs required monitoring of environmental goals. Similarly, 44% of government- and industry-sponsored VEPs imposed sanctions on non-conforming participants.

participants to adopt an environmental management system, whereas others do not—there was no significant statistical variation among program sponsors and their use of these design features over others. These similarities exist even though government-sponsored VEPs tend to be cross-sector focused³ (to attract the largest number of participants possible) and industry-sponsored VEPs tend to be sector based.⁴

VEP SPONSORSHIP AND STAKEHOLDER PRESSURES

The previous discussion suggests that organizations' decisions to join VEPs may vary systematically across different types of program sponsors because of differing managers' perceptions about stakeholder concerns, even if these programs are designed similarly. Stakeholder theory suggests that secondary and primary stakeholders would influence organizations' VEP participation decisions. We focus on three types of secondary stakeholders—environmental and community stakeholders, regulatory stakeholders, and industry stakeholders and their relationship with organizations' VEP participation. In addition, we consider how primary stakeholders—value chain stakeholders and management stakeholders—are related to organizations' decisions to participate in government- and industry-sponsored VEPs. Our empirical expectations about these relationships are described in the following.

Environmental and Community Stakeholders

Environmental and community stakeholders can create public support in favor of or against an organization's environmental activities (Clair, Milliman, and Mitroff 1995; Turcotte 1995). Environmental stakeholders consist of individuals participating in formalized organizations or groups with the primary focus of protecting the natural environment. These groups exist at the local, state, or national or international level and include organizations such as Greenpeace and the Sierra Club. By contrast, community stakeholders may or may not participate in formalized organizations. They typically consist of individuals focused on improving community conditions generally at the local level, which include environmental issue sections. In some instances, environmental and community stakeholders have launched public protests against organizations that fail to yield to their concerns (Hoffman 2000). In other instances, environmental and community stakeholders have publicized

3 Government-sponsored strategic alliances, such as EPA's Sector Strategies Program, are more sector based. This program creates ad hoc partnerships with essential stakeholders, including business leaders in each sector, state and local officials, and others. Through informal dialogue, stakeholder teams design tailored strategies to improve environmental performance and reduce regulatory burdens (USEPA 2008). Although useful as policy tools, alliances of this sort differ from VEPs in their approach as well as the participants they seek to attract. VEPs are tools to reduce information asymmetries between business organizations and their outside stakeholders who cannot observe companies' internal operations. Alliances are not motivated by such concerns. In terms of the attributes of participants, government-sponsored strategic alliances (like the Sector Strategies Program) are more likely to recruit industry associations as their primary participants rather than individual businesses (Grant and Baden-Fuller 2004). VEPs, in contrast, recruit businesses as participants. As the reviewer correctly pointed out, for industry VEPs, the industry associations serve as program sponsors, instead of program participants.

4 Although industry-sponsored VEPs can be cross-sector based in theory, there are limited examples in large part because industry associations are the sponsors of these VEPs and industry associations are typically sector based. Possible exceptions include the Caux Round Table, which is a network of business leaders that puts forward codes or principles for corporate social responsibility. However, since its codes and principles do not recruit firms as program participants, cross-sector-based programs like this one are not considered VEPs.

information that persuaded consumers to favor the products of competitors that demonstrate a stronger regard for the environment (Gould, Schnaiberg, and Weinberg 1996). By undertaking boycotts and initiating media campaigns aimed at organizations and their supply chains (Friedman 1999), environmental and community stakeholders can alter organizations' incentives to join VEPs.

Many environmental and community stakeholders have been cynical about whether VEPs help improve environmental conditions (Barber 1998). Such skepticism stems from the belief that VEPs are symbolic public relations gestures rather than serious efforts to improve participants' environmental performance. Much of their resistance is rooted in their preference for command and control environmental regulation, in which governments establish allowable pollution thresholds and the technologies required to comply with the law. Environmental and community stakeholders find command and control regulations easier to monitor, which increases their ability to hold polluting organizations accountable. Furthermore, environmental and community stakeholders often have legally sanctioned opportunities to provide input in the development command and control regulations, whereas VEPs do not.

In light of these concerns, managers who perceive that environmental and community stakeholders are important to their business' environmental activities may forgo VEP participation altogether. However, the same managers may ask about whether environmental and community stakeholders are equally skeptical about both types of VEPs. We think not given the different core missions of the two sponsors and the varying processes, these sponsors tend to follow in developing their VEPs. For instance, environmental and community stakeholders often question whether profit-seeking organizations have incentives to voluntarily incur additional private costs to protect the environment. This skepticism is especially true for programs sponsored by industry associations since the primary role of an industry trade group is to protect the economic well-being of its members. Indeed, industry associations often seek to benefit their members by lobbying policy makers to design public policies that favor of their economic interests. By contrast, environmental regulators have a primary mission of protecting the natural environment. This core mission has given rise to adversarial attitudes between environmental regulators and business (Kagan 1991). It also has led to impassioned industry complaints that environmental agencies are populated by environmentalists (Kagan 1991; Kollman and Prakash 2001) who lack concern about how their environmental goals affect the regulated community's profit-seeking objectives. For these reasons, we believe that although environmental and community stakeholders may be wary of VEPs, their skepticism is likely to be less for government-sponsored programs.⁵ We therefore, hypothesize, that:

- H_{1a} Organizations with greater pressures from environmental stakeholders related to their environmental practices are less likely to join a VEP; these pressures are expected to be weaker for government-sponsored VEPs.
- H_{1b} Organizations with greater pressures from community stakeholders related to their environmental practices are less likely to join a VEP; these pressures are expected to be weaker for organizations that join government-sponsored VEPs.

⁵ The support for government-sponsored VEPs might vary depending on which party controls the executive. Arguably, support may be muted during Republican presidencies because of fears of industry "capture" of the regulatory agencies. But the potential of such capture might be limited given the oversight authority of the Congress.

Regulatory Stakeholders

Other secondary stakeholders consist of environmental regulatory agencies, sometimes called regulatory stakeholders, which consist of actors that administer environmental regulations and policies. Although goodwill with regulatory stakeholders is an important incentive for organizations to join government-sponsored VEPs (Potoski and Prakash 2004), given the adversarial conditions that often plague relations between organizations and regulatory stakeholders (Kagan 1991), businesses generally are wary of getting entangled further in the regulatory web. Nevertheless, under some conditions, organizations may believe that the benefits derived from increased goodwill with regulatory stakeholders exceed the costs of additional oversight. For instance, when regulators hold goodwill toward an organization, they may be inclined to monitor it less frequently. In some cases, regulators may give VEP participants greater latitude when a permitting discrepancy is discovered, assuming that the incident was accidental. In other instances, regulator goodwill may lead to collaborative relationships that explore nonregulatory approaches in which government can encourage greater environmental improvements (Andrews et al. 2003) or cooperative trust-based relationships that foster shared learning (Potoski and Prakash 2004). In still other instances, VEPs may help to preempt more stringent regulation and enhance the public image of program participants (Maxwell, Lyon, and Hackett 2000; Nash and Ehrenfeld 1997).

Although the command and control regulations have led to impressive reductions in pollution levels, within the United States, the Environmental Protection Agency (EPA) has struggled to satisfy its congressional mandate of ensuring compliance. The difficulty generally is due to limited congressional funding for regulatory inspections and audits (Davies et al. 1996) and other budgetary reductions at a time when the agency's mandated responsibilities are increasing (Portney and Stavins 2000). Both factors have limited EPA's ability to inspect a large number of organizations (Davies and Mazurek 1998). However, some organizations undergo repeated regulatory inspections, in general, because of their previous noncompliances and environmental mishaps (Firestone 2002), subjecting them to more scrutiny from regulatory stakeholders than organizations with fewer or no regulatory inspections.

In response to this type of stakeholder pressure, organizations may choose to participate in a VEP in an effort to signal to regulators that they are good environmental citizens. When faced with the decision to join a VEP, organizations with greater regulatory inspections may have an increased probability to participate in a government-sponsored VEP because doing so can offer a more credible signal of their intent to adhere to regulatory expectations. Since participation in a VEP involves interaction with program managers, organizations that join a government-sponsored program may be hoping to convey more directly to their regulatory stakeholders that they do not pose a major threat to the environment and that they are serious about complying with the law. Moreover, by participating in a government-sponsored VEP, managers who perceive that regulatory stakeholders have a greater influence on their organization's environmental practices may be able to influence the tone of engagement with these stakeholders so that it is more collaborative.

H₂ Organizations with historically greater numbers of environmental inspections are more likely to join a VEP; these pressures are expected to be stronger for government-sponsored VEPs.

Industry Stakeholders

Industry stakeholders are an additional type of secondary stakeholder that may influence an organization's environmental practices. Industry stakeholders consist of an organization's competitors operating within the same industrial sector. Organizations generally monitor the environmental activities of competing companies within their industrial sector and respond to normative expectations about emerging standards for environmental stewardship. If managers see a trend emerging where industry stakeholders are endorsing various types of VEPs, managers may be more likely to follow this trend regardless of program sponsor. The rationale for such mimetic behavior is that these managers are avoiding having their company being identified as a laggard among their peers. For these reasons, industry stakeholders may be relevant to managers' decisions to participate in VEPs in general. However, industry stakeholders often are well networked, especially among their professional associations. They also take a lead role in the development of industry-sponsored VEPs. As a consequence, businesses that view their industry stakeholders as being salient to their environmental practices are more likely to endorse industry-sponsored VEPs (Potoski and Prakash 2005).

- H₃ Organizations with greater pressures from industry stakeholders related to their environmental practices are more likely to join a VEP; these pressures are expected to be stronger for organizations that join industry-sponsored VEPs.

Value Chain Stakeholders

Organizations' primary stakeholders include individuals operating in the value chain (Freeman 1984). Increasingly, value chain stakeholders have been exerting pressures on organizations to improve their environmental performance and adopt proactive environmental management practices (Zhu and Sarkis 2004; Zhu, Sarkis, and Geng 2005). These pressures arise because buyers wish to ensure that their purchases are of sufficient environmental quality since doing so reduces environmental liabilities associated with final product development (Handfield et al. 2002). Similarly, suppliers that are concerned about their potential environmental liabilities increasingly are exerting greater pressures on downstream organizations to reduce environmental impacts since doing so decreases the likelihood that the supplier's products will be associated with an environmental mishap (Darnall, Seol, and Sarkis 2009). To address concerns raised by value chain stakeholders about firms' environmental programs, organizations may choose to participate in a VEP of any sort. However, participation in an industry-sponsored VEP may be particularly appealing because these programs are generally sponsored by industry associations and are well recognized throughout their value chains. As a consequence, these VEPs may have stronger brand name recognition among value chain stakeholders.

- H₄ Organizations with greater pressures from buyers and suppliers related to their environmental practices are more likely to join a VEP; these pressures are expected to be stronger for organizations that join industry-sponsored VEPs.

Management Stakeholders

Other primary stakeholders include management employees who are internal to the organization (Waddock and Graves 1997). Support and leadership from top-level managers is

vital to ensuring an organization-wide understanding of and commitment to environmental issues (Prakash 2000; Tilley 1999; Zutshi and Sohal 2004). Related to VEPs, adhering to program requirements can entail a significant commitment of resources. For this reason, we anticipate that greater support from management stakeholders is associated with organizational decisions to participate in a VEP. However, different types of VEPs may require greater support from top-level managers.

For instance, in the United States, the relationship between organizations and their industry associations is less adversarial than the relationship between organizations and environmental regulators. Hence, a business' decision to participate in a government-sponsored VEP, as opposed to an industry-sponsored program, is likely to require additional support from the top management. This is because by joining a VEP, an organization publicly commits itself to certain types of beyond-compliance programs and may be held accountable to these new standards. Additionally, organizations must consider the costs of exiting VEPs, if after joining they find that the program requirements are too burdensome. By exiting government-sponsored VEPs, organizations may invite unwanted attention from regulators. For these reasons, a greater level of commitment from management stakeholders is anticipated to be associated with organizations' decisions to join VEPs sponsored by governments.

H₅ Organizations with greater pressures from top-level managers related to their environmental practices are more likely to join a VEP; these pressures are expected to be stronger for organizations that join government-sponsored VEPs.

RESEARCH METHODS

Data

To evaluate our hypotheses, we relied on a subset of data collected from a 12-page survey developed and administered by the Organisation for Economic Co-Operation and Development (OECD) Environment Directorate and researchers from Canada, France, Germany, Hungary, Japan, Norway, and the United States. The OECD survey was pretested in France, Canada, and Japan before it was translated into each country's official language and validated for accuracy. In 2003, surveys were sent to individuals who worked in manufacturing facilities having at least 50 employees and who were responsible for the facility's environmental activities. The OECD used Dillman's (1978) *total design method* in administering its survey in that the original questionnaire was followed by two additional mailings to prompt additional responses.

US respondents were the subject of this study since the United States was the only country in the OECD data set that included four important questions regarding facilities' participation in VEPs. The survey was mailed to environmental managers of all US manufacturing facilities that had 50 employees or more and that reported data to EPA's Toxic Release Inventory (TRI) since nearly all manufacturing organizations with more than 50 employees are required to submit data to the TRI (USEPA 2003). Facilities with 10 or more full-time employees who manufacture or process quantities above 25,000 pounds, or use more than 10,000 pounds of any of the 650 listed toxic substances during a calendar year, must file a separate form for each TRI chemical (USEPA 2001). The OECD surveyed the population of 3,746 facilities meeting these inclusion criteria. A total of 489 facility managers completed the US survey, yielding a response rate of 13%, which is similar to

previous surveys of US organizations' environmental practices (e.g., Christmann 2000; Delmas and Keller 2005; Melnyk, Sroufe, and Calantone 2003) where response rates were 20.1%, 11.2%, and 10.4%, respectively. Almost half of the sample was either small- or medium-sized enterprises (<250 employees).

To check for common method variance, we relied on the post hoc Harman's single-factor test (Podsakoff and Organ 1986). This test assumes that if a substantial amount of common method variance is present, a factor analysis of all the data will result in a single factor accounting for the majority of the covariance in the independent and dependent variables. The results of Harman's single-factor test revealed that no single factor accounted for the majority of the variance in the variables, offering evidence that this type of bias was not a concern.

Social desirability bias was addressed by ensuring respondent anonymity. Anonymity assurances reduce bias even when responses relate to sensitive business topics (Konrad and Linnehan 1995; Sharma 2000). To further address potential problems related to social desirability bias, survey questions related to stakeholder influences were separated from questions pertaining to participation in government and industry VEPs. In instances where a social desirability bias exists, researchers are less likely to identify statistically significant relationships because there is less variability in respondents' survey answers. However, by finding statistical significance, additional evidence would be offered about the strength of the relationship between the variables of interest (Hardin and Hilbe 2001).

Nonresponse bias was addressed by obtaining the international standard industrial classification (ISIC) codes for respondents in our sample. We then acquired US census data to compare respondents to the population of manufacturing facilities listed in the USEPA's TRI 2003. We found that the OECD sample overrepresented some industries and underrepresented others. Following standard practice for addressing response bias, we weighted our sample to reflect actual industry representation.

Measures

Dependent Variable

For the purposes of this study, *VEP sponsors* were defined as agents who financed and administered a VEP. Our operational definition included programs that encouraged participants to reduce nonregulated impacts as well as programs that encouraged participants to reduce their regulated pollutants beyond mandated regulatory thresholds. Facilities' membership in government-sponsored VEPs was determined by relying on data from the OECD survey that asked environmental managers whether their facility had participated in a government-sponsored VEP. Similarly, membership in industry-sponsored VEPs was assessed by relying on data drawn from a question asking whether the facility had participated in an industry-sponsored VEP. Environmental managers indicated either "yes" or "no" to both questions. In instances where facilities answered "yes" to both questions, these organizations were recognized as participating in both government- and industry-sponsored VEPs. Facilities that answered "no" to both questions did not participate in either type of VEP.

In determining program sponsorship, we also relied on OECD data that asked facilities to report the name of the VEP for which they participated. We used this information to verify assignment of program sponsorship by reviewing each VEP homepage to identify the organizations that presently finance and administer the program. In the absence of such information, VEP contact designations and the server where the Web site was hosted were

used to determine the organizations responsible for a program’s financing and administration. If a VEP was discontinued or no longer had an active Web site, secondary reports were examined instead.

A total of 83 organizations participated in government-sponsored VEPs and 42 participated in industry-sponsored VEPs. Of these respondents, 17 reported that they participated in both types of VEPs, as described in table 1.

Stakeholder Variables

Pressures from environmental, community, industry, value chain (buyers and suppliers), and internal (e.g., managers) stakeholders were assessed by relying on OECD survey data that asked facility managers, “How important do you consider each of the following influences on the environmental practices of your facility?” Respondents reported the importance of each type of stakeholder by indicating whether they were “not important,” “moderately important,” or “very important.” To assess regulatory stakeholder pressures related to environmental inspections, we used OECD survey data that asked facility managers, “How many times has your facility been inspected by public environmental authorities (central, state/province, and municipal governments) in the past three years?”

Control Variables

In addition to our stakeholder variables, we included several control variables in our empirical models to account for the fact that VEPs may attract managers whose actions

Table 1
VEPs Identified by Respondents^a

Government-Sponsored VEPs	Industry-Sponsored VEPs
1. Clean Texas 2000 Program	1. American Chemistry Council’s Responsible Care Program
2. EPA’s 33/50 Program	2. American Home Furnishings Alliance’s Enhancing Furniture’s Environmental Culture
3. EPA’s Climate Wise Program	3. American Textile Manufacturers Institute’s Encouraging Environmental Excellence (E-3) Program
4. EPA’s Design for Government	4. Coatings Care Program
5. EPA’s Energy Star Program	5. National Metal Finishers Strategic Goals Program
6. EPA’s Environmental Leadership Program	6. Wisconsin Paper Council’s Pollution Prevention Partnership
7. EPA’s Green Lights Program	
8. EPA’s Wastewise Program	
9. Indiana’s 5 Star Program	
10. Michigan’s Business Pollution Prevention Partnership	
11. Michigan’s Clean Corporate Citizen	
12. Water Smart Program	
13. Wisconsin’s Focus on Energy	
Total number of respondents participating in	
Government-sponsored VEPs	83
Industry-sponsored VEPs	42
Both types of VEPs	17
Neither VEP	381

^aApproximately 63% of the facilities identified the name of the VEP in which they participated.

are consistent with the programs' stated goals. Organizations are continually faced with making changes to their production technologies. Those that chose to make changes in their production process to reduce pollution emissions at the source (rather than relying on end-of-pipe technologies) may be in a better position to exceed environmental regulatory requirements. For this reason, organizations that rely on production process changes may have a stronger incentive to join government-sponsored VEPs because they believe they can more easily meet program requirements. These managers may perceive that program membership can increase goodwill with critical stakeholders because it signals their organizations' intentions to exceed regulatory requirements. In return, these organizations may be recognized for their investments in pollution prevention technologies. To address this issue, we considered whether the facility had undertaken significant environmental measures related to its production technologies. If so, the OECD data asked facility managers, "Which of the following most closely characterizes the nature of such measures?" Facility environmental managers reported whether these changes were "production process modifications that reduced pollution emissions and/or resource use" or whether they were "end-of-pipe technologies that reduced pollution emissions or allow for resource recovery." Affirmative responses to production process modifications suggested that facilities are more proactive in their approach in dealing with environmental concerns, whereas end-of-pipe technology utilization suggested a more reactive approach.

Similarly, organizations that have developed production processes that use fewer natural resources than their industry peers may be positioned to go beyond regulatory expectations and therefore have an incentive to join a VEP simply because they believe they can meet program requirements. At the same time, these organizations may seek goodwill with external stakeholders by indicating their intentions to go beyond mere compliance with environmental laws. We assessed whether facilities had developed production processes that were decreasing their natural resource usage by relying on data from the OECD survey that asked environmental managers, "Has your facility experienced a change in the environmental impacts per unit of output of its products or production processes in the past three years with respect to its natural resource use?" Respondents indicated whether they had incurred a "significant decrease," "decrease," "no change," "increase," or "significant increase."

With respect to organizational efficiency, organizations that operate with strong efficiency goals may be more likely to participate in VEPs because they recognize the potential cost savings related to minimizing waste in their production cycle. From a profit-maximizing viewpoint, rational businesses possessing sufficient information (regarding costs, substitute products, and other factors) examine the gross benefits and costs of an environmental strategy and undertake it if the strategy offers the best net positive benefits compared with other alternatives (Henriques and Sadorsky 1996). This strategic approach is based on the notion that businesses are driven to increase their operational efficiencies, which in turn drives organizational action and subsequent profits (Alchian and Demsetz 1972). As a consequence, organizations that believe that VEPs increase internal efficiencies may be more likely to participate in them. To assess the extent to which facilities were efficiency driven with respect to the environment, we relied on data from the OECD survey that asked facility managers how important it was for them to achieve cost savings due to their environmental practices. Facility managers reported whether these influences were "not important," "moderately important," or "very important."

Additionally, managers concerned with benchmarking often are looking for ways to distinguish themselves from their peers. Industry-sponsored VEPs target all organizations within a single industry sector, and signal that participants are in conformance with an industry standard rather than creating differentiation among industry peers. By contrast, membership in a government-sponsored VEP offers greater opportunities for differentiation since these programs are more applicable to organizations in a variety of production industries. For this reason, managers who are using benchmarking to distinguish themselves from their industry peers are more likely to participate in a government-sponsored VEP. To account for these relationships, we relied on OECD data that asked facility managers whether they used environmental performance benchmarking practices. Environmental managers indicated either “yes” or “no.”

Since organization size is related to community visibility and its associated external pressures (Bowen 2002), we included a variable to account for the number of employees (logged) within the facility. Finally, we controlled for industry-specific effects. Organizations operating within some industrial sectors have access to more VEPs than others, and some industries have stronger industry associations that may promote VEP participation. Additionally, regulators may direct enforcement action toward specific industrial sectors, which may encourage organizations that operate in these industrial sectors to join a VEP in an effort to reduce their regulatory scrutiny. To address these issues, we included five industry sector dummies to account for facilities’ international standard industrialization codes at the two-digit level: (ISIC) 15–19 (food, beverage, textiles, leather goods), 20–22 (wood products, paper, publishing), 23–25 (petroleum, chemicals, plastics), 26–28 (non-metallic mineral products, metals, fabricated metal products), and 34–35 (transportation equipment). Our excluded dummy variable for empirical modeling was ISIC 29–35 (machinery, communication equipment).

Empirical Models

Table 2 includes descriptive statistics and correlations for all variables. Although Spearman correlations among the explanatory variables were within the range of acceptability, empirical models that rely on numerous categorical variables (as was the case in our model) tend to exhibit multicollinearity. For this reason, we evaluated the variance inflation factors (VIFs) for each of our explanatory variables. The results revealed the highest VIF being 2.77, which was below Kennedy’s (1997) maximum acceptable threshold of 10.0, indicating that multicollinearity did not substantially influence the standard errors in our models.

To empirically assess the reasons why facilities participated in government- and industry-sponsored VEPs, we relied on seemingly unrelated bivariate probit regression (Greene 1993). We corrected for heteroskedasticity-robust standard errors and weighted our sample based on industry representation. Our seemingly unrelated bivariate probit model jointly evaluates the decision to participate in a government-sponsored VEP with the motivations to participate in an industry-sponsored VEP using a full-information maximum likelihood estimator. The method relies on a two-stage maximum likelihood estimation approach in which the factors that determine a facility’s industry VEP participation (first stage) are estimated simultaneously with the factors that determine its government VEP participation (second stage). In so doing, the technique provides a *unique* set of estimates for the motivations to participate in a government- and industry-sponsored VEP while accounting for the correlation between the disturbances of the two equations.

Table 2
Descriptive Statistics

Variable Name	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1 Environmental stakeholders	1.00																
2 Community stakeholders	.582	1.00															
3 Number of inspections	.023	.003	1.00														
4 Industry stakeholders	.558	.426	.049	1.00													
5 Buyer stakeholders	.242	.310	.046	.276	1.00												
6 Supplier stakeholders	.404	.314	-.075	.329	.466	1.00											
7 Management stakeholders	.281	.375	-.031	.299	.268	.314	1.00										
8 Production process changes that focus on pollution prevention	.015	.001	-.121	-.029	.187	.132	.008	1.00									
9 Reductions in natural resource use	.009	-.053	-.031	-.018	-.025	-.069	-.037	-.060	1.00								
10 Importance of cost savings related to environmental practices	.177	.172	.005	-.127	-.011	.195	.109	.193	.175	1.00							
11 Benchmarks environmental performance	.104	.100	.135	-.173	-.009	.142	.137	.247	.131	.169	1.00						
12 Facility size—log	.021	-.019	-.055	-.121	.159	.024	.047	.077	.036	.126	.132	1.00					
13 ISIC 15–19	.083	.066	-.082	.018	.141	.052	.022	-.020	-.118	-.052	.011	.054	1.00				
14 ISIC 20–22	-.025	.031	.005	.005	-.035	-.041	.037	.025	-.028	.095	-.075	.013	-.064	1.00			
15 ISIC 23–25	-.014	.039	-.005	-.003	.005	.021	.059	-.039	.022	.040	.020	-.164	-.203	-.115	1.00		
16 ISIC 26–28	-.019	-.027	-.043	.098	-.008	-.003	-.018	.001	.069	-.090	-.035	-.140	-.228	-.129	-.403	1.00	
17 ISIC 29–33	-.104	-.073	.039	-.123	-.104	-.169	-.038	.029	.014	.043	-.017	.208	-.126	-.071	-.224	-.250	1.00
Mean	1.96	2.09	7.01	1.87	2.11	1.72	2.41	.74	2.51	2.58	.57	5.57	.10	.03	.27	.31	.12
SD	.70	.71	9.68	.70	.74	.69	.62	.44	.84	.57	.50	1.07	.30	.18	.44	.46	.33
Minimum	1	1	0	1	1	1	1	0	1	1	0	2.30	0	0	0	0	0
Maximum	3	3	100	3	3	3	3	1	5	3	1	8.96	1	1	1	1	1

Note: $N = 287$.

The seemingly unrelated bivariate probit regression is especially relevant to our setting since some organizations can participate in both types of VEPs (as noted in table 1), and stakeholders likely affect both participation decisions. Although not all types of organizations have the option to participate in industry-sponsored VEPs (because they might not exist for their industry) by omitting organizations that participate in both types of programs, our results would be less generalizable.

Seemingly unrelated bivariate probit models generate an ancillary parameter (ρ) that measures the correlation between the error terms of the two equations. Since ρ represents a nonlinear function of the variables in the first-stage model, the second-stage model is identified even without instrumental variables via the normality assumption for the probit model (Greene 1993). When ρ is statistically different from zero ($\alpha = 0.05$), there is at least a 95% probability that a relationship exists between the second-stage model variables and the first-stage model variables such that simultaneous estimation procedures improve estimation. Model significance was determined by evaluating the Wald χ^2 statistic. The results showed that our model was significant at $p < .01$ (see table 3). Moreover, our Wald test of ρ was 8.24 ($p = .004$), offering support for the validity of our empirical estimation approach.

Determining Similarities in VEP Design

Since variations in VEP design are a potential confounds that may explain facilities' participation in one type of VEP over another, it was important for us to consider this issue formally. However, we were constrained in our ability to include VEP design information as a control variable in our empirical model since doing so would reduce our model to VEP adopters only because it was not possible to account for the unobservable VEP design factors associated with facilities' decisions to not participate in a VEP. In other words, it was not possible to know how facilities perceived the features of VEPs they chose not to join.

To more systematically address whether VEP design features, other than sponsorship, might explain facilities' decisions to participate in a government- and industry-sponsored VEPs, we relied on OECD survey data that asked for the name of the VEP in which facilities participated. We used this information to assess the design of the VEPs in our sample. Following Darnall and Carmin's (2005) approach to measuring VEP requirements, we identified the following design features for the VEPs in our sample: specific environmental requirements (environmental targets, statements of environmental values/goals, environmental management systems), administrative requirements (letters of intent, signed agreements or formalized memorandum or cooperative agreement), and conformance requirements (self-monitoring, sponsor monitoring, third-party monitoring, sanctions for non-conformance). From these requirements, Darnall and Carmin describe four distinct types of VEPs: information/assistance/awareness programs, environmental pledge programs, voluntary reporting programs, and performance monitoring programs.⁶

In categorizing the VEPs in our sample, we compared the list of program names reported in the OECD survey with those in Darnall and Carmin's article. For VEPs that were included in Darnall and Carmin's study (seven total), we contacted the authors to obtain information on how these programs were categorized. We then coded the remaining 12 programs identified by survey respondents using data collected by Internet searches and

6 See Darnall and Carmin (2005) for an expanded discussion of these programs.

Table 3
Seemingly Unrelated Bivariate Probit Results—Perceived Stakeholder Pressures to Join Government- and Industry-Sponsored VEPs^a

Variable	Government VEPs			Industry VEPs		
	Coefficient	SE	Z	Coefficient	SE	Z
Stakeholder influences						
Environmental stakeholders	-0.400**	0.200	-1.990	-0.471**	0.214	-2.200
Community stakeholders	0.308*	0.189	1.630	0.275	0.205	1.340
Number of inspections	0.003	0.008	0.350	0.025**	0.011	2.320
Industry stakeholders	0.123	0.179	0.690	0.483***	0.183	2.640
Buyer stakeholders	-0.004	0.178	-0.020	0.033	0.177	0.190
Supplier stakeholders	-0.190	0.203	-0.930	0.049	0.199	0.240
Management stakeholders	0.351**	0.181	1.940	0.014	0.185	0.080
Controls						
Production process changes that focus on pollution prevention	0.276	0.246	1.120	-0.235	0.281	-0.840
Reductions in natural resource use	-0.297**	0.137	-2.160	-0.131	0.131	-1.000
Importance of cost savings related to environmental practices	0.339	0.213	1.590	0.113	0.237	0.480
Benchmarks environmental performance	0.503**	0.213	2.360	-0.011	0.253	-0.040
Facility size—log	0.164	0.101	1.630	-0.187	0.114	-1.640
ISIC 15–19 (food, beverage, textiles, leather goods)	0.019	0.398	0.050	0.595	0.533	1.120
ISIC 20–22 (wood products, paper, publishing)	-0.003	0.585	-0.010	0.749	0.655	1.140
ISIC 23–25 (petroleum, chemicals, plastics)	0.147	0.314	0.470	0.971**	0.409	2.370
ISIC 26–28 (non-metallic minerals, metals, fabricated metals)	-0.110	0.324	-0.340	0.721***	0.426	1.690
ISIC 34–35 (machinery, communication equipment)	-1.135*	0.537	-2.110	-5.222***	0.437	-11.94
Constant	-3.161	0.965	-3.280	-0.471*	0.214	-2.200
N	287					
Wald $\chi^2(34)$	3046.10					
Prob > χ^2	0.000					
Log pseudolikelihood	-1437.54					
Rho	.428					
Wald test of rho	7.44					
Rho Prob > χ^2	0.006					

^aExcluded sector is ISIC 29–33 (machinery, communication equipment); variance inflation factors are <2.77.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

by relying on Darnall and Carmin's VEP classification criteria. This analysis indicated that all the programs in our OECD sample met Darnall and Carmin's definition of a "voluntary reporting" VEP in that they required facilities to develop specific environmental targets and submit a self-initiated report of their progress to VEP administrators. Unfortunately, not all facilities reported the name of the first VEP for which they participated in, and in other instances, the program name was too ambiguous to research (e.g., state-level pollution prevention program). Consequently, these programs could not be categorized. These findings offer some evidence that although VEPs' design features often vary considerably, the

VEPs in our sample had similar designs. As such, our findings may only be generalized to these types of programs.

Our second approach toward examining VEP design variations involved assessing facilities' reported VEP participation costs (or club costs per Prakash and Potoski [2006]) since costs may reflect VEP design features and may account for variations in facilities' participation decisions. To determine whether participants' reported costs differed by sponsor for the VEPs included in our study, we drew on data from the OECD survey that asked, "How significant were the following costs of participating in your first industry-sponsored program?" These data were collected for VEP participants only. Facilities reported on costs related to completing general paperwork, writing environmental reports, meeting environmental requirements, and improving operations to meet program requirements. Facilities were asked the same question related to government- and industry-sponsored programs. Respondents indicated whether items were "very costly," "moderately costly," or "not costly."

We used Fisher's exact test to assess responses among perceived program costs and VEP sponsorship categories. Fisher's exact is a nonparametric test that determines the statistical differences between two or more categorical variables within a contingency table. This test was selected over a χ^2 test because of the fact that some cells within our contingency table (of perceived cost by VEP sponsor) had fewer than five affirmative responses (Stokes, Davis, and Koch 1995). In contingency tables with more widely populated cells, Fisher's exact and χ^2 tests yield statistically equivalent results. Additionally, we aggregated facility responses into perceived "administrative costs" by summing facility responses for completing paperwork costs and writing environmental reports. We also combined costs associated with meeting environmental requirements with those related to improving operations to meet VEP requirements since these costs represent "operational costs."

Overall, the costs of joining a VEP do not differ statistically between government- and industry-sponsored VEPs ($p = .548$), as shown in table 4. Similarly, facilities' administrative and operational costs did not differ across program sponsor ($p = .119$ and $.135$, respectively), as shown in tables 5 and 6. Combined, these assessments offer support for the notion that the VEPs in our sample were similar in their program design. These findings further suggest that potential confounds related to program design are less of a concern for our sample.

RESULTS

Table 3 reports the results of the seemingly unrelated bivariate probit analyses of facilities' decisions to join government- and industry-sponsored VEPs. Overall, our findings suggest that facilities' decisions to join a specific type of VEP were influenced by stakeholder pressures. Consistent with our first hypotheses (H1a), we found that organizations with greater pressures from environmental stakeholders were less likely to join industry-sponsored and government-sponsored VEPs, although the difference between these coefficients were not statistically discernible ($p = .774$). Contrary to H1b, firms experiencing greater pressures from community stakeholders were more likely to participate in a government-sponsored VEP.

Facilities that had higher numbers of environmental inspections were more likely join an industry-sponsored VEP as opposed to a government-sponsored program (H2), which

Table 4
Facilities' Total VEP Participation Costs by VEP Sponsor^a

Total Perceived Cost Ranking ^b	Industry-Sponsored VEP, <i>n</i> (%)	Government-Sponsored VEP, <i>n</i> (%)	Total, <i>n</i> (%)
4	9 (20.45)	17 (20.00)	26 (20.16)
5	7 (15.91)	10 (11.76)	17 (13.18)
6	4 (9.09)	18 (21.18)	22 (17.05)
7	7 (15.91)	17 (20.00)	24 (18.60)
8	9 (20.45)	15 (17.65)	24 (18.60)
9	3 (6.82)	4 (4.71)	7 (5.43)
10	1 (2.27)	2 (2.35)	3 (2.33)
11	2 (4.55)	1 (1.18)	3 (2.33)
12	2 (4.55)	1 (1.18)	3 (2.33)
Total (<i>N</i>)	44 (100)	85 (100)	129 (100)

^aFisher's exact = 0.548.

^bPerceived total costs relate to completing general paperwork, writing environmental reports, meeting environmental requirements, and improving operations to meet program requirements. A rank of 4 indicates "not costly," 8 "moderately costly," and 12 "very costly."

was not anticipated. However, facilities that perceive their industry stakeholders have greater importance to their environmental practices were more likely to join industry-sponsored VEPs (H3). In evaluating the association between facilities' primary stakeholders and facilities' decisions to participate in government- and industry-sponsored VEPs, managers who perceived that value chain stakeholders had a greater influence on their environmental activities did not have a statistically discernible relationship with VEP participation decisions (H4). However, consistent with our prior expectations, managers who perceived that managerial stakeholders had a greater influence on their environmental activities showed an increased probability of joining government-sponsored VEPs (H5).

With respect to our control variables, facilities were more likely to join a government-sponsored VEP if they had recently changed their production technologies to reduce pollution emissions at the source. Additionally, facilities that reduced their natural resource usage were more likely to participate in government-sponsored VEPs. Additionally, facilities that joined government-sponsored VEPs were more likely to stress efficiency gains from their environmental practices and benchmark their environmental performances. Finally, our results emphasize the importance of controlling for facility size and industrial sector in exploring our relationships of interest.

Table 5
Facilities' Administrative Costs by VEP Sponsor^a

Total Administrative Cost Ranking ^b	Industry-Sponsored VEP, <i>n</i> (%)	Government-Sponsored VEP, <i>n</i> (%)	Total, <i>n</i> (%)
2	15 (34.09)	44 (51.76)	59 (45.74)
3	9 (20.45)	20 (23.53)	29 (22.48)
4	16 (36.36)	18 (21.18)	34 (26.36)
5	1 (2.27)	1 (1.18)	2 (1.55)
6	3 (6.82)	2 (2.35)	5 (3.88)
Total (<i>N</i>)	44 (100)	85 (100.00)	129 (100.00)

^aFisher's exact = 0.119.

^bPerceived administrative costs relate to completing general paperwork and writing environmental reports. A rank of 2 indicates "not costly," 4 "moderately costly," and 6 "very costly."

Table 6
Facilities' Operational Costs by VEP Sponsor^a

Total Operational Cost Ranking ^b	Industry-Sponsored VEP, <i>n</i> (%)	Government-Sponsored VEP, <i>n</i> (%)	Total, <i>n</i> (%)
2	12 (26.67)	20 (23.26)	32 (24.43)
3	12 (26.67)	11 (12.79)	23 (17.56)
4	13 (28.89)	42 (48.84)	55 (41.98)
5	3 (6.67)	7 (8.14)	10 (7.63)
6	5 (11.11)	6 (6.98)	11 (8.40)
Total (<i>N</i>)	45 (100)	86 (100)	131 (100)

^aFisher's exact = 0.135.

^bPerceived operational costs relate to meeting environmental requirements, and improving operations to meet program requirements. A rank of 2 indicates "not costly," 4 "moderately costly," and 6 "very costly."

In sum, after controlling for numerous other effects, including program design features, greater stakeholder pressures were associated with facilities' actions to participate in VEPs, and these pressures differed for facilities' that chose to participate in government- and industry-sponsored VEPs.

DISCUSSION AND CONCLUSIONS

The literature examining organizations' motivations to participate in a VEP (Arora and Cason 1995; Coglianese and Nash 2001; Darnall 2006; Potoski and Prakash 2005) tends to focus on single VEP case studies. This article takes an important step by evaluating stakeholder influences across numerous VEPs. Our empirical analyses suggest that firms' incentives to join a government- or industry-sponsored VEP depend on how managers anticipate the preferences of their critical stakeholders regarding these program types. We find that organizations join government-sponsored programs for different reasons than they join industry-sponsored programs, even for programs that are designed similarly.

Organizations that participate in government-sponsored VEPs are more likely to perceive having greater pressures from community stakeholders. In contrast, organizations perceiving pressures from environmental stakeholders are less likely to join both government- and industry-sponsored VEPs. Indeed, environmental groups have been skeptical about whether VEPs help improve environmental conditions (Barber 1998). The recent decision by the EPA Administrator Lisa Jackson to terminate EPA's flagship VEP, Performance Track, arguably in response to the pressures from environmental groups, reflects their VEP opposition.

Organizations participating in government-sponsored VEPs tend to have greater pressures from management stakeholders. These results are most likely due to the fact that by joining a VEP, an organization publicly commits itself to certain types of beyond-compliance programs and can likely be held accountable to these new standards. Moreover, exiting government-sponsored VEPs can involve higher costs in that program dropouts may invite unwanted attention from environmental regulators. As such, a greater level of top-level managerial commitment may be required to motivate organizations to join VEPs sponsored by government. By contrast, our results offer evidence that organizations that participate in industry-sponsored VEPs endure a greater number of regulatory inspections. One reason for these findings may be due to the generally unpleasant relationship between organizations and regulatory stakeholders (Kagan 1991). To avoid additional regulator monitoring that

comes with participating in a government-sponsored VEP, these organizations may be more likely to participate in an industry-sponsored VEP. In doing so, these organizations may be attempting to signal their intent to exceed regulatory requirements and improve the organization's environmental image, while avoiding additional regulatory oversight (King and Lenox 2000).

Additionally, participants of industry-sponsored VEPs are more likely to have greater pressures from industry stakeholders for environmental consideration; industry-sponsored VEP participation may signal that participants are conforming to industry-created environmental standards rather than distinguishing themselves from their competitors. These results are most likely due to the fact that industry stakeholders take a lead role in the development of industry-sponsored VEPs. For businesses that view their industry stakeholders as being salient to their environmental practices, conformity to industry-sponsored standards is especially important.

The EPA tends to inspect companies that pose the greatest potential environmental harm (Firestone 2002). This lends support to our finding that organizations that participate in industry-sponsored VEPs are more likely to have higher levels of regulatory inspections because industry-sponsored VEPs appear to attract businesses that have more environmental risk. This notion is further supported by the results of our control variables that indicate that organizations participating in government-sponsored VEPs are more likely to have made changes in their production process to reduce pollution at the source rather than rely on end-of-pipe technologies. They are also making a conscious effort to employ fewer natural resources in their production process. As a result, participants of government-sponsored VEPs may be less burdened by the environmental regulatory system. Moreover, participants in government-sponsored VEPs are more likely to emphasize the efficiency gains of their environmental practices and are seeking ways to distinguish themselves from their industry peers by way of benchmarking their environmental practices.

Combined, our findings raise important questions for future research. If government-sponsored VEPs are attracting organizations that already are ahead of the regulatory curve, these programs may be more successful at improving the natural environment- than industry-sponsored VEPs, which appear to attract organizations with greater environmental problems. If so, then critics of industry-sponsored VEPs may be justified in their suspicions about these programs. Alternatively, industry-sponsored VEPs may have a greater success at improving participants' environmental performance because member organizations have more low-hanging fruit. Consequently, even small changes in participants' environmental strategies could lead to potentially significant environmental benefits for member organizations in industry-sponsored programs. As yet, VEP research has not considered the environmental performance outcomes of VEPs as it relates to their program sponsors. Rather, existing performance studies that examine multiple VEPs have tended to focus on environmental performance issues as they relate to monitoring or external certification (e.g., Darnall and Sides 2008; Koehler 2007). Future research would benefit from considering VEP sponsorship issues further. Such efforts may show that (despite the fact that there are similarities in the way in which government- and industry-sponsored VEPs are designed) because participants self-select into these programs for different reasons, environmental performance outcomes may differ. It would also be interesting to know whether managers correctly anticipated stakeholders' preferences in selecting to participate in one VEP over another, and the extent to which organizations are rewarded or punished for making these selection decisions.

Additionally, although government and industry associations are key actors in sponsoring VEPs, independent third-party organizations also develop VEPs. Third-party-sponsored VEPs are created by a wide range of nonindustry nongovernment organizations including standard-setting bodies, advisory groups, and environmental advocacy organizations (Carmin, Darnall, and Mil-Homens 2003). Although there are fewer third-party VEPs than government and industry programs, some have had a significant impact on the business community. ISO 14001, the Sustainable Forestry Initiative, and the Global Reporting Initiative are a few examples. Future research should consider the extent to which stakeholders encourage organizations to participate in these programs. Such an evaluation may highlight the interesting dilemma facing sponsors of third-party VEPs in that the program designers are important stakeholders to whom organizations wish to communicate their environmental commitments. As such, these programs may have a greater credibility with some (more confrontational) environmental stakeholders.

Since our findings offer evidence of distinctions between stakeholder pressures and organizations' participation in government- and industry-sponsored VEPs, additional research would benefit from a more in-depth analysis of how these differences might vary within industrial sectors. Although our analysis controlled for industry effects at a more macrolevel, additional research could offer more nuanced information about the relationships between stakeholder pressures for environmental consideration and organizations' VEP participation decisions within a particular manufacturing sector.

There is still much to learn about VEPs and their promise for improving the environment. This research offers broader generalizations regarding the population of VEPs and the extent to which program sponsorship is associated with organizations' participation decisions. Our findings suggest that business managers who recognize the importance of stakeholder influences on their environmental practices are more likely to participate in a VEP but that different stakeholder pressures are associated with the participation in government- or industry-sponsored VEPs. These findings have important implications about the types of businesses that participate in these programs, the broader perceptions of VEP legitimacy, and overall program performance.

FUNDING

This work was partially supported by the Organisation for Economic Co-operation and Development Environmental Directorate (OECD) and the United States Environmental Protection Agency, Office of Environmental Policy, Economics and Innovation.

REFERENCES

- Alchian, A. A., and H. Demsetz. 1972. Production, information costs and economic organization. *American Economic Review* 62:777–95.
- Andrews, R. N. L., D. Amaral, N. Darnall, D. Gallagher, D. Edwards, Jr, A. Hutson, C. D'Amore, and Y. Zhang. 2003. *Environmental management systems: Do they improve performance?* Chapel Hill, NC: Department of Public Policy, Univ. of North Carolina at Chapel Hill and Environmental Law Institute.
- Arora, S., and T. N. Cason. 1996. Why do firms volunteer to exceed environmental regulations? Understanding participation in EPA's 33/50 Program. *Land Economics* 20 (2): 283–307.
- Ayres, I., and J. Braithwaite. 1992. *Responsive regulation: Transcending the deregulation debate.* New York: Oxford Univ. Press.

- Barber, J. 1998. Responsible action or public relations? NGO perspectives on voluntary initiatives. *Industry and Environment* 21:19–22.
- Bowen, F. E. 2002. Does size matter? Organisational slack and visibility as alternative explanations for environmental responsiveness. *Business & Society* 41:118–24.
- Buchanan, J. M. 1965. An economic theory of clubs. *Econometrica* 32:1–14.
- Carmin, J., N. Darnall, and J. Mil-Homens. 2003. Stakeholder involvement in the design of U.S. voluntary environmental programs: Does sponsorship matter? *Policy Studies Journal* 31:527–43.
- Christmann, P. 2000. Effects of ‘best practices’ of environmental management on cost competitiveness: The role of complementary assets. *Academy of Management Journal* 43:663–880.
- Clair, J. A., J. Milliman, and I. I. Mitroff. 1995. Clash or cooperation? Understanding environmental organizations and their relationships to business. In *Research in corporate social performance and policy: Sustaining the natural environment—Empirical studies on the interface between nature and organizations*, eds. J. E. Post, D. Collins, and M. Starik, supplement 1, 163–93. Greenwich, CT: JAI Press.
- Coglianesi, C., and J. Nash, eds. 2001. *Regulating from the Inside: Can environmental management systems achieve policy goals?* Washington, DC: Resources for the Future.
- Darnall, N. 2006. Why organizations mandate ISO 14001 certification. *Business & Society* 45 (3): 354–81.
- Darnall, N., and J. Carmin. 2005. Greener and cleaner? The signaling accuracy of U.S. voluntary environmental programs. *Policy Sciences* 38:71–90.
- Darnall, N., I. Seol, and J. Sarkis. 2009. Perceived stakeholder influences and organizations’ use of environmental audits. *Accounting, Organizations and Society* 34 (2): 170–87.
- Darnall, N., and S. Sides. 2008. Assessing the performance of voluntary environmental programs: Does certification matter? *Policy Studies Journal* 36:95–117.
- Davies, J. C., and J. Mazurek. 1998. *Pollution control in the United States: Evaluating the system.* Washington, DC: Resources for the Future.
- Davies, J. C., J. Mazurek, K. McCarthy, and N. Darnall. 1996. *Industry incentives for environmental improvement: Evaluation of U.S. federal initiatives.* Washington, DC: Resources for the Future, Center for Risk Management.
- Delmas, M., and A. Keller. 2005. Free riding in voluntary environmental programs: The case of the U.S. EPA WasteWise program. *Policy Sciences* 38:91–106.
- Dillman, D. A. 1978. *Mail and telephone surveys: The total design method.* New York: Wiley.
- Donaldson, T., and L. Preston. 1995. The stakeholder theory of the corporation: Concepts, evidence, and implications. *Academy of Management Review* 21:65–91.
- Fineman, S., and K. Clarke. 1996. Green stakeholders: Industry interpretations and response. *Journal of Management Studies* 33:715–30.
- Fiorino, D. J. 1999. Rethinking environmental regulation. *Harvard Environmental Law Review* 23:441–469.
- Firestone, J. 2002. Agency governance and enforcement: The influence of mission on environmental decision making. *Journal of Policy Analysis and Management* 21:381–408.
- Freeman, R. E. 1984. *Strategic management: A stakeholder approach.* Boston, MA: Pitman.
- Friedman, M. 1999. *Consumer boycotts: Effecting change through the marketplace and the media.* London: Routledge.
- Gould, K., A. Schnaiberg, and A. Weinberg. 1996. *Local environmental struggle: Citizen activism in the treadmill of production.* Cambridge, MA: Cambridge University Press.
- Grant, R. M., and C. Baden-Fuller. 2004. A knowledge accessing theory of strategic alliances. *Journal of Management Studies* 41:61–84.
- Greene, W. H. 1993. *Econometric analysis*, 2nd ed. Upper Saddle, NJ: Prentice-Hall.
- Handfield, R., S. Walton, R. Sroufe, and S. Melnyk. 2002. Applying environmental criteria to supplier assessment: A study in the application of the analytical hierarchy process. *European Journal of Operational Research* 141:70–87.
- Hardin, J., and J. Hilbe. 2001. *Generalized linear models and extensions.* College Station, TX: Stata Press.
- Henriques, I., and P. Sadosky. 1996. The determinants of an environmentally responsive organization: An empirical approach. *Journal of Environmental Economics and Management* 30:381–95.

- . 1999. The relationship between environmental commitment and managerial perceptions of stakeholder importance. *Academy of Management Journal* 42:87–99.
- Hoffman, A. 2000. *Competitive environmental strategy: A guide to the changing business landscape*. Washington, DC: Island Press.
- Kagan, Robert. 1991. Adversarial legalism and American government. *Journal of Policy Analysis and Management* 10:369–406.
- Kennedy, P. 1997. *A guide to econometrics*, 3rd ed. Cambridge, MA: MIT Press.
- King, A., and M. Lenox. 2000. Industry self-regulation without sanctions: The chemical industry's responsible care program. *Academy of Management Journal* 43:698–716.
- Koehler, D. A. 2007. The effectiveness of voluntary environmental programs—A policy at a crossroads? *Policy Studies Journal* 35:689–722.
- Kollman, K., and A. Prakash. 2001. Green by choice? Cross-national variations in firms' responses to EMS-based environmental regimes. *World Politics* 53:399–430.
- Konrad, A. M., and F. Linnehan. 1995. Formalized HRM structures: Coordinating equal employment opportunity or concealing organizational practices? *Academy of Management Journal* 38:787–820.
- Maxwell, J. W., T. P. Lyon, and S. C. Hackett. 2000. Self-regulation and social welfare: The political economy of corporate environmentalism. *Journal of Law and Economics* 43:583–618.
- Melnyk, S. A., R. P. Sroufe, and R. L. Calantone. 2003. Assessing the impact of environmental management systems on corporate and environmental performance. *Journal of Operations Management* 21:329–51.
- Mitchell, R. K., B. R. Agle, and D. J. Wood. 1997. Toward a theory of stakeholder identification and salience: Defining the principle of who and what really counts. *Academy of Management Review* 22:853–86.
- Nash, J., and J. Ehrenfeld. 1997. Codes of environmental management practice: Assessing their potential as a tool for change. *Annual Review of Energy and the Environment* 22:487–535.
- Podsakoff, P. M., and D. W. Organ. 1986. Self-reports in organizational research. *Journal of Management* 12:531–44.
- Portney, P. R. and R. N. Stavins, eds. 2000. *Public policies for environmental protection*, 2nd ed. Washington, DC: Resources for the Future.
- Potoski, M., and A. Prakash. 2004. The regulation dilemma. *Public Administration Review* 64 (2): 137–48.
- . 2005. Green clubs and voluntary governance: ISO 14001 and organizations' regulatory compliance. *American Journal of Political Science* 49 (2): 235–48.
- Prakash, A. 2000. *Greening the firm*. Cambridge, UK: Cambridge University Press.
- Prakash, A., and M. Potoski. 2006. *The voluntary environmentalists*. Cambridge, UK: Cambridge University Press.
- Sharma, S. 2000. Managerial interpretations and organizational context as predictors of corporate choice of environmental strategy. *Academy of Management Journal* 43:681–716.
- Sharma, S., and I. Henriques. 2005. Stakeholder influences on sustainability practices in the Canadian forest products industry. *Strategic Management Journal* 26:159–80.
- Stokes, M. E., C. S. Davis, and G. G. Koch. 1995. *Categorical data analysis: Using the SAS System*. Cary, NC: SAS Institute.
- Tilley, F. 1999. Small-organization environmental strategy: The UK experience. *Greener Management International* 25:1–14.
- Turcotte, M.-F. 1995. Conflict and collaboration: The interfaces between environmental organizations and business organizations. In *Research in corporate social performance and policy: Sustaining the natural environment—Empirical studies on the interface between nature and organizations*, eds. J. E. Post, D. Collins, and M. Starik, supplement 1, 195–229. Greenwich, CT: JAI Press.
- US Environmental Protection Agency. 2001. *1999 Toxic Release Inventory: Public data release*. Washington, DC: USEPA, Office of Environmental Information. EPA 260-R-01-001.
- . 2008. *2008 Sector performance report*. Washington, DC: USEPA.
- Waddock, S. A., and S. B. Graves. 1997. Finding the link between stakeholder relations and quality of management. *Journal of Investing* 6:20–4.

- Zhu, Q., and J. Sarkis. 2004. Relationships between operational practices and performance among early adopters of green supply chain management practices in Chinese manufacturing enterprises. *Journal of Operations Management* 22:265–89.
- Zhu, Q., J. Sarkis, and Y. Geng. 2005. Green supply chain management in China: Drivers, practices and performance. *International Journal of Operations and Production Management* 25:449–68.
- Zutshi, A., and A. S. Sohal. 2004. Adoption and maintenance of environmental management systems: Critical success factors. *Management of Environmental Quality: An International Journal* 15: 399–419.