VOLUNTARY ENVIRONMENTAL INITIATIVES:
SPONSORSHIP AND STAKEHOLDER INVOLVEMENT

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Thesis submitted to the Faculty of the Virginia Polytechnic Institute and State University
in partial fulfillment of the requirements for the degree of

Masters in Urban and Regional Planning

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August 6, 2002
Blacksburg, Virginia

Keywords: Voluntary environmental initiative, sponsor, stakeholder participation.

Voluntary Environmental Initiatives: Sponsorship and Stakeholder Involvement

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Abstract

Voluntary environmental initiatives (VEIs) promise to provide firms and facilities additional flexibility and motivation in managing their environmental affairs in part by reducing compliance and enforcement costs and improving their public image. As a result, since 1990, over 13,000 organizations have participated in more than 100 US and international VEIs. In order for these initiatives to be successful, they need to be implemented following good practice guidelines, reliable enforcement mechanisms, appropriate monitoring, reporting, transparency, and public information availability. All of these activities may be contingent on high levels of stakeholder participation. Little is known, however, about how different stakeholders have been involved in the development of these programs and how this participation varies for different types of VEIs. By conducting an Internet based survey to 63 VEI managers, this research examines the diversity and intensity of stakeholder participation in the design and implementation of VEIs relative to sponsorship.

This study concluded that VEIs developed by a partnership between different organizations had the largest number of different types of stakeholders involved. Yet, industry and government sponsored initiatives had a number of different types of participants very close to what occurred in the design of partnership VEIs. Third-party initiatives had the lowest diversity of participants involved in the design of their programs. This pattern illustrates that the VEI sponsors traditionally more susceptible to criticism in terms of credibility are the ones more concerned with stakeholder involvement in the development of their initiatives.

As for the role of specific stakeholders, it was observed that government sponsored VEIs had a higher degree of involvement from industry associations than from any other stakeholder. Even if the degree of involvement by non-profit organizations was not considerably lower than by industry associations, the existing difference supports the critique that government VEIs are generally developed in a tighter cooperation with the private sector and sometimes without the collaboration of the civil society. As for third-party initiatives, it was observed that the industry sector had a higher degree of involvement than the government.

Acknowledgments

I would like to thank Dr. JoAnn Carmin and Dr. Nicole Darnall for the opportunity to share their research on Voluntary Environmental Initiatives. Special thanks to Dr. Joann Carmin for her insightful supervision. I am also grateful to the other members of my thesis committee, Dr. Maria Papadakis and Dr. Alnoor Ebrahim, for their helpful counsel and guidance. I gratefully acknowledge financial support from Fundação Luso-Americana para o Desenvolvimento and Fundação para a Ciência e Tecnologia.

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CHAPTER I

Introduction

In the last half of the 20th century, companies guided their environmental policy by what they were demanded by law. In the last decade, the emergence of a new movement that is trying to change not only the polluters' practices, but also its underlying values is revolutionizing the actual environmental policy system. Voluntary Environmental Initiatives (VEIs) have been increasing in number, with the promise of providing businesses with additional flexibility and motivation to tailor environmental reduction goals, while reducing both compliance and enforcement costs, and improving the business's image in the eyes of the public. VEIs can be broadly defined as, "voluntary commitments from polluting firms or industrial sectors to improve their environmental performance" (Leveque, 1998: 2). VEIs are based on the assumption that the responsibility to formulate environmental policy can be shifted to the private sector. Their goal is to foster decentralized use of measures that are environmentally effective and economically efficient, and that allow for the development of actions that fit individual needs and circumstances of the participants (e.g. Business and Industry Committee to the OECD, 1998; EPA, 2001b; Segerson and Miceli, 1997)).

In the United States (US) VEIs have been mainly sponsored by governmental regulatory agencies like the Environmental Protection Agency (EPA). However, VEIs can also be sponsored by industry associations, by third-party organizations or by partnerships between government, private and non-profit sectors. In 1999, the Organization for Economic Co-operation and Development (OECD) reported the existence of 300 negotiated agreements in European Union (EU) countries, 30,000 local pollution control agreements in Japan, and over 40 voluntary environmental programs managed by the US at the federal level (OECD, 1999). Other countries such as New Zealand, Canada, Australia also started implementing VEIs. The reason for this sudden interest in voluntary approaches is closely related to the potential benefits that have been connected to their application. These benefits generically include flexibility, lower costs, speed in establishing and amending rules and structures, avoidance of jurisdictional concerns, potential for positive use of peer pressure, internalization of responsibility, and informality (DeClercq *et al*, 2001; Webb and Morrison, 1997; Business and Industry Committee to the OECD, 1998; EPA, 2001b; Segerson and Miceli, 1997).

In order for voluntary approaches to be effective, they need to be implemented following good practice guidelines, including stakeholder participation, reliable enforcement mechanisms, appropriate monitoring, reporting, transparency, and public information availability (e.g. EEA, 1997; Collins, 2002). More important, to guarantee the acceptability of VEIs, it is essential to ensure that they have stringent targets that can ensure real progress in achieving environmental goals. One of the biggest critiques pointed out in the use of VEIs, is the lack of public participation in its design and implementation, that may lead to poor environmental targets (Friends of the Earth, 2002).

Government agencies, mainly EPA through its Reinvention Environmental Protection Program, claim significant efforts on the development of partnerships with the private and non-profit sector, supported by improved stakeholder involvement (United States General Accounting Office, 1997b; United States General Accounting Office, 1997a; EPA, 1999; EPA, 2001a; EPA, 2002c). Programs such as Project XL or the Common Sense Initiative, sponsored by EPA, have clearly demonstrated the existence of successfully implemented programs with the support of stakeholders (EPA, 2000b; EPA, 2000c). However, it has not been demonstrated that these efforts were also taken in other government initiatives. Another important point is the fact that the non-profit sector, mainly through environmental groups, has raised some suspicion over industry initiatives, as the public is generally not very receptive to a type of environmental tool that asks the private sector to regulate itself (Potier, 1994). Also, partnerships between the government and private sector that are developed without the collaboration of civil society contribute to the mistrust of the use of this type of environmental tool (Friends of the Earth, 2002).

Unlike other environmental policy tools, such as environmental taxes and tradable permits, that have benefited from extensive theoretical research, VEIs have been designed and implemented by practitioners with little guidance from formal theory (Paton, 2001). The growth that voluntary initiatives have achieved in the last decade, particularly in the US and in the EU, has attracted the attention of several researchers. A small but growing theoretical and empirical literature on the use of VEIs has emerged recently. The primary focus of this literature has been to explain the economic and environmental advantages that result when firms and regulators join and implement VEIs (Delmas and Keller, 2001; United Nations Global Compact Network, 1999; Paton, 1999b). However, in order for VEIs to contribute significantly to a more effective environmental policy, considerable advances in the design and development of VEIs are necessary (Maxwell and Lyon, 1999).

There has never been a rigorous study exclusively dedicated to assessing the differences in program design and implementation of VEIs. Further, there is clearly a gap in the literature in terms of the role played by stakeholders in the creation, design and implementation of VEIs. This research project therefore assesses the relationship between the type of sponsor of the VEI (the actors who initiated and financed a program - government, industry, third-party or partnerships) and the intensity and diversity of stakeholder participation in the design and implementation processes of the VEI. Intensity of participation represents the degree of involvement of the different stakeholders in the VEI development. Program administrators ranked the intensity of participation of each stakeholder as "None", "Very Low", "Somewhat Low", "Somewhat High", and "Very High". Diversity of participation was defined as the number of different stakeholders involved in the VEI development, operationalized by counting the number of different types of stakeholders that had an intensity of participation different from "None".

This research contributes to the theoretical understanding of the importance of stakeholder involvement and its relation with the sponsor of the VEI. At a policy level, this research may help regulators and agency officials to better understand the degree of public participation in the development of VEIs. Such information may give decision-makers a stronger background when deciding whether to support the implementation of a particular voluntary initiative, and while working on the development of new voluntary approaches and guidelines to assist other organizations in implementing their own initiatives.

To address the relation between VEI sponsorship and intensity and diversity of stakeholder participation, an Internet survey was conducted. This "VEI Survey" was developed by a joint venture between the Department of Urban Affairs and Planning at Virginia Tech and the Department of Political Science and Public Administration at North Carolina State University. A total of 111 VEIs were contacted and 63 program managers responded to the survey for a response rate of 58 percent. The majority of the responses received were from government sponsored VEIs (60 percent). Third-party and partnership VEIs were each responsible for fourteen percent of the responses and industry VEIs for eleven percent.

The following research questions and hypothesis were specifically analyzed:

Research Question 1 - Which type of sponsor includes the greatest variety of stakeholders in the development of VEIs?

Hypothesis 1 - Government sponsored initiatives will have a higher diversity of stakeholders participating in the design of VEIs than industry or third-party sponsored initiatives.

Hypothesis 2 - VEIs sponsored by partnerships will have the highest diversity of stakeholder involvement in the design of VEIs.

Hypothesis 3 - Industry initiatives will have the lowest diversity of stakeholder involvement in the design stage of the VEI.

Research Question 2 - From among those involved, which stakeholder groups are more likely to work with each category of VEI sponsor in the design phase of the initiative?

Hypothesis 4 - Industry associations will be the stakeholders with the highest intensity of participation in the design of government VEIs.

Hypothesis 5 - Federal government and industry associations will be the stakeholders with the highest intensity of participation in the design of partnership VEIs.

Research Question 3 - Which type of VEI sponsor is associated with a higher intensity of participation by the non-profit sector?

Hypothesis 6 – From among all sponsors, government initiatives will have the highest intensity of participation by the non-profit sector in the design of their programs.

Hypothesis 7 - Industry sponsored initiatives will have the lowest intensity of participation by the non-profit sector in the design of their programs.

Research Question 4 - Which type of VEI sponsor is associated with a higher intensity of participation by industry associations and for-profit firms?

Hypothesis 8 - Government initiatives will have the highest intensity of participation by firms and industry associations in the design of their programs.

Hypothesis 9 - Because of the traditional adversarial positions, third-party initiatives will have the lowest intensity of participation by firms and industry associations in the design of their programs.

The conclusions of this research provide information in terms of the diversity of stakeholders involved with each VEI sponsor and information on the sponsors that are more likely to work with certain stakeholders. In terms of the number of different types stakeholders involved, it was observed that VEIs developed by a partnership between different organizations had the largest diversity of stakeholders involved (Hypothesis 2 was supported). Yet, industry and government sponsored initiatives had a diversity of participants very close to what occurred in the design of partnership VEIs. Third-party initiatives had the lowest diversity of participants involved in the design of their programs.

If partnership initiatives by their nature are developed by a group of different types of stakeholders, the fact that they have the largest diversity of participation is somewhat expected. Perhaps more surprising is the fact that government and industry VEIs had a diversity of stakeholders involved close to what occurs with partnership VEIs and significantly higher than third-party VEIs. The implementation of VEIs has been criticized (e.g. Baeke, DeClercq, and Matthijs, 1999; Droll, 1998; Gibson, 2000; UNEP, 2000; Webb and Morrison, 1997; Davies *et al*, 1996; Segerson and Miceli, 1998; DeClercq *et al*, 2001) on the basis of, for example, less likelihood of rigorous standards being developed. Traditionally, government and industry, together or separately, are the sponsors less credible, and commonly their initiatives are accused of remaining as good intentions, lacking an authentic implementation, or being designed according their sponsors own priorities (UNEP, 1998b; Pollution Probe, 1999; Friends of the Earth, 2002; Borkey and Leveque, 1998; Labatt and Maclaren, 1998). Theoretically, it is likely that third-party VEIs are the ones less susceptible to criticism, as the motivation of their sponsors are different from either the public or private sector. Therefore, the results reflect that sponsors that traditionally are more susceptible of being criticized, are the ones more concerned in involving more types of stakeholders in the development of their programs.

Government VEIs are the most common type of U.S. initiatives. They have been criticized for being developed in tight cooperation with industry associations, but without other forms of public involvement (e.g. Paton, 2000; Maxwell and Lyon, 1999; EEA, 1997; UNEP, 1998b; Krarup, 1999). The results from this research project support this idea since government initiatives have a higher intensity of participation from industry associations than from any other stakeholder. Yet, non-profit organizations also have a significant intensity of participation in the design of governmental initiatives. As governmental programs are typically designed exclusively for participation by industry, it can be considered normal that industry associations have a higher intensity of participation in the development of governmental VEIs. However, associated with these straight collaboration between government and industry are critiques of unacceptably weak targets, or lack of transparency and openness in the development of VEIs (Mazurek, 1999a; Paton, 2000; Maxwell and Lyon, 1999; EEA, 1997). It would be beneficial for the successful implementation of government initiatives (and other types of initiatives) if there were no threats of criticisms towards their trustworthiness. In order to ensure the acceptability of any VEI, several authors (Jenkins, 1995; OECD, 1999; Muldoon, 1999; Gartelmann, 2002) state that a stronger participation by representatives of the non-profit sector is required at all stages of development, implementation, verification and review of VEIs in order to establish their credibility.

As for third-party initiatives, it was observed that the industry sector had a higher degree of involvement than the government. This fact supports Rondinelli and London's (2001: 2) argument that environmental groups are beginning to recognize that by working collaboratively with corporations to solve environmental problems, they might be more successful than attacking them on corporate policies through the media.

CHAPTER II

Background and Characteristics of VEIs

Environmental Policy and the Path to Voluntary Approaches

Environmental management and policy in the United States (US) started more than a century ago. The period from 1890 to the 1950 was characterized by the concern for proper use of natural resources, and on the preservation of natural areas. This early stage of environmental policy has been referred to as the "Land Preservation Era" (Morelli, 1999). The first stage of environmental policy lasted approximately 60 years. However, in the last three decades it went through three new policy changes. In OECD countries, during the middle 1960s, a new generation of environmental policy instruments arose, that focused on environmental regulation. This new approach was based on a philosophy of attacking pollution and the degradation of natural resources as, "crime and punishment," where an external regulator sets standards with which industry must comply and punishes those that don't (Gartelmann, 2002) (Kraft and Vig, 1999b).

This type of regulation however, has tended to focus almost exclusively on pollution control and especially end-pipe pollution control, rather than on the management of economic and environmental interests. This policy approach gave rise to extensive legislation during the 1970s, commonly known as command-and-control regulation, where issues such as efficiency of resource use, non-point sources of pollution, overall consumption levels, type of resources used in the production process, and the decision-making process were not taken into account (Higley, Convery, and Leveque, 2001; Gartelmann, 2002; Kraft and Vig, 1999b; Long, 1997; Karamanos, 2001). Instead, standards (with regard to processes, equipment, staffing and emissions), penalties for non-compliance, and administrative procedures were prescribed to control pollution and wastes from industrial facilities (Barde, 2000). These standards are enforceable by law. If a firm does not comply with the environmental regulations, it can be charged in the courts as a result of its delinquency (Higley, Convery, and Leveque, 2001). Since the middle 1970s, this type of regulation has remained the tool of choice for governments, mainly because when properly enforced, it offers a high degree of assurance that the objective will be achieved (Long, 1997). However, while this type of approach was being more widely adopted, industry became increasingly resistant to its use, mainly because of the administrative burdens and economic costs they were encountering, in order to comply with environmental regulation (Boger and Stackpole, 1998; Long 1997; Kraft and Vig, 1999a; Gartelmann, 2002). Also, in terms of environmental effectiveness, this type of approach is often considered to be misdirected (focusing excessively on some problems and forgetting others), not addressing the environmental problems as a whole but in separate parts (e.g. land, air, water, hazardous waste and toxics), responsible for stifling innovation and being productive inefficient. It is also narrow in the sense that it focuses excessively in point source pollution while ignoring the service sector, agriculture, and other non point sources (Miller, 1999).

Partly because of industry opposition, triggered by the command-and-control regulation implications for trade, competitiveness, investment and employment of domestic regulation (Morelli, 1999), and also because of economists' critiques of its costliness and inflexibility (Lyon and Maxwell, 2001; Spence and Gopalakrishnan, 2001), in the mid 1980s environmental regulation entered what can be considered a new stage. Several OECD countries began to reform programs aimed at rationalizing and improving regulatory instruments and procedures. This led to the rise of market-based strategies, which included charges, deposit-refund systems, emissions-trading programs, tradable permits, environmental liability and environmental taxes (Segerson and Miceli, 1997; Karamanos, 2001; Barde, 2000). The objective of these new policy tools was both to promote technical innovation and to improve the economic efficiency and environmental effectiveness of the policy instruments (Long, 1997).

Even after the implementation of marked-based strategies, the criticism over the structure of environmental regulations continued to intensify. During the 1990s, the cost-effectiveness of regulatory instruments continued to be questioned (Long, 1997), while industry was facing tightening international competition, and governments were finding it increasingly difficult to use direct regulation to control non-point source pollution or to deal with global issues like global warming (Potier, 1994; Collins, 2002). EPA has been facing tremendous difficulties to implement the complex environmental laws passed by the US Congress, that include the setting of thousands of discharge standards, the establishment of monitoring standards, allowing only for a short period of time for the completion of these tasks (Maxwell and Lyon, 1999). As a consequence, national environmental groups such as Sierra Club and the Natural Resources

Defense Council, began to sue the EPA for failure to enforce its own regulations (Maxwell and Lyon, 1999).

The step to another level of environmental policy was about to be taken. In March 1995, President Clinton issued a report, "Reinventing Environmental Regulation," with the slogan, "cleaner, cheaper, smarter" that was a keystone in the development of a new approach towards environmental policy. The report encompassed initiatives that include the elimination of obsolete environmental rules, the use of innovation and flexibility to achieve better environmental results, and the encouragement of self-policing by companies and voluntary agreements (Barde, 2000). At the same time, relations between government and industry started to change, and the confrontational attitudes of the last two decades gave room to a more collaborative approach. The private sector was starting to realize that the environment was not just a constraint on its business operations, but it also offered prospects of new market opportunities (Potier, 1994).

In the beginning of a new century, these changes in attitude and the President Clinton's guidelines gave environmental policy a push to the edge of a new generation. This new reform was assigned to guide policy-makers to use a more intensive and comprehensive approach to improve the quality of actual environmental regulation (Long, 1997), and to search for an optimized mix of policy tools, that links command-and-control instruments with economic incentives, and the newly emerged voluntary environmental initiatives (VEI) (Karamanos, 2001; Lyon and Maxwell, 2001). The following sections examine the different types of VEIs implemented all over the world, their goals, and the advantages and disadvantages of the adoption of this type of tool in contrast to traditional command-and-control regulation.

Types and Characteristics of VEIs

Voluntary environmental initiatives, which are also known as voluntary environmental programs, voluntary codes, environmental agreements, self-regulation, or business-led environmental strategies (Baeke, DeClercq, and Matthijs 1999; Carraro and Siniscalco, 1999; Lyon and Maxwell, 2001; OECD, 1999; United Nations Global Compact Network, 1999), are broadly defined as a voluntary commitment from polluting firms or industrial sectors to improve their environmental performance (Leveque 1998: 2). More recently, other definitions take into account the existence of VEIs that do not target specifically the industry sector, but other type of participants such as services.

Different taxonomies have been created based on several characteristics that differentiate VEIs (Bailey, 2000). The OECD (1998) developed a taxonomy based on the method of target or goal setting, the type of participant commitment, the degree of regulatory (or fiscal) threat, and the types of participation incentives. Delmas and Keller (2001) created three categories that differentiate VEIs based on the type of environmental targets. Hansen (1999) categorized voluntary initiatives based on the degree of public involvement. Finally, Segerson and Miceli (1997) developed a taxonomy based on the incentive mechanism to enter a VEI.

A classification system that has been widely used is the approach by Leveque (1998) which distinguishes four types of VEIs based on who developed the program and type of negotiation with participants (Baeke, DeClercq, and Matthijs, 1999): (1) Unilateral initiatives are actions to improve environmental performance set up by firms themselves and communicated to their stakeholders (e.g. Hewlett-Packard's Product Stewardship program, Ford Motor Company supplier standards); (2) Private codes include initiatives by industry associations, non-government organizations and standards organizations (e.g. Responsible Care program, CERES, ISO 14000); (3) Voluntary challenges are government sponsored programs that encourage firms to improve environmental performance and receive public recognition for their efforts (e.g. Green Lights, Energy STAR, 33/50 and Climate Wise); and (4) Negotiated agreements are contracts reached between government and industry (Paton, 2000; Ameels, Suck, and DeClercq, 2000; Nash and Ehrenfeld, 1997)

In terms of characteristics of voluntary approaches, probably the most important is volunteerism, meaning that the firms, industries or organizations (the polluters) that enter into this approach do so on a voluntary basis without formal obligation put upon them by the government (non-statutory initiative). Other important characteristics are that there are no penalties for non-participants and usually no penalties for terminating participation. Accordingly, while both the VEI sponsor and the participant have the common goal of improving environmental quality or natural resource utilization, VEI participants have a greater degree of freedom to act in comparison to command-and-control regulation, (Baeke, DeClercq, and Matthijs, 1999; Karamanos, 2001; Labatt and Maclaren, 1998).

VEIs are not required by legislation, and agreements are often made among the corporate sector (companies and trade associations), public sector (local, state, or federal governments, as well as their agencies) and/or non-profit sector (environmental groups and community groups) (Karamanos, 2001; Carraro and Siniscalco, 1999). Voluntary approaches can range from voluntary self-commitments, informal understandings or pledges of over compliance, to negotiated environmental agreements in the form of a formal document such as a contract, a memorandum of understanding, or a letter of intent (Baeke, DeClercq, and Matthijs, 1999; Karamanos, 2001). Under voluntary initiatives, statutory sanctions ensuring the compliance of the agreements do not exist. Instead, the implementation of the agreements is shifted to the corporate sector, by inducing them to comply through threats of new command-and-control regulation in the area (Hansen, 1999). VEIs may also vary in terms of the content of the agreements. Several elements that can be found individually or aggregated are setting of objectives, definition of principles, implementation of guidelines, assessments and reporting (Business and Industry Committee to the OECD, 1998).

While participants, content, and types of voluntary initiatives vary widely, they all have some basic characteristics in common (Barth and Dette, 2001). The most important of which is that participants adopt new forms of environmental behavior that are systematic in approach and broad in scope. The corporate sector is being pushed in directions that are different from those required by traditional environmental regulation. This pressure is not in response to Congressional mandate, but it reflects emerging public concerns about corporate environmental conduct that hold the promise of safeguarding the environment more efficiently (Nash and Ehrenfeld, 1996).

Through their voluntary nature and flexibility, VEIs can offer innovative solutions and reduce command-and-control regulation (Business and Industry Committee to the OECD, 1998). However, it is very important to realize that these do not have to be seen as "stand alone" measures. By being always one step beyond existing environmental regulations in terms of environmental stringency (United Nations Global Compact Network, 1999), VEIs can be used as a supplement to command-and-control regulation, and can serve as an efficient tool to implement politically defined objectives to ensure the goal of improving environmental quality or natural resource utilization (Business and Industry Committee to the OECD, 1998).

Goals of VEIs

Unlike market-based instruments or command-and-control regulation, voluntary initiatives have been developed primarily by policy makers and the corporate sector with the main goal of providing pragmatic responses to new policy problems. In general, their objective is to create more flexible ways to achieve improved environmental performance and to take into account the concerns on industrial competitiveness and on the increasing administrative burden of three decades of command-and-control-based environmental policy (OECD, 1999).

Examples of VEI objectives range from the intention to contribute to national environmental targets (i.e. agreements to reduce $C0_2$ emissions), to management tools to improve the efficiency of operations like the implementation of Environmental Management Systems (EMS), to the development of markets for new technologies such as energy or emissions savings. Other objectives include the improvement of consumer choice through eco-labelling, codes of conduct that reflect environmental concern, and the improvement of public awareness, transparency and public relations (ECOTEC Research and Consulting, 1999).

VEIs with different types of objectives are, for example, the Water Alliance for Voluntary Efficiency (WAVE), The Recycled Paper Coalition and Energy Star. WAVE is a governmental VEI dedicated to water conservation by helping the hotel industry change certain practices and install water-saving devices (EnviroSense, 1994). The Recycled Paper Coalition is a partnership between several industries that aim to conserve natural resources and reduce waste by purchasing "environmentally-preferred" paper products and by maximizing the efficient use of paper (Recycled Paper Coalition, 2002). Energy Star is a government sponsored labeling initiative dedicated to the promotion of building and product design and practices that maximizes energy efficiency (EPA, 2002).

In terms of VEIs' role in environmental policy, their main goals are to reduce both compliance and enforcement costs and to provide businesses with additional flexibility and motivation to tailor environmental management approaches to their specific needs (Business and Industry Committee to the OECD, 1998; EPA, 2001b; Segerson and Miceli, 1997). The objectives include the development of cost-effective and clean production methods, the encouragement of companies to respond to environmental demands, the promotion of partnerships between the corporate sector, public authorities and the non profit sector, allowing a quicker and smoother achievement of environmental objectives and reduced administrative burden (Business and Industry Committee to the OECD, 1998).

Advantages and Disadvantages of VEIs

The rapid increase in the number of VEIs both in the European Union and in the US during the 1990s can be explained by the advantages of voluntary approaches over the more traditional environmental policy instruments (DeClercq *et al*, 2001), and by the advantages that the different stakeholders benefit from participating in a VEI.

VEIs and the Traditional Regulatory System

If voluntary approaches were expected to transform environmental policy, it is far from being proven. In the last decade they became an increasingly popular tool for ensuring environmental protection, however it is still not possible to guarantee the effectiveness of these initiatives. The truth is that VEIs like traditional regulatory instruments both have advantages and disadvantages. Table 1 illustrates the differences between both traditional and voluntary approaches. Command-and-control approaches tend to be advantageous, for example in terms of visibility, credibility, accountability, greater likelihood of rigorous standards being developed, and cost spreading. On the other hand, they tend to be highly formal, expensive to operate, may foster adversarial relations, have limited scope, and usually are difficult to develop and amend. The main potential advantages of voluntary initiatives include their flexibility, lower cost, quickness, avoidance of jurisdictional concerns, and informality (Baeke, DeClercq, and Matthijs, 1999; Gibson, 2000; UNEP, 2000; UNEP, 1998b; Segerson,1999 ; Segerson and Miceli, 1997; Droll, 1998; DeClercq *et al*. 2001; Business and Industry Committee to the OECD, 1998; EPA, 2001b).

Typical drawbacks of voluntary approaches are for example lower visibility, credibility, difficulty in applying the rules to free riders, less likelihood of rigorous standards being developed, uncertain public accountability, and a more limited array of potential sanctions (Baeke, DeClercq, and Matthijs, 1999; Droll, 1998; Gibson, 2000; UNEP, 2000; Webb and Morrison, 1997; Segerson and Miceli, 1998; Davies *et al*, 1996; DeClercq *et al*, 2001).

Table 1 – Differences in Key Characteristics Between Traditional Regulation and VEIs

Characteristics	Traditional Regulation	Voluntary Initiatives
Visibility	High	Lower - but depends on procedures such as fees, actions to non-compliance, monitoring or public reporting requirements
Cost	High - but spread across society	Lower - but supported by a small group
Accountability	High	Lower - depends on requirements in monitoring and public reporting
Credibility	High	Tends to be lower
Sanctions for non-compliance	May include coercive measures	May be more limited
Formality	Normally high	Variable
Likelihood of Rules Being Followed	High - few wish to be seen in violation of the law	Low - pressure to comply comes from peers and market perceptions

Based on Webb and Morrison (1997)

Despite the advantages and disadvantages of the two policy instruments, it has been argued that both can and should operate concurrently, and in complementary ways (Webb and Morrison, 1997). It is also unlikely that VEIs could ever be effective without a background regulatory framework (Gartelmann, 2002). Even if VEIs prove ineffective, they can nevertheless provide a useful start for regulatory initiatives (Webb and Morrison, 1997). According to Gartelmann (2002), voluntary initiatives appear to be well-accepted approaches to achieve environmental performance gains, but should remain part of an overall spectrum of environmental management tools. Which means, they are not an alternative to command-and-control approaches, but complementary to them, and are unlikely to be effective without a background regulatory framework. According to the European Environmental Agency (EEA) (2002), voluntary approaches follow the current trends of consensus-building and participatory processes, complementing the traditional command-and-control approach with their ability to increase environmental awareness, create consensus and to provide support for information-sharing by the different stakeholders.

Advantages and Disadvantages of VEIs for Stakeholders

In relation to more traditional environmental regulatory approaches such as command-and-control regulation, or even market-based policy instruments, several critiques have been pointed out. Traditional regulation focus on end-of-pipe solutions such as emissions targets, leaving polluting products and processes unchanged. In contrast, voluntary approaches concentrate on correcting or preventing environmental problems through organizational reforms or enhanced production processes (Collins, 2002). This difference in approach creates several advantages and disadvantages for the stakeholders involved.

For polluters, traditional command-and-control regulation imposes solutions that have high cost and are inefficient and that may also reduce their capacity to respond quickly to new challenges with regard to process and product development. Even if properly designed and administered, taxes and charges can elicit an efficient response. However, the corporate sector has always the on-going cost of paying the tax or charge, or paying for the permit (Higley, Convery, and Leveque, 2001). As for the governmental sector (government and environmental agencies), command-and-control regulation can be technically and administratively difficult to implement (Marcus, Geffen, and Sexton, 2001). It is not easy to realistically know what is possible to achieve and at what cost, and it can be very expensive and time consuming to go through legal procedures in the event of non-compliance (United States General Accounting Office,1997b; United States General Accounting Office, 1997a).

Table 2 summarizes the advantages and disadvantages of VEIs for different stakeholders. For government, VEIs have the benefit of possibly reducing agency administration and enforcement costs associated with traditional regulation. They may also accelerate the implementation of environmental policies (Karamanos, 2000; Cabugueira, 2000). On the other hand, VEIs may create problems for the public sector by increasing the risk of regulatory capture or by decreasing the credibility of the environmental policy (Ameels, Suck, and DeClercq, 2000).

For the private sector, there are also several incentives that attract their participation, for example: economic savings, financial assistance, competitive advantage and public recognition (Schmelzer, 1999; Darnall, 2001; Brau and Carraro, 2001; Conroy, 2001; Karamanos, 2000; NCPA, 2002). Examples of disadvantages are investment costs or the risk of free riders (those that get the benefits of participating in a VEI but fail to adequately fulfill their obligations). As for incentives for third-parties, the most important should be the increase of interactions with other stakeholders, particularly the private sector (Conroy, 2001; Karamanos, 2000).

Table 2 – Advantages and Disadvantages of the Adoption of VEIs

	Main Advantages / Incentives	Main Disadvantages / Costs / Risks
For Public Authorities	Information disclosure by the participant firms	Risk of regulatory capture
	Efficacy and efficiency of the environmental policy	Costs of monitoring environmental performance
	Encouragement of pro-active attitudes by the participants	Restrain commitment on future governments and governmental freedom
	Higher consent	Bureaucracy
	Incentives to innovation and technological transfer	Credibility depends on the setting of demanding standards
For Industry	May avoid, affect or delay coercive regulation	Small and medium-sized companies that cannot afford the necessary investments
	Flexibility in reaching the environmental goals, cutting down times and costs	Negotiation, implementation, monitoring and public reporting costs
	Improved public image	Increased chance of sanctions for non-compliers
	Innovative technological solutions	Loss of competitive advantage
	Use of cost-effective customized solutions	Risk of free-riders
	Staff motivation	Unpredictable effects on third-parties
For Third-Parties	Increased influence on industry's behavior	Difficult and expensive to participate and monitor

Based on Ameels, Suck, and DeClercq (2000)

VEIs Around the World

VEIs represent a new environmental policy tool, which presents many potential benefits that make them very attractive to the corporate, governmental, and non-profit sectors. As a result, it is no surprise to see the growth of these initiatives in so many countries, such as the United States, the European Union and Japan. Although the most significant growth in the number of VEIs only occurred during the last decade, the first VEIs appeared during the 1960s and 1970s (Karamanos, 2001). In the US, there are more than 40 VEIs managed at the federal level (Mazurek, 1999a). There are also records of the existence of 300 negotiated agreements in EU countries. Japan has made a significant use of local voluntary pollution control initiatives and 30,000 programs have been implemented so far (Sugiyama, 1999; Tsutsumi, 2001). Other countries such as New Zealand, Canada and Australia also started implementing VEIs (Karamanos, 2001; OECD, 1999).

Most voluntary environmental programs in the United States have been designed and implemented by the US EPA (e.g. Project XL, Energy Star, and Common Sense Initiative), although the industrial sector has also been involved in the development of a number of voluntary programs such as Responsible Care (EPA, 2001b; Orts and Deketelaere, 2001). VEIs can also be found at other levels of environmental policy design. At the local level, there are neighborhood cleanup and recycling programs, while at the international level, programs such as European Eco-Management and Audit Scheme (EMAS) and ISO 14000 have been implemented (Collins, 2002).

Within the U.S., between 1988 and 1999, 42 national voluntary initiatives have been developed by the EPA and industrial trade organizations (Mazurek, 1999a). By the year 2000, the EPA was projecting that more than 13,000 firms, non-government organizations, and state and local regulatory agencies would participate in voluntary EPA initiatives (Mazurek, 1999b). In 2002, EPA's Partners for the Environment included nearly 11,000 businesses, trade associations, citizen groups, state and local governments and universities (EPA, 2002e). Because of the importance of the EPA on VEI implementation, for the most part VEIs in the US are considered government voluntary programs. EPA, independently or in conjunction with other federal agencies, administers 33 of the 42 voluntary nationwide initiatives in the U.S. (Mazurek, 1999a). The Commission for Environmental Cooperation (1998: 143) commented on the growth of voluntary approaches in the US regulatory system stating, "Not very long ago, the observation that environmental regulatory systems in the US appeared to be moving from traditional command-and-control instruments to a more inclusive "compliance" philosophy might be regarded as perceptive. The same observation today would merely be trite, so quickly has this movement taken hold."

According to Collins and Starik (2001), US voluntary environmental programs design and implementation have been criticized by various stakeholders: first by environmental groups suspecting that voluntary initiatives were industry's attempt to avoid regulatory requirements, and, on the other side, by some Republicans in the Congress that viewed voluntary initiatives as an effort to push public policy forward without a legislative check.

In the EU, VEIs began to emerge in the 1980s and exhibited strong growth in the 1990s (Hontelez, 1998). During the period 1982 to 1986, 23 new initiatives were created, while during 1992 to1996, 300 initiatives were formed (Karamanos, 2001). Also, European firms have led the world in the implementation of programs such as ISO14000 and the Global Reporting Initiative (Paton, 2001). Since the beginning of the 1990's, the use of VEIs has become more common in practically all EU countries. All but one of the 15 countries has experience with voluntary approaches as a policy tool (Segerson and Miceli, 1998). According to Borkey and Leveque (1998) different types of VEIs exist in the EU, with their main distinction being the degree of public intervention in the design of the initiative. Part of this strong interest of EU members in VEIs is fostered by the Fifth Environmental Action Program of the EU that identifies the need to diversify the environmental policy instruments and to extend the application of voluntary agreements (Karamanos, 2001).

In terms of contrasts with the US, EU Members mostly use VEIs that are negotiated between the corporate sector and public authorities. On the other hand, the US uses mainly VEIs that are unilaterally set by federal agencies to which firms comply individually and on a voluntary basis (Baeke, DeClercq, and Matthijs, 1999). These differences may be the result of differences in culture, historical experience with other forms of environmental policy, and the type of relationships between business and government (Paton, 2001). In the US, the diversity of regulatory authorities (federal, state and local) creates a complex overlay of laws that provide opportunities for challenge decisions in court. In contrast, it is argued that in most European Countries, regulators and regulatees have a history of more informal and cooperative environmental policy, that might make easier the implementation of negotiated VEIs (Delmas and Terlaak, 2001).

CHAPTER III

Design and Implementation of VEIs

The different types of voluntary approaches that exist around the globe are possibly a consequence of the different approaches of the parties affected by environmental policy. In Japan, the existence of thousands of VEIs designed and implemented at a local level may be a consequence of a pro-active attitude to deal with environmental problems at a small scale. In contrast, in the western world, the development of VEIs relies heavily on the initiatives taken by federal (US-EPA) or inter-governmental agencies (EU-EEA and UNEP). In the EU, these initiatives are mostly designed using a negotiation process between the public and private sector, that reflect a more cooperative approach, particularly by corporations and industry associations. In the US, the fact that most VEIs are designed and implemented almost exclusively by the federal government (EPA and DOE) reflects a more adversarial relation between public and private interests in terms of environmental policy development. This chapter illustrates the differences in characteristics of VEIs designed and implemented by different types of sponsors, as well as the importance of stakeholder participation in the development of voluntary approaches to environmental regulation.

VEIs and Sponsorship Characteristics

VEIs can be categorized based on several characteristics (e.g. Bailey, 2000; OECD, 1998; Hansen, 1999; Segerson and Miceli, 1997; Leveque, 1998; Paton, 2001). Diversity in types of VEIs is essential to meet different types of goals, which may vary according to social, economic and environmental contexts. This diversity also makes the classification of voluntary initiatives difficult. One of the characteristics that distinguish VEIs is their sponsor. This type of classification is essential explaining the level of stakeholder participation in the design and implementation stages of the development of a VEI. UNEP (2000) and Lynes and Gibson (1998) developed two examples of taxonomies based on the parties involved in the design and implementation of VEIs.

The first example by UNEP, classifies VEIs into five main categories, based on which stakeholders are involved in the design of the initiative:

- Industry initiatives: When an industry or company unilaterally decides the characteristics of the initiative, including what goals to meet, how to meet them, and whether or how to monitor and report progress publicly. This type of initiative may be industry specific, or may involve several types of industries. Other stakeholders may also be involved in the design process as consultants.
- Government initiatives: Governments set the goals to be met and monitor the performance of the participants. Industry and other stakeholders usually participate as consultants.
- Joint government / industry (and tripartite) initiatives: Negotiated agreements between government and industry. The definition of the environmental targets and characteristics of the initiative implementation is negotiated between the governments and companies or industry associations. Other stakeholders usually have only a consultative role.
- Third-party initiatives: Non-government and non-business groups develop and run the initiative. Companies or industry associations can be involved in an advisory capacity.
- UN and other international voluntary initiatives: Programs that represent the moral authority of international commitments and globally accepted values.

Expanding on the UNEP definition, Lynes and Gibson (1998) defined VEIs not only by who was involved in the development of the initiative, but also on the type of participant. These authors identify six different VEI categories:

- Voluntary pollution control measures by individual firms: VEIs initiated by individual firms, with the goal of improving public image or cost savings. Typically this type of VEIs do not include the government sector.
- Government-to-industry pollution reduction challenges: Initiatives designed by the government sector, where the rules for compliance and monitoring requirements for firms are defined by the government.
- Performance agreements between industry and governments: A VEI similar to the government-to-industry type of initiative, that includes a more formal agreement that typically contains legally-binding obligations for the participants.
- Voluntary adherence to industry sector codes of practice: The environmental targets, and other provisions governing compliance, are defined by the private sector, mainly by industry

associations. Governments may act as advisors, but are generally not included.

- Business-to-business challenges, incentives and agreements: Initiatives designed to ensure that companies require other companies that they deal with to improve their environmental performance.
- Agreements between industry and non-government third parties: Initiatives designed in partnership between firms and non-government third parties, traditionally as a means of enhancing the credibility of industry initiatives.

Finnaly, Collins (2002) added to this typology an additional category identified by Paton (1999a):

- Cross-industry efforts: programs designed by industry to address environmental performance across a wider range of industries.

These different examples of classification systems based on who was involved in the design and implementation of VEIs illustrate that this type of policy approach can be developed by various sectors. These include the public sector (federal, state and local governments or agencies and inter-governmental agencies), the private sector (companies, industries, trade associations or similar groups), and the non-profit sector (such as environmental groups, community groups or other NGOs). In addition, VEIs can also be implemented through partnerships between different sectors such as the private and government sectors, private and non-profit sectors, government and non-profit sectors or even between all three sectors (Karamanos, 2001).

Government Sponsored VEIS

Government sponsored VEIs are ones in which government authorities determine environmental needs and set goals for industry to meet, providing the structure for individual companies to participate (UNEP, 1998b). Governmental bodies are usually also responsible for running the program, including monitoring, evaluating and providing public information. Industry is likely to be consulted or involved at a certain level on the design of the program, and third parties may have advisory or other indirect roles (Pollution Probe, 1999). Government VEIs can take the form of, for example, challenge programs, technology upgrade programs, ecolabelling programs, regulatory relief programs, award or prize programs, and research &

development and innovation programs (UNEP, 2000; UNEP, 1998b; Droll, 1998). These types of initiatives are usually much broader in terms of participants than industry initiatives.

So far, in the US, more than 7,000 organizations have participated in one of EPA's sponsored initiatives (EPA, 2000a). Usually these companies decide to participate after contacting a government agency such as EPA or DOE, and finding out how the program works and the type of benefits they get from participating. For some programs, participants are required to sign a participation agreement, that is not legally binding and that will help the participant commit to pursuing environmental improvements. Typically, by participating in an EPA VEI, participants expect to benefit from cost savings, public recognition and technical assistance (EPA, 2000a).

Authors have different opinions on whether government sponsored VEIs have more specific environmental targets than industry VEIs (UNEP, 1998b; Pollution Probe, 1999). According to Pollution Probe (1999), government initiatives create a higher level of concern among NGOs than do industry initiatives. This is because they often take the form of challenges (objectives that firms are invited to try o achieve), rather than firmly managed initiatives (where standards are strictly imposed). This fact raises concerns in terms of appropriateness, goal setting and the role of government in the development of VEIs.

Industry Sponsored VEIs

Industry sponsored VEIs are those in which industry has exclusive management responsibilities (including its financing, implementation, monitoring, verification and public communication) of the program itself. This type of initiatives appeared in the 1930s as private codes, charters, or self-commitments developed by private sources (Mondello, 1997). Industry initiatives may be set internally by individual companies (e.g. corporate Environmental Management Systems or corporate codes of conduct), or by industry associations (e.g. Responsible Care). Industry initiatives may also be considered cross-sectoral if they are guided for an heterogeneous group of participants such as the Business Charter for Sustainable Development, or industry specific if targets are set for a specific type of participants as is the case with Responsible Care (UNEP, 1998b). Other examples of industry sponsored VEIs are the American Forest & Paper Association's "Sustainable Forestry Initiative", the American Petroleum

Institute's "Strategies for Today's Environmental Partnership", and the National Paint and Coatings Association "Coatings Care" program (Kappas, 1997).

Within industry sponsored VEIs, governments have no formal role, which means that this type of initiative does not require major government investments of time and resources. Third parties may participate on the design of an industry initiative as advisors or through indirect roles (Labatt and Maclaren, 1998; Pollution Probe, 1999). The UNEP (1998b) criticizes industry initiatives on the basis that most of them remain as good intentions, lacking an authentic implementation by many companies, not monitoring environmental results, or any public prove that they are effectively working. Also, several concerns have been raised about the fact that industry sponsored initiatives might impose lower standards that those required by traditional regulation (Borkey and Leveque, 1998). Labatt and Maclaren (1998) went a step further and stated that industry has power to design environmental policies according to its own priorities rather than those expressed by environmental groups or other interested stakeholders.

Third-Party Sponsored VEIs

Third-party sponsored VEIs are developed by NGOs, standard setting organizations, or other types of community groups (Pollution Probe, 1999). These types of initiatives are generally few in number, and they vary significantly in type and effectiveness. While some are ignored by the industry, others have been equally, or more, influential that government or industry initiatives (UNEP, 1998b). Usually on the design of these initiatives, governments are limited to indirect or informal roles (Pollution Probe, 1999). Individual companies and industry associations may be involved in the development of third-party initiatives, and according to UNEP (1998b) the involvement of industry since the beginning of the design of the initiative can be crucial to ensure that they will end up by being participants of the VEI.

Jointly-Sponsored VEIs (Partnerships)

Partnership VEIs are designed in cooperation with other stakeholders, in order to find more efficient solutions to environmental problems (EPA, 2002b). Partnerships may include a wide variety of stakeholders from the public, private and non-profit sector. Commonly these stakeholders include EPA, industry associations, and environmental groups.

In terms of partnerships between different sectors, the cooperation between government and industry has created the largest number of joint initiatives. Examples of these VEIs are EPA´s Metal Finishing Strategic Goals Program and the Global e-Sustainability Initiative. This is consequence of a shift from an adversarial relationship to a more collaborative one between the public and private sectors (The Conference Board, 1998). With this type of VEIs, government and industry share responsibility for implementing and monitoring a program, in a process that usually involves some form of negotiation (EPA, 2002a; Pollution Probe, 1999). This negotiation process may involve different levels of government, firms or an entire industry sector. Agreements between the government and an entire sector usually give rise to free rider problems, while agreements between the government and a firm give more control to the government, reducing the transaction costs for companies and eliminate the free rider problem (Convery and Leveque, 2001).

Generally third parties are not involved on the design of joint government/industry initiatives or simply have an advisory or indirect role (Pollution Probe, 1999). According to (UNEP, 1998b), one of the limitations of these initiatives is the fact that many still fail to include third parties. The involvement of third parties on the design of VEIs would contribute to its public acceptance in terms of environmental effectiveness, and not for them to be seen as an effort to postpone new regulation. Paton (2000) points out that joint government/industry initiatives have the advantage of improving information flows between government and industry. This contributes to the awareness of new practices, leading to more flexible responses by both government and industry. On the other side, Paton claims that the difficulties in evaluating the environmental effectiveness of VEIs limit their credibility. The existence of successful and unsuccessful partnerships between the government and industry is explained by Paton (2000) by the existence of problems in the design and implementation of the VEIs, rather than intrinsic problems in the voluntary approach concept.

Stakeholder Participation in the Development of VEIs

VEIs can be unilaterally implemented, usually by a governmental agency that designs a program that companies are invited to join, by an individual company or industry association, or by a third-party. Negotiated agreements can also be implemented, most commonly by the public sector and the polluters, or through the involvement of other stakeholders (Convery and Leveque, 2001; Leveque, 1998). A stakeholder is defined by Freeman (1984; vi) as "any group or individual who can affect, or is affected by, the achievement of a corporation's purpose." For the specific case of VEIs, major stakeholders are members of the private sector, different levels of government, NGOs and the local community (Collins, 2002). More specifically these may include national, regional and local governments, industry associations and companies, environmental, consumer and other civic society groups, research organizations and academic institutions, trade unions, professional associations, independent standard organizations, taxation authorities, bankers, insurers, investors, employees and unions, neighbors, commercial suppliers and customers, victims and the judiciary, educators and the media (Gibson, 2000; UNEP, 2000).

The involvement of this diversity of stakeholders can be influential for the overall success of VEIs development. Collaboration, as defined by Gray and Wood (1991: 4), is a process "through which parties who see a different aspect of a problem can constructively explore their differences and search for solutions that go beyond their own limited view of what is possible." Julich and Falk (1999) point out that stakeholder involvement occurs at different levels. When information is publicly available, but there is no active role for the public, it is considered a passive process. An indirect process may also occur through lobbying or participation of public representatives in expert review panels. The most preferable process in terms of developing a credible VEI is, however, when the initiative is the result of an approach to collaborative policy making where stakeholders of different interests are involved in the negotiations. This concept is particularly important for the design and implementation of voluntary approaches. In order for potential participants to agree to participate in a VEI, and in order for the public sector to accept it as an alternative to other regulatory instruments, they both need to express their different definitions of what a successful VEI should be and attempt to build their ideas into the VEI design, implementation, and evaluation (Collins and Starik, 2001).

By nature, VEIs can be seen as the result of the innovation of environmental policies based on a new type of relation between the public and private sectors. According to Pesaro (2001), this new approach will be strengthened by the direct involvement of all stakeholders in the policy-making and target setting processes. Following this pattern, VEIs rely on the assumption that all the affected parties abandon their typical behaviors and cooperate in a new and different system of goals, means, resources and interaction forms. In order to implement successful programs with ambitious targets, it is essential to foster this change of behavior in all the stakeholders involved in the policy process (Pesaro, 2001).

Benefits of Stakeholder Participation

Voluntary initiatives have the potential to foster constructive dialogue among groups that traditionally act against each other. They also offer more opportunities for stakeholder involvement than command-and-control regulation (EPA, 2001b). The list of potential benefits of stakeholder involvement in the design of voluntary environmental approaches is quite vast, but it can also be seen as possibly too optimistic. Potential benefits found in the literature are for example, the involvement of third parties in the process of setting the objectives and the monitoring scheme of a VEI increases its credibility, by making environmental performance more public and transparent, while providing industry with additional incentives to achieve their commitments (Jenkins, 1995; OECD, 1999; Muldoon, 1999). Gartelmann (2002) reinforces this idea by stating that in order to establish credibility, third party involvement is required at all stages of development, implementation, verification and review of VEIs.

In many cases the government lacks information about firm operations and environmental issues that may be essential for the development of effective environmental policies. By fostering stakeholder participation, VEIs have the potential to encourage information exchange between stakeholders, that may contribute to the development of better programs based on a shared understanding of environmental issues (EEA, 1997; Goodin, 1986). Also, the cooperation between public authorities and stakeholders can promote common understandings that may make policy implementation easier for the authorities (resolve conflict among competing interests). A well-designed collaborative process has also the potential to avoid the dramatization and the polarization of positions by the stakeholders, and facilitate the observation of the details of the demands of all the affected parties (Turcotte, 1995). Moreover, if stakeholders participate on the design process of a VEI, they may feel bound to the promises they made and more committed to work towards achieving common goals, even helping in the implementation of the initiative (Krarup and Kraeme, 1996; Beierle and Konisky, 2000; Hillman and Keim, 2001).

Early and meaningful involvement of all affected parties in the design and implementation of the VEI increases the potential that judicial conflicts may be avoided (Barth and Dette, 2001; Webb and Morrison, 1997). According to Faure (2001), it is important to guarantee the participation of third parties specifically in order to avoid the risk of regulatory capture. This accusation is common by environmental groups that claim that regulatory agencies have become overly protective of industry interests at the expense of consumers.

The participation of third parties may not only be advantageous in the design stage of VEIs. Non-profit sector involvement monitoring participants' behaviors and environmental performance have the potential to contribute to the acceptance of the initiative and consequently affect its successful implementation (Paton, 2001). In addition, environmental groups have the potential to get involved outside the direct development of the VEI. By getting involved through consumer boycotts and shareholder activism, they may incite VEIs' participants to be more accountable. Ultimately, the involvement of all the stakeholders affected by environmental policy may force every group to be more accountable.

According to Rondinelli and London (2001: 2) a larger number of corporations are beginning to use the, "skills and resources of environmental non-profits in finding effective ways of reducing waste and resource use, preventing pollution, and mobilizing the support of stakeholders." This has led to an increase in the number of alliances that aim to increase both corporate financial and environmental performance by improving internal operations and envisioning a more sustainable future. Environmental groups are also beginning to recognize that by working collaboratively with corporations to solve environmental problems, they might be more successful than attacking them on corporate policies through the media.

Recently, EPA claims to be particularly aware of the importance of public participation in environmental policy. During the 1970s and 1980s, the private sector knowledge was generally disregarded in the development of environmental policy. In the beginning of the 21st century, EPA significantly changed its attitude towards stakeholder participation (EPA, 2000b). According to Cannon (2001: 39), "collaboration is in fashion at EPA, and words such as cooperation, partnerships, negotiation, and collaborative efforts have become watchwords for the EPA's reinvention of its regulatory programs." Participation and endorsement by stakeholders as became one of the key measures of EPA's voluntary environmental programs' success (Rosenbaum, 2000). According to EPA (1999), the private and non-profit sector are increasingly engaging in partnerships with the government with the goal of improving environmental performance, reducing costs and avoiding more command-and-control regulation

This change in attitude started in the 1990s, when EPA increased its efforts to involve the public by giving the opportunity to citizens, industry, environmental groups, and academics to play key roles in environmental policy. As evidence appeared showing that the best solutions to environmental policy could be achieved in partnerships with the public, EPA continued to foster the engagement of stakeholder participation (EPA, 2001a). According to Beierle and Konisky (2000), increasing the access and influence of NGOs in environmental policy, and ensuring trust between EPA and the public is a key component of EPA reinvention activities. According to EPA (2001a), the greater the diversity of stakeholders involved, the more likely the environmental initiatives will be accepted as credible, contentious issues will be resolved and effective and long-lasting initiatives will be developed.

Disadvantages of Stakeholder Participation

Although the several benefits that can be pointed out to stakeholder involvement in the design of VEIs, there are also some potential disadvantages. These include the fact that it might affect the attractiveness of the instrument especially for the industry, business strategies may have to be revealed, more interests have to participate in the process, and this might contribute to the design and implementation to take longer (Barth and Dette, 2001). Also, participatory initiatives may require greater resources and induce excessive expectations of environmental and economic benefits (Boger and Stackpole, 1998). Coglianese (2001) points out that consensual processes between different stakeholder can change the focus of the VEI development process from importance to tractability, leading to imprecision and to the selection of the lowest common denominators. About Project XL, according to Hirsch (2001), the industry sector has claimed that the participatory process is too time consuming and expensive, consequently leading to the increase in the transaction costs of participating. Environmental groups also stated that it is unrealistic to expect them to effectively participate in the development of all XL projects.

In summary, associated with the extensive list of potential benefits of stakeholder participation, there is possibly a very optimistic collaborative process where all affected parties had the opportunity to be meaningfully involved. In practice, this process can be extremely difficult. Not only it could be very time consuming and expensive, but it could also be a hard task to have all the affected parties present in a discussion and engaged in a constructive dialog that would lead to the development of a successful VEI. Based on the difficulties of designing an effective collaborative process, potentially, the most common situation is having poor-designed processes where the disadvantages of stakeholder participation could probably go beyond the potential benefits.

Critiques to Lack of Stakeholder Involvement

Even if the idea beyond the implementation of VEIs, particularly joint implemented VEIs, suggests the increased interest of the corporate and public sectors in environmental policy, and more broadly based public participation (Karamanos, 2001), several questions and critiques have been raised about the lack of participation of some affected parties. One of the strongest criticisms that has been raised at VEIs is that they lack a multi-stakeholder consensus based input process (Labatt and Maclaren, 1998; Barth and Dette, 2001). The most common situation in terms of lack of stakeholder involvement occurs when the government's executive branch comes to an agreement and neither the legislative bodies nor affected parties are heard (Julich and Falk, 1999). Gibson (2000) claims that the development of VEIs tend to be less participatory and less open to effective public participation than command-and-control regulation. For that reason voluntary approaches are often preferred over traditional regulation because they avoid the involvement of the civil society. Higley, Convery, and Leveque (2001), Hansen (1999) and Krarup (1999) state that the effects of this reduced third party participation presents the danger of contributing to lower environmental targets and reduced environmental effectiveness of the voluntary initiatives.

According to Mazurek (1999a), unilateral and negotiated approaches lack credibility among environmental groups and some industries. This fact is mainly caused because industry and public agencies negotiate directly, with the exclusion of other affected parties, and industry might succeed in convincing the government to agree on unacceptably weak targets. Paton (2000) cites several studies that have raised concerns about the transparency and openness of negotiated environmental initiatives (e.g. Maxwell and Lyon (1999), and EEA (1997)). This could happen due to pro-industry governments, the concern for avoiding conflicts, a disproportionate bargaining power between the agency and industry, or even the prospect of future employment of regulators in the regulated industry (Krarup, 1999). The UNEP (1998b) also states that a common characteristic of government, industry and joint government-industry

VEIs is the limited role of non-governmental organizations, public groups and trade unions as advisors, leaving third parties with the uncertainty on whether their opinions were taken into account.

The non-profit sector is typically the most skeptical to the development of industry voluntary initiatives, particularly when these are designed with the purpose of dismantling regulation or to prevent independent monitoring and evaluation (Barber, 1998). Friends of the Earth (2002), referring to initiatives developed in the UK, expressed their discontent by referring that this initiatives were undemocratic, because the government left to the private sector to decide how much action to take, when to take it and whether to tell the public, and that they lack public credibility. For similar reasons, it is common for environmental groups to advocate centralized command-and-control regulation instead of voluntary approaches (Maxwell and Lyon, 2001), preferably making existing laws even tougher (Miller, 1999).

Stakeholder Participation in Effective Development of VEIs

In order to ensure effective voluntary initiates, these need to go through a thorough development process. Several authors have developed lists of principles for designing voluntary approaches, mostly concerned with VEI's credibility and effectiveness. Generically, the design and implementation of VEIs should follow certain guidelines. Examples are the setting of quantified targets, monitoring, periodic reporting and verification of results (EEA, 1997). This section demonstrates the importance of stakeholder participation based on the lists of principles for the effective development of VEIs identified by several authors.

The most notable work in terms of developing guidelines for a credible and effective VEI was done by a group of representatives of private and non-profit sectors entitled New Directions Group. These guidelines were developed in 1990 with the goal of provide guidance to governments, industry and NGOs in the development and review of VEIs. Their effort was particularly noticeable because it involved an agreement between traditional adversarial parties, and because they used as concrete examples several VEIs implemented in Canada. Eight key principles were developed (Collins, 2002). For this group the importance of stakeholder participation was evident, as the first two of the eight principles state that VEIs should be developed and implemented in a participatory manner, and transparent in their design and operation.

More recently, several authors (e.g. Beardsley and Albers & Company (1996), UNEP (1998a), Davies *et al* (1996) and Carraro and Leveque (1999)) have introduced more principles dedicated to enhancing collaboration on the development of VEIs. These guidelines include objectives for stakeholder involvement such as all parties should assess the advantages and disadvantages of their involvement, all parties should know their roles, rights and responsibilities during the design and implementation of the initiative, and clear procedures should be established for open participation. It is also important to involve all the stakeholders in the discussion so that the design is transparent and known to all.

According to The Conference Board (1998) the building of trust among stakeholders with divergent objectives involves ensuring, equal standing of all stakeholders, commitment by all stakeholders, and a basic level of knowledge by stakeholders. The UNEP (2000) stresses out the importance of also including in the process the employees of the companies affected. The environmental group Pollution Probe (1999) introduced the idea that the government and/or industry should provide financial and technical assistance to guarantee a fair participation of non-profit groups in the development of VEIs.

The UNEP (1988) produced a technical report dedicated to providing guidance for effective industry initiatives, based on the experience of industry associations that have introduced the implementation of VEIs. The relevance of this report goes totally to the fact that it was developed based on the premise that industry VEIs cannot be effective without a sound governmental regulatory and policy framework and public involvement. The UNEP (1988) also identified communication as one of the five critical aspects of effective codes of conduct, including listening to the public in every stage of the VEI development, communicating the implementation of the VEI and communicating the environmental results achieved. In summary, the development of VEIs has to go through the involvement of all stakeholders in the design process, and the implementation of the voluntary approach must be transparent so stakeholders are able to control the performance of firms (Krarup, 1999).

CHAPTER IV

Research Methods

Summary of Research Questions and Hypothesis

Little research exists that details the current practices among the different sponsors of VEIs. This research aims to enhance the limited understanding on the role of different stakeholders in the development of VEIs, and relate stakeholder participation to different types of VEI' sponsors.

The first question raised in this research deals with the issue of diversity of participation. *Diversity of participation* represents the number of different types of stakeholders involved in the development of VEIs. More specifically, this question asks which type of sponsor includes the greatest diversity of participation in the development of VEIs? The literature suggests that stakeholder participation has recently become a very important issue for EPA (e.g. EPA, 1999; EPA, 2001a; EPA, 2000b; Cannon, 2001; Rosenbaum, 2000; Beierle and Konisky, 2000). Evidences indicate that the private and non-profit sector are increasingly collaborating with the government and therefore government sponsored initiatives are expected to have a high diversity of stakeholders participating in the development of their programs. As for partnership initiatives, by their very nature, they should include multiple participants as they are developed through the collaboration of different types of stakeholders. These typically include the federal government, industry associations, and in some cases non-governmental organizations, although other stakeholders like state and local governments, corporations or community groups may also be involved. Very little is known in terms of the VEIs developed by the industry sector. Some authors have suggested that corporations are changing their adversarial attitude towards government and environmental groups to a more cooperative one (Rondinelli and London, 2001). Yet, it is still unknown if this is a common behavior or the result of isolated actions. Based on UNEP (1998b), Borkey and Leveque (1998) and Labatt and Maclaren (1998) criticisms to industry sponsored VEIs, it is most likely that VEIs sponsored by the private sector are still the ones with the lowest diversity of stakeholder involvement in the development of VEIs.

Hypothesis 1 - Government sponsored initiatives will have a higher diversity of stakeholders participating in the design of VEIs than industry or third-party sponsored initiatives.

Hypothesis 2 - VEIs sponsored by partnerships will have the highest diversity of stakeholder involvement in the design of VEIs.

Hypothesis 3 - Industry initiatives will have the lowest diversity of stakeholder involvement in the design stage of the VEI.

The second research question addressed in this study deals with stakeholders' intensity of participation in the design of VEIs. *Intensity of participation* represents the degree of involvement of the different stakeholders in the VEI development. This question focuses on which stakeholder groups are more likely to work with each category of VEI sponsor in the design phase of the initiative? Existing literature demonstrates the existence of a strong connection between industry associations and government in the design of VEIs (e.g. Mazurek, 1999a; Paton, 2000; Maxwell and Lyon, 1999; EEA, 1997; UNEP, 1998b). Most of the critiques to VEIs focus on the lack of participation by the non-profit sector in contrast to the private sector. This fact occurs particularly with governmental sponsored VEIs and partnership VEIs.

Hypothesis 4 - Industry associations will be the stakeholders with the highest intensity of participation in the design of government VEIs.

Hypothesis 5 - Federal government and industry associations will be the stakeholders with the highest intensity of participation in the design of partnership VEIs.

The third question asks: Which type of VEI sponsor is associated with a higher intensity of participation by the non-profit sector? Because public participation is claimed to be in fashion at EPA (Cannon, 2001) and several reports suggest that the non-profit sector is increasingly engaged with EPA (EPA, 1999; EPA, 2000b; EPA, 2001a; Beierle and Konisky, 2000), government sponsored VEIs should have the highest intensity of participation by non-profit organizations. On the other side, although some authors (Rondinelli and London, 2001) suggest that some industries are starting to cooperate with non-profit organizations in the development of VEIs, there is no research that demonstrates that this is a systematic occurrence. UNEP (1998b) goes so far as to criticize industry sponsored VEIs because of the limited role of non-governmental organizations in their development.

Hypothesis 6 – From among all sponsors, government initiatives will have the highest intensity of participation by the non-profit sector in the design of their programs.

Hypothesis 7 - Industry sponsored initiatives will have the lowest intensity of participation by the non-profit sector in the design of their programs.

The last research question raised in this study assesses which type of VEI sponsor is associated with a higher intensity of participation by industry associations and for-profit firms. Although there is limited literature on the role of the private sector in the development of third-party VEIs, due to their traditional adversarial positions, third-party initiatives are expected to have the lowest intensity of participation by industry associations and firms. In contrast, because of the strong bond between public and private sector in the development of government and partnership VEIs (Mazurek, 1999a; Paton, 2000; Maxwell and Lyon, 1999; EEA, 1997; UNEP, 1998b), and because of EPA's efforts to foster stakeholder participation (EPA, 1999; EPA, 2001a; Rosenbaum, 2000), government initiatives are expected to have the highest intensity of participation by industry associations and firms.

Hypothesis 8 - Government initiatives will have the highest intensity of participation by firms and industry associations in the design of their programs.

Hypothesis 9 - Because of the traditional adversarial positions, third-party initiatives will have the lowest intensity of participation by firms and industry associations in the design of their programs.

Independent Variable

Sponsorship

VEIs can be of different types and can have different sponsors. For the purpose of this study, program sponsorship refers to the actors who initiated and financed a program. The most common VEIs in the US are the initiatives sponsored by governmental agencies such as EPA. Other types of sponsors include corporations, industries and their associations, and non-profit organizations. There are cases where the sponsorship of the program is responsibility of a partnership between some of these actors. The information regarding this variable was collected through an analysis to the programs' Internet homepages. If the program was discontinued and no longer had an active website, reports and brochures were examined instead.

Sponsorship was determined by identifying on the programs' homepages clear evidence of the organization(s) that initiated and financed the program. As this information was not always available, a second criteria was introduced. The contact information available on the website (email and postal address) and the server where the website is hosted were assessed in order to identify the organizations involved in the administration of the initiative. In the specific case where an organization was created with the purpose of developing and implementing a VEI, the elements of these organizations were identified. If these elements belong to different types of stakeholders these initiatives were considered partnerships between each sector.

Two individual researchers were responsible for independently coding sponsorship for each VEI. Sponsorship was compared for each program with 92% (58 VEIs) of the programs coded similarly by the two researchers. The ones that differed (five programs) were further analyzed and discussed in order to reach a consensual decision.

The sponsor(s) of each program was categorized based on the following taxonomy. The first four categories were developed by UNEP (2000) and two new categories were added. This taxonomy differs slightly from UNEP's in the way that it goes beyond the organization exclusively responsible for the design of the initiative, but it also includes the organizations responsible for initiating and financing the program.

Government initiatives - the federal, state and local government, or even intergovernmental organizations (e.g. United Nations) are responsible for initiating and financing the VEI. They are usually also responsible for setting the goals to be met and monitor the performance of the participants (usually with consultation with industry and other stakeholders).

Industry initiatives - it is an industry association or an individual firm who unilaterally (although others may be consulted) decides to implement a VEI, including deciding what goals to meet, how to meet them, and whether or how to monitor and report progress publicly.

Third-party initiatives - Third parties (non-industry non-profit associations, consulting firms, and individuals) develop and run the initiative although companies or industry associations are usually involved in an advisory capacity or as members of the organization.

Joint government / industry initiatives - government and industry decide to implement a VEI and at the same level negotiate the characteristics of the program. Other stakeholders may also be involved in the negotiation process but usually have only a consultative role.

Joint government / third-party initiatives - government and third parties are equally involved on the design and implementation of the voluntary initiative.

Joint industry / third-party initiatives - firms or industry associations and third parties share responsibilities on the design and implementation of the voluntary initiative.

Multi-party initiatives - representatives from the public, private and non-profit sector form a partnership to negotiate the characteristics and administer the voluntary initiative.

Dependent Variables

Intensity of Participation

Intensity of participation represents the degree of involvement (formal and/or informal) of the different stakeholders in each stage of the VEI development. Using a Likert scale, program administrators ranked the intensity of participation of each of the eight stakeholders (federal, state and local governments, industry associations, non-industry non-profit associations, consulting firms, other for-profit firms, individuals not affiliated with an organization). In the survey, the respondents ranked the intensity of each stakeholder's participation as "None", "Very Low", "Somewhat Low", "Somewhat High", and "Very High". For each stage of the VEI development, three different questions were used (see Appendix 2):

Design (Survey Question 5) - "For each group listed below, please select the one response that best indicates the level of formal and/or informal involvement that individuals from the following groups had in designing the program requirements, structure, and protocols for your VEI."

Routine Administration (Survey Question 22) - "For each group listed below, please select the one response that best indicates the level of involvement that individuals from the following groups have in routine administration of your VEI-exclusive of monitoring."

Monitoring (Survey Question 25) - "For each group listed below, please select the one response that best indicates the level of involvement that individuals from the following groups, who are external to the organization, have in monitoring the environmental performance of your VEI participants."

Diversity of Participation

Diversity of participation was operationalized as the number of different stakeholders in each of the three stages of VEIs development. This was operationalized by counting the number of different types of stakeholders that had an intensity of participation different from "None" in a certain stage of the VEI (Survey Questions 5, 22, and 25 of the survey described above). The respondents were able to rank the intensity of participation of a maximum of ten different types of stakeholders: Eight that were presented in the survey questions (described above) and an extra two that the respondent could specify as a stakeholder that was also involved. This way, the diversity of stakeholders involved ranged from zero to ten.

Sampling Frame

VEIs were identified through a snowball sampling technique. This research process started with an Internet search that led to the identification of some VEIs, but also provided information on the existence of other websites, reports, government and trade publications and research literature on voluntary approaches. As this information was being analyzed, more VEIs were identified and more literature found. While program officials were being contacted, more information on new programs was also gathered.

Overall, this snowball process led to the identification of 181 programs. Once a complete list of programs was identified, the population was reviewed and limited to initiatives that fit the project definition of a VEI: "any program, code, agreement or commitment that encourages organizations to voluntarily reduce their environmental impacts beyond that required by the environmental regulatory system." We also limited the sampling frame to initiatives that operate in the U.S., and initiatives where program participants are the potential polluters (Carmin and Darnall, 2001). This process reduced the population to 111 programs (see Appendix 1).

A database to store detailed information on each program was constructed. This included the program name, type of sponsor, duration of the program, its description, contact information, homepage web address and related Internet sites, monitoring scheme, type of participants and number of participants. At this point, it is important to note that the biggest limitation of this research methodology is indeed the sampling frame. Although the number of programs is considered significant and even above what was initially expected, a snowball technique can always lead to overlooked cases that should be included in the sampling frame.

Survey

This research was based on an Internet survey of program managers of VEIs, developed by a joint venture between the Department of Urban Affairs and Planning at Virginia Tech and the Department of Political Science and Public Administration at North Carolina State University. As presented in Appendix 2, the survey questions examined the VEI's background, environmental performance requirements, benefits of the adoption, and the design and administration processes, including the role of stakeholders.

The survey was developed using Microsoft Active Server Pages (ASPs). This technology allows the creation of dynamic forms that permit entering information in a database located in an Internet Server from a remote location through the Internet. The survey and all the data collection process was designed using the guidelines of the Tailored Design Method made popular by Dillman (2000). The survey instrument contains 29 close-ended questions and one open-ended question. The survey questions examine the VEI's background, environmental performance requirements of the program, the benefits of the adoption of the VEI, and design and administration processes, including the role of specific stakeholders at different stages of the VEI development.

Most of the design principles that apply to traditional mail surveys can also be applied to web surveys, however particular care has to be taken in relation to certain features of Internet applications. The following list is a set of guidelines identified by (Dillman, 2000) for designing web survey instruments that were taken into consideration:

- The main concern while developing the survey was to <u>limit the amount of computer resources required</u>, while keeping it as <u>uniform</u> as possible among different hardware and software characteristics of the respondents.

- The survey was introduced with a welcome screen (see Appendix 3) with the purpose of providing <u>motivation</u> for the respondents to answer it, as well as some information regarding <u>confidentiality</u> and <u>instructions</u> on how to proceed.
- Going to the survey (see Appendix 2), the respondents encountered a <u>format similar</u> to the traditional paper self-administered questionnaires, however enhanced with <u>innovative question displays</u> (such as drop-down menus) only possible on this type of survey.
- The <u>first question</u> of the survey was made particularly easy to give the impression to the respondents that they would not have any problems responding to the rest of the questions. It was also made very relevant to the focus of the study to promote face validity.
- The use of <u>color was restrained</u> so that consistency and readability were maintained, and navigational flow was unimpeded.
- The <u>width</u> of the web page was fixed so that all types of resolutions and screens could <u>safely display</u> the survey without differences on its appearance. The width was also controlled to ensure that any <u>print out</u> of the survey would fit on the traditional letter paper size (8.5' x 11').
- Specific <u>instructions</u> were given on each question to guarantee that the respondent would know how to deal with the possible answers. For example, questions where only one radio button should be selected or indicate how to reveal the answers on drop-down menus.
- <u>Drop-down menus</u> were rarely used as they have a high potential for non-response.
- Respondents were <u>not required to answer any questions</u> before moving to subsequent ones since this could lead to annoyance and premature termination of the survey.
- The survey was divided in two sections so that the respondents, after completing the questions related to their VEI, were directed to a <u>Thank You</u> website were they could provide their contact information (see Appendix 5).

The survey was designed so that when program managers submitted responses, they were automatically entered with the desired code into an Access Database. Once the survey was on-line, it was reviewed by the research team to make sure that the coding of the survey was being correctly inserted into the database.

The survey was pre-tested by three state managers of the Multi-State Working Group on Environmental Management Systems. This VEI was selected because it is a State program and therefore it did not fit the VEI definition of this research. Because this VEI was implemented by several states, program officers from each state were contacted in order to pre-test the survey.

These program officers were contacted with a similar e-mail to the one the respondents of the survey were going to receive, with the exception of asking them to provide feedback on the time it took them to respond as well as their comments to the survey (see Appendix 5). The survey was also reviewed by one doctoral student who conducts VEI research. Revisions to the survey were made based on the pre-test comments.

Contacting Participants

The process of contacting the program officers of each VEI was conducted following the guidelines of the Tailored Design created by Dillman (2000: 4). This method is based on the idea of, "creating respondents trust and perceptions of increased rewards and reduced costs for being a respondent, which take into account features of the survey situation and have as their goal the overall reduction of survey error." The first contact with the program officers consisted of sending them an email, in order to inform them of the nature of the research and its methodology. Also, the program officers were asked if they were the correct person to answer the survey, if they were able to participate, or if they could provide the contact of the most appropriate person to answer the survey (see Appendix 5). This e-mail summarized what will happen during the research, what the research is about and the usefulness of the survey. Some e-mail responses requesting more information or pointing us to the most appropriate person to answer the survey were received. Responses to requests for more information were all sent as were messages to new contacts when appropriate.

While the contact confirmations were being received, an Excel worksheet was created with the purpose of managing the contact information for all those who agreed to participate, and to keep records of all the contacts made and information received. Approximately three weeks after the first contact was made, a second email was sent to all the programs that did not respond (see Table 3). This time a different e-mail was sent pointing out that this was the second contact being made, and emphasized the paragraph on the usefulness of the study (see Appendix 5). This procedure was again repeated three weeks after the second contact. For programs that never responded to the introductory contacts new e-mail contacts were researched. If no other e-mail contact was available, programs were contacted through telephone to assess the availability of someone who could participate in the survey.

After the pre-test, the program officer identification process was completed and an email with the survey's Internet address was sent to all those who agreed to participate (see Appendix 5). This e-mail thanks all the participants for their participation in the survey, reminds them of the importance of the survey and their participation, and points out characteristics of the survey such as the number of questions, the time it should take to complete, and matters of confidentiality. Four e-mail follow-ups were sent to non-respondents at an interval of two weeks requesting their participation in the study. Table 3 summarizes the dates the participant's were contacted. As program officers answered the survey, their responses were automatically coded into a Microsoft Access database. While the survey was in process, the database was downloaded on a daily basis in order to assess the evolution of the response rate and to guarantee that the information was being properly stored. This was done by checking if all the questions were differently responded and by reading the comments left by the respondents.

Table 3 – Timeline for Data Collection

Task	Date
Pretest Survey Instrument	February 4^{th} - 12^{th}
Implement Survey	February 28^{th}
1^{st} E-mail Follow Up	March 12^{th}
2^{nd} E-mail Follow Up	March 25^{th}
3^{rd} Email Follow Up	April 8^{th}
4^{th} Email Follow Up	April 22^{th}
Data collection concluded	April 28^{th}

Because of the snowball technique used, some programs were only identified after the first batch of email messages were sent. From some programs, returned e-mails were received due to incorrect/outdated e-mail addresses or to the unavailability of the respondent. Also, while the survey was in process, some programs redirected us to another contact person. Due to time constraints this thesis will use responses received by April 28^{th}, which does not ensure that the correct contact person for all programs received the four e-mail follow-ups planned.

Response Rate

During nine weeks, 63 program managers responded to the survey, 10 declined participating, and 35 did not respond to the survey or answer the email messages they received. Overall, the survey had a response rate of 58 percent.

Data Analysis

Fisher's Exact Test was used to assess the relationship between sponsorship and diversity and intensity of stakeholder participation in the development of VEIs. This type of statistical analysis is used to determine if there are nonrandom associations between two categorical variables. Fisher's calculates the difference between the data observed and the data expected. Fisher's Exact Test works similarly to the Chi-square test for independence, however, the Chi-square gives only an estimate of the true probability value. This might not be very accurate if the marginal frequency is very uneven or if there are any cells with an expected frequency of less than five. The Fisher's exact test is a nonparametric test that makes no assumptions about the normality of the data, and therefore can be used for small samples and distributions. Fisher's Exact Test is based on exact probabilities from a specific distribution (the hypergeometric distribution) and can be very computer intensive, while the Chi-square test relies on a large sample approximation. For the purpose of this research, an alpha value of 0.1 was used to infer significance.

Human Subjects Considerations

Steps were taken to ensure informed consent and confidentiality. In terms of informed consent, in the initial e-mail (see Appendix 5), program officers were informed of the nature of the study and received contact information for the researchers. Participants were also able to choose whether or not they wanted to participate in the survey. In the introductory website (see Appendix 3), they were again informed of the nature of the study and the confidentiality procedures. While on the survey website they were able to review the survey prior to answering any of the questions and they may stop answering questions and terminate their participation simply by closing their web browser.

As for confidentiality, although the names of programs and program officers are a matter of public record, efforts were made to ensure the confidentiality of each participant. The survey was divided in two sections to guarantee that the information referring to the characteristics of the VEI and the personal information of the respondent were submitted separately and stored in two distinct databases without any connection between them. More important, the results of the study only contain aggregate data, which guarantees that there will be no way to identify a specific program or program officer from the reports produced. Also, the information collected is generally available to all members of the public and the respondents provide this information as part of their work related activities.

CHAPTER VI

Findings

In order to assess the relationship between the type of sponsor and the diversity and intensity of stakeholder participation in the development of VEIs, an Internet survey targeting 111 VEI program managers was conducted. From the 63 responses received, the relation between VEI sponsorship and intensity and diversity of participation was analyzed. The next sections of this chapter provide a descriptive analysis of the variables studied and a discussion of each research question and hypothesis tested.

Sponsorship

An analysis of program sponsors illustrates that the public sector (federal, state and local government) was responsible for the majority of the responses to the survey. From a total of 63 responses, 38 were programs developed by a governmental body, representing 60 percent of the responses (see Table 4). The private sector (industry associations and firms) sponsored seven programs (11 percent), and third-parties (non-profit groups, consulting firms and individuals) nine programs (14 percent). Because of the small number of VEIs sponsored by partnerships between different stakeholders, only nine programs representing 14 percent of the responses, the four initial categories (government and industry, government and third-party, industry and third-party and joint initiates) were aggregated into a single category denominated as partnerships.

The high number of governmental VEIs should not be attributed to a low response rate by the industry and non-profit sector program managers, but as a consequence of the fact that EPA developed most of the VEIs operating in the US. Furthermore, the distribution of responses per sponsor is somewhat close to the assessment of VEIs developed in the US made by Mazurek's (1999a). In 1999, she assessed that 31 out of 42 voluntary nationwide initiatives in the United States were purely public voluntary programs. This proportion of 74 percent is indeed even larger than the proportion of governmental responses collected in this study (60 percent).

Table 4 – Number of VEIs for Type of Sponsor

Type of initiative	Number of VEIs	% of total
Government	38	60
Industry	7	11
Third-party	9	14
Partnerships	9	14
Total	63	100

Diversity of Participation

The diversity of stakeholder participation was determined based on the number of different types of stakeholders that had an intensity of participation above "None" in each of the stages of the VEI development. Possible stakeholders are federal, state and local governments, industry associations, non-industry non-profit associations, consulting firms, other for-profit firms, individuals not affiliated with an organization, and others specifically stated by the respondents. Table 5 illustrates the number of programs that had the participation of a certain number of different types of stakeholders. On average, each VEI had 5.1 different stakeholders participating in its design stage, 3.9 in its routine administration, and 3.4 in the monitoring process.

Table 5 - Number of VEIs for Level of Diversity of Participation

	Stage of VEI		
Number of different stakeholders involved	**Design**	**Administration**	**Monitoring**
0	0 (0%)	1 (2%)	4 (10%)
1	5 (8%)	12 (19%)	6 (15%)
2	5 (8%)	12 (19%)	9 (23%)
3	5 (8%)	7 (11%)	4 (10%)
4	10 (16%)	8 (13%)	4 (10%)
5	7 (11%)	6 (10%)	3 (8%)
6	10 (16%)	3 (5%)	3 (8%)
7	13 (21%)	5 (8%)	2 (5%)
8	6 (10%)	7 (11%)	4 (10%)
9	2 (3%)	1 (2%)	0 (0%)
10	0 (0%)	1 (2%)	0 (0%)
Average	**5.1**	**3.9**	**3.4**

This decrease in the diversity of participation from the design stage to the routine administration and then to the monitoring process is visible on Figure 1. In the design stage the number of programs increases with the number of different type of stakeholders involved, till it reaches a peak with 13 programs with seven different stakeholders involved in the design of the VEI. In the routine administration of the VEI this phenomenon is inverse and the largest number of programs (12) has only one or two different types of stakeholders involved. After that, as the number of types of stakeholders involved increases, the number of programs decreases. A similar situation occurs during the monitoring stage, where the number of programs is higher (nine) for the involvement of only two types of stakeholders, and then this number decreases as the number of different types of stakeholders involved increases.

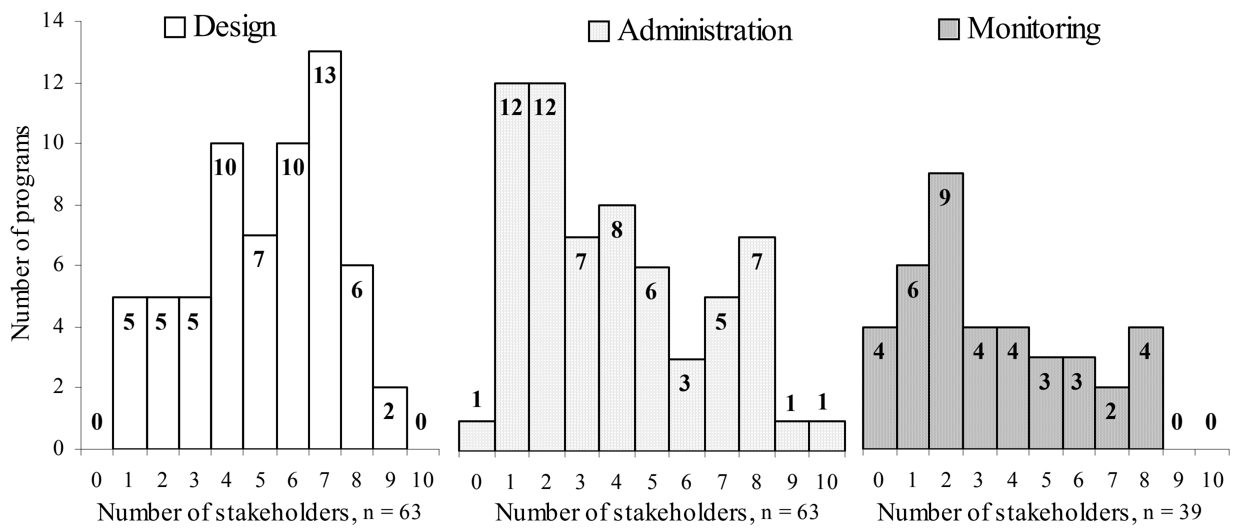

Figure 1 - Number of VEIs for Level of Diversity of Participation

Intensity of Participation

The high intensity of participation by the government is evident in the three different stages of VEI development, particularly by the federal government. These results are evidently conditioned by the large percentage of government sponsored VEIs in opposition to industry, third-party or partnership VEIs that responded to the survey. Table 6 illustrates the intensity of participation of each stakeholder in the design of the program requirements, structure, and protocols of the VEI. The federal government had a "Very High" intensity of participation in the design of 59 percent of the programs studied. Only 11 VEIs had no involvement on the part of the federal government in the design of the initiative. The intensity of participation by the state and local government is substantially lower than for the federal government. This is somewhat expected as state level VEIs were not included in the sampling frame.

The private sector has also been active in the design of VEIs. Industry associations had a "Very High" intensity of participation in the design of 21 VEIs while for-profit firms had a "Very High" intensity of participation in the design of 20 VEIs. There were only 12 VEIs that in their design had no involvement at all on the part of industry associations. The involvement by third-parties has been mostly done by non-industry non-profit associations. Consulting firms and particularly individuals not affiliated with any organization had a low involvement in the design of the VEIs.

Table 6 - Intensity of Stakeholder Involvement Designing the VEI

	Stakeholders									
	Government			Industry		Third-Party				
Level of Involvement	Federal	State	Local	Ind. Assoc.	Firms	Non-profit	Consultant	Individual	Other	Other
None	11 (17%)	30 (48%)	32 (51%)	12 (19%)	21 (34%)	17 (27%)	31 (49%)	34 (58%)	24 (55%)	28 (80%)
Very Low	5 (8%)	10 (16%)	15 (24%)	10 (16%)	4 (7%)	9 (14%)	9 (14%)	12 (20%)	0 (0%)	0 (0%)
Somewhat Low	4 (6%)	6 (10%)	10 (16%)	9 (15%)	5 (8%)	8 (13%)	7 (11%)	3 (5%)	5 (11%)	1 (3%)
Somewhat High	6 (10%)	10 (16%)	2 (3%)	9 (15%)	10 (16%)	12 (19%)	14 (22%)	4 (7%)	4 (9%)	1 (3%)
Very High	37 (59%)	7 (11%)	3 (5%)	22 (35%)	20 (33%)	17 (27%)	1 (2%)	2 (3%)	9 (20%)	3 (9%)
Don't Know	0 (0%)	0 (0%)	1 (2%)	0 (0%)	1 (2%)	0 (0%)	1 (2%)	4 (7%)	2 (5%)	2 (6%)

n = 63

Changes between the intensity of participation in the design stage of the VEI and the routine administration of the VEI occur mostly with the industry sector, particularly with industry associations. Table 7 illustrates the intensity of participation of each stakeholder in the routine administration of the VEI. When compared with the design stage, the number of programs with no participation of industry associations in the routine administration stage was higher (12 to 26). Also, the number of programs with "Very High" intensity of involvement by industry associations was lower in the routine administration stage than in the design of the VEI (22 to 11). The decrease in intensity of participation by industry associations might be explained by the fact that they collaborate with governmental agencies in the design of the characteristics of a significant number of VEIs, and leave the implementation of the initiatives exclusively to the government sector.

The only stakeholder with a higher intensity of participation in the routine administration stage than in the design of the VEI was consultant firms. There is only one program that had a "Very High" involvement of a consulting firm in its design, while this number raised to five in the implementation stage of the VEI development. This small increase can be a consequence of some programs designed by governmental agencies that subsequently transfer the responsibility of the routine administration to a consulting firm.

Table 7 - Intensity of Stakeholder Involvement in the Routine Administration of the VEI,

	Stakeholders									
	Government			Industry		Third-Party				
Intensity of Participation	Federal	State	Local	Ind. Assoc.	Firms	Non-profit	Consultant	Individual	Other	Other
None	16 (26%)	37 (60%)	41 (67%)	26 (42%)	25 (43%)	25 (40%)	35 (57%)	43 (75%)	30 (70%)	31 (82%)
Very Low	3 (5%)	4 (6%)	4 (7%)	7 (11%)	8 (14%)	8 (13%)	3 (5%)	6 (11%)	1 (2%)	2 (5%)
Somewhat Low	5 (8%)	5 (8%)	9 (15%)	10 (16%)	5 (9%)	8 (13%)	7 (11%)	4 (7%)	2 (5%)	0 (0%)
Somewhat High	2 (3%)	9 (15%)	5 (8%)	8 (13%)	7 (12%)	8 (13%)	10 (16%)	2 (4%)	2 (5%)	1 (3%)
Very High	36 (58%)	7 (11%)	1 (2%)	11 (18%)	12 (21%)	13 (21%)	5 (8%)	1 (2%)	7 (16%)	3 (8%)
Don't Know	0 (0%)	0 (0%)	1 (2%)	0 (0%)	1 (2%)	0 (0%)	1 (2%)	1 (2%)	1 (2%)	1 (3%)

n = 63

There is a small number of programs that monitor the environmental performance of VEI participants. Only 32 programs have as a requirement monitoring the performance of participants, and just 36 programs actually develop some level of monitoring activities. The federal government is still the stakeholder with the highest level of involvement in monitoring the performance of the VEI participants (see Table 8). Industry associations, firms, non-profit associations all have a similar level of intensity of involvement in the monitoring process. Clearly the stakeholder with the lowest intensity of participation is individuals not associated with any organization.

Table 8 - Intensity of Stakeholder Involvement Monitoring the Environmental Performance of VEI Participants

	Stakeholders									
	Government			Industry		Third-Party				
Intensity of Participation	Federal	State	Local	Ind. Assoc.	Firms	Non-profit	Consultant	Individual	Other	Other
None	13 (33%)	23 (59%)	24 (62%)	21 (54%)	20 (57%)	23 (61%)	27 71(%)	26 (76%)	17 (61%)	16 (80%)
Very Low	4 (10%)	3 (8%)	5 (13%)	7 (18%)	4 (11%)	5 (13%)	2 (5%)	3 (9%)	0 (0%)	0 (0%)
Somewhat Low	6 (15%)	6 (15%)	6 (15%)	4 (10%)	3 (9%)	4 (11%)	4 (11%)	3 9(%)	2 (7%)	1 (5%)
Somewhat High	3 (8%)	4 (10%)	3 (8%)	2 (5%)	1 (3%)	2 (5%)	2 (5%)	0 (0%)	1 (4%)	0 (0%)
Very High	13 (33%)	2 (5%)	0 (0%)	5 (13%)	6 (17%)	4 (11%)	2 (5%)	0 (0%)	7 (25%)	2 (10%)
Don't Know	0 (0%)	1 (3%)	1 (3%)	0 (0%)	1 (3%)	0 (0%)	1 (3%)	2 (6%)	1 (4%)	1 (5%)

n = 39

Sponsorship and Diversity of Participation in the Development of VEIs

The first research question of this study asks which type of VEI sponsor includes the greatest variety of stakeholders in the development of VEIs. The variable diversity of participation was analyzed in three different stages of the VEI development (design, routine administration and monitoring) and the following hypotheses were tested:

Hypothesis 1 - Government sponsored initiatives will have a higher diversity of stakeholders participating in the design of VEIs than industry or third-party sponsored initiatives.

Hypothesis 2 - VEIs sponsored by partnerships will have the highest diversity of stakeholder involvement in the design of VEIs.

Hypothesis 3 - Industry initiatives will have the lowest diversity of stakeholder involvement in the design stage of the VEI.

The diversity of stakeholder participation in the design of the VEI requirements, structure and protocols is illustrated in Table 9. This information reflects, for each sponsor, the number of VEIs that had the participation of a certain number of different types of stakeholders. The Fisher's exact test probability value, $p = 0.066$, indicates that there is a significant difference in the number of types of stakeholders that different VEI sponsors included in the design of their programs.

VEIs sponsored by a partnership of stakeholders included the largest diversity of participants. However, it is interesting to notice that both governmental and industry sponsored VEIs had a diversity of participation very close to what occurred in initiatives sponsored by partnerships. These included in average 5.6 types of stakeholders in the design of VEIs, while industry and governmental programs had in average 5.4 types of stakeholders. Initiatives sponsored by third-parties clearly had less diversity of stakeholder participation with only 3.3 types of stakeholders involved per program.

These results support Hypothesis 2 (at $\alpha = 0.1$) that states that partnership VEIs will have the highest diversity of stakeholders involved in the design of their initiatives. Somehow unexpected was the fact that industry initiatives had a diversity of participants similar to government initiatives and higher than third-party initiatives. Therefore both Hypothesis 1 and 3 were rejected. Not only industry initiatives do not have the lowest diversity of participation (third-party initiatives do) but it also has a diversity of participation similar to government initiatives. Table 12 summarizes the research questions, the hypothesis tested and the conclusions reached.

In terms of governmental initiatives, 84 percent involved at least four types of stakeholders. These results suggest that EPA efforts to change their attitude towards stakeholder participation (EPA, 2000b) are indeed achieving the goal of involving the private and non-profit sector in partnerships with the government, avoiding more command-and-control regulation as claimed by EPA (1999). More remarkable is that industry sponsored VEIs have a diversity of participation similar to partnership and governmental VEIs (Jenkins, 1995; OECD, 1999; Gartelmann, 2002; Muldoon, 1999). With 57 percent of the industry VEIs involving more than six types of stakeholders in program design and on average 5.4 types of stakeholders per program, it is not reasonable to suggest that they have less input than governmental or partnership initiatives. In addition, these numbers also support Rondinelli and London's (2001) assessment that a larger number of corporations are indeed changing their behavior towards the relations with other stakeholders. It appears that for-profit firms and industry associations engaged in the development of voluntary initiatives are mobilizing the support of the stakeholders affected by their actions and sharing knowledge with stakeholders to whom they traditionally have had adversarial relationships.

Among all sponsors, third-party initiatives had the lowest diversity of participation in the design of their programs. It is interesting that the VEI sponsors that are less susceptible to criticism (when compared to government, industry or partnership VEIs) are the ones with fewer types of stakeholders involved in the design of their initiatives. This may again be related to the need to involve stakeholders in the development of the programs in order to guarantee their credibility. Third-party sponsors, as a consequence of less questionable motivations to develop voluntary initiatives, may not need to ensure the participation of other stakeholders as a way to achieve credibility and acceptability of their programs.

Table 9 - Diversity of Participation in the Design of VEIs*

	Number of different types of stakeholders			Total**
Sponsor	0 - 3	4 - 6	> 6	
Government	6 (16%)	18 (47%)	14 (37%)	***38 (100%)***
Industry	2 (29%)	1 (14%)	4 (57%)	***7 (100%)***
Third-Party	5 (56%)	4 (44%)	0 (0%)	***9 (100%)***
Partnership	2 (22%)	4 (44%)	3 (33%)	***9 (100%)***
Total	***15 (24%)***	***27 (43%)***	***21 (33%)***	***63 (100%)***

* $p = 0.066$ (significant at $\alpha = 0.1$)
** Percentages may not sum due to rounding

During the routine administration of the VEI there is no statistically significant difference between sponsorship and diversity of stakeholder participation. As seen before, the number of types of stakeholders involved decreases from the design to the administrative stage. Because of this decrease in the diversity of participation, the differences between each VEI sponsor get smaller, and therefore there is no significant difference. A comparison between Tables 9 and 10 suggests that there is a decrease in diversity of participation for each of the four types of VEIs' sponsors. Both government, industry and third-party initiatives have the highest number of programs in the less than four types of stakeholders category. The smallest difference between the design and administration stages were observed for partnership initiatives, indicating that the same types of stakeholders that were involved in the design of the program also participate in its routine administration.

Table 10 - Diversity of Participation in the Routine Administration of VEIs*

	Number of different types of stakeholders			Total**
Sponsor	0 - 3	4 - 6	> 6	
Government	18 (47%)	10 (26%)	10 (26%)	38 (100%)
Industry	4 (57%)	1 (14%)	2 (29%)	7 (100%)
Third-Party	7 (78%)	2 (22%)	0 (0%)	9 (100%)
Partnership	3 (33%)	4 (44%)	2 (22%)	9 (100%)
Total	***32 (51%)***	***17 (27%)***	***14 (22%)***	***63 (100%)***

* $p = 0.441$ (not significant at $\alpha = 0.1$)
** Percentages may not sum due to rounding

The same pattern that was observed for the administration stage is present during the monitoring phase. Although no significant difference was found between the type of sponsor and the number of different types of stakeholders involved in the monitoring process of the VEI, the level of participation was lower for all sponsors in comparison to both the design and administration stages.

Table 11 - Diversity of Participation Monitoring the Performance of VEIs' Participants*

	Number of different types of stakeholders			Total**
Sponsor	0 - 3	4 - 6	> 6	
Government	13 (57%)	7 (30%)	3 (13%)	***23 (100%)***
Industry	2 (40%)	1 (20%)	2 (40%)	***5 (100%)***
Third-Party	5 (100%)	0 (0%)	0 (0%)	***5 (100%)***
Partnership	3 (50%)	2 (33%)	1 (17%)	***6 (100%)***
Total	***23 (59%)***	***10 (26%)***	***6 (15%)***	***39 (100%)***

* $p = 0.428$ (not significant at $\alpha = 0.1$)
** Percentages may not sum due to rounding

The fact that the diversity of participation for all the sponsors in both the administration and monitoring stages was lower when compared to the design stage of the VEI, may suggest that independently of the type of initiative, sponsors seeks the input of several stakeholders in the definition of the main characteristics of the VEI (such as environmental standards and structure of the program) while being exclusively responsible for the implementation of the program.

Table 12 - Research Question 1 and Hypothesis Tested

Research Question 1 - Which type of sponsor includes the greatest variety of stakeholders in the development of VEIs?	
Hypothesis 1 - Government sponsored initiatives will have a higher diversity of stakeholders participating in the design of VEIs than industry or third-party sponsored initiatives.	Rejected
Hypothesis 2 - VEIs sponsored by partnerships will have the highest diversity of stakeholder involvement in the design of VEIs.	Supported
Hypothesis 3 - Industry initiatives will have the lowest diversity of stakeholder involvement in the design stage of the VEI.	Rejected

Sponsorship and Intensity of Participation in the Design of VEIs

The second research question deals with the issue of intensity of participation on an important phase of the VEI development, the design of the requirements, structure, and protocols of the VEI. More specifically, it asks from among those involved, which stakeholder groups are more likely to work with each category of VEI sponsor in the design phase of the initiative? The following hypothesis were tested:

Hypothesis 4 - Industry associations will be the stakeholders with the highest degree of involvement in the design of government VEIs.

Hypothesis 5 - Federal government and industry associations will be the stakeholders with the highest intensity of participation in the design of partnership VEIs.

When analyzing intensity of participation, in order to avoid colinearity problems, the sponsor of the initiatives were removed from the list of stakeholders involved. Therefore, the intensity of participation was only evaluated for stakeholders other than those who were sponsors.

Government Initiatives

For the specific case of government sponsored initiatives, because the stakeholder "individuals" had a very low intensity of participation, it would be possible that the presence of this type of stakeholder could be the only reason for the existence of a significant difference. For that reason, fisher's exact test was run without the stakeholder "individuals" and it was observed that the statistically significant difference occurred. The probability value, $p = 0.108$, for an α of 0.1 indicates that there is a statistically significant difference between the various stakeholders and their intensity of participation in the design of governmental initiatives (see Table 13).

As discussed and criticized by some authors, the highest intensity of participation in the design of governmental initiatives occurred with industry associations (Hypothesis 4 is supported, see Table 17). Only five government programs (representing 14 percent) had no involvement by industry associations. Although less involved than industry associations, both for-profit firms and non-profit organizations had a high level of participation in, respectively, 47 percent and 42 percent of the governmental initiatives. Consultant firms had no involvement in 41 percent of the governmental initiatives, but a high level of involvement in 32 percent of them. The lowest intensity of participation was observed for individuals not affiliated with an organization.

Table 13 - Intensity of Participation in the Design of Government VEIs*

	Stakeholders				Total**
Intensity of participation	Industry Assoc.	Firm	Consultant	Non-Profit Org.	
None	5 (14%)	13 (36%)	15 (41%)	10 (26%)	***63 (35%)***
Low	14 (38%)	6 (17%)	10 (27%)	12 (32%)	***51 (28%)***
High	18 (49%)	17 (47%)	12 (32%)	16 (42%)	***67 (37%)***
Total	***37 (100%)***	***36 (100%)***	***37 (100%)***	***38 (100%)***	***181 (100%)***

* $p = 0.108$ (significant at $\alpha = 0.1$)
** Percentages may not sum due to rounding

The fact that the highest intensity of participation occurred with industry associations is very important, due to fact that the majority of the criticisms toward government sponsored VEIs are claims that regulatory agencies have become overly protective of industry interests at the expense of consumers (Faure, 2001). In addition, a higher intensity of participation of the private sector over the non-profit sector increases the potential for conflict and regulatory capture (Barth and Dette, 2001; Webb and Morrison, 1997) while according to some scholars, contributing to lower environmental targets and reduced environmental effectiveness of the voluntary initiatives (Higley, Convery, and Leveque, 2001; Hansen, 1999; Krarup, 1999).

Although industry associations are the stakeholder with the highest intensity of participation in the design of governmental VEIs, non-profit sector intensity of participation is not much lower. The biggest difference between these two stakeholders occurred with programs with no participation at all by non-profit organizations (10 out of 38) while industry associations were involved in all but five programs. This difference in intensity of participation does not have the magnitude that would allow a severe critique to the public sector as a discriminatory sponsor of voluntary initiatives. Yet, it is important to notice that even if the intensity of participation by the private and non-profit sector was similar, there is still a relevant percentage of VEIs that had no involvement by non-profit organizations, contributing to the suspicion and limitation of the successful implementation of these initiatives.

<u>Industry Initiatives</u>

In order to study the intensity of stakeholder participation in the design of industry VEIs, the information regarding stakeholders from similar sectors was aggregated into one singe stakeholder. Governmental participation was aggregated by selecting the highest intensity of participation within each of the governmental categories (federal, state and local) for each program. This way, the program manager that responded to the survey is acknowledging high participation by at least one segment of government. This new variable was compared with intensity of participation by non-profit organizations in the design of industry VEIs and. Both consultant firms and individuals have a very weak participation and they were not considered for this analysis.

Table 14 shows the relation between the two types of stakeholders and their intensity of participation in the design of industry initiatives (p = 1.000). The probability value indicates that there are no statistically significant differences in terms of the different types of stakeholders' intensity of participation in the design of industry initiatives.

Table 14 - Intensity of Participation in the Design of Industry VEIs*

	Stakeholders		Total**
Intensity of participation	Government	Non-Profit Org.	
None	2 (29%)	2 (29%)	***4 (29%)***
Very Low	1 (14%)	1 (14%)	***2 (14%)***
Somewhat Low	1 (14%)	2 (29%)	***3 (21%)***
Somewhat High	2 (29%)	1 (14%)	***3 (21%)***
Very High	1 (14%)	1 (14%)	***2 (14%)***
Total	***7 (100%)***	***7 (100%)***	***14 (100 %)***

* $p = 1.000$ (not significant at $\alpha = 0.1$)
** Percentages may not sum due to rounding

Third-Party Initiatives

A very similar analysis as above was developed for the design of third-party VEIs. The first test that included all stakeholders indicated that there were no statistically significant differences in terms of the different stakeholders' intensity of participation. Again, a second analysis limited to the aggregate intensity of participation by the government (federal, state and local) and industry (firms and industry associations) was developed. Table 15 shows the relation between the intensity of participation by government and industry in the design of third-party initiatives ($p = 0.056$), and the existence of statistically significant differences.

From Table 15, it is noticeable the low intensity of participation by the government stakeholders (no participation in 67 percent of the initiatives and "High" intensity of participation in only 11 percent of them). On the other hand, the industry stakeholders had a "High" intensity of participation in 56 percent of the programs, and in only one program there was no industry stakeholder involved.

Table 15 - Intensity of Participation in the Design of Third-Party VEIs*

	Stakeholders		Total **
Intensity of participation	Government	Industry	
None	6 (67%)	1 (11%)	***7 (39%)***
Low	2 (22%)	3 (33%)	***5 (28%)***
High	1 (11%)	5 (56%)	***6 (33%)***
Total	***9 (100%)***	***9 (100%)***	***18 (100%)***

* $p = 0.056$ (significant at $\alpha = 0.1$)
** Percentages may not sum due to rounding

Partnership Initiatives

The analysis of the intensity of participation of stakeholders involved in the design of VEIs sponsored by partnerships is particularly difficult. Because of the large number of different types of stakeholders involved and the small number of partnership sponsored VEIs that are implemented in the US, the expected frequencies for this distribution table are very low. For that reason the Fisher's Exact Test should be used in this analysis. Yet, because of the large number of categories (8 stakeholders) the Fisher's Exact Test was not possible to compute. Again, the government and industry stakeholders were aggregated and the stakeholders consultants and individuals were not included in order to run the significance test.

Although the nonexistence of statistically significance differences (Hypothesis 5 was rejected, see Table 17), from the descriptive analysis of the distribution table (Table 16), it is noteworthy that there are very similar results for both government and industry. Both had a "Very High" intensity of participation in 78% of the partnership initiatives, while in opposition, non-profit organizations had none or low intensity of participation in 55 percent of the programs.

Table 16 - Intensity of Participation in the Design of VEIs by Partnerships*

Intensity of participation	Stakeholders			Total**
	Government	Industry	Non-Profit Org.	
None	1 (11%)	1 (11%)	3 (33%)	***5 (19%)***
Very Low	1 (11%)	0 (0%)	0 (0%)	***1 (4%)***
Somewhat Low	0 (0%)	1 (11%)	2 (22%)	***3 (11%)***
Somewhat High	0 (0%)	0 (0%)	1 (11%)	***1 (4%)***
Very High	7 (78%)	7 (78%)	3 (33%)	***17 (63%)***
Total	***9 (100%)***	***9 (100%)***	***9 (100%)***	***27 (100%)***

* $p = 0.266$ (not significant at $\alpha = 0.1$)
** Percentages may not sum due to rounding

These results once again suggest the strong connection that exists between the government and industry in the development of voluntary approaches, and at a certain level might give support to some of the critiques of VEIs. Mazurek (1999a), Maxwell and Lyon (1999) and EEA (1997) have questioned the implementation of VEIs where industry and public agencies negotiate directly, to the exclusion of other affected parties. They suggest that industry might succeed in convincing the government to adopt unacceptably weak targets. The results of this survey do not suggest that the public and private sectors are negotiating VEIs without input from other stakeholders. Yet, it seems like industry and government were the stakeholders most involved. The limited role of non-profit organizations might leave third parties with the uncertainty on whether their opinions were taken into account.

As summarized in Table 17, hypothesis 5 states that federal government and industry associations will be the stakeholders with the highest intensity of participation in the design of partnership VEIs. Even if a descriptive analysis seems to illustrate that these two stakeholders were the ones with the highest intensity of participation, this hypothesis was rejected. Hypothesis 4 was supported because, as noted, industry associations are the stakeholder with the highest intensity of participation in the design of government sponsored initiatives.

Table 17 - Research Question 2 and Hypothesis Tested

Research Question 2 - From among those involved, which stakeholder groups are more likely to work with each category of VEI sponsor in the design phase of the initiative?	
Hypothesis 4 - Industry associations will be the stakeholders with the highest intensity of participation in the design of government VEIs.	Supported
Hypothesis 5 - Federal government and industry associations will be the stakeholders with the highest intensity of participation in the design of partnership VEIs.	Rejected

Sponsorship and Intensity of Non-Profit Participation

Non-profit organizations have criticized the adoption of voluntary initiatives on the basis of being developed under an exclusionary process. Therefore, it is important to see if there are differences between the various sponsors in terms of their involvement with the non-profit sector. The third research question asks which type of VEI sponsor is associated with a higher intensity of participation by the non-profit sector? The following hypotheses were tested.

Hypothesis 6 – From among all sponsors, government initiatives will have the highest intensity of participation by the non-profit sector in the design of their programs.

Hypothesis 7 - Industry sponsored initiatives will have the lowest intensity of participation by the non-profit sector in the design of their programs.

Table 18 shows the intensity of involvement of non-profit organizations in the design of VEIs. According to the probability value, 0.637, there is no statistical evidence of differences between government, industry and partnership initiatives in terms of their involvement with non-profit organizations (Hypothesis 6 and 7 rejected, see Table 21). Yet, from the analysis of the distribution table, it seems like industry sponsored initiatives have the lowest intensity of participation by non-profit organizations.

Table 18 - Intensity of Participation by Non-Profit Organizations in the Design of VEIs*

	Sponsors			Total**
Intensity of participation	Government	Industry	Partnership	
None	10 (26%)	2 (29%)	3 (33%)	***15*** ***(28%)***
Very Low	8 (21%)	1 (14%)	0 (0%)	***9*** ***(17%)***
Somewhat Low	4 (11%)	2 (29%)	2 (22%)	***8*** ***(15%)***
Somewhat High	10 (26%)	1 (14%)	1 (11%)	***12*** ***(22%)***
Very High	6 (16%)	1 (14%)	3 (33%)	***10*** ***(19%)***
Total	***38*** ***(100%)***	***7*** ***(100%)***	***9*** ***(100%)***	***54*** ***(100%)***

* $p = 0.637$ (not significant at $\alpha = 0.1$)
** Percentages may not sum due to rounding

During the routine administration of the VEI, the scenario is similar and again there is no significant difference between various sponsors and the intensity of non-profit organizations participation (p = 0.328). From Table 19 it is, however, possible to notice the decrease in participation in government and industry initiatives while in partnerships the intensity of involvement remains approximately the same. Again this supports the idea than in partnership initiatives, the stakeholders that are involved in the design of an initiative remain engaged during the administration of the program.

Table 19 - Intensity of Participation by Non-Profit Organizations in the Routine Administration of VEIs*

	Sponsors			Total**
Intensity of participation	Government	Industry	Partnership	
None	16 (42%)	4 (57%)	2 (25%)	***22 (42%)***
Very Low	8 (21%)	0 (0%)	0 (0%)	***8 (15%)***
Somewhat Low	6 (16%)	1 (14%)	1 (13%)	***8 (15%)***
Somewhat High	5 (13%)	1 (14%)	2 (25%)	***8 (15%)***
Very High	3 (8%)	1 (14%)	3 (38%)	***7 (13%)***
Total	***38 (100%)***	***7 (100%)***	***8 (100%)***	***53 (100%)***

* $p = 0.328$ (not significant at $\alpha = 0.1$)
** Percentages may not sum due to rounding

As for the monitoring stage of the VEI, it is also not possible to establish a significant difference between sponsorship and intensity of non-profit organizations' participation (see Table 20).

Table 20 - Intensity of Participation by Non-Profit Organizations Monitoring the VEIs*

	Sponsors			Total**
Intensity of participation	Government	Industry	Partnership	
None	14 (61%)	3 (60%)	3 (60%)	***20 (61%)***
Very Low	2 (9%)	0 (0%)	2 (40%)	***4 (12%)***
Somewhat Low	3 (13%)	1 (20%)	0 (0%)	***4 (12%)***
Somewhat High	1 (4%)	1 (20%)	0 (0%)	***2 (6%)***
Very High	3 (13%)	0 (0%)	0 (0%)	***3 (9%)***
Total	***23 (100%)***	***5 (100%)***	***5 (100%)***	***33 (100%)***

* $p = 0.474$ (not significant at $\alpha = 0.1$)
** Percentages may not sum due to rounding

Non-profit organizations are responsible for making some of the biggest criticisms of the development of VEIs (Friends of the Earth, 2002; Barber, 1998). Typically the non-profit sector is very skeptical of the development of VEIs, particularly if they are developed with the purpose of dismantling regulation preventing independent monitoring and evaluation.

Overall, it can be said that different sponsors share a similar concern for involving non-profit organizations in order to hear their demands and ensure the acceptability of the program. On the other side, it seems like there is no "arduous concern" to ensure the participation of non-profit organizations in every VEI. Because non-profit organizations have been responsible by raising judicial conflicts or other actions such as consumer boycotts against the development of VEIs, it would be very beneficial for the success of this type of voluntary approach to ensure that they can be involved with a higher intensity.

In the routine administration and monitoring stages, the intensity of participation by non-profit groups was significantly lower when compared to the design stage. Still, it was not possible to differentiate their intensity of participation between the different types of sponsors. Again, it would likely enhance the acceptance of VEIs if non-profit organizations were substantially more involved in the administration and monitoring stages, ensuring that participants were effectively following what was initially established in the design of the initiative and consequently improving the success of the VEIs implementation (Paton, 2001).

Table 21 - Research Question 3 and Hypothesis Tested

Research Question 3 - Which type of VEI sponsor is associated with a higher intensity of participation by the non-profit sector?	
Hypothesis 6 – From among all sponsors, government initiatives will have the highest intensity of participation by the non-profit sector in the design of their programs.	Rejected
Hypothesis 7 - Industry sponsored initiatives will have the lowest intensity of participation by the non-profit sector in the design of their programs.	Rejected

Sponsorship and Intensity of Industry Associations and For-Profit Firms Participation

The last research question asks which type of VEI sponsor is associated with a higher intensity of participation by industry associations and for-profit firms? The following hypothesis were tested:

Hypothesis 8 - Government initiatives will have the highest intensity of participation by firms and industry associations in the design of their programs.

Hypothesis 9 - Because of the traditional adversarial positions, third-party initiatives will have the lowest intensity of participation by firms and industry associations in the design of their programs.

Like the non-profit sector, industry associations and for-profit firms' intensity of participation in the development of VEIs was compared for different sponsors. For the design stage of VEI development, it was noticed that there is no significant difference between the sponsor of the VEI and the intensity of involvement by industry associations (p = 0.173). Yet, from Table 22 it is perceptible that there is a higher intensity of participation by industry associations in the design of partnership VEIs ("Very High" in 65 percent of the VEIs) than in third-party initiatives (44 percent of programs with no participation and just 22 percent with high intensity participation).

Table 22 - Intensity of Participation by Industry Associations in the Design of VEIs*

	Sponsors			Total**
Intensity of participation	Government	Third-Party	Partnership	
None	5 (14%)	4 (44%)	1 (11%)	***10 (18%)***
Very Low	9 (24%)	1 (11%)	0 (0%)	***10 (18%)***
Somewhat Low	5 (14%)	2 (22%)	1 (11%)	***8 (15%)***
Somewhat High	7 (19%)	1 (11%)	1 (11%)	***9 (16%)***
Very High	11 (30%)	1 (11%)	6 (67%)	***18 (33%)***
Total	***37 (100%)***	***9 (100%)***	***9 (100%)***	***55 (100%)***

* $p = 0.173$ (not significant at $\alpha = 0.1$)
** Percentages may not sum due to rounding

As for the role of for-profit firms, it is also not possible to observe a statistically significant relationship between the different sponsors and their involvement with for-profit firms in the design of the VEIs. Table 23 and the *p*-value of 0.592 show that there are no differences among the stakeholders (Hypothesis 8 and 9 rejected, see Table 28).

Table 23 - Intensity of Participation by Firms in the Design of VEIs*

	Sponsors			Total**
Intensity of participation	Government	Third-Party	Partnership	
None	13 (36%)	4 (50%)	3 (33%)	***20 (38%)***
Very Low	4 (11%)	0 (0%)	0 (0%)	***4 (8%)***
Somewhat Low	2 (6%)	1 (13%)	2 (22%)	***5 (9%)***
Somewhat High	7 (19%)	1 (13%)	0 (0%)	***8 (15%)***
Very High	10 (28%)	2 (25%)	4 (44%)	***16 (30%)***
Total	***36 (100%)***	***8 (100%)***	***9 (100%)***	***53 (100%)***

* $p = 0.592$ (not significant at $\alpha = 0.1$)
** Percentages may not sum due to rounding

Just like it was seen before, the intensity of participation tends to get lower from the design to the routine administration stage. This time, the intensity of participation by industry associations (see Table 24) decreased in governmental and third-party initiatives, while remaining significant in the case of partnership initiatives. The p-value so close to 0.1 (0.103) suggests that there are statistically significant differences in the intensity of participation between the different sponsors.

Table 24 - Intensity of Participation by Industry Associations in the Routine Administration of VEIs*

Intensity of participation	Sponsors: Government	Third-Party	Partnership	Total**
None	15 (39%)	7 (78%)	1 (13%)	***23 (42%)***
Very Low	6 (16%)	1 (11%)	0 (0%)	***7 (13%)***
Somewhat Low	6 (16%)	1 (11%)	3 (38%)	***10 (18%)***
Somewhat High	6 (16%)	0 (0%)	1 (13%)	***7 (13%)***
Very High	5 (13%)	0 (0%)	3 (38%)	***8 (15%)***
Total	***38 (100%)***	***9 (100%)***	***8 (100%)***	***55 (100%)***

* $p = 0.103$ (significant at $\alpha = 0.1$)
** Percentages may not sum due to rounding

As for for-profit firms (see Table 25), the p-value (0.130) is slightly outside the established significance range. Although the lower intensity of participation in the routine administration of both governmental and partnership initiatives, the intensity of participation by for-profit firms in third-party initiatives remained constant. This fact seems to originate a small difference between the different sponsors. In 38 percent of the third-party initiatives, for-profit firms have a somewhat high or very high intensity of participation, while in the other two types of VEIs this intensity of involvement occurs in much fewer programs. Yet, this difference was not enough to ensure statistically significance between sponsorship and the intensity of participation by for-profit firms.

Table 25 - Intensity of Participation by Firms in the Routine Administration of VEIs*

	Sponsors			Total**
Intensity of participation	Government	Third-Party	Partnership	
None	17 (49%)	4 (50%)	1 (14%)	***22 (44%)***
Very Low	4 (11%)	0 (0%)	4 (57%)	***8 (16%)***
Somewhat Low	3 (9%)	1 (13%)	1 (14%)	***5 (10%)***
Somewhat High	6 (17%)	1 (13%)	0 (0%)	***7 (14%)***
Very High	5 (14%)	2 (25%)	1 (14%)	***8 (16%)***
Total	***35 (100%)***	***8 (100%)***	***7 (100%)***	***50 (100%)***

* $p = 0.130$ (not significant at $\alpha = 0.1$)
** Percentages may not sum due to rounding

The relation between intensity of participation by industry associations (Table 26) and for-profit firms (Table 27) in the monitoring stage of the VEI developed by different types of sponsors cannot be explained (p = 0.700 and p = 0.784 respectively).

Table 26 - Intensity of Participation by Industry Associations Monitoring the VEIs*

	Sponsors			Total**
Intensity of participation	Government	Third-Party	Partnership	
None	13 (57%)	4 (80%)	3 (50%)	***20 (59%)***
Very Low	4 (17%)	1 (20%)	0 (0%)	***5 (15%)***
Somewhat Low	2 (9%)	0 (0%)	2 (33%)	***4 (12%)***
Somewhat High	2 (9%)	0 (0%)	0 (0%)	***2 (6%)***
Very High	2 (9%)	0 (0%)	1 (17%)	***3 (9%)***
Total	***23 (100%)***	***5 (100%)***	***6 (100%)***	***34 (100%)***

* $p = 0.700$ (not significant at $\alpha = 0.1$)
** Percentages may not sum due to rounding

Table 27 - Intensity of Participation by Firms Monitoring the VEIs*

Intensity of participation	Sponsors: Government	Third-Party	Partnership	Total**
None	12 (55%)	4 (80%)	2 (40%)	18 (60%)
Very Low	2 (9%)	0 (0%)	2 (40%)	4 (13%)
Somewhat Low	2 (9%)	0 (0%)	0 (0%)	2 (7%)
Somewhat High	1 (5%)	0 (0%)	0 (0%)	1 (3%)
Very High	3 (14%)	1 (20%)	1 (20%)	5 (17%)
Total	22 (100%)	5 (100%)	5 (100%)	30 (100%)

* $p = 0.784$ (not significant at $\alpha = 0.1$)
** Percentages may not sum due to rounding

Overall, from a descriptive perspective, for both government and particularly partnership VEIs, industry associations had a high intensity of participation, while for third-party initiatives the intensity of participation was very low. Although this descriptive analysis is in agreement with the hypothesis proposed, because there are no significant differences, both Hypothesis 8 and 9 were rejected (see Table 28).

As it was seen for non-profit organizations, the intensity of participation of industry associations was lower in the administration and monitoring stages than in the design stage of the VEI. This time there was a significant difference that also showed the low intensity of participation by industry associations in the administration of third-party VEIs. These differences in intensity of participation by industry associations in both the design and implementation of the VEIs, reflect a different approach by each sponsor in the development of these programs. For governmental and partnership approaches, the involvement of industry associations in the design of VEIs might be crucial to ensure the participation of the associations' members, making them a successful alternative to command-and-control regulation. For third-parties, the motivations are probably different. The lack of participation by industry associations perhaps still reflects a sense of confrontational behavior between the private and non-profit sectors, and clearly the fact that third-parties do not need (or want) to be associated with industry associations in order to ensure the credibility of their initiatives. In addition, in contrast to the case of non-profit organizations, the participation of industry associations in the administration and monitoring stages might not be necessary. If stakeholder participation is beneficial in terms of sharing knowledge, the participation of industry associations monitoring the environmental performance of participants will not necessarily lead to an increased acceptability of the initiative.

Table 28 - Research Question 4 and Hypothesis Tested

Research Question 4 - Which type of VEI sponsor is associated with a higher intensity of participation by industry associations and for-profit firms?	
Hypothesis 8 - Government initiatives will have the highest intensity of participation by firms and industry associations in the design of their programs.	Rejected
Hypothesis 9 - Because of the traditional adversarial positions, third-party initiatives will have the lowest intensity of participation by firms and industry associations in the design of their programs.	Rejected

CHAPTER VII

Conclusion

In environmental policy, three types of instruments emerged during the last century: command-and-control regulation, incentive-based and voluntary instruments. The difference between these approaches is the degree of control imposed by the regulator to achieve policy targets. Traditional regulatory tools take the form of emission or technology standards. These impose strong restrictions that obligate polluters to change their behavior in the way stated by the government. The main advantage of traditional regulation is that the regulator is more certain about the outcomes providing it has resources for monitoring and enforcement, however, it is often costly to control efficiency and hard for polluters that have to face sanctions when the regulation is not kept. Incentive-based policies do not impose direct restrictions on the polluters. They give polluters economic incentives to act in a certain way, offering them the choice between decreasing their emissions level or paying higher taxes. This approach has the disadvantage of being more uncertain in terms of what can be achieved, however, it is possible to get a more efficient outcome and provide a long-term incentive (Krarup and Kraemer, 1996). Twenty years after the appearance of regulatory instruments, voluntary approaches emerged as a complement to traditional regulation. Voluntary environmental initiatives are efforts designed to improve environmental performance beyond existing legal requirements (Paton, 2000). It is argued that VEIs may exert less adverse impacts on national corporate competitiveness and that they are better adapted to deal with pollution abatement actions that are profitable for firms (Glachant, 1995).

The use of voluntary approaches is a world-wide strategy in modern environmental policy. Since the beginning of the 1990s there has been a proliferation of this approach in many countries, particularly in the US, EU and Japan. VEIs have been mainly sponsored by governmental regulatory agencies like EPA. There are also several examples of initiatives sponsored by the corporate sector, non-profit sector, or by partnerships between government, industry and non-profit organizations. Because voluntary approaches can vary in many aspects concerning their sponsors, content, participants, and implementation, a diversity of forms within this approach exist (DeClercq *et al*, 2001). In the last decade, thousands of organizations have joined voluntarily environmental initiatives (EPA, 2001b). VEIs have received much attention in recent years because of their promise to achieve environmental goals in a more flexible manner than traditional regulation.

VEIs are based on the assumption that responsibility to formulate environmental policy can be shifted to the corporate sector. This results in more flexibility in formulating the means by which pollution will be reduced and in a customized approach to environmental policy. In contrast, command-and-control techniques have always tried to overlay a single approach to different types of industries. VEIs allow firms to allocate the burdens of environmental protection amongst themselves in the most efficient way. By encouraging corporate responsiveness, VEIs also promote an open flow of information between all the stakeholders involved in the environmental policy process, which contributes to the acceptance of this type of policy by all the sectors of the society (Higley, Convery, and Leveque, 2001).

An important process of the design and implementation of VEIs, and one of the benefits over traditional command-and-control regulation, is the possibility to take advantage of the perceptions of different stakeholders within the public, private and non-profit sectors. The higher the level of cooperation between stakeholders, the higher the level of awareness of the initiative and the higher motivation to support the initiative (ECOTEC Research and Consulting, 1999). However, several critiques have been raised about the lack of stakeholder participation in the design and implementation of VEIs. Non-profit organizations have been particularly active condemning joint government-industry initiatives which, without the knowledge of the civil society, might be contributing to lower environmental targets and reduced environmental effectiveness of the voluntary initiatives. Industry sponsored initiatives have been criticized for their lack of openness and transparency in many instances, not allowing independent monitoring and evaluation of environmental progress. Government initiatives have also been accused of lacking multi-stakeholder involvement in their development.

This research suggests that these critiques are not always fair. In terms of the number of different stakeholders involved, it was observed that industry sponsored initiatives have included a similar number of different types of stakeholders in the design of their programs as government initiatives. Also, the diversity of participants in industry and government initiatives was very close to what occurred in the design of partnership VEIs. Interestingly, third-party initiatives had the lowest diversity of participants involved in the design of their programs. This fact is remarkable in terms of the relationship between public participation and the acceptability of these programs. The initiatives that traditionally are more susceptible of being criticized in terms of their credibility (government or industry sponsored VEIs) had more stakeholders involved in their design than the ones less susceptible to criticism (third-party VEIs).

As for the specific case of government sponsored initiatives, the most common type in the US, it was observed that they had a higher intensity of participation from industry associations than from any other stakeholder. This fact supports some of the criticisms that have been directed to government VEIs. Although the results suggest that non-profit organizations also have a high level of participation in the design of governmental initiatives, it would be beneficial for their successful implementation if there were no mistrust on the reasons that lead government and industries to develop voluntary approaches. An equal involvement by non-profit organizations might enhance the credibility of governmental programs.

Despite the nonexistence of statistically significant differences in terms of the role of non-profit organizations in the development of VEIs, there are some preliminary evidences that suggest that industry sponsored initiatives are the ones less likely to collaborate with non-profit organizations. Similarly, industry associations seem to have a low intensity of participation in the development of third-party sponsored initiatives. Although these patterns are still hard to prove, a stronger cooperation between these traditionally adversarial stakeholders could be a fundamental step to foster the establishment of voluntary approaches as an effective instrument of environmental policy. Because the members of the private sector are the traditional participants in voluntary programs and because non-profit organizations have been the main critics of VEIs, a stronger cooperation between these different partners would allow a better understanding of the importance of voluntary approaches in environmental policy.

Although VEIs have been introduced as an environmental policy instrument quite recently, there are some programs that already claimed significant cost reductions and better environmental performance. Yet, the establishment of VEIs is still in the shadow of some criticism on the reasons beyond the creation of such programs, the number of participants, or the merits of the environmental objectives achieved. In order for VEIs to be accepted they need strong engagement by participants, stringent environmental standards and an effective monitoring and reporting processes. The public sector, mainly through federal agencies such as EPA, has shown that it is willing to invest in voluntary approaches. Now it is necessary for the private sector to participate and foster the participation of its members in VEIs, and to encourage input from the civil society as actors that can serve as a source of knowledge and as engaged parties in the development of voluntary initiatives.

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Appendix 1 – List of contacted VEIs

- ISO 14000
- 33/50 Program
- AgStar
- Alliance for Environmental Innovation
- Audubon Cooperative Sanctuary Program
- Best Practices
- Building America
- Business Charter Sustainable Development
- Business for Social Responsibility
- Caux Roundtable
- Chemical Safety Audit Program
- Chemical Strategies Partnership
- Clean Cities
- Clean Water Act Compliance Audit Program
- Climate Challenge Program
- Climate Savers
- Coalbed Methane Outreach Program
- Coalition for Environmentally Responsible Economies (CERES)
- Coatings Care
- Combined Heat and Power Partnership
- Commuter Choice Program
- Consumer Labeling Initiative
- Corporate Wildlife Habitat Certification/International Accreditation Program
- Encouraging Environmental Excellence
- Energy Star
- Environmental Accounting Project
- Environmental Leadership Program
- Environmental Management Systems at the Municipal Level
- Environmental Preferable Purchasing

- Environmental Stewardship Program
- Environmental Technology Verification Program
- Farm*A*Syst
- Federal Energy Management Program
- Federal Facility Environmental Management Review
- Forest Stewardship Council
- Global e-Sustainability Initiative
- Global Reporting Initiative
- Great Lakes Automotive Pollution Prevention Project
- Great Printers Project
- Green Chemistry Program
- Green Globe 21
- Green Hotel Initiative
- Green Hotels
- Green Power Market Development Group
- Green Power Partnership
- Green Seal
- Green-e Renewable Electricity Certification Program
- Hatter's Pledge - Campaign for a Mercury-Free NIH
- HFC-23 Emission Reduction Program
- Hospitals for a Healthy Environment
- Indoor Environments Program
- International Cooperative for Environmental Leadership
- International Ecotourism Society
- International Fabric Institute Certification Program
- International Hotels Environmental Initiatives
- International Institute for Sustainable Development
- Landfill Methane Outreach Program
- Mercury Challenge
- Merit Partnership for Pollution Prevention
- Metal Finishing Strategic Goals Partnership
- Mobile Air Conditioning Climate Protection Partnership

- MOM Programs Project
- National Environmental Performance Track
- National Forum on Non-Point Source Pollution
- National Office Paper Recycling Project
- Natural Gas Star
- Natural Step
- North American Communications Environmental Excellence Initiative
- Paper Task Force
- Pesticide Environmental Stewardship Program
- PFC Emission Reduction Partnership for the Semiconductor Industry
- Project XL
- Recycled Paper Coalition
- Responsible Care
- Responsible Carrier
- Responsible Distribution Process
- Ruminant Livestock Efficiency Program
- SF6 Emission Reduction Partnership for the magnesium industry
- SF6 Emissions Reduction Partnership for Electric Power Systems
- Southern Appalachian Mountain Initiative
- Standards of Corporate Social Responsibility
- StarTrack
- State and Local Climate Change Outreach
- Strategies for Today's Environmental Partnership
- Sustainable Forestry Initiative
- Sustainable Industries Performance Partnership Program
- Tour Operators' Initiative for Sustainable Tourism Development
- Transportation Partners changed to Commuter Choice Leadership Initiative
- UNEP Advertising and Communication Initiative
- UNEP Financial Institutions Initiative
- United States Auto Project
- US EPA Design for the Environment Adhesives & Foam
- US EPA Design for the Environment Automotive Refinishing Partnership

- US EPA Design for the Environment Cleaner Technologies Substitute Assessments
- US EPA Design for the Environment Computer Display Partnership
- US EPA Design for the Environment Flexographic Printing Partnership
- US EPA Design for the Environment Garment and Textile Care Partnership
- US EPA Design for the Environment Gravure Printing Partnership
- US EPA Design for the Environment Greening the Supply Chain
- US EPA Design for the Environment Industrial and Institutional Laundry Partnership
- US EPA Design for the Environment Integrated Environmental Management Systems
- US EPA Design for the Environment Lifecycle Assessment
- US EPA Design for the Environment Lithographic Printing Partnership
- US EPA Design for the Environment Printed Wiring Board Partnership
- US EPA Design for the Environment Screen Printing Partnership
- Voluntary Aluminum Industrial Partnership
- Voluntary Mobile Source Emission Reduction Program
- Voluntary Reporting of Greenhouse Gases
- Waste Minimization National Plan
- Waste Wise
- Water Alliances for Voluntary Efficiency (WAVE)
- Water Quality Guidelines for the Textile Industry
- World Business Council for Sustainable Development

Appendix 2

VOLUNTARY ENVIRONMENTAL INITIATIVE (VEI) SURVEY

Program Background

VEIs have different types of structures. The first set of questions examines the general structure, scope, and design of your VEI.

1. What is the name of your voluntary environmental initiative (please answer for only one VEI)?

2. What country is the headquarters of your VEI located?

3. Which one of the following best describes the geographic scope of your program?
   - International
   - National, within the U.S.
   - National, outside of the U.S.
   - Regional, within the U.S.
   - Regional, outside of the U.S.
   - Single state in the U.S.

4. Sometimes different groups are formal participants in VEIs while others are informal participants. For each group listed below, please select the one response that best indicates the level of formal and/or informal involvement that individuals from the following groups had in <u>initiating</u> the idea for your VEI.

   a. Federal government
   None / Very low / Somewhat low / Somewhat high / Very high / Don't know

   b. State government
   None / Very low / Somewhat low / Somewhat high / Very high / Don't know

   c. Local government
   None / Very low / Somewhat low / Somewhat high / Very high / Don't know

   d. Industry association
   None / Very low / Somewhat low / Somewhat high / Very high / Don't know

   e. Non-industry nonprofit association
   None / Very low / Somewhat low / Somewhat high / Very high / Don't know

   f. Consulting firm
   None / Very low / Somewhat low / Somewhat high / Very high / Don't know

   g. For-profit firm
   None / Very low / Somewhat low / Somewhat high / Very high / Don't know

   h. Individual(s) not affiliated with an organization
   None / Very low / Somewhat low / Somewhat high / Very high / Don't know

   i. Other organization or group (please specify)
   None / Very low / Somewhat low / Somewhat high / Very high / Don't know

   j. Other organization or group (please specify)

None Very low Somewhat low Somewhat high Very high Don't know

5. As noted above, sometimes groups are formal participants in VEIs while others are informal participants. For each group listed below, please select the one response that best indicates the level of formal and/or informal involvement that individuals from the following groups had in designing the program requirements, structure, and protocols for your VEI.

a. Federal government

None Very low Somewhat low Somewhat high Very high Don't know

b. State government

None Very low Somewhat low Somewhat high Very high Don't know

c. Local government

None Very low Somewhat low Somewhat high Very high Don't know

d. Industry association

None Very low Somewhat low Somewhat high Very high Don't know

e. Non-industry nonprofit association

None Very low Somewhat low Somewhat high Very high Don't know

f. Consulting firm

None Very low Somewhat low Somewhat high Very high Don't know

g. Other for-profit firm

None Very low Somewhat low Somewhat high Very high Don't know

h. Individual(s) not affiliated with an organization

None Very low Somewhat low Somewhat high Very high Don't know

i. Other organization or group (please specify)

None Very low Somewhat low Somewhat high Very high Don't know

j. Other organization or group (please specify)

None Very low Somewhat low Somewhat high Very high Don't know

6. What year did your VEI begin recruiting participants?

7. Is your VEI still operational? No Yes - Please proceed to Question 9

8. If you answered "No" to the previous question, what year did your VEI conclude?

9. What was the total number of organizations, associations, groups or individuals participating in your VEI as of January 1, 2002? If your VEI has concluded, please indicate its total number of participants during its final year.

10. Please indicate the number, or your best estimation of the number, of participants in your VEI from each of the following categories. If there are no participants in a category, please indicate "0."

a. [ ] For-profit parent corporations
b. [ ] For-profit facilities or operational units of parent corporations
c. [ ] Nonprofit organizations
d. [ ] Government agencies
e. [ ] Government facilities or operational units
f. [ ] Individuals not affiliated with an organization
g. [ ] Other. Please describe: [ ]
h. [ ] Other. Please describe: [ ]

11. Is your VEI designed to target one or more specific industries as participants?
○ Yes ○ No - Please proceed to Question 13

12. If you answered "Yes" to the previous question, please indicate which industry or industries are targeted. Please enter only one industry in each box.
a. [ ] b. [ ]
c. [ ] d. [ ]
e. [ ]

Environmental Performance Requirements
The following set of questions examines the specific environmental performance requirements incorporated in your VEI.

13. Does your VEI expect participants to designate a specific individual to be responsible for their organization's environmental progress in the program? ○ Yes ○ No

14. Does your program expect participants to submit reports to VEI administration or another external party on their environmental progress? ○ Yes ○ No - Please proceed to Question 16

15. If you answered "Yes" to the previous question, then please indicate the frequency that participants must report their progress: [ ] times per [Click Here ▾]

16. Sometimes programs give their participants the flexibility to establish their own environmental goals. However, for each of the following, please indicate whether VEI participants are <u>required</u> to:
a. ○ No ○ Yes Prepare a statement that expresses their views about the natural environment?
b. ○ No ○ Yes Prepare a statement that expresses their environmental <u>goals?</u>
c. ○ No ○ Yes Demonstrate compliance with environmental regulations <u>before entering</u> the VEI?
d. ○ No ○ Yes Adhere to environmental performance criteria specified by the VEI?
e. Create targets for <u>waste reduction</u>? *(Waste reduction includes any activity*

○ No ○ Yes *where waste is first produced and later controlled through treatment or disposal. It is synonymous with pollution control)*

f. ○ No ○ Yes Demonstrate that waste reduction targets have been met?

g. ○ No ○ Yes Create targets for recycling and/or reuse? *(Recycling and reuse include any activities where waste is first produced and later controlled through reclamation or reprocessing)*

h. ○ No ○ Yes Demonstrate that recycling and/or reuse targets have been met?

i. ○ No ○ Yes Create targets for pollution prevention? *(Pollution prevention focuses on the avoidance of waste production rather than management after its production. It includes process changes, input substitutions, and other activities that minimize the production of waste)*

j. ○ No ○ Yes Demonstrate that pollution prevention targets have been met?

k. ○ No ○ Yes Create targets for minimizing water consumption?

l. ○ No ○ Yes Demonstrate that targets for minimizing water consumption have been met?

m. ○ No ○ Yes Create targets for minimizing energy consumption?

n. ○ No ○ Yes Demonstrate that targets for minimizing energy consumption have been met?

o. ○ No ○ Yes Create a plan for continual reductions of pollution?

p. ○ No ○ Yes Demonstrate continual reductions of pollution?

q. ○ No ○ Yes Have top management review the performance of environmental activities?

r. ○ No ○ Yes Implement an environmental management system?

s. ○ No ○ Yes Conduct product life-cycle analysis?

t. ○ No ○ Yes Establish an environmental training program?

u. ○ No ○ Yes Disclose facts about environmental performance to the public?

v. ○ No ○ Yes Demonstrate compliance with environmental regulations while participating in the VEI?

Program Administration

Many VEIs, while similar in their general characteristics, are administered differently. The following set of questions examines how your VEI is administered.

17. Is a signed administrative agreement required to participate in your VEI?
    ○ Yes ○ No - Please proceed to Question 19

18. If you answered "Yes" to the previous question, which one of the following best describes the signed agreement required by your VEI?
    ○ Letter of intent or pledge of participation submitted to program administration
    ○ Formalized memorandum of understanding
    ○ Other. Please describe: ________

19. Do participants pay a fee to participate your VEI? ○ Yes ○ No - Please proceed to Question 22

20. If you answered "Yes" to the previous question, please indicate the amount of the fee in US$ [ ] .00

21. From the choices below, please select one response to indicate how often the fee is paid:

- ○ One time only
- ○ Annually
- ○ Every 3 years
- ○ Every 6 months
- ○ Every 2 years
- ○ Other (Please describe)

22. For each group listed below, please select the one response that best indicates the level of involvement that individuals from the following groups have in <u>routine administration</u> of your VEI-exclusive of monitoring.

a. Federal government

○ None ○ Very low ○ Somewhat low ○ Somewhat high ○ Very high ○ Don't know

b. State government

○ None ○ Very low ○ Somewhat low ○ Somewhat high ○ Very high ○ Don't know

c. Local government

○ None ○ Very low ○ Somewhat low ○ Somewhat high ○ Very high ○ Don't know

d. Industry association

○ None ○ Very low ○ Somewhat low ○ Somewhat high ○ Very high ○ Don't know

e. Non-industry nonprofit association

○ None ○ Very low ○ Somewhat low ○ Somewhat high ○ Very high ○ Don't know

f. Consulting firm

○ None ○ Very low ○ Somewhat low ○ Somewhat high ○ Very high ○ Don't know

g. For-profit firm

○ None ○ Very low ○ Somewhat low ○ Somewhat high ○ Very high ○ Don't know

h. Individual(s) not affiliated with an organization

○ None ○ Very low ○ Somewhat low ○ Somewhat high ○ Very high ○ Don't know

i. Other organization or group (please specify) [ ]

○ None ○ Very low ○ Somewhat low ○ Somewhat high ○ Very high ○ Don't know

j. Other organization or group (please specify) [ ]

○ None ○ Very low ○ Somewhat low ○ Somewhat high ○ Very high ○ Don't know

23. Does your VEI require monitoring of environmental performance?

○ Yes ○ No - Please proceed to Question 27

24. Please indicate whether the following individuals or groups monitor the environmental performance of VEI participants.

a. ○ Yes ○ No VEI participants self-monitor

b. ○ Yes ○ No VEI administrators monitor

c. ○ Yes ○ No Independent third parties who are not affiliated with either the program administrators or the organization itself monitor

d. ○ Yes ○ No Other (please indicate) [ ] monitor

25. For each group listed below, please select the one response that best indicates the level of involvement that individuals from the following groups, who are external to the organization, have in <u>monitoring</u> the environmental performance of your VEI participants.

a. Federal government

○ None ○ Very low ○ Somewhat low ○ Somewhat high ○ Very high ○ Don't know

b. State government

○ None ○ Very low ○ Somewhat low ○ Somewhat high ○ Very high ○ Don't know

c. Local government

○ None ○ Very low ○ Somewhat low ○ Somewhat high ○ Very high ○ Don't know

d. Industry association

○ None ○ Very low ○ Somewhat low ○ Somewhat high ○ Very high ○ Don't know

e. Non-industry nonprofit association

○ None ○ Very low ○ Somewhat low ○ Somewhat high ○ Very high ○ Don't know

f. Consulting firm

○ None ○ Very low ○ Somewhat low ○ Somewhat high ○ Very high ○ Don't know

g. Other for-profit firm

○ None ○ Very low ○ Somewhat low ○ Somewhat high ○ Very high ○ Don't know

h. Individual(s) not affiliated with an organization

○ None ○ Very low ○ Somewhat low ○ Somewhat high ○ Very high ○ Don't know

i. Other organization or group (please specify) [ ]

○ None ○ Very low ○ Somewhat low ○ Somewhat high ○ Very high ○ Don't know

j. Other organization or group (please specify) [ ]

○ None ○ Very low ○ Somewhat low ○ Somewhat high ○ Very high ○ Don't know

26. Are monitoring reports submitted to VEI administration made available to the public?

○ Yes ○ No

27. Is action taken for non-compliance with program guidelines?

○ Yes ○ No - Please proceed to Question 29

28. Which of the following actions are taken if a participant does not conform with your VEI's program guidelines? Please check all that apply:

☐ a. Participants receive a formal notice of their non-conformance(s)

☐ b. Participants must submit to program administrators a plan to achieve conformity

☐ c. Participants must provide program administrators with evidence of actions that brought them into conformity

- ☐ d. Participants are fined
- ☐ e. Participants are removed from the program
- ☐ f. Other (please specify) __________

Program Benefits

The following question examines the specific benefits your VEI offers its participants.

29. Sometimes established programs offer participants numerous benefits while newer programs may do so in the future. For each item listed below, please select the one response that best indicates how frequently you believe participants in your VEI <u>actually receive(d)</u> each the following benefits:

a. Increased access to government sponsored technical assistance

○ Always ○ Often ○ Sometimes ○ Rarely ○ Never ○ Don't Know

b. Increased access to government funding

○ Always ○ Often ○ Sometimes ○ Rarely ○ Never ○ Don't Know

c. Increased learning from access to peer networks

○ Always ○ Often ○ Sometimes ○ Rarely ○ Never ○ Don't Know

d. Improved access to environmental regulators

○ Always ○ Often ○ Sometimes ○ Rarely ○ Never ○ Don't Know

e. Improved relations with environmental regulators

○ Always ○ Often ○ Sometimes ○ Rarely ○ Never ○ Don't Know

f. Improved ability to achieve compliance with environmental regulations

○ Always ○ Often ○ Sometimes ○ Rarely ○ Never ○ Don't Know

g. Improved ability to over-comply with environmental regulations

○ Always ○ Often ○ Sometimes ○ Rarely ○ Never ○ Don't Know

h. Increased public recognition

○ Always ○ Often ○ Sometimes ○ Rarely ○ Never ○ Don't Know

i. Reduced regulatory monitoring

○ Always ○ Often ○ Sometimes ○ Rarely ○ Never ○ Don't Know

j. Waivers of environmental regulations by regulators

○ Always ○ Often ○ Sometimes ○ Rarely ○ Never ○ Don't Know

k. Reduced applicability of some environmental regulation because of participant's pollution reductions

○ Always ○ Often ○ Sometimes ○ Rarely ○ Never ○ Don't Know

l. Expedited environmental permits

○ Always ○ Often ○ Sometimes ○ Rarely ○ Never ○ Don't Know

m. Consolidated environmental permits

○ Always ○ Often ○ Sometimes ○ Rarely ○ Never ○ Don't Know

n. Other (please specify) ____

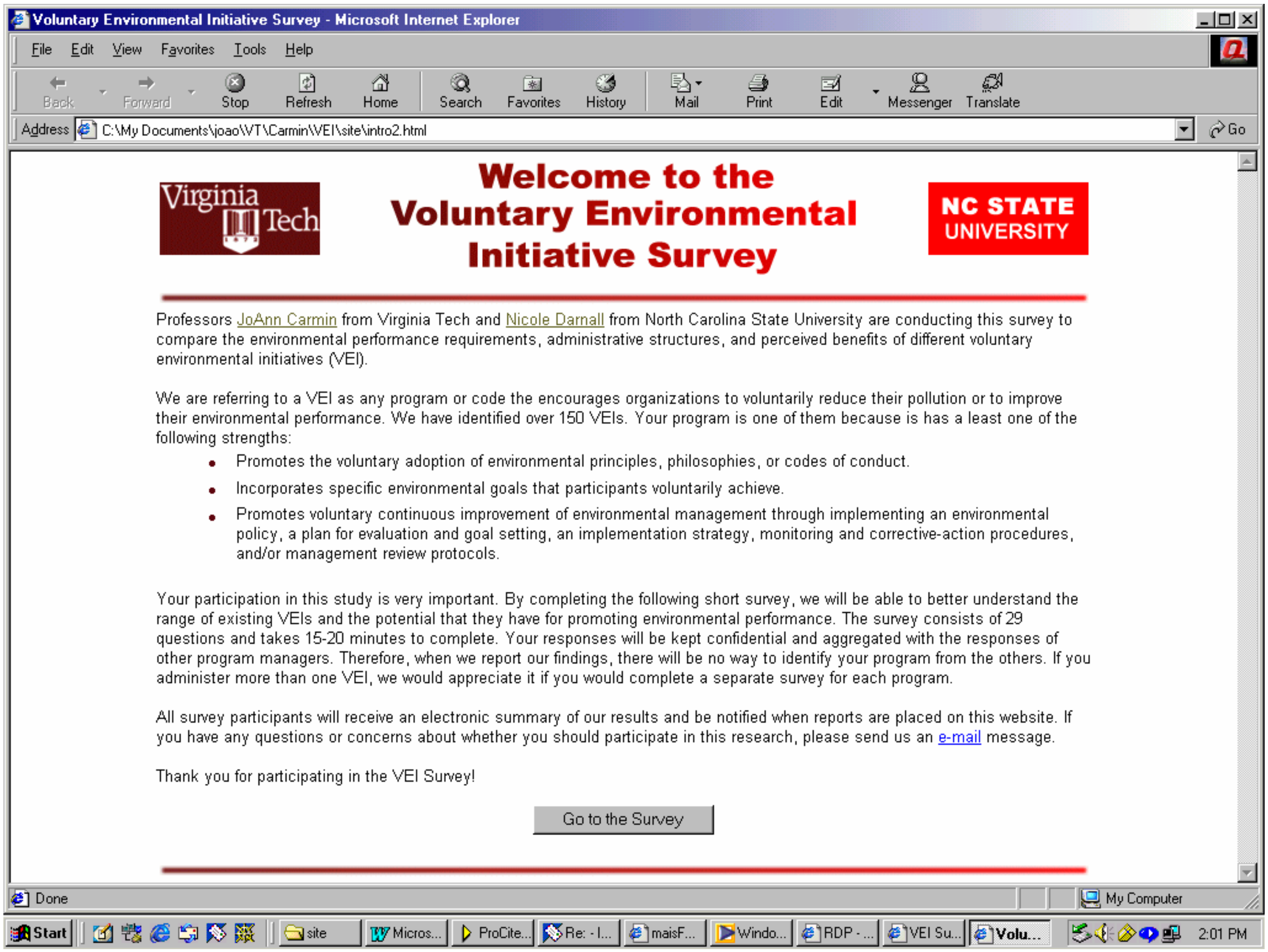
○ Always ○ Often ○ Sometimes ○ Rarely ○ Never ○ Don't Know

Other Relevant Information

In the space below, please provide any additional information you think is relevant about your VEI:

Submit Survey

Appendix 3 – Welcome Website



Voluntary Environmental Initiative Survey - Microsoft Internet Explorer

Welcome to the Voluntary Environmental Initiative Survey

Professors JoAnn Carmin from Virginia Tech and Nicole Darnall from North Carolina State University are conducting this survey to compare the environmental performance requirements, administrative structures, and perceived benefits of different voluntary environmental initiatives (VEI).

We are referring to a VEI as any program or code the encourages organizations to voluntarily reduce their pollution or to improve their environmental performance. We have identified over 150 VEIs. Your program is one of them because is has a least one of the following strengths:

- Promotes the voluntary adoption of environmental principles, philosophies, or codes of conduct.
- Incorporates specific environmental goals that participants voluntarily achieve.
- Promotes voluntary continuous improvement of environmental management through implementing an environmental policy, a plan for evaluation and goal setting, an implementation strategy, monitoring and corrective-action procedures, and/or management review protocols.

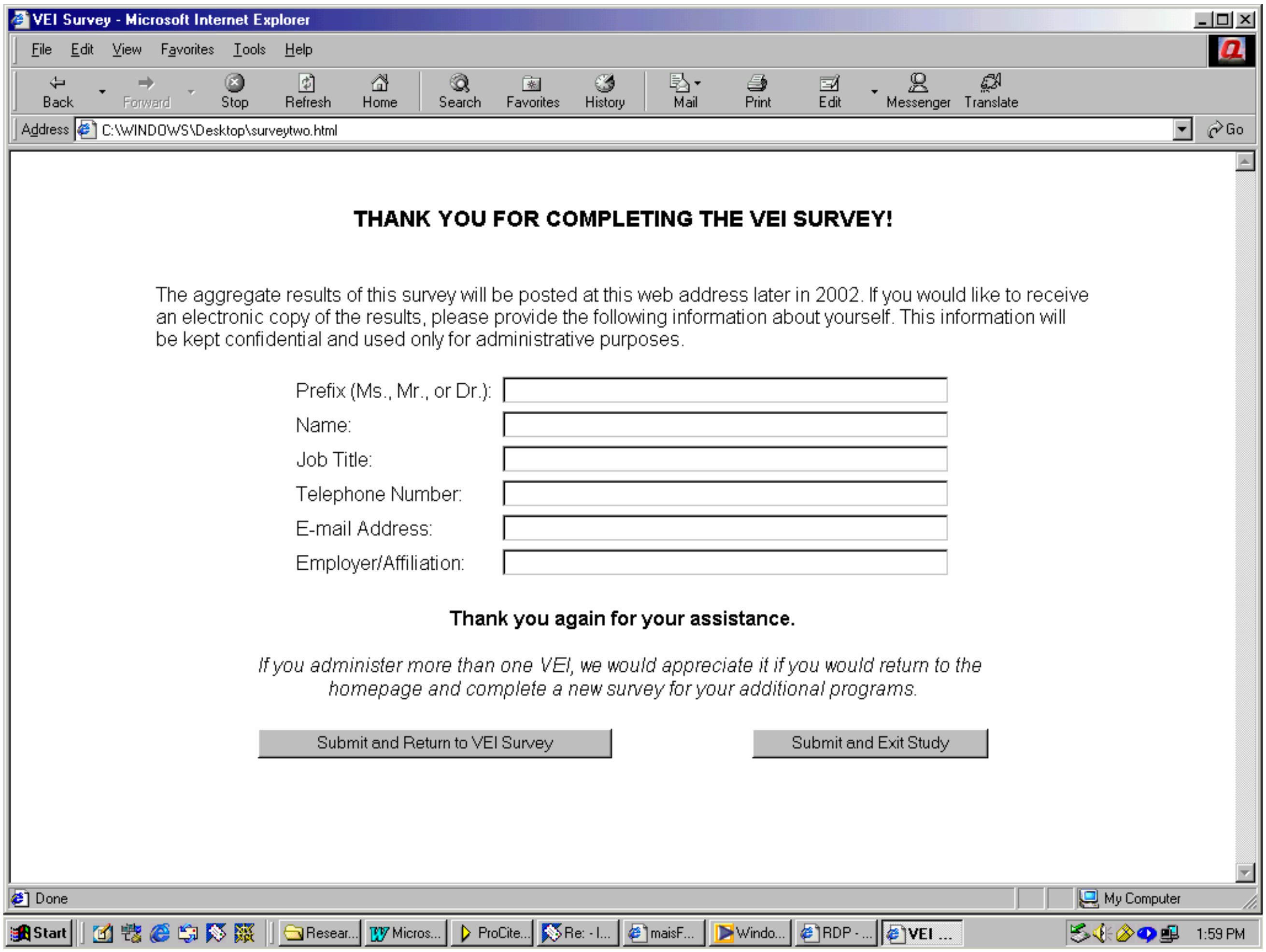
Your participation in this study is very important. By completing the following short survey, we will be able to better understand the range of existing VEIs and the potential that they have for promoting environmental performance. The survey consists of 29 questions and takes 15-20 minutes to complete. Your responses will be kept confidential and aggregated with the responses of other program managers. Therefore, when we report our findings, there will be no way to identify your program from the others. If you administer more than one VEI, we would appreciate it if you would complete a separate survey for each program.

All survey participants will receive an electronic summary of our results and be notified when reports are placed on this website. If you have any questions or concerns about whether you should participate in this research, please send us an e-mail message.

Thank you for participating in the VEI Survey!

Go to the Survey

Appendix 4 – Thank You Website



THANK YOU FOR COMPLETING THE VEI SURVEY!

The aggregate results of this survey will be posted at this web address later in 2002. If you would like to receive an electronic copy of the results, please provide the following information about yourself. This information will be kept confidential and used only for administrative purposes.

Prefix (Ms., Mr., or Dr.):

Name:

Job Title:

Telephone Number:

E-mail Address:

Employer/Affiliation:

Thank you again for your assistance.

If you administer more than one VEI, we would appreciate it if you would return to the homepage and complete a new survey for your additional programs.

Submit and Return to VEI Survey

Submit and Exit Study

Appendix 5 –E-mails sent to research participants

First contact:

Dear (program officer's name)

I am writing to inquire about the (program's name). I am working with Professors Nicole Darnall from North Carolina State University and JoAnn Carmin from Virginia Tech and on a research project that examines the design and standards of voluntary environmental initiatives.

They will be conducting a short web-based survey in mid-January that will study the features and characteristics of voluntary environmental initiatives. Can you please let us know if you are the correct person to respond to the survey and, if not, who we should contact?

If you have any questions about the study, you can send a message by simply replying to this email or by calling Professor Darnall at 919-515-5034 or Professor Carmin at 540-231-5426.

Thank you in advance for your assistance.

Best regards,

Joao Mil-Homens

Graduate Research Assistant

Virginia Tech

Contact Follow up:

Dear (program officer's name)

Several weeks ago we sent you an email about our plan to conduct a survey of environmental programs in mid-January. So far, we have not heard back from you or anyone else in your organization about the (program's name).

This study will compare the environmental performance requirements, administrative structures, and perceived benefits of different voluntary environmental initiatives. We are referring to any program or code that encourages organizations to voluntarily reduce their environmental impacts beyond that required by the environmental regulatory system as a voluntary environmental initiative (VEI). We have intentionally created a very broad definition so that we can represent the full range of programs that are presently available.

The survey will consist of approximately 30 close-ended questions so it will take a very short time to complete. So far, over 50 programs have agreed to participate. To ensure that we represent all of the various environmental initiatives that have been developed, we hope that you too will agree to participate on behalf of your program.

Please let us know if you would be willing to participate in this survey. If you would like further information, please do not hesitate to contact Professor Carmin at jcarmin@vt.edu or at 540-231-5426.

We look forward to your response. Thank you.

Joao Mil-Homens

Graduate Assistant

Virginia Tech

Survey notification:

Dear (program officer's name)

A few weeks ago we contacted you, or your name was forwarded to us, regarding (program's name) as we made preparations for our survey of voluntary environmental initiatives (VEIs). We are pleased to inform you that our Internet survey is now available for you to complete. We thank you in advance for your participation. With your assistance, we will be able to compare the range of VEIs that have been implemented in the United States.

The survey consists of 29 close-ended questions and should take you approximately 15 minutes to complete. At our website we also provide additional information about our research goals. To go to the VEI homepage and survey, just click on the following link: http://www.uap.vt.edu/vei.

The results of this study will be emailed to you later this year. In the meantime, if you have any questions or concerns, please do not hesitate to contact us by replying to this email or by calling Professor Carmin at 540-231-5426.

Thank you for helping us to learn more about your VEI. We look forward to hearing from you soon!

Sincerely,

Joao Mil-Homens

Graduate Research Assistant

Virginia Tech

1st Survey Follow Up

Dear (program officer's name)

Ten days ago we contacted you about completing a survey regarding (program's name). Although we have not heard from you, we want you to know that your participation in this study is important. Only with your assistance, we will be able to compare the range of voluntary environmental initiatives (VEI) that have been implemented in the United States.

The survey should take you approximately 15 minutes to complete. At our website we also provide additional information about our research goals. To go to the survey and VEI homepage, just click on the following link: http://www.uap.vt.edu/vei.

The results of this study will be emailed to you later this year. In the meantime, if you have any questions or concerns, please do not hesitate to contact us by replying to this email or by calling Professor Carmin at 540-231-5426.

We look forward to learning about your program. Thank you in advance for your participation.

Sincerely,
Joao Mil-Homens
Graduate Research Assistant
Virginia Tech

2nd and 3rd Survey Follow Up

Hi (program officer's name)

A few weeks ago I emailed you about completing a survey regarding (program's name). I recognize that you have likely been busy, but encourage you to participate in my study. With your critical assistance, I will be able to compare the wide range of voluntary environmental initiatives (VEI) that have been implemented in the United States. In return for your thoughtful responses, I will email you the results of this study later in the year.

The survey should take you approximately 15 minutes to complete and can be accessed at the following link: http://www.uap.vt.edu/vei.

If you have any questions or concerns, please do not hesitate to contact me by replying to this email or by calling Professor Carmin at 540-231-5426.

I look forward to learning about your program and thank you in advance for your participation!

Sincerely,

Joao Mil-Homens

4th Survey Follow Up

Dear (program officer's name),

I am emailing you to give you a final opportunity to participate in our study of voluntary environmental initiatives (VEIs). (program's name) is an important VEI and I sincerely hope you will share more information about it by completing our survey at http://www.uap.vt.edu/vei. If you do, I will send you a summary of our results later this year.

This is the last message I will send you about participating in our important research.

Thank you in advance for your assistance!

Best regards,

Joao Mil-Homens

Vita

Joao Loureiro Mil-Homens was born in Lisbon, Portugal, on August 31, 1975. He completed his Environmental Engineering Degree, on the Faculty of Sciences and Technology of the New University of Lisbon (FCT-UNL) in 1998. As part of his final project, he worked as an environmental auditor at Shell. Still in 1998, he published his first article in the Journal of Infrastructure Systems, ASCE, entitled Water Quality Management in Virtual Environments. After the completion of his college degree he worked as a junior researcher in GASA (Environmental Systems Analysis Group) in FCT-UNL. Besides receiving scholarships from PRODEP (European Unit Program) and Luso-American Development Foundation (FLAD) to research development, he also had the opportunity to work for the Portuguese Navy's Hydrographic Institute, the National Center for Geographic Information, and Observa (a sociology research group). In the Summer of 2000, he joined the Masters of Urban and Regional Planning in the Urban Affairs and Planning Department, Virginia Polytechnic Institute and State University.