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# A Framework for Analyzing Environmental Voluntary Agreements

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**E**nvironmental Voluntary Agreements (VAs) are collaborative arrangements between firms and regulators in which firms voluntarily commit to actions that improve the natural environment. The regulator encourages and/or supervises these actions. This cooperation with regulatory agencies can be used by firms as a strategic tool to reduce their regulatory burden, develop new environmental competencies ahead of competition, and communicate their environmentally responsible behavior to customers. Regulators, meanwhile, can employ VAs to protect the environment in a less confrontational and costly way than through traditional command-and-control regulations.

The U.S. Environmental Protection Agency (EPA) launched a number of VAs through its program "Partners for the Environment," which included the 33/50 Program and the Climate Wise Program. In 1992, the EPA invited 1300 companies to join its 33/50 Program. Companies who volunteered to participate had to submit individual plans to reduce the release and transfer of 17 high-priority toxic chemicals by 33% in 1992 and by 50% in 1995. In return, the EPA publicized firms with outstanding pollution prevention achievement.<sup>1</sup> Climate Wise aims at reducing industrial greenhouse gas emissions. Participating firms set their own pollution reduction targets and submit Action Plans to local regulators and the EPA on how to meet these targets. In exchange, regulators provided firms with technical assistance and financial support and they advertised the firms' environmental improvement. Table 1 shows some examples of VAs in Europe and the United States.

VAs increasingly supplement and sometimes replace traditional command-and-control regulation. To date, more than 300 VAs are in place in the European Union.<sup>2</sup> Despite the increasing prevalence of VAs, use of this novel instrument remains limited in the United States as compared to Europe. In the

**TABLE I.** Examples of VAs in Europe and the U.S.

<b>EVA</b>	<b>Partners</b>	<b>Targets</b>
<p>German Agreement on Global Warming Prevention</p> <p>Start date: 1995, updated in 1996</p>	<p>The Ministry of Industry, the Ministry of the Environment, and 19 industry and trade associations</p>	<p>The agreement states overall reduction targets of 20% of specific CO<sub>2</sub> emissions by 2005 with a base year of 1990.</p> <p>Each association has individual targets (adding up to a 20% reduction), there are no company specific targets.</p>
<p>Dutch Agreement on the Implementation of Environmental Policy in the Chemical Industry</p> <p>Start date: 1993</p>	<p>3 Ministries and other public authorities such as the Water Control Boards, the Association of the Dutch Chemical Industry, and 103 individual companies</p>	<p>The agreement aims at implementing targets that are set out in the National Environmental Policy Plan. Targets include 61 quantitative emission reduction targets for 2000 and 2010.</p>
<p>French Agreement on End-of-Life-Vehicles</p> <p>Start date: 1993</p>	<p>The Ministries of Industry and Environment, 2 French car manufacturers and 12 importers, 8 trade associations (e.g., dismantlers, shredders, recyclers, material producers and equipment supply)</p>	<p>Partners negotiated that no more than 15% of total car weight is to be land-filled by 2002 (maximum of 200kg), no more than 5% in the long run. From 2002, new models must allow 90% recovery, re-use, or recycle.</p>
<p>UK Aire and Calder Project on Waste Minimization</p> <p>Start date: 1992</p>	<p>UK regulatory authorities, the Center for the Exploitation of Science and Technology, the March Consulting Group, and 11 companies</p>	<p>The parties agreed on the implementation of waste reduction measures. The focus of the EVA was limited to liquid effluent. Objectives of the EVA included the identification of gaps in supply, technology and science, the demonstration of benefits of a systematic approach to emission reduction, and the focus on procedural changes and cleaner technologies.</p>
<p>Agreement between EPA and the American Forest &amp; Paper Association (AF&amp;PA)</p> <p>Start date: 1994</p>	<p>U.S. EPA, AF&amp;PA, and 2 pulp and paper mills</p>	<p>The parties agreed on two memoranda of understanding that limit the dioxin/furan concentrations in sludges and soils, specify requirements concerning management practices for spreading sludge, and state periodic monitoring and reporting schemes.</p>
<p>EPA 33/50 Program</p> <p>Start date: 1992, concluded in 1995</p>	<p>U.S. EPA and 1300 companies</p>	<p>The program is targeted to reduce the transfer and chemical release of 17 high-priority pollutants by 33% in 1992, and by 50% in 1995. Firms individually committed and pledged to reduce transfer and release of these chemicals.</p>
<p>EPA Design for the Environment Program</p> <p>Start date: 1992</p>	<p>U.S. EPA and stakeholders such as industry, research institutions and environmental groups</p>	<p>The program does not contain clearly defined targets other than to coordinate R&amp;D efforts on specific environmental issues and to disseminate knowledge on improved environmental practices.</p>
<p>EPA Project XL</p> <p>Start date: 1995</p>	<p>U.S. EPA and 10 companies</p>	<p>The agreement aims to grant companies relief from existing regulatory procedures in exchange for environmental performance superior to status quo standards.</p>

**TABLE I.** Examples of VAs in Europe and the U.S. (*continued*)

<b>EVA</b>	<b>Partners</b>	<b>Targets</b>
EPA Energy Star Program Start date: 1993	U.S. EPA and office equipment manufacturers	The program aims to reduce office equipment energy consumption. Firms enter the program by agreeing to manufacture energy-efficient products that meet specified performance criteria.
EPA Waste Wi\$e Program Start date: 1994	U.S. EPA and 926 firms from 77 industry sectors	The program aims to reduce municipal solid waste. Firms establish individual goals in three waste reduction areas: waste prevention, recycling collection, and buying/manufacturing recycled products.

U.S., only about 42 VAs have been implemented between industry and the EPA since 1988.<sup>3</sup> Differences in the broader institutional context between the two continents may explain the disparity in the use of VAs. In the U.S., the multiplicity of regulatory authorities generates a complex overlay of federal, state, and local laws and provides wide-ranging opportunities for diverse stakeholders to challenge decisions in court. The relationship between regulatory authorities and industry in the U.S. has traditionally been more adversarial and legalistic than in Europe.<sup>4</sup> In contrast, in most European countries, regulators and regulatees have an established history of seeking to reduce pollution levels in a more informal and cooperative manner. This makes the use of cooperative solutions such as VAs much easier.<sup>5</sup>

A recent report compared the EPA's voluntary agreement programs with "1000 flowers blooming."<sup>6</sup> However, while individual VAs might have been successful, there is little guidance to determine where and how the 1000 flowers should spring up and what role and value they should have within the regulatory framework. This creates uncertainties for firms that could impede their participation in VAs.

The involvement of regulators *and* firms in creation and implementation of VAs distinguishes them from conventional environmental command-and-control regulation as well as from industry self-regulation. Under command-and-control regulation, industry's legitimized involvement in the initiation and implementation of environmental standards is restricted. Under self-regulation, industry initiates and implements policies and monitors itself with little or no government involvement. This is the case with the environmental management system standard ISO 14000 or the Responsible Care Initiative in the chemical industry.<sup>7</sup>

Although VAs encompass a variety of forms and objectives, there are two main kinds of VAs: Negotiated Agreements and Public Voluntary Programs.<sup>8</sup> In Negotiated Agreements, regulatory agencies and firms negotiate the targets of environmental performance that firms will have to reach. These VAs may resemble a form of negotiated rulemaking, but most of the time these agreements are

legally non-binding.<sup>9</sup> Legally non-binding agreements do not require congressional or parliamentary approval and rely on each party's moral obligation to fulfil responsibilities. In contrast, legally binding VAs require congressional approval and are enforceable in courts. Negotiated Agreements can be concluded between regulatory agencies and either an entire industry or individual firms. They can serve as an alternative to new command-and-control regulation or as a means to grant flexibility within the existing regulatory system. A prominent example of a Negotiated Agreement implemented in lieu of regulation is the German VA on Global Warming Prevention. In 1995, thirteen industry associations agreed to reduce their specific CO<sup>2</sup> emissions by 20% of 1990 emissions until the year 2005. In return, the government signaled that it would refrain from implementing an energy tax and/or heat ordinance as long as industry complies with the VA.<sup>10</sup>

In Public Voluntary Programs, regulators establish the frame and the basic requirements for participation. Participating firms typically set pollution reduction targets that are beyond regulatory requirements. In exchange, regulatory agencies provide R&D subsidies and technical assistance or enhance the environmental reputation of the firm. Public Voluntary Programs co-exist with existing regulations, which remain unchanged. Climate Wise is an example of a Public Voluntary Program in which firms pledge to reduce greenhouse gas emissions and in exchange receive technical assistance as well as recognition from the EPA that can be used for marketing purposes.

Both forms of VAs have the potential to benefit both firms and regulators. These agreements favor pollution reduction through the use of flexible, cost-saving strategies that are aligned with the firms' competitive objectives as well as the regulators' mandate to protect the environment. VAs can also favor the development of innovative and efficient solutions to complex environmental issues. The problem of the disposal of disused cars presents just such a case. Disposal of junk cars is characterized by a high level of uncertainty concerning the scale of the waste stream, the content of end-of-life items, the existing level of recycling, and the size of the market for recycled goods and materials. These factors have implications for the potential structure and viability of any proposed recovery and recycling schemes and thus must be explored before regulations can be issued. Faced with such a complex environment, regulators in France decided to launch a VA consisting of car manufacturers along with shredding, cement, and chemical companies to explore alternative solutions to reduce waste from junk cars.<sup>11</sup>

While VAs can provide strategic opportunities, they can also be costly for firms. As with any inter-firm alliance, the partners may behave opportunistically, causing the benefits of participating in VAs to be outweighed by their associated transaction costs. These costs can be reduced if VAs are properly designed and aligned with the institutional environment. For firms, it is crucial to assess whether participation in a VA offers a unique opportunity to gain a competitive advantage or the possibility of turning into a costly enterprise.

## **Integrating Voluntary Agreements into Competitive Strategy**

### ***Regulatory Benefits***

Participation in VAs can confer benefits to firms in the form of regulatory flexibility, preemption of existing regulation, and improved anticipation of future regulation. Such benefits are especially valuable to industries in which regulation imposes considerable costs.

Regulatory flexibility refers to streamlined or consolidated permitting processes and to increased flexibility on the means to meet pollution standards. For example, in the EPA's Project XL (eXcellence and Leadership), firms commit to a higher environmental performance than what is achieved under current standards. In exchange, they obtain consolidated permitting procedures. Project XL allows participants to develop strategies that facilitate or modify specific permitting requirements. In industries where high regulatory pressures and intensive permitting procedures slow production processes, the regulatory flexibility that firms can get through Project XL can be critical to creating a competitive advantage.<sup>12</sup>

For example, Intel, the semi-conductor manufacturer, has derived considerable benefits from participating in Project XL. Semiconductor manufacturing is characterized by constant changes in chemical recipes and process equipment that improves production yields and quality. To acquire the permits to operate in the semi-conductor manufacturing business requires paperwork revisions for such changes. These revisions can delay production processes. This can become problematic when dealing with products that have a short business cycle, and it can result in a loss of potential competitive advantages in the global market. Project XL allows Intel to implement a facility-wide cap on air emissions, replacing individual limits for different air emission sources. Intel has been granted the privilege to make operational changes without permit review (as long as overall permit limits are met) and can therefore bring products on line faster. The results of Intel's participation in Project XL show that the company avoided millions of dollars worth of production delays by eliminating 30-50 permit reviews annually.<sup>13</sup>

In the Netherlands, many VAs grant firms flexibility on the means to achieve emission levels set by regulation. National Policy Plans set emission reduction targets for different sectors, and firms and regulators implement Negotiated Agreements on the methods to reach these targets. In 1993, a Negotiated Agreement between the Dutch government and the chemical industry established a VA to meet the 61 quantitative emission reduction targets set forth in the National Policy Plan. Every four years, each participating company provides an environmental plan that identifies tasks intended to meet the targets. In addition, the permitting process of complying firms is streamlined.<sup>14</sup>

In some cases, participation in VAs can also allow business to preempt command-and-control regulation. This allows firms to reach emission targets at their own pace and through their own means. The German VA on Global Warming Prevention allowed firms to avoid the implementation of an energy tax and/or waste-heat ordinance. Furthermore, industry succeeded in its negotiations to lower government's initial emission reduction targets from 25% to 20%. The French VA on end-of-life vehicles did not involve an explicit threat of a stricter regulation, yet firms were inclined to participate as they wished to avoid a regulation that had previously been implemented in Germany that required manufacturers to take back used cars.<sup>15</sup>

Another example where industry successfully avoided alternative regulation is the VA implemented in 1994 between the EPA and the American Forest & Paper Association (AF&PA). This agreement was negotiated after the EPA had proposed regulations limiting the land application of pulp and paper mill sludge from bleached kraft mills. The parties signed two memoranda of understanding addressing the land application of sludge from kraft and sulfite pulp mills using chlorine and chlorine-derivative bleaching processes. These memoranda limit the dioxin/furan concentrations in sludges and soils, specify requirements governing management practices for spreading sludge, and impose periodic monitoring and reporting schemes.<sup>16</sup>

Lastly, participation in VAs can serve to anticipate and shape future regulations. This is, for example, likely to be the case with the EPA's Energy Star Office Equipment Program, which aims at reducing office equipment energy consumption by encouraging manufacturers to produce energy-efficient products. The EPA and industry jointly develop energy performance criteria and then allow participating firms to place the Energy Star logo on any product that meets or exceeds the performance criteria. Developing voluntary standards together with the EPA can allow firms to influence and learn about potential future regulations, thereby gaining a head start vis-à-vis competitors. The French VA on end-of-life vehicles also allows participating car manufacturers to anticipate and shape potential future regulations addressing End-of-Life vehicles.

Compared to Negotiated Agreements, Public Voluntary Programs generally provide fewer regulatory benefits.<sup>17</sup> Most Public Voluntary Programs merely complement regulations and do not serve to preempt new or to relax existing regulations. As a result, firms in heavily regulated industry might gain greater benefits from participating in a Negotiated Agreement rather than in a Public Voluntary Program.

### ***Innovative Solutions***

VAs can also give firms the opportunity to develop innovative environmental solutions that can improve their industrial performance and provide competitive advantages.<sup>18</sup> Environmental problems are often highly complex both socially and technically. Most of the time, the knowledge necessary for the

development of environmental innovations is likely to be dispersed among different industries and firms. Linkages to technological information and complementary assets must be established if environmental innovation is to be successful.<sup>19</sup> The collaborative structures of VAs can provide a unique mechanism for partners to establish these linkages, and participation in VAs therefore can facilitate the development of environmental innovation.

In the French VA on end-of-life vehicles, the French Ministries of the Environment and Industry, car manufacturers, and trade associations all negotiated targets to reduce the waste resulting from junk cars going into landfill. No more than 15% of total car weight is to be deposited into landfills by the year 2000. Car waste consists of diverse materials such as plastics, glass, textiles, rubber, and hazardous substances. This diversity complicates recycling efforts, and solutions to the end-of-life vehicle issue concerning involve more than can be handled by a single firm or industry. Players must collaborate to find solutions. The VA serves such a purpose by providing a coordination mechanism and establishing linkages between the players. For example, waste reduction requires design adaptations. To change designs and increase the plastic recyclability rate, automobile manufacturers need the expertise of the chemical industry and the dismantling industry. In this VA, Renault, a French car manufacturer, is engaged in a number of research projects with Dow Chemicals, Atochem, CPP, and Rhone Poulenc. To develop a recycling system, Renault is also involved in a partnership with Compagnie General des Ferrailles, a shredding company. PSA Peugeot Citroen, another French car manufacturer, is cooperating with Vicat, a cement manufacturer, to work on energy recovery from automobile shredding residue. Up to now, these collaborations have resulted in a "zero-waste approach" and technologies that allow recycling rates between 80 and 90%.<sup>20</sup> When the French Environmental Ministry decides to adopt these solutions for the entire country, the participating shredders will have the competitive edge to sell the new technology on the national market.

VAs further foster innovation by facilitating the exchange of tacit knowledge. Tacit knowledge is crucial for the development of new competencies. However, this type of knowledge is difficult to formalize and communicate and thus cannot be transferred via market transactions.<sup>21</sup> VAs, on the contrary, provide a suitable arrangement to share tacit knowledge, as their collaborative structure allows the transfer of intangible assets.

The EPA's Design for the Environment (DfE) is an example of an agreement created to facilitate the exchange of tacit knowledge. In this Public Voluntary Program, the EPA forms partnerships with industry, research institutions, and environmental groups to develop technological solutions to specific environmental challenges. The EPA then disseminates the solutions among businesses. The emphasis of the agreement is to exchange and compile expertise from different players. Within DfE, the EPA has undertaken collaborative research with the dry cleaning industry, solvent producers, research institutes, and other stakeholders to reduce exposure to perchloroethylene, a chemical solvent that poses

health and environmental concerns. These research efforts have led to a new take on alternative and environmentally friendly (wet cleaning) procedures.<sup>22</sup> Again, participating firms will be ahead of competition when the market for these new cleaning procedures takes off.

The English Aire and Calder Project is an example of a VA that has allowed firms to develop new competencies through providing access to tacit knowledge and linkages among firms, research institutions, and regulators. The Aire and Calder Project aims at minimizing liquid effluent from companies in West Yorkshire. UK regulatory authorities, the Center for the Exploitation of Science and Technology, March Consulting Group, and 11 companies in West Yorkshire (including Rhone Poulenc Chemicals, DuPont Howson Printing Systems, Hickson and Welch, and CCSB) established the agreement in 1992. These cooperative R&D efforts not only resulted in the improved environmental performance of participants, but also in a total saving of over £3.3 million a year. The VA allowed Hickson Fine Chemicals, a company that produces organic chemical intermediaries and chemicals, to reduce its cost by developing an innovative closed loop cooling system. The new cooling system reduced the company's liquid waste volume, thereby achieving an annual saving of \$161,000 (with an investment of around \$ 61,250, the payback period was about four months).<sup>23</sup>

While the collaborative structure of VAs facilitates the development of new environmental competencies, it does not automatically induce innovative solutions. If VAs do not set environmental targets that challenge firms' boundaries they will not encourage collaborative research efforts. Furthermore, if VAs do not encourage real collaboration between partners, firms might not be able to exchange tacit knowledge and develop innovative solutions. Accordingly, VAs in which participants set their own targets that are either already achieved at the time of entering the VA, or that are met by following a business-as-usual-path, are unlikely to result in any significant innovation.

As a result, Public Voluntary Programs do not seem to be appropriate to trigger radical environmental innovation. In most Public Voluntary Programs, firms set their own pollution reduction targets, making significant innovation an unlikely result. This is, for example, the case in the EPA's Climate Wise Program. Most targets do not require innovation, but instead, innovation can be achieved through improved housekeeping and updates of equipment. Nevertheless, the programs are likely to improve environmental protection as they raise environmental awareness and diffuse best practices.

In summary, Negotiated Agreements can be a suitable means for firms to develop environmental innovation if the agreements facilitate close collaboration and targets are set high enough to require new technologies. As far as how the technological innovations shape future regulations, firms engaged in such partnerships may be well ahead of the competition and benefit from the market created by the regulatory standard. Public Voluntary Programs can be a suitable means to diffuse best practices in the industry.



### ***Public Recognition***

Public recognition is one of the most important benefits firms can gain from participating in a Public Voluntary Program. Marketing based on environmental performance becomes more important for firms as the consumer's environmental awareness increases. However, it can be difficult for companies to communicate their environmental performance. Especially in consumer markets where the product accounts for a small fraction of the consumer's total budget, customers have few incentives to invest in information about the product, and firms may not attract sufficient attention to communicate the products' environmental attributes. Additionally, customers may find it difficult to identify environmentally preferable firms or products in an unambiguous way.<sup>24</sup>

In most Public Voluntary Programs, regulators advertise firms' improved environmental performance. Participation in Public Voluntary Programs thus allows firms to alert consumers of their willingness and ability to provide processes and products with improved environmental performance.<sup>25</sup> If consumers value improved environmental performance, differentiation through participation in VAs allows firms to set higher prices or to capture additional market share. For environmentally based differentiation to succeed, firms must provide credible information about their environmental efforts.<sup>26</sup> Because VAs join firms *and* regulatory agencies, firms are able to take advantage of an implicit or at least perceived regulatory endorsement when selling their environmental performance.

Public Voluntary Programs may publicize firms' environmental improvements through several mechanisms. VAs can publicly award successful participants, or use labels as a means to obtain consumer recognition. The label of the EPA Energy Star Program, for instance, offers a marketing tool to the participants to capture the growing share of environmentally concerned customers. A study conducted by the American Council for an Energy-Efficient Economy found that 80% of consumers surveyed were familiar with the Energy Star logo and that 43% of those consumers had used the logo to aid in product purchase.<sup>27</sup> Likewise, Climate Wise participants receive publicity through public awards ceremonies and media events.

While most Public Voluntary Programs emphasize public recognition as the most important benefit, Negotiated Agreements entail fewer mechanisms to explicitly provide such recognition. Project XL requires that negotiations involve local communities, which possibly allows firms to improve community relations.

### **Potential Costs of Participating in Voluntary Agreements**

While potentially providing important benefits, participation in Negotiated Agreements and Public Voluntary Programs can be costly for both firms and regulators. Both the bargaining processes and the administration of the agreements require resources. In addition, the opportunistic behavior of partners can

translate into transaction costs. Because most VAs are legally non-binding, and therefore are not enforceable in courts, regulators risk poor compliance from firms. Regulators also risk being captured by one specific industry, which would result in undermining the public's trust in the regulatory authorities. For firms, participation in VAs entails potential costs due to free-riding partner firms and the disclosure of confidential information to regulators, third parties, and competitors. Costs are also caused by the negotiations and the administrative responsibilities that are associated with VAs.

### ***Free-Riding Behavior***

Many benefits of VAs (most importantly the preemption of regulatory measures) are of a collective nature. Committing to an objective as a group provides the possibility and incentive for individual firms to free ride and to benefit from the shared results of the VA without having invested in it.<sup>28</sup>

VAs run the risk of collapsing if the number of free riders is too high. Free-riding partners impose costs on complying firms since the latter have to increase their effort to attain overall targets. Furthermore, failure to attain overall targets can provoke stricter regulations that all (not only the defecting) firms would have to comply with. In some cases, non-defecting firms might find it easier to come into compliance with new regulations, as the Negotiated Agreement gave them sufficient time and experience to improve practices and even to be ahead of competition. In such a case, free riding might not cause costs and may even provide a competitive edge to complying firms. However, in other cases, new regulations might require pollution reduction by a certain percentage, setting actual pollution levels as a base. Non-defecting firms that have undertaken abatement action within the VA then face additional costs, as further abatement is likely to be more expensive.

Free riding can also undermine the credibility of the VA. The German VA on Global Warming Prevention illustrates the consequences of free-riding industry associations on the success of a VA. Participating associations split the 20% overall reduction target among themselves. The reduction shares to which each association committed varied. A number of associations, such as the paper manufacturers association, committed to targets that they fulfilled very rapidly and far ahead of schedule.<sup>29</sup> This diminished the credibility of the entire Negotiated Agreement and put unnecessary burden on those associations that committed to targets requiring comparably greater effort to meet the agreed emission reduction goals.

The EPA's Waste Wise Program is another example where firms potentially reap benefits without compliance, thereby threatening the program's credibility. Waste Wise is a Public Voluntary Program, where firms identify waste reduction goals and draft waste prevention plans to meet these goals. Participation requires firms to submit annual progress reports, but only 20% of participating firms in Waste Wise do actually report their environmental performance.<sup>30</sup>

### ***Confidentiality Concerns***

Firms participating in VAs face the risk that confidential information might be disclosed to third parties, regulators, and competitors. For example, in the United States, firms have little certainty that monitoring reports—one source of information provided within VAs—will be treated confidentially. Under the Freedom of Information Act, third parties can gain access to monitoring reports. This can be costly for firms, as easy access to courts enables these parties to undertake judicial action should the reports reveal unlawful behavior.

Firms also risk having regulators use information provided during the process of negotiating and implementing VAs to undertake enforcement lawsuits or to draft stricter regulations. However, regulators stand to damage their reputation, lose credibility, and risk future successes of VAs should they decide to engage in such behavior. Also, firms might even be able to turn leakage of information into a benefit, as far as such leakage helps to shape future regulations.

The risk of information leaking to competitors is especially high in VAs focusing on the development of new environmental innovation. As is the case in many strategic alliances, the cooperative development of new competencies through VAs requires partners to disclose and exchange knowledge. Knowledge represents a highly specific asset, and its exchange makes firms particularly vulnerable to opportunistic behavior.<sup>31</sup> A firm can lose its potential competitive advantage if partners imitate and replicate the core knowledge the firm had revealed as part of the effort to develop new environmental solutions.<sup>32</sup>

### ***Negotiation and Administrative Costs***

Participation in VAs entails negotiation and administrative costs. In Negotiated Agreements, industry is involved in the drafting process of the VA and therefore has to dedicate resources to this process—specifically, with regulators, other firms, and stakeholders. A recent study of Project XL estimated the cost of developing a Project XL Agreement at an average of \$516,187 per firm.<sup>33</sup>

Such negotiation costs are lower in Public Voluntary Programs, where regulators have already established a framework and basic requirements for participation. As a “take it or leave it” program, firms are not involved in any major negotiation. However, as is the case for Negotiated Agreements, most Public Voluntary Programs require firms to devote resources to monitoring and reporting their environmental performance. For instance, participants in the EPA’s Waste Wise and Climate Wise Programs are asked to provide annual reports that describe their accomplishments.

Information leakage as well as negotiation costs are issues firms face in any inter-firm alliance. The risk of free-riding partners may be relevant in inter-firm alliances engaging numerous partners (such as R&D consortia). However, in inter-firm alliances, firms have the possibility to reduce some of these potential costs through safeguards such as acquiring equity in the partner firm. This option is not available in the case of VAs, as firms cannot acquire any equity in

the regulatory agency. Additionally, the costs of negotiating and potential opportunism may be greater in VAs than in inter-firm alliances. Negotiations in VAs may involve third parties (which usually is not the case in inter-firm alliances), and finding consensus is likely to be more difficult as the number of parties involved increases. Furthermore, firms may lack power to challenge a partner with unequal authority and as a result, face high costs should regulators misuse information or change the rules of the game. Changes in the rules of the games, for example, can happen as a result of a change in government.

## **Design and Institutional Environment of Voluntary Agreements**

The potential costs caused by free riding, information disclosure, and negotiations can be mitigated through the organizational design of VAs and the institutional environment in which they are implemented. Monitoring and sanctioning procedures, as well as the number of parties involved, characterize the organizational design of a VA. The legal and political “rules of the game” constitute the institutional environment of a VA.<sup>34</sup> An important aspect of the institutional environment in the context of VAs is the ability of the regulatory agency to commit credibly to the objectives of the VA.

In VAs that monitor the compliance of participants, the likelihood of free-riding behavior is reduced. If a firm defects and that defection is detected, the reputation of that firm might be harmed. Some VAs employ self-reporting, where firms collect, evaluate, and report data themselves. Other VAs assign the monitoring responsibility to third parties, such as research or certification institutes.

In the German Agreement on Global Warming Prevention, for example, an independent research institute monitors industry’s efforts to reduce CO<sup>2</sup> emissions on a yearly basis. The industry associations collect data on their members’ energy use and pass it on to the research institute, which then verifies this data by comparing it with official statistics on energy consumption. The institute adjusts the data by accounting for external influences that could affect energy use (such as variations in temperature) and subsequently publishes a monitoring report in which it evaluates each industry association’s efforts and goal attainment. This mechanism ensures transparency and credibility of the agreement.

However, it is not always easy to develop monitoring mechanisms in VAs. For example, in the EPA’s Design for the Environment it is difficult to assess the results of research and development efforts in advance and, therefore, to implement reporting procedures and provide safeguards against free riding. Disclosure of confidential information is another danger that specifically applies to this VA. For Design for the Environment to be successful, all partners must invest and expose specific assets to partner-firms and regulators.

Sanctioning mechanisms that penalize defecting firms can complement monitoring mechanisms. Combining monitoring and sanctioning mechanisms deters free-riding behavior more effectively. Without sanctions, free riding, though detected, would have no negative consequences other than bad publicity and therefore might persist. In legally binding VAs (i.e., in VAs that can be enforced in courts and allow for legal sanctions against defecting firms), these sanctions might include denying the relaxation of other regulatory measures.

The Dutch Agreement on the Implementation of Environmental Policy in the Chemical Industry is an example of a VA with a legal foundation. The Dutch government and the chemical industry agreed on implementing an environmental policy in order to meet pollution reduction targets set forth in framing National Policy Plans. As noted, each participating company has to provide periodically a Company Environmental Plan that identifies tasks intended to meet the targets. If a firm produces an unacceptable Company Environmental Plan, the procedure to acquire operation permits will be more stringent for that firm.<sup>35</sup>

However, most VAs (except in the Netherlands) are legally non-binding and therefore do not have a legal basis to sanction defecting firms. In legally non-binding VAs, sanctions are restricted to measures such as excluding the defecting firm from the VA and the industry association, or disclosing the free-riding behavior to the public. Disclosure of free riding may serve as a sanctioning mechanism as it can damage the firm's reputation.

The number of parties involved in the agreement is one factor affecting the negotiation costs of VAs. Legally binding VAs require congressional and parliamentary approval. Regulators and firms must respond to this additional bargaining partner. Negotiation costs also increase if the agreement requires consent from third parties (such as environmental groups or local communities). While VAs without congressional approval and third-party participation are associated with fewer negotiation costs, they can suffer from a loss of credibility and legitimacy.

Regulatory credibility affects the stability and success of the VA. Regulators must guarantee their own commitment to the VA to manage the agreement in a stable and legitimate manner, and they must threaten firms with more stringent regulations if the VA targets are not met.<sup>36</sup>

As is the case with Project XL, regulatory credibility is weakened if the implementation of the VA requires approval from diverse and independent institutions. So far, the success of Project XL is hampered by uncertainties concerning the EPA's authority to relax regulatory standards enacted by Congress.<sup>37</sup> In Project XL, the EPA provides firms some flexibility on how they elect to exceed regulatory standards, thereby requiring federal and state regulators to exercise enforcement discretion. However, this relief from prosecution by federal and state regulators does not protect participating firms from citizen enforcement suits.<sup>38</sup> As long as EPA and state agency approval is not sufficient to protect the firm from third-party law suits, the risks for firms associated with such a

Negotiated Agreement can be very high. In the same vein, uncertainty about future regulatory regimes affects the degree of commitment firms make and, more to the point, their innovative behavior.<sup>39</sup>

The success of the Dutch VA on the Implementation of Environmental Policy in the Chemical Industry shows the importance of a credible and stable regulatory commitment. The National Environmental Plans, which frame the Dutch VAs, are based on a broad consensus of industry, national and local regulators, and environmental and political groups. Coupled with the long time horizon of the targets in the National Plans, this consensual system reduces uncertainty associated with unpredicted changes in environmental policy. It secures industry's cooperation with VAs and favors innovative solutions.<sup>40</sup>

The situation is very different in the U.S., where federal, state, and local regulatory agencies are subject to multiple political forces and constant shifts in political surroundings. This fragmentation results in a maze of complex, confusing, and, most importantly, contestable rules.<sup>41</sup> Uncertainties resulting from an ever-changing political environment make it difficult for regulatory agencies to commit to the objective of a VA on a long-term basis. Also, the contestability of regulations hinders federal agencies from committing to VAs that might entail changes in state rules; state and local authorities likewise have difficulty committing to VAs that potentially conflict with federal rules.

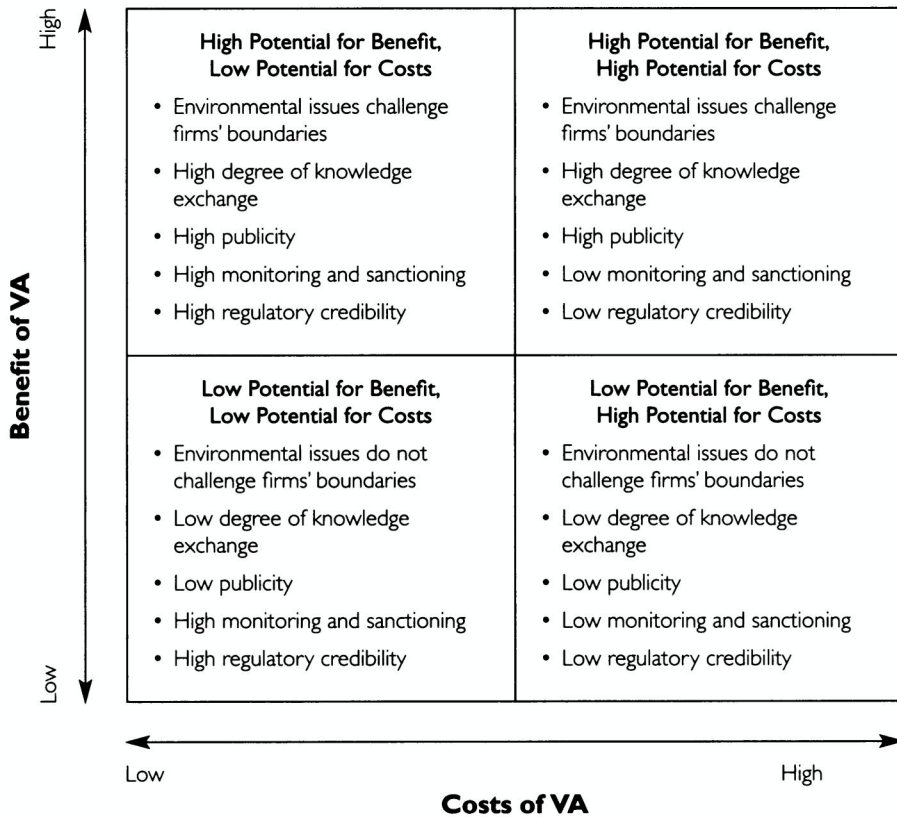
## **When Should a Company Participate in a Voluntary Agreement?**

The increasing use of Environmental Voluntary Agreements marks a shift away from adversarial and legislative regulatory measures toward more cooperative actions. Both regulatees and regulators can benefit from a more amiable relationship, and so can the environment. Preliminary evaluations suggest that VAs have a positive impact on environmental performance.<sup>42</sup> Through cooperation, firms and regulators can learn from each other and find solutions to environmental problems that are too complex to be addressed with conventional regulatory tools.

Figure 1 differentiates four simplified VAs in terms of their potential benefits and costs. It offers managers an initial set of guidelines with which to evaluate VAs.

VAs that correspond to the upper left square of the matrix optimize the trade off between benefits and cost. They have a high potential for benefits and a low potential for costs. The innovative outcome is triggered through environmental targets that challenge the firm's boundaries. In such cases, firms are encouraged to exchange knowledge. These agreements are highly publicized. An appropriate design and institutional environment limit the potential costs linked to participating in the EVA. The Dutch Agreement on the Implementation of Environmental Policy in the Chemical Industry is an example of the type of VA

**FIGURE I.** A Framework for Organizing VAs



that corresponds to the upper left square of the matrix. The long-term targets of this VA are difficult to meet with the existing end-of-pipe technologies. The agreement provides for a discussion forum to encourage the exchange of knowledge required for the development of radical innovations.<sup>43</sup> The design of the VA limits free riders and thus the potential for costs, because it includes yearly monitoring procedures (that adequately address the confidentiality concerns of participants) as well as procedures to sanction defecting firms.<sup>44</sup> The VA is set within a framing National Policy Plan; the long time horizon as well as the political independence of this plan increases regulatory credibility and provides stability.

VAs fitting the description in the top right square are associated with a high potential for benefits and a high potential for costs. VAs in this category do not have a design and an institutional environment that adequately stabilize the collaborative governance mode. Firms or industry associations entering into such a VA should carefully weigh the potential benefits and risks of participation. They might be better off re-negotiating the design and modifying the institutional environment of the VA. The French End-of-Life Vehicle Agreement and

the EPA Design for the Environment Program present examples of this category. High targets and the exchange of knowledge stimulate innovation, but the design of these VAs provides few safeguards limiting the potential for costs. Project XL is another example where the benefits may be offset by the costs if there is uncertainty on the regulatory authority to relax regulatory standards.

VAs corresponding to the lower left square of the matrix are marked with a low potential for benefits and a low potential for costs. In this category of VAs, collaborative behavior resulting in innovative solutions is unlikely, as the targets that the agreements set can be met without challenging firms' capabilities. However, participation can still be of use for business, as it can preempt command-and-control regulation or provide public recognition. The potential for costs in these VAs tends to be low. Participants do not undertake significant investments, because fulfilling the targets does not require measures considerably different than a business-as-usual path. Their exposure to the opportunistic behavior of partners is consequently minimized. In such cases, the design and institutional environment of the VA becomes less important. The EPA's Waste Wise program serves as an example of a VA corresponding to this category. Because firms set their own goals, and because the monitoring mechanisms to ensure compliance with these goals are poorly enforced, it is unlikely that Waste Wise will result in significant innovations as there is little interaction between firms. The benefits are limited to public recognition. These benefits may be low, as the actual results in terms of improved environmental performance are unknown since only 20% of participating firms report the results of their efforts. The potential for costs is reduced to reporting costs.

Theoretically, VAs described by the lower right square could exist; however, they are empirically without any precedent. These are VAs that have a low potential for benefits and a high potential for costs. Clearly, firms have no incentive to participate in such VAs. However, they should be on guard against entering into a VA that has the possibility of exhibiting these tendencies.

## Conclusion

In general, the success of cooperative strategies with regulators will depend on the characteristics of industry structure and the organizational capabilities that determine corporate success. Some firms have a profitable option to differentiate products or processes along environmental lines and, therefore, benefit from publicizing their efforts through regulatory agencies. For others, any time spent pursuing such strategies is squandered. Still other firms should not spend time streamlining their permit procedure if this is a minor element of their costs. That is to say, these strategies will depend on the firm's main corporate strategy.

Cooperative environmental problem solving has a longer history in Europe than in the U.S. In Europe, it evolved over time and industry has been playing an important role in its development. The U.S., the EPA's current efforts



spring from a conscious political decision to revamp the adversarial, legalistic, and thus costly American system of environmental regulation. However, for VAs to gain significance in the U.S., legal frameworks as well as deeply rooted beliefs and norms must change. The aggressive legal supervision of state and local regulatory authorities by the federal government, as well as the high levels of litigation, make it difficult for VAs to diffuse to the local levels.

VAs are a promising tool to solve environmental problems in a more cooperative way. As more experience is gathered and research on VAs advances, the design and institutional environment of VAs can be improved further. This would lower the costs of VAs for regulators and firms, and reinforce the benefits of VAs. It could also allow for trust to evolve between regulators and firms, and could strengthen VAs' role as an emerging regulatory paradigm.

## Notes

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