THE PROS AND CONS OF
VOLUNTARY APPROACHES TO ENVIRONMENTAL REGULATION

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Written for
Reflections on Responsible Regulation Conference
Tulane University
March 1-2, 2013

ABSTRACT
Recent years have seen a distinct shift from mandatory to voluntary approaches to environmental regulation. These new approaches include industry self-regulation, negotiated agreements, public voluntary programs, information disclosure, and eco-certification schemes. Some observers consider these to be more efficient institutional forms than traditional regulation, while others consider them weak substitutes for regulation. While not yet definitive, the research base on these approaches has grown rapidly over the past decade. Evidence suggests that in most cases their first-order impacts on environmental performance have been modest, and that in some cases they have served to delay the implementation of mandatory regulations. Nevertheless, they may be useful steps when scientific information is imprecise, political will is lacking, or regulatory capabilities are weak.
1. Introduction

Recent years have seen a major shift away from mandatory environmental regulations and toward the use of voluntary modes of regulation. These new approaches encourage environmental improvement but do not compel it. They take many forms: industry self-regulation, negotiated agreements between government and industry, voluntary partnership programs offered by government, information disclosure programs, and environmental labeling. After more than twenty years of experience with programs such as the Toxic Release Inventory and Energy Star, researchers have developed a substantial body of knowledge regarding the strengths and weakness of these alternative approaches. While definitive assessments are still premature, this paper attempts to draw some broad conclusions on the pros and cons of voluntary approaches to environmental regulation.

The paper begins with a brief summary of the pros and cons of traditional government regulation, which helps to explain the emergence of alternatives. It then provides brief reviews of the knowledge base on the performance of voluntary approaches. It concludes with some thoughts on whether voluntary approaches are first-best or second-best instruments.

2. The Pros and Cons of Traditional Mandatory Regulation

Markets can fail due to externalities imposed on people not part of an economic transaction. When this happens, textbook microeconomics calls for the government to impose a Pigouvian tax to “internalize” the externalities.
2.1 Benefits of Regulation

Although regulation is sometimes derided as rigid and inflexible, this criticism does not apply to Pigouvian taxes. Such taxes do not mandate any particular technology or managerial practices, instead leaving managers with the flexibility to choose the least-cost method of abatement. Furthermore, Pigouvian taxes equate the marginal benefits and marginal costs of abatement across all firms, thereby avoiding allocative inefficiency. Thus, it is inappropriate to refer to such taxes as a form of “command control” regulation, a designation that should be reserved for rules that require the use of the “best available control technology” (BACT). Indeed, one might argue that Pigouvian taxes are an example of “enlightened regulation” or “responsible regulation.”

In a simple static setting, there are a number of alternative regulatory instruments that can accomplish the same results as a Pigouvian tax. If all firms have the same cost structure, then a uniform regulatory emissions standard can implement the same outcomes as an emissions tax. If costs are heterogeneous, a system of tradable permits with a fixed emissions cap can achieve the same results as a tax. When there is uncertainty over abatement costs, however, the performance of the permits and taxes diverges. As shown by Weitzman (1974), permits are preferred when the marginal benefits of abatement are steep and taxes are preferred when the marginal benefit curve is flat.

When regulation is properly designed and well enforced, it solves the externality problem in a reliable and efficient fashion. In practice, of course, the benefits of landmark environmental regulations such as the Clean Air Act must be weighed against the costs of implementation and enforcement.
2.2 Limitations of Regulation

Although regulation can be a very powerful and effective tool, it does have serious limitations. Implementation costs can be high, as with the Clean Air Act’s delegation of implementation to the states through State Implementation Plans (SIPs). Policymakers may choose inefficient regulatory instruments such as uniform emissions standards or BACT that eliminate managerial flexibility and drive up compliance costs. Pressures from special interest groups may lead policymakers to choose policies that actually reduce welfare.

Despite the limitations of regulation, the U.S. Office of Management and Budget has estimated that with the exception of the Department of Agriculture, all major government agencies produced greater benefits than costs over the decade from 1997 – 2007. Furthermore, the Environmental Protection Agency’s major rules issued from 1999-2004 produced benefits that were over 5 times greater than their costs (US OMB, 2001-2005).

2.3 The Move towards Voluntary Regulation

If regulation holds such potential, what have been the motivations for moving towards voluntary approaches?

First, regulation is a slow-moving process. Assembling the political will to pass legislation can take years. Often a galvanizing disaster is required before a legislature will act. Examples includes the nuclear disaster at Fukushima, the near-meltdown at Three Mile Island, the explosion of BP’s Deepwater Horizon rig, the oil spill from the Exxon Valdez, the release of methyl isocyanate from Union Carbide’s plant in Bhopal, and the discovery of toxic waste under the town of Love Canal. Sadly, the resulting legislation may be a hastily conceived exercise comprising a set of inefficient and possibly ineffective rules. Even after legislation is passed, the
U.S. Administrative Procedures Act of 1945 (APA) requires that regulators leave an elaborate paper trail documenting their decisions and guarantees affected parties the right to intervene in regulatory proceedings. Thus, it can easily take a decade or more before a newly discovered environmental problem receives a regulatory remedy.

Second, when the causal connections between emissions and social harms are poorly understood, it is difficult for regulators to promulgate rules that will withstand lawsuits from affected parties alleging that the rules are “arbitrary and capricious.” Thus, many toxic chemicals remain unregulated in the United States because the burden of proof in on policymakers to show that chemicals are dangerous and scientific data documenting harms from their use is lacking. In contrast, recent regulations in Europe place the burden of proof on chemical companies to show that chemicals are safe, paving the way for effective regulations but running the risk that beneficial chemical compounds will be delayed in reaching the market.

Third, when problems stem from many small “non-point sources” rather than a few large ones, the cost of implementation, monitoring and enforcement may simply be exorbitant. For example, regulating the use of toxic chemicals by the millions of dry cleaners around the country is immensely difficult. Similarly, regulating agricultural runoff from many small farms is extremely costly.

Fourth, many emerging economies lack the regulatory capacity to implement even well-designed regulations (Blackman 2010).

Fifth, there may not exist a majority of citizens willing to support legislative action. Even when an externality is well documented and understood, it may fail to attract a legislative solution if it affects only a minority of citizens. Even if all citizens are affected, the benefits of regulatory action may accrue largely to future generations while the costs fall on the present one,
which may discount the future too heavily to take action. If the connection between cause and effect is clouded by scientific uncertainty, majoritarian legislation becomes even more unlikely.

Finally, special interest groups may block, distort or capture the regulatory process. Subsidies for corn ethanol are widely understood to be a waste of taxpayer money, yet the importance of the Iowa caucuses as the first major test of Presidential candidates elevates corn to a nearly unassailable position as political “pork” of the very first order. Inefficient old coal generating power plants were “grandfathered” into the Clean Air Act of 1970 and exempted from its requirements because of the political power of Senator Robert Byrd (D-WVA) and the coal lobby. Gasoline taxes in the U.S. are too low (Parry and Small 2005) but pressure from automobile manufacturers has kept them from rising.

For all of these reasons, regulation may be difficult or impossible to implement as a solution to externality problems. Hence regulators and environmental activists have increasingly turned to alternatives. Voluntary agreements between government and business have become popular around the world, from the US to South America to Europe to Japan. Industry trade associations have undertaken self-regulation in an attempt to preempt government regulation. Information disclosure programs have been promulgated by governments, institutional investors, news magazines and activists. Environmental activists and trade associations alike have created environmental labels designed to unleash market forces in support of a cleaner environment. It is to these alternatives that we now turn.

3. **Voluntary Approaches to Regulation: What Have We Learned?**

In the late 1980s, European countries began to take a serious interest in voluntary approaches to regulation as alternatives to mandatory regulation (European Environment Agency
1997a,b). By the late 1990s, academic researchers had begun to study voluntary approaches to regulation (Segerson and Miceli 1998; Khanna, Quimio, and Bojilova 1998; Khanna and Damon 1999; King and Lenox 2000; Lyon, Maxwell and Hackett 2000). This activity was accelerated by the European Union’s decision to fund a research program entitled “Concerted Action on Voluntary Approaches” (CAVA) that ran from 1998-2001 and was coordinated through a group of six research institutions: AKF, Copenhagen; CERNA, Paris; Fondazione Eni Enrico Mattei, Venice; Oeko-Institut, Darmstadt; University of Gent; and University College Dublin.1 A series of conferences at these institutions led to the formation of an active trans-Atlantic community of scholars, who began developing a robust theoretical and empirical understanding of voluntary approaches. Today, thanks in part to CAVA, we have a relatively solid basis for thinking about voluntary approaches, although more work is needed in a number of specific areas.

The CAVA community divided voluntary approaches into three types: 1) unilateral agreements, 2) negotiated agreements, and 3) public voluntary programs. In addition, this paper will consider information disclosure and environmental labeling.

3.1 Industry Self-Regulation

“Unilateral agreements” are emissions reduction agreements among firms, with no involvement from government. They are also referred to by the somewhat more descriptive term “industry self-regulation.” Self-regulation has a long history in a range of industries, including the movie ratings system, technology standards in various industries, and certification exams in professions such as law, medicine and accounting. Self-regulation in the professions has been

1 For details, see (http://www.2020-horizon.com/Concerted-Action-on-voluntary-approaches-Project-details(Concerted-Action-on-voluntary-approaches)-s59359.html)
criticized for raising artificial entry barriers and driving up incomes and fees (Shaked and Sutton 1981). Its use in the environmental domain is much more recent, however, and has been somewhat controversial.

Maxwell, Lyon and Hackett (2000) present a theoretical model of industry self-regulation adopted under the threat of government regulation. Self-regulation in this case means voluntary adoption of an abatement technology that reduces per-unit emissions. The authors find that self-regulation can preempt the regulatory threat and, more importantly, improve social welfare in the process. Like the results of any model, this finding depends upon certain assumptions: 1) it is costly for members of the public to organize and lobby for regulation, 2) the public receives reliable and up-to-date information about industry performance, 3) the industry can make a credible commitment to abatement, and 4) if the extent of self-regulation is not satisfactory, the public retains the ability to mobilize and press for even more stringent regulation. Glachant (2007) shows that if assumptions (2) and (3) are relaxed, then self-regulation may reduce social welfare by delaying regulation. Self-regulation then serves as a form of greenwash (Lyon and Maxwell 2011) or as symbolism without substance (Delmas and Montes-Sancho 2010). These studies imply that self-regulation must be carefully monitored, and industry held closely to its promises, if the public is to benefit from regulatory preemption.

Ahmed and Segerson (2011) show theoretically that firms may also self-regulate by eliminating the less environmentally-friendly parts of their product lines, e.g. low-efficiency air conditioners. Such cooperation always harms consumers by reducing their consumption options, but it may benefit the environment enough to make it socially advantageous. However, firms have incentives to cheat on any such agreements, so some sort of enforcement mechanism is needed, such as an eco-certification program monitored by a third party.
Industry self-regulation can also serve to influence, rather than preempt, government regulation. Unfortunately, the literature suggests there is no guarantee that such influence is socially beneficial. One possibility is that self-regulation by some firms signals to the regulator that a certain abatement technology has low costs, thereby encouraging the regulator to require the technology of all firms in the industry (Denicolo 2008). This can enhance welfare, but can also force an excessively costly technology upon the industry, depending upon details of the industry’s cost structure. A second possibility is that some firms “lock in” an abatement technology that is good, but not great, and that regulators with some concern for industry profits choose to require the good technology rather than the great one (Lutz, Lyon and Maxwell 2000). A third possibility is that self-regulation can weaken a future negotiated agreement between the industry and the regulator (Fleckinger and Glachant 2011). Thus, even carefully monitored self-regulation by firms that keep their promises can reduce welfare, either by weakening subsequent regulations or voluntary agreements, or by encouraging the adoption of excessively costly abatement technology.

The best known example of environmental self-regulation is probably the Responsible Care program initiated by the chemical industry in Canada after the disastrous methyl isocyanate leak at Union Carbide’s plant in Bhopal, India in 1984, which killed over 3,000 people and left tens of thousands of others injured. The public outcry threw the chemical industry into a state of panic, fearing it might lose its “social license to operate.” The Responsible Care program was quickly adopted by the US Chemical Manufacturers Association, now known as the American Chemistry Council (ACC). The program requires a set of practices be adopted by all firms that wish to be ACC members. It has received a significant amount of attention from academic researchers. The influential work of King and Lenox (2000) found that over the period 1990-
1996, Responsible Care members reduced toxic emissions more slowly than they had during 1987-1990, while non-members reduced emissions more rapidly during 1990-1996. The authors were highly critical of the fact that Responsible Care did not involve auditing by independent third parties, and did not levy sanctions on non-complying members. Their findings suggest that Responsible Care was essentially a form of greenwash, distracting regulators from passing new legislation while allowing members to get away with worse performance than otherwise. Indeed, the ACC revised the rules of Responsible Care after the results of the study became well known, apparently embarrassed enough to try to inject more rigor into the self-regulatory scheme.

Gamper-Rabindran and Finger (2013) point out that King and Lenox (2000) fail to control for the possibility that omitted variables may have led to a correlation between participation and performance. Thus, they revisit the early years of the Responsible Care program using a more sophisticated econometric approach that includes instrumental variables for program participation. Their analysis reinforces the earlier findings of King and Lenox. The authors conclude:

“We find that on average, plants owned by RC participating firms raise their toxicity-weighted pollution intensity by 12.6% to 17.1% relative to statistically-equivalent plants owned by non-RC participating firms. This estimated increase is large relative to the yearly 5% reduction of pollution intensity among all plants in our sample between 1988 and 2001.”

Taken together the two papers make a compelling case that Responsible Care actually increased the toxic emissions of member firms, rather than reducing them. These findings appear to underline the results of the theoretical work cited above: industry self-regulation should not be
relied upon unless it involves commitments that are made credible through careful monitoring of performance.

Despite the foregoing results, it is important to recognize that the driver for the creation of Responsible Care was not toxic emissions in general, but the terrible industrial accident at Bhopal in 1984. Firms in the chemical industry were primarily concerned about reducing the risk of industrial accidents, rather than reducing overall toxic emissions. Thus, Gamper-Rabindran and Finger (2012) explore the effects of Responsible Care on the frequency of industrial accidents. In light of prior work on Responsible Care, their findings were totally unexpected:

“We find that participation in RC reduces the likelihood of accidents by 2.99 accidents per 100 plants in a given year, or by 69.3%. Participation in RC also reduces the likelihood of process safety accidents and accidents related to violations of RC codes by 5.75 accidents per 100 plants in a given year, or by 85.9%.”

These results call for a much more nuanced evaluation of the Responsible Care program. It apparently succeeded in reducing the risk of industrial accidents, which was presumably its true goal. The fact that it did not reduce toxic emissions may be essentially irrelevant when it comes to evaluating the performance of industry self-regulation.

ISO 14001 certification is sometimes considered to be a form of industry self-regulation (Prakash and Potoski 2006), and sometimes as a particular environmental management system (EMS) or environmental certification system. It has attracted a substantial amount of empirical research, but the results have been mixed. For example, Dasgupta et al. (2000) use survey data from 236 Mexican firms, which includes self-reported compliance information, and find that firms with ISO 14001 certification report better compliance with government environmental
regulations. However, Blackman (2012), using a sample of 80,000 plants in Mexico, finds that plants with ISO 14001 certification are fined for environmental non-compliance just as often as non-certified firms. Prakash and Potoski (2006) find that ISO 14001 certification in the US was associated with greater reductions in toxic chemical emissions and lower amounts of time spent out of compliance with air pollution regulations. King et al. (2005) find that EMS adoption reduces US firms’ toxic emissions, but ISO certification does not have any additional impact on emissions. And Barla (2007) finds that in the Canadian pulp and paper industry, ISO 14001 was associated with greater emissions of some water pollutants. It seems premature, then, to make any strong conclusions regarding the impact of ISO 14001 certification on environmental performance.

Overall, industry self-regulation holds the potential for meaningful environmental improvement, but the evidence for its impact is fairly thin on the ground. It seems reasonable to take a cautious view, and hold low expectations for self-regulation except in times when there is a substantial regulatory threat and industry performance is carefully monitored.

3.2 Negotiated Agreements

A second form of voluntary regulation is an agreement negotiated between a government and a firm or industry, often with an implicit or explicit threat. The ability of governments and industries to make binding commitments through contractual means appears to be highly dependent upon the constitution of government and the corporate culture in particular countries. Negotiated agreements have been used extensively in the Netherlands and Germany (European Environment Agency 1997), Japan (Sugiyama and Imura 1999), and Colombia (Blackman et al. 2012), and with somewhat lesser frequency in other European countries. Such agreements are
virtually unheard of in the United States, however. In fact, the one commonly-cited example was Project Excel, which was apparently a failure because environmental activists sued to prevent the Environmental Protection Agency from relaxing the letter of the law on any dimension in order to achieve improved overall compliance (Boyd 2001).

Theoretical models of negotiated agreements indicate that they can reduce transaction costs relative to the costs of passing and enforcing mandatory regulations (Segerson and Miceli 1998). However, the environmental performance of such agreements depends upon the underlying political economic power of industry relative to regulators (Glachant 2005). Furthermore, when industry members vary in their costs of abatement, a negotiated agreement tends to be driven by the interests of the lowest common denominator, that is, the poorest performer tends to set the standard for the entire group (Manzini and Mariotti 2003). Thus, the performance of negotiated agreements is an empirical matter.

Because negotiated agreements are extremely heterogeneous across countries and industries, assessment of them has proceeded through case studies rather than through large-scale econometric analyses. Probably the most comprehensive attempt at an integrated assessment of the case study literature was a report prepared for the Organization for Economic Cooperation and Development in 2003. The report concluded that “While the environmental targets of most – but not all – voluntary approaches seem to have been met, there are only a few cases where such approaches have been found to contribute to environmental improvements significantly different from what would have happened anyway.” (OECD 2003, p. 14) This suggests that the main benefit of negotiated agreements in developed countries comes through a reduction in the red tape that would have been associated with mandatory regulation, a finding consistent with the theoretical literature.
Negotiated agreements have also been used in developing countries. Among the most active signers of such agreements have been Chile, Colombia, and Mexico (Blackman and Sisto 2006; Jimenez 2007; Blackman et al. 2012). The way in which negotiated agreements operate in developing countries appears to be quite different from the way in which they function in developed countries. The key difference lies in the regulatory capacity of the country in question (Blackman, Lyon and Sisto 2006). When a nation lacks the ability to monitor and enforce environmental laws, then putting strong laws on the books (as has been done in Colombia and Mexico, for example) means little in practice. In such situations, negotiated agreements can facilitate the exchange of information between industry and regulator that is needed for regulators to establish a baseline understanding of the environmental issues in a given industry (Blackman et al. 2012). Negotiated agreements can also provide a “probationary period” during which industry is free to pursue environmental improvement in a flexible manner, but with the understanding that a failure to make progress will result in more stringent demands in the future (Blackman, Lyon and Sisto 2006).

3.3 Public Voluntary Programs

The third type of voluntary agreement is known as a public voluntary program (PVP). Initiated by government, such programs invite firms to set goals and undertake abatement efforts, in exchange for technical assistance, an opportunity to share information with fellow participants, and public recognition. The US EPA has created scores of these “partnership programs,” and they have arguably received more attention from researchers than self-regulatory schemes and negotiated agreements put together. Much of the reason for this attention is that PVPs are amenable to large-N econometric studies.
Despite government enthusiasm for PVPs, econometric analysis suggests that they are largely ineffective. (Lyon and Maxwell 2007; Morgenstern and Pizer 2007) The best known, and most widely studied, US PVP was the 33/50 Program operated by the U.S. Environmental Protection Agency (EPA) between 1991 and 1995.\(^2\) This program identified seventeen high-priority toxic chemicals, and invited thousands of industrial companies to join the program and reduce their emissions of these chemicals 33% by 1992 and 50% by 1995. Early research found that 33/50 participants reduced toxic emissions significantly more than non-participants (Khanna and Damon 1998), but more recent work has been less sanguine. Innes and Sam (2008) find the program only had a significant impact on emissions in 1991 and 1992. Vidovic and Khanna (2007) find no impact at all from 33/50 Program participation once they control for emission reductions during the two years prior to the inception of the 33/50 Program. Gamper-Rabindran (2006) accounts for some important measurement problems inherent in the Program.\(^3\) She finds that participants in the fabricated metals and paper industries cut emissions relative to non-participants, while in the chemical and primary metals industries participants actually did less emissions reduction than non-participants. Furthermore, even in the industries where participation seemed to be beneficial, the vast bulk of the apparent emission reductions were really transfers off-site rather than true pollution prevention. In sum, it appears that the impact of the 33/50 Program was modest at best. Studies of other PVPs have reached similarly pessimistic conclusions. (Morgenstern and Pizer 2007; Delmas and Montes-Sancho 2010)

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\(^2\) Toxic reductions were measured against a 1988 baseline, but according to US EPA (1999) companies were not invited to participate until the spring of 1991, hence I consider that as the beginning of the program.

\(^3\) First, she excludes two ozone depleting substances (ODS)—carbon tetrachloride and methylchloroform (or 1,1,1-trichloroethane)—that were included in the 17 chemicals on the 33/50 Program’s list, but whose reduction can better be attributed to mandatory phase-outs under the Clean Air Act. Their reduction accounted for one-fifth of the aggregate reduction of 33/50 chemicals from all Toxic Release Inventory (TRI) plants. She also excludes chemicals whose changes in reporting requirements led to paper reductions in emissions. Changes in the reporting requirement of ammonium sulfate in 1994 accounted for 27 percent of the total reduction in toxic releases reported for 1988-91, while the de-listing of non-aerosol sulphuric and hydrochloric acid in 1994 and 1995 led to similar paper reductions.
A particular concern about PVPs is that they may create the illusion of environmental progress, thereby slowing the passage of more meaningful mandatory regulations. Delmas and Montes-Sancho (2010) study the Department of Energy’s “Climate Challenge” program for electric utilities, which asked companies to set their own goals for abatement of greenhouse gas emissions. The authors find there was a substantial difference between the behavior of early and late joiners. Early joiners actually did reduce their emissions more than non-joiners, but late joiners simply took a “free ride” on the reputation of the program, making no measurable improvement in their emissions. In the aggregate, the program had no significant impact on the emissions reductions of participants. The reputation built up by the early joiners was dissipated by the opportunism of the late joiners, who burnished their own reputations while degrading the program’s performance. Thus, one can make a case that the government’s own program helped create the appearance that industry was voluntarily making progress on climate change, and that mandatory regulations might be unnecessary.

In a similar vein, Kim and Lyon (2011) study the Department of Energy’s “Voluntary Greenhouse Gas Registry,” which encouraged firms to file reports with the government documenting their emissions reductions. Participating firms might then be eligible to receive “early reduction credits” if and when a federal cap-and-trade program is created. Rather disturbingly, program participants in the aggregate increased their emissions over time but claimed substantial emissions reductions, while non-participants actually reduced their emissions over time. Participants were not filing false information, but they were given great latitude in how to report, and they conveniently chose to report emissions reductions while neglecting to include information about projects that increased emissions. This “selective disclosure” of positive information while choosing not to report negative information is exactly what Lyon and
Maxwell (2011) call “greenwash.” Kim and Lyon (2010) found no evidence that program participation led to greater reductions. Thus, one can make a case that the government’s own program facilitated corporate greenwash, making it appear that industry was making progress voluntarily and hence mandatory emissions controls might not be necessary.

There are good reasons to expect PVPs to be relatively ineffective compared to Pigouvian taxes (Lyon and Maxwell 2003). Environmental taxes force inefficient plants to exit the industry; raise tax revenues from firms that continue to pollute; and induce some firms to cut their emissions. Public voluntary programs, in contrast, can only accomplish the third of these outcomes, and they are unlikely to induce as much abatement as an optimal tax. Hence, PVPs are only adopted when political opposition prevents regulators from adopting more effective environmental taxes. Thus, the very fact that a PVP has been put in place suggests that it is likely to have relatively modest impact, and this is indeed what the empirical literature suggests.

Despite these discouraging perspectives, Lyon and Maxwell (2007) argue that there may be a silver lining to PVPs that has largely been missed in earlier work. An important aspect of most PVPs is an attempt to collect information about pollution abatement from leading firms and diffuse it throughout the industry, but this information may be received by non-participants as well as participants. If so, there will be little or no difference in performance between firms that join a PVP and those that do not. It is possible that a difference would be observed in the early phases of a program, when the government is trying to attract participants who already have information to share; once the program moves to the dissemination stage, however, there is likely to be no measurable difference between participants and non-participants. Indeed, this is exactly what Delmas and Montes-Sancho (2010) find for the EPA’s Climate Challenge Program. Lange
(2009) finds evidence that EPA’s Coal Combustion Products Partnership produced results that diffused across all industry members, regardless of whether they participated in the program.

4. Conclusions: The Pros and Cons of Voluntary Agreements

It is tempting to dismiss voluntary agreements as abject failures accepted by regulators who fervently wanted to believe environmental progress was occurring even when public politics prevented substantial government action. But the fact that voluntary approaches were embraced around the world at roughly the same time suggests that something larger was at work. And the fact that they play different roles in different parts of the world, and show varying degrees of success, suggests that they may be more than pure window dressing.

We can extract some insight from the rather surprising convergence of theory and empirics in the literature surveyed above. The literature on self-regulation suggests that self-regulation can be welfare-enhancing, but only if industry can make credible commitments that are backed up by rigorous third-party monitoring schemes, something that is only likely to happen when there is a strong regulatory threat. The gains in this case come from the political transaction costs that are avoided by preempting the regulatory process. The literature on negotiated agreements suggests that in the developed world they can also be welfare-enhancing if they are credibly monitored and enforced, again through a reduction in political transaction costs. In the developing world, negotiated agreements can facilitate the process of building regulatory capacity, a necessary condition for imposing more effective mandatory regulations in the future. The literature on public voluntary programs suggests that they can be a second-best instrument when political opposition prevents the imposition of more effective Pigouvian taxes.
PVPs are unlikely to accomplish environmental improvements that go much beyond business as usual, but they can aid in the diffusion of best abatement practices throughout an industry.

In all three cases, voluntary agreements are responses to government failure. They will not achieve the first-best levels of environmental protection targeted by the classical model of Pigouvian taxes. That model, however, fails to take into account the political transaction costs, the weak regulatory capacity, and the power of special interests that are often central to the actual practice of regulation. When these factors are acknowledged, voluntary approaches can be seen as institutional innovations that can lower costs, speed information diffusion, build regulatory capacity and achieve some modest good when the best is unattainable.

Even this modest set of “pros” for voluntary approaches to regulation must be balanced against their “cons.” Perhaps most importantly, voluntary approaches can serve as a form of greenwash (Kim and Lyon 2012), as a symbolic gesture that hides the need for more substantive measures and delays the passage of effective mandatory regulation (Glachant 2007; Delmas and Montes-Sancho 2010). Indeed, if industry knows it may be rewarded with a public voluntary program rather than being punished with an emissions tax, its incentives to lobby against the tax are increased (Lyon and Maxwell 2003). Oreskes and Conway (2010) offer a powerful account of the ways in which special interests---from the tobacco industry to the chemical industry to the fossil fuel industry---have spread doubt about the need for effective regulation, often delaying government action by decades. One can argue that the emphasis on voluntary programs for the mitigation of climate change during the Clinton and Bush years helped maintain the illusion that mandatory regulations were unnecessary, and contributed to the stalling that continues to characterize the climate debate.
REFERENCES


