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**THE USE OF UNILATERAL AGREEMENTS IN THE UNITED STATES:
THE RESPONSIBLE CARE INITIATIVE**

This report was prepared by Ms. Janice Mazurek, an environmental policy consultant in Washington DC, in the context of the OECD survey on the use of voluntary approaches in environmental policy.

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**THE USE OF UNILATERAL AGREEMENTS IN THE UNITED STATES:
THE RESPONSIBLE CARE INITIATIVE**

by

Janice Mazurek¹

I. Introduction

The Chemical Manufacturers Association (CMA) implemented Responsible Care in 1988 in response to declining public confidence in the chemical industry. Patterned after a similar program first developed by the Canadian Chemical Producers Association (CCPA), the voluntary initiative marks the first major attempt at industry self-regulation in the United States. Participation is a condition of membership for CMA's 190 member companies. To promote public recognition, CMA allows Responsible Care participants to use a registered Responsible Care trademark.

Since CMA first implemented Responsible Care, the trade association has extended participation beyond its membership to encompass 42 non-member companies and 24 additional trade associations (CMA 1998a). Responsible Care also is gaining popularity outside the United States and Canada. The initiative has been adopted in over 40 countries, or 86 percent (by production volume) of the global chemical industry (ICCA 1996).

Findings and organization

On paper, Responsible Care appears to be a promising blueprint for the voluntary adoption of ethical conduct codes. If universally adopted, the initiative could significantly enhance the way in which the chemical industry conducts business in the United States and abroad. However, implementation of unilateral initiatives in the United States is constrained by the presence of anti-trust law and environmental legislation. Anti-trust law discourages industry trade associations from undertaking initiatives that ostensibly create trade barriers and constrain competition. CMA's rational response was to design an initiative that describes in general terms how industry can improve environmental management practices (Kappas 1997).

One result is that CMA has successfully managed to avert competitiveness problems. Anti-trust legislation limits the degree to which CMA or any other trade association may employ sanction. Nonetheless, CMA also has developed a number of strategies to reduce the potential for members to act as free riders, or benefit from Responsible Care without bearing the initiative's implementation cost (ibid). For example, CMA relies on reward and the presence of external pressures such as environmental laws, initiatives, and interest group pressure to influence companies to implement Responsible Care's provisions.

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Paradoxically, however, the persistence in the United States of individual air, water, waste, and toxic laws provides few incentives for regulated industry to voluntarily bear the administrative and abatement cost of more holistic, prevention-based measures (Davies et al. 1996). Implementation of Responsible Care is further challenged by the historic mistrust between industry and environmental groups that characterizes administration of U.S. environmental laws.

Due primarily to legal constraints, it is likely that Responsible Care's greatest private benefits to date are in the form of improved public outreach in communities where member company plants operate. Responsible Care's persistent shortcoming is the voluntary initiative's lack of credibility among some U.S. environmental groups. Environmental group critics charge that the initiative lacks transparency. Indeed, few quantitative data exist with which to link changes in the environment to Responsible Care. The lack of quantitative data has caused some to conclude that the initiative is unsuccessful. However, Responsible Care's focus on management practices, rather than quantitative environmental targets, makes performance measurement difficult. It is likely that no additional amount of performance data will be sufficient to silence some of Responsible Care's most strident critics. In this regard, it is likely that environmental groups' mistrust of the initiative is due more to years of adversarial relations surrounding administration of environmental law rather than Responsible Care's lack of quantitative targets and performance measures.

To assess Responsible Care's effectiveness, this paper contains seven sections. Section two shows how Responsible Care is closer in spirit to a gentleman's agreement than regulation. Responsible Care's conduct codes are designed to improve the public's perception of firms' management practices. Sections three and four examine the legal framework and policy context in which Responsible Care operates. Section five examines how the persistence of individual air, waste, water, and toxic laws further limit Responsible Care's effectiveness.² Section six applies selectively eight OECD criteria to assess Responsible Care's effectiveness. Section seven concludes that voluntary agreements such as Responsible Care are likely to remain of limited effectiveness in the United States due to the legal barriers associated with anti-trust and environmental legislation.

II. Background

The terminology used to describe the various types of voluntary instruments is still in flux. However, they share the common characteristic of harnessing self-interest to achieve a desirable social outcome (Storey et al. 1996). Voluntary agreements typically seek to achieve these aims through methods less adversarial than those associated with status quo regulation (Dowd and Boyd 1998). Lévêque identifies three categories of "voluntary approaches" including: unilateral commitments, public voluntary schemes, and negotiated agreements.

Unilateral commitments refer to programs established by industry to encourage firms to achieve environmental improvements. In the United States, Responsible Care is the most prominent example of a unilateral agreement. To the extent that the initiative is administered by a trade organization instead of individual firms, it involves concerted rather than unilateral action.

² An overview of voluntary environmental agreements employed in the United States is provided in a companion paper to this study, see Mazurek (1998).

Goals and objectives

Responsible Care's goals focus on management practices rather than environmental performance standards. According to CMA: "We view it as not a 'program' at all but a cultural change in the way the chemical industry does business (Chemical Week 1991)." CMA's 190 member companies pledge to pursue continuous improvement of environmental, health, and safety practices, and enhance public outreach.

Goals are to be achieved through the adoption of ten guiding principles and the implementation of six management practice codes. (See Tables 1 and 2.) The codes range from pollution prevention to product stewardship.

Responsible Care's six codes outline 106 management practices that cover the lifecycle of a chemical -- from production to handling, use, recycling, and disposal. CMA adopted the first Community Awareness & Emergency Response (CAER) code in 1989. The code was patterned after a pre-existing CMA program and forms the cornerstone of Responsible Care. The CAER (pronounced "care") code is designed to encourage chemical facilities to work with local residents to develop emergency response plans in the event of a chemical disaster. As part of its provisions, the CAER program requires plants to establish citizen advisory panels (CAPs). In general, the six codes emphasize strategic planning, documentation, information sharing, training, and customer relations.

Responsible Care was created by 15-member "code drafting groups" comprised of managers from CMA member companies. The groups met monthly for 12 to 18 months and employed a consensus-based process to negotiate the code provisions. Some code groups conducted regional meetings to obtain input from CMA member firms. Upon completion, draft codes were submitted to CMA for review. Upon approval, CMA submitted the codes to a 14-member national public advisory panel convened by the trade association. The 14 public panelists included a fire chief, a farmer, a doctor, an ethicist, and an individual who lived near a chemical plant, among others. The group agreed to remain anonymous until 1990 after their work was well underway (Lodge and Rayport 1991). Absent from the code development and implementation process were environmental activists, organized labor, and regulatory officials. CMA sought to constrain the number of participants in order to preserve the program's autonomy and maintain Responsible Care's appeal to member companies (Kappas 1997).

Since Responsible Care was first implemented in the United States, CMA has extended participation beyond its membership. In 1997, CMA entered into an agreement with the Synthetic Organic Chemical Manufacturers Association (SOCMA) to extend the prevention-based portion of Responsible Care to 120 batch and custom chemical manufacturers (SOCMA 1997). Trade organizations representing industries related to chemical manufacturing also have patterned similar voluntary programs after Responsible Care. For example, the American Waterways Operators' 350 members participate in the "Responsible Carrier" program (AWO 1998). The National Paints and Coatings Association's 400 members have a self-regulation process entitled "Coatings Care." About 335 firms participate in the "Responsible Distribution Process" administered by the National Association of Chemical Distributors (NACD 1998).

Reporting and monitoring

Responsible Care's focus on management systems makes progress more difficult to measure than initiatives that contain quantitative performance goals. For example, while pollution prevention is a program objective, Responsible Care does not impose quantitative pollution reduction thresholds or

reduction timetables. CMA's primary performance criterion is whether or not companies have implemented Responsible Care's six management practice codes. CMA expects members to fully implement five of the six codes by 1998. The trade association expects firms to fully implement the product stewardship code by 1999. While the codes carry a deadline for implementation, Responsible Care's goal of continuous improvement does not contain a definite endpoint. Instead, CMA expects member companies to indefinitely make continuous management improvements. Furthermore, CMA allows member companies to independently define and determine "full implementation" on the assumption that self-definition promotes flexibility and minimizes the potential of placing companies at a competitive disadvantage. CMA extends this reasoning to Responsible Care's reporting requirements.

CMA requires firms to self-report annually on implementation progress. The self-evaluation forms are not performance evaluations but are intended primarily to help CMA identify where companies are having trouble implementing the individual codes. CMA does not specify how firms should complete the forms, or who should complete them. Companies are not required to disclose to the public the results of self-evaluations. CMA encourages companies to share the information with other firms to promote benchmarking. The trade association also encourages top performers to assist companies who have determined that their own management systems require improvement.

Table 1. Ten guiding principles

- Recognize and respond to community concerns about chemicals and plant operations.
- Develop and produce chemicals that can be manufactured, transported, used, and disposed of safely.
- Make health, safety, and environmental considerations a priority in planning for all existing and new products and processes.
- Report promptly to officials, employees, customers, and the public, information on chemical-related health or environmental hazards and recommend protective measures.
- Counsel customers on the safe use, transport, and disposal of chemical products.
- Operate plants and facilities in a manner that protects the environment and the health and safety of employees and the public.
- Extend knowledge by conducting or supporting research on the health, safety, and environmental effects of products, processes, and waste materials.
- Work with others to resolve problems created by past handling and disposal of hazardous substances.
- Participate with government and others in creating responsible laws, regulations, and standards to safeguard the community, workplace, and environment.
- Promote the principles and practices of Responsible Care by sharing experience and offering assistance to others who produce, handle, use, transport, or dispose of chemicals.

Table 2. Six management practice codes

- Community Awareness and Emergency Response (CAER): Ensure emergency preparedness and foster community right-to-know.
- Pollution Prevention: Promote efforts to protect the environment by generating less waste and reducing emissions.
- Process Safety: Prevent fires, explosions, and accidental releases.
- Distribution: Reduce the risk to public carriers, customers, contractors, employees, and environment posed by the transportation and storage of chemicals.
- Employee Health and Safety: Protect and promote the health and safety of employees or people visiting company sites.
- Product Stewardship: Promote the safe handling of chemicals from initial manufacture to distribution, sale, and ultimate disposal.

Source: Chemical Manufacturers Association (CMA). 1997b. The Year in Review 1995-1996: Responsible Care® Progress Report. Arlington, Virginia: CMA.

CMA supplements information from self-evaluation forms with data that member companies must file annually with federal agencies including the U.S. Environmental Protection Agency (EPA), Occupational Safety and Health Administration (OSHA) and the U.S. Department of Transportation (DOT). For example, under Responsible Care's pollution prevention code, CMA collects toxic emissions data reported by companies to EPA's Toxics Release Inventory (TRI). Under Responsible Care's Distribution Code companies submit DOT accident data. CMA aggregates self-evaluation information and federal data and publishes the information annually in the "Responsible Care Progress Report (CMA 1997b)." The implementation data are typically reported as percentage of company operations that have the management practice codes in place.

In 1993, CMA developed a third party "management system verification (MSV)" process to increase Responsible Care's credibility. Outside verification of the industry's Responsible Care performance, established in Canada, has been undertaken by about 10 percent of CMA's membership in the United States (Chemical Week 1997b). The verification system is not a mandatory requirement of Responsible Care. Furthermore, CMA will treat the results as a member company's privileged information, although the company is free to disclose the results to the public if it wishes. As of July 1997, twelve companies had undertaken the third-party verification and eight others conducted more limited pilots (Chemical Week 1997b). (See Table 3.)

The MSV process is not a formal environmental audit. Instead, it is a system to insure that member companies have adequate systems in place to implement Responsible Care's management practices. However, the MSV process is not designed to verify company code implementation. CMA does not scrutinize member firms for performance against industry-wide standards. Instead, the third-party verifications are case-by-case, tailored to the requirements of individual facilities. The verification is conducted as a peer-level review by CMA-appointed individuals who have no direct competitive interest in the company under review. Reviewers include members of the plant's public advisory panel or local emergency response personnel such as fire fighters.

Table 3. Companies that have undertaken Management Systems Verification (MSV)

Lyondell Petrochemical	Harris Chemical
Rohm and Haas	Reichhold Chemicals
ICI Americas	Elf Atochem
Arco Chemical	Bayer Corp.
Ashland Chemical	Reilly Industries
Eli Lilly	OxyChem
Companies that have conducted pilot MSVs	
Haltermann	Velsicol Chemical
Amoco Chemical	LaRoche Industries
Millennium Petrochems	Degussa Corp.
DuPont	Milliken Chemical

Source: Chemical Week. 1997b. Deadlines Near: CMA strives to meet 1998 implementation targets. 2-9 July.

Sanction

CMA relies on communication, education, and outreach to persuade members to adopt Responsible Care's principles and implement the initiative's management codes. CMA has developed code resource guides and implementation materials that provide companies with ideas and examples of how to implement Responsible Care. CMA makes guidance materials available to non-member companies as well. In addition to printed documents, CMA has developed an electronic bulletin board to disseminate information and promote communication among member companies.

Participation in Responsible Care is largely an ethical obligation upheld through peer pressure, rather than binding requirement enforced by a central authority. Failure on behalf of a company executive to achieve Responsible Care's goals imposes internal psychic costs in the form of reputation. In theory, member firms that fail to meet the requirements of the self-evaluation process may be expelled from CMA, but only as a last resort. To date, there is no record of expulsion. Non-member participants are subject to termination for non-fulfillment of obligations.

For its membership, CMA in 1990 developed a multi-stage policy to review company performance with respect to implementation of the management practice codes. The plan identifies triggers for non-compliance such as failure to submit self-evaluations or failure to demonstrate adequate code implementation. CMA would impose a successively stringent series of communications with companies identified as out of compliance, beginning with notification letters and culminating in an official review with the non-responding company's executives. At each stage, however, CMA would provide the company with customized assistance to promote compliance. As one CMA representative explained, "Our intent with Responsible Care has never been to kick people out. Our intent is to keep them in the family and help [them] (Ember 1992)."

III. Legal Context

Responsible Care more closely resembles an informal gentleman's agreement than legally binding regulatory program. According to Kappas (1997), Responsible Care's informal terms and conditions are designed to minimize legal risk. Historically, attempts at industry self-regulation in the

United States have been discouraged by anti-trust legislation. It is only within narrowly defined limits that antitrust law and regulation in the United States recognize the right of industry associations to develop and enforce self-regulatory codes. According to Kappas, Responsible Care's design is a rational response to legislative barriers. He writes: "Given the uncertainty about [Responsible Care's] outcomes and their associated legal consequences, it would obviously be very foolish for the CMA and its members to have invested in the development of institutions that were eventually condemned by antitrust authorities as a restraint on trade (1997, p. 12)."

In response to anti-trust legislation, CMA developed codes that minimize the potential for discriminatory or exclusionary behavior on behalf of member companies. Primarily, CMA refrained from the use of codes that would require companies to employ specific management strategies, actions, or outcomes. CMA's ability to use such methods would have made Responsible Care considerably less ambiguous and more transparent. Uncertainties regarding the legality of Responsible Care therefore have the added effect of limiting the effectiveness of monitoring and enforcement (*ibid*).

Anti-trust legislation also constrained the type of decision-making tools that CMA could use in Responsible Care's development. According to Kappas, courts in the United States have determined that trade association use of product or process standards allowed firms to fix prices and, in effect, restrict competition. To further minimize this possibility, CMA used a consensus process, rather than majority rule among its members, to minimize the potential for internal schism (Kappas 1997). While the use of consensus may minimize the potential for rifts, the process tends to increase incremental time and resources required for parties to come to an agreement. It is likely that CMA's use of a consensus process also served to dilute Responsible Care's goals. In general, it has been demonstrated that the consensus process tends to result in sub-optimal or "lowest common denominator" goals and objectives that minimize potential losses to participants invested in the status quo (Ostrom 1990).

Anti-trust law also constrains the type of enforcement mechanisms available to CMA. Courts have interpreted the legislation to limit the types of sanction that trade associations may employ. At most, trade associations may use persuasion to encourage companies to improve practices. Stronger action could be construed as an unreasonable restraint of trade. Thus, CMA relies upon external factors such as status quo law, regulation, and interest group pressure to ensure compliance with Responsible Care (CMA News 1995). To enhance the likelihood of company compliance, CMA made Responsible Care's six codes consistent with current and reasonably foreseeable future federal and state laws and regulations.

Three major federal environmental laws are particularly relevant to the chemical industry. The Toxic Substances Control Act (TSCA) deals with the 70,000 chemicals in commercial production in the United States. The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) deals with accidents, spills, dump sites, and liability. The Resource Conservation and Recovery Act (RCRA) is focused primarily on hazardous waste disposal -- but deals with other matters as well. Other relevant laws include the Occupational Safety and Health (OSH) Act.

Responsible Care's advent and development is inextricably related to federal laws, regulations, and initiatives. In 1986, Congress patterned Title III of the Superfund Amendment Reauthorization Act (SARA) after CMA's Community Awareness & Emergency Response (CAER) program -- Responsible Care's forerunner. The portion of SARA patterned after CMA's emergency planning program is known as the Emergency Planning and Community Right to Know Act (EPCRA) (Lodge and Rayport 1991). Among its provisions, EPCRA requires states to develop commissions responsible for coordinating certain emergency response activities and for appointing local emergency planning committees to address chemical hazards.

Conversely, CMA based part of Responsible Care's prevention reporting requirements on the EPCRA's public right-to-know provision. In addition to requiring states to develop emergency planning programs, EPCRA establishes EPA's Toxics Release Inventory (TRI). CMA member companies must report to the trade association annually on emissions and transfers off-site reported to the TRI. Responsible Care's pollution prevention code also is consistent with the 1990 Pollution Prevention Act, which makes prevention a national policy goal that is to be achieved through voluntary approaches. Finally, Responsible Care's codes also are compatible with other public and industry-led voluntary initiatives including EPA's 33/50 Program. Former EPA Administrator, William K. Reilly, patterned the voluntary 33/50 Program after Responsible Care's pollution prevention code (Chemical Week 1991). Like Responsible Care, EPA's Energy Star program similarly allows participants that meet agency energy use standards to display Energy Star product logos. Responsible Care also is compatible with ISO 14000 and the Valdez Principals.

Responsible Care's consistency with federal laws, regulations, and voluntary initiatives reflects CMA's primary mission as an organization devoted to advancing the interests of its members. Originally known as the Manufacturing Chemists Association, CMA was founded in 1872 to provide a forum for chemical executives to exchange views on issues of common concern. In 1978, MCA's name was changed to the Chemical Manufacturers Association (CMA). CMA provides technical support in the areas of toxicology, epidemiology, biochemistry, engineering, and environmental affairs (Lodge and Rayport 1991). Among its aims, CMA lobbies the federal government on behalf of the association's 190 chemical producers. Such lobbying efforts have caused some to view Responsible Care with skepticism (Ember 1992). For example, the chemical industry, through their lobbyists, has generally favored recent attempts by Congress to weaken environmental legislation (Hook 1996).

IV. Policy Context

Responsible Care is premised on the assumption that the "survival" of the U.S. chemical industry depends on improving public perceptions about how plants are managed (Chemical Week 1991). To better understand the context in which CMA developed Responsible Care, it is necessary to understand a few key economic features of the U.S. chemical industry.

Economic features

The U.S. chemical industry is known as a "keystone" industry -- critical to the global competitiveness of the automobile, electronics, and aircraft industries. Products made by chemical manufacturers also are integral to the U.S. construction and health care industries. In 1996, U.S. chemical manufacturers shipped \$372 billion dollars worth of products. The industry accounts for 1.9 percent of U.S. output (CMA 1998b). It is the fourth largest manufacturing industry in the United States and the nation's number one exporter, with a trade surplus totaling \$163 billion over the last decade. The industry supplies more than \$1 out of every \$10 of U.S. exports. Roughly two-thirds of these exports are by U.S. chemical manufacturers to their foreign affiliates. In 1996, the chemical industry employed 1.03 million workers who helped produce over 70,000 products in 12,000 U.S. facilities (ibid).

The industry is heterogeneous in terms of size, products, and processes. Most U.S. companies have sales of less than \$5 million per year. However, a handful of Fortune 500 companies account for the majority of production volume. The industry's heterogeneity is evidenced by CMA's composition. CMA's 190 members operate about 2,000 U.S. facilities and represent about 90 percent of the nation's basic industrial chemical manufacturing capacity. Yet CMA's members include only about one percent of

all chemical manufacturers in the United States (Hook 1996). CMA's major contributing members are comprised of about 14 multinational companies such as DuPont, Monsanto, Dow, and Union Carbide. However, CMA members also include companies with one plant that employ less than 100 workers. About 100 CMA companies consist of firms whose annual chemical sales are generally less than \$150 million. CMA's members also include U.S. subsidiaries of foreign-owned companies.

Product diversity also is reflected in CMA's membership. For example, DuPont and Dow are diversified, while others such as Merck or Weyerhaeuser focus on pharmaceuticals and wood products, respectively. Others, such as Air Products and Chemicals make specialty gases integral to computer and electronics manufacture. Petroleum companies such as Exxon, Mobil, and Chevron operate chemical subsidiaries.

The U.S. chemical industry is mature. According to CMA, the constant dollar demand for the entire U.S. industry, including CMA's 190 members will grow at a rate of about 1.2 times the rate of gross domestic product (GDP) growth in the 1990s. Most of the industry's growth is in pharmaceuticals, rather than industrial chemicals. CMA expects pharmaceuticals to grow at a rate of 2.7 times GDP growth. Industrial chemicals during the decade have averaged only about 0.7 times GDP growth. To put these numbers into perspective, consider that a 2.5 percent rise in U.S. GDP translates into less than 1.8 percent real growth in industrial chemicals (Storck 1996).

The industry is competitive yet highly interdependent. For example, Dow and DuPont are major rivals but DuPont also is Dow's best customer. Firms compete primarily on the basis of price and make large investments in research and development. In 1996, chemical manufacturers invested \$18.3 billion dollars in research and development (R&D), reflecting international competitiveness concerns and environmental goals. R&D spending has increased from 3.7 percent of sales in 1983 to 4.9 percent in 1996. Investment in plants and equipment (P&E) was \$34.6 billion in 1996. From 1987 to 1996, real P&E investment growth excluding inflation averaged 9.2 percent annually. Such innovations lower prices and take markets from other chemicals and from non-chemical products.

A key area of rising industry costs is attributed to environmental regulation. About one-sixth of P&E investment is for environmental improvements such as pollution abatement. Chemical industry pollution abatement spending in 1994 was \$4.6 billion -- about 5.8 times larger than in 1975. According to CMA, pollution abatement costs are rising faster than sales. Abatement costs rose from 1.9 cents per dollar of sales to 3.0 cents per dollar of sales (CMA 1998b).

Motivations

Responsible Care is premised on the assumption that rising abatement costs are partially a function of negative public perception. Until the mid-1980s, only a few proactive chemical companies recognized the importance of favorable public opinion. For the most part, the response of the industry as a whole was uncoordinated and piecemeal. Management largely believed that the intangible cost of disasters, in terms of public perception, was largely confined to the plant or parent company in which the disaster occurred. The piecemeal approach was reinforced by the compliance and reporting requirements of individual federal air, water, waste, and toxics laws. The prevailing industry wisdom started to change in 1984, when 3,000 people died in a chemical accident at a Union Carbide subsidiary plant in Bhopal, India. After Bhopal, it became clear to the majority of U.S. chemical manufacturers that piecemeal, regulatory-driven responses were inadequate. The lesson was reinforced later that year when a similar but smaller accidental release occurred at a Union Carbide plant in Institute, West Virginia.

The chemical disasters catalyzed two related processes -- one among industry and other among environmental groups and the public. Industry framed the problem as one of public perception. In contrast, environmental activists and some legislators responded to the crisis with a series of laws, regulations, and novel policy instruments such as the Toxics Release Inventory (TRI) and the voluntary 33/50 Program. Both sides agreed that the fragmented, control-based focus of federal laws failed to encourage risk prevention.

Chemical industry executives agreed that unless something was done to improve public opinion, firms would be increasingly unable to build and operate new plants in the United States. Chemical company executives reasoned that negative public opinion also could increase operating and abatement costs by contributing to more stringent regulation (Chemical Week 1991).

CMA commissioned several public opinion studies that demonstrated the need for approaches more interventionist than advertisement. A 1989 survey commissioned by CMA found that the chemical industry ranked only above the tobacco industry among ten industries studied in terms of public perception. Whereas 78 percent of those surveyed had a favorable impression of the computer industry -- an industry largely dependent on solvents, acids, and gases supplied by chemical manufacturers -- only 28 percent had a favorable opinion of chemical manufacturers. About 33 percent had a favorable impression of the nuclear industry, while only 15 percent held favorable views of the tobacco industry (NFO Research, Inc. 1989).

Another study commissioned by CMA examined public opinion trends. The results revealed that the public believed the chemical industry was inadequately regulated and increasingly superfluous to the U.S. economy. Responsible Care's focus on management practices is largely in response to these findings. CMA decided that the industry needed to demonstrate to the public how chemical plants are operated and managed (Chemical Week 1991).

Responsible Care's outreach program distinguishes among ten different audiences to be targeted. In order of priority, they include more than one million industry employees; residents who live near chemical plants; local activists; local and state regulators; and federal regulators, including EPA and OSHA, among others. Responsible Care targets plant employees first because they are ultimately charged with plant operations. CMA reasoned that if employees failed to understand Responsible Care's six management practice codes, then the initiative was likely to have little impact on plant operations.

CMA gave residents and local activists who live near plants higher priority than national environmental groups because CMA believes that locals are the chemical industry's most important public constituency. In the opinion of CMA's members, local activists focus more on real plant performance, while national environmental groups are trained more on political ideology (Chemical Week 1991).

CMA developed the community advisory panel (CAP) process as a mechanism to promote dialogue between chemical plant managers and people who live in the communities in which plants operate. CAPs typically include a cross section of representatives from the community who meet regularly, often monthly, to discuss issues ranging from plant expansion, to local education needs, to helping the plant site develop environmental improvement plans (CMA 1997b). Recently, CMA has harnessed the CAP process as a way to comply with EPA regulations. EPA now requires companies to file risk management plans (RMPs) that specify "worst case" scenarios -- accidents of catastrophic proportions and their off-site consequences. Firms are required to demonstrate to regulators and to the public that measures are in place to prevent such catastrophes (Chemical Week 1997d).

V. Implementation

In theory, industry self-regulation carries the potential for free rider problems because the industry's public image is a collective good. One company's consumption of the industry's public image does not materially affect the amount available to another company, and no company may be entirely excluded from the benefit of improved public perception. In practice, CMA has successfully minimized potential free rider problems. The initiative's greatest implementation challenge involves its persistent lack of credibility among some environmental and public advocacy organizations. Transparency problems contribute to the perception among some groups that the initiative is unsuccessful. However, it is plausible that Responsible Care's credibility problems stem more directly from the persistence of status quo environmental law and administration.

To gain further insight into implementation issues, it is useful to understand how CMA's members have elected to accomplish Responsible Care's objectives. CMA minimized collective action problems by convincing its membership that the economic viability of the industry in the United States was in jeopardy. Kappas (1997) posits that the collective sense of crisis engendered by negative public perceptions following Bhopal and Institute helped to foster cooperation among chemical companies.

To promote implementation, CMA designed Responsible Care to minimize the additional time and cost necessary to develop and comply with the program's requirements. As a result, companies with established EHS programs have opted primarily to weave Responsible Care's codes into pre-existing programs. For example, Monsanto has integrated the goals of Responsible Care into its "Monsanto Pledge" program. ARCO has integrated the Responsible Care into its pre-existing, "Manufacturing Excellence" program. Companies that lacked established EHS programs or whose efforts were previously uncoordinated have used Responsible Care as a way in which to consolidate EHS activities previously housed in different parts of the organization.

Business-as-usual?

CMA designed Responsible Care to minimize additional burdens to industry imposed by environmental regulation. While Responsible Care's consistency with the status quo helps to improve the initiative's appeal to industry, overlap makes it difficult to isolate environmental and economic changes due to Responsible Care from other factors. To gain further insight into this question, CMA (1997a) surveyed member companies to ascertain the extent to which Responsible Care may have changed business practices. Companies reported that it was difficult to separate the benefits of Responsible Care from their own EHS activities. Many companies reported that they had good EHS systems in place prior to adopting Responsible Care, and that Responsible Care might have improved their performance, but not caused the improvements solely. The response is not surprising because individual companies with poor programs prior to Responsible Care's development have little incentive to report that their practices were initially lacking. The result underscores the difficulty of ascertaining the degree to which the initiative has contributed to improvements in industry practices.

Information asymmetries

CMA's membership is extremely heterogeneous with respect to firm size. Not surprisingly, information asymmetries between large and small Responsible Care participants remain a persistent implementation challenge. Participants considered "small" (less than \$150 million in total annual sales) continue to have trouble understanding what is expected of them under Responsible Care (Chemical Week

1997b). Such findings suggest that questions regarding free riders are particularly relevant with regard to small firms.

CMA has sought to minimize the potential for smaller companies to benefit at the expense of larger firms primarily by improving small and medium sized firms' access to information. For example, CMA uses the "Council of 100" -- firms with less than \$150 million in annual total sales -- as a forum to identify implementation problems unique to small and medium sized firms and to provide targeted implementation assistance tailored to the needs of smaller companies (Chemical Week 1997b).

The practice of free riding is further discouraged through Responsible Care's "mutual assistance" process. The mutual assistance process is a member-driven series of efforts designed to encourage companies to share information on Responsible Care's implementation. The process establishes a "network" of senior company executives and plant-level employees who coordinate Responsible Care's provisions with other facilities and public groups, and individuals responsible for Responsible Care's day-to-day implementation. The executive networks meet periodically to exchange information and re-affirm their commitment to Responsible Care. Coordinators exchange implementation information among plants located in the same geographic region of the United States. Individuals charged with implementation of Responsible Care at the plant level share information through state-level chemical industry councils. CMA's role in the assistance networks is largely limited to that of a facilitator and information repository (Chemical Week 1991).

Transparency

CMA's efforts improve Responsible Care's transparency to the public are hampered by adversarial relations that characterize the administration of environmental law. Fear that public disclosure may be used to initiate citizen suits or enforcement actions curbs the amount of information that firms are willing to voluntarily provide. Transparency problems make it difficult for CMA to balance the needs of its members with those of the public.

To illustrate, consider the case of third-party verification. CMA developed the management system verification (MSV) process as a way to promote greater transparency and provide assurance to the public and to industry that Responsible Care's goals were being met. In practice, however, member companies have expressed concern that regulators or citizens would use information developed through MSV to mount lawsuits or enforcement actions. As a result, CMA advances Responsible Care's verification system largely as a tool for inter-industry learning, rather than a device for verification and information dissemination.

Responsible Care's lack of transparency fuels environmentalists' mistrust of the initiative. The results of two studies reflect the belief among some advocacy organizations that Responsible Care is opaque. The U.S. Public Interest Research Group (PIRG) and *Mother Jones* magazine independently investigated public access to Responsible Care information. Both PIRG and *Mother Jones* are advocacy organizations that have historically maintained adversarial relationships with the chemical industry. While their research methods are questionable, their results nonetheless are illustrative of views held by some advocacy organizations.

PIRG telephoned 192 Responsible Care member chemical facilities in 28 states and posed nine questions about toxic chemical use and accident prevention. PIRG researchers were unable to find any one to answer their questions at 42 percent of the facilities contacted. Representatives at only 17 percent of the facilities contacted were able to answer all nine questions (Ember 1992). *Mother Jones* magazine

took a different approach and used a toll-free telephone number provided by CMA to identify appropriate Responsible Care contacts for ten CMA member companies. According to the *Chemical & Engineering News*, the *Mother Jones* staff was unable to successfully reach representatives at any of the ten companies contacted (ibid).

Credibility

As the foregoing examples suggest, Responsible Care's greatest implementation challenge is the initiative's lack of credibility among some U.S. environmental and public advocacy groups. While transparency problems contribute to Responsible Care's credibility problems, it is likely that no additional amount of information provision may be sufficient to satisfy Responsible Care's most strident critics.

In general, the U.S. environmental community holds a range of views toward Responsible Care. For example, the National Audubon Society and the Natural Resources Defense Council (NRDC) have taken a moderate, "wait-and-see" approach to Responsible Care. Environmental groups such as Greenpeace and Friends of the Earth maintain that Responsible Care is tantamount to a "fox guarding the henhouse (Ember 1992; Chemical Week 1991)." For this subset, Responsible Care lacks credibility because it is administered by an organization whose interests appear to be aligned with industry. Among these groups, Responsible Care's credibility problems have been reinforced by CMA's decision to exclude environmental and labor groups from Responsible Care's development and implementation.

In some cases, the chemical industry's credibility problems appear to be due to divergent interests rather than Responsible Care's design. For example, Responsible Care is unlikely to satisfy the demands of environmental groups that seek to phase out the use and manufacture of chemical industry products such as chlorine. In this regard, the root cause of Responsible Care's credibility problems is due more to adversarial relations that characterize implementation of the major air, water, waste, and toxics laws. As Davies et al. (1996, p ii.) observe: "...programs which depend for their success on cooperation, voluntariness, and trust still do not fare well."

VI. Assessment

Overview

This section applies eight OECD (1997) criteria to assess Responsible Care:

- Environmental effectiveness
- Administrative cost
- Competitiveness implications
- "Soft effects" (e.g., trust, cooperation)
- Economic efficiency
- Wider economic effects (e.g., prices)
- Dynamic effects
- Viability

Responsible Care is assessed primarily with respect to "soft effects" because the program's primary goal is to improve public opinion. Another yardstick involves examination of the degree to which companies have implemented public outreach efforts. It is likely that Responsible Care's greatest benefits are intangible and difficult to measure. Specifically, the initiative's community advisory process appears to be the initiative's greatest success to date. The process appears to build trust in local communities where plants operate. While it is popular among firms and among some local citizenry who now have access to

plants in their community, Responsible Care has not yet managed to improve the public perceptions of the chemical industry.

Assessment of Responsible Care is complicated by the initiative's goals, design, and metrics. As mentioned, CMA regards Responsible Care not as a 'program' but as a philosophy designed to create a 'cultural change' in the way the chemical industry does business (Chemical Week 1991). Responsible Care is designed to promote continuous improvement in environmental management methods and improve public outreach and opinion. To minimize legal liabilities, the initiative contains no concrete quantitative goals or emissions thresholds. While Responsible Care contains implementation deadlines, firms individually interpret the extent to which the initiative is fully implemented. Responsible Care's consistency with ongoing company EHS programs, laws, regulations, and other environmental initiatives also complicates evaluation. The overlap makes it difficult, if not impossible, to isolate changes due to Responsible Care from other factors.

Despite measurement difficulties, Responsible Care's growing popularity among companies world wide suggests that the initiative's private benefits to industry outweigh private participation costs. However, the lack of environmental performance goals and data make it difficult to assess economic effectiveness. No data have been developed to reflect Responsible Care's potential effects on abatement costs. Lack of benefits data is due to Responsible Care's lack of quantifiable objectives. CMA is attempting to survey members to calculate total savings for the industry in precise dollar terms that result from Responsible Care. Benefits are in the form of lower costs from treatment of injuries, reduced losses of materials in spills, and improvements in regulatory compliance (Chemical Week 1997b). To date, however, benefits reported to CMA by member firms remain largely anecdotal and based on the experiences of a few individual companies (CMA 1997a).

The exclusionary potential of unilateral agreements suggests that Responsible Care has broader competitiveness implications. However, such effects have not been observed (Kappas 1997). Responsible Care's most persistent challenge is due to the initiative's lack of credibility in some quarters.

Soft effects

The initiative has not yet significantly altered the general public's perception of the chemical industry. However, Responsible Care's greatest success is likely manifest in the initiative's Community Advisory Panel (CAP) provisions, which encourage plants to establish public panels. The following discussion summarizes both factors and attempts to resolve the apparent paradox in public opinion.

To date, the effects of Responsible Care remain localized because CMA has opted to focus its resources on plant employees and on communities in which plants operate. For both subgroups, Responsible Care appears to be achieving its intended effects. Still, the initiative's effects appear too localized to have modified the opinions of the general public. To date, the percent of people who hold generally favorable or very favorable views of the chemical industry declined by seven percent from 1990 to 1995. (See Table 4.) In 1996, even fewer respondents (20 percent) held favorable views toward the industry. Survey questions asked respondents whether they thought that the chemical industry informed citizens about plant safety, as well as whether the industry has taken sufficient voluntary actions to protect public health and the environment (Chemical Week 1997a).

Employee awareness of Responsible Care has steadily increased over the last three survey years. Still, employee understanding of Responsible Care's requirements remains low. CMA's 1996 employee survey shows that 77 percent of 10,458 employees surveyed were aware of Responsible Care. Only 43

percent of those polled had a good understanding of the program (Chemical Week 1997c). To increase employee involvement, companies are extending the scope of the initiative beyond the plant level to all levels of the corporation.

Most observers agree that Responsible Care's 15-member Community Advisory Panels (CAPs) are the initiative's greatest achievement (Hook 1996; Chemical Week 1997a). Nine out of ten companies surveyed by CMA report that improved community relationships provide the greatest benefit (CMA 1997a). Among the companies surveyed, 61 percent reported that Responsible Care significantly "improved community dialogue." Surveys of plant neighbors, local politicians, and emergency response personnel familiar with Responsible Care were more favorable to the industry than those who were unfamiliar with the voluntary initiative. Community surveys showed improvement in public favorability from 44 percent in 1989 to over 80 percent in 1994 (CMA 1997a).

**Table 4. Public favorability towards ten industries, 1990-1995
(percent very/generally favorable)**

Industry	1990	1991	1992	1993	1994	1995
Computer		78	78	79	83	82
Food		73	72	73	57	69
Lumber and Paper		61	57	60	57	62
Airline		68	62	62	44	52
Automobile		59	51	42	42	50
Pharmaceutica l		58	51	42	42	50
Petroleum		36	39	41	35	44
Nuclear		33	35	38	25	26
Chemical	28	27	25	26	20	21
Tobacco		15	12	14	12	11

Source(s): NFO Research, Inc. 1989-1993. National Opinion Surveys for the Chemical Manufacturers Association. Arlington, Virginia: CMA; Market Directions. 1994-1995. Attitude and Perception Studies. Arlington, Virginia: CMA in Kappas 1997.

Table 5. Percent of CMA members with code fully implemented, 1996 (unless noted)

Code	Full implementation
Community Awareness, Emergency Response (CAER)	89 percent
Pollution Prevention ^a	88 percent
Process safety	86 percent
Distribution code	84 percent
Employee health and safety ^a	92 percent
Product stewardship ^a	70 percent

Source: Chemical Manufacturers Association. 1997b. The Year in Review, 1995-1996. Responsible Care Progress Report. Arlington, Virginia: CMA.

Note: ^a 1995 in Kappas 1997.

CAPs are credited with providing a formal communications channel between plant managers and the local community. To illustrate their success, CMA points to their growing popularity. As shown in Figure 1, the number of CAPs in the United States grew from 56 in 1991 to 316 in 1997 (CMA 1997b). Furthermore, companies outside the chemical industry such as semiconductor manufacturer, Intel Corp., have adopted the CAP process for their own manufacturing facilities.

According to some, CAPs have contributed substantially to increased understanding of environmental issues faced by both industry and community. In this regard, local citizens and industry officials have been able to maximize benefits to both the manufacturer and the community (Hook 1996; Chemical Week 1997a). It is believed that CAPs help to modify risk perceptions by giving outsiders an opportunity to directly meet with plant managers and observe operations. Such interactions build trust and improve public perceptions. However, it is likely that the overall effect of CAPs on public opinion remains negligible simply because they target such a small fraction of the total U.S. population (Chemical Week 1997a).

While popular with CMA members and some individuals who live near member plants, CAPs continue to lack credibility among some environmental groups (Ember 1992). Opponents are critical of the way in which CAPs are developed, as well of the process, itself. Critics charge that industry uses CAPs as a way to advance its interests. Opponents argue that public participants lack the technical expertise to sufficiently evaluate and challenge industry claims (ibid). Indeed, CAP meetings have been characterized in the trade industry press as relatively non-controversial proceedings (Chemical Week 1997a). Opponents of the CAP process use such observations to support their claims. In contrast, industry maintains that the lack of controversy at CAP meetings is illustrative of the level of trust and goodwill engendered by the CAP process (ibid).

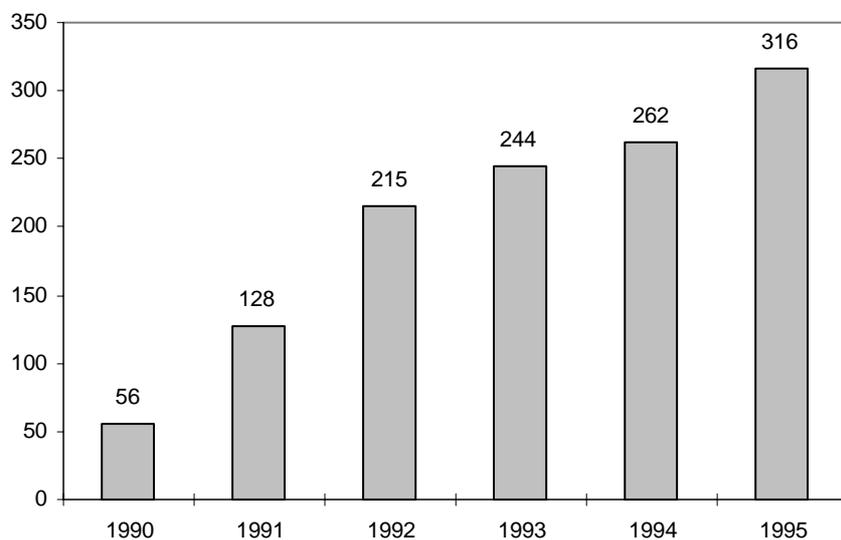


Figure 1. Community Advisory Panels in the United States, 1990 - 1995

Source: Chemical Manufacturers Association. 1997b. The Year in Review, 1995 - 1996. Responsible Care Progress Report. Arlington, VA: CMA.

Implementation progress

CMA designed Responsible Care to improve public perception through the voluntary adoption of six management practice codes. Uniform assessment of implementation is complicated because CMA allows member companies to define full implementation on a case-by-case basis. Nonetheless, CMA expects member companies to implement fully five of the six management practice codes by 1998 (Chemical Week 1997b). CMA members are expected to fully implement the sixth code, product stewardship, in 1999. Table 5 displays the percent of CMA membership that in 1997 reported full implementation of the six practice codes. According to CMA's 1997 progress reports, 92 percent of Responsible Care participants have fully implemented Responsible Care's employee health and safety code. The code is largely consistent with Occupational Health and Safety Administration (OSHA) law and regulations. Only 70 percent have fully implemented Responsible Care's product stewardship code, which is arguably the initiative's most complex provision. The product stewardship code requires companies to promote the safe handling of chemicals from initial manufacture to distribution, sale, and ultimate disposal.

Environmental effectiveness

To monitor pollution prevention progress, CMA collects emissions data reported by member companies annually to the TRI. CMA also tracks injury and illness rates reported by companies to OSHA. To monitor distribution accidents, CMA collects records on bulk rail shipment accidents reported to Department of Transportation (DOT).

Combined, all industries required to report to TRI in 1994 released and transferred off-site roughly six billion pounds of 343 toxic chemicals. Among all manufacturers required to report, TRI totals were highest for the chemical industry followed by primary metals (U.S. EPA 1996). Releases from the entire chemical industry in 1994 came to more than 800 million pounds. Total transfers offsite for the chemical sector in 1994 were about 989 million pounds.

According to CMA, members reduced toxic releases to air, water, and land by 52 percent, or around 350 million pounds, between 1988 and 1994, while sales volume increased 10 percent (CMA 1998b). CMA based its calculation on reports from 55 member companies that account for about 90 percent of all TRI releases and offsite transfers reported by CMA membership. Some of these declines likely reflect commitments on behalf of member companies to voluntary curb releases and transfers of 17 priority chemicals under EPA's 33/50 program. According to CMA, member companies reduced emissions of 17 high priority chemicals by 53 percent between 1988 and 1994 (CMA 1998b). However, CMA has not tracked the number of members that participated in the 33/50 Program.

CMA reports that occupational illness rates have declined over the period as well. In 1990, CMA member companies reported to OSHA 3.61 recordable illnesses and injuries per 200,000 employee exposure hours. By 1995, the rate had fallen to 2.5 incidents (CMA 1997b). Unlike the TRI data, which firms are required to report publicly, OSHA does not require companies to report publicly on illnesses and injuries. Finally, DOT bulk rail shipment data show that CMA member company accidents declined from 378 in 1992 to 262 in 1994, a 21 percent drop (CMA 1995). CMA will need to collect these data for several years before a clear trend line emerges.

While they illustrate general trends, the federal data are not a reliable Responsible Care progress indicator for several reasons. Primarily, it is impossible to isolate the degree to which changes in the federal data are due to Responsible Care. Second, the federal data contain a number of weaknesses (U.S.

GAO 1994). For example, while approximately 70,000 chemicals are in commercial use in the United States, TRI until 1994 only required firms to report on emissions and transfers of 343 chemicals. EPA in 1994 expanded to roughly 650 the number of chemicals on which companies are required to report. EPA's expansion of TRI, which took effect in 1995, makes it possible to track emissions and transfers for more chemicals. However, the change makes it difficult to directly compare reports for 1995 with reports from previous years. Furthermore, until recently, only firms that fall within Standard Industrial Classification (SIC) Codes 20 through 39 (manufacturers) are required to report on emissions and transfers. However, starting in 1997 seven additional industrial sectors will be required to report to the TRI.

In addition to covering only a subset of chemicals and industries, TRI exempts firms that employ less than ten workers or use less than 10,000 pounds or manufacture fewer than 25,000 pounds of TRI chemicals per year. Finally, TRI release and off-site transfer data are based on self-reported estimates, rather than actual measures from the facility that companies report to EPA annually. Thus, environmental assessment data must be interpreted with caution.

Economic effectiveness

About one-sixth of the chemical industry's investment in plants and equipment investment is for environmental improvements such as pollution abatement. Chemical industry pollution abatement spending in 1994 was \$4.6 billion, about 5.8 times larger than the 1975 level. Ideally, industry self-regulation would provide firms with sufficient flexibility to use the most cost-effective abatement strategy. However, Responsible Care is constrained by environmental laws and regulations that mandate abatement methods. Under the status quo, it is obviously impossible for CMA to provide participants with relief from regulatory requirements under Responsible Care. It is therefore unlikely that Responsible Care has reduced pollution abatement costs. Estimation of abatement cost changes is complicated by the lack of data with which to link Responsible Care to environmental improvements.

Transaction costs

In contrast to abatement costs, which refer to production, consideration of transaction costs requires moving beyond the factory floor to examine Responsible Care's institutional features. The transaction costs associated with Responsible Care refer to the time and money spent to negotiate, report, and monitor the initiative. Assessment requires examining the incremental transaction costs of Responsible Care, i.e., transaction costs associated with the initiative minus costs associated with status quo laws, regulations and initiatives such as 33/50.

A priori, these costs may be positive or negative. For example, improved community favorability may carry indirect benefits such as accelerated permitting and reduced reporting requirements. Responsible Care's information-dissemination and mutual assistance provisions may lower the total transaction costs associated with implementation to CMA and to member firms. Unfortunately, there is no systematic public data to illustrate transaction costs associated with Responsible Care.

Cost estimation also is complicated by Responsible Care's overlap with status quo laws, regulations, initiatives, and on-going company EHS programs. It is virtually impossible to isolate changes due to Responsible Care from other factors. Overlap may reduce or minimize some categories of transaction costs. For example, the incremental cost to firms of reporting prevention, transportation accident, and occupational injury data to CMA is probably close to zero because firms are required by law to develop and file such data to federal agencies. Similarly, incremental transaction costs due to

Responsible Care are likely to be negligible for companies that report having well-established EHS programs in place prior to the development of the voluntary initiative.

The relationship between CMA and its membership also complicates assessment. It is difficult to isolate costs borne by firms from costs borne by the trade association. For example, more than 500 chemical industry employees volunteered on Responsible Care committees and task forces in 1997 (Chemical Week 1997b). Company executives who serve as CMA officers may devote up to 25 percent of their time to CMA activities such as Responsible Care (Chemical Week 1991).

While some categories of transaction cost are likely to be minimal, costs associated with recent efforts to improve public opinion are likely to be positive. CMA added the third-party verification process in 1996 as a way to improve Responsible Care's transparency. Two companies that have undertaken the management systems verification report that the process is time-consuming and expensive. Lyondell Petrochemical devoted up to 100 employees who spent two to four hours each day to conduct for the exercise. Ashland Chemical devoted between 15 and 20 employees who required six weeks (Chemical Week 1997b). (See Table 3.)

The benefits of improved public opinion may outweigh the incremental costs of third-party verification. Some CMA members report that Responsible Care reduces transaction costs associated with permitting, siting decisions, and reporting. For example, one company reported that interaction with the community through Responsible Care was a critical factor in gaining a permit to expand plant operations. Two others reported that Responsible Care expedited local permitting processes (CMA 1997a).

To date, Responsible Care's primary benefit to companies appears to be in the form of reduced insurance premiums (CMA 1997a). Some companies report achieving 25 to 40 percent reductions in their insurance coverage through their involvement in Responsible Care. CMA also has worked with several insurance brokers and underwriters to obtain recognition for member companies. CMA member companies and non-member partners who have adopted Responsible Care can realize up to 30 percent reductions on their insurance premiums.

Related to reduced insurance costs are declines in workers' compensation costs. Several companies report that Responsible Care reduced compensation costs by improving employee health and safety programs and reducing work-related injuries and accidents. For example, one company reports cutting workers' compensation costs from \$2 million in 1988 to \$60,000 in 1996 (CMA 1997a).

Companies also report that Responsible Care led to fewer citations and fines. However, it is impossible to definitively link such changes directly to Responsible Care. Declines may be due to EHS improvements made before Responsible Care, or to exogenous factors such as EPA funding cutbacks in compliance and enforcement.

In addition to reduced fines, several companies report that their relationships with EPA have improved "dramatically" as a result of Responsible Care. Primarily, companies report that commitment to Responsible Care enabled them to convince regulators to reduce product toxicology testing. One company reported that fines paid have decreased 90 percent as a result of Responsible Care, indicating a decline in seriousness of reported violations (CMA 1997a).

Competitiveness

Voluntary programs have the potential to restrain trade within an industry by changing relative costs or by establishing entry barriers. CMA designed Responsible Care with attention to anti-trust law. As a result, the industry has successfully managed to avert competitiveness issues (Kappas 1997). CMA members report that Responsible Care has had no impact on price, which remains the principle basis of competition in the industry. However, Responsible Care's distribution and stewardship codes are not confined to chemical manufacturers. A relevant issue is therefore whether the initiative has erected entry barriers in downstream industries.

Responsible Care encourages chemical manufacturers to select distributors and transporters that comply with Responsible Care's codes. One result is that several industries downstream from chemical manufacture, including chemical distribution and transport, have developed programs similar to Responsible Care. For example, the National Association of Chemical Distributors (NACD) patterned its own unilateral program, "Responsible Distribution Process" in response to chemical manufacturers' requests for distributors who comply with Responsible Care's codes.

The chemical distribution and carrier industries have experienced a general consolidation in recent years, due to both market factors and to chemical manufacturers' attempts to minimize risks associated with large numbers of distributors and trucking firms. Primarily, though, high entry costs associated with regulatory compliance have reduced the number of chemical distributors from 1000 in 1990 to 890 in 1997. Thus, consolidation in these industries appears to be driven by factors other than Responsible Care (Kappas 1997).

VII. Conclusion

On paper, Responsible Care appears to be an exemplary blueprint for the voluntary adoption of ethical conduct codes. If universally adopted, the initiative could significantly enhance the way in which the chemical industry conducts business in the United States and abroad. Despite its significant promise, the effects of Responsible Care on public opinion remain confined to the several hundred U.S. communities in which advisory panels (CAPs) have been established. The CAP process has begun to create a dialogue and degree of openness between industrial facilities and their neighbors previously lacking in the United States. It will likely require more time and resources for these local effects to spread among the general public.

One reason is that Responsible Care's design and implementation have been weakened by the presence in the United States of legislation to discourage anti-competitive behavior. The presence of anti-trust legislation has encouraged CMA to successfully craft a voluntary program that minimizes the potential for firms to use the initiative as a way to deter competition. The trade-off is that Responsible Care's generalized goals are difficult to enforce, monitor, and evaluate. CMA's reluctance to dismiss recalcitrant firms is one example of how anti-trust law constrains the ability of the trade association to employ sanction. It may be possible for CMA to avert such problems by establishing an independent body to investigate implementation and misconduct (Hook 1996). Given the initiative's growing popularity outside the United States, it may be that Responsible Care's potential is greatest in countries that lack comparable anti-trust laws. At a minimum, trade associations in the United States contemplating the development of similar initiatives would be well advised to consider the potential effects of legislation on program design.

While anti-trust laws pose a formidable challenge to industry attempts at self-regulation, the chief barrier to Responsible Care is the fragmented system of environmental laws and regulations in the United States and the adversarial relations between industry and environmental groups that characterize their administration. Responsible Care lacks credibility in the environmental community due to transparency problems, but also to adversarial relations that characterize the administration of environmental laws.

It is likely that Responsible Care appeals to industry for precisely the same reasons it fails to appeal to some environmentalists -- the initiative was developed by industry, for industry. In order to increase the appeal of the initiative to industry, CMA designed Responsible Care in such a way as to minimize additional burdens on member companies. Responsible Care's overlap with pre-existing company EHS programs may reduce incremental transaction costs to firms. However, overlap further complicates assessment and contributes to the impression that the initiative lacks transparency. Efforts to improve transparency are limited by the presence of enforcement threats and civil lawsuit. The CMA effort to improve transparency through the third party verification process is one example. To date, Responsible Care's third-party verification process has only been undertaken by a handful of companies. The process is purely voluntary and companies are not required to disclose results.

Ultimately, the degree to which CMA is able to strengthen Responsible Care is constrained by the regulatory context in which the voluntary initiative operates. The initiative's six management practice codes are a laudable attempt to craft a more systematic, integrated management system that focuses on prevention and product stewardship, rather than abatement and control. However, as long as U.S. environmental laws and regulations are inconsistent with the goals and focus of voluntary efforts neither CMA nor EPA will be capable of crafting successful policy alternatives.