Environmental Information Disclosure: Three Cases of Policy and Politics

Thomas C. Beierle

March 2003 • Discussion Paper 03-16

Resources for the Future
1616 P Street, NW
Washington, D.C. 20036
Telephone: 202–328–5000
Fax: 202–939–3460
Internet: http://www.rff.org

Environmental Information Disclosure: Three Cases of Policy and Politics

Thomas C. Beierle

Abstract

One of the most notable innovations in environmental management in the past 15 years has been the use of environmental information disclosure as a strategy for improving firms' environmental performance. Following the Environmental Protection Agency's success with the Toxics Release Inventory, the agency and Congress initiated a number of other disclosure initiatives. This discussion paper documents the experience of three of these: risk management planning, materials accounting, and the Sector Facility Indexing Project. The paper examines the benefits and costs of these programs, their effectiveness, and the dynamics by which disclosure works.

Key Words: disclosure, Toxics Release Inventory, risk management planning, materials accounting, Sector Facility Indexing Project, right-to-know

JEL Classification Numbers: Q28

Contents

Environmental Information Disclosure: Three Cases of Policy and Politics

Thomas C. Beierle*

Introduction

In 1986, Congress ushered in a new era of federal environmental management by introducing information disclosure as a strategy for improving industrial environmental performance. The Emergency Planning and Community Right-to-Know Act (EPCRA), passed that year, contained a low-profile provision called the Toxics Release Inventory (TRI) that required certain manufacturing facilities to report annually on releases and transfers of toxic materials. It called on the Environmental Protection Agency (EPA) to make that information publicly available. EPA first published the release data in 1989, showing that 22,000 facilities produced around 6 billion pounds of reportable toxic substances.[1] By 1999, reportable TRI emissions had dropped by 46% despite the rapidly growing economy, a trend that led EPA to call TRI "one of the most effective environmental programs ever legislated by Congress and administered by EPA."[2]

Information disclosure programs such as TRI work by drawing environmental groups, the press, local communities, peer firms, investors, a range of other actors, and facilities themselves into a complex web of communication and action that pressure low-performing firms to improve environmental performance. Although environmental organizations and others have long been able to obtain and communicate information about regulated facilities through the Freedom of Information Act and other means, new computing power has dramatically enhanced the ability of

* Thomas C. Beierle is a fellow in the Risk, Resource and Environmental Management Division at Resources for the Future. He would like to thank Michael Barrette, Jim Belke, Maria Doa, Melinda Dower, Lois Epstein, Tom Natan, and Paul Orum for their thorough and insightful comments on a draft of this paper. Although the research described in this paper has been funded wholly or in part by the U.S. Environmental Protection Agency through grant number R 827585-01-0 to Resources for the Future, it has not been subjected to the agency's peer and policy review and therefore does not necessarily reflect the views of the agency and no official endorsement should be inferred.

[1] Frances M. Lynn and Jack D. Kartez, "Environmental Democracy in Action: The Toxics Release Inventory," *Environmental Management* 18(4): 511–21.

[2] Mary Graham and Catherine Miller,. "Disclosure of Toxic Releases in the United States," *Environment* 43(8) (October 2001): 11.

a variety of actors to seek out, compile, compare, combine, and share data in ways that were all but impossible previously. One analyst has described TRI as "the first regulatory instrument to exploit the revolutionary potential of contemporary information technology to store, manipulate, and disseminate large volumes of performance information efficiently, quickly, and cheaply."[3] When TRI was first released in 1989, the preferred technology for sophisticated users was electronic tapes and disks, which were supplanted two years later by CD-ROMs and then by the Internet in middecade.[4] The public now has direct access to TRI data in its rawest form, as well as in the context of vast amounts of additional information on sources, geography, toxicity, and other data.

EPA's success with TRI made public disclosure of environmental information a core mission of the agency throughout the 1990s, during which EPA and Congress initiated a number of new disclosure programs. Most prominent among these were risk management planning (RMP), which would provide detailed information on chemical accident risks and prevention; materials accounting (also known as chemical use reporting), which would provide information on how chemicals traveled through processes at industrial facilities; and the Sector Facility Indexing Project (SFIP), which would consolidate enforcement, compliance, and other data into a package of environmental performance indicators.

The purpose of this paper is to draw three sets of lessons from the RMP, materials accounting, and SFIP cases. First is to understand the benefits and costs of information disclosure policies. The obvious principle behind these disclosure programs is a community's "right to know," but advocates also outline a much broader set of benefits, such as prioritizing action, effecting change, and measuring success. Opponents of disclosure point to the costs, including the direct expense of generating and reporting data, concerns about misuse of information by terrorists and corporate spies, and public misunderstanding of low-quality or poorly presented data.

The second aspect of interest in this paper is how the political debates between benefits and costs ultimately determined the nature of the programs. In each case the interplay between

---

[3] Bradley C. Karkkainen, "Information as Environmental Regulation: TRI and Performance Benchmarking, Precursor to a New Paradigm?" *Georgetown Law Journal*, 89(2) (January 2001): 257–370, 257.

[4] Mark A. Greenwood and Amit K. Sachdev, "The Toxics Release Inventory: A Regulatory History of the Emergency Planning and Community Right to Know Act," prepared for the Chemical Manufacturers Association. Washington, DC: Ropes and Gray (April 5, 1999).

benefits and costs resulted in programs that departed from the TRI ideal: communication was circumscribed, data elements were lost, or the program was scrapped altogether.

Finally, the paper outlines the extent to which each program achieved (or in one case could have achieved) EPA's programmatic goals. If TRI could reduce releases by 46% simply by making toxic release data broadly available, could information disclosure programs also reduce industrial accidents, prevent pollution, or improve compliance, as the other programs sought to do? By comparing programs, we can gain insights into critical components of information disclosure relating to the nature of the data released, the importance of broad communication of information, patterns of communication among various actors, and other factors.

Each case is treated in its own section. These sections begin with the background for the program, discussing its origins and motivations. The conflict between those who argued for the program's benefits and those who protested its costs is examined, as well as how this debate determined the ultimate architecture of information release. Next, each section describes how various parties used the available data to create pressure for environmental change or how limitations of the architecture prevented them from doing so. Finally, each section outlines what is known about each program's ability to achieve its programmatic goals.

The lessons from the three programs profiled here are something of a cautionary tale about information disclosure politics and policy. None of the programs replicated TRI's architecture. In each case, political realities stunted the original design of the program, limiting what more extensive information disclosure might have achieved. When information was broadly disclosed, it didn't necessarily produce the intended benefits or generate the anticipated costs. Based on these three cases, it is difficult to conclude that information disclosure policies can easily replicate TRI's success in improving facilities' environmental performance. The clearest benefits have been elsewhere, such as improving the information base that companies, agencies, and nongovernmental organizations (NGOs) use to make and influence public policy.

1. Chemical Risk Management Plans

Following September 11, 2001, visitors to EPA's Web site could no longer find risk management plans (RMPs). Long before the terrorist attacks on the Pentagon and World Trade Center, industry charged that some RMP information could provide targeting information for terrorists, an argument that ultimately led Congress to dramatically circumscribe disclosure. Once the terrorist threat became real, EPA quickly removed what was left of RMP information from the Internet, even that previously deemed of little security concern.

The purpose of the RMP program was to reduce the likelihood and potential consequences of chemical accidents through facility-level planning and information disclosure about the possible impacts of a release. It ultimately became an exercise in balancing the benefits of disclosure (e.g., chemical accident prevention) with the risk from disclosure (e.g., the likelihood of a terrorist attack) in order to keep citizens safe from both sources of harm. Congress ultimately asked EPA and the Department of Justice to strike just such a balance.

The current RMP program is far from the TRI model of open access to a national electronic database. Much information is provided only locally. This architecture has limited the ability of communities to learn about local risks and prevented NGOs, the media, and others from using national data to focus attention on those facilities posing the greatest potential harm.

Background and History

The RMP program's official origins came in Section 112(r) of the 1990 Clean Air Act Amendments. However, its roots intermingle with those of the Toxics Release Inventory, reaching back to the chemical disaster in Bhopal, India, and Congress's efforts to protect communities from such risks with the 1986 Emergency Planning and Community Right-to-Know Act.

Under the RMP program, facilities using threshold amounts of certain flammable or toxic substances were required to provide EPA with a risk management plan by June 1999. These plans would contain several elements:

- a hazard assessment, including a five-year accident history and scenarios describing worst-case and alternative-case accidental releases;
- a prevention program for analyzing hazards and managing the risks of chemical accidents;

- an emergency response program for responding to accidental chemical releases; and
- a management system for implementing the hazard assessment, prevention program, and emergency response.

As with TRI, a primary motivator in the RMP program would be public disclosure of information about hazards, and Congress required that EPA make RMP information broadly available. In program regulations, EPA describes disclosure as a strategy for reducing chemical risks at the community level by allowing the public and officials to engage in a dialogue with industry to reduce risk: "EPA recognizes that regulatory requirements, by themselves, will not guarantee safety. Instead, EPA believes that information about hazards in a community can and should lead public officials and the general public to work with industry to prevent accidents."[5]

Many analysts pointed to the success of a New Jersey program of similar design, the Toxic Catastrophe Prevention Act, which among other things encouraged 80% of water treatment facilities in the state to eliminate or reduce their storage and use of hazardous chlorine gas in only three years.[6] Many hoped that the national RMP program would similarly encourage firms to take advantage of opportunities for switching to inherently safer technology.[7]

Public disclosure of worst-case accidental release scenarios triggered the program's greatest controversy. These scenarios would ultimately show that worst-case releases at 125 facilities around the country would put at least 1 million people at risk, another 700 facilities would put at least 100,000 people at risk, and 3,000 facilities would put at least 10,000 people at risk.[8] Just how these scenarios, known as off-site consequence analyses (OCAs), would be made

---

[5] Federal Register, Vol. 61, No. 120 (June 20, 1996): 31670.

[6] Testimony of Robert C. Shinn, Jr., Commissioner, New Jersey Department of Environmental Protection, before the U.S. Senate Committee on Environment and Public Works, Superfund, Toxics, Risk and Waste Management Subcommittee (November 14, 2001).

[7] Nicholas A. Ashford, James V. Gobbell, Judith Lachman, Mary Matthiesen, Ann Minzner, and Robert Stone, "The Encouragement of Technological Change for Preventing Chemical Accidents: Moving Firms from Secondary Prevention and Mitigation to Primary Prevention," Center for Technology, Policy and Industrial Development, Massachusetts Institute of Technology, Cambridge, MA (July 1993).

[8] Numbers are approximate and are provided in Jeremiah Baumann, "Protecting Our Hometowns: Preventing Chemical Terrorism in America: A Guide for Policymakers and Advocates," U.S. Public Interest Research Group Education Fund (2002). Baumann's numbers are based on a histogram in James C. Belke, "Chemical Accident Risks in U.S. Industry—A Preliminary Analysis of Accident Risk Data from U.S. Hazardous Chemical Facilities," EPA (September 25, 2000).

publicly available sparked years of intensive debate and ultimately circumscribed EPA's right-to-know vision for the program.

In 1996, EPA's Chemical Emergency Preparedness and Prevention Office issued the final rule for the RMP program.[9] The rule called for interested parties to "be able to access electronically the data in RMPs." It made clear that electronic availability was the best way to ensure unimpeded public access to the data and permit external stakeholders to build databases and compare the performance of companies across the country.

The RMP rules stated that several remaining aspects of the program, including precisely how electronic dissemination would work, were to be analyzed by an advisory committee, the Chemical Accident Prevention Subcommittee (CAPS) of the Clean Air Act Advisory Committee. At the first meeting of CAPS, an official with Dupont serving on the committee as a representative of the Chemical Manufacturers Association (CMA) raised concerns about terrorism.[10] Although there had never been (nor has there since been) a terrorist attack on industrial facilities in the United States, he argued that "given the proven acts of terrorism committed in the U.S. in recent years…legitimate concerns for security…are understandably on the rise. Clearly putting a Hazard Assessment database on the Internet unnecessarily increases the risk of terrorism and/or sabotage."

Interestingly, the issue of terrorism had not arisen in any significant way in the extensive administrative process that resulted in EPA's 1996 rule. Throughout the early 1990s, industry's efforts to influence the OCA component of the program focused instead on weakening the definition of worst-case scenarios. Multiple assumptions in EPA's definition, industry argued, compounded to produce a highly unrealistic scenario that would lead "to gross exaggerations of the populations that might be hurt by catastrophic releases."[11] In the 32 pages of federal regulations discussing comments on the 1996 rule, the word *terrorist* appears only once.

Nevertheless, the terrorism issue exploded within the subcommittee in 1996 and quickly centered on electronic dissemination of OCAs. CAPS members who favored unrestricted access

---

[9] Federal Register, Vol. 61, No. 120 (June 20, 1996): 31667–730.

[10] Arthur F. Burk,. "Risk Management Plan—Information Work Group Statement," Electronic Submission Workgroup of the Chemical Accident Prevention Subcommittee of the Clean Air Act Advisory Committee (March 4, 1997).

[11] Peter L. Gray, "Environmental Data on the Internet: A Wired Public Setting Environmental Policy," *Environmental Law Reporter* (February 2000) and Federal Register, Vol. 61, No. 120 (June 20, 1996): 31681.

to OCAs argued that Internet access was consistent with the right-to-know intent of the law and the legislative language that information be "available to the public."[12] They pointed out that the real hazards were the chemicals being used and stored in communities, not the availability of information about those chemicals. They argued for the value of national information to allow researchers to rank facilities and do comparative studies of hazards. Sophisticated terrorists, they argued, could already get information beyond that found in OCAs from readily available sources, even by driving by in a car or reading labels from beyond a facility fence.

Those in favor of restricted access stated that the compilation of information and the ability to access it from anywhere in the world easily and anonymously made it a very appealing tool for domestic and foreign terrorists to target facilities that could do the greatest damage. They argued that OCA information should be available only to local communities for facilities in their area, and that there was no compelling reason to make national data available electronically for anyone to see.[13]

In fall 1997, CAPS requested that Aegis Research Corporation study the terrorism issue.[14] Taking the perspective of a potential adversary, Aegis sought to quantify the incremental risk that a terrorist would target an industrial facility because of the availability of OCA information. It established 10 data elements a terrorist would want to know and various means by which such information could be found, including direct observation and the media, but also via OCAs. Analysts graded each means of access based on factors such as comprehensiveness and the degree of anonymity provided. The report concluded that the incremental risk of an attack due to the widespread availability of OCAs was twice as high as it would be without OCAs available, although the risk was "still very small." The study was criticized at the time for not providing a good baseline risk of terrorist attack on chemical facilities (because none had

---

[12] Arguments for and against the Internet distribution of OCAs are presented in Electronic Submission Workgroup of the Chemical Accident Prevention Subcommittee of the Clean Air Act Advisory Committee, *Final Report of the Electronic Submission Workgroup to the Accident Prevention Subcommittee of the Clean Air Act Advisory Committee*, Washington, DC: Chemical Emergency Preparedness and Prevention Office, Environmental Protection Agency (June 18, 1997).

[13] Arthur F. Burk,. "Risk Management Plan—Information Work Group Statement," Electronic Submission Workgroup of the Chemical Accident Prevention Subcommittee of the Clean Air Act Advisory Committee (March 4, 1997).

[14] Aegis Research Corporation, ICF Incorporated, and Science Applications International Corporation, "Security Study: An Analysis of the Terrorist Risk Associated with the Public Availability of Offsite Consequence Analysis Data under EPA's Risk Management Program Regulations," EPA 550-R97-003 (December 1997).

occurred) without which the incremental risks from OCA availability had little meaning. The study would later be challenged by members of Congress and their staffs and even a vice-president of the consulting firm that subcontracted the work to Aegis, but it nonetheless helped set the terms of debate.[15]

Rather than convincing CAPS that posting OCA data on the Internet posed an unacceptable terrorism risk, the Aegis study merely introduced a note of caution. Nine of the 10 CAPS members agreed at their December 17, 1997, meeting that national OCA data should be available electronically on the Internet but that EPA should install "speed bumps" to hinder terrorists' ability to use the information for targeting.[16]

Although most members of CAPS and staff at EPA were opting for openness over secrecy, industry was calling attention to concerns about terrorism elsewhere. Around the time that the Aegis study came out, industry representatives alerted the FBI that EPA planned to make OCAs available on the Internet. The FBI held meetings throughout 1998 with law enforcement and intelligence agencies to discuss the electronic distribution plans. The security community felt that national OCA data should not be distributed electronically and was highly skeptical that EPA's proposed "speed bumps" would provide adequate protection.

In April 1998, the Chemical Manufacturers Association released *The Terrorist Threat to America*, a report that explicitly linked the new terrorist threat, the Internet, and EPA's RMP program.[17] Industry representatives also brought the issue to the attention of members of Congress and successfully lobbied for nonbinding report language in the 1999 EPA appropriations bill (signed in October 1998) mandating that EPA work closely with the FBI on the RMP program and asking the bureau to submit its recommendations directly to Congress.[18]

---

[15] Commerce Committee Democratic Staff, memo "Public Dissemination of Risk Management Plans" to The Honorable John D. Dingell, Ranking Member; The Honorable Ron Klink, Ranking Member, Oversight and Investigations Subcommittee; The Honorable Sherrod Brown, Ranking Member, Health and Environment Subcommittee (March 25, 1999).

[16] EPA Chemical Emergency Preparedness and Prevention Office, "Accident Prevention Subcommittee Meeting, February 3, 1998," Washington, DC.

[17] Chemical Manufacturers Association, *The Terrorist Threat in America*, Washington, DC. (April 1998).

[18] Conference report on H.R. 4194, Departments of Veterans Affairs and Housing and Urban Development, and Independent Agencies Appropriations Act, 1999. House of Representatives, October 5, 1998. House Report 105-769.

External events stoked terrorism fears as well. In May 1998 President Clinton issued two presidential decision directives on combating terrorism and protecting America's critical infrastructure. Three months later terrorists bombed the U.S. embassies in Kenya and Tanzania.

Following the presidential directives and the terrorist attacks in Africa, Jim Makris, the EPA official in charge of the RMP program, told CAPS members that these events had "intensified and elevated the debate" and that the FBI had advised EPA not to post any OCA data on the Internet.[19] In November 1998, he notified CAPS of EPA's decision not to post OCA data on the Internet and asked that CAPS continue to discuss how to make OCA information available to local communities, if not via the Internet.[20] By 1999, however, the debate had largely shifted away from this stakeholder body to the interagency process and into the halls of Congress.

June 22, 1999, was the deadline for facilities to submit their RMPs to EPA. The approach of the RMP submission date was important because under 1996 amendments to the Freedom of Information Act (FOIA), EPA would have to make its electronic database of RMP information (including its searching and query functions) available electronically to those who requested it. Without some legislative exemption to FOIA, it was inevitable that a third party would post a database of OCAs on the Internet even if EPA chose not to.

Some members of Congress had been monitoring the interagency debate, and in early 1999 the FOIA issue brought their interest to a head. On February 9, 1999, Rep. Tom Bliley (R), chairman of the House Commerce Committee, held a press conference to announce hearings on the issue. Appearing with a widow of the Oklahoma City bombing for effect, he criticized EPA's "reckless plan to put the worse-case scenario data at every terrorist's fingertips" and stated that he would propose legislation to settle the matter.[21] Bliley was roundly criticized by right-to-know advocates and some of his colleagues for holding a press conference and presenting his conclusions before even holding hearings. Despite all the concern about terrorism, notably absent from the hearings was any effort to deal directly with the potential threat of terrorism by

---

[19] EPA Chemical Emergency Preparedness and Prevention Office, "Accident Prevention Subcommittee Meeting, September 9, 1998," Washington, DC.

[20] Memo from Jim Makris, Director, Chemical Emergency Preparedness and Prevention Office, Environmental Protection Agency, to Clean Air Act FACA—Accident Prevention Subcommittee (November 5, 1998).

[21] House Committee on Commerce news release, "Fighting Terrorism and Protecting 'Right-to-Know'" (February 10, 1999).

increasing security at chemical facilities or modifying technology and practices to make them less appealing targets.

After Bliley's hearings, EPA sat down with the Department of Justice, the FBI, the Office of Management and Budget, the National Security Council, and other federal entities to offer legislators compromise language on the issue of public access to OCAs. Their principal objective was to prevent anyone from creating an electronic database that could be posted on the Internet. Their proposal

- exempted OCAs from FOIA;
- provided for paper copies of RMPs (including OCAs) in reading rooms around the country (subject to access restrictions);
- provided OCA information to relevant state and local agencies and some qualified researchers;
- established criminal penalties for distribution beyond what was laid out in the law; and
- called on the Department of Justice to study facility security practices and make recommendations accordingly.

The House passed these provisions into law (H.R. 1301) on July 21, 1999—a month to the day after EPA was to make RMP data publicly available. The Senate followed in early August (S. 880), and on August 5, the president signed the Chemical Safety Information, Site Security and Fuels Regulatory Relief Act (CSISSFRRA) into law.[22] (The law's unwieldy name comes from provisions that exempted certain facilities storing and supplying fuel, reducing the number of reporting entities from the original 65,000.)

The legislation outlined important responsibilities for government entities and industry. It gave EPA one year to develop final rules governing public access. During that year OCAs would be exempted from FOIA. However, if EPA did not provide rules in one year, the OCA FOIA exemption would expire. The law also called on EPA and Justice to conduct another assessment of terrorism risks versus the benefits of on-line public access to OCAs. Justice was further required to review site security at chemical plants and make recommendations to improve

[22] Public Law 106-40.

security, with an interim report due in one year and a final report in three years. Finally, as a quid pro quo for restricted Internet access to OCAs, the law required that each covered facility hold a community meeting on its RMP within a year.

The Justice Department's risk-benefit analysis largely arrived at the same conclusions as the Aegis study of 1997.[23] Of particular concern was the availability of "one-stop shopping" for information that could be used to identify targets and turn industrial facilities into weapons of mass destruction. None of the information useful for targeting, Justice concluded, was available elsewhere in "as readily accessible and user-friendly form."

EPA's benefits assessment, however, concluded that Internet publication of OCAs "would likely lead to a significant reduction in the number and severity of accidental chemical releases."[24] Drawing an analogy to TRI, EPA argued that Internet access to OCAs would provide a single point of access to performance data comparable among firms. Paper-based or local-only access, EPA argued, would severely restrict the public safety benefits of the program and be inconsistent with Congress' vision "to inform members of the public and allow them to participate in decisions that affect their lives and communities."

Despite such disparate perspectives, EPA and the Department of Justice jointly issued final rules on August 4, 2000, the last day of the one-year limit.[25] The rules were a blueprint for restricted public access.[26] After showing identification, citizens could read, but not remove or copy, paper copies of OCAs in approximately 50 federal reading rooms around the country. They could examine all the OCAs for facilities in their area, but they could look at only 10 facilities elsewhere per month. Additionally, state and local emergency response committees were encouraged to make OCAs available under similar conditions for facilities in their jurisdiction. Available on-line would be RMP executive summaries (which described OCAs in brief) and other RMP information posing "the least serious criminal risk." Following the attacks of

---

[23] Department of Justice, "Assessment of the Increased Risk of Terrorist or Other Criminal Activity Associated with Posting Off-Site Consequence Analysis Information on the Internet" (April 18, 2000).

[24] EPA and Department of Justice,. "Accidental Release Prevention Requirements; Risk Management Programs under the Clean Air Act Section 112(r)(7); Distribution of Off-Site Consequence Analysis Information; Proposed Rule," Federal Register, Vol. 65, No. 82 (April 27, 2000): 24834–48, 40 CFR Chapter IV, Part VII.

[25] Ibid.

[26] EPA Chemical Emergency Preparedness and Prevention Office, "Chemical Safety Information, Site Security and Fuels Regulatory Relief Act: Public Distribution of Off-Site Consequence Analysis Information," EPA 550-F00-012 (August, 2000).

September 11, EPA removed all of this less-sensitive RMP information from its Web site, and the debate raged anew.[27]

To date, EPA and the Department of Justice have not completed some of the requirements of the 1999 CSISSFRRA legislation. Justice has not yet produced its study of chemical facility security and recommendations for reducing vulnerability to terrorist attacks, despite numerous requests to do so from members of Congress and right-to-know organizations.[28] EPA has not yet finalized regulations implementing a legislative provision to make an electronic database available to qualified researchers. In the early months of the Bush administration, these rules fell victim to a review of last-minute Clinton administration regulations.[29]

Information, Communication, and Effectiveness

In its final form, the RMP program was largely a repudiation of the broad public disclosure model outlined in its 1996 rulemaking. The argument that more information would invite terrorist attacks prevailed over efforts to broadly expose and mitigate chemical accident risks. The program included strong restrictions on access to the OCA portions of the plans, effectively making information available only locally.

Some NGOs sought to compile OCA data and publicize it, but restrictions on public access made the results of these efforts limited and fragmentary. The most extensive effort to publicize OCA data was undertaken by Greenpeace, which amassed information on 50 chemical companies in Louisiana whose worst-case releases could put 100,000 people or more at risk.[30] Researchers obtained OCA data from EPA's Washington, D.C., reading room and posted information about populations at risk and corresponding impact maps on the Internet.

---

[27] Elaine Stanley, testimony before the Subcommittee on Water Resources and Environment of the Committee on Transportation and Infrastructure, U.S. House of Representatives (November 8, 2001).

[28] See, for example, letter from Senator Harry Reid, Committee on Environment and Public Works, to Attorney General John Ashcroft (June 14, 2001) and letter from Paul Orum, Working Group on Community Right-to-Know, to Attorney General John Ashcroft (September 27, 2001).

[29] Risk Policy Report, "EPA Withdraws Draft Plans for Dissemination of Accident Risks" (April 16, 2001).

[30] Greenpeace, "Bhopal in the Bayou: Are Chemical Accidents a Trade Secret?" http://www.greenpeaceusa.org/features/bhopal_bayoutext.htm (accessed September 19, 2002).

Most NGO efforts to publicize information on chemical accident hazards have utilized data that are more easily accessible than the OCAs. OMB Watch's RTKNet, for example, established a searchable electronic database of RMP executive summaries, which EPA also provided on its Web site.[31] (Although EPA removed this information after September 11, RTKNet continues to provide it.) In 1999, the Public Interest Research Group (U.S. PIRG) used publicly available information on chemical use in production processes—rather than the more complete information available in OCAs—in "Accidents Waiting to Happen." This report showed that 4,860 facilities around the United States stored more extremely hazardous substances than were released in Bhopal and listed the 100 facilities storing the largest quantities of such substances.[32]

The limited role of NGOs in publicizing OCA data can be seen in press coverage of RMPs. In the two years following the official release of RMP data in June 1999, major U.S. and regional papers published 43 news stories referencing RMP data.[33] In nearly 70% of these, the primary sources were either facilities themselves or a government agency. In nearly all of the remainder, one of the sources was OMB Watch's RTKNet, again providing data already made available by EPA. Only two articles cited an environmental NGO source other than RTKNet. As one might expect, few articles told readers how to learn more about RMPs or referred them to local public meetings held by companies to discuss RMPs.

Government responsibility for disseminating RMP information had both a national and a local character. At the national level, EPA provided tools to help people find RMPs in their areas and ensured that RMPs were available in 50 federal reading rooms around the country. At the local level, RMPs would be provided primarily through the roughly 3,500 local emergency planning committees (LEPCs) across the country. These organizations were established under the 1986 Emergency Planning and Community Right-to-Know Act to receive and disseminate information about hazards from local facilities and to prepare comprehensive emergency response plans.

---

[31] RTKNet, "Risk Management Plans," http://www.rtknet.org/rmpsearch.html (accessed September 19, 2002).

[32] Jeremiah Baumann, Paul Orum, and Richard Puchalsky, "Accidents Waiting to Happen: Hazardous Chemicals in the U.S. Fifteen Years after Bhopal," Washington, DC: Public Interest Research Group (1999).

[33] Articles were identified through a search of Lexis-Nexis regional news libraries for the Midwest, Northeast, Southeast, and West.

To help citizens find RMPs in their area, EPA developed the Vulnerable Zone Indicator System, which allowed people to locate their LEPC (based on address or region) and identify facilities with RMPs within that LEPC's jurisdiction. It also gave LEPC contact information. Beyond providing such information, EPA has made only limited use of the RMP data to publicize problems about chemical accidents and to compel companies to reduce hazards to local communities. The agency published one report in 2000 and funded some outside research on non-OCA portions of RMPs.[34] As of the end of September 2001, EPA had reviewed for accuracy only around 15% of RMPs submitted.[35] Analysts have suggested ways that EPA could further utilize OCA to produce information useful to citizens without providing targeting information, such as describing the kinds of technologies in use at facilities with small vulnerability zones.[36]

Federal reading rooms have proved to be poor points of public access. As of early 2002, only 33 people had visited federal reading rooms to examine RMP documents, 25 of these in Washington, D.C.[37] Concludes an analyst writing in the American Chemical Society's trade publication: "the bureaucratic hurdles are so high that almost no one is using" the federal reading rooms.[38]

At the local level, LEPCs were citizens' primary contact point for reading (but not removing or copying) OCAs from facilities in their area. Studies suggest a great deal of variety in the capability and effectiveness of these LEPCs. In a 1999 survey by George Washington University, researchers found that only 60% could be classified as active.[39] Including both active and inactive LEPCs, 30% were found to be compliant with their responsibilities under the Emergency Planning and Community Right-to-Know Act, 29% were mostly compliant, and 41%

---

[34] James C. Belke, "Chemical Accident Risks in U.S. Industry—A Preliminary Analysis of Accident Risk Data from U.S. Hazardous Chemical Facilities," EPA (September 25, 2000). An example of funded outside research is Paul R. Kleindorfer, Harold Feldman, and Robert A. Lowe, "Accident Epidemiology and the U.S. Chemical Industry: Preliminary Results from RMP*Info," Working Paper 00-01-15, Center for Risk Management and Decision Processes, The Wharton School, University of Pennsylvania (revised March 6, 2000).

[35] General Accounting Office, "Chemical Safety: Emergency Response Community Views on the Adequacy of Federally Required Chemical Information," GAO-02-799 (July 2002).

[36] Personal communication with Thomas Natan, National Environmental Trust (October 4, 2002).

[37] Jeff Johnson, "The Vanishing Risk Management Plan," *Chemical and Engineering News* (February 25, 2002).

[38] Ibid.

[39] Mark Starik, William C. Adams, Polly A. Berman, and Krishnan Sudharsan, "1999 Nationwide LEPC Survey" George Washington University, Department of Public Administration (May 17, 2000). The percentage of active LEPCs is likely to be smaller than reported because only around half of all LEPCs returned surveys, and it is likely that the group of non-responding LEPCs was disproportionately inactive.

were not compliant.[40] Researchers further classified 27% of facilities as very proactive, 34% as somewhat proactive, and 39% as not proactive. (Only 18% were both compliant and very proactive).

Many of the active LEPCs (61%) reported working with local industry to prepare RMPs, but data suggest that they have not been effective in providing information about RMPs to communities. In a survey conducted in 1994, George Washington University researchers found that public communication was even the most proactive LEPCs' weakest area of activity.[41] When researchers from the National Institute for Chemical Studies interviewed 32 of the best-performing LEPCs for a 2001 study, they found that "nearly all" lacked RMPs for local facilities on site (although they said they knew how to get them).[42] Pointing to the criminal penalties in the law regarding improper distribution of OCA information, some LEPC staff were uncertain whether it was appropriate for them to have RMPs at all. EPA has not established procedures to ensure that LEPCs obtain RMP plans, nor does it monitor whether LEPCs have done so.[43] George Washington University researchers found that 57% of active LEPCs were not even aware of EPA's primary web-based database of RMP information, RMP*Info.[44]

Not surprisingly, local communities don't appear to be looking to LEPCs for information on hazards. The National Institute for Chemical Studies researchers found that "nearly all [LEPCs]…reported…few or no requests for RMP data or any other hazard information" from the public.[45] The finding comports with that of George Washington University's 1999 survey, which

---

[40] Ibid.

[41] William C. Adams, Stephen D. Burns, and Philip G. Handwerk, "Nationwide LEPC Survey: Summary Report," George Washington University, Department of Public Administration (October 1994).

[42] National Institute for Chemical Studies, "Local Emergency Planning Committees and Risk Management Plans: Encouraging Hazard Reduction," prepared for EPA Chemical Emergency Preparedness and Prevention Office (June 2001): 19.

[43] General Accounting Office, "Chemical Safety: Emergency Response Community Views on the Adequacy of Federally Required Chemical Information," GAO-02-799 (July 2002): 17

[44] Mark Starik, William C. Adams, Polly A. Berman, and Krishnan Sudharsan, "1999 Nationwide LEPC Survey" George Washington University, Department of Public Administration (May 17, 2000).

[45] National Institute for Chemical Studies, "Local Emergency Planning Committees and Risk Management Plans: Encouraging Hazard Reduction," prepared for EPA Chemical Emergency Preparedness and Prevention Office (June 2001), p. 19.

found that 58% of LEPCs classified as active reported having no public requests for information in the previous year.[46]

In addition to communicating risks, EPA expected LEPCs to undertake a variety of activities to encourage, compel, and pressure companies to reduce hazards—many of the activities that EPA had hoped the public would undertake under the original vision of the RMP program.[47] However, LEPCs were given neither an explicit mandate for hazard reduction nor the money, expertise, or authority to support such a role. The National Institute for Chemical Studies researchers found that "with a few exceptions, LEPCs do not believe they are positioned to effectively encourage facilities to reduce chemical hazards" proactively, and "since initial submission of RMPs in June 1999," they concluded, "most LEPCs have not continued to be actively involved in the RMP program."[48]

There are notable examples of LEPCs that have been proactive in communication and hazard reduction, often in areas with high concentrations of chemical facilities. In particular, these LEPCs were active in assisting facilities in the initial public rollouts of their risk management plans. Data from the George Washington University survey and the National Institute for Chemical Studies research, however, suggest that these proactive facilities may be far from the norm and that most LEPCs face significant constraints in their abilities to communicate about hazards and pressure firms directly.

In addition to placing much responsibility on LEPCs, the 1999 legislation boosted the responsibility of firms to reach out to local communities. Congress required that facilities conduct public meetings to describe worst-case scenarios to surrounding communities and report to the FBI by June 5, 2000 that they had done so. Seventy-three percent of firms required to conduct meetings had done so by October, 2000.[49] Although there are some high-profile exceptions (e.g., facilities in Kanawha Valley and East Harris County, Texas), EPA reported in 2000 that "early indications" suggested that such meetings were poorly attended, even in cases

---

[46] Mark Starik, William C. Adams, Polly A. Berman, and Krishnan Sudharsan, "1999 Nationwide LEPC Survey" George Washington University, Department of Public Administration (May 17, 2000).

[47] EPA, "RMPs Are on the Way! How LEPCs and Other Local Agencies Can Include Information from Risk Management Plans in Their Ongoing Work,." EPA 550-B99-003 (November 1999).

[48] National Institute for Chemical Studies, "Local Emergency Planning Committees and Risk Management Plans: Encouraging Hazard Reduction," prepared for EPA Chemical Emergency Preparedness and Prevention Office (June 2001): 23.

[49] Data on meetings can be found at http://epa.gov/ceppo/meetings/ (accessed January 13, 2003).

where local citizens were personally invited.[50] Subsequent National Institute for Chemical Studies research revealed poor attendance as well. Lest poor attendance be seen as a lack of public interest about local risks, EPA noted that outreach was much more effective when companies took their message to places where local citizens actually spend their time, like shopping malls.

With the limited effectiveness of companies, LEPCs, and EPA communicating risks at the local level—along with the limited role NGOs could play—companies felt little external pressure to reduce the accident risks described in their OCAs. Of course, firms may have been spurred to take action anyway in order to avoid having to report under the program or for other reasons.

Evidence about the number of RMPs submitted suggests that some companies did in fact reduce or eliminate their use of hazardous materials to avoid the RMP regulatory program altogether. EPA initially estimated that 64,000 facilities would fall under the program, but half of these were subsequently exempted by CSISSFRRA. Of the 33,000 facilities still expected to report, only 15,000 ultimately did.[51] A relatively small number of facilities that should have reported have not yet done so, and EPA acknowledges that the agency may have overestimated the universe of subject facilities.[52] However, the discrepancy between those expected to report and those who actually did can also be attributed to companies reducing their chemical inventories below reporting thresholds or switching to chemicals not covered by the program. In interviews, industry representatives and agency staff agree that avoiding the RMP program (or

---

[50] EPA and Department of Justice, "Accidental Release Prevention Requirements; Risk Management Programs under the Clean Air Act Section 112(r)(7); Distribution of Off-Site Consequence Analysis Information; Proposed Rule," Federal Register, Vol. 65, No. 82 (April 27, 2000): 24834–48 , 24838. Two exceptions to the poor attendance record are Kanawha Valley and East Harris County, Texas. These cases are documented in O. Homer Erekson and Pamela C. Johnson, "Community-Industry Dialogue in Risk Management: Responsible Care and Worst Case Scenarios in the Valley of the Shadow, Case Study Number 10," in Orie L. Loucks, O. Homer Erekson, Jan Willem Bol, Raymond F. Gorman, Pamela C. Johnson, and Timothy C. Krehbiel, eds., *Sustainability Perspectives for Resources and Business,* Washington, DC: Lewis Publishers (1999); and National Institute for Chemical Studies, "Local Emergency Planning Committees and Risk Management Plans: Encouraging Hazard Reduction," prepared for EPA Chemical Emergency Preparedness and Prevention Office (June 2001).

[51] General Accounting Office, "Chemical Safety: Emergency Response Community Views on the Adequacy of Federally Required Chemical Information," GAO-02-799 (July 2002).

[52] Conversation with Jim Belke, EPA (December 3, 2002).

New Jersey's similar program) is a powerful motivator for facility-level changes.[53] To the extent that inventory reductions and chemical substitution reduced potential hazards, the regulatory burdens of the program—perhaps including public disclosure requirements—accomplished some of its goals before any information was made public at all.

There is anecdotal evidence that some firms changed their practices as a result of undertaking RMP planning as well. In interviews, National Institute for Chemical Studies researchers found examples of facilities that made process changes because of information revealed in the course of preparing OCAs. In his May 19, 1999, appearance before the House Commerce Committee, EPA's Tim Fields suggested the same by relating how "many facility representatives also have told us that while they were at first skeptical of the benefits of the accident prevention program, completing a RMP has led to many unexpected safety improvements at their facilities."[54]

Despite evidence that some facilities avoided the program or made changes based on information revealed, it is very difficult to judge whether safety has improved as a result of the RMP program. Accident data reporting and collection are quite poor, and data about hazards, such as information generated through the RMP process, are not available.[55] A 1999 report by the federally appointed Chemical Safety and Hazard Investigation Board claimed to be "the first federal study that casts a wide net over the [chemical accident] problem, looking at its magnitude and characteristics and…highlighting the limitations of…the government's own acknowledged 'best' databases."[56] This study was withdrawn after publication, however, because of problems with data quality.[57] Accident data reported to EPA in the 1999 RMP submissions may be useful as a baseline once RMPs are updated. The 1999 reports showed that among reporting firms, there

---

[53] Personal conversations with Mark Nelson, Chlorine Gas Disinfection Association (December 2, 2002), John Notta, New Jersey Department of Environmental Protection (July 1, 2002), and Jim Belke, EPA (November 11, 2002).

[54] Timothy Fields, prepared statement for hearing before the House Commerce Committee concerning the Chemical Safety Information, Site Security and Fuels Regulatory Relief Act (May 19, 1999).

[55] M. Sam Mannan, Michela Gentile, and T. Michael O'Connor, "Chemical Incident Data Mining and Application to Chemical Safety Analysis," unpublished manuscript from Mary Kay O'Connor Process Safety Center, Chemical Engineering Department, Texas A&M University (2001).

[56] Chemical Safety and Hazard Investigations Board, "The 600K Report: Commercial Chemical Incidents in the United States, 1987–1996," Washington, DC.

[57] Chemical Safety and Hazard Investigations Board press release, "CSB Restructures Accident Data Program, Withdraws '600K' Study," http://www.chemsafety.gov/news/2000/n001202.htm (accessed September 19, 2002).

were 1,913 serious accidents between 1994 and 1999 that resulted in 33 deaths, 2,038 injuries, evacuation or sheltering of over 200,000 people, and more than $1 billion in direct damages.[58] A more recent study, utilizing numerous accident reporting databases and including facilities not reporting under the RMP program, concludes that 34,527 chemical incidents in 1998 caused 115 deaths and 5,008 injuries.[59]

Short of waiting for updated accident reports, one way to judge the effect of the RMP program is to look at industry efforts to shift to inherently safer technologies. In the water treatment arena, this often involves switching from elemental chlorine, which can be released as a toxic gas, to sodium hypochlorite or other technologies.[60] Water treatment is a reasonable barometer for the RMP program as a whole, since water supply and sewage treatment facilities account for around 25% of the industrial processes reported under the RMP program (second only to farm supply wholesalers), and chlorine is the second most frequently reported chemical; this sector also has the second-highest gross accident rate.[61] Recall that a New Jersey program similar to RMP prompted more than 80% of the water treatment facilities in the state to eliminate or reduce their use or storage of hazardous chlorine gas.[62]

Although EPA has not surveyed water treatment facilities, RMP program staff report considerable anecdotal evidence that facilities are reducing their inventory of gaseous chlorine or switching to other technologies to avoid having to report under the RMP program.[63] The trend is particularly apparent in large metropolitan water and wastewater systems, such as those in

---

[58] Paul R. Kleindorfer, Harold Feldman, and Robert A. Lowe, "Accident Epidemiology and the U.S. Chemical Industry: Preliminary Results from RMP*Info," Working Paper 00-01-15, Center for Risk Management and Decision Processes, The Wharton School, University of Pennsylvania (revised March 6, 2000).

[59] M. Sam Mannan, Michela Gentile, and T. Michael O'Connor, "Chemical Incident Data Mining and Application to Chemical Safety Analysis," unpublished manuscript from Mary Kay O'Connor Process Safety Center, Chemical Engineering Department, Texas A&M University (2001).

[60] It should be noted that some safety concerns have emerged about the use of non-gas chlorination systems, such as gaseous releases from the accidental introduction of acidic chemicals. See, American Water Works Association Water Quality Division Disinfection Systems Committee, "Committee Report: Disinfection at Large and Medium-Size Systems" *Journal AWWA*, 92(5) (May 2000).

[61] James C. Belke, "Chemical Accident Risks in U.S. Industry—A Preliminary Analysis of Accident Risk Data from U.S. Hazardous Chemical Facilities," EPA (September 25, 2000).

[62] Testimony of Robert C. Shinn, Jr., Commissioner, New Jersey Department of Environmental Protection, before the U.S. Senate Committee on Environment and Public Works, Superfund, Toxics, Risk and Waste Management Subcommittee (November 14, 2001).

[63] Personal communication with Jim Belke, EPA (November 11, 2002).

Washington, Seattle, and Wichita, which have ceased to use chlorine gas (or plan to do so). The Chlorine Gas Disinfection Association, a trade association, was created explicitly to counter this apparent trend away from chlorine gas. Association representatives say that the regulatory environment, and the RMP program in particular, is the prime motivator for the switch and that the trend has accelerated in the past five years.[64] The most recent industrywide data, collected around the time that companies were compiling RMPs, shows a small decline in the use of chlorine gas and a rise in the use of sodium hypochlorite. According to 1998 data from the American Water Works Association (AWWA), 84% of large and medium-sized water systems used chlorine gas, down from 87% in 1989 and 91% in 1978.[65] Twenty percent of large and medium-sized facilities used sodium hypochlorite in 1998, up from 7% in 1989 and 6% in 1978.[66] Based on surveys of utilities, the AWWA attributes the decline in chlorine gas use and increases in sodium hypochlorite use to pressure from a variety of regulatory programs, including RMP.

Summary

Originally inspired by the TRI lesson that one of the best ways to reduce chemical accidents risks is to publicly expose them, the RMP program turned into a test case for how to circumscribe public disclosure. In practice, it evolved from a program based on broad public accountability and pressure to industry self-policing and government promises about site safety and security.

Proponents of the original program model saw a variety of benefits from broad public access to information. They recognized a basic right-to-know about risks facing workers and communities and the role of broad disclosure in making communities aware. They argued that information generated through the program would improve local communities' ability to "dialogue with industry to reduce risks," encourage industry to identify and correct problems,

---

[64] Letter from Chris S. Leason and Robert A. Mathews, Chlorine Gas Disinfection Association, to James Belke, EPA, September 2000.

[65] American Water Works Association Water Quality Division Disinfection Systems Committee, "Committee Report: Disinfection at Large and Medium-Size Systems" *Journal AWWA*, 92(5) (May 2000). Chlorine Chemistry Council, "Drinking Water Chlorination White Paper: A Review of Disinfection Practices and Issues," http://c3.org/chlorine_knowledge_center/whitepaperc1.html.

[66] The combination of facilities using chlorine gas and sodium hypochlorite exceeds 100% because some facilities use more than one disinfectant.

and improve government agencies' knowledge about the facilities they regulate and their ability to act on that knowledge. Finally, proponents saw programmatic benefits, with public exposure pressuring companies to make their industrial processes safer and more secure.

Opponents of the program saw a number of potential costs, including direct expenditures on new technology, complicated public relations deriving from the release of OCAs, more regulatory scrutiny, and the like. It was the debate over terrorism, however, that most affected the disclosure program's design, starting with EPA's advisory committee, moving into the conflict between EPA and the security agencies, and finally ending up in Congress. Policymakers ultimately determined that the risks of broadly publicizing OCAs on the Internet outweighed the benefits.

Critics of the final architecture of the program legitimately question the extent to which agencies, industry, and some members of Congress were primarily concerned about terrorist attacks on chemical facilities rather than new regulatory burdens. Throughout the debates over the RMP program, there was very little effort to deal directly with the vulnerability of chemical facilities to terrorist attack. The Department of Justice has not finished its chemical site security study, despite information both before and after September 11 that security is a problem.[67] Congressional hearings on curtailment of the RMP program didn't address the prevention of terrorist attacks by increasing site security or other means. Although authorized to do so, EPA has not developed regulatory programs to encourage companies to "harden" targets through investments in inherently safer technologies, and legislative efforts to require planning for inherent safety and increased security are opposed by the current administration.[68] In short, although much effort went into hiding information about potentially attractive terrorist targets, little went into how to make those targets less attractive and more difficult to attack.

Efforts to keep information out of terrorists' hands did, however, severely limit analysis and communication about risks from chemical facilities. Without access to OCAs nationwide, national and regional NGOs were severely hampered in their ability to identify problems, get

---

[67] For concerns prior to September 11, 2001, see ATSDR, "Industrial Chemicals and Terrorism: Human Health Threat Analysis, Mitigation, and Prevention." For concerns after September 11, see, for example, James Bruggers, "Rubbertown Security: 4 Chemical Plants Lack Night Guards," *Louisville Courier-Journal* (October 14, 2002); and James V. Grimaldi and Guy Gugliotta, "Chemical Plants Feared as Targets," *Washington Post* (December 16, 2001).

[68] "Point-Counterpoint: The Corzine Bill: Public Protection or Intrusive Government?" *Pesticide and Toxic Chemical News* (September 30, 2002). Senate bill 1602, offered by Senator Jon Corzine (D-NJ), would require facilities to consider options for inherently safer technology.

stories in the media, and communicate with the grassroots. Limited access to RMPs at the local level meant that outside the few areas with effective LEPCs and proactive companies, there was little community knowledge of the RMP program and therefore little local public pressure on firms or government agencies to address accidental and criminal risks.

In essence, the RMP program left most of the pressure for action with firms themselves. There is good evidence that some firms altered their use of hazardous substances so as to avoid the program altogether, and the threat of public disclosure may have played some role in those decisions. Other firms, although we don't know how many, reportedly changed their practices as a result of information and opportunities revealed in the planning process. Although there is little information, limited communication of RMP information makes it highly unlikely that firms faced much direct pressure from local communities, NGOs, or the media.

By throwing industrial site safety and security into the national spotlight, September 11 revealed a number of continuing risks to surrounding communities, whether releases are triggered accidentally or intentionally.[69] As a result, pressure from federal regulators may increase. Water treatment plants, for example, will now undergo vulnerability assessments as part of recent bioterrorism legislation, and industry representatives think this will increase pressure to move away from chlorine gas.[70] It gets to the essence of the RMP debate to question whether continuing problems with site safety and security would have been as bad if NGOs, the media, and local citizens had played a more active oversight role before September 11, facilitated by broader access to all RMP data.

[69] See, for example, James V. Grimaldi and Guy Gugliotta, "Chemical Plants Feared as Targets," *Washington Post* (December 16, 2001); and Eric Pianin, "Study Assess Risk of Attack on Chemical Plant," *Washington Post* (March 12, 2002).

[70] Conversation with Mark Nelson, Chlorine Gas Disinfection Association (December 2, 2002).

2. Materials Accounting

As the large amount of emissions reductions attributed to TRI became clear, EPA considered ways to expand the program. One idea was to resurrect an aspect of TRI dropped in the compromise version of the Emergency Planning and Community Right-to-Know Act. It would take TRI inside the fenceline by requiring that facilities track what chemicals were entering a facility, how they were being transformed into waste and products, and what was coming out of facilities at the end.

Known as chemical use reporting or materials accounting, the program would serve two broad purposes. First, it would assist EPA in promoting source reduction as a strategy for reducing waste.[71] The Pollution Prevention Act, passed in 1990, declared that source reduction was the preferred approach for addressing toxic waste, whether achieved by increased efficiency, product redesign, or reduced production inputs. Surveys had revealed that most firms were reducing emissions at the "end of the pipe," not by source reduction.[72] Materials accounting data, it was argued, could be used by firms, governments, NGOs, and communities to encourage facilities to reduce pollution through changes in processes upstream. According to EPA, it would help bring "pollution prevention into the mainstream of environmental dialogue at the community level."[73]

The second purpose of materials accounting was to promote community right-to-know about risks. EPA argued that "exposure is the key to risk, and use is an important surrogate for exposure. Use information defines potential exposure."[74] Not only would materials accounting data provide more information on possible risks from facility operations, it would also give local

---

[71] The 1990 Pollution Prevention Act calls on EPA to "establish standard methods of measurement of source reduction," and EPA argued that no data sources available at the time did so. Quote from EPA, "Issues Paper #2: Expansion of the Toxics Use Inventory (TRI) to Gather Chemical Use Information: TRI-Phase 3" (October 4, 1995) (hereafter, EPA Issues Paper #2)

[72] Thomas E. Natan, Jr. and Catherine G. Miller, "Are Toxics Release Inventory Reductions Real?" *Policy Analysis* 32(15) (August 1, 1998). Mary Graham and Catherine Miller, "Disclosure of Toxic Releases in the United States," *Environment* 43(8) (October 2001).

[73] EPA Issues Paper #2: 18.

[74] EPA, "Issues Paper: Expansion of the Toxics Use Inventory (TRI) to gather chemical use information: TRI-Phase 3: Use Expansion" (September 2, 1994): 2 (hereafter, EPA Issues Paper #1).

residents better information on how chemicals were being transported through their communities and being integrated into products they used.

Debates over EPA's materials accounting plan highlight the multiple benefits proffered in support of public disclosure and the many costs seen by the affected industries. Ultimately, those opposing the plan prevailed over those who supported it. Lessons about what such a plan might have accomplished come from two state programs on which EPA modeled its efforts. Both states reduced toxic releases and generated less waste than the national norm, and this section closes with an examination of the role of public disclosure of materials accounting data in that accomplishment.

Background and History

EPA took its lead from chemical use reporting programs in two states, Massachusetts and New Jersey. Massachusetts passed the Toxics Use Reduction Act in 1989. Through a combination of public data release on chemicals flowing into and out of facilities' production processes, detailed pollution prevention planning, and technical and other assistance, the law sought to reduce statewide toxic waste generation by 50% between 1987 and 1997 (even though reporting began only in 1990). Although planning and reporting were required, actual pollution prevention activities were not. The law was based on the beliefs that firms often didn't realize how inefficient their production processes were and that knowledge derived from the program would help firms identify money-saving process changes. To support the program, the law established the Toxics Use Reduction Institute, a quasi-governmental body housed at the University of Massachusetts at Lowell. Along with the Massachusetts Department of Environmental Protection, the institute undertook technical assistance, training, dissemination of materials accounting data, and other activities.[75]

In a similar program, New Jersey collected detailed materials accounting data pursuant to its 1991 Pollution Prevention Act. That act built on the 1984 Worker and Community Right to Know Act, which had mandated the collection of some materials accounting information since

[75] The Toxic Use Reduction Institute's Web site, which is the main access point for Massachusetts materials accounting data, is http://www.turi.org/ (accessed September 19, 2002).

1987.[76] Like the program in Massachusetts, New Jersey's Pollution Prevention Act melded the materials use reporting with new requirements that facilities conduct extensive pollution prevention planning. Again, the actual pollution prevention steps were voluntary, and the act set a statewide goal of 50% reduction in waste between 1987 and 1997.

With their pollution prevention planning requirements, the Massachusetts and New Jersey programs were not strictly information *disclosure* efforts. Although they required the release of data to the public, both encouraged facilities to analyze their operations and identify pollution prevention opportunities themselves, and varying degrees of technical assistance were provided. Much of the information generated by firms was proprietary; detailed plans were intended for facilities' own use and never made it past the fenceline (except that government regulators or third-party inspectors could review plans on site).

EPA's program incorporated the data-reporting aspects of the Massachusetts and New Jersey programs, but not the pollution prevention planning requirements or the extensive technical assistance. The agency began developing its outline of a proposed materials accounting program in 1993. The policy development process got a boost in August 1995 when the White House issued a memorandum calling on EPA to develop and implement "an expedited, open, and transparent process for consideration of reporting under EPCRA on information on the use of toxic chemicals at facilities, including information on mass balance, materials accounting, or other chemical use data."[77] Although it was never clear exactly what information EPA sought to collect from facilities, the following list[78] illustrates the types of data being considered:

- starting raw material inventory;
- amount produced on site;

---

[76] The Community Right to Know Program is administered by the New Jersey Department of the Environment Bureau of Chemical Release Information and Prevention. Information is available at http://www.state.nj.us/dep/enforcement/relprev/crtk/ (accessed September 19, 2002).

[77] William J. Clinton, "Memorandum for the Administrator of the Environmental Protection Agency and the Heads of Executive Departments and Agencies, Subject: Expediting Community Right-to-Know Initiatives,." The White House, Office of the Press Secretary (August 8, 1995).

[78] The list comes from Kerr, Greiner, Anderson and April, Inc., "Materials Accounting and P2: A Good Team?" Materials Accounting Project: Phase II Report, National Pollution Prevention Roundtable and Member Companies of the Business Roundtable—Industrial Pollution Prevention Council Report (October 1, 2000). The design for this study came from a multistakeholder team convened by the National Pollution Prevention Roundtable, a membership organization of state and local government programs that supports efforts to eliminate or reduce pollution at its source.

- amount brought on site;
- amount consumed on site;
- amount shipped off site as or in product;
- ending raw material amount;
- amount of wastes prevented by source reduction, in pounds; and
- annual percentage reduction in wastes.

EPA developed its vision for the program by producing a series of issues papers published by the agency's Office of Pollution Prevention and Toxic Substances between 1994 and 1996 and then asking stakeholders to comment.[79] The comments outline competing arguments by environmental and right-to-know advocates on one side and industry on the other.

Environmentalists and right-to-know advocates saw the need for more information than that provided by TRI to monitor progress in pollution prevention. With a more detailed focus, materials accounting would generate higher-quality data as well, providing a check on the accuracy of reported TRI releases. The data would allow local communities to monitor performance and engage more fully in problem solving about how to reduce emissions. It would provide information on the chemical content of products and assist with product stewardship efforts. And in a more explicit right-to-know framework, proponents argued that materials accounting information was crucial to helping local communities understand accident risks and prevention opportunities within facilities and potential risks from chemicals being transported through their communities. Here environmental activists joined with labor activists and their calls for increased information on worker exposures.

Industry took a far less favorable view, even though many industry stakeholders recognized the potential importance of tracking chemical use as many progressive companies already did.[80] Industry charged that EPA had not adequately justified the purported benefits of

---

[79] EPA Issues Paper #1; EPA Issues Paper #2; and EPA, "Issues Paper #3: TRI-Phase 3: Expansion of the EPA Community Right-to-Know Program to Increase the Information Available to the Public on Chemical Use" (1996), (hereafter, EPA Issues Paper #3). These papers contain all the arguments proffered by EPA and nongovernmental supporters and opponents of the program as outlined below, unless otherwise indicated.

[80] Shelley A. Hearne, "Tracking Toxics: Chemical Use and the Public's 'Right-to-Know'," *Environment* July-August 1996; Pojasek and Cali, "Measuring Pollution Prevention Progress," *Pollution Prevention Review* (Spring 1991); The Business Roundtable, "A Benchmarking Study of Pollution Prevention Planning: Best Practices, Issues and Implications for Public Policy," Environmental Task Force, The Business Roundtable (August 1998).

releasing materials accounting data to the public. People wouldn't understand the data, industry said, and the program wouldn't generate the kind of information necessary to either encourage source reduction or reduce risk. Chemical use was not a good predictor of exposure, and reducing use would take attention away from other, more significant risks.

Industry pointed to two costs in particular. First was confidential business information (CBI). Materials accounting, industry argued, could reveal too much information about a company's market share and production trends as well as secrets about production processes. Pointing to the growing business of competitive intelligence gathering, industry said that competitors could piece together disparate data elements to form a complete picture of facility operations.

Second, industry charged that data collection costs would be very high. The Chemical Specialties Manufacturing Association reported that one company in Massachusetts spent 150 hours of staff time reporting on one chemical. The Chemical Manufacturers Association estimated costs for a large chemical manufacturer at around $1.5 million for the first year and $800,000 after that.[81]

EPA took issue with industry's assertions about both types of costs. The agency pointed out that CBI claim rates in the Massachusetts and New Jersey programs had been only around 1% to 2%, concluding that "low rates seem… to suggest that state reporting and CBI provisions are successfully addressing CBI concerns."[82] (A subsequent General Accounting Office report found that those who practiced competitive intelligence for a living regarded disclosed environmental information as of relatively low value and easily obtainable from other sources.[83]) On the data collection cost issue, EPA pointed to a 1993 New Jersey Department of Environmental Protection study of 14 facilities that found much lower costs than those cited by the two industry associations.[84] The state agency's followup study of 42 facilities in 1995 confirmed the lower numbers.[85] In both states, direct reporting costs averaged around $10,000

---

[81] EPA, Issues Paper #2: 6–7.

[82] EPA, Issues Paper #2: 21.

[83] General Accounting Office, "Environmental Information: EPA Could Better Address Concerns about Disseminating Sensitive Business Information." GAO/RCED-99-156 (June 1999): 5, 13.

[84] EPA, Issues Paper #2: 22.

[85] New Jersey Department of Environmental Protection, "Early Findings of the Pollution Prevention Program" (June 1995). http://www.state.nj.us/dep/opppc/.

for initial planning efforts and $3,000 for the first year of reporting (costs declined after the first year).[86] The fact that firms had already developed data collection infrastructures for TRI—a significant portion of which is based on materials accounting-type data—reduced costs of additional collection and reporting considerably. Also, many of the data required for materials accounting were already available through information on raw materials purchases, inventories, and product composition.[87]

EPA was still grappling with program design when it published an advance notice of proposed rulemaking in 1996.[88] The notice communicated EPA's decision to pursue materials accounting and requested further public input on program design issues. The agency expected to propose formal rules in 1997. In the meantime, it would continue to study program issues, including unsettled questions about the agency's statutory authority for collecting and disseminating materials accounting data.

As industry mobilized to oppose chemical use reporting, it found more traction for its arguments on Capital Hill than at EPA. Industry lobbied members of the Senate to have the General Accounting Office investigate the handling of confidential business information at EPA.[89] Congressional Republicans also raised concerns about EPA's statutory authority to pursue materials accounting and the regulation's impacts on small businesses.[90] Rep. Joe Barton (R) of the House Subcommittee on Oversight and Investigations called for a study of state

---

[86] Randi Currier and Christopher E. Van Atten, "Benefit-Cost Analysis of the Massachusetts Toxics Use Reduction Act," prepared by Abt Associates for the Massachusetts Toxics Use Reduction Institute (February 1997); and Kerr, Greiner, Anderson and April, Inc., "Materials Accounting and P2: A Good Team?" Materials Accounting Project: Phase II Report, National Pollution Prevention Roundtable and Member Companies of the Business Roundtable—Industrial Pollution Prevention Council Report (October 1, 2000).

[87] Shelley A. Hearne, "Tracking Toxics: Chemical Use and the Public's 'Right-to-Know'," *Environment* July-August 1996.

[88] EPA, "Addition of Reporting Elements; Toxics Chemical Release Reporting; Community Right-to-Know; and Emergency Planning and Community Right-to-Know; Notice of Public Meetings; Proposed Rules," 40 CFR Part 372, Federal Register Vol. 61, No. 191 (October 1, 1996): 51321–30.

[89] General Accounting Office, "Environmental Information: EPA Could Better Address Concerns about Disseminating Sensitive Business Information," GAO/RCED-99-156 (June 1999).

[90] "Congress to Tighten Oversight of EPA Effort to Expand Toxics Reporting," *Inside EPA* (June 27, 1997).

materials accounting programs.[91] Industry threatened to bring suit against EPA as soon as the agency proposed a rule.[92]

The public comment period on the advance notice, accompanied by a series of public meetings around the country, lasted five months and generated more than 40,000 comments. Such a volume of input, along with intensified pressure from industry and Congress, caused EPA to move its projected date of regulations "well into 1998."[93] Within the agency, there was increasing skepticism that staff could put together a workable program under existing legislation.

EPA's best hopes for the materials accounting program lay with legislation proposed in May 1997 by Reps. Henry Waxman (D) and Jim Saxton (R). The Children's Environmental Protection and Right-to-Know Act included a title authorizing chemical use reporting. Even the sponsors felt that the bill stood little chance in the Republican-led Congress, but they vowed to attach it to any environmental legislation moving through Congress and attempted (unsuccessfully) to do so at least twice in 1998.[94]

As 1998 dawned, EPA was publicly stating that materials accounting rules would not appear until late 1998 or beyond. In meetings that spring, the agency came to realize that putting a materials accounting system together under existing statutes would lead to, at best, a cumbersome and unwieldy program. Legal challenges from industry were inevitable.[95] Absent specific legislation—such as the languishing Children's Environmental Protection and Right-to-Know Act—EPA felt it best to scrap the rulemaking effort and look at voluntary options, pilot programs, or other small steps toward pollution prevention and materials accounting.[96]

---

[91] General Accounting Office, "Toxic Substances: Few States Have Considered Reporting Requirements for Chemical Use Data," GAO/RCED-97-154.

[92] "Congress to Tighten Oversight of EPA Effort to Expand Toxics Reporting," *Inside EPA* (June 27, 1997).

[93] "EPA Efforts to Expand TRI Are Slowed By Flood of Comments," *Inside EPA* (August 15, 1997).

[94] Sponsors attempted to attach the bill to a RCRA reform bill in January 1998 and a Superfund reform bill in March 1998.

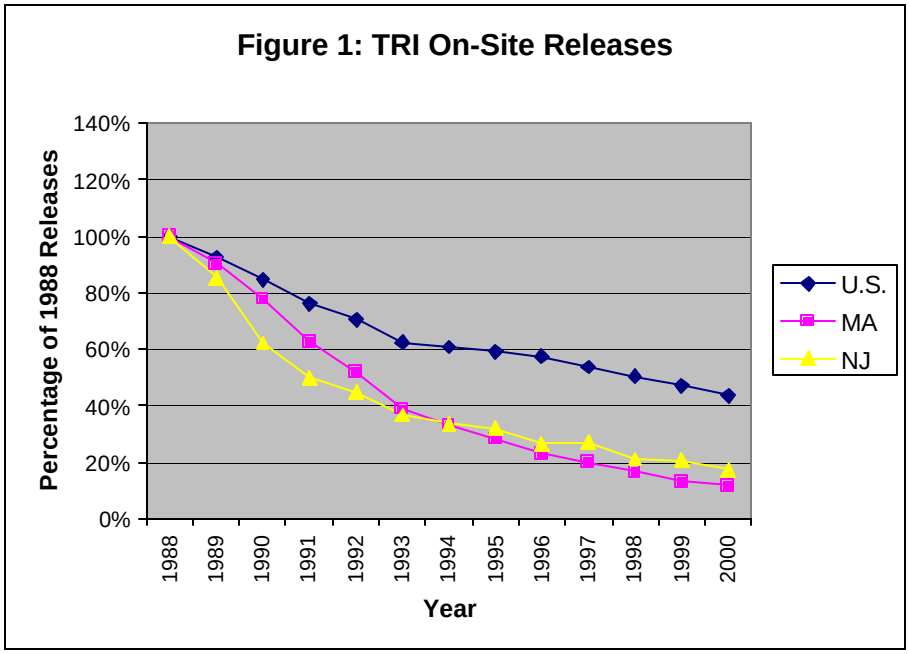
[95] "Browner Briefed on Options for Collecting 'Chemical Use' Information," *Inside EPA* (March 6, 1998).

[96] "EPA Reconsiders Expanding TRI to Include 'Chemical-Use' Information," *Inside EPA* (February 6, 1998). "Environmentalists Cite Need For Expanding Toxic Reporting Requirements," *Inside EPA* (June 26, 1998). General Accounting Office, "Environmental Information: EPA Could Better Address Concerns about Disseminating Sensitive Business Information," GAO/RCED-99-156 (June 1999).

Information, Communication, and Effectiveness

Because EPA never developed a materials accounting program, it is necessary to turn to the state programs to examine how such data are used and communicated and the role they play in promoting pollution prevention. Complicating the comparison is EPA's intent to replicate only the reporting aspect and not the extensive pollution prevention planning process, the technical assistance, or other aspects of the state programs.

New Jersey and Massachusetts have been quite effective in reducing toxic releases and waste. From a base year of 1988, both states outpaced the nation as a whole in reducing on-site TRI releases, as shown in Figure 1.[97]



Source: Environmental Protection Agency, TRI Explorer. Trend data cover sectors and chemicals in the TRI program in 1988.

[97] To provide consistent data, only the chemicals and industrial sectors in the TRI program in 1988 are shown in Figure 1. Facilities reporting TRI data in New Jersey and Massachusetts also report under the state materials accounting programs.

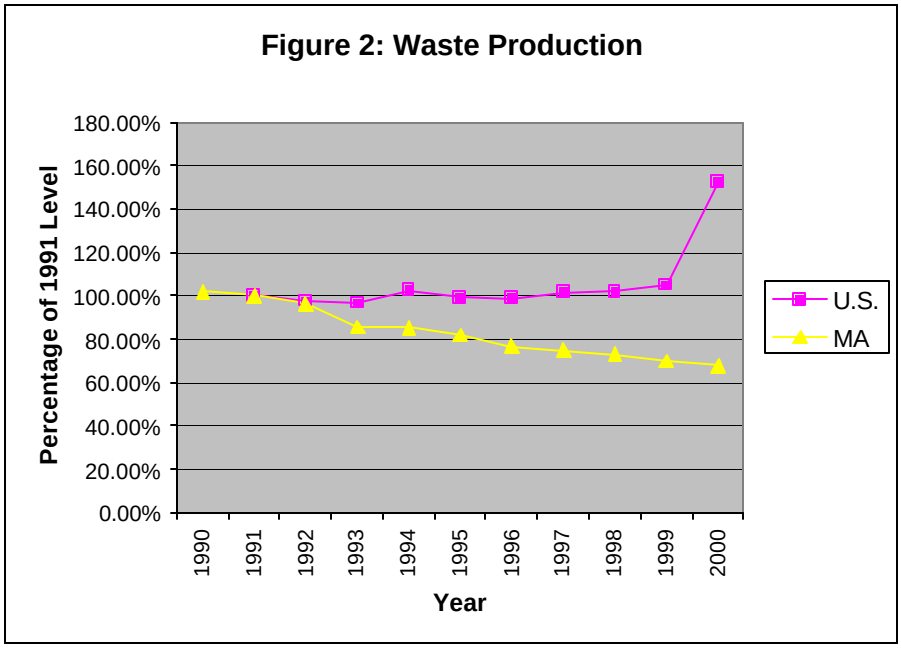
Figure 2 compares trends in waste production. The trend for the United States comes from TRI data on total wastes managed, which corresponds to performance measures on waste production used in both state programs.[98] Comparable data on "by-product" generation show that Massachusetts has outperformed the rest of the nation in waste reduction. Trends for New Jersey waste production (called nonproduct output) are not shown in Figure 2 because the state's Department of Environmental Protection regards state-level data for the years 1991 through 1993 as unreliable and not comparable with later years.[99] However, a 1996 study by the agency concluded that nonproduct output for New Jersey facilities declined between 1990 and 1993 while rising for comparable facilities nationwide.[100] During that time "employment at all New Jersey industrial facilities [covered by the analysis] also declined, although [nonproduct output] appears to have declined at a greater rate." In both New Jersey and Massachusetts, economic declines in the manufacturing sector may explain some of the early decreases in releases and waste production, but since 1993, the sector has held roughly steady in the case of New Jersey and actually grown in Massachusetts (see Figure 3).

---

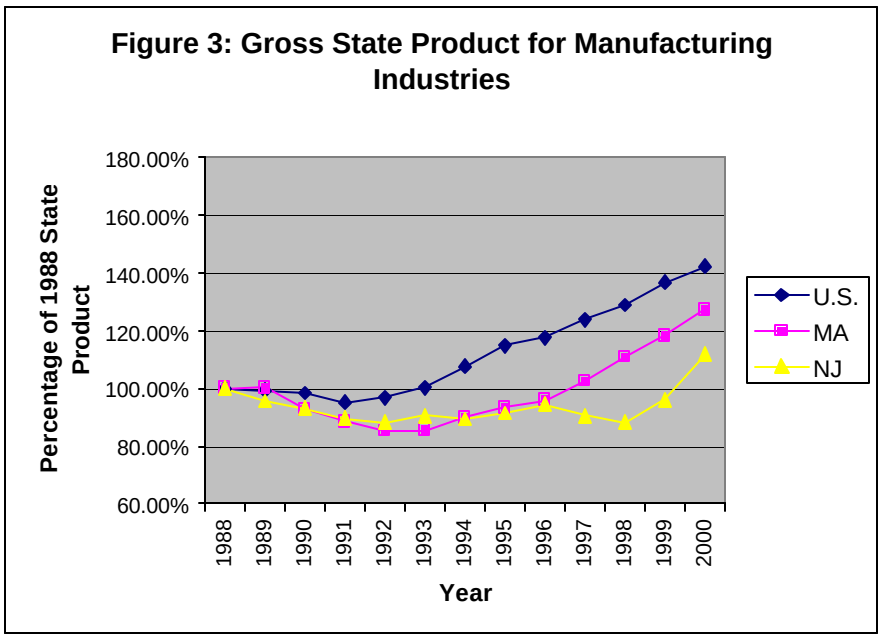
[98] National data reflect chemicals in the TRI program in 1991 and the original industries—the manufacturing sector. Data are "total waste managed" as reported in Section 8 of the TRI form, which was introduced by the 1990 Pollution Prevention Act. EPA's definition of "total waste managed" is similar to that for "by-product" in Massachusetts and "nonproduct output" in New Jersey. Elizabeth Harriman and Maureen Hart, "Measuring Progress in Toxics Use Reduction and Pollution Prevention," Massachusetts Toxics Use Reduction Institute, University of Massachusetts, Lowell (1996); Inform, "Tracking Toxic Chemicals: The Value of Materials Accounting Data"(1997). According to Thomas Natan, National Environmental Trust, TRI data are regarded as unreliable for state-level analysis (personal communication, October 4, 2002).

[99] Personal communication with Kenneth Ratzman, New Jersey Department of the Environment (December 4, 2002).

[100] New Jersey Department of the Environment, "Industrial Pollution Prevention Trends in New Jersey" (December 1996).



Sources: U.S data are for "total waste management" reported under TRI for chemicals in the program in 1991 and all original sectors (Environmental Protection Agency, TRI Explorer). Massachusetts data are "by-products" for chemicals and facilities in the state program in 1990 (Massachusetts Department of Environmental Protection, "2000 Toxics Use Reduction Information Release," June 2002, 7).



Source: Bureau of Economic Analysis; data normalized to 1996 dollars.

To understand the relationship between materials accounting programs and the pollution reduction trends seen in Massachusetts and New Jersey, it is useful to disaggregate the programs into four phases, some of which overlap. First was a prereporting period, when disclosure laws were passed (or were anticipated) and firms had a year or more to compile relevant data; for many firms, the prereporting period was the first time time they had compiled materials accounting information. Second was the initial reporting period, when facilities compiled and reported information to state agencies, but there was little public access to the information or public knowledge about it. Third was a planning period, in which companies were required to undertake pollution prevention planning. Fourth was a period of public awareness, when NGOs began writing reports based on materials accounting data, media stories increased, and public access to data improved generally. Toward the end of this fourth period, some data became available on the Internet. Table 1 presents the rough dates of these phases for each program.

Table 1: Phases of State Materials Accounting Programs

Phase	*Massachusetts*	*New Jersey*
1. Prereporting	1989–1990	1987–1991
2. Initial reporting	1990–1994	1991–1994
3. Planning	1993–1994	1992–1995
4. Public awareness	1994 to present	1994 to present

It is striking how much of the reductions in releases and waste in both states occurred *before* the public awareness phase, when pressure from NGOs, the media, and the general public on facilities would be expected. In Massachusetts, the public awareness phase began in 1994, when the first set of NGO reports using the data appeared, following the first public release of data (in hard copy) in 1993.[101] By this time, however, on-site releases were down 57% and by-product generation was down 16% from the first year of reporting in 1990; statewide trends had already significantly diverged from those for the United States as a whole. A number of other

[101] In 1994, MassPIRG and the Environmental League of Massachusetts began writing reports using materials accounting data to chart statewide trends and identify the largest users of chemicals across the state and in particular communities: Paul Burns and Hillel Gray, "Tracking the Toxics Crisis: A Call for State Action on Toxics Use Reduction," Massachusetts Public Interest Research Group and the National Environmental Law Center, Boston (January 1994); James R. Gomes, "Halfway to…Where? A Report on the Implementation of the Massachusetts Toxics Use Reduction Act," Environmental League of Massachusetts Education Fund, Boston (May 1994); and Elizabeth Sturcken, "The Carcinogens around Us: Chemical Use in Massachusetts, 1990–1992," Environmental League of Massachusetts Education Fund (August 1994).

NGO reports and media articles followed after 1994.[102] Data were first made available on the Internet in 1996, although they were not easily used by the public until a new data interface was launched in 2000.[103] During the period of increasing public awareness after 1994, however, average annual rates of reductions in releases slowed to 11% per year from a 14% average rate prior to 1994. Average annual reductions in by-product slowed slightly to 3% from 4%.

In New Jersey, the public awareness phase also began in 1994, with the first of a series of NGO reports.[104] By the beginning of this public awareness period, on-site releases were already down one third from the first year of reporting in 1991. Nonproduct output dropped by a third over the period as well.[105] After 1994, public access to data improved somewhat as more NGO reports and media articles came out, and some data became available on the Internet in 1998 (although it remains difficult to access for any less-than-sophisticated user). As in Massachusetts, average annual rates of reductions in releases slowed after 1994 from 11% to 8%. For reasons cited above, average rates for nonproduct output reductions prior to 1994 are unreliable.

What was pushing companies to reduce pollution *before* the public awareness phase? The most likely answer lies in how compiling materials accounting data and undergoing pollution prevention planning revealed opportunities to firms for improving their environmental performance. Many firms saw, for the first time, data on the volumes of chemicals flowing

---

[102] Between 1996 and 2001, several additional NGO reports used the data: Deborah Adler and James R. Gomez, "A Commonwealth at Risk: Toxic Chemical Use in Massachusetts, 1992–1994," Environmental League of Massachusetts Education Fund (May 1996); Massachusetts Public Interest Research Group, "Pollution Prevention under Attack," MassPIRG Alert (1996); Mark Rossi and Iris Vicencio-Garaygay , "Detoxifying Massachusetts: Reducing Industry's Use of the Most Toxic Chemicals," Massachusetts Public Interest Research Group (December 2001); and Jessica Champness, "Carcinogen Use and Release to the Environment in Massachusetts, 1994–1998," Environmental League of Massachusetts (July 2001).

[103] The main point of public access to materials accounting data now comes from TURI's Web site where, since 2000, users can find an extremely user-friendly interface that allows direct access to data on a facility-by-facility basis, or reports organized by facility, chemical, and communities, along with a great deal of information about how to interpret the data.

[104] The NGO INFORM has conducted the lion's share of analysis on New Jersey materials accounting data, producing a series of reports: "A Clearer View of Toxics: New Jersey's Reporting Requirements as a Model for the United States" (1994); Toxics Watch 1995; "Tracking Toxic Chemicals: The Value of Materials Accounting Data" (1997); and "Expanding the Public's Right to Know: Materials Accounting Data as a Tool for Promoting Environmental Justice and Pollution Prevention" (2000). At least one other NGO has used the data as well: Lois N. Epstein, Stephen Greetham, and Anna Karuba, "Ranking Refineries: What Do We Know about Oil Refinery Pollution from Right-to-Know Data?" Environmental Defense Fund (November 1995).

[105] New Jersey Department of the Environment, "Industrial Pollution Prevention Trends in New Jersey" (December 1996).

through their processes and how chemicals were transformed into products and waste. Process changes based on such information may have been driven by opportunities for costs savings or by expectations that public exposure would eventually bring public pressure. These motivations appear to have been present even in the prereporting phase, when on-site releases dropped 14% in one year in Massachusetts and an average of 17% per year in the three years prior to reporting in New Jersey—both at rates higher than for the nation as a whole.

Revelations provided by compiling materials accounting information were greatly enhanced in both programs by the extensive planning phases that accompanied the first three to four years of reporting. A 1996 study by Hampshire Research Associates of 115 reporting facilities in New Jersey found that "a majority of facilities found planning worthwhile and found benefits," causing them to take a close look at "processes that would not ordinarily have been examined [and to investigate] new reduction options."[106] Once planning was required, these facilities projected much more ambitious waste reduction goals than reported in their previous annual right-to-know reports. In Massachusetts, a survey of more than 400 facilities found that the percentage examining the environmental and health and safety impacts of their production processes more than doubled, to 76%, following the pollution prevention planning requirements.[107] Of the surveyed facilities, 70% said the planning process led them to identify toxic use reduction opportunities, and 81% said that "they have [implemented] or will implement at least a few of the projects" in their pollution prevention plans. In-depth case studies of 22 Massachusetts firms showed that each had implemented such projects between 1990 and 1996.[108] In both states, researchers found that the average savings to firms from process changes exceeded average costs of planning.[109] In New Jersey, an analysis by the Department of

---

[106] Thomas E. Natan, Catherine G. Miller, Bonnie A. Scarborough, and Warren R. Muir, "Evaluation of the Effectiveness of Pollution Prevention Planning in New Jersey," Alexandria, VA: Hampshire Research Associates (May 1996).

[107] Monica Becker and Ken Geiser, "Evaluating Progress: A Report on the Findings of the Massachusetts Toxics Use Reduction Program Evaluation," prepared by the Toxics Use Reduction Program (March 1997).

[108] Ibid.

[109] For New Jersey, see Thomas E. Natan, Jr., and Catherine G. Miller, "Are Toxics Release Inventory Reductions Real?" *Policy Analysis* 32(15) (August 1, 1998); and New Jersey Department of Environmental Protection, "Early Findings of the Pollution Prevention Program," http://www.state.nj.us/dep/opppc/ (June 1995; accessed January 13, 2003). For Massachusetts, see Randi Currier and Christopher E. Van Atten, "Benefit-Cost Analysis of the Massachusetts Toxics Use Reduction Act," prepared by Abt Associates for the Massachusetts Toxics Use Reduction Institute (February 1997).

Environmental Protection revealed that for each dollar spent on planning and implementation, including the capital costs of process changes, facilities had net savings of $5 to $8.[110]

The experiences in Massachusetts and New Jersey suggest that materials accounting programs supplied a variety of motivations for pollution reduction. Large initial reductions appear to have been achieved when firms acted on information generated by compiling data and undertaking planning. Although some firms may have been spurred to implement process changes because of expectations about public reaction, extensive surveys and interviews suggest that facilities actually learned about new opportunities for cost savings from process changes. By the time the public awareness phase came along, both states were well on the way to an improved environmental record. It would be easy to oversell the impact of public awareness on facility actions even after 1994. Nearly 10 years into the programs, there were substantial problems with public access to data and little use of the information. A 1999 study conducted for the National Pollution Prevention Roundtable concluded that public use and awareness of the data in both states were "spotty," and a followup in 2000 observed that the data were still "underutilized."[111]

Summary

Materials accounting at EPA never saw the light of day. Opposition from industry, centered on direct reporting costs and leaks of confidential business information, combined with a lack of a specific mandate for EPA to pursue the program, ultimately spelled its demise. Based on the experiences of firms in Massachusetts and New Jersey, industry's arguments were exaggerated in the national debate; costs and CBI claims rates were much less significant in practice.[112]

It is difficult to know the extent to which the benefits of EPA's program would have mirrored those in Massachusetts and New Jersey. Extensive planning requirements and technical assistance, which were not envisioned for EPA's program, surely explain some of the trends in

---

[110] New Jersey Department of Environmental Protection, "Early Findings of the Pollution Prevention Program, Part I: On-Site Reviews of Pollution Prevention Plans" (June 1995).

[111] Kerr, Greiner, Anderson and April, Inc., "Materials Accounting and P2: A Good Team?" Materials Accounting Project: Phase II Report, National Pollution Prevention Roundtable and Member Companies of the Business Roundtable—Industrial Pollution Prevention Council Report (October 1, 2000).

[112] EPA Issues Brief #2: 21.

reduced emissions and waste in the state programs. Public availability of materials accounting data—a crucial feature of the EPA program—was poor in both states until recently and is still so in New Jersey. The state programs do suggest, however, that simply compiling and reporting materials accounting data—as well as, possibly, expectations about public reaction—drove some of the trends. The compilation of data has also greatly improved the information base on which facilities make decisions and by which agencies and others can chart progress in pollution prevention and evaluate programs.

3. The Sector Facility Indexing Project

The Sector Facility Indexing Project (SFIP), developed by EPA's Office of Enforcement and Compliance Assurance, makes information about the compliance records of regulated facilities publicly available.[113] Unlike TRI, the RMP program, or materials accounting, SFIP was never intended to require facilities to report new information about their activities. Rather, it was an effort to integrate and repackage data already held by EPA in a way that would be more useful to the agency and to outside stakeholders.

Unlike the RMP program and materials accounting, SFIP made it through the policy development process relatively unscathed. The project was launched in 1998 and has run continuously, with numerous data updates and a major related expansion in fall 2002. Among the three EPA programs, then, SFIP is the most representative of a broad disclosure model. SFIP's ability to improve facility environmental performance, however, has been limited, and this section examines possible reasons why.

Background and History

SFIP integrates data on regulatory compliance, emissions, and other information on a facility-by-facility basis for five industrial sectors: pulp manufacturing, petroleum refining, automobile assembly, iron and steel manufacturing, and primary smelting and refining of nonferrous metals. It allows users inside and outside of EPA to develop profiles of individual facilities or summaries of entire industrial sectors. These allow comparisons of performance from facility to facility or sector to sector.

As originally envisioned by EPA, the data (beyond facility name, address, etc.) would be of three types. First were compliance and enforcement data from the agency's three major programs dealing with hazardous waste (i.e., the Resource Conservation and Recovery Act, RCRA), air, and water. Second was information on chemical releases, such as spills and TRI data. SFIP would expand on TRI by calibrating release data to reflect the relative toxicity of each chemical and by including a "risk indicator" for each facility. Pollution information would also

[113] SFIP can be found at http://www.epa.gov/sfipmtn1/.

be calibrated to production and presented as a pollution-to-production ratio. Third were demographic data on the population surrounding the facility.

The Office of Enforcement and Compliance Assurance had four somewhat overlapping visions of how the data could be used internally to improve the agency's effectiveness and externally to serve the needs of stakeholders. Its first vision for the program was to integrate data along sectoral lines for internal use as part of a 1994 reorganization of EPA's compliance and enforcement offices. The reorganization sought to move EPA away from enforcement on a program-by-program, medium-by-medium basis to a multiprogram and multimedia approach tailored to different industrial sectors. The shift to a sector-based approach required that the enforcement and compliance offices integrate data from various programs, first by compiling "sector notebooks" and then by matching data on a facility-by-facility basis. As the success of TRI became obvious, the idea of providing the integrated compliance data to the public via the Internet emerged.

The second vision for the program came from a shift in emphasis at the agency from enforcement of individual programs to a more holistic assessment of the performance of facilities and sectors. The desire to judge performance explains what otherwise might appear to be SFIP's collection of unrelated data. As EPA staff outlined it, performance in SFIP would be measured in terms of both regulatory performance (indicated by compliance and enforcement data) and pollution performance (indicated by spill data and TRI). Tying pollution data to production and demographic data would provide a calibrated performance measure suited to comparisons and benchmarking among facilities and communities. The performance data would allow EPA to tailor programs to highlight leaders and bring laggards up to speed, and for industry and environmentalists, the information would allow benchmarking among peer companies and a measurement of performance over time.

The third vision for SFIP came from the acknowledged deficiency of TRI in calibrating results by the relative toxicity of different chemicals. SFIP would act as a proving ground for methods developed elsewhere in the agency for using TRI to calculate risk. Such risk information had both internal and external utility. Internally, it would allow EPA to target its enforcement and compliance programs at the worst problems first. Externally, it would satisfy complaints from both industry and environmentalists that providing release data without any indication of toxicity or exposure was misleading.

The fourth vision for the program was its right-to-know component and the information it might provide to other stakeholders. Communities could use the information to learn about a

local facility's compliance record, state and local governments could examine multimedia impacts from facilities, environmental groups could compare state enforcement programs, trade associations could develop voluntary compliance programs, and facilities could benchmark their performance on that of peers.[114]

From the start, EPA was operating under constraints. The program would use existing EPA data only, with no new reporting by industry and no reporting of state data not required by EPA. The agency was also under pressure to get something out quickly, in part because of EPA's 1995 Reinventing Environmental Regulation Initiative, which promoted the SFIP program.[115] With the reinvention charge, enforcement and compliance staff had increased clout to get the help of program offices to assist with data, and a higher profile to confront subsequent opposition from industry and state regulators.

After the Office of Enforcement and Compliance Assurance announced that it would initiate SFIP as a pilot project in 1995, staff began integrating the RCRA, air, water, and TRI databases. The first step, taking about a year and a half, was simply to compile a list of facilities in each sector and link the various permits to each, a task made very difficult by the different facility identifiers used in each program.

As staff constructed the database, a parallel effort was under way to identify an approach for introducing risk-related information into SFIP. The Office of Enforcement and Compliance Assurance established a working group in 1995 to examine various risk-based models, ultimately settling on what was then called the TRI Indicators Model, developed by the Office of Pollution Prevention and Toxic Substances. The model combined TRI data with chronic toxicity weighting factors borrowed from a methodology used to rank potential Superfund sites. For SFIP, it would calculate an indicator of relative hazard associated with facility releases, which could be used to compare one facility with another.

In April 1997, EPA went to its Science Advisory Board for a review of the toxicity weighting approach. The board gave a mixed review. It "applauded" EPA for moving toward greater use of risk-related information but said that SFIP was "getting to risk, but it is not there

---

[114] EPA Office of Enforcement and Compliance Assurance, "Summary of Sector Facility Indexing Project Public Meeting held on May 14, 1997," prepared by Abt Associates, Inc., Cambridge, MA (July 1, 1997).

[115] President Bill Clinton and Vice-President Al Gore, "Reinventing Environmental Regulation," March 16, 1995.

yet."[116] The principal shortcomings of the SFIP risk indicator were its lack of exposure information and its failure to consider acute health effects and ecological effects. The board concluded that use of the hazard index was ultimately a policy call on the part of EPA.

While the Science Advisory Board was evaluating the toxicity-weighting approach, EPA introduced the program in a day-long public meeting on May 14, 1997, which initiated a month-long public comment period. The public comments drew the lines of debate between environmentalists and EPA on one side and industry and states on the other.[117]

Environmentalists largely supported the project, sharing EPA's vision of the gains from integration, performance measurement, risk-based prioritization, and community right-to-know. They saw the project as a way to help them target their efforts at the most important problems within sectors and across environmental media and to compare and benchmark facility, sectoral, and state regulatory performance. Environmentalists supported EPA's efforts to include more risk-based information in SFIP even though they recognized that the information did not provide a complete picture of risk. More information about compliance and performance, they argued, would also allow citizens to be more informed participants in decisionmaking with government and with industry.

Industry opposed SFIP and was joined by an unlikely ally: state environmental agencies. Responsible for 85% of environmental enforcement, states—no less than industry—felt that the project could present them in a poor light. Industry and states centered their opposition on SFIP's potential to mislead the public, creating what one opponent characterized as "a public relations nightmare." Unlike other disclosure programs, SFIP would publicize information generated by regulatory agencies, not industry. And the integrated presentation of SFIP data gave EPA considerable influence on how the data would be perceived, interpreted, and understood by the public. Opponents pointed out that a facility's compliance status, for example, was not calibrated to the number of regulatory requirements to which it was subjected, nor was there a distinction between minor paperwork violations and serious violations. Moreover, the presentation of data, they argued, created perceived associations that would mislead the public, such as suggesting

---

[116] EPA Science Advisory Board, "Use of Toxicity Weighting Factors in the OECA/SFIP Review," Washington, DC: SAB Environmental Engineering Committee, Special Topics Subcommittee (April 29, 1997)

[117] EPA Office of Enforcement and Compliance Assurance, "Summary of Sector Facility Indexing Project Public Meeting held on May 14, 1997," prepared by Abt Associates, Inc., Cambridge, MA (July 1, 1997). This report the source for all descriptions of stakeholder positions unless otherwise noted.

that legal TRI emissions are a result of noncompliance. Both industry and state environmental officials leveled their most intense criticism at the toxicity weighting index, contending that the approach was not based on sound science and had not been adequately peer-reviewed.

Not only were the data misleading, industry and states argued, but some compliance data were of questionable quality. Industry argued that EPA needed to much improve its "data stewardship" through improved quality assurance and quality control. The flawed data would lead to "lawsuits and negative publicity engendering serious financial consequences for companies." Once inaccurate information is in public domain, critics said, "you cannot get the genie back into the bottle."

By August 1997, the controversy over SFIP had heated up to the point that it earned a front-page story in the *New York Times.*[118] Two of industry's concerns—data quality and the toxicity weighting approach—ultimately had the most impact.

To respond to data quality concerns, EPA provided each affected facility with its data for review; 62% of the facilities submitted comments, requesting correction of less than 10% of the records. EPA responded by granting around half of these requests.[119] That EPA's data were already around 90% correct and that the agency undertook such an intensive data review process were critical to rebuffing opposition to the program. (In its final version of SFIP, EPA included data correction procedures that became the model for error correction in other agency data products, such as Envirofacts.) Responding to data interpretation concerns, EPA also agreed to visually separate some indicators to avoid suggesting a causal relationship.

Targeting the risk indicator, opponents of SFIP brought suit against EPA in 1998. The lawsuit challenged that provisions of the Paperwork Reduction Act should prevent EPA from publishing the toxicity weighting data on the Internet. Briefly, the lawsuit charged that to use TRI information for a different purpose than that for which industry was required to report it, EPA needed prior approval from the Office of Management and Budget.[120] Although the lawsuit was considered mainly a nuisance by the agency, it added to the pressure from Congress, the states, and industry. Recognizing political realities, EPA dropped its plan to include the controversial

---

[118] John H. Cushman, Jr., "EPA Is Pressing Plan to Publicize Pollution Data," *New York Times*, August 12, 1997: 1.

[119] EPA, "Comment and Data Review Process," wysiwig://13/http://www.epa.gov/sfipmtn1/review.htm (accessed February 11, 2002).

[120] Center for Regulatory Effectiveness, "Regulation by Information," http://www.thecre.com/information/index.html (accessed September 19, 2002).

toxicity weighting measure in the SFIP three days before the suit was to go to court. Without the risk indicator, the court determined that there was no case and threw it out.

The elimination of the risk indicator was significant because both industry and environmentalists had long argued that TRI failed to inform the public about the relative toxicities of releases. Integrated and easily accessible information on relative risks from TRI releases is now broadly available through Environmental Defense's Scorecard Web site, not from EPA.[121]

Still facing considerable opposition from industry, states, and some in Congress, Administrator Carol Browner chose to launch SFIP—minus the risk indicator—in May 1998. SFIP profiled around 625 facilities in the five industrial sectors. It was publicly accessible and allowed customized data searches. As planned, it combined compliance data with production, release, and demographic data to provide a more comprehensive picture of surrounding communities' potential exposure to toxic chemicals than that provided by TRI. It allowed viewers to "go deep" into information by providing both aggregated and raw data and to compare and benchmark facilities across programs and across media.

EPA has continued to expand SFIP. In 2001, data on federal facilities became available. In November 2002, the agency greatly expanded the Internet availability of SFIP-type compliance information by launching a pilot version of Enforcement and Compliance History Online (ECHO), which profiles more than 800,000 facilities nationwide.[122] In contrast to the strained state and federal relations over SFIP, ECHO was developed through a partnership of EPA and the Environmental Council of the States. Indeed, agency staff say that one of the biggest benefits of the extensive negotiations with states and large companies about the content and presentation of SFIP was to pave the way for ECHO.[123]

---

[121] The Environmental Defense site can be found at www.scorecard.org.

[122] EPA, "Enforcement and Compliance History Online (ECHO) Pilot Web Site Fact Sheet" (November 18, 2002).

[123] Personal communication with Michael Barrette, EPA (November 4, 2002).

Information, Communication, and Effectiveness

In 1999, a year into SFIP's operation, EPA conducted an evaluation, which is still the most complete compilation of information about public use of, and reaction to, the site.[124] Despite the intense controversy surrounding SFIP development, EPA found most of the stakeholders consulted to be relatively happy with the product.

The greatest use, by far, of SFIP data by national NGOs comes from the Environmental Working Group. Its 1999 report "Above the Law" took EPA, state regulators, and industry to task for Clean Air Act violations.[125] The national report was accompanied by more than 20 additional reports focusing on air pollution violations in individual states. A second set of reports by the Environmental Working Group in 2000 highlighted lax enforcement of the Clean Water Act in Michigan, Ohio, and Pennsylvania.[126]

Environmental Defense has used SFIP data as well, issuing a press release in 1998 detailing Clean Air Act violations and accidental spills revealed by the program. Environmental Defense has also used SFIP data to profile auto and steel companies and as a source of data for its Scorecard Web site.[127] Other organizations, such as U.S. Public Interest Research Group, the Ecology Center of Ann Arbor, and the Council on Economic Priorities (a corporate social

---

[124] EPA Office of Enforcement and Compliance Assurance, "Sector Facility Indexing Project Evaluation: December 1999" (December 10, 1999).

[125] John Coequyt, Richard Wiles, and Christopher Campbell, "Above the Law: How the Government Lets Major Air Polluters Off the Hook," Environmental Working Group (1999).

[126] The states were Michigan, Ohio, and Pennsylvania. See, for example, John Coequyt, Emily Headen, and Richard Wiles, "Pollution Pays: Failure to Enforce Clean Water Laws in Pennsylvania," Environmental Working Group (2000).

[127] Lois N. Epstein, "Environmental Defense Fund Analysis of Sector Facility Indexing Data Finds Violators," Environmental Defense Fund press release (May 8, 1998). In its Scorecard and Green Cars initiative, Environmental Defense uses SFIP information to normalize TRI data for production. Along with Friends of the Earth, Environmental Defense used data on iron and steel facilities to support the "Clean Steel Coalition" initiative, designed to educate community activists and have them monitor industry activities.

responsibility watchdog), have used SFIP data for various reports.[128] Although some of these reports highlight compliance data provided by SFIP, many simply use SFIP for its more prosaic information on facility production levels and its definitions of sectors, both of which are useful for normalizing TRI data.

Press coverage of the launch of SFIP and the controversies surrounding its development was extensive, but articles actually using SFIP to discuss industry compliance records are very few. In May 1998, there were 23 articles about the launch of the site and the program's controversy (some in response to press releases from NGOs), and 30 more articles appeared during the first year of the project.[129] However, a search of national and regional newspapers across the country from May 1998 to May 2000 revealed only four articles that actually used SFIP compliance data, all of them based on the Environmental Working Group's report "Above the Law."[130] (Other reports, such as one by U.S. PIRG on timber companies, received some media coverage as well, but the coverage did not focus on the kind of information provided in SFIP.)

Despite publicity about the program, companies and state agencies have heard little from citizens directly about information provided by SFIP. In discussion sessions held for the 1999 evaluation, industries said that they had not been contacted by citizens regarding SFIP information, a finding reinforced by information from a broader 1999 trade association meeting. State agencies—which initially had feared a deluge of citizen queries—also reported little contact from the public regarding SFIP. In fact, some state agency personnel pointed to a lack of public awareness of the program.

---

[128] PIRG used the data to examine compliance for several timber companies (Sims Weymuller, Ben Mills, Lexi Schultz, and Kim Delfino, "Public Loss, Private Gain: How Timber Companies Clear-Cut Forests, Pollute Our Air and Water and Reap Millions in Profits at Taxpayer Expense," Washington, DC: U.S.PIRG, 1999). The Ecology Center of Ann Arbor used data to "gather compliance data for the automobile assembly sector and [track] the performance of individual facilities" (EPA Office of Enforcement and Compliance Assurance, "Sector Facility Indexing Project Evaluation: December 1999," December 10, 1999). The Council on Economic Priorities used SFIP for its report, "The Worst and Best Auto and Tire Companies," which analyzed 13 auto assembly and tire manufacturers. SFIP data were used to aggregate information fromall auto assemblers and rank them from most-polluting to least-polluting.

[129] EPA Office of Enforcement and Compliance Assurance, "Sector Facility Indexing Project Evaluation: December 1999" (December 10, 1999).

[130] The search included major U.S. and regional papers housed in four Lexis-Nexis news libraries: Midwest regional, Northeast regional, Southeast regional, and western regional.

Web site use data suggest a relatively fixed group of regular users, many of them working for the facilities that are profiled, rather than a groundswell of interest from local communities about the performance of facilities in their midst. In its 1999 assessment, EPA found that the use of SFIP had leveled off at about 3,500 user sessions and 21,000 hits per month. In November and December 2001 and January 2002, user sessions had increased somewhat to an average of around 4,300 per month (representing some 2,000 unique visitors), and hits had decreased to an average of around 14,000 per month. EPA staff suspect that the modest rise in user sessions and drop in hits mean that a pool of people are making more regular and targeted visits to the site, perhaps bookmarking particular pages for repeat use. Site use jumps when new data are released (and an automatic e-mail is sent out to members of a listserv), again suggesting the presence of regular users.[131] Site use data are inadequate for identifying who is actually using the site, but EPA can track site activity to some extent through calls to the SFIP hotline. In the first year of the program, industry accounted for 43% of these calls; the remainder came from citizens, environmental groups, law firms, consulting firms, and groups seeking industrial customers for their products.

One reason that SFIP may be attracting mainly regular users is that it is difficult for the casual browser to find it on EPA's Web site. SFIP does not appear in Envirofacts, where it would seem a natural complement to the other facility-level data (including TRI), or under any of the EPA homepage's links to various databases and information resources.

Compliance and enforcement staff at EPA (and likely at the state level as well) use SFIP for a variety of purposes because it is one of the more user-friendly database to which they have access. Inspectors, for example, consult the database to check on the compliance status of a facility they are about to visit or even to confirm its address. More formally, staff have used the data to identify "outlier" facilities, including seemingly high-performing facilities that may not be reporting all spills, TRI releases, or other information. The data have also been used for trend analyses of particular sectors and the development of sector-specific compliance and enforcement strategies. Most recently, SFIP is being used to assist EPA's Performance Track effort, aimed at recognizing and rewarding firms that go beyond compliance.

---

[131] EPA Office of Enforcement and Compliance Assurance, "Sector Facility Indexing Project Evaluation: December 1999" (December 10, 1999).

There have been no notable sector-level efforts by industry trade associations to use SFIP data as a performance measure, although some individual companies have used the information.[132] Many companies involved in EPA's evaluation effort said that for sectoral benchmarking, they would be more likely to use their own internally produced data or trade association data, which would likely be of higher quality. Companies said they primarily use SFIP to monitor whether their facility information is correct, and such visits may make up much of the site's regular visitor base.

Have facilities covered by the program increased their compliance with environmental laws or reduced toxic releases? Table 2 summarizes SFIP's primary compliance data—historical noncompliance and significant current noncompliance with air, water, and RCRA permits. The table shows the trends and magnitudes of noncompliance over the years of the program. Although compliance has improved in some areas for some sectors (down arrow), there are more areas where it has become worse (up arrow).

The relationship between improvements in compliance and attention from environmental NGOs is mixed. As mentioned, NGOs focused primarily on what SFIP revealed about Clean Air Act compliance. Although Table 2 shows that the percentage of facilities in current significant noncompliance with air permits has decreased in three of five sectors, the number of quarters of historical noncompliance for an average facility has increased for four of five sectors. In the other major area of NGO attention—water permit compliance highlighted by the Environmental Working Group—historical and significant noncompliance rates have largely stayed the same or worsened across sectors.

[132] One company, Georgia-Pacific, uses SFIP data as a performance measure for its various facilities, instructing managers to make sure they have a clean SFIP record. Other companies, such as ASARCO, have announced their clean SFIP record in press releases.

Table 2: Summary of Selected SFIP Performance Indicators

	Historical noncompliance *Trend in average number of quarterly periods with 1 or more violations or noncompliance events over previous 8 quarters* *April 1998–October 1998 to December 2001–July 2002*			***Significant noncompliance*** *Trend in percentage of facilities for which most recent data (at the time) indicated significant noncompliance* *April 1998–October 1998 to January 2001–June 2001*		
	Air	*Water*	*RCRA*	*Air*	*Water*	*RCRA*
Automobile assembly	⬅➡ (0.8 to 0.8)	⬆ (2.8 to 2.9)	⬆ (2.6 to 3.0)	⬇ (17% to 8%)	⬅➡ (0% to 0%)	⬆ (2% to 5%)
Pulp mills	⬆ (1.1 to 1.6)	⬆ (1.7 to 2.1)	⬇ (0.6 to 0.3)	⬇ (18% to 16%)	⬆ (6% to 11%)	⬅➡ (0% to 0%)
Petroleum refining	⬆ (2.1 to 2.8)	⬆ (2.2 to 2.5)	⬇ (3.8 to 3.7)	⬆ (36% to 38%)	⬇ (7% to 5%)	⬆ (12% to 15%)
Iron and steel mills	⬆ (2.1 to 2.4)	⬆ (3.1 to 3.2)	⬇ (2.9 to 2.7)	⬅➡ (35% to 35%)	⬅➡ (11% to 11%)	⬅➡ (9% to 9%)
Nonferrous metals	⬆ (1.0 to 1.2)	⬇ (2.3 to 2.1)	⬇ (2.8 to 1.5)	⬇ (16% to 13%)	⬆ (10% to 14%)	⬇ 8% to 4%)

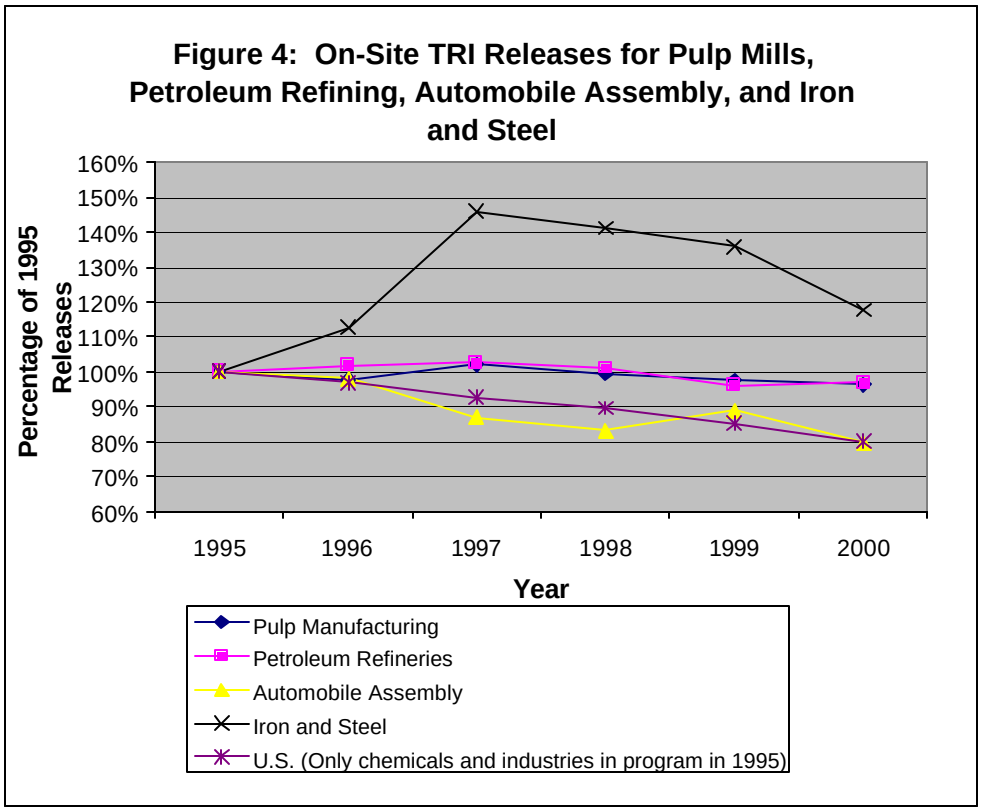
⬆ = higher noncompliance, ⬇ = lower noncompliance, ⬅➡ = no change.

Note: The trend for historical noncompliance measures the difference between the average for the first six months of the program (three measures between April 1998 and October 1998) and the average for the most recent eight months of the program (two measures between December 2001 and July 2002). The trend for significant noncompliance is the difference between the average for the first six months of the program and the average for the most recent six months with data (two measures between January 2001 and June 2001).

Of course, many factors contribute to the compliance trends in Table 2, and some may mask subtle influences from disclosure. Production levels, changes in data quality, and changes in the composition of industrial sectors would all have to be taken into account in a more extensive analysis. The trend toward less compliance in some sectors, however, probably can't be attributed to increased detection of compliance problems through more aggressive enforcement. Over the periods shown in the table, the total number of inspections for each sector declined.

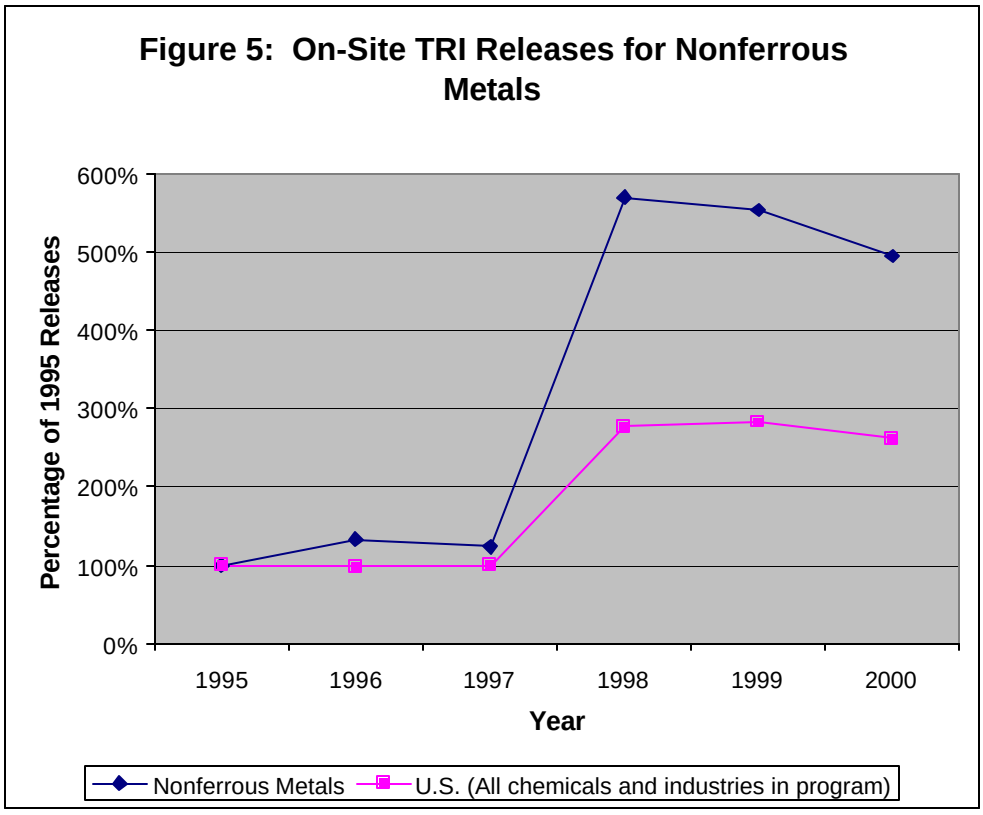
In addition to compliance, SFIP monitors performance through changes in releases, transfers, and other waste management of toxic chemicals as measured by TRI. Figure 4 shows the trend in on-site TRI releases from 1995 to 2000 for facilities covered by SFIP in four sectors:

pulp mills, petroleum refining, automobile assembly, and iron and steel. The baseline, 1995, was a year of significant changes to the TRI program and subsequent changes have affected these four sectors little. Performance in the four sectors is compared with a national indicator of TRI releases that encompasses those industries and chemicals in the program in 1995 but not those introduced in later changes to the program. Downward trends illustrated by the figure correspond to a general decline in overall TRI data. However, between the launch of SFIP in 1998 and 2000 (the last year for which data are available), only iron and steel demonstrated a greater percentage decline (17%) than the 5% decline seen in TRI data overall, and this followed a large spike in reported releases in 1997. Some of the trend in iron and steel may be due to changes in the number of facilities reporting, which jumped from 113 to 121 (a 7% increase) from 1995 to 1997 and then declined from 121 to 118 (a 2% decrease) between 1997 and 2000. The number of facilities in the petroleum refining and automobile assembly sectors remained relatively constant through the period, and the number of TRI-reporting pulp mills declined by 6%.



Source: Environmental Protection Agency, Envirofacts.

Figure 5 shows the trend in on-site TRI releases for the nonferrous metals sector. This sector was affected much more than the others by a 1998 expansion of TRI, which among other things added mining operations. Because SFIP includes both nonferrous mining and nonferrous manufacturing facilities, the expansion of TRI caused the number of reporting facilities in the sector to grow by 25% in 1998. The trend in releases from the nonferrous metals sector is compared with an overall TRI measure that includes the 1998 expansion. As illustrated in the figure, on-site emissions by the nonferrous metals sector declined more rapidly (13% decline) between 1998 and 2000 than did TRI as a whole (5% decline). However, this may simply reflect easy reductions in early years for processes that did not previously have to report, as well as a 7% decline in the number of TRI-reporting facilities in the nonferrous metals sector between 1998 and 2000.



Source: Environmental Protection Agency, Envirofacts.

Although not a full accounting of the performance indicators included in SFIP, permit compliance and TRI emissions are arguably its most prominent. An examination of these indicators does reveal a few examples of improvement for SFIP-profiled sectors. But there are at least as many stories of less compliance and release trends that fall behind the national norm. It all adds up to a decidedly mixed record, making it rather difficult to make the case that SFIP has had much influence on the performance of the facilities it covers.

Summary

Despite controversies about the benefits and costs of integrating compliance and other performance data on a sectoral basis and making it available on the Internet, SFIP, when launched in 1998, was basically true to its original design except for the abandonment of the SFIP risk indicator. In some sense, SFIP was an easier program to implement than RMPs or materials accounting because it didn't require new data collection and reporting by industry. However, this aspect of SFIP also created some of its difficulties.

Because EPA was constrained in using data already available to it, it had to be conservative about the program's benefits. Improving "performance" became the primary benefit, as measured by a mosaic of compliance and enforcement data matched to existing TRI data. One analyst describes the compliance and enforcement information as "highly fragmented and narrowly drawn…convey[ing] little information about the overall performance of a facility or firm."[133] Arguing that more compliant companies were less likely to pose risks to communities, EPA could point to a right-to-know benefit as well. The loss of the SFIP risk indicator, however, removed an innovative right-to-know feature from the program.

The main costs of the program, as outlined by industry and the states, involved the direct and reputation costs of what they regarded as misleading and inaccurate data. The principal victim of these charges was the SFIP risk indicator. The considerable time that EPA spent on quality assurance resulted in a more robust dataset, new procedures for data correction, and a smoother path for the recent launch of the much more extensive ECHO project.

An analysis of some of the most prominent environmental indicators in SFIP reveals little evidence of a broad impact on facility performance. There is no clear record across sectors of

---

[133] Bradley C. Karkkainen, "Information as Environmental Regulation: TRI and Performance Benchmarking, Precursor to a New Paradigm?" *Georgetown Law Journal* 89(2) (January 2001): 257–370, 257.

increased compliance or decreases in emissions that surpass the national norm. More time and more in-depth analysis may ultimately reveal more subtle impacts from the program, but its principal achievements appear to be in expanding the ability of EPA, business, and NGOs to conduct analyses of compliance patterns—not in actually forcing industries to improve their performance. The specialized and some would say fragmented nature of the data, as well as its relative inaccessibility on EPA's Web site, may explain why there is little evidence of broader public interest in SFIP.

Conclusion: The Costs and Benefits of Information Disclosure

In each of the cases profiled in this paper, the political interplay between benefits and costs dominated the programs' development. For RMPs, Congress ultimately asked EPA and the Department of Justice to strike a balance between the benefits of disclosure and the risks of terrorism. In the materials accounting debate, political opposition coalescing around the loss of confidential business information helped undermine EPA's ability to institute a program already weakened by the lack of a clear and specific legislative mandate. SFIP weathered the battle of benefits and costs by dropping its controversial risk indicator and leading EPA, state agencies, and industry to expend great efforts on the quality assurance of data.

Industry vociferously detailed the costs of disclosure programs. All programs spurred complaints about the costs of planning, reporting, and correcting data. Other costs cited included increasing the likelihood of terrorist attacks, revealing confidential business information, and leading to public misunderstanding of risks. More generally, industry saw the cost of these programs in terms of the uncertainty that comes when NGOs and communities call the regulatory shots rather than state and federal agencies.

Some of the arguments about costs are undermined by experience and analysis. In materials accounting, for example, actual costs of collecting data and problems related to releasing confidential business information were demonstrated to be much less onerous than predicted. Similarly, states' fears of a deluge of calls from citizens about SFIP information were never realized. Arguments about costs nevertheless carried great weight, particularly with sympathetic ears on Capitol Hill.

The arguments for disclosure, proffered by EPA and NGO advocates, involved three categories of benefits.[134] First are *normative* benefits, based on people's right to self-protection and therefore their right to know about the risks they face, including how the actions or inactions of government and industry help determine those risks. These benefits were claimed for all the programs discussed here, although each program provided different kinds of information about

[134] These categories are drawn from the public involvement literature. See, Daniel Fiorino, "Citizen Participation and Environmental Risk: A Survey of Institutional Mechanisms," *Science, Technology, and Human Values* 15(2) (1990): 226–43; Ralph Perhac, "Defining Risk: Normative Considerations," *Human and Ecological Risk Assessment* 2(2) (1996): 381–92.

risk. There are important questions, however, about the extent to which each program achieved these benefits. Communication of RMP data was restricted. Materials accounting at EPA didn't happen and data in the state programs are reportedly underutilized by the public. And the relationship between SFIP's compliance information and risk is unclear. Although we can't quantify the extent to which people have become more aware of environmental risks because of information disclosure, a common theme in these programs is the absence of a strong public reaction. Interestingly, data in which the public may have been most interested—the alarming consequences of worst-case accident scenarios for facilities in the RMP program and the relative risk information from the SFIP indicator—could not weather political battles. If such information had been made available, the public may have been far more interested—not to mention alarmed—and the right-to-know missions of the programs better achieved.

Second are *substantive* benefits—the new information and opportunities revealed through the collection, compilation, and dissemination of information—that may accrue to government, industry, and the public. Here the benefits of the three programs are far more clear. By requiring that new data be generated or that data be integrated and presented in new ways, these programs have created a much more information-rich decisionmaking environment for companies, regulators, and NGOs. Pollution prevention planning under the Massachusetts and New Jersey programs, for example, provided substantive benefits to firms that identified cost-saving projects to reduce chemical use and prevent waste. RMP planning may have similarly revealed opportunities for reducing hazards. SFIP provided substantive benefits to EPA, which could better target its enforcement efforts, and materials accounting allowed state agencies to track and improve pollution prevention efforts. The data helped NGOs monitor industry and government; analysis of those data let them identify problems and more effectively push for change. SFIP, for example, allowed the Environmental Working Group to focus on what they saw as the most egregious compliance and enforcement problems. In all programs, data collection, reporting, and disclosure improved the quality of data on which agencies rely to understand the facilities they regulate.

Finally are *instrumental* benefits: the extent to which information programs are a way to make progress toward explicit policy goals. All these programs were intended to force change in some manner or another, be it reduced emissions, increased safety, pollution prevention, better regulatory compliance, or some other goal. Most of the analysis in this paper focused on these instrumental benefits. Unfortunately, there is a nearly complete absence of in-depth evaluations of the effectiveness of the programs in achieving programmatic goals. This paper, however,

provides at least preliminary insights into what disclosure programs can accomplish and what we know and don't know about the dynamics by which they work.

In the RMP program, severe restrictions on sharing OCA data made information largely inaccessible and of limited use for NGOs, the media, and much of the public. Neither EPA nor local emergency planning committees filled the void left by the lack of public pressure. To the extent that the program has caused a shift toward inherently safer technology—and there is some evidence that this is happening—it is because firms sought to avoid the regulatory burdens of the program (possibly including its disclosure provisions), not because there was direct public or agency pressure to alter practices. What we don't know about RMP is whether a greater public role would have provided more attention to industrial safety and security issues before September 11, 2001.

Evidence on instrumental benefits is much clearer in the materials accounting case. The two states with such programs outperformed the nation as a whole in reducing releases and waste. The collection and reporting of materials accounting data, coupled with pollution prevention planning based on a materials accounting approach, appear to have revealed to firms new information and opportunities (often cost-saving ones) for reducing pollution. Interestingly, industry corrected problems before there was much public awareness of the data. Indeed, public use and awareness of disclosed information in both states are still considered low.

SFIP has not appeared to drive firm-level environmental improvements, even though it provides extensive, comparable, and easily accessed data for facilities, agencies, NGOs, the press, and whoever else cares to see it. Perhaps the explanation lies in the nature of SFIP's data. As mentioned, it may be too fragmentary and specialized to be meaningful to the public. Also, unlike other disclosure programs, it did not generate new information for firms about their performance; only the integration and comprehensiveness of the data were new. If the success of disclosure programs rests, at least in part, on the proactive efforts of firms responding to previously unknown information about their performance, then this may explain SFIP's story as well.

Together, what do these cases tell us about the dynamics by which information disclosure works to achieve instrumental goals? The theory that disclosure works because NGOs, the media, and an informed public put pressure on local facilities is, at best, incomplete. The RMP program appears to be driving technology change in the water treatment sector even though information sharing is very circumscribed. Massachusetts and New Jersey have continued to reduce emissions and waste even though materials accounting data were difficult to access and

underutilized throughout the 1990s. SFIP data appear to be underutilized by the public as well, and there is little obvious improvement in areas specifically targeted by NGOs.

There are clearly other forces at work in disclosure programs besides direct public pressure. The RMP case suggests that facilities will make process changes to avoid disclosure programs altogether, although the particular motivation of disclosure, versus other regulatory burdens, is not known. Systematic evidence from state materials accounting programs (along with anecdotal evidence from RMP) suggests that firms will act on information revealed in required planning processes that feed into disclosure.

Overall, the most compelling arguments for disclosure programs may not lie in instrumental benefits, or even right-to-know benefits. Instead, the clearest benefits are substantive: more information, greater integration of data, and higher-quality data with which to make environmental decisions. These substantive benefits are largely underappreciated and perhaps carry little weight in political debates, but they may ultimately have the longest-lasting impact on environmental management.