

Using Competition-Based Regulation to Bridge the Toxics Data Gap

WENDY WAGNER *

INTRODUCTION

A person unfamiliar with the intricacies of chemical regulation in the United States might assume that regulators are hard at work weeding out dangerous products, requiring warnings on thousands of others, and collecting copious toxicity research on the rest. In truth, however, the regulatory regime in the United States works nothing like this. There is little information available to regulators for evaluating the possible hazards of chemicals, and even for the limited research that does exist, some unspecified portion of the scientific studies is at risk of being biased or otherwise unreliable.¹ Moreover, since the Environmental Protection Agency (EPA) focuses most of its firepower on regulating individual chemical substances rather than chemical mixtures, consumers have little notion of the comparative toxicity of the chemical products on the market and lack adequate instructions regarding their proper use.² There is simply no way to sugarcoat the ugly truth: chemical regulation in the United States has been a dismal failure.³

The basic structure of the law governing toxic substances—the Toxic Substances Control Act (TSCA)⁴—deserves much of the blame for this regulatory dysfunction.⁵ In the regulation of chemicals, manufacturers are not required to do any testing unless commanded by the EPA, and the EPA must justify its demand with some scientific evidence.⁶ Due in part to this formidable burden, in the nearly thirty years of its

* Joe A. Worsham Centennial Professor, University of Texas School of Law. I am grateful to Jonathan Adler, John Applegate, Peter Gerhart, Will Huhn, Bill Jordan, Mary Lyndon, Rena Steinzor, and participants at a faculty workshop at the University of Akron School of Law for their very helpful comments on an earlier draft.

1. See John S. Applegate, *The Perils of Unreasonable Risk: Information Regulatory Policy and Toxic Substances Control*, 91 COLUM. L. REV. 261, 284–89 (1991) (discussing the toxic data gap); *infra* notes 23–25 and accompanying text. For a general discussion of the biases that sometimes afflict research produced for regulation, see Katherine S. Squibb, *Basic Science at Risk: Protecting the Independence of Research*, in RESCUING SCIENCE FROM POLITICS: REGULATION AND THE DISTORTION OF SCIENTIFIC RESEARCH 46 (Wendy Wagner & Rena Steinzor eds., 2006).

2. See *infra* notes 78–79 and accompanying text.

3. See, e.g., John S. Applegate, *The Government Role in Scientific Research: Who Should Bridge the Data Gap in Chemical Regulation?*, in RESCUING SCIENCE FROM POLITICS, *supra* note 1, at 255, 268 (discussing the failure of environmental law in general and the Toxic Substances Control Act (TSCA) in particular to generate information).

4. 15 U.S.C. §§ 2601–2692 (2000).

5. See generally Daniel C. Esty, *Environmental Protection in the Information Age*, 79 N.Y.U. L. REV. 115 (2004) (discussing how access to lower cost information through technological advances prompts a need for institutional efficiency, and suggesting that laws should thus be restructured to create incentives to generate knowledge).

6. Except for chemicals produced in high volumes and posing a substantial risk of exposure, see, for example, 15 U.S.C. § 2603(a)(1)(A) (2000), TSCA provides the EPA with the authority to impose testing requirements on new chemicals only if the EPA can demonstrate that

regulatory authority, the EPA has issued testing mandates for fewer than 200 chemicals.⁷ Most of the remaining chemicals, which include approximately 75,000 individual chemical substances, are effectively unrestricted and often unreviewed with regard to their health and environmental impacts.⁸ Even when there is considerable information indicating that a chemical is unsafe, as there was in the case of asbestos, the EPA still must engage in a long and difficult regulatory struggle before imposing the “death penalty” on the hazardous chemical.⁹

If it isn't bad enough that TSCA provides inadequate chemical screening, the Act contributes one more black eye to the manufacture of safe chemicals: it inadvertently reinforces adverse selection for under-tested chemicals. Without regulatory certifications or rewards for extensive testing, there is no market recognition or other trustworthy validation of a manufacturer's conscientious research investment. Cost-cutting manufacturers can thus out-compete rival manufacturers who invest heavily in testing to ensure the safe and efficacious use of their chemicals.¹⁰ In fact, “good” manufacturers, who invest in researching the effectiveness and safety of their products, may not only lose the money spent on testing but could also inadvertently trigger interest from plaintiffs' attorneys and regulators since there will be some toxicity information available that flags their products as potentially hazardous. In such a regime, testing can become a negative attribute, and the chemicals about which little is known are given a competitive advantage over chemicals subjected to extensive research or “green” innovations.

While such a counterproductive regulatory scheme would seem at first blush to be a perfect candidate for public-spirited reform, the political system is poorly equipped to redress the perverse incentives for chemical ignorance. The highest stakes participants in toxics policy are the chemical manufacturers and, not surprisingly, they have become well-organized and fortified against reform of a regulatory scheme that they

existing data are “insufficient” to assess the chemical and the EPA has reason to suspect that the new chemical “may present” a risk or hazard. *Id.* § 2604(e). The weaknesses of this form of law is discussed in Applegate, *supra* note 1, at 315–16.

7. U.S. GOV'T ACCOUNTABILITY OFFICE, REPORT NO. GAO-05-458, CHEMICAL REGULATION: OPTIONS EXIST TO IMPROVE EPA'S ABILITY TO ASSESS HEALTH RISKS AND MANAGE ITS CHEMICAL REVIEW PROGRAM 18 (2005), available at <http://www.gao.gov/new.items/d05458.pdf> [hereinafter CHEMICAL REGULATION]; see also U.S. GEN. ACCOUNTING OFFICE, REPORT NO. GAO/RCED-94-103, TOXIC SUBSTANCES CONTROL ACT: LEGISLATIVE CHANGES COULD MAKE THE ACT MORE EFFECTIVE 46 (1994), available at <http://archive.gao.gov/t2pbat2/152799.pdf> (discussing the lack of testing required of existing chemicals and reporting that “[a]ccording to EPA officials, the agency has not used its authority to require more testing, largely because it must undergo a lengthy and costly rule-making process”).

8. See, e.g., EPA, What is the TSCA Chemical Substance Inventory?, <http://www.epa.gov/opptintr/newchems/pubs/invntory.htm> (identifying roughly 75,000 chemicals in the TSCA Inventory). The EPA estimates that for new chemicals, only fifteen percent of the pre-manufacture notices contain any information on health and safety testing. CHEMICAL REGULATION, *supra* note 7, at 11.

9. See e.g., *Corrosion Proof Fittings v. EPA*, 947 F.2d 1201, 1215 (5th Cir. 1991) (invalidating the EPA's ban of asbestos under TSCA because the agency has the burden of proving a chemical places an unreasonable risk on the public, and in this case, the EPA did not do a thorough enough assessment).

10. See *infra* Part I.B.

find quite congenial to their interests.¹¹ The diffuse public, whose views are loosely represented by a few public interest groups, cannot begin to match this strong manufacturer block with a vested interest in the status quo.¹² With the exception of a few highly publicized near-crises that spark majoritarian activity, chemical regulation is likely to be paralyzed in its existing dysfunctional state.

This Article considers the entrenched failure of chemical regulation and offers a different angle for regulatory reform that taps into market competition between rival firms to produce relevant information about the toxicity of certain chemical products on the market.¹³ By repositioning the regulatory decision as an adjudication between rival manufacturers, the proposed regulatory process is fueled by the expertise, information, and energies of manufacturers of safer products eager to put their competitors' more hazardous products out of business. This shift in regulatory approach also breaks up the unified political coalition of manufacturers into two groups—those that might enjoy competitive benefits from such a proposal because they have been vigilant in testing their products and those that will lose because they have not. While this shift does not guarantee that some manufacturers will be persuaded to support a competition-based reform of toxics policy, it at least provides some hope of an altered configuration of stakeholders that are less resilient in opposing reform.

The proposal for a competition-based approach to chemical regulation unfolds in three Sections. The first Section details the ways that TSCA exacerbates adverse selection in the chemical market by failing both to encourage adequate toxicity testing and to reward elaborate testing when it does occur. The second Section offers a competition-based proposal that redresses this problem by rewarding manufacturers who prove that their products are environmentally superior to identified competitor products. The final Section looks beyond the regulation of chemicals to other regulatory arenas—including the regulation of pesticides, nanotechnology, drugs, and polluting activities—to consider how competition-based regulation might advance these programs. This Section also explains how competition-based regulation fits with other economic and incentive-based tools used in environmental policy.

I. WHY CHEMICAL REGULATION HAS FAILED IN THE UNITED STATES

The regulation of chemicals in the United States is based on a familiar cops-and-robbers model that pits regulators and regulated parties against one another. Under such a regime, it is ultimately up to the cops (the EPA) to find the robbers (the

11. *See infra* Part I.C.

12. *See, e.g.*, NEIL K. KOMESAR, *IMPERFECT ALTERNATIVES: CHOOSING INSTITUTIONS IN LAW, ECONOMICS, AND PUBLIC POLICY* 167–68, 192 (1994) (noting that in the area of product safety where the potential for injuries is small, but the harm to individuals is serious, “[t]he skewed distribution can lead and, in this context, appears to have led to overrepresentation of the position of the potential injurer group” in the political process).

13. For the first and apparently the only discussion of using competition as a regulatory tool, see DAVID DRIESEN, *THE ECONOMIC DYNAMICS OF ENVIRONMENTAL LAW* 153–61 (2003). Professor Driesen not only offers some concrete examples of how such an approach might work in the context of polluting industries, but he also provides a thoughtful, theoretical discussion of how the approach fits with existing regulatory tools.

problematic chemicals) and develop evidence against them before taking regulatory action. The effectiveness of toxics policy thus depends in large part on how many cops there are relative to robbers and how easy it is to amass evidence against them.

As one might expect in such a resource-intensive regulatory regime, the cards are stacked in the robbers' favor. The number of chemicals dwarfs the number of regulators by at least two-hundred fold.¹⁴ Adding insult to injury, there are no incentives for manufacturers to take affirmative steps to voluntarily test their chemicals for long-term hazards; as a regulatory matter, chemicals subjected to rigorous toxicity testing are not distinguished from the tens of thousands of other chemicals about which nothing is known. Finally, since regulated parties are pitted as a group against regulators, the manufacturers have formed a unified coalition that blocks meaningful reform. Each of these problems is considered in turn.

A. The Cops-and-Robbers Model

While TSCA creates a "presumption of innocence" for a chemical unless the EPA establishes that it may pose an "unreasonable risk" to human health or the environment, the Act does not provide the EPA with the equivalent authority or resources to develop evidence against a chemical when information is scarce.¹⁵ Unlike the regulatory programs governing drugs and pesticides, chemical manufacturers are not automatically required to test their products as a condition to marketing. In fact, the Act actually places the burden on the EPA to justify not only the need for regulatory action, but also any demands for basic testing in circumstances where little information is available.¹⁶ The EPA thus faces a classic Catch-22: the agency can require a manufacturer to conduct testing on a chemical in order to evaluate its safety, but in order to require testing, the EPA must have some scientific information that shows evidence of a risk.¹⁷

As long as the EPA bears the burden of proof of showing risk as a prerequisite for regulation, the rational response from manufacturers is to stonewall by producing as

14. As of December, 2007, the EPA's Office of Pollution Prevention and Toxics employed between 325 and 350 employees, including secretarial assistants. Telephone conversation with EPA, OPPT receptionist at (202) 564-3810 (Dec. 11, 2007). Only a portion of this staff is assigned to the oversight of chemicals under TSCA. *Id.* By comparison, there are currently over 75,000 chemicals under the jurisdictional reach of TSCA. *See supra* note 8.

15. *See* 15 U.S.C. §§ 2604(f)(1), 2605(a) (2000); *see also* Applegate, *supra* note 3, at 257 (discussing how TSCA places the burden on the EPA to justify regulatory intervention).

16. For an excellent discussion of the current obstacles that afflict the ability of regulators to specify the quantity and quality of testing needed under TSCA, *see* Applegate, *supra* note 1, at 310–13.

17. *E.g.*, Chem. Mfrs. Ass'n v. EPA, 859 F.2d 977, 984 (D.C. Cir. 1988) (holding that the EPA must establish a "more-than-theoretical" probability of an unreasonable risk in order to require additional testing). *See generally* CHEMICAL REGULATION, *supra* note 7, at 18, 26 (finding that the EPA's burden has deterred the agency from requiring testing); Applegate, *supra* note 1, at 315–16 (discussing the test rule in more detail); Sarah Bayko, Note, *Reforming the Toxic Substances Control Act to Protect America's Most Precious Resource*, 14 SE. ENVTL. L.J. 245, 267–69 (2006) (relating that the EPA now negotiates testing largely outside the jurisdiction of TSCA).

little information as possible on their chemicals.¹⁸ If there are no toxicity testing results available, the EPA is handicapped in establishing that a chemical poses a risk.

The EPA is further handicapped in its “cops” role by its adversarial relationship with manufacturers who enjoy asymmetrical access to information about the riskiness of their chemical products.¹⁹ Because of their unique role as the creators of chemicals, manufacturers typically have superior knowledge about potential adverse health and environmental effects as well as trade secret protected information about chemical structures that are inaccessible to the general public and the scientific community.²⁰ Even if they choose not to test for long-term hazards, manufacturers typically know best the types of risks that deserve priority attention and are often the first to learn of adverse effects in the lab, in the workplace, or in commerce.²¹

Manufacturers’ superior access to information about the risks of chemicals may not only adversely impact the quantity of scientific information they share with regulators,²² but could also impair its quality. If there is not a pre-set protocol that constrains how a toxicity study is conducted, it is difficult to limit a manufacturer’s discretion in how it chooses to conduct, analyze, and report its toxicity testing.²³ There is some evidence that manufacturers have sometimes taken advantage of this discretion by manipulating research to produce a particular outcome.²⁴ In some instances, the only way for regulators to detect distorted research is to replicate the study themselves. Yet the EPA rarely does this and has even failed to implement simple measures that would assist it in evaluating the reliability of environmental research, such as requiring

18. *E.g.*, Mary L. Lyndon, *Information Economics and Chemical Toxicity: Designing Laws to Produce and Use Data*, 87 MICH. L. REV. 1795, 1813–17 (1989).

19. *E.g.*, Wendy E. Wagner, *Commons Ignorance: The Failure of Environmental Law to Produce Needed Information on Health and the Environment*, 53 DUKE L.J. 1619, 1641–49 (2004) (detailing the ways that regulated parties enjoy asymmetrical information).

20. *See* Mary L. Lyndon, *Secrecy and Innovation in Tort Law and Regulation*, 23 N.M.L. REV. 1, 34–39 (1993) (discussing the costs of broad protections for confidential business information). *See generally* Thomas O. McGarity & Sidney A. Shapiro, *The Trade Secret Status of Health and Safety Testing Information: Reforming Agency Disclosure Policies*, 93 HARV. L. REV. 837, 840–48 (1980) (discussing benefits of the full disclosure of health and safety data submitted to administrative agencies).

21. *E.g.*, Applegate, *supra* note 1, at 299; Lyndon, *supra* note 18, at 1815.

22. Manufacturers are required to disclose adverse effects of their products, *see*, for example, 15 U.S.C. §§ 2607(c), (e) (2000), but the requirements for disclosure under TSCA are weak and ambiguous. *See, e.g.*, TSCA Section 8(e); Notification of Substantial Risk; Policy Clarification and Reporting Guidance, 68 Fed. Reg. 33,129, 33,130, 33,138 (June 3, 2003) (requiring reporting only for a “substantial risk” that occurs when, for example, evidence “reasonably supports the conclusion that the chemical substance or mixture can produce cancer, mutation, birth defects, or toxic effects resulting in death, or serious or prolonged incapacitation”).

23. For some types of toxicity tests, the EPA is able to establish the testing protocol in advance. *See* 40 C.F.R. § 158.340 (2004) (providing testing protocols under the Federal Insecticide, Fungicide, and Rodenticide Act, 7 U.S.C. § 136 (2000)). These protocols present cookbook-like steps that provide the researcher with very limited discretion in conducting tests.

24. *E.g.*, Wagner, *supra* note 19, at 1649–59.

manufacturers to provide statements on the extent of control they retain over the research that they commission.²⁵

The EPA's formidable burden of proof, coupled with a universe of tens of thousands of chemicals, many of which lack basic toxicity tests, is clearly not a blueprint for regulatory success. Without a large team of regulators, which the EPA lacks, the game is essentially over before it begins.²⁶ While the EPA has managed to take some regulatory action, including requiring additional testing on approximately ten percent of new chemicals through its more rigorous premanufacture notice (PMN) regulatory program,²⁷ it has demanded testing or imposed regulatory restrictions on less than two percent of chemicals that were in the TSCA inventory as of 1979.²⁸

Even the most vigilant public interest groups will find it difficult to fill these large gaps in regulatory oversight since they are similarly impeded by the extensive uncertainties and the correspondingly large investment of scientific expertise needed to determine whether and which chemicals are most hazardous. Their notoriously limited resources thus force them to engage in triage, generally focusing only on a few of the worst chemical substances and leaving the rest without public interest oversight.²⁹ Indeed, although public interest groups have been able to draw the public's attention to

25. See David Michaels & Wendy E. Wagner, *Disclosure in Regulatory Science*, 302 SCIENCE 2073, 2073 (2003) (proposing that agencies adopt a policy requiring parties submitting research to disclose conflicts of interest).

26. See, e.g., OFFICE OF TECH. ASSESSMENT, U.S. CONGRESS, NO. OTA-BP-ENV-166, SCREENING AND TESTING OF CHEMICALS IN COMMERCE 11 (1995) (reporting a 1994 GAO finding that in the nineteen-year history of TSCA implementation, the EPA had reviewed only about two percent of the chemicals then existing in commerce); see also *supra* note 14 (citing the relatively small staff the EPA has under TSCA). It should be acknowledged, however, that underfunding of the EPA is considered a chronic problem across virtually all programs, with greatest attention given to EPA's limited enforcement resources. See, e.g., JOEL A. MINTZ, ENFORCEMENT AT THE EPA: HIGH STAKES AND HARD CHOICES 113-18 (1995). Yet since TSCA is implemented only by the EPA and not supplemented by states, its underfunded status may have more dire consequences nationally relative to some of these other programs.

27. EPA, Summary of Accomplishments, <http://www.epa.gov/opptintr/newchems/pubs/accomplishments.htm>. Moreover, the EPA estimates that only about twenty percent of new chemicals submitted as pre-manufacture notices get a detailed review. CHEMICAL REGULATION, *supra* note 7, at 12.

28. See, e.g., *id.* at 17-18.

29. In the EPA's more than thirteen-year effort to promulgate a rudimentary rule requiring additional testing of certain chemical substances for neurological effects, for example, the chemical industry provided the bulk of the critical input on the proposed guidelines. See Multi-Substance Rule for the Testing of Neurotoxicity, 58 Fed. Reg. 40,262, 40,262-63 (July 27, 1993) (to be codified at 40 C.F.R. pt. 799). In another case, the EPA attempted to demand through one of its testing powers under TSCA that industry conduct additional tests on their chemicals. In settling the case in order to expedite the industry's testing, the EPA made a number of concessions that limited the information that the EPA would ultimately acquire from the regulated parties. See EPA, Revocation of Final Multi-substance Rule for the Testing of Neurotoxicity, 60 Fed. Reg. 4514 (Jan. 23, 1995). For example, the settlement involved requiring testing on seven, not ten of the chemicals; and the tests were less ambitious and fewer in number. The only party commenting on this negotiated settlement was the industry trade organization, the Chemical Manufacturers Association (CMA), which endorsed the settlement.

the program-wide absence of basic toxicity testing (a success discussed below),³⁰ that may well be the outer limit of what they can accomplish when confronted with such an immense and data poor chemical universe.³¹

Once a regulatory system fails, other institutions may pick up the slack, but in practice, both the market and the tort system serve in many instances only to compound the perverse incentives for chemical ignorance. For its part, the market offers few comparative advantages to manufacturers who conduct rigorous toxicity tests to ensure the safety of their chemicals. Corporate self-proclamations that a chemical is safe or “green”—even when true—generally cannot be verified by consumers and thus may be discounted as “cheap talk,” despite the fact that consumers may be otherwise receptive to this type of information.³² Adding to the equation is the unfortunate fact that the costs of conducting toxicity testing are often significant and may not produce definitive results one way or another or, even worse, might reveal unexpected hazards.³³ In most situations, then, the market provides no rewards for manufacturers who make the investment to ensure that their chemicals are adequately tested and that long-term hazards are minimized.³⁴ As a result, there are both no rewards and potential penalties arising from the market with respect to what a manufacturer might learn if they conduct testing.

Tort law provides little corrective in reversing these perverse incentives for ignorance and instead similarly tends to exacerbate the problem.³⁵ Much like

30. See *infra* text accompanying notes 50–53.

31. *Id.*

32. Lyndon, *supra* note 18, at 1816 (discussing how information on chemical safety produced voluntarily by manufacturers might be discounted because of its commercial context); *id.* at 1813–14 (“Comprehensive and accessible toxicity rating systems would support affirmative advertising, but without a developed information context, there is no incentive to study a chemical: the long-term health effects remain invisible for one’s own products and for those of one’s competitors.”). At least one commentator has suggested that some manufacturers are also worried about exposing themselves to Federal Trade Commission enforcement if that agency later determines that their “green” claims are in error. E. Howard Barnett, *Green with Envy: The FTC, the EPA, the States, and the Regulation of Environmental Marketing*, 1 ENVTL. LAW. 491, 507–08 (1995). Thus, current federal regulation of labels may actually act as a deterrent to advertising environmental attributes of products. *Id.*

33. Richard J. Pierce, Jr., *Causation in Government Regulation and Toxic Torts*, 76 WASH. U. L.Q. 1307, 1324–25 (1998) (emphasizing false positives resulting from early screening tests and expressing the concern that “there is no finite limit on the amount of testing that can enhance our understanding of the potential risks that are posed by a substance.”).

34. See generally Lyndon, *supra* note 18.

35. See, e.g., Applegate, *supra* note 1, at 299–300 (noticing how toxic tort claims are unlikely to fill the toxics data gap); see also Margaret A. Berger, *Eliminating General Causation: Notes Towards a New Theory of Justice and Toxic Torts*, 97 COLUM. L. REV. 2117, 2135–40 (1997) (arguing that the current common law causation standard provides perverse incentives for defendants to remain ignorant); Heidi Li Feldman, *Science and Uncertainty in Mass Exposure Litigation*, 74 TEX. L. REV. 1, 41 (1995) (arguing that under-deterrence will occur under current toxic tort liability rules because “placing the burden of proof on the plaintiff creates a perverse incentive for actors to foster strong uncertainty about general causation”); Wendy E. Wagner, *Choosing Ignorance in the Manufacture of Toxic Products*, 82 CORNELL L. REV. 773, 796 (1997) (“The common law requirement that plaintiffs assume the entire burden of proving causation in toxic tort cases . . . creates inappropriate incentives for long-term safety

regulation, tort law requires plaintiffs to bear the burden of proving that the defendant's products or pollutants "more likely than not" caused their diseases.³⁶ Unless there are scientific links between the product and a particular disease, such as the association of asbestos exposure with a rare cancer like mesothelioma, victims are generally without recourse. When virtually no toxicity information is available on a chemical product, the manufacturer has little to fear from tort liability.³⁷ The tort system thus compounds the perverse incentives of the regulatory and market systems favoring ignorance³⁸ and seems capable of counteracting them only in highly unusual cases where plaintiffs have just the right mix of information regarding potential hazards and manufacturer neglect.³⁹

These entrenched incentives for ignorance help explain the substantial lack of toxicity testing for most chemicals in the United States. Virtually every prominent expert panel convened to consider the topic has expressed alarm at the dearth of research and basic information about the potential adverse effects of products, wastes, and industrial activities.⁴⁰ For example, as of 1984 no toxicity testing existed for more than eighty percent of all toxic substances used in commerce,⁴¹ and by 1998 at least one-third of the toxic chemicals produced in the highest volumes still failed to satisfy the minimal testing standards recommended by an international expert commission.⁴²

research . . .").

36. *E.g.*, W. PAGE KEETON, DAN B. DOBBS, ROBERT E. KEETON & DAVID G. OWEN, PROSSER AND KEETON ON TORTS § 41, at 269 (5th ed. 1984) (discussing that when proving causation, the "plaintiff must introduce evidence which affords a reasonable basis for the conclusion that it is more likely than not that the conduct of the defendant was a cause in fact of the result"). *See generally* Jean Macchiaroli Eggen, *Toxic Torts, Causation, and Scientific Evidence after Daubert*, 55 U. PITT. L. REV. 889, 895-909 (1994) (discussing the causation issue in toxic tort cases).

37. *Cf.* *Rider v. Sandoz Pharms. Corp.*, 295 F.3d 1194 (11th Cir. 2002) (affirming district court ruling that plaintiff's experts' testimony was inadmissible because it relied too heavily on circumstantially linking individual studies together to lead to an inference of causation between the drug Parlodel and the plaintiff's stroke; absent admissible evidence supporting a finding of causation, summary judgment in favor of the defendant was therefore appropriate).

38. *See supra* note 35.

39. This was arguably the case in the breast implant litigation. For competing accounts of that litigation that all seem to agree on the importance of manufacturer neglect in supporting plaintiffs' causation claims, see generally MARCIA ANGELL, *SCIENCE ON TRIAL: THE CLASH OF MEDICAL EVIDENCE AND THE LAW IN THE BREAST IMPLANT CASE* (1996); David E. Bernstein, *The Breast Implant Fiasco*, 87 CAL. L. REV. 457 (1999); Rebecca S. Dresser, Wendy E. Wagner & Paul C. Giannelli, *Breast Implants Revisited: Beyond Science on Trial*, 1997 WIS. L. REV. 705 (1997).

40. *See, e.g.*, NATIONAL RESEARCH COUNCIL, *GRAND CHALLENGES IN ENVIRONMENTAL SCIENCE* (2000); NATIONAL RESEARCH COUNCIL, *BUILDING A FOUNDATION FOR SOUND ENVIRONMENTAL DECISIONS* (1997); NATIONAL RESEARCH COUNCIL, *REVIEW OF EPA'S ENVIRONMENTAL MONITORING AND ASSESSMENT PROGRAM: OVERALL EVALUATION* (1995); NATIONAL RESEARCH COUNCIL, *RESEARCH TO PROTECT, RESTORE AND MANAGE THE ENVIRONMENT* (1993); NATIONAL RESEARCH COUNCIL, *TOXICITY TESTING: STRATEGIES TO DETERMINE NEEDS AND PRIORITIES* (1984) [hereinafter *TOXICITY TESTING*].

41. *See TOXICITY TESTING, supra* note 40, at 118 fig.2.

42. *See, e.g.*, ENVIRONMENTAL DEFENSE FUND, *TOXIC IGNORANCE: THE CONTINUING ABSENCE OF BASIC HEALTH TESTING FOR TOP-SELLING CHEMICALS IN THE UNITED STATES* (1997); Bureau of National Affairs, *CMA More Optimistic than EDF on lack of Data for 100*

B. Nice Guys Finish Last

The cops-and-robbers approach not only allows the “robber” (or untested chemical) to hide in the weeds, it also neglects to provide rewards for those manufacturers who do rise above this rational course by testing their chemicals for long-term hazards. TSCA makes no effort to distinguish the well-tested, environmentally benign chemicals from the under-tested yet potentially very toxic products.

In many ways, this chemical marketplace resembles Nobel Laureate George Akerlof’s famous “market for lemons.”⁴³ In his classic 1970 article, Akerlof explains why some markets, like the used car market, lead to the depressed quality of goods, called “adverse selection.”⁴⁴ When sellers of used cars enjoy asymmetrical information about the quality of their cars and withhold this information from buyers, buyers have no way to distinguish the “cream puffs” from the “lemons.” Instead, in such a market, buyers will tend to assume the mean quality and hence the mean price for used cars, a price that is too low to adequately compensate the owners of higher quality used cars, who then gradually exit the market.⁴⁵ As higher quality goods leave the market, the price continues to drop, leading to still more market exodus by the higher quality goods, and so on.

In the market for chemicals, an analogous type of adverse selection seems to exist, making it difficult for rigorously tested chemicals to compete with their untested rivals. Since tested chemicals are not distinguished from untested chemicals but are more costly to produce, they are likely to be less competitive in a nondiscriminatory market largely unable to validate a manufacturer’s claim of superiority.⁴⁶ Instead of counteracting this perverse feature of the market, regulatory requirements and tort law may ultimately reinforce the resulting market for lemons by singling out and imposing heavier demands on chemicals for which some testing exists but where the resulting risks remain quite uncertain. In such a regime, nice guys finish last, or they at least find it tough to compete with their cost-cutting competitors. There is no straightforward way to determine empirically whether adverse selection occurs in the chemical market, but the dearth of toxicity testing available for most chemicals suggests that conscientious testing for long-term hazards may not be a successful competitive strategy.⁴⁷

Chemicals, DAILY ENV’T REP., at A-4 (Dec. 1, 1997); Environmental Protection Agency, Office of Pollution Prevention and Toxics, *What Do We Really Know About The Safety of High Production Volume Chemicals?*, 22 Chem. Reg. Rep. (BNA) 261 (1998).

43. George A. Akerlof, *The Market for “Lemons”: Quality Uncertainty and the Market Mechanism*, 84 Q. J. ECON. 488 (1970); see also Lyndon, *supra* note 18, at 1814 n.72 (making this same observation about the chemicals market).

44. Akerlof’s “lemons market” is the same as “adverse selection,” although the latter term does not appear in his article. NobelPrize.org, The Prize in Economics 2001—Information for the Public, http://nobelprize.org/nobel_prizes/economics/laureates/2001/public.html (attributing Akerlof with developing the theory of adverse selection in his 1970 article).

45. Akerlof, *supra* note 43, at 489–90.

46. Lyndon, *supra* note 18, at 1814 n.72 and accompanying text.

47. See *supra* text accompanying notes 40–42.

C. The Impasse for Reform

For the uninitiated in toxics regulation, the most curious part of this regulatory saga is the unhappy ending—why has such a badly structured program been tolerated for more than thirty years? The answer is grim. Somewhat perversely, the multiple, overlapping incentives for toxic ignorance seem to have solidified within the regulated community a resolve to resist legislative change.⁴⁸

Currently, the benefiting stakeholders—namely chemical manufacturers—have a strong interest in keeping the dysfunctional program in place, in part because the disincentives for under-testing are tightly interconnected. Requirements that demand additional testing, lower the EPA's burden of proof, or otherwise subject chemical manufacturers to greater regulation risk subjecting them to a greater probability of tort liability and marketplace stigma. Mandatory toxicity testing thus becomes a dreaded development since there is no telling what such testing might ultimately reveal. At the same time, this group of high stakeholders is able to form, through its members' common interests and ample resources, a powerful coalition to block political action by its adversaries.⁴⁹

Positioned against this powerful high stakes coalition are a few poorly organized environmental nonprofits who loosely represent the diffuse public. These nonprofits face the challenge of making the risks posed by untested chemicals salient for the public in a way that will catalyze the masses into action.⁵⁰ This is not an easy task. The fact that a chemical, or even tens of thousands of chemicals, has been inadequately tested is hardly an environmental catastrophe. In fact, additional testing may simply reveal that the untested chemicals are nevertheless safe. While environmentalists have managed to publicize the fact that a large number of chemicals are rarely tested, even this victory has been accomplished with extraordinary effort and only partial success. In the United States, as the result of a powerful initiative by the Environmental Defense Fund, basic testing is now being voluntarily conducted for a subset of the chemicals produced in high volumes, but this is an advance that was arguably already guaranteed under the 1976 version of the Act.⁵¹ In Europe, the new REACH program⁵²

48. See *infra* text accompanying note 49.

49. Examples of such coalitions are trade associations among sectors of the chemical industry, which include the American Chemistry Council (formerly Chemical Manufacturers Association), <http://www.americanchemistry.com>, as well as subgroups such as the Chlorine Chemistry Council, <http://c3.org>.

50. Cf. Constance A. Nathanson, *Social Movements as Catalysts for Policy Change: The Case of Smoking and Guns*, 24 J. HEALTH POL. POL'Y & L. 421, 442 (1999) (discussing how nonprofits require "credible risks" to motivate the diffuse public).

51. See generally EPA.gov, High Production Volume (HPV) Challenge Program, <http://www.epa.gov/chemrtk/index.htm> (providing information on the program). The HPV Challenge Program involves voluntary agreements between the EPA and manufacturers to test chemicals produced in high volumes. This voluntary agreement was attractive to industry in part because the EPA has greater authority to require testing for this set of chemicals produced in high volumes where exposure risks are presumptively greater. 15 U.S.C. § 2603(a)(1)(B) (2000).

52. REACH stands for Registration, Evaluation, Authorization and Restriction of Chemical substances. REACH: What is Reach?, http://ec.europa.eu/environment/chemicals/reach/reach_intro.htm.

requires all chemicals marketed there to be tested under several basic tests, but this requirement is also limited in its scope and has not been extended to the United States.⁵³

Washington insiders seem to concede that meaningful reform of TSCA is not in the cards; the industry's fortified resistance is simply an insuperable obstacle to any meaningful amendments to increase testing or lower the EPA's burden to impose regulatory restrictions on toxic products.⁵⁴ Moreover, the public is simply not engaged or attuned to these abstract, futuristic worries. High profile, high media events that have sparked the dormant public into action against environmental harms in the past—oil spills, burning rivers,⁵⁵ Bhopal, and Love Canal—are less likely to arise in the chemical market where long-term risks of chemicals are difficult to link to a public catastrophe except in very unusual circumstances.

While occasional bursts of public-interest oriented activity, like REACH, may break through this political impasse from time to time by addressing part of the undertesting problem, it is not clear that even these significant strides can make substantial progress in securing meaningful regulatory oversight of chemicals. As skeptics have noted, the fact that some basic testing will be done on all chemicals, as guaranteed by REACH, still provides little assurance that the scientific results will factor back into regulatory consequences or produce useful information to purchasers.⁵⁶ Extrapolating from animal studies, which ply animals with high doses of a chemical to predict the human health risks from consumer products that include the same chemical in lower quantities, requires scientific expertise and assumption-laden models.⁵⁷ As long as scientific resources are in short supply, the ability to integrate this new batch of basic toxicity tests into regulation or market decisions may be quite disappointing.

53. See, e.g., EUROPEAN COMMISSION, ENVIRONMENT DIRECTORATE GENERAL, REACH IN BRIEF (2007), available at http://ec.europa.eu/environment/chemicals/reach/pdf/2007_02_reach_in_brief.pdf.

54. See, e.g., U.S. HOUSE OF REP. COMM. ON GOV'T REFORM, A SPECIAL INTEREST CASE STUDY: THE CHEMICAL INDUSTRY, THE BUSH ADMINISTRATION, AND EUROPEAN EFFORTS TO REGULATE CHEMICALS i-ii (2004), available at <http://www.democrats.reform.house.gov/Documents/20040817125807-75305.pdf> (discussing the chemical industry's fortified resistance to REACH); *Senate Democrats Plan TSCA Reform Bill Negotiations with Industry*, INSIDE THE EPA, July 22, 2005, at 29 (discussing industry's cohesive opposition to important aspects of TSCA reform).

55. But see Jonathan H. Adler, *Fables of the Cuyahoga: Reconstructing a History of Environmental Protection*, 14 FORDHAM ENVTL. L. REV. 89 (2002) (conceding that the burning Cuyahoga was a catalyst for the Clean Water Act, but arguing that the media reports about the significance of the fire and its implications for water quality were overstated and inaccurate).

56. See, e.g., William F. Pedersen, *Regulation and Information Disclosure: Parallel Universes and Beyond*, 25 HARV. ENVTL. L. REV. 151, 199-200 (2001) (discussing this problem with testing for the human papillomavirus (HPV)).

57. See also Jamie A. Grodsky, *Certified Green: The Law and Future of Environmental Labeling*, 10 YALE J. ON REG. 147, 221-24 (1993) (outlining the scientific obstacles involved in trying to develop green labels).

II. A DIFFERENT APPROACH: COMPETITION-BASED REGULATION

If a catastrophe is unlikely to occur to catalyze the low stakes, diffuse public, then an alternate way to effect change is to break up the block of high stakes interests and turn them against one another. A “divide and conquer” approach that taps into competition within an industry not only breaks the political impasse barring reform, but could also encourage the production of relevant toxicity testing and reward the “good guys” within the chemical industry, reversing the downward spiral of adverse selection in the chemical market.⁵⁸

This Section offers just such a “divide and conquer” proposal. It begins with the premise that the status quo regulatory approach, the cops-and-robbers model, will not produce meaningful regulatory oversight of chemical products. Uniform, basic testing for all chemicals as promised by the HPV initiative and the REACH program may move the regulatory glacier forward a few inches, but it cannot engage the regulation of chemicals in a manner that provides effective oversight of chemical hazards.⁵⁹ The first subsection presents the basic structure of a competition-based approach to chemical regulation. The next two subsections then delve into the details of the proposal: first, with respect to how it fits with TSCA, and second, by anticipating some of the challenges that remain with respect to such a competition-based regulatory approach.

A. Divide and Conquer—A Competition-Based Approach

A competition-based approach to chemicals regulation ties the regulation of chemicals back into the market, but unlike many other types of regulatory schemes, this one relies fundamentally on competitive processes to run the program. In competition-based regulation, regulators provide a venue for the “better” chemicals to prosper at the expense of the “worse” (untested or unnecessarily risky) chemicals by adjudicating claims of environmental superiority.⁶⁰ If a competitor establishes that there are measurable and significant differences between its product and a competitor’s product with regard to health or environmental consequences, the EPA may not only

58. I am most grateful to Neil Komesar and Victoria Nourse at the University of Wisconsin for this insight.

59. See *supra* text accompanying note 51.

60. Professor Applegate notes that rather than find ways to meet the high demand for toxicity information, legislative programs could be altered to regulate in a precautionary way, without insisting first on a great deal of scientific research documenting toxicity. Applegate, *supra* note 3, at 261–62. I assume, along with Applegate, that this will not be a politically feasible approach to regulation, particularly for the regulation of products that produce social goods along with the negative externalities. By contrast, in the regulation of pollution, a precautionary approach makes more sense since there are fewer social costs to overregulation. Limiting pollution may cause some lost profits, but this upstream, indirect cost seems less worrisome than the prospect of living without useful chemical products that often provide direct health benefits alongside the costs. In fact, most of the risk-risk tradeoff literature is concerned with finding the right level of regulation of products or deliberate additives, where the levels of regulation need to be more precise and hence information intensive. See *infra* note 91 and accompanying text.

certify this environmental superiority, but in some cases it might also restrict the inferior chemical with regard to its range of uses or even ban it entirely.

This regulatory power is justified by the EPA's authority to make "unreasonable risk" determinations under TSCA.⁶¹ By identifying the superior qualities of its product, a competitor effectively establishes that the inferior, more risky chemical product presents an unreasonable risk since the benefits of the inferior chemical, in light of an effective substitute, approach zero and do not offset the product's risks.⁶² Competition-based regulation carries the unreasonable risk calculation one step further, however, by rewarding the superior product. This certification of superiority operates almost like a patent or other intellectual property reward for first-movers who demonstrate socially positive innovations relative to more dangerous competitor products.⁶³ Government procurement decisions could even be tethered—by rule—to require the government to purchase only these superior products if they are available, or at least require government purchasers to stop purchasing inferior chemicals.⁶⁴

The key attribute of this approach is its ability to dredge up more comprehensive and accurate information on chemical risks and safer substitutes than the traditional command and control approach. Rather than rely on manufacturers to produce unflattering information about their own products' risks—an approach that has arguably failed—the competition-based approach enlists competitors to do the dirty work. As a result, far more useful information regarding chemical risks and exposures is likely to come forward. The striking similarity of this proposal with recent proposals for competition-based reform of the patent system—where non-patent-holders could file petitions to cancel a patent as invalid—attests to the increasing recognition by policymakers of the valuable role market competitors can serve in informing regulatory decisions.⁶⁵ Undoubtedly, manufacturers will sometimes overstate the risks of competitor products, but adversarial adjudications help protect against this overstatement by providing competitors with a full opportunity to rebut or disprove allegations of risk. Even the requirements of REACH and other proposals for more

61. *E.g.*, 15 U.S.C. §§ 2604(f)(1), 2605(a) (2000) (authorizing regulatory action on toxic substances "[i]f the Administrator finds that there is a reasonable basis to conclude that the manufacture, processing, distribution in commerce, use, or disposal of a chemical substance or mixture, or that any combination of such activities, presents or will present an unreasonable risk of injury to health or the environment").

62. *Id.* § 2605(c)(1)(C) (directing the EPA to consider "the benefits of such substance or mixture for various uses and the availability of substitutes for such uses").

63. The proposal essentially opts for a new type of property right to generate information, a move that bucks the current tide of pessimism regarding whether or how property rights can be meaningfully employed in environmental law, particularly to generate useful information. *See* Esty, *supra* note 5, at 129–39, 176–78 (discussing the limitations of a pure property rights approach to thinking about regulation); Richard T. Rapp, *How Economists See Competition Problems in High-Technology Industries*, 137 A.L.I.-A.B.A. 139, 139, 147 (1995) (discussing a variety of incentives that encourage innovation, beyond patents).

64. I am grateful to Rena Steinzor for suggesting this addendum to make the proposal particularly effective for government suppliers.

65. *See* Patent Reform Act of 2007, H.R. 1908, 110th Cong. ch. 32 (placed on Senate calendar, Sept. 11, 2007); *see also* NATIONAL RESEARCH COUNCIL, A PATENT SYSTEM FOR THE 21ST CENTURY 95 (2004).

rigorous substitute analyses rely primarily on manufacturers to produce the incriminating information on their own chemical's risks.⁶⁶

Although the details undoubtedly will require significant tweaking, a preliminary formulation of the proposal positions the EPA as the certifier of competitive claims of environmental or health superiority under TSCA. EPA would adjudicate these competitive claims through adversarial hearings in formal rulemaking fashion. If a company establishes that its product is significantly safer to the public health or the environment than a competitor product for an identified set of uses,⁶⁷ and it is available at roughly the same price per application, then the product could be certified as competitively superior for those uses unless this evidence is rebutted by the competitor.⁶⁸ Certifications of superiority need to be time-limited, but they should also provide claimants with some assured time—say two years—during which they can label their product as superior. If other, “me too” products file for similar superiority certifications in piggyback fashion, they would be required to reimburse the original manufacturer through a compulsory license.⁶⁹ A company receiving an inferior designation would, at the very least, be required to label its product by noting its inferior status relative to a superior substitute. The company receiving an inferior certification could appeal the agency's decision.

This claim of competitive superiority could encompass any number of different factors involving health or environmental effects. For example, a product could be characterized as superior if it provides the same service at the same cost, but involves fewer health risks to users, to the workers who manufacture it, or to the environment through leaching or volatilization. One could also imagine claims of environmental superiority with regard to life cycle costs where a product that is otherwise identical to

66. See, e.g., Registration, Evaluation, and Authorisation of Chemicals (REACH), Regulation (EC) No. 1907/2006, OJ L 396/1 (Dec. 30, 2006), at arts. 55, 60(4)–(5); see also Lars Koch & Nicholas A. Ashford, *Rethinking the Role of Information in Chemicals Policy: Implications for TSCA and REACH*, 14 J. CLEANER PRODUCTION 31–46 (2006) (arguing for greater attention to the availability of substitutes earlier in the risk analysis process).

67. The criteria for when evidence establishes a “significant” difference between products and how uses and risks should be compared could be determined either on a case-by-case basis or, ultimately through a rulemaking. The scant attention given to it here does not imply that it is an easy undertaking. The best approach might rely on several years of case-by-case adjudications to develop factual scenarios from which more general agency rules or guidelines can be drawn to help channel future petitions and adjudications.

68. The company can affix this certification of superiority relative to a competitor on its label. It also seems appropriate to require the inferior product to bear a label of their inferiority relative to the superior product. Such a label of “inferiority” would improve the value of the information to the market as well as penalize the loser. It would likely be justified under the broad authority to restrict products that the EPA enjoys under Section 6(a) of TSCA. 15 U.S.C. § 2605(a) (2000).

69. Under this compulsory license, first-movers would be required to sell their superior label to other manufacturers for a reasonable price that included not only the costs of innovation but also a premium to encourage that innovation. Cf., 17 U.S.C. § 115 (establishing a compulsory license for making and distributing phonorecords for nondramatic musical works). If the manufacturer-buyers believe the licensing fee is unreasonable, they could appeal the fee to the EPA for arbitration. A compulsory license is an essential component of the proposal since it helps keep the market competitive and saturated with superior products.

a competitor may be superior because it can be more safely disposed into landfills or is biodegradable. Keeping the idea of “superiority” open-ended might actually spur product innovation in unforeseeable, environmentally positive ways.

If a product is certified as superior, the certification could be useful not only to consumers, but also to insurers, investors, and might even ward off tort litigation since it would indicate that the manufacturer produced at least a “reasonable alternative design.”⁷⁰ This resolution of competitive claims will sometimes involve difficult decisions about the uses to which a product can be put, as well as the risks facing multiple users. For example, a competitor may argue that all uses are not replaced by a superior product, which in turn could potentially lead to complicated, detailed labels. A clear presumption could help streamline the decision making process in these cases; for example, EPA could establish a presumption that once a superior substitute is established, it is considered a complete substitute for all uses of the inferior product unless the manufacturer of the inferior product rebuts this presumption.

A claim of superiority would not only entail rewards in the market, but the prospect of regulatory awards as well. Once compared against a superior substitute, some inferior, risky products will have no redeeming benefits. When such a showing has been made by a competitor, the EPA may have little choice other than to ban or significantly restrict the inferior product since the evidence effectively establishes that the inferior product presents an “unreasonable risk” to health or the environment given the ready availability and comparable cost of a superior substitute.⁷¹ Such regulatory restrictions would fall only on those products that are completely out-competed with regard to all uses relative to the certified superior substitute. In addition, there is always a danger of a monopoly resulting from a regulatory determination to ban an inferior product, particularly when the market for a particular product is small. This possibility would obviously need to be factored into the agency’s ultimate decision, at least with respect to banning or restricting an inferior competitor, although a compulsory license requirement helps mitigate this risk.

A recent experience with coal-tar based asphalt sealants illustrates how this competition-based regulation might work. Through detective work, the City of Austin learned that coal-tar based asphalt sealants leach high levels of very toxic substances, called polycyclic aromatic hydrocarbons (PAHs), into surface waters.⁷² Austin officials discovered this because the PAHs were found in sediments in Barton Springs and biologists determined that the resulting toxic sediments were responsible for the decline of the endangered Barton Creek salamander population.⁷³ By tracing the

70. See RESTATEMENT (THIRD) OF TORTS: PRODUCTS LIABILITY § 2(b) (1998).

71. See, e.g., 15 U.S.C. § 2605(a) (2000).

72. See, e.g., Barbara J. Mahler, Peter C. Van Metre, Thomas J. Bashara, Jennifer T. Wilson & David A. Johns, *Parking Lot Sealcoat: An Unrecognized Source of Urban Polycyclic Aromatic Hydrocarbons*, 39 ENV'T. SCI. TECH. 5560 (2005); see also PETER C. VAN METRE, BARBARA J. MAHLER, MATEO SCOGGINS & PIXIE A. HAMILTON, *PARKING LOT SEALCOAT: A MAJOR SOURCE OF POLYCYCLIC AROMATIC HYDROCARBONS (PAHS) IN URBAN AND SUBURBAN ENVIRONMENTS* (U.S. Geological Surv., Fact Sheet 2005–3147, 2006).

73. See, e.g., David C. Richardson, *Parking Lot Sealants: On the Trail of Urban PAHs*, STORMWATER, May/June 2006, at 40, 42–44 (describing the City of Austin’s investigations); see also Kevin Carmody, *City Didn’t Provide All Data Needed to Assess Pool Risks*, AUSTIN AM. STATESMAN, Feb. 4, 2003, at A1 (reporting that an inquiry began when a city biologist got a

source of the PAH contamination upstream, Austin officials isolated the culprit—a parking lot at the top of a hill that had recently been sealed with coal-tar sealant and produced very high PAH readings. Further tests revealed that coal-tar sealants typically leach very high levels of PAHs, but other types of asphalt sealants not created from coal tar are significantly less toxic to the environment and are no more expensive than the coal-tar based sealants.⁷⁴ As a result of its findings, the City of Austin banned the use of coal-tar based asphalt sealants.⁷⁵ Several retailers, including Lowes and Home Depot followed the City's lead and refused to carry coal-tar sealants, and Dane County in Wisconsin also banned coal-tar sealants.⁷⁶ For reasons that appear to be linked to the perceived impotency of TSCA and the enormous burdens of restricting chemicals under Section 6 of that Act, the EPA has not taken regulatory action under TSCA against coal-tar based sealants.⁷⁷

Under the competition-based proposal, if a petition is filed by the manufacturer of a purportedly less toxic sealant, the EPA would be forced to rule on whether the coal-tar based asphalt sealants produce an “unreasonable risk.” This would be established through an adversarial hearing and buttressed by evidence supplied by the petitioner, including the availability of a safer substitute product.⁷⁸ Even if a competitor

rash after being immersed in Barton Springs while looking for sick salamanders); Memorandum from Joseph G. Pantaloni, Director, Watershed Protection and Development Review Department to [Austin] Mayor and [City] Council Members (June 22, 2005), at 4, *available at* http://www.ci.austin.tx.us/watershed/downloads/council_memo_jun05.pdf.

74. *See, e.g.*, CITY OF AUSTIN, THE COAL TAR FACTS: COAL TAR SEALANT FACT SHEET (2004), *available at* <http://www.ci.austin.tx.us/watershed/downloads/coaltarfacts.pdf>.

75. *See, e.g.*, Richardson, *supra* note 73, at 46.

76. *See, e.g.*, *Coal Tar-based Pavement Sealers Implicated As a Source of Urban Water Pollution*, SCI. DAILY., Feb. 13, 2007, *available at* <http://www.sciencedaily.com/releases/2007/02/070212101900.htm>; Matthew DeFour, *Dane County Bans Sealants with Coal Tar*, WIS. ST. J., April 6, 2007, *available at* <http://www.madison.com/wsj/home/local/index.php?ntid=128156&ntpid=5>.

77. *See, e.g.*, Letter from Brent Fewell, Acting Assisting Administrator, U.S. EPA, to Senator Jim Jeffords (Oct. 16, 2006) (unpublished letter on file with the Indiana Law Journal). In response to congressional inquiry as to its intentions to regulate coal-tar based asphalt sealants under TSCA, the EPA responded:

The Agency has authority under section 6 of the Toxic Substances Control Act (TSCA) to regulate the manufacture, processing, distribution in commerce, use, or disposal of a chemical or mixture; however, there are no TSCA restrictions on the use of coal tar or PAHs. To issue such a regulation, the Agency would have to show that it has a reasonable basis to conclude that one, or a combination of these activities, presents or will present an unreasonable risk. In taking this step, EPA would need to consider the relative contribution of PAH sources and judge the significance of coal-tar releases and the need for action.

Id. The EPA seems to be saying that it simply did not perceive the costs to outweigh the benefits of coal-tar sealants in light of the information collected by the City of Austin, but there is no analysis available to support its decision. The Agency also maintains it lacks jurisdiction to regulate the coal-tar under the Resource Conservation and Recovery Act, 42 U.S.C. §§ 6901–6908a (2000), since it is a legitimate, recycled product. *See* VAN METRE *supra* note 72, at 4.

78. This competitor-triggered approach could lead to rent-seeking behavior by some manufacturers. For example, even if they do not believe they will ultimately prevail in their claims of superiority against an inferior chemical, a larger manufacturer might abuse the processes to wear down a smaller competitor. *Cf.* Jonathan H. Adler, *Rent-Seeking Behind the*

manufacturing the non-coal-tar based sealant chose not to file a competitive claim, the City of Austin, Lowes, or an environmental group could advance the claim. A formal, adversarial hearing would also provide the manufacturers of coal-tar based sealants with the opportunity to defend their product; indeed, it may turn out after a fair and balanced hearing that the coal-tar based sealants are not environmentally inferior after all.⁷⁹

By engaging in oversight of chemical safety using information generated by competitors and other adversaries, this competition-based approach to regulation surmounts several problems that currently paralyze TSCA. First and most importantly, the competitive approach breaks through political gridlock by separating the high stakes participants into two competing factions—those that are likely to benefit from competitive “good guy” rewards and those that are not. Although it is unclear how many stakeholders will land on each side of this new political fence (an issue discussed more fully in Section II.C.), the proposal might generate enough defectors to support meaningful reform of TSCA.

Second, a competition-based approach uses economic inducements rather than generic statutory commands to generate useful toxicity information. This not only has the advantage of being more likely to produce information expeditiously, but is also more likely to produce information that has immediate, real world consequences in terms of public health and safety.⁸⁰ Rather than unilaterally demanding across-the-board testing, regardless of the effectiveness of substitutes or possible risks of exposure, this approach isolates the places in the market where dramatic improvements in the safety of chemicals are possible.⁸¹ The deployment of market forces thus focuses regulatory attention on the worst products that enjoy the largest market share. Profitable commercial products such as air fresheners, road de-icers, and fertilizers, which may contribute significantly to health and environmental hazards, might be scrutinized more intently through this new, competitive lens if manufacturers perceive that differences in product safety are significant enough to warrant regulatory distinctions.

Green Curtain, REG., No. 4 1996, at 26. To deter such abuses, the competition-based proposal should include a sanction for frivolous petitions or perhaps even award costs to manufacturers who are subject to claims of superiority that ultimately turn out not to be meritorious.

79. The coal-tar sealant producers in fact have made this argument in their defense. *See, e.g.*, Allan Heydorn, *Blinded by Science: Austin Coal Tar Ban Based on Flawed Study, Bad Science*, FORCONSTRUCTIONPROS.COM, Feb. 15, 2007, <http://www.forconstructionpros.com/publication/article.jsp?pubId=3&id=4487&pageNum=1> (reporting on industry position that Austin coal tar ban was based on bad science).

80. One of the drawbacks of generic, basic testing under the HPV or REACH programs has been the fact that this information is only preliminary and does not provide sufficient information upon which to base regulatory decisions. Instead, it may at best only provide a firmer foundation for prioritizing testing needs. *See, e.g.*, CHEMICAL REGULATION, *supra* note 7, at 41.

81. This proposal also effectively works to combat areas of preventable ignorance where participants have few incentives to learn of better ways to produce chemicals, but where this malaise produces considerable inefficiencies and unnecessary social losses. *See, e.g.*, Esty, *supra* note 5, at 154 (discussing a type of information gap “where the harm arises from production or consumption inefficiencies or mistakes, not externalities per se”) (emphasis omitted).

Third, competition-based regulation provides a mechanism for avoiding some of the scientific uncertainties that can paralyze chemical regulation, not only because competitors will produce more information on chemicals, but also because the proposal will lead to natural presumptions against suspect chemicals when well-tested and “safer” substitutes exist. For example, if one type of herbicide appears to disrupt hormonal systems in frogs, or is carcinogenic to animals, then a competitor’s product that lacks these risks and has no apparent offsetting risks may be certified as superior unless there is a compelling rebuttal. There need not be decisive evidence of harm in humans from the inferior product; only credible risks which are unjustified in view of the competition. Unjustified risks—relative to a substitute product—thus create a “default” presumption that the competitor must rebut in order to ward off a certification of inferiority.

Finally, reliance upon an adversarial hearing for a challenged chemical product would assure that the quality of the research underlying an assessment of both the inferior and superior products is better than when regulators are left to depend on self-testing provided by individual manufacturers without meaningful checks and balances. While those filing claims need not be competitors—they could be nonprofits or municipalities for example—the adversarial process should provide a more robust forum for rigorous, adversarial evaluation of the quality of research as compared to the current system which largely relies on uncontested information supplied to regulators by regulated parties.

B. Legal Details

In terms of legal specifics, the proposed reform involves three changes to the EPA’s current implementation of TSCA, each of which might be shoehorned into the existing program without additional legislative authorization. The first, relatively modest change is to clarify the agency’s role as referee over the claims of chemical product superiority with respect to health or environmental effects.⁸² Parties, including rival manufacturers, would submit information on competitive superiority under the citizen petition process of Section 21 and the agency would then preside over these claims.⁸³ The EPA’s ultimate authority to make unreasonable risk determinations and to restrict the inferior chemical with respect to labeling or use appears fully authorized by Section 6,⁸⁴ although the EPA could be explicitly directed to serve in this adjudicatory

82. In addition to showing that the contents of a product are superior to a competitor, a claimant could also show that the product—as labeled (with warnings or even the user instructions)—is inferior. For example, suppose that a strong body of evidence reveals that the dose recommended for a fertilizer is actually double what is necessary if the user does not remove grass clippings during the mowing cycles. A competitor that provides more precise use instructions could file a claim of inferiority against this product because the doses are effectively double what they should be for many consumers. *See* 15 U.S.C. § 2605(a)(3) (2000) (The EPA may require a chemical to be “marked with or accompanied by clear and adequate warnings and instructions with respect to its use, distribution in commerce, or disposal or with respect to any combination of such activities. The form and content of such warnings and instructions shall be prescribed by the Administrator.”).

83. *See id.* § 2620.

84. *See, e.g., id.* § 2605(a)(1)–(7).

role through an amendment to TSCA if the EPA were reluctant to implement this approach on its own.⁸⁵ The certification determination would necessarily be adversarial and include, at the request of an affected party, a formal hearing; but technically, since the authority to conduct a public hearing on a petition filed under TSCA is already authorized under the current statute, no legislative action is needed.⁸⁶

The second change from the status quo would require broadening the implementation of TSCA beyond the EPA's narrow focus on single chemical formulations to encompass regulatory oversight over chemical mixtures. As a legal matter, the EPA already has authority over chemical mixtures,⁸⁷ although it seems to have opted for a narrower approach—focusing primarily on individual chemical substances—presumably due to concerns about its regulatory workload and the feasibility of tracking commercial mixtures.⁸⁸ Technically, then, no formal amendment to TSCA would be needed for this aspect of the proposal either.

The third, and perhaps most important addendum to the EPA's current implementation of TSCA involves the EPA's authority to certify a product as superior: an amendment to the Act may be required to give the EPA this authority. Currently the EPA clearly has the legislative authority to restrict "inferior" products if they pose an "unreasonable risk."⁸⁹ The EPA's authority to certify products as superior, however, is not explicitly authorized or arguably contemplated by TSCA. The EPA may be able to argue that this authority is inherent in its ability to make any type of "unreasonable risk" determination; the labeling restriction includes the authority to identify a superior competitor as a form of regulatory restriction or warning.⁹⁰ If Section 6 of TSCA is not read this generously, then a statutory amendment might be required to provide the EPA with this authority since the certification of superiority provides an essential reward for those "good" manufacturers who engage in the claim process. Without this

85. *Id.*

86. *Id.* § 2620(b)(2) (granting the Administrator the authority to hold a "public hearing or . . . conduct such investigation or proceeding as the Administrator deems appropriate in order to determine whether or not such petition should be granted").

87. *See, e.g., id.* §§ 2601(a), 2605(a).

88. While the EPA has the authority to regulate chemical mixtures under Section 6 of TSCA—the section that provides it with the authority over existing chemicals—the EPA's chemical inventory and authority over new chemicals is limited only to "chemical substances," which by the EPA's own definition excludes most mixtures. *See, e.g.,* TOXIC SUBSTANCES CONTROL ACT INVENTORY REPRESENTATION FOR PRODUCTS CONTAINING TWO OR MORE SUBSTANCES: FORMULATED AND STATUTORY MIXTURES (undated), <http://www.epa.gov/opptintr/newchems/pubs/mixtures.txt>. It seems that these limits inherent in the inventory and new chemicals program have permeated the EPA's approach to existing chemical regulation as well, even though this is clearly not warranted or arguably even allowed under the explicit terms of the statute, which refer to both "chemical substances" and "chemical mixtures." *See, e.g.,* 15 U.S.C. § 2605(a) (2000) (instructing the EPA to regulate "chemical mixtures" that pose "unreasonable risks").

89. 15 U.S.C. § 2605(a) (2000).

90. *See id.* § 2605(a)(3), (7) (providing the EPA with the authority to require the manufacturers of the unreasonable risk products to provide warnings). One could argue that labels of superior products are part of a complete warning scheme in some settings and are thus included under this authority.

certification of superiority, the benefits of identifying inferior products accrue to all competitors, not just to the one bringing the claim.

C. Anticipating Problems

Despite its promise as a regulatory tool, there are a number of open-ended questions regarding the implementation of competition-based regulation that could impair its success in practice. First and foremost, it is not clear whether there actually will be significant distinctions in the safety of a sizable number of chemical products. In order to know in advance if there will be significant distinctions, we would need to know more about the characteristics of the products on the market, which is precisely the problem competition-based regulation seeks to redress. The few data points that do exist—for example, Austin’s discovery of the hazards of coal-tar sealant—suggest that there are at least some meaningful distinctions that could be drawn between competing products.

Second and relatedly, it is possible that an enormous amount of information and resources will be required by regulators to preside over each competition-based claim. A single claim of product superiority might not only be technically complex, but it might also be rebutted by showing that the allegedly superior product is actually environmentally inferior in other ways. This, in turn, will entail a more technical dispute that considers a number of individual risks and how the two competitor products fare in this multivariate matrix. Ultimately, multiple, risk-risk tradeoffs between two competitors could be thrashed out for weeks in highly technical hearings, only to end in a standoff that proves irreconcilable.⁹¹ One, modest anticipatory correction to limit some of these administrative costs is to require an unambiguous showing of superiority and to impose rigid limitations on evidence and briefs. If regulators insist on a clear showing of environmental superiority, then they may be able to quickly dispense of cases that involve apples-oranges comparisons.

Third, even if bright lines can be drawn between some inferior and superior chemicals on the market, manufacturers may still choose not to file competitive claims. Underutilization of the process could result from an unwritten allegiance between chemical manufacturers to resist regulatory intervention, but it more likely could emerge out of a perception that filing the claims will involve more costs than benefits. As an economic matter, the process might simply demand too many resources from claimants. If out-of-pocket costs associated with engaging in the process, which include the costs of the adversarial process and the costs of evaluating a competitor, appear to outweigh the profit gains, particularly given the uncertain probability of success, then filing a claim may simply not be worth the trouble. Even more problematic, manufacturers might resist taking advantage of the process out of fear that it will backfire—that their claim might not only fail to lead to a competitive advantage, but could generate dreaded tort liability if their competitor identifies unrecognized hazards with their product. Most states have adopted a “state of the art” defense to tort

91. Cf. JOHN D. GRAHAM & JONATHAN BAERT WIENER, *RISK VERSUS RISK: TRADEOFFS IN PROTECTING HEALTH AND THE ENVIRONMENT* (1995) (establishing the conceptual framework for making risk-risk comparisons). Even then, however, the resultant glut of information might move the market forward through improved information about various product-related risks.

claims, but the usefulness of this defense to manufacturers is often uncertain, even with respect to relatively well-tested products.⁹²

In order to anticipate and counteract possible underutilization of the process, at least to the extent it is driven by a concern about exposing oneself to unnecessary tort liability, the EPA could provide further clarification of what constitutes “careful” or “state of the art” chemical testing for purposes of tort law. While a preemptive federal statement of what constitutes “state of the art” would be a mistake for reasons discussed by a number of other commenters elsewhere,⁹³ federal guidance on what constitutes “exemplary” testing could provide more concrete guidance for manufacturers to use in assessing their litigation risks. The identification of clearer standards for the state of the art defense also helps set a high, but manageable, bar for chemical testing, thus reinforcing rewards for the “good guys.”

Fourth, challenges could arise under the First Amendment with respect to agency requirements for labeling or from antitrust law with regard to certifying one product as superior to another product. A closer look at both sets of concerns, thanks to work by Professor Grodsky in the eco-labeling context, suggests that these types of challenges are unlikely to be successful as long as the regulator’s decision of superiority involves significant health or environmental improvements between competitors, follows a robust evidentiary process, and is not otherwise arbitrary and capricious.⁹⁴ This is not

92. See, e.g., Michael A. Pope & Michael K. Bartosz, ‘State of the Art’: Is There any Life Left in the Defense?, in PREPARATION AND TRIAL OF A COMPLEX TOXIC CHEMICAL OR HAZARDOUS WASTE CASE 1986, 190 (PLI Litig. & Admin. Practice, Course Handbook Series No. 316, 1986) (outlining the various approaches of courts in adopting the state-of-the-art defense in products liability action); John W. Wade, *On the Effect in Product Liability of Knowledge Unavailable Prior to Marketing*, 58 N.Y.U. L. REV. 734, 756–60 (1983) (outlining variability in “state of the art” immunity with regard to types of knowledge over various time periods); Ellen Wertheimer, *Unknowable Dangers and the Death of Strict Products Liability: The Empire Strikes Back*, 60 U. CIN. L. REV. 1183, 1213–39 (1992) (describing the differences between the states in the adoption of the state-of-the-art defense). There are even variations within states. For example, the New Jersey Supreme Court refused to apply the state-of-the-art defense to an asbestos case in *Fischer v. Johns-Manville Corp.*, 512 A.2d 466, 473–79 (N.J. 1986), although the defense was allowed in a drug product liability action several years before. See *Feldman v. Lederle Labs.*, 479 A.2d 374, 386–88 (N.J. 1984).

93. See, e.g., Nina A. Mendelson, *Regulatory Beneficiaries and Informal Agency Policymaking*, 92 CORNELL L. REV. 397, 397 (2007) (arguing that the diffuse public is generally not included as participants in agency “guidances” that set policy and enforceable requirements).

94. There are both conceivable First Amendment and antitrust claims against such a certification scheme, but these claims seem to be peripheral and ultimately unsuccessful avenues for challenging the proposal. See, e.g., Grodsky, *supra* note 57, at 183–84 (analyzing First Amendment risks and concluding that successful claims are unlikely in national environmental certification scheme); *id.* at 199–200 (analyzing antitrust claims and concluding that courts will likely use “rule of reason” in assessing the certification and its anti-competitive effects). See also *Zauderer v. Office of Disciplinary Counsel of Supreme Court of Ohio*, 471 U.S. 626 (1985) (holding that the State of Ohio’s required disclosures for attorney advertisements did not violate the First Amendment since the requirements were reasonably related to the State’s interest in preventing consumer confusion and deception); *cf.* *Int’l Dairy Foods Ass’n v. Amestoy*, 92 F.3d 67 (2d Cir. 1996) (striking down mandatory labels of milk derived from cows treated with bovine growth hormones because the State of Vermont had not

to say that these types of challenges to competition-based regulation cannot be filed, but at this point they do not appear to present meaningful impediments.

Finally, it is unclear as a political matter whether manufacturers will actually fracture or whether they will instead remain united against regulatory or legislative change, even when it involves competition-based regulation. With respect to this question, a fair amount of the answer might depend on the specific gains and losses among different stakeholders and the way that reformists package the proposal for the regulated community.⁹⁵ Nevertheless, even if manufacturers continue to unite to resist change from the EPA or Congress, it is possible that a respected nonprofit could preside over claims of competitive superiority regardless of the political support for such a service.⁹⁶ While a nonprofit is not as publicly accountable as the EPA and would not enjoy the same regulatory powers to ban products, such an entity might still influence the market if some consumers, investors, or insurers considered its pronouncements reliable.⁹⁷

Despite these and undoubtedly a number of other open questions, there seem to be few risks to at least experimenting with competition-based regulation.⁹⁸ Competition-based regulation does not displace existing regulation; it simply adds to it. Except for modest staffing of the EPA to preside over the competitive claims, there is little to lose and possibly a great deal to gain. Experimentation may ultimately reveal that there are too many kinks, some of them unforeseeable, to make the proposal workable. Alternatively, the approach could be highly successful, leading to the creation of so much information that a larger forum and staffing for the adjudications would be necessary.

demonstrated that there was any health risk resulting from this type of milk or that it had any other credible interest in requiring labels regarding use of bovine growth hormones).

95. See Rena I. Steinzor, *The Reauthorization of Superfund: Can the Deal of the Century Be Saved?*, 25 ENVTL. L. REP. 10,016 (1995) (describing how a wide variety of affected stakeholders joined forces for Superfund reform and the features of the negotiations that led to this consensus).

96. See, e.g., Grodsky, *supra* note 57, at 209–10 (discussing this possibility in certification decisions).

97. Nonprofits already provide an important source of information on the effectiveness and safety of competing pesticide products. See, e.g., Pesticide Action Network, www.pesticideinfo.org. This organization is funded largely by foundations and the U.S. EPA. See *id.* (listing funders).

98. As noted above, there are risks that the process could be abused. See *supra* note 78. It is also unclear how the proposal might affect the structure of the industry. For example, perhaps small specialty chemical firms could thrive by establishing the superiority of their products. Conversely, perhaps only the very largest chemical producers could afford to file a petition and could gradually “take out” smaller competitors in a number of chemical markets. Greater study of the structure of the industry may be beneficial before engaging in modest experimentation; however, it is also possible that this type of regulatory innovation could actually cause a positive restructuring by creating new market niches for small producers of green specialty chemicals. Experimentation may thus be needed to gauge whether the impact of the proposal on the chemical market is on balance positive or negative.

III. BEYOND TOXIC PRODUCTS

Competition-based regulation is fueled by the power of fierce competition to generate information and tee up greater regulatory oversight over widely-used, unreasonably risky products. This final Section first considers how competition-based regulation fits within the regulatory toolkit more generally and then considers whether this approach can be transferred to the regulation of other types of products and polluting activities.

Although it is quite novel, the idea of using competition as a regulatory tool is not new: it was pioneered by David Driesen in his prize-winning book, *The Economic Dynamics of Environmental Law*.⁹⁹ Driesen argues that environmental law fails to adequately tap into the powerful, dynamic features of the market to encourage innovation and proposes, among other things, an “Environmental Competition Statute” to produce heightened rewards for environmental innovators.¹⁰⁰ Under Driesen’s proposed statute, firms that pollute less (for example, by devising cleaner processes) would be entitled to a private claim for damages against their dirtier competitors. The damages would include not only the costs expended in achieving the lower pollutant levels (i.e., switching to more expensive, but cleaner-burning fuels), but also a premium charge levied against the dirtier firm(s).¹⁰¹ This claim thus provides “first movers” with incentives for innovation by not only allowing them to recoup their costs of innovation, but simultaneously punishing their competitors.¹⁰² Since Driesen’s proposal focuses on ways that actors who create significant externalities should be forced to reimburse innovators who minimize those same externalities through innovation, there is no need for government except to adjudicate private claims arising between the clean innovators and dirtier plants.¹⁰³

The competition-based proposal for toxics policy introduced in this Article fits nicely with Driesen’s model since it also taps into competition to generate incentives for environmental innovation, but there are also a few key differences between the two approaches worthy of mention. First and possibly most important, in toxics policy one of the advantages of competition-based regulation is that it may offer a way to fracture the industry and produce a defecting coalition of manufacturers in support of reform. Driesen, by contrast, worries about firms colluding in opposition to his environmental competition statute since much of the affected, existing industry might be comprised of “dirty” companies and non-innovators.¹⁰⁴ Second, the primary function of competition-based regulation in toxics is to generate information about chemical products that regulators can then use to regulate these products more vigorously. While Driesen notes the potential information-generation advantages of his proposed statute,¹⁰⁵ the primary impetus of his approach is to reward environmental innovation and charge the

99. DAVID DRIESEN, *supra* note 13. Driesen’s book was awarded the American Political Science Association’s Lynton Keith Caldwell Award for the best book published in 2003 in science, technology, and environmental studies.

100. *Id.* at 153.

101. *Id.* at 153.

102. *Id.* at 155.

103. *Id.* at 153–54.

104. *Id.* at 154.

105. *Id.* at 155.

heaviest polluters with the resulting costs of improvement.¹⁰⁶ Indeed, he suggests that some information disclosure may need to be mandated in order to provide the first movers with information about other firms' emissions for their private causes of action.¹⁰⁷ Third and finally, in the toxics proposal the government, through the EPA, retains the key role in adjudicating claims of superior chemical products. Competition is used as the means for generating the regulation-relevant information. Driesen's proposal operates as a private claim between firms and thus entails much less administrative cost and bureaucratic infrastructure.¹⁰⁸ While these differences between the two proposals do not place the competition-based approach to toxics policy in direct conflict with Driesen's conception of competition-based regulation, they do suggest that competition-based regulation may be an even more dynamic tool for effecting environmental improvement than Driesen imagines.

A. Incentive-Based Regulation

With the notable exception of Driesen's pioneering work, the notion of tapping into fierce market competition to generate information about environmental hazards appears to be uncharted territory.¹⁰⁹ Economic-based regulatory tools focus almost exclusively on using the market to induce changes in pollution levels by charging polluters directly for their negative externalities. Primitive market-based controls, like taxes, simply assess producers of externalities for the costs they impose on society or some very rough equivalent.¹¹⁰ More advanced market-based approaches, like tradable pollution permit systems, allow participants to lower the marginal cost of pollution control through bargaining among themselves to meet pollution-reduction goals.¹¹¹ While these latter, market-based approaches encourage efficiency through the participants' bargaining, this regulatory approach does not tap into the competitive qualities of the market in a direct way likely to induce participants to generate adverse information against one another.

106. *Id.* at 153 ("If firms could systematically externalize the costs of cleanup without substantial administrative intervention, just as they externalize the cost of pollution, then even a fairly modest premium might create adequate incentives to control pollution.").

107. *Id.* at 155.

108. *Id.* at 154, 156–57.

109. The leading books on economic incentives in environmental law do not appear to consider this approach. *See, e.g.*, DAVID M. DRIESEN & ROBERT W. ADLER, ENVIRONMENTAL LAW: A CONCEPTUAL AND PRAGMATIC APPROACH 303–28 (2007); Jody Freeman & Charles Kostad, *Prescriptive Environmental Regulations Versus Market-Based Incentives*, in MOVING TO MARKETS IN ENVIRONMENTAL REGULATION: LESSONS FROM TWENTY YEARS OF EXPERIENCE 3 (Jody Freeman & Charles Kostad eds., 2006). *See also* Esty, *supra* note 5, at 147–48, 187–88 (outlining the regulatory approaches available to encourage the production of information in environmental law, but not listing this type of competition-based regulation, which includes voluntary features, market-based features, and information-disclosure features at the same time).

110. *See, e.g.*, ENVIRONMENTAL AND NATURAL RESOURCES POLICY DIVISION, CONGRESSIONAL RESEARCH SERVICE, REPORT ON POLLUTION TAXES, EFFLUENT CHARGES, AND OTHER ALTERNATIVES FOR POLLUTION CONTROL, 2–8 (1977).

111. *See, e.g.*, DRIESEN & ADLER, *supra* note 109, at 306, 317 (discussing the lack of empirical support for the ability of pollution trading programs to spur innovation).

A different set of incentive-based regulatory tools—information disclosures—come closer to simulating competition-based regulation, but these disclosures also stop short of using competitors to generate information.¹¹² Professor Karkkainen has argued persuasively that when they operate at their best, information disclosures of toxic releases or other hazards can be used by consumers, investors, or even companies themselves to establish their superiority in the market.¹¹³ The market and the related benefits of submitting flattering toxic release disclosures will generate some incentives for environmental reductions and reward the “good guys” in a relative sense. Yet the possibility that competitors might use this information more directly against one another is less likely under this program. Without a designated, regulatory mediator and more accurate information regarding the risks of individual products or processes, information disclosures cannot support rigorous claims of environmental superiority.¹¹⁴

Competition-based regulation also comes close to existing proposals for “eco” or “green” labels, but again it diverges in important ways that could cause competition-based regulation to be more successful, at least in theory. First, competition-based regulation is structured in a way that both provides pseudo-property rights for superior products, and, at the same time, stigmatizes one or more inferior substitutes with an increased risk of market, regulatory, or even tort types of liabilities. The effect of a certification of superiority is thus much more powerful than an eco-label, which, at its best, simply signifies that some producers have gone above the average standards of the industry. In addition, because it is adaptive and depends on competitors for information, competition-based regulation manages to dodge many of the problems that afflict eco-labeling by focusing narrowly on two or at least a discrete number of competitor products in a robust, adversarial process.¹¹⁵ The extraordinary difficulty of

112. Some scholars see information disclosures as the culmination—or at least the third step—of regulatory approaches that follow market-based tools. *See, e.g.*, Richard B. Stewart, *A New Generation of Environmental Regulation?*, 29 *CAP. U. L. REV.* 21, 127–52 (2001); Tom Tietenberg & David Wheeler, *Empowering the Community: Information Strategies for Pollution Control*, 3–5 (1998), <http://www.colby.edu/personal/t/ttieten/front.pdf>. In this schema, competition-based regulation might be the fourth step of regulation, which builds on these prior tools but also adds to them.

113. *See* Bradley C. Karkkainen, *Information as Environmental Regulation: TRI and Performance Benchmarking, Precursor to a New Paradigm?*, 89 *GEO. L.J.* 257, 323–28 (2001).

114. The information required to be disclosed under the Toxic Release Inventory (TRI) is only approximate and would not be reliable enough for making competitive claims of superiority. Under the Emergency Planning and Community Right-to-Know Act, 42 U.S.C. §§ 11001–11050 (2000), the regulated party is only required to make “reasonable estimates” using available data. If monitoring is not otherwise required by law, the regulated party need not do more than make a reasonable estimate. *Id.* § 11023(g)(2). An EPA study on the quality of data reported to the TRI reveals that manufacturers use actual monitoring data as one of the bases for estimating annual use, release, and disposal of hazardous substances less than 20 percent of the time, whereas purchase or inventory records are used in making roughly 80 percent of the estimates. EPA, 1996 TOXIC RELEASE INVENTORY: DATA QUALITY REPORT iii, tbl.4-1 (1998), available at http://www.epa.gov/tri/tridata/data_quality_reports/1996/sectx-4.pdf.

115. Eco-labeling generally involves generic certifications, approved through a rigorous process, that direct consumers to the more environmentally benign products on the market. *See, e.g.*, Roger D. Wynne, *The Emperor’s New Eco-Logos?: A Critical Review of the Scientific Certification Systems Environmental Report Card and the Green Seal Certification Mark*

promulgating certification standards and the moving target introduced by developing science that affect eco-labeling are studiously avoided in competition-based regulation through a rolling adjudicatory process that compares only a few products relative to one another.¹¹⁶ There is much less risk in a competition-based scheme that mediocre standards will become locked into place than there is in an eco-label program. There is also much less risk of misleading consumers since the comparison is a narrow one between two or a few specific competing products.¹¹⁷ Also unlike eco-labels, the attentiveness of consumers to superior certifications is secondary since competition-based regulation manages to impose unwelcome regulation or even tort consequences for the inferior product as well. If consumers and investors do not care about environmental superiority, then there is little value to an eco-label,¹¹⁸ but competitors may still perceive advantages to filing a claim of superiority against a competitor product in a competition-based regulation system. Finally, the proposal avoids the problems of poor quality or biased research that a manufacturer might use to support a “green label” since the information provided to the EPA under a competition-based approach is produced in an adversarial setting and is more thoroughly vetted by adversaries.

In sum, it appears that competition-based regulation falls outside the existing system of incentive-based regulatory tools. Turning regulated parties against one another to generate information and enhance regulatory oversight is a different sort of engine for environmental advancement. By combining property-types of rewards through the certification of superiority with increased risks of market stigma, regulatory restrictions, and an increased risk of tort liability for inferior products,¹¹⁹ competition-based regulation rolls several features of other incentive-based regulatory tools into a single approach.¹²⁰ Because of these critical differences in its fundamental operating features, competition-based regulation thus deserves its own unique label in the regulatory toolbox.¹²¹

Programs, 14 VA. ENVTL. L.J. 51, 55–56 (1994).

116. See Grodsky, *supra* note 57, at 221–24 (outlining some of the problems in defining open-ended “life cycle” benefits for products in certification programs); *Id.* at 224–26 (proposing a narrower basis, i.e. “limited multiple attribute analysis,” for certification decisions that seem to parallel the competition-based approach proposed in this Article); Wynne, *supra* note 115, at 64–72 (discussing the “vexing” task of identifying standards for eco-labels).

117. See, e.g., Wynne, *supra* note 115, at 93–114 (discussing how eco-labels may mislead consumers).

118. Cf. Michael P. Vandenbergh, *Order without Social Norms: How Personal Norm Activation Can Protect the Environment*, 99 NW. U. L. REV. 1101, 1132–38 (2005) (discussing why current eco-labeling approaches might fail to motivate consumers to avoid products that benefit society at large, rather than the consumers individually).

119. Competition-based regulation shines a worrisome light on the inferior product in general, but the prospect of increased tort liability is particularly worrisome in jurisdictions that use the “reasonable alternative design” test in determining design defects. See RESTATEMENT (THIRD) OF TORTS, *supra* note 70, at § 2(b) (formulating the “reasonable alternative design” basis for design defect claims).

120. See generally Guido Calabresi & A. Douglas Melamed, *Property Rules, Liability Rules, and Inalienability: One View of the Cathedral*, 85 HARV. L. REV. 1089 (1972).

121. In such a system, green chemistry and other expensive research and development efforts may still fail to receive adequate support in the early, unprofitable years. There will be clear market advantages to less toxic fertilizers, pesticides, herbicides, and other products like

B. Extending Competition-Based Regulation to Other Program Areas

Competition-based regulation is likely to be most effective, relative to the status quo, when the oversight of products or polluting activities requires the compilation of a great deal of information,¹²² when regulated parties possess most of this information and/or necessary expertise, and when there are sufficient distinctions between competing products or approaches. Competition-based regulation is also particularly useful in situations where nonprofit organizations or the diffuse public are unlikely to be able to counter the political power of the high stakes regulated communities and where adverse consequences of under-regulation are unlikely to materialize in visible or material catastrophes that spark public outrage.

In terms of applying competition-based regulation to other regulatory problems, pesticide regulation is the most obvious extension. Although the EPA has forced the generation of considerable information about the risks of pesticides in recent years through the Food Quality Protection Act (FQPA),¹²³ there is still little effort by the EPA to compare pesticide substitutes or translate existing toxicity information in a way that provides meaningful information to consumers' purchasing decisions.¹²⁴ In fact, although a comparison of substitutes is arguably allowed under FIFRA,¹²⁵ the EPA does not require data on the effectiveness of a pesticide during the registration process when assessing whether the pesticide constitutes an "unreasonable risk."¹²⁶ The EPA instead assumes that each pesticide has benefits, even if those benefits are clearly

sealants and materials entering the air, water, or land.

122. This seems to be an escapable feature of product regulation, at least when the products are socially beneficial. *See, e.g., supra* note 60.

123. *See, e.g.,* EPA, IMPLEMENTING THE FOOD QUALITY PROTECTION ACT: PROGRESS REPORT 35 (1999), available at <http://www.epa.gov/oppfead1/fqpa/fqpareport.pdf>.

124. Donald T. Hornstein, *Lessons from Federal Pesticide Regulation on the Paradigms and Politics of Environmental Law Reform*, 10 YALE J. ON REG. 369, 392 (1993) (arguing that "pesticide regulation is not . . . a body of law that addresses in any strategic way the underlying prevalence of pesticides in American agriculture, nor is it a body of law designed to minimize pesticide use.").

125. *See, e.g.,* 7 U.S.C. § 136(bb) (2000) (defining "unreasonable adverse effects" to include "taking into account the economic, social, and environmental costs and benefits of the use of any pesticide," which would seem to include consideration of the available substitutes); *id.* § 136d(b) (requiring the EPA to make an "unreasonable adverse effects" determination as a prerequisite to canceling or otherwise restricting a pesticide registration). On the other hand, FIFRA seems to actively protect worthless pesticides, at least at the registration stage. *See, e.g., id.* §136a(c)(5) (prohibiting the administrator from making the "lack of essentiality" of a pesticide a basis for denying its registration). This could support an argument that FIFRA bars the consideration of substitutes and efficacy.

126. *See, e.g.,* Mary Jane Angelo, *Embracing Uncertainty, Complexity, and Change: An Eco-pragmatic Reinvention of a First-Generation Environmental Law*, 33 ECOLOGY L.Q. 105, 163 (2006) (observing that "to obtain a registration, there is no requirement to demonstrate that a pesticide is essential. Moreover, the availability of alternative pesticides for the same use does not preclude registration. Further, FIFRA expressly authorizes EPA to waive all data requirements pertaining to efficacy and EPA has, by rule, done so."); *id.* at 183 (finding that benefits for a pesticide are assumed by EPA in its cost-benefit analysis because "at the time of registration, EPA does not determine whether more efficacious alternatives, including non-chemical alternatives, exist.").

overshadowed by more effective and less risky substitutes. As a result, the market could be glutted with unreasonably risky pesticides relative to safer substitutes.¹²⁷ If the EPA does not distinguish between an herbicide that is five times as toxic and ten times less effective than its similarly-priced competitor, then these environmental differences may not be known to others purchasing the products on the market.¹²⁸

Under the competition-based approach, the EPA would be forced to make these important comparisons between competitor products, which could in turn create incentives for the production of more environmentally sensitive pesticides.¹²⁹ Pesticide manufacturers, who have great expertise and considerable information about their own products as well as how to evaluate competitors' products, would be rewarded for sharing this information with regulators if they believe that their product is superior. In fact, in tort litigation there is some precedent for a risk-based type of comparison between substitute pesticides, although the comparison is not motivated by a competitor, but instead by a tort victim. At least one state has adopted a "reasonable alternative design" test for determining if a pesticide is unreasonably defective.¹³⁰ Under this test, if there is a superior and less hazardous substitute, the pesticide is vulnerable to product liability claims since its design may be considered unreasonable.

The oversight of health and environmental risks of nanotechnology is another problem regulatory area that might benefit from competition-based regulation. A number of scholars have expressed great concern that the available information is insufficient to evaluate the health and safety consequences of manufacturing, using, and disposing of products made with nanotechnology.¹³¹ Because the manufacturing community benefits from this unregulated state, moreover, it has been difficult to generate pressure for greater regulatory oversight.¹³² Competition-based regulation might provide a backdoor to encourage the generation of this type of information if the risks of competitor nanotechnology products are sufficiently divergent from one

127. If a manufacturer makes false claims about the efficacy of its pesticide, however, the EPA could take regulatory action against the manufacturer. *See, e.g.*, 7 U.S.C. § 136a(c)(1)(F) (2000) (providing the EPA with authority to require manufacturers to substantiate claims about a pesticide).

128. Currently, only consumers or municipalities collecting extensive information and/or engaging in grassroots campaigns develop this information and use it in the marketplace. *See* Pesticide Action Network, Pesticides Database, <http://www.pesticideinfo.org/index.html> (serving as an example of an excellent nonprofit website that provides this type of extensive information, including the availability of safer substitutes for individual pesticides).

129. Competition-based regulation would be most effective for products that have large markets, where competition is fierce. Coincidentally, these markets will also involve the most widespread use of the products. As a result, competition-based regulation naturally prioritizes the most widely used and unreasonably risky products by focusing on market competition.

130. *See, e.g.*, Keith Cunningham-Parmeter, *A Poisoned Field: Farmworkers, Pesticide Exposure, and Tort Recovery in an Era of Regulatory Failure*, 28 N.Y.U. REV. L. & SOC. CHANGE 431, 474–75 (2004) (discussing the use of the "reasonable alternative design" test in design defect litigation brought by an injured farmworker against a pesticide manufacturer in Washington state).

131. *See generally* J. CLARENCE DAVIES, EPA AND NANOTECHNOLOGY: OVERSIGHT FOR THE 21ST CENTURY (2007).

132. *E.g., id.* at 17–32 (describing the current failure of EPA to regulate nanotechnology and the weaknesses of the Toxic Substances Control Act in this particular effort).

another or from substitute products not made with nanotechnology to support credible claims of environmental superiority between rival products. More importantly, such a regulatory approach could reverse the incentives that currently lead to adverse selection and instead create positive incentives for competitive leap frogging with regard to environmental and health safety for at least some product lines.

Other products, like pharmaceuticals, might also benefit from competition-based regulation as a means to generate more reliable information about safety and efficacy, particularly in the years after a drug has been approved. If a competitor of Vioxx had an incentive and some preliminary information to file a competitive claim regarding the high risks and limited benefits of Vioxx relative to its own product, then the FDA might have learned sooner of the dangers of the drug.¹³³

Externalities-based regulatory programs are also amenable to competition-based regulation. Driesen suggests a private claims approach to encourage further pollution reductions for classic pollution problems.¹³⁴ Other permutations of competition-based regulation are also possible that may not encourage innovation, but at least might strengthen incentives for compliance with pollution-related requirements. In the Toxic Release Inventory (TRI) disclosure program¹³⁵ or standard pollution discharge requirements, for example, a statutory amendment could provide a company with competitive profit losses if they prove that their competitor failed to file timely or reliable estimates of toxic releases or otherwise enjoyed cost savings from noncompliance. More specifically, the competitor could file a claim for any economic losses—both transient and long-term—that they suffered by complying with the laws when their competitors failed to do so. This might include the simple costs of filling out the regulatory paperwork, plus interest, or even some percentage of profit losses that they suffered at the hands of their noncompliant competitor. Interestingly, these types of competitive claims might also survive standing obstacles that have barred other types of citizen suits, particularly with regard to proving possible redress and injury, since the manufacturers will be able to show real and direct economic losses from their competitor's noncompliance.¹³⁶ Somewhat similarly, under Proposition 65 in California, which requires warnings on products sold in California regarding carcinogenic risks and risks to pregnant women and fetuses, firms could turn in competitors for failing to disclose the adverse effects of their products. In exchange, they could receive, as a bounty, the profits that they lost to their competitor during the period the competitor product was illegally marketed.¹³⁷ In the related area of market-based pollution trading schemes, permit holders could also be awarded lost profits, extra permits, or other bonuses for reporting the violations of other permit holders, even for wholly past violations.¹³⁸ A more novel extension of competition-based

133. See, e.g., David Michaels, *Doubt Is Their Product: Industry Groups are Fighting Government Regulation by Fomenting Scientific Uncertainty*, SCIENTIFIC AMERICAN, June 2005, at 100.

134. See, e.g., DRIESEN, *supra* note 13, at 153–61.

135. See 42 U.S.C. § 11023 (2000) (requiring companies to report releases of hazardous substances that exceed a threshold amount).

136. See, e.g., *Steel Co. v. Citizens for a Better Env't.*, 523 U.S. 83 (1998).

137. See, e.g., Karkkainen, *supra* note 113, at 345–47 (describing the large incentive created by the liability rule in forcing companies to provide warnings under Proposition 65).

138. Since the value of permits in a tradable pollution market depreciates when there is

regulation would allow competitor manufacturers to report unjustified adverse health consequences from a rival's unsophisticated handling of toxic materials, as compared with their own superior substitute processes or technologies that result in lower amounts of toxic releases.¹³⁹ Again, the superior manufacturer would be rewarded the profits that they would have enjoyed had their inferior competitor used these more expensive, but less environmentally risky superior processes or technologies.

Competition-based regulation might be useful in a wide variety of other contexts that go beyond those enumerated here.¹⁴⁰ The market provides a valuable regulatory tool, not only because it offers a convenient forum for bargaining, but also because it can tap into competitive pressures that lead to increased information generation and innovation.¹⁴¹ By rewarding superior products with a property-type of entitlement—in the form of a short-lived certification or an award of lost profits—and subjecting inferior products to increased risks of regulatory restrictions, market stigma, and tort liability, competition-based regulation begins to reverse the downward spiral of adverse selection that has taken hold in a number of regulatory-influenced environmental markets.

CONCLUSION

The important but still seemingly unobtainable goal for chemical regulation is to generate a great deal of useful information which in turn informs decisions about the risks of chemicals on the market. When set against a regulatory community that enjoys asymmetrical information regarding their products and that is well-organized and well-staffed, the few overburdened environmental groups and regulators who represent the diffuse public cannot begin to keep up.

Competition-based regulation helps fracture these high stakeholders and pit them against one another in generating risk-related information that will allow the best products to rise to the top as competitively superior and the worst to be singled out as inferior. Perhaps as promising as its theoretical potential for solving the regulatorily-created market for lemons problem is the practical fact that this regulatory approach can be implemented without radical changes in the existing regulatory infrastructure and with few costs associated with experimentation. Chemical regulation shows no

significant cheating and noncompliance, permit-holders may be particularly eager to take advantage of opportunities to report fellow noncompliers.

139. Such a claim would take the TRI one step further by including direct competition into the release reporting. If a petroleum refinery reports high levels of fugitive air toxic releases, for example, a competitor refinery may be able to show that much lower emissions are possible with various processing or technological innovations. A fine, as well as a public statement, might result if the EPA determines, using the TRI data, that a firm's processing is indeed inferior to a competitor.

140. Technology-forcing mandates, with the paradigmatic example of the 1970 Clean Air Act mandating reduction in tailpipe emissions that resulted in the catalytic converter, may actually succeed through a form of this regulation. *See, e.g.*, ROBERT PERCIVAL, CHRISTOPHER H. SCHROEDER, ALAN S. MILLER & JAMES P. LEAPE, ENVIRONMENTAL REGULATION: LAW, SCIENCE, AND POLICY 564–67 (5th ed. 2006) (discussing the history of this technology-forcing mandate). If the “good guys” are truly rewarded with larger market shares of these technology-forcing mandates, then this might create competitive gains for some companies that lead them to increase their innovation and ultimately support the regulatory/legislative mandate.

141. *See generally* DRIESEN, *supra* note 13.

sign of immediate reform. It is time to give the competitive capabilities of the market a try.