

A R T I C L E

Using Competition-Based Regulation to Bridge the Toxics Data Gap

by Wendy Wagner

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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 U.S. 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. There is simply no way to sugarcoat the ugly truth: chemical regulation in the United States has been a dismal failure.²

The basic structure of the law governing toxic substances—the Toxic Substances Control Act (TSCA)³—deserves much of the blame for this regulatory dysfunction.⁴ In the regulation of chemicals, manufacturers are not required to do any testing unless commanded by EPA, and EPA must justify its demand with some scientific evi-

dence.⁵ Due in part to this formidable burden, in the nearly thirty years of its regulatory authority, EPA has issued testing mandates for fewer than 200 chemicals.⁶ Most of the remaining chemicals, which include approximately 83,000 individual chemical substances, are effectively unrestricted and often unreviewed with regard to their health and environmental impacts.⁷ Even when there is considerable information indicating that a chemical is unsafe, as there was in the case of asbestos, EPA still must engage in a long and difficult regulatory struggle before imposing the “death penalty” on the hazardous chemical.⁸

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. 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

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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).
2. 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* 255, 268 (Wendy Wagner & Rena Steinzor eds., 2006); Applegate, *supra* note 1.
3. 15 U.S.C. §§2601–2692, ELR STAT. TSCA §§2–412.
4. See generally Daniel C. Esty, *Environmental Protection in the Information Age*, 79 N.Y.U. L. REV. 115 (2004).

5. Except for chemicals produced in high volumes and posing a substantial risk of exposure, see, for example, 15 U.S.C. §2603(a), ELR STAT. TSCA §4(a). TSCA provides EPA with the authority to impose testing requirements on new chemicals only if EPA can demonstrate that existing data are “insufficient” to assess the chemical and EPA has reason to suspect that the new chemical “may present” a risk or hazard. *Id.* §2604(e).
6. U.S. GOV’T ACCOUNTABILITY OFFICE, *CHEMICAL REGULATION: OPTIONS EXIST TO IMPROVE EPA’S ABILITY TO ASSESS HEALTH RISKS AND MANAGE ITS CHEMICAL REVIEW PROGRAM*, (2005) REPORT NO. GAO-05-458, at 18, available at <http://www.gao.gov/new.items/d05458.pdf> [hereinafter *CHEMICAL REGULATION*].
7. See, e.g., EPA, *What Is the TSCA Chemical Substance Inventory?*, <http://www.epa.gov/opptintr/newchems/pubs/invntory.htm> (last visited June 1, 2009).
8. See, e.g., *Corrosion Proof Fittings v. EPA*, 947 F.2d 1201, 1215, 22 ELR 20037 (5th Cir. 1991).

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 find quite congenial to their interests. 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.⁹ 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.¹⁰ 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.

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 (EPA) to find the robbers (the 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.

More specifically, TSCA creates a presumption of innocence for a chemical unless EPA establishes that it may pose an "unreasonable risk" to human health or the environment.¹¹ 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 EPA to justify not only the need for regulatory action, but also any demands for basic testing in circumstances where little information is available. 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, EPA must have some scientific information that shows evidence of a risk.¹²

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 EPA lacks, the game is essentially over before it begins.¹³ While EPA has managed to take some regulatory action, including requiring additional testing on approximately 10% of new chemicals through its more rigorous premanufacture notice regulatory program,¹⁴ it has demanded testing or imposed regulatory restrictions on less than two percent of chemicals that were in the TSCA inventory as of 1979.¹⁵ Even the most vigilant public interest groups 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.

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

11. See 15 U.S.C. §§2604(f)(1), 2605(a), ELR STAT. TSCA §§5(f)(1), 6(a).

12. *E.g.*, Chem. Mfrs. Ass'n v. EPA, 859 F.2d 977, 984, 19 ELR 20001 (D.C. Cir. 1988).

13. See, *e.g.*, OFFICE OF TECH. ASSESSMENT, U.S. CONGRESS, SCREENING AND TESTING OF CHEMICALS IN COMMERCE, (1995) No. OTA-BP-ENV-166, at 11.

14. See EPA, Summary of Accomplishments, <http://www.epa.gov/opptintr/new-chemicals/pubs/accomplishments.htm> (last visited Feb. 11, 2009). 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 6, at 12.

15. See, *e.g.*, CHEMICAL REGULATION, *supra* note 6, at 17–18.

9. See, *e.g.*, NEIL K. KOMESAR, IMPERFECT ALTERNATIVES: CHOOSING INSTITUTIONS IN LAW, ECONOMICS, AND PUBLIC POLICY 167–68, 192 (1994).

10. 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).

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,” even when consumers may be otherwise receptive to this type of information.¹⁶

Tort law similarly provides little corrective in reversing the perverse incentives for ignorance and instead similarly tends to exacerbate the problem.¹⁷ Much like 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.¹⁸ 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.¹⁹ The tort system thus compounds the perverse incentives of the regulatory and market systems favoring ignorance 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.

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.²⁰ 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.²¹ Indeed, 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.

These multiple, 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 poten-

tial adverse effects of products, wastes, and industrial activities.²² For example, as of 1984 *no* toxicity testing existed for more than 80% of all toxic substances used in commerce,²³ 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.²⁴

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. 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 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.

II. A Different Approach: Competition-Based Regulation

The lessons from TSCA are incontrovertible: The cops-and-robbers approach to regulation is a failure and alternative approaches are desperately needed. In this section, I propose a competition-based approach to chemical regulation that divides and conquers by setting manufacturers against one another and rewarding the good guys within the chemical industry at the expense of the dirtier, unsafe chemicals.

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. If a competitor establishes that there are measurable and significant differences between its product and a competitor's product with

16. Mary L. Lyndon, *Information Economics and Chemical Toxicity: Designing Laws to Produce and Use Data*, 87 MICH. L. REV. 1795, 1816 (1989). 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).

17. See, e.g., Applegate, *supra* note 1, at 299–300; 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).

18. E.g., W. PAGE KEETON ET AL., PROSSER AND KEETON ON TORTS §41 (5th ed. 1984).

19. Cf. Rider v. Sandoz Pharms. Corp., 295 F.3d 1194 (11th Cir. 2002).

20. Cf. George A. Akerlof, *The Market for “Lemons”: Quality Uncertainty and the Market Mechanism*, 84 Q. J. ECON. 488 (1970); see also Lyndon, *supra* note 16, at 1814 n.72.

21. Lyndon, *supra* note 16, at 1814 n.72 and accompanying text.

22. 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].

23. See TOXICITY TESTING, *supra* note 22, at 118 fig.2.

24. See, e.g., ENVIRONMENTAL DEFENSE FUND, TOXIC IGNORANCE: THE CONTINUING ABSENCE OF BASIC HEALTH TESTING FOR TOP-SELLING CHEMICALS IN THE UNITED STATES (1997) available at http://www.edf.org/documents/243_toxicignorance.pdf; BUREAU OF NAT'L AFFAIRS, *CMA More Optimistic Than EDF on Lack of Data for 100 Chemicals*, DAILY ENV'T REP., Dec. 1, 1997, at A-4; OFFICE OF POLLUTION PREVENTION AND TOXICS 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).

regard to health or environmental consequences, EPA may not only 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 EPA's authority to make "unreasonable risk" determinations under TSCA.²⁵ By identifying the superior qualities of its product, a competitor effectively establishes that the inferior, more risky chemical product presents an unreasonable risk: The benefits of the inferior chemical, in light of an effective substitute, approach zero and do not offset the product's risks.²⁶ 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. 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.

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.²⁷ 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 the European Community's Registration, Evaluation, and Authorisation of Chemicals (REACH) regulation and other proposals for more rigorous substitute analyses rely primarily on manufacturers to produce the incriminating information on their own chemical's risks.²⁸

Although the details will require significant tweaking, a preliminary formulation of the proposal positions 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 rule-making 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,²⁹ 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.³⁰ 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 also appeal the agency's decision.

This claim of competitive superiority would 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 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 a "reasonable alternative design."³¹ 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; 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 also entails the prospect of regulatory awards. 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, EPA may have little choice other than to ban or significantly restrict the inferior product since the evidence effectively

25. *E.g.*, 15 U.S.C. §§2604(f)(1), 2605(a), ELR STAT. TSCA §§5(f)(1), 6(a).

26. *Id.* §2605(c)(1)(C).

27. 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).

28. See, *e.g.*, Registration, Evaluation, and Authorisation of Chemicals (REACH), Regulation (EC)), No. 1907/2006, OJ L 396/1 (Dec. 30, 2006), 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).

29. 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.

30. Such a label of "inferiority" would likely be justified under the broad authority to restrict products that EPA enjoys under §6(a) of TSCA. 15 U.S.C. §2605(a), ELR. STAT. TSCA §6(a).

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

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.³²

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.³³ 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.³⁴ By tracing the 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.³⁵ As a result of its findings, Austin banned the use of coal-tar based asphalt sealants.³⁶ Several retailers, including Lowe’s and Home Depot followed Austin’s lead and refused to carry coal-tar sealants, and Dane County in Wisconsin also banned coal-tar sealants.³⁷ 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, EPA has not taken regulatory action under TSCA against coal-tar based sealants.³⁸

Under the competition-based proposal, if a petition is filed by the manufacturer of a purportedly less toxic sealant, 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. Even if a competitor manufacturing the non-coal-tar based sealant chose not to file a competitive claim, the city of Austin, Lowe’s, 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.

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, 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. Rather than unilaterally demand 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. 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.

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. As a result, 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 untested information supplied to regulators by regulated parties.

32. See, e.g., 15 U.S.C. §2605(a), ELR. STAT. TSCA §6(a).

33. See, e.g., Barbara J. Mahler et al., *Parking Lot Sealcoat: An Unrecognized Source of Urban Polycyclic Aromatic Hydrocarbons*, 39 ENV’T. SCI. TECH. 5560 (2005).

34. 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).

35. 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> (last visited June 1, 2009).

36. See, e.g., Richardson, *supra* note 34, at 46.

37. 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., Apr. 6, 2007, available at <http://www.madison.com/wsj/home/local/index.php?ntid=128156&ntpid=5>.

38. 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 author).

As with any new approach, however, there are also several open-ended questions regarding the implementation of competition-based regulation that might 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 such 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.

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. 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.³⁹ 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. It is also 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. Nevertheless, even if manufacturers unite and block change from EPA or Congress, it is possible that a respected nonprofit could still preside over claims of competitive superiority and, in so doing, provide better market information.⁴⁰

Despite these and undoubtedly a number of other open questions,⁴¹ there seem to be few risks to at least experiment-

ing with competition-based regulation. Competition-based regulation does not displace existing regulation; it simply adds to it. Except for modest staffing of 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.

III. Beyond Toxic Products

Competition-based regulation falls outside the existing system of incentive-based regulatory tools. 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, competition-based regulation rolls several features of other incentive-based regulatory tools into a single approach. Competition-based regulation thus deserves its own unique label in the regulatory toolbox.

In practice, competition-based regulation is likely to be most effective, relative to other regulatory tools, when the oversight of products or polluting activities requires the compilation of a great deal of information, 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 catastrophes that spark public outrage.

Pesticide regulation fits this profile and is an ideal candidate for competition-based regulation. Although EPA has forced the generation of considerable information about the risks of pesticides in recent years through the Food Quality Protection Act,⁴² there is still little effort by EPA to compare pesticide substitutes or translate existing toxicity information in a way that provides meaningful information to consumers' purchasing decisions.⁴³ In fact, although a comparison of substitutes is arguably allowed under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA),⁴⁴ EPA does

39. Cf. generally JOHN D. GRAHAM & JONATHAN BAERT WIENER, *RISK VERSUS RISK: TRADE OFFS IN PROTECTING HEALTH AND THE ENVIRONMENT* (1995). (Note that even then, however, the resultant glut of information might move the market forward through improved information about various product-related risks.)

40. See, e.g., Jamie A. Grodsky, *Certified Green: The Law and Future of Environmental Labeling*, 10 YALE J. REG. 147, 209-10 (1993).

41. There is also the possibility that 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. See *id.* at 183-84. This is 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.

42. See, e.g., ENVIRONMENTAL PROTECTION AGENCY, IMPLEMENTING THE FOOD QUALITY PROTECTION ACT: PROGRESS REPORT 35 (1999), available at <http://www.epa.gov/oppead1/fqpa/fqpareport.pdf> (last visited June 1, 2009).

43. Donald T. Hornstein, *Lessons From Federal Pesticide Regulation on the Paradigms and Politics of Environmental Law Reform*, 10 YALE J. REG. 369, 392 (1993).

44. See, e.g., 7 U.S.C. §136(bb), ELR STAT. FIFRA §2(bb) (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), ELR STAT. FIFRA §3(c)(5) (prohibiting the administrator from making the "lack of essentiality" of a pesticide a basis

not require data on the effectiveness of a pesticide during the registration process when assessing whether the pesticide constitutes an “unreasonable risk.”⁴⁵ Under the competition-based approach, 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.

The oversight of health and environmental risks of nanotechnology is another 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.⁴⁶ Because the manufacturing community benefits from this unregulated state, moreover, it has been difficult to generate pressure for greater regulatory oversight.⁴⁷ 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 another or from substitute products not made with nanotechnology to support credible claims of environmental superiority between rival products.

The regulation of pollution is also amenable to competition-based regulation. David Driesen suggests a competitive, private claims approach to encourage further pollution reductions for classic pollution problems.⁴⁸ Under Driesen’s proposal, 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).⁴⁹ 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 disclosure program⁵⁰ 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 non-compliance. A more novel extension of competition-based 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. 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.

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

for denying its registration). This could support an argument that FIFRA bars the consideration of substitutes and efficacy.

45. See, e.g., Mary Jane Angelo, *Embracing Uncertainty, Complexity, and Change: An Eco-Pragmatic Reinvention of a First-Generation Environmental Law*, 33 *ECOLOGICAL L.Q.* 105, 163 (2006).

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

47. E.g., *id.* at 17–32 (describing the current failure of EPA to regulate nanotechnology and the weaknesses of the TSCA in this particular effort).

48. See, e.g., DRIESEN, *supra* note 10, at 153–61.

49. *Id.* at 153.

50. See 42 U.S.C. §11023 (2000), ELR STAT. EPCRA §313.