

RACING TO THE TOP: HOW REGULATION CAN BE USED TO CREATE INCENTIVES FOR INDUSTRY TO IMPROVE ENVIRONMENTAL QUALITY

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I. INTRODUCTION

One is hard pressed to find in environmental regulation, or in any other area of regulation for that matter, a concerted effort by a regulator to continuously calibrate a regulatory standard to the highest level of performance within industry, thus creating a “race to the top.”¹ Even though rigorous competition among firms is a vital ingredient for encouraging innovation and overall excellence in markets and regulation alike, this type of best-in-market standard is missing from most regulatory programs. In fact, rather than reward innovation and accomplishment, our regulatory system tends to cater to the noisy complaints of the lowest common de-

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1. Technology based standards seem to hold the promise of accomplishing some of this race-to-the-top approach, but as discussed in Part III.B., *infra*, they have not lived up to their promise.

nominator firms, who often make their presence known at each step of the regulatory process.²

A recent experience in Austin, Texas offers a particularly telling indication of just how blind the regulatory system has become to distinguishing between superior and inferior actors and products. In 2004, the City of Austin discovered that coal-tar based asphalt sealant was killing the highly endangered Barton Springs Salamander.³ The sealant was leaching off freshly sealed parking lots and entering downstream pools where these fragile animals live.

The surprise in the City's investigation was not just that this one product—*asphalt sealant*—was gradually destroying its river system but that other asphalt sealants were far safer by comparison.⁴ More specifically, when the City investigated the sealant market, it learned there were other products that were much less toxic and yet they are just as effective, sold at the same price, and in some cases made by the same company.⁵ The Environmental Protection Agency (EPA) declined to restrict sale of the toxic sealant in response to this discovery, so the City of Austin passed an ordinance to ban the use of the highly toxic variant of asphalt sealant.⁶ Lowes and Home Depot followed the City's lead and no longer carry it on their shelves.⁷

The sealant story not only underscores the recurring problem of under-regulation, but it highlights the rather obvious way that regulation could be improved; rather than focus on the floor—the point at which a chemical is simply too hazardous to be tolerated—regulators could instead assess whether a product is relatively more toxic than its competitors. When a product lags significantly behind its competitors in terms of unjustified toxicity, some type of regulatory action—ranging from labels to outright banning—

2. See, e.g., THOMAS O. MCGARITY, *FREEDOM TO HARM: THE LASTING LEGACY OF THE LAISSEZ FAIRE REVIVAL* (2013) (establishing this feature of our administrative process in detail).

3. 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); 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).

4. See, e.g., WATERSHED PROT. & DEV. REVIEW DEPT', CITY OF AUSTIN, *The Coal Tar Facts: Coal Tar Sealant Fact Sheet* (2004), available at <http://ci.austin.tx.us/watershed/downloads/coaltarfacts.pdf>.

5. *Id.*

6. See, e.g., Richardson, *supra* note 3, at 46; Letter from Brent Fewell, Acting Assisting Administrator, EPA, to Senator Jim Jeffords (Oct. 16, 2006) (on file with author).

7. See, e.g., *Coal Tar-based Pavement Sealers Implicated As a Source of Urban Water Pollution*, SCIENCE DAILY (Feb. 13, 2007), <http://sciencedaily.com/releases/2007/02/070212101900.htm>; Matthew DeFour, *Dane County Bans Sealants with Coal Tar*, MADISON.COM (Apr. 6, 2007), http://host.madison.com/news/local/dane-county-bans-sealants-with-coal-tar/article_9deaa275-9856-55c9-97fa-3bc758c187ef.html.

should follow. Certain asphalt sealants, along with a number of other products played out in the news, including corrosive hair permanents,⁸ toxic drywall,⁹ and cancerous air fresheners,¹⁰ are considerably more toxic than their competitors and yet offer no offsetting advantages or benefits in efficacy or cost. In such a situation, regulators are fully justified in culling out the needlessly unsafe products that duplicate other, safer products.¹¹

This essay argues that a race-to-the-top approach to regulation will not only improve some failing regulatory programs but could well be transformative. Such a seemingly modest adjustment in the regulatory endgame—focusing regulators on a “best-in-market”—could effectuate a fundamental shift in the regulatory standard-setting exercise. Instead of ensuring that actors are above the floor, the best becomes the focus and debate centers on why competitors cannot do as well or better than these exemplars. In doing so, the new standard creates a race to the top. In this race, firms benefit from investing in environmental innovation, perhaps for the first time. Front-movers recoup significant regulatory rewards by their foresighted investments, again, a stark contrast with the status quo. And rather than engaging in a collective that resists any form of regulatory intervention, the race-to-the-top approach fractures regulated industry and pits them against each other. In doing this, firms encounter first-time incentives to share with regulators unflattering information on other firms, boast of accomplishments that exceed the collective industry standards, and continue to invest in research for improvement beyond the promulgated standards.

Rather than attempt a systematic overhaul of environmental law in a short essay, this piece examines the race-to-the-top approach in one discrete area of environmental regulation in particular need of repair—the regulation of chemicals and other toxic products. This preliminary assessment of both the merits and practicalities of this approach for toxics control proceeds in five parts. The first section provides background and context on chemical regulation and its well-established regulatory failures. The sec-

8. See, e.g., Susannah Gonzalez, *OSHA Warning Issued For Brazilian Keratin Treatment Hazard*, NATURALLYCURLY.COM (Apr. 29, 2011), <http://naturallycurly.com/curl/reading/ingredients/osha-warning-issued-for-brazilian-keratin-treatment-hazard> (discussing controversy over Brazilian hair permanents).

9. See, e.g., Greg Allen, *Toxic Chinese Drywall Creates A Housing Disaster*, NPR (Oct. 27, 2009, 12:01 AM), <http://npr.org/templates/story/story.php?storyId=114182073>.

10. See, e.g., Michelle Schoffro Cook, *Exposed: Cancer-Causing Toxins Found in Air Fresheners*, CARE2 (Sept. 14, 2012, 4:11 PM), <http://care2.com/greenliving/exposed-cancer-causing-toxins-found-in-air-fresheners.html>.

11. This regulatory intervention is reinforced by the fact that the market for hazardous products functions poorly on its own given information asymmetries, high search costs, and many unknowns. See *infra* Part I.

ond section introduces the idea of altering regulatory standards to focus on the best in the market and considers the advantages to that approach. The third section places the idea against other, somewhat similar regulatory programs and from this synthesis identifies design features that appear integral to ensuring the success of a regulatory standard based on the best performers. The final two sections troubleshoot some of the remaining challenges associated with the proposal and attempt to chart a path forward in toxics regulation and beyond.

II. TOXICS REGULATION IN CONTEXT

Even by the most generous accounts, the regulation of chemical products in the United States is badly broken. One can count on one hand the number of chemicals banned by EPA over the last thirty-five years.¹² Equally regrettable, our regulatory programs do not require agencies to cull out these useless toxic products that are outcompeted by safer products.¹³ This section explores this particularly inexplicable lapse in the regulatory oversight of chemicals in the United States.

A. *Toxics 101*

Chemical regulation in the United States is extraordinarily information and resource-intensive, and these demands have slowed agency progress considerably. Under the statutes governing chemical and toxic consumer products, in order to restrict a product, EPA must prove that the product presents an “unreasonable risk” to health and the environment.¹⁴ This showing requires evidence that the aggregate costs of each product and chemical to society, such as cancer or environmental degradation, outweigh the benefits to society. If the Agency can make this showing, it can then justify restricting or even banning unreasonable products.¹⁵

12. Noah M. Sachs, *Jumping the Pond: Transnational Law and the Future of Chemical Regulation*, 62 VAND L. REV. 1817, 1830 (2009).

13. See *infra* Part I.B.

14. See the Toxic Substances Control Act (TSCA), 15 U.S.C. §§ 2604(f)(1), 2605(a) (2012), and for consumer products, the Federal Hazardous Substances Act, 15 U.S.C. § 1261 (2012) and the Consumer Product Safety Act (CPSA), 15 U.S.C. § 2082 (2013). 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 John S. Applegate, *The Perils of Unreasonable Risk: Information, Regulatory Policy, and Toxic Substances Control*, 91 COLUM. L. REV. 261, 310-13 (1991).

15. 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: REGULATION AND THE DISTORTION OF SCIENTIFIC RESEARCH 255, 257 (Wendy Wagner

Needless to say, the actual showing that a chemical presents an unreasonable risk—namely, that the costs outweigh the benefits—is not a simple exercise. In the case of asbestos, EPA dedicated over ten years to data collection and analysis.¹⁶ EPA's proposed partial ban of asbestos, which was published in the 1980s, long after the hazards of asbestos had been established, was then subjected to twenty-two days of public hearings and sparked 13,000 pages of comments from over 250 parties. The administrative record spanned over 45,000 pages.¹⁷ Yet in the view of the Fifth Circuit panel, EPA's record was still incomplete in showing the Agency had selected the "least burdensome" approach to certain asbestos products, nor had the Agency adequately demonstrated the cumulative health costs that result from asbestos. These gaps in EPA's rule were so significant that the Fifth Circuit vacated the rule and remanded it to the Agency.¹⁸ Congress ultimately intervened and accomplished much of what EPA endeavored to do through amendments to Toxic Substances Control Act (TSCA) that addressed asbestos specifically.¹⁹ EPA never repaired the rule itself.²⁰

Even in less elaborate cases, the Agency's analytical work is non-trivial.²¹ The assessment and ultimate quantification of the potential costs of a chemical to society, integral to the unreasonable risk standard, necessarily involve quantitative assessments of the product's basic toxicity to humans (of all ages) and the environment through all the life stages of the product.²² The Agency must also evaluate the exposure scenarios to assess the extent to which humans, animals, plants, and other resources will come in contact with the chemical. Much information—even for the crudest regulatory assessments—will be necessary for this analysis. Final-

& Rena Steinzor eds. 2006) (discussing how TSCA places the burden on EPA to justify regulatory intervention).

16. See, e.g., JOHN S. APPLGATE ET AL., *THE REGULATION OF TOXIC SUBSTANCES AND HAZARDOUS WASTES* 291 (Robert C. Clark et al. eds., 2d ed. 2011) (summarizing the history of the asbestos rule).

17. *Id.*

18. *Corrosion Proof Fittings v. EPA*, 947 F.2d 1201, 1214 (5th Cir. 1991) (invalidating EPA's ban of asbestos under TSCA because (citing *Benzene*) the Agency has the burden of proving banned products place an unreasonable risk to the public and EPA did not do a thorough enough assessment (with evidence)).

19. See Asbestos Hazard Emergency Response, 15 U.S.C. §§ 2641-2656 (2012).

20. See, e.g., Thomas O. McGarity, *The Courts, and the Ossification of Rulemaking: A Response to Professor Seidenfeld*, 75 TEX. L. REV. 525, 548 (1997) (noting that EPA abandoned the project).

21. For an excellent overview of the steps to the assessment of whether a chemical presents an unreasonable risk—still in force today—see Applegate, *supra* note 14, at 284-89.

22. For more detail on this step, see JOHN R. FOWLE III, ENVTL. PROT. AGENCY, EPA 100-B-00-002, *RISK CHARACTERIZATION HANDBOOK* (2000), available at <http://epa.gov/spcl/pdfs/rchandbk.pdf>.

ly, the benefits of the product must be quantified, usually by assuming that the purported uses are important and by identifying the extent that the product is or could be used in the future. While the evaluation of benefits is much more determinable, it still entails considerable data-dredging and speculation.

The assessment of risks, exposures, and benefits—followed always by the monetization of these features so that the units can be cross-compared—must then be accompanied by a regulatory plan of action proved by the Agency to be the least disruptive to the status quo.²³ Chemicals that may appear to come close to having costs that exceed benefits are not necessarily candidates for banning. Restrictions on their use might be developed to mitigate the worst harms while preserving the benefits. Simple labeling changes or use instructions, for example, might take care of the worst of the problems. In all cases, the Agency is expected to develop reasonable scenarios and identify the best way to make the most of the product without subjecting it to the “death penalty.”²⁴

Two further problems arise from this basic regulatory design that add still more impediments to the Agency’s ability to make progress. First, as mentioned, the Agency must have information about a chemical to undertake its analysis, but information is not always cheap and sometimes it may not even exist without concerted testing. For their part, manufacturers will generally not invest voluntarily on testing for latent harms; this type of testing is rarely decisive, and the uncertainties typically raise doubts about safety that only hurt and do not help sell the product.²⁵ Moreover, since latent harms are difficult to prove in tort cases, tort liability provides additional incentives to choose ignorance than to invest in robust and complete tests.²⁶

Despite the market failure that can arise in creating toxicity information, the Agency’s authority to require testing is limited. Under the TSCA, EPA must first make a regulatory finding that

23. See 15 U.S.C. § 2605(a) (2012) (specifying that EPA’s action must be the “least burdensome” action).

24. See, e.g., *Corrosion Proof Fittings v. EPA*, 947 F.2d 1201, 1214 (5th Cir. 1991).

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

26. See 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 research . . .”).

the chemical “may present an unreasonable risk of injury to health or the environment” as a prerequisite to requiring more testing,²⁷ which requires a “more-than-theoretical” possibility of an unreasonable risk.²⁸ Ironically, where there is effectively no toxicity information at all on a reactive chemical, the Agency may not be able to support its demand for testing since it lacks concrete evidence that the chemical is risky. This testing standard thus creates a Catch-22 for the Agency with respect to requiring testing on under-tested chemicals.²⁹ As a result, the gaps in toxicity data for most chemicals in commerce are still substantial.³⁰

Second, the Agency’s decisions can be challenged in court.³¹ While in theory these challenges can be brought by both public interest groups and manufacturers, in practice the oversight of EPA’s regulation of chemicals is dominated by the chemical industry.³² This is not surprising since chemical manufacturers have immediate and high stakes in the outcome of product oversight and typically have more resources to engage in the battles in rela-

27. See TCSA, 15 U.S.C. § 2604(e) (2012).

28. Chem. Mfrs. Ass’n v. EPA, 859 F.2d 977, 984 (D.C. Cir. 1988).

29. This prerequisite has deterred EPA from requiring testing. See, e.g., U.S. GOV’T ACCOUNTABILITY OFFICE, GAO-05-458. CHEMICAL REGULATION: OPTIONS EXIST TO IMPROVE EPA’S ABILITY TO ASSESS HEALTH RISKS AND MANAGE ITS CHEMICAL REVIEW PROGRAM 18, 26 (2005) [hereinafter GAO, OPTIONS], available at <http://gao.gov/new.items/d05458.pdf>; Applegate, *supra* note 14, at 315-17 (discussing the test rule in more detail). In fact, EPA now negotiates testing largely outside the jurisdiction of TSCA. See, e.g., Sarah Bayko, Note, *Reforming the Toxic Substances Control Act to Protect America’s Most Precious Resource*, 14 SOUTHEASTERN ENVTL. L.J. 245, 255, 267-69 (2006).

30. The last assessment of the extent of toxicity testing on chemicals in commerce is somewhat dated, but the conclusion is that there is only limited toxicity data available on about two-thirds of all chemicals in commerce; the remaining chemicals are supported by almost no data. See, e.g., ENVTL. HEALTH. PROGRAM, ENVTL. DEF. FUND, TOXIC IGNORANCE (1997) available at http://edf.org/sites/default/files/243_toxicignorance_0.pdf; *Testing: CMA more optimistic than EDF and lack of data for 100 chemicals*, 230 Daily Env’t Rep. (BNA), at A-4, (Dec. 1, 1997); OFFICE OF POLLUTION PREVENTION & TOXICS, ENVTL. PROT. AGENCY, WHAT DO WE REALLY KNOW ABOUT THE SAFETY OF HIGH PRODUCTION VOLUME CHEMICALS? 261 (1998), available at <http://epa.gov/hpv/pubs/general/hazchem.pdf>. Since the late 1990s, high production volume chemical manufacturers did agree to produce some data voluntarily, but this initiative only applies to some high production volume chemicals, and even with respect to these chemicals as of 2007 (eleven years into the program), expert observers observed that it was still “well away from delivering on the promises it made.” RICHARD A. DENISON, ENVTL. DEF. FUND, HIGH HOPES, LOW MARKS: A FINAL REPORT CARD ON THE HIGH PRODUCTION VOLUME CHEMICAL CHALLENGE 3 (July 2007), available at http://edf.org/documents/6653_HighHopesLowMarks.pdf.

31. See, e.g., 15 U.S.C. § 2618; CPSA, 15 U.S.C. § 2060(a) (2012) (providing for judicial review of Agency decisions).

32. See Preliminary Participation of Industry and Public Interest Groups in Data Pie Charts for EPA TSCA Test Rule study, PI-Wagner (Nov. 14, 2013) (on file with author); See generally Jason Webb Yackee & Susan Webb Yackee, *A Bias Towards Business? Assessing Interest Group Influence on the U.S. Bureaucracy*, 68 J. POL. 128, 128 (2006) (identifying a “bias towards business”); Wendy Wagner et al., *Rulemaking in the Shade: An Empirical Study of EPA’s Air Toxic Emission Standards*, 63 ADMIN. L. REV. 99, 125 (2011).

tion to public interest counterparts.³³ The result, however, is that the Agency receives lopsided feedback in favor of weaker standards and the dominant constituency that holds EPA's feet to the fire is this same collective of regulated parties.

B. The Lowest Common Denominator Problem

With regulatory action conditioned on an initial, detailed cost-benefit analysis of an individual chemical, the availability of safer products—used for the same purpose—becomes largely peripheral to the regulatory investigation. Under the current program, the existence of clearly safer substitutes may not even be part of the analysis unless the Agency decides that the chemical must be banned.³⁴

The resulting irrelevance of the best products in the market in assessing the worst leads to a textbook adverse selection or “market for lemons” problems.³⁵ If innovating in green chemistry or even running in-house toxicity tests to identify safer recipes is not relevant in evaluating whether a chemical makes it over the regulatory bar, then, as a regulatory matter, this type of testing is not cost-justified.

While safer products could be a market virtue, without the Agency's validation of tests, there is no practical way for investors or consumers to assess the self-serving claims and supporting data.³⁶ Nonprofits attempt to provide mechanisms for distinguishing between competitors on important features like toxicity, but these metrics are crude and entail added search costs for consumers.³⁷ But even if manufacturer claims were validated and established by agencies to be rigorous, consumers and even savvy investors may

33. See, e.g., William T. Gormley, Jr., *Regulatory Issue Networks in a Federal System*, 18 *POLITY* 595, 607-08 (1986) (describing how this high stakes, high resources feature, when pitted against the general public interest, places the issue in the “boardroom” where the engagement in Agency decision-making is lopsided against the public interest).

34. One author has even suggested that the consideration of substitutes may be outside the Agency's statutory authority, although this conclusion seems to take the legal analysis too far. See Richard A. Denison, *Comment on Using Competition-Based Regulation to Bridge the Toxics Data Gap*, 39 *ENVTL L. REP.* 10799, 10800-01 (2009).

35. See, e.g., George A. Akerlof, *The Market for “Lemons”: Quality Uncertainty and the Market Mechanism*, 84 *QUART. J. ECON.* 488 (1970); see also Lyndon, *supra* note 25, at 1814-15 (making this same observation about the chemical market).

36. See, e.g., Lyndon, *supra* note 25, at 1816 (discussing how information on chemical safety produced voluntarily by manufacturers might be discounted because of its commercial context). See also *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.”).

37. See *infra* note 76.

often lack the expertise and resources to process this information.³⁸ Mere disclosures are thus likely to be insufficient to produce a functioning market.³⁹

In view of the market and regulatory failure to distinguish between toxic and less toxic competitors, there is no point to being above average in the chemical market. Excellence is not rewarded; instead, it is the noisy bottom of the class that sets the regulatory standards.

III. A BETTER WAY

Rather than focusing on the worst, regulators should seek out the best performers in the market—for products that perform comparable services—and hold all other chemical products to it. This comparison should include nonchemical alternatives.⁴⁰ Such an altered focus could transform chemical regulation in a variety of ways: it could create powerful incentives for innovation, raise product standards, and break up the powerful industry coalition that has monopolized the political process. Even if basing standards on the best in the market does not have all of these salutary effects or becomes somewhat compromised, it should only move products regulation forward and seems unlikely to be capable of making the status quo worse for health and environmental protection.

38. Search costs include costs associated with accessing and processing information. Information processing costs can arise from information that requires specialized training or extensive background expertise, information that is voluminous, information that is dense and complex, and information that is poorly organized and not explained in clear ways. The importance of these different types of information costs to rational behavior is still being worked out, but their basic features—of raising the costs for audiences to understand a message—seems well accepted. For some of the ongoing work that attempts to better understand how these species of information costs affect behavior, see, for example, Haruo Horaguchi, *The Role of Information Processing Cost as the Foundation of Bounded Rationality in Game Theory*, 51 *ECON. LETTERS* 287 (1996); Stephen Morris & Hyun Song Shin, *Optimal Communication*, 5 *J. EUR. ECON. ASS'N* 594 (2007).

39. See, e.g., HERBERT A. SIMON, *ADMINISTRATIVE BEHAVIOR: A STUDY OF DECISION-MAKING PROCESSES IN ADMINISTRATIVE ORGANIZATIONS* 242 (4th ed. 1997) (criticizing organizations' information systems as generally not being designed to "conserve the critical scarce resource—the attention of managers").

40. 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, 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").

A. Specifics

Rather than rely on an abstract cost-benefit analysis, the reformed test for product safety looks to the market and engages in a rigorous substitute analysis. Ideally, the regulator would construct this alternative, best-in-market approach by breaking down all chemical or toxic products into functional use categories and sub-categories (e.g., sets of industrial solvents, cleaning fluids, etc.) and then the regulator would—with the help of information from manufacturers and public stakeholders—identify the “mean” or “better” among the chemical products to meet these functional uses.⁴¹ (At least a few products would need to be selected for this best-in-market benchmark to avoid creating a monopoly in a sector of the market.) During this exercise, the green manufacturers and front-movers in product safety would presumably emerge to showcase the significant gains in product chemistry that allow for much safer products relative to laggards.⁴²

Both EPA and the states have been experimenting with conducting methods for alternatives assessments, and thus the procedures for conducting these comparisons are already becoming well worked out.⁴³

After the regulator identifies the appropriate best-in-market benchmark,⁴⁴ it would be up to the individual manufacturers to show their product(s) exceed this floor or standard.⁴⁵ The burden of

41. The categorization of chemicals by functional uses is by no means automatic, but methodological advances are being made on that score as well. See, e.g., *Functional-Class Criteria*, EPA, available at <http://epa.gov/dfe/pubs/projects/gfcp/index.htm#Functional> (last updated Sept. 26, 2013) (breaking the chemical universe into various end uses which can then be compared against one another in identifying safer substitutes for use classes).

42. If there are grounds for concern regarding information available to the Agency, the best-in-market approach may present an opposite risk that the Agency will have too much, rather than too little, information. Manufacturers could conceivably inundate the Agency with evidence supporting the benefits of their pet projects. Much like the use of contractors to handle thousands of comments, presumably the Agency can delegate some of the initial assessment of these filings, if they occur in high number (which might not happen), to contractors and other early gatekeepers who approach the information with a very coarse filter.

43. In 2010, EPA issued a draft guideline for conducting alternatives assessments in general. OFFICE OF POLLUTION PREVENTION & TOXICS, ENVTL. PROT. AGENCY, DESIGN FOR THE ENVIRONMENTAL PROGRAM ALTERNATIVES ASSESSMENT CRITERIA FOR HAZARD EVALUATION, OFFICE OF POLLUTION PREVENTION & TOXICS (2010), available at http://epa.gov/dfe/alternatives_assessment_criteria_hazard_eval_nov2010_final_draft2.pdf. The Toxic Use Reduction Institute, a think tank based at the University of Massachusetts-Lowell, has developed an even more elaborate set of methods and alternatives assessment techniques. See, e.g., *Chemical Hazard Comparison Tools*, TURI, http://turi.org/Our_Work/Research/Alternatives_Assessment/Chemical_Hazard_Comparison_Tools (last updated Nov. 17, 2011).

44. This showing would presumably be subject to some general comment, although it may not require full notice and comment.

45. This approach parallels the emphasis in alternatives assessment advocated by Joel Tickner. See, e.g., Joel A. Tickner, *Science of Problems, Science of Solutions or Both? A*

proof for establishing safety of individual products or classes of products relative to the best-in-market standard, once established, would rest with the individual manufacturers.

To expedite the analysis, various default presumptions could apply that identify whether the product meets the standard.⁴⁶ For example, if a product offers no benefits beyond its competitors and yet is more toxic—perhaps by two times or more—in ways that do not involve trade-offs, then the inferior chemical might be automatically slated for banning or gradual phase-out.⁴⁷ Since this type of approach has never been applied to toxic products or chemicals before, there may be quite a few chemicals that flunk this relatively straightforward default rule. Other trade-offs, say between acute and chronic harms or energy-saving versus toxicity, might involve more complicated assessments. Ultimately, these complex trade-offs might lead to the opposite default presumption that when two products cannot be compared against one another due to many incommensurables, both are presumed market-worthy. Using defaults that presumptively, but not conclusively, compare chemicals, the Agency should be able to make considerable progress in culling out useless toxic chemicals and products from the marketplace.

This comparative exercise requires vastly less information than is currently demanded to regulate a chemical or even require testing under TSCA because the primary areas of inquiry are *relative* toxicity, cost, and effectiveness.⁴⁸ Routes of exposure can be assumed to be similar across similar variations of the same product. The benefits can also be assumed to be the same for products or chemicals within the same use category. Even some features of toxicity can be bracketed if they are shared in common with some chemicals. The primary point of inquiry is the relative question of whether one product is more carcinogenic or more reactive than another.

Since product innovation in the open market may not go far enough, a protective backstop could be added to authorize the

Case Example of Bisphenol A, 65 J. EPIDEMIOLOGY & COMMUNITY HEALTH 649 (2011), available at <http://jech.bmj.com/content/65/8/649.full.pdf+html>.

46. Some of the areas for guidance would be in comparing efficacy vs. health, price vs. health, and acute vs. chronic toxicity.

47. Some firms may need time to adjust if key chemicals in their processes are banned. Greenwood raises this concern about a best-in-market approach. See Mark Greenwood, *Comment on Using Competition-Based Regulation to Bridge the Toxics Data Gap*, 39 ENVTL. L. REP. 10796, 10797 (2009). A gradual phase out should take care of these concerns.

48. See Tickner, *supra* note 45 (arguing for alternatives assessments rather than detailed singular characterizations of the risk of a substance); see also NAT'L RESEARCH COUNCIL, SCIENCE AND DECISIONS 246 (2008) (the NRC's framework for risk analysis attempts to minimize the effects of uncertainties by comparing an intervention (e.g., a suspect chemical) against the status quo).

Agency to intervene in marketing a product if information indicates that, even without superior substitutes, the costs of a product outweigh the benefits. The proposal here is not intended to be a complete replacement for the Agency's discretion to intervene in dangerous products; rather, the proposal is that in the first instance the Agency need apply only a best-in-market standard to determine whether a toxic product can enter or remain on the market. If the product passes the best-in-market test, it still may be restricted based on larger concerns about its net social value in light of its costs.

Even with simple default presumptions, there may be a great deal of analysis and information-collection required to make various judgments about chemicals and products. To address these demands, Agency processes, particularly in processing the rebuttal information, could be subsidized in a variety of ways, such as mini-adjudications funded by licensing fees.⁴⁹ Manufacturers could even petition to eliminate competitors by establishing the superior safety attributes of their own products in an effort to emerge as among the best in the market for regulatory purposes.⁵⁰

Ideally, the selection of "best" or "mean" products against which competitors are held would be revisited every few years or at least could be revised in a dynamic fashion. A standing expert committee could dedicate itself full-time to keep up with green chemistry and related developments in the field and alter product standards accordingly. Additionally, a manufacturer with a new innovative product could petition the Agency to revisit the best-in-market product benchmark for a given functional use of chemicals/products. While all manufacturers could be allowed a several-year grace period to come into compliance with a new product benchmark, or at least to affix a label to their product that signals that the product falls below the mean standard (or other intermediate regulatory-backed signals), regulatory standards would reflect, at least, the developments and innovations in the market and expect the same dynamism from regulatory standards. Indeed, since the target is the regulation of products, there is no reason to permit manufacturers more latitude than the market itself permits.

The proposal here is admittedly ambitious, particularly given the potentially enormous size of the chemical market (there are over 80,000 chemicals in commerce alone, although some estimate that only about ten percent of these chemicals are in use at signifi-

49. These specifics can be worked out but currently are considered beyond the scope of this article.

50. See *infra* Part IV.

cant levels).⁵¹ Some triaging of the chemical universe will likely be necessary, at least at the beginning. The prioritization approach advocated by a number of authors would identify “chemicals of concern” or “extremely hazardous chemicals” and investigate these chemicals’ potentially less toxic substitutes for various uses.⁵² An alternate prioritization system could focus instead on identifying chemicals that compete with numerous other products for the same use. In such saturated markets, there may be particularly useful opportunities for culling out unnecessarily toxic products. Manufacturers might also be invited to nominate competitor chemicals (or products) that involve potentially high risks, which, at least based on the readily available information, do not appear to be justified by their benefits.

B. Benefits

A shifted regulatory focus on the best in the market makes several positive moves. To the extent that the regulatory process looks to the best performers for standards, at least some regulated parties will become involved in building regulatory solutions, rather than lobbying for reduced regulatory oversight. Innovators who expect their products to fare well may even share in-house expertise with the Agency in developing assessment processes that are rigorous and allow for smooth comparisons.

Relatedly, as the regulatory process treats regulated parties differently—as winners and losers—the now solidified collective of regulated parties will become more fragmented and could even fracture completely. Rather than finding common ground in arguing for a low floor, manufacturers seem more likely to be pitted against one another in a race to the top. By focusing on the best products, then, the regulatory endgame infuses market competition back into the manufacture of products and the political process.⁵³ The benefits to collective action are greatly reduced in a regulatory system that provides for winners and losers among manufacturers, with the winners setting the standards for the rest. The incentives within the regulated community will thus be

51. See, e.g., Greenwood, *supra* note 47, at 10796.

52. See, e.g., Richard A. Denison, *Ten Essential Elements in TSCA Reform*, 39 ENVTL. L. REP. 10020, 10021-22 (2009) (arguing for the identification and prioritization of chemicals of concern in chemicals regulation).

53. Political positions are often the result of powerful collective action among regulated parties. See, e.g., Gormley, *supra* note 33. The best-in-market approach breaks apart this strong collective action and pits manufacturers against one another.

turned from rent-seeking in the political process to a self-interested drive to be selected among the best in the market.⁵⁴

By culling out the worst in the market, this regulatory oversight also improves the functioning of the market. Consumers and investors may not have the expertise or resources to make fine comparisons in the toxicity of different products, even if they had this information in accessible formats. Yet by doing this work for them—eliminating the surplus of inferior products that offer no price or efficacy advantages—the bad products are culled out and the market functions more efficiently. And by holding products to the best standards, the adverse selection problems of the market are reversed and transformed into quite the opposite—a race to the top among competitors. In response to this incentive, other companies are more likely to innovate just to keep up, as well as invest to win the regulatory competition and enjoy the privilege of being the best, against which all other products are compared.⁵⁵

With more assistance from regulated parties in dredging up relevant information to make relative assessments of products, coupled with far lower analytical demands because of this much more limited comparison (as opposed to a full-fledged cost-benefit assessment), standards will not only be more rigorous but likely be considerably easier to set as compared to the predecessor approach under TSCA.⁵⁶ For example, once a functional category of products is identified based on a type of general use, the only relevant issue is whether a product falls below a set of identified superior products in terms of efficacy, cost, and toxicity; the entire benefits side of the equation, as well as exposure information, can be bracketed since the products in a functional use will likely share similar characteristics on these variables. The analysis is thus made immensely simpler, since it focuses much more narrowly on toxicity and, to a lesser extent, the price and efficacy of the product. Since this simpler analysis has not yet been undertaken, it seems likely that some products will flunk quickly and even be withdrawn by

54. Cf. Neil Komesar, *Stranger in a Strange Land: An Outsider's View of Antitrust and the Courts*, 41 LOY. U. CHI. L.J. 443 (2010) (making some of these same arguments in the context of anti-trust regulation).

55. Although Akerlof does not explicitly identify clear rewards for first-movers as a solution to the lemons problem, surely turning the asymmetrical information into a competition against the top entrants does exactly that type of flipping of a market for lemons into a market that encourages top innovation and gains. See Akerlof, *supra* note 35. Markets also incorporate vastly more expertise and information than regulatory processes can hope to replicate, and they integrate this information much more swiftly, seamlessly, and without the large transaction costs that afflict the regulatory process. Markets work continuously, so the need for updating, which can be a significant cost endemic in regulatory analyses, is eliminated to the extent the regulatory standards can be calibrated adaptively to changes in the availability of safer products.

56. See Tickner, *supra* note 45.

manufacturers voluntarily once a benchmark is established, like asphalt sealant.⁵⁷

The validity and availability of information available to regulators to assess chemicals should also be improved if manufacturers must prove that their chemical does not fall below the best-in-market standard. Since they will be put into competition with one another, the veracity of the information will be subjected to scrutiny by rival manufacturers. Under the current system, by contrast, manufacturer-produced data is submitted to the Agency, but the Agency often lacks the resources to investigate its reliability, much less to replicate it, and there are few to no incentives for competitors to provide added oversight.

Beyond the numerous domestic advantages, a shift to the best-in-market determination of safety might also become useful as a global standard that not only draws its information from the best in the global market but produces an output—a regulatory standard—that is easily exported and communicated across national borders. From the standpoint of regulatory harmonization, a market benchmark for product safety provides something akin to the Rosetta Stone; standards based on market analogs raise fewer concerns about objectivity, political representation, and the like as compared to national standards that are based on varying levels of precaution. If the test is simply what is a “reasonable alternative design” or even the “best reasonable alternative design” on the market, then this type of simple market-benchmark translates to a variety of political structures regardless of the precise approaches that the decision-maker takes to decision-making. A best-in-market standard is also dynamic and calibrated to changes in the market that should ideally lead to smoother harmonization across borders over time.

Setting product standards against the best in the global market would also seem, in the abstract, to satisfy concerns about unfair trade barriers.⁵⁸ A nation that demands only the safest products in

57. For example, San Francisco determined that phthalates are a non-essential ingredient in children’s toys, and yet they present health hazards. The City banned the use of phthalates in children’s toys, which in turn triggered similar actions at the federal level. See, e.g., Debbie O. Raphael & Chris A. Geiger, *Precautionary Policies in Local Government: Green Chemistry and Safer Alternatives*, 21 *NEW SOLUTIONS* 345, 354 (2011) (describing this and other similar developments).

58. Although the implications of the best-in-market standard for fair trade deserves further research, at least facially it would seem to survive one of the most rigorous trade agreements. See *The WTO Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement)*, WORLD TRADE ORG., http://wto.org/english/tratop_e/sps_e/spsagr_e.htm (last visited Feb. 9, 2014). The SPS Agreement expects that restraints on trade be supported by risk assessments and other legitimate analyses. See, e.g., *id.* at art. 2(2) (“Members shall ensure that any sanitary or phytosanitary measure is applied only to the extent necessary to protect human, animal or plant life or health, is based on scientific

the global market across a number of functional product categories would not seem protectionist, particularly when those standards are justified in part by the substantial scientific uncertainties that preclude more precise human and environmental testing and analysis. In contrast to an abstracted regulatory judgment based on national preferences, a basic “demand safer alternatives in the global market when the risks are unspecified” regulatory standard considers all products in the global marketplace and not simply those sold by its own manufacturers.

At the same time, a global best-in-market determination for product safety should accelerate the race-to-the-top features of this regulatory standard. Manufacturers in a global market may find themselves in competition for possibly the first time, innovating better ways to design products regarding human health and environment in order to be considered an exemplar. Much like the technological revolution, this regulatory-triggered revolution would turn the market for lemons into precisely the opposite regarding product innovation. By focusing on global innovation and rewarding the best, the standards will be set to encourage research, development, and safety by singling out market “winners.”

In benchmarking regulatory standards against this global market, there may even be potentially significant gains from the economies of scale in sharing information between governments. Some countries might want to benchmark their product regulatory standard on the “average” best product in the market; others might prefer a higher standard based on the three safest products in a functional class. Yet whatever the determination, methods for identifying and assessing the relative safety of functionally equivalent products should become fungible and easy to translate across borders since they compare global products against one another based on seemingly translatable features of toxicity and cost.

IV. EXISTING HYBRID APPROACHES THAT PARALLEL A BEST-IN-MARKET APPROACH TO TOXICS PRODUCT REGULATION

Although basing regulatory standards on best performers may seem a relatively dramatic change from the status quo, this hybrid approach resonates with existing approaches found in tort law and pollution control standards in the United States and chemical reg-

principles and is not maintained without sufficient scientific evidence . . .”). An alternatives assessment that identifies a chemical as both risky and presenting no additional benefit, particularly as against a global marketplace of analogous products, would seem to meet this test.

ulation in the European Union. These complementary, existing approaches are considered in this section. The investigation explores both their similarities to the proposal for toxic product regulation and also how implementing these various programs could be improved, particularly if adapted to toxic product regulation in the future.

A. “Reasonable Alternative Design”
in Products Liability Law

In United States tort law, negligence is generally determined—implicitly or explicitly—by comparing a defendant’s behavior or product against alternative courses of action.⁵⁹ Whether a defendant is negligent or unreasonable depends on whether the costs of his activity, as compared against alternative precautions, outweigh the benefits. Negligence is thus relational; it involves a comparison of what a defendant did against what he could have done.

Over time, the largest area of products liability law—governing design defects—has evolved to develop a similar, relative standard for product safety in tort law: namely, whether a product’s costs outweigh its benefits when compared against a “reasonable alternative design.”⁶⁰ This reasonable alternative design (RAD) serves as a comparison point that anchors an assessment of a product’s safety against the market alternatives.⁶¹ The RAD standard is dynamic: improvements in product design lead to a constant, upward pressure for innovation by manufacturers. Since the RAD test is applied to individual tort claims on a case-by-case basis, it should be more insulated from politics and collective self-interested action by product manufacturers as compared to the political process.⁶²

To stave off liability, product manufacturers must keep up with competitors to produce products at least average in safety. If some cars are designed to prevent mis-shifting when a gear is not engaged⁶³ or from allowing power windows to close even if objects

59. See, e.g., Mark F. Grady, *Untaken Precautions*, 18 J. LEGAL STUD. 139, 144 (1989) (“by selecting an untaken precaution on which to rely, the plaintiff defines the analysis that everyone else will use [in a negligence case] . . .”).

60. RESTATEMENT (THIRD) OF TORTS: PROD. LIAB. § 2(b) (1998).

61. Plaintiffs may also be required to create prototypes of the preferred alternative, at least in some states. See, e.g., *Unrein v. Timesavers, Inc.*, 394 F.3d 1008, 1012 (8th Cir. 2005) (requiring plaintiff to develop a prototype of the preferred alternative); *Jaurequi v. Carter Mfg. Co.*, 173 F.3d 1076, 1084 (8th Cir. 1999).

62. This is not always the case. See, e.g., Alan Schwarz, *As Injuries Rise, Scant Oversight of Helmet Safety*, N.Y. TIMES, Oct. 20, 2010, at A1 (documenting the low standards set by an association for football helmets, which are overseen by an association made up of helmet manufacturers and physicians; the standards have been influential in some tort litigation against manufacturers).

63. See, e.g., *Gen. Motors Corp. v. Sanchez*, 997 S.W.2d 584 (Tex. 1999).

(such as children's heads) are in the way,⁶⁴ then plaintiffs injured by cars without these safety features can argue that a RAD would have prevented the accident at little to no additional cost. While in theory the assessment involves quantifications of risks and benefits, in reality the analysis generally considers only whether this "reasonable alternative design" is available and affordable. If it is, then the defendant is at risk of liability for choosing a less safe design.

In theory, a RAD standard would ensure reasonable product safety for all products, including toxic products. Products that are unreasonably toxic as compared to equally efficacious competitors would trigger liability, and manufacturers would reconsider their decision to market unreasonably unsafe products. In practice, however, the "actual cause" requirement necessary for a successful case involving latent injuries absolves most manufacturers from liability for the manufacture of unreasonably unsafe toxic products.⁶⁵ Products that are highly carcinogenic, teratogenic, or otherwise reactive will generally remain unaffected by tort law because there is not likely to be adequate information to connect a plaintiff's generic injuries to his exposure to the product decades earlier. While tort law provides a RAD standard that should encourage safer toxic products (since tort law requires injured victims to prove causation), the retrospective, information-intensive nature of the proof leaves tort law ineffective in reaching most toxic products that cause latent harm.⁶⁶

The test advocated here to regulate toxic products is the equivalent of the RAD test, but it would be applied by regulators and not be barred by uncertainties involved in tracing cause and effect. Additionally and in contrast to tort law, rather than a plaintiff, the Agency would be in search of a prototype or better reasonable alternative product. And, rather than a jury, regulators will determine whether the case has been made against an unreasonably unsafe product.

64. See *Power Windows*, KIDSANDCARS.ORG, <http://kidsandcars.org/power-windows.html> (last visited Feb. 9, 2014).

65. See, e.g., Berger, *supra* note 26.

66. This problem—a Catch-22 of sorts—has led to its own series of puzzles and possible fixes within the four corners of tort law itself. Leading among them is a suggestion that rather than physical injuries that are causally linked to a toxic product, at least for non-therapeutic drugs (or presumably by extension highly toxic chemicals with high exposure), the plaintiff need only show dignitary harm from the lack of notice or informed consent. By approaching the claim as effectively a battery (without the intent), tort law can offer some deterrence value for some of these problems that otherwise fall through the cracks. See Margaret A. Berger & Aaron B. Twersky, *Uncertainty and Informed Choice: Unmasking Daubert*, 104 MICH. L. REV. 257 (2005).

*B. Pollution Control Standards
in the United States*

“Best available pollution control technology” standards, which are required by Congress in the Clean Air and Clean Water Acts and, to a lesser extent, in a few other statutory programs, offer another analogy to the proposed best-in-market standards for toxic product regulation.⁶⁷ Under these statutes, the Agency is directed to find the best pollution control technology, or sometimes the ninety-five percent best technology, and to promulgate industry-wide pollution control standards based on the capabilities of these best technologies. There are several overlapping justifications for this best-in-market approach to pollution regulation. First, basing pollution control on the technologies that have been installed at some facilities ensures that the pollution control requirements are feasible. Second, the best-in-market standard dodges information-intensive inquiries into what levels of pollution might be appropriate in different localities. Third, as a moral imperative, this best-in-market standard demands that industry “do their best,” but does not require regulators to invest scarce resources into determining, with added precision, whether “doing one’s best” is enough regarding public health and welfare.

Despite the seemingly clear best-in-market benchmark for identifying appropriate levels of pollution, the Agency’s promulgation of these pollution control standards has been weakened by unrelenting and often unchecked pressure from the regulated industry. For example, due to asymmetries in information regarding industry capabilities, it has been difficult for the agencies to determine what and whether various pollution control technologies are truly feasible across facilities or to determine with quantitative precision the types of reductions these pollution control technologies can generally accomplish once installed.⁶⁸ These informational hurdles have not only slowed the Agency’s setting of the standards but may have led the Agency to strike compromises with affected industries hoping to stave off judicial challenges.⁶⁹ It should be

67. Technology-based standards made their initial appearance in the first major statute to impose federal regulatory controls on pollution—the Clean Air Act of 1970. Clean Air Act Amendments of 1970, Pub. L. No. 91-604, 84 Stat. 1676 (codified as amended at 42 U.S.C. §§ 7401-7671q (2006)). Section 111 of the Clean Air Act requires EPA to set technology-based emission limitations for new major sources of air pollution. *Id.* at § 111 (codified as amended at 42 U.S.C. § 7411).

68. See, e.g., Sanford E. Gaines, *Decisionmaking Procedures at the Environmental Protection Agency*, 62 IOWA L. REV. 839, 839-64 (1977); D. Bruce La Pierre, *Technology-Forcing and Federal Environmental Protection Statutes*, 62 IOWA L. REV. 771, 809-31 (1977).

69. See, e.g., Wendy Wagner, *Revisiting the Impact of Judicial Review on Agency Rulemakings: An Empirical Investigation*, 53 WM. & MARY L. REV. 1717 (2012) (conjecturing on this point).

noted, however, that in best-in-market benchmarks for product safety, these asymmetrical information problems would not be as significant; products can be compared without more intricate determinations of underlying industrial processes, and a product's feasibility can be assessed by its market price. This is not the case for pollution control technologies, which must be retrofitted and maintained in a wide variety of facilities.

Industry has also weakened the standards by successfully lobbying agencies to subdivide the relevant sets of industrial actors subjected to a "best available technology" standard into smaller and smaller units.⁷⁰ If there are only five industries within a group, the best available pollution control technology is less costly and rigorous than when hundreds of facilities are compared in the search for the single best technology. In products, identifying the set of comparators could be equally slippery and subject to manipulation for determining which products are functionally equivalent. The initial categorization of products and their comparators will need process-based rules to stave off concerted lobbying by regulated parties in order to ensure the categories are not too narrow.

Even more problematic, the existing standards for pollution control technology are rarely updated by the agencies.⁷¹ While Congress requires the Agency to revisit the standards every five years, the Agency rarely does this in practice. Many of the pollution control standards are based on what the Agency identified as among the best technologies in the 1970s and 1980s. These standards lag well behind the actual best-in-market, technological exemplars contemplated in the original environmental laws.

C. Chemicals Regulation Locally and Globally

The notion of a comparative approach to toxics regulation—that culls out inferior and dangerous substitutes—is becoming increasingly well accepted in both the states and Europe. In Maine, regulators may ban children's products that contain priority chem-

70. One example is the deeply buried discussion of the authority to subcategorize industries to set the standards and the economic advantages to this technique in a court case where this practice was challenged. *Sierra Club v. EPA*, 479 F.3d 875, 885 (D.C. Cir. 2007) (Williams, J., concurring) ("[Although] authority to generate subcategories is obviously not unqualified . . . one legitimate basis for creating additional subcategories must be the interest in keeping the relation between 'achieved' and 'achievable' in accord with common sense and the reasonable meaning of the statute.").

71. A 2012 GAO study documents this problem in detail under the Clean Water Act. See U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-12-845, WATER POLLUTION: EPA HAS IMPROVED ITS REVIEW OF EFFLUENT GUIDELINES BUT COULD BENEFIT FROM MORE INFORMATION ON TREATMENT TECHNOLOGIES (2012), available at <http://gao.gov/assets/650/647992.pdf>.

icals if a safer alternative is available at a comparable cost.⁷² The core idea is that if needlessly hazardous chemicals are used in producing a product, like children's products, that can be replaced with safer chemicals, the product should be banned.⁷³ A Massachusetts's law may be even more far-reaching since it requires the state's businesses to identify and use less toxic materials for all products where possible. Alternatives assessments are conducted to identify these opportunities.⁷⁴ Other state laws are cropping up that follow Maine's and Massachusetts's leadership on substitute analysis. Even nonprofits are engaging in ways that help both tee up the ready availability of safer substitutes and make the information easier to access regarding conducting these comparative assessments.⁷⁵

The European Union's renowned effort to regulate chemicals, through the Registration, Evaluation, Authorization and Restriction of Chemicals regulation (REACH), is perhaps the most wide-ranging effort to integrate a comparative or substitute analysis into toxics regulation. Although the primary thrust of REACH requires basic toxicity testing as a precondition to the sale of chemical products, for extremely hazardous chemicals the European Union legislation requires manufacturers to also justify the continued marketing of their products against the available substitutes.⁷⁶ Like RAD, this substitute analysis requires a best-in-market assessment of the viability of at least a subset of chemicals against their competitors.

Since the REACH program is only just getting started, it is unclear how vigorously this substitute analysis will be implemented.⁷⁷ The fact that the substitute analysis requirement is codified in REACH, however, lends at least some credence to a best-in-market approach to chemicals regulation. While identifying a reliable set of comparators presumably will be difficult, it is apparent-

72. ME. REV. STAT. ANN. tit. 38 §§ 1691-1699 (2013).

73. *Id.* § 1696.

74. The Massachusetts legislature established a program to assist businesses in reducing the use of toxics. That program has resulted in a concerted effort to identify safer substitutes and to develop methods for alternatives assessments. See MASS. GEN. LAWS ch. 21I (2013) (the Toxics Use Reduction Act of 1989); see also *Alternative Assessments*, TURI http://turi.org/Our_Work/Research/Alternatives_Assessment (last visited Feb. 9, 2014).

75. See, e.g., GOODGUIDE, <http://www.goodguide.com> (last visited Feb. 9, 2014); see also EWG'S SKIN DEEP, <http://ewg.org/skindeep/> (last visited Feb. 9, 2014).

76. Regulation 1907/2006, of the European Parliament and of the Council of 18 December 2001 Concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), Establishing a European Chemicals Agency, Amending Directive 1999/45/EC and Repealing Council Regulation No 793/93 and Commission Regulation No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC, 2006 O.J (L 396) 3, 4.

77. See, e.g., Joanne Scott, *From Brussels with Love: The Transatlantic Travels of European Law and the Chemistry of Regulatory Attraction*, 57 AM. J. COMP. L. 897, 898 (2009).

ly not such a great challenge that the drafters and stakeholders found it necessary to avoid substitute analysis altogether.

Relatedly, REACH is likely to produce considerable practical information about a best-in-market approach to chemical regulation, at least as applied to extremely hazardous chemicals. Such practical experience can expedite the adoption of this approach in the United States and elsewhere. Implementation in the European Union should also stigmatize the marketability of at least those extremely hazardous substances that cannot establish their continued market viability in comparison with substitutes.

D. Learning from Experience

Some general lessons for the design of best-in-market approaches emerge from these analogous experiences in tort law, United States pollution control, and REACH. First, a market benchmark must be based on the products or options on the market. In setting market standards, there can be no deference to industry collectives in defining the best alternatives or in establishing the appropriate set of comparators. A best-in-market benchmark simulates the market by placing manufacturers in competition against one another.

Second, Agency efforts to find the average or best toxic product in the market must be structured to be constantly updated with the emergence of new and better products. Just as the market is dynamic, so the regulatory standards must change as well. To block political pressure that might be placed on the Agency to forgo this updating, adaptive mechanisms should be hardwired into the authorizing legislation. Fortunately, and in contrast to the installation of pollution control technologies, rapid developments in innovation and product design are generally a fact of life for product manufacturers; innovations in preventing immediate risks and acute harms are ever-present in the market. At least facially requiring a similar, dynamic regulatory standard for latent harms seems non-problematic. From the manufacturers' standpoint, provided there are reasonable grace periods—two years or so—to meet the rising product standards, the need for this type of periodic updating should be capable of being factored into manufacturers' research and development plans.

The final challenge involves incorporating a best-in-market approach into a regulatory system to ensure there is a reliable, relatively objective way to find market analogs or standards. This is more challenging. Under one approach, regulators could identify a presumptive "best" or "average" product against which others are

compared and then shift the burden to those attempting to defend their individual products to provide evidence of how their product fares by comparison. In this way, regulators need not find a perfect analog, and the asymmetries and complexity of the relevant information will still rest on the individual manufacturers in distinguishing their product from the presumptive best product.⁷⁸

Even if this basic approach is used, there may be regulatory challenges in identifying the average or best products on the market. To supplement this critical inquiry, regulators could provide rewards or other inducements for the discovery of a particularly good product within a functional use category; the rewards could be provided to citizens, nonprofits, and competitors.⁷⁹ Regulatory agencies would also benefit from a standing expert committee assigned the task of monitoring the market for examples of innovative products and even reviewing agency determinations of the best in the market. The more independent such a research body, the more successful the regime should be in objectively making comparisons and identifying superior analogs.

V. GETTING FROM HERE TO THERE

Although the race to the top seems a much-improved approach to regulating toxic products from all perspectives ranging from pure efficiency to public health protection, that fact alone does not guarantee that the reform will be politically viable. Since the existing regulatory oversight of toxic chemicals and products has been effectively nonexistent over the last forty years, there will inevitably be a strong segment of regulated groups that will vigorously resist this type of change. Tethering product safety assessments to market options may also signal a bumpy future ride for manufacturers who currently do not invest much in research and development, where products can quickly grow obsolete as front-moving global firms innovate and put competitors out of business. The vast majority of manufacturers, in other words, may worry they won't be singled out as among the best, particularly in a market that has been characterized by noncompetitive features for so long. Manufacturers who view themselves as losing the race to the top will likely be the most vigorous opponents to the legislation.

A first step to importing a best-in-market approach into EPA's review of chemicals might be accomplished incrementally and

78. The methods are already being worked out for these comparisons. *See supra* text accompanying note 43.

79. See similar suggestions in Wendy Wagner, *Using Competition-Based Regulation to Bridge the Toxics Data Gap*, 83 *IND. L. J.* 629 (2008).

through light external pressure using the petition process. A petitioner—either a nonprofit or even the manufacturer of a superior product—could argue that a chemical presents an unreasonable risk if there is a safer substitute that provides comparable benefits at comparable cost. In an earlier article, I discuss how this petition process might work.⁸⁰ While there are still kinks to be worked out, the statute seems to create space for this type of assessment by the Agency.⁸¹

The identification of superior substitutes, at least in some product categories, might also be provided by reliable nonprofits to help fill some of the many information gaps in the market. While this will not cure the regulatory programs, it may create pressure on manufacturers that will lead them to ultimately prefer or at least not resist as strenuously various regulatory interventions that provide this type of comparison.

There are already moves towards providing this type of comparison research and product disclosure, however preliminarily, through public interest groups who partner with academic institutions to generate the information.⁸² Front-moving product manufacturers might also partner with public interest groups to develop robust sources of consumer and investor based information to raise the salience of the range of safety risks in diverse chemical products and to highlight the benefits of greater regulatory oversight of chemical products.⁸³ These information-based reforms, albeit expensive, could identify in a primary way the losses to consumers and the adverse selection problems that result without more rigorous information on product toxicity. This salience-raising could then raise the majoritarian interest in reform and may even lead to some fragmentation among the strong industry coalition in resisting political reform.

Cross-national differences might also help raise public awareness of the otherwise invisible institutional failures and tip the political process towards more meaningful regulatory oversight which includes a comparison of similar products based on their relative toxicity. If the European Union's REACH succeeds in generating a wealth of new information on toxicity and, even more, to the extent it implements a rigorous approach to substitute-analysis for at least the most toxic chemicals, it ups the ante for other nations by changing the salience of the risks and alternative

80. *See id.*

81. *See id.* But see Dennison, *supra* note 34 (suggesting the statute may not provide the policy space for this type of decision).

82. *See, e.g., supra* text accompanying note 76; *Who We Are*, TURI, http://turi.org/About/Who_We_Are (last updated Jan. 1, 2014).

83. *See, e.g., CERES*, <http://www.ceres.org/> (last visited Feb. 9, 2014).

regulatory approaches. This type of cross-national exporting of information may be an important mechanism for triggering change in domestic settings that are overcome with institutional stasis and perpetual inaction. Although it is circuitous, there is evidence that the salience-raising/information cost-lowering features of chemical regulation in the European Union can catalyze activity in local and state regimes in the United States, which might trickle up to create public pressure for change at the national level.⁸⁴

However it is accomplished, once the best-in-market approach is incorporated incrementally into toxics control, it will have practical experience upon which to proceed. The experimentation should also affect the coalitions that build to support it and that might not otherwise exist. Firms that succeed in a best-in-market approach may rally behind it, and the current, strong industry coalition might be more fragmented, if not disbanded entirely.⁸⁵

VI. BEYOND TOXICS REGULATION

A best-in-market approach that introduces competition among regulated parties in a “race-to-the-best” regulatory standard might also transfer to other faltering regulatory programs. At the least, the notion of an ever escalating, competition-based standard could be retrofitted into the technology-based standards programs. Active competition among firms in identifying the ideal pollution control standard would seem to be a critical feature in making this regulatory approach successful. EPA’s current implementation of the “best technology” standard under the Clean Air and Clean Water Acts, however, generally resists basing the best standard on a rigorous race to the top. The standards are rarely updated,⁸⁶ and even when set the first time, EPA seems to capitulate to weaker standards advocated by trade associations and some industries.⁸⁷

The analysis here suggests that EPA’s current approach misses the genius at the core of these standards. In order to make meaningful progress and encourage continued innovation in pollution control, the Agency must set standards based on rigorous compari-

84. Cf. Hari M. Osofsky & Janet Koven Levit, *The Scale of Networks?: Local Climate Change Coalitions*, 8 CHI. J. INT’L L. 409 (2008) (discussing the role of cities as leaders in U.S. policy on climate change and the coalition of local governments as an important source of innovation that integrates global policies back into the United States).

85. Short of this more gradual wearing down of the anticipated strong anticipation through experience, beginning with a legislative approach may be the most risky way to proceed and could even backfire by causing the opposition to sabotage early experimental efforts to get it working.

86. See *supra* text accompanying note 71.

87. See, e.g., Wendy Wagner et al., *supra* note 32, at 125 (2011) (documenting this weakening of the standards).

sons of the best available possibilities. The Agency should also consistently revise the standards as technology evolves and may even need to subsidize or even encourage the development of these technologies in other ways. In doing so, the regulatory program will continually bring out the best that industry has to offer by splicing in a market-based competitive edge to the standard setting process.

Corporate sustainability, which appears to be stalled perpetually,⁸⁸ might also be advanced by a race-to-the-top approach. EPA could identify exemplars of sustainability in various manufacturing and other heavy industry categories. These exemplars could provide a basis for identifying reasonable soft standards (e.g., certifications or star labeling) initially. Key characteristics of the exemplars could then become enforceable later with legislation. Sustainability goals and, ultimately, requirements would be set by the best innovators in the industry. The front-movers would not only receive positive publicity but also receive an edge on competitors if others are expected to follow in their technological footsteps. Other competitors presumably will be inclined to leapfrog over these accomplishments to become the regulatory standard in the future, both for publicity and for profit-making reasons.

Other regulatory programs governing products—like diet supplements and processed foods—might also adopt a best-in-market approach for setting standards for purity, quality, and other features. While there is considerable variation among these programs in terms of the challenges that regulators face, if safety remains a concern, the regulatory system could adopt standards based on the best designs within the industry and continuously adjust them upwards as the technology develops. This would be a best-in-industry type of standard.

Finally, areas where there is little consensus over the best approach—like climate change and even fracking regulation—could similarly adopt a best-in-market approach to controlling the industry. Within fracking, for example, there is likely to be at least some variation in the environmental sensitivity of the firms and the precautions they take during extraction. Rather than attempt to establish standards based on environmental sensitivities, the standards could be tied back to the precautions that the best firms take. These types of established measures could form at least the starting point for industry-wide requirements. And, with the focus on insisting on the best available techniques, the incentives are al-

88. See, e.g., Alan D. Hecht, *The Next Level of Environmental Protection: Business Strategies and Government Policies Converging on Sustainability*, 8 SUSTAINABLE DEV. L. & POL'Y 19, 23 (2007) (lamenting the absence of a sustainability policy in the United States).

ways pointed upwards to encourage more innovation on careful extraction techniques in the future. Some of the debates over the risks of spills, human exposures versus worker exposures, and the like can be circumvented by a more simple moral resolve that, at the least, firms that contribute greenhouse gasses or extract natural gas should use the best techniques available to minimize the public harm.

There may be other relatively easy applications of the best-in-market approaches beyond those listed here. Because it looks to the best of what is being done as a standard for what should be done more generally, the best-in-market approach is technologically realistic. As long as these standards are constantly being updated, the approach creates incentives for firms to innovate in environmental protection. The competition created to do better ripples over to the political process. Rather than engage collusively to pressure the Agency—often in processes where they are the only voice—to weaken standards and lower the floor, the best-in-market approach shifts the focus to identifying the best actors and setting standards accordingly. With clear winners (and losers), the political endgame changes and the previously unified industry coalition is fractured into smaller pieces.

VII. CONCLUSION

Some of the best regulatory analyses in environmental law have been focused on the deplorable state of toxics regulation. These combined analyses expose several major weaknesses that combine to create a seemingly hopeless system. In this essay, I developed one of the recurring themes: namely, the failure of many environmental regulatory programs to encourage a race to the top in technological and related innovation. By reframing the standards to inject a best-in-market goal in areas like toxics control, some of the consistent failures may be capable of being redressed, while the incentives within regulated industry will shift from the collective benefits of ignorance regarding product toxicity to more competitive struggles within one another to rise to the top. Through this competition, more information that is also vetted in an adversarial way will be available to the regulatory system. There will be more significant payoff associated with innovating in green and related technologies, which include not only positive publicity but gaining a head start on competitors in setting regulatory standards. While still preliminary and many details in need of filling in, the essay makes a case for considering this new approach more integrally throughout environmental law and regulation.