

GREEN BUSINESS AND THE IMPORTANCE OF REFLEXIVE LAW: WHAT MICHAEL PORTER DIDN'T SAY

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INTRODUCTION

Recently, General Electric Corp. (GE) committed to investing \$1.5 billion in environmental technologies.¹ Employees at 3M Corp. (3M), charged with developing pollution prevention ideas, generated almost five thousand projects that eliminated 2.2 billion pounds of pollutants and saved the company \$1 billion.² IKEA, the home furniture company, instituted a program to identify the source of all the wood that it uses and evaluate each supplier for emissions, waste, and sustainable forestry practices.³ Chiquita Corp. (Chiquita) worked with the Rainforest Alliance to develop a set of guidelines on how to produce bananas in a more environmentally and socially responsible way.⁴

These are but a few examples of the trend toward “green business” that is sweeping through American industry.⁵ Green business can be defined as voluntary actions by a private firm that are aimed at achieving better environmental performance and, simultaneously, making the company more competitive.⁶ Until recently, many have assumed that corporate expenditures on environmental performance inevitably impose costs on the company, leading to a trade-off between environmental performance and competitiveness.⁷ Green business turns this idea on its head. It posits that

1. DANIEL C. ESTY & ANDREW S. WINSTON, *GREEN TO GOLD* 138 (2006).

2. *Id.* at 107. In another example, when E.I. du Pont de Nemours and Co.’s (DuPont’s) Chief Executive Officer (CEO) learned that his company was spending over \$1 billion each year on waste treatment and pollution control, he insisted that the company reduce these costs. Since that time, DuPont has reduced its waste treatment and pollution control costs to \$400 million. The company estimates that, but for this initiative, these costs would have grown to \$2 billion by now. *Id.* at 111.

3. *Id.* at 202–04.

4. *Id.* at 183.

5. See generally ENVTL. DEF. FUND, *INNOVATIONS REVIEW: MAKING GREEN THE NEW BUSINESS AS USUAL* (2008) (describing green business innovations); ESTY & WINSTON, *supra* note 1 (reviewing and analyzing green business activities); NEIL GUNNINGHAM, ROBERT A. KAGAN & DOROTHY THORNTON, *SHADES OF GREEN* (2003) (reviewing and analyzing green business activities); JOEL MAKOWER, *STATE OF GREEN BUSINESS* (2008) (describing green business developments in 2008); Kurt A. Strasser, *Do Voluntary Corporate Efforts Improve Environmental Performance: The Empirical Literature*, 35 B.C. ENVTL. AFF. L. REV. 533, 533–35 (2008) [hereinafter Strasser, *Voluntary Corporate Efforts*] (identifying the trend toward voluntary corporate environmental programs and categorizing these initiatives); William L. Thomas, *Rio’s Unfinished Business: American Enterprise and the Journey Toward Environmentally Sustainable Globalization*, 32 ENVTL. L. REP. 10,873 (2002) (reviewing business sustainability strategies with comprehensive citations to literature).

6. DANIEL J. FIORINO, *THE NEW ENVIRONMENTAL REGULATION* 91 (2006) (“[G]reening involves a constant and verifiable effort to do better than compliance.”).

7. ENVTL. LAW INST., *INNOVATION, COST AND ENVIRONMENTAL REGULATION: PERSPECTIVES ON BUSINESS, POLICY AND LEGAL FACTORS AFFECTING THE COST OF COMPLIANCE* 1 (1999) (“[T]raditional economic theory . . . indicates that regulations

investment in environmental performance can enhance, rather than detract from, business competitiveness. Some have described this as a fundamental departure from past conceptions of the business–environment relationship and as opening a new chapter in the history of corporate environmentalism.⁸ Others, including President Obama, have claimed that it can play an important role in restoring American industrial competitiveness.⁹ Inspired by such ideas, *New York Times* columnist Thomas Friedman went so far as to declare that “[g]reen is the new red, white and blue.”¹⁰

Yet legal scholars have paid surprisingly little attention to the possible connections between law, policy, and green business. Important questions present themselves. Are market forces alone sufficient to promote green business, or is there a role for law and policy? If there is a role for government, are the existing environmental statutes and regulations up to the job, or would other regulatory strategies work better? What might these new regulatory initiatives look like? One might expect legal scholars to have something important to say about these questions of law and policy. Yet, with a few exceptions,¹¹ legal academics have largely ignored them.¹²

imposing additional environmental requirements on industry would tend to reduce profitability and competitiveness.”).

8. See ANDREW J. HOFFMAN, *FROM HERESY TO DOGMA: AN INSTITUTIONAL HISTORY OF CORPORATE ENVIRONMENTALISM* (2001) (describing four stages of corporate environmental behavior).

9. See Barack Obama, U.S. President, Address at the NAACP Centennial (July 16, 2009), in *Obama's Remarks at NAACP Centennial*, POLITICO (July 16, 2009), <http://www.politico.com/news/stories/0709/25053.html>; *This Week: George Stephanopoulos' Exclusive Interview with President-Elect Barack Obama* (ABC television broadcast Jan. 11, 2009) (transcript available at <http://abcnews.go.com/ThisWeek/Economy/story?id=6618199>); see also Judd F. Sneirson, *Green is Good: Sustainability, Profitability, and a New Paradigm for Corporate Governance*, 94 IOWA L. REV. 987, 989 (2009) (predicting that green energy and business will eventually revitalize the American economy).

10. Thomas L. Friedman, *The New Red, White and Blue*, N.Y. TIMES, Jan. 6, 2006, at A21.

11. See FIORINO, *supra* note 6; GUNNINGHAM ET AL., *supra* note 5; Joseph F. DiMento & Francesco Bertolini, *Green Management and the Regulatory Process*, 9 TRANSNAT'L LAW. 121 (1996); Strasser, *Voluntary Corporate Efforts*, *supra* note 5 (discussing the empirical literature on programs that encourage firms to adopt cleaner products and processes); cf. Kurt A. Strasser, *Cleaner Technology, Pollution Prevention and Environmental Regulation*, 9 FORDHAM ENVTL. L. REV. 1 (1997) [hereinafter Strasser, *Cleaner Technology*] (noting how regulation can promote corporate pollution prevention efforts).

12. See GUNNINGHAM ET AL., *supra* note 5, at 39 (explaining that the area is “woefully” undertheorized). In a helpful contribution to the general area, the *Boston College Environmental Affairs Law Review* recently held a symposium on “The Greening of the Corporation.” See 35 B.C. ENVTL. AFF. L. REV. (2008). However, none of the papers offered a comprehensive analysis of the relationship between regulation and green business.

Instead, it is a business professor, Professor Michael Porter of the Harvard Business School, who has set out the foundational ideas on the relationship between law, policy, and green business.¹³ As will be explained more fully below, Professor Porter argues that traditional technology-based standards, which push companies to adopt specific pollution control technologies, are “bad” because they deter green innovation.¹⁴ By contrast, outcome-based standards, which specify the environmental result but let companies figure out how to get there, encourage such innovation and are “good.”¹⁵ Professor Porter concludes that the key to promoting green business is to substitute outcome-based rules for technology-based standards, good regulation for bad. Professor Porter’s formulation is extremely insightful and constitutes a major leap forward in the thinking about how law and policy can promote green business. It is, perhaps, for this reason that his ideas have become the accepted wisdom in this area of regulatory theory.¹⁶ While some have taken issue with Professor Porter’s empirical claims, few have questioned his endorsement of outcome-based regulation as the best way to promote environmental innovation.¹⁷ Many economists,¹⁸ legal academics,¹⁹ and policymakers²⁰ have embraced the

13. See Michael E. Porter, *America’s Green Strategy*, SCI. AM., Apr. 1991, at 168 [hereinafter Porter, *Green Strategy*]; Michael E. Porter & Claas van der Linde, *Green and Competitive*, HARV. BUS. REV., Sept.–Oct. 1995, at 120 [hereinafter Porter & van der Linde, *Green and Competitive*]; Michael E. Porter & Claas van der Linde, *Toward a New Conception of the Environment–Competitiveness Relationship*, 9 J. ECON. PERSP. 97, 98 (1995) [hereinafter, Porter & van der Linde, *New Conception*].

14. Porter & van der Linde, *Green and Competitive*, *supra* note 13, at 129 (comparing “good” regulation with “bad” regulation).

15. *Id.*

16. See FIORINO, *supra* note 6, at 93 (describing the “oft-cited” Porter theory); GUNNINGHAM ET AL., *supra* note 5, at 23 (discussing the “particular influence” of Professor Porter’s theory).

17. See, e.g., Karen Palmer, Wallace E. Oates & Paul R. Portney, *Tightening Environmental Standards: The Benefit–Cost or the No–Cost Paradigm?*, 9 J. ECON. PERSP. 119, 120 (1995) (questioning empirical claims but concurring with regulatory theory).

18. See ENVTL. LAW INST., *supra* note 7, at 9 (“[E]conomists and writers have agreed strongly with [Professor Porter’s] views.”); Adam B. Jaffee, Steven R. Peterson & Paul R. Portney, *Environmental Regulation and the Competitiveness of U.S. Manufacturing: What Does the Evidence Tell Us?*, 33 J. ECON. LITERATURE 132, 152 (1995) (agreeing with Professor Porter’s ideas on regulation).

19. See, e.g., FIORINO, *supra* note 6, at 119 (“In thinking about what greening means for public policy, Porter and van der Linde’s distinctions between good and bad regulation are critical.”); David M. Driesen, *The Societal Cost of Environmental Regulation: Beyond Administrative Cost–Benefit Analysis*, 24 ECOLOGY L.Q. 545, 575–76 (1997) (discussing and accepting Professor Porter’s idea that properly-designed environmental regulations can enhance business competitiveness); Kirk W. Junker, *Tax Exemption for Pollution Control Devices in Pennsylvania*, 34 DUQ. L. REV. 503, 530 (1996) (accepting Professor Porter’s ideas with respect

idea.

Yet, as insightful as it is, Professor Porter's thesis also suffers from a serious problem. An outcome-based approach to promoting many of today's green business activities would incur unacceptably high administrative costs. Building on Professors Coglianese and Lazer's work on management-based regulation,²¹ this Article will show that the costs involved in setting an appropriate outcome-based target, and in measuring and monitoring the environmental results, make outcome-based standards an ineffective tool for promoting all but a subset of green business practices.²² To illustrate this, we need only return to the examples with which this Article began and ask whether an outcome-based standard that specified numeric outcomes for specific pollutants could effectively promote such behaviors. An outcome-based standard would not be a good tool for getting companies to duplicate Chiquita's stakeholder involvement initiative or IKEA's auditing of its wood products supply chain. The information costs involved in accurately predicting the amount of pollution or waste reduction that such initiatives would yield would be extremely high, rendering this approach practically unusable. The same can be said for 3M's Pollution Prevention Pays (3P) program. This initiative generated almost five thousand small projects that take place at many different points in the operation and involve a variety of different pollutants and wastes. A regulator would find it extremely difficult and costly—if not impossible—to predict in advance the source, nature, and extent of these reductions. Moreover, the cost of measuring and monitoring the reductions achieved—another essential prerequisite for any outcome-based standard²³—would also prove excessive. Outcome-based regulation, as Professor Porter has defined it, does not fit and would not work to motivate these activities and many others that lie at the core of the green business phenomenon. While Professor Porter has generated a whole field of study on how regulation can promote green business and made a foundational and highly valuable contribution to this field, his central theory is lacking something important.

Reflexive law is that missing piece. As coined by the German social

to "technology-forcing" regulations); Barton H. Thompson, Jr., *What Good is Economics?*, 27 ENVIRONS ENVTL. L. & POL'Y J. 175, 183 (2003) (accepting Professor Porter's view that "mandatory regulation may also spur improvements that simultaneously benefit the environment and bottom lines").

20. See, e.g., PRESIDENT BILL CLINTON & VICE PRESIDENT AL GORE, REINVENTING ENVIRONMENTAL REGULATION (1995) (endorsing "performance-based" regulation).

21. Cary Coglianese & David Lazer, *Management-Based Regulation: Prescribing Private Management to Achieve Public Goals*, 37 LAW & SOC'Y REV. 691 (2003).

22. See *infra* notes 196–234 and accompanying text.

23. Coglianese & Lazer, *supra* note 21, at 701.

theorist Gunther Teubner, the term *reflexive law* refers to law that fosters self-regulation.²⁴ It consists of legal standards and regulatory policies that push private firms to: (1) internalize social goals (e.g., environmental performance goals) and adopt them as their own,²⁵ and (2) creatively self-manage their operations so as better to achieve these goals.²⁶ Reflexive laws do not mandate specific technologies like traditional regulation.²⁷ Nor do they require particular environmental results like outcome-based rules.²⁸ Instead, they use tools such as information disclosure, stakeholder involvement, and planning requirements to motivate companies to undertake their own, self-directed improvement efforts, while leaving it up to the firms to determine both the means of pollution reduction and the ultimate environmental outcomes.²⁹

As will be explained later, the idea of reflexive law has deep roots in the Continental “systems” theory of Jürgen Habermas and Niklas Luhmann.³⁰ For introductory purposes, however, it is best to illustrate reflexive law through an example. The Emergency Planning and Community Right to Know Act requires facilities that use toxic substances to report annually the amount of such substances they have released or transferred off-site.³¹ Each year, the Environmental Protection Agency (EPA) compiles this information and publishes the Toxics Release Inventory (TRI), which ranks

24. See Gunther Teubner, *Substantive and Reflexive Elements in Modern Law*, 17 LAW & SOC'Y REV. 239, 275 (1983) [hereinafter Teubner, *Elements*].

25. JEAN L. COHEN, REGULATING INTIMACY: A NEW LEGAL PARADIGM 155 (2002) (noting that the purpose of reflexive law is “to foster internal reflection: to force the organization to internalize outside conflicts in its own decision structure, to become socially sensitive” to the externalities caused by its own behaviors and so “to develop effective internal control structures”); Michael C. Dorf, *The Domain of Reflexive Law*, 103 COLUM. L. REV. 384, 395 (2003) (reviewing COHEN, *supra*) (“Reflexive law is thus the best tool for the society in general to influence the individual social subsystems with which the law interacts, because it encourages actors within subsystems to internalize the general norm.”); Richard Stewart, *A New Generation of Environmental Regulation?*, 29 CAP. U. L. REV. 21, 127 (2001) (reflexive law’s “aim is to promote the internalization of environmental norms by firms and other organizational actors as opposed to directly controlling their external conduct”).

26. See COHEN, *supra* note 25, at 155 (reflexive law “make[s] possible the internal reflexion of external implications of future actions”); Eric W. Orts, *Reflexive Environmental Law*, 89 NW. U. L. REV. 1227, 1339 (1995) (“The idea is to create a climate in which businesses voluntarily adopt procedures to encourage environmentally sound decisionmaking and to monitor environmental progress.”); Teubner, *Elements*, *supra* note 24, at 246 (stating that the goal is to instill “self-reflective processes within different social subsystems”).

27. Stewart, *supra* note 25, at 130.

28. *Id.*

29. *Id.* at 130–34.

30. See *infra* notes 242–43 and accompanying text.

31. STEPHEN JOHNSON, ECONOMICS, EQUITY, AND THE ENVIRONMENT 197–99 (2004).

companies by the amount of toxic substances they released.³² News reporters and environmental groups put together additional rankings by industry, state, and zip code.³³ No company wants to appear near the top of these lists. The TRI rankings accordingly provide a substantial incentive for firms to reduce their use, transfer, and release of toxic substances. Studies credit TRI with causing a 45% drop in toxic releases between 1988 and 1998.³⁴ The TRI does not push facilities to adopt particular technologies, as traditional regulation would do; nor does it mandate a specific environmental result, as outcome-based regulation would do. Instead, it uses *information disclosure* to create incentives that lead *firms themselves* to decide to reduce their toxic emissions and to manage their operations to this end. The TRI is thus a law that promotes self-regulation. It is a reflexive law.

Reflexive law's emphasis on self-regulation dovetails nicely with green business's focus on self-initiated efforts to improve environmental performance. As I will demonstrate below, reflexive law can motivate many of the green behaviors that outcome-based regulation is unable to inspire. This does not mean that reflexive law should be the only means of promoting green business, replacing the market, technology-based standards, and outcome-based regulation. To the contrary, each of these other mechanisms also has a role to play in promoting green business. But reflexive law should supplement these other strategies. It is the missing piece that rounds out the regulatory theory and addresses important aspects of green business that the others do not. To date, the scholarly literature has largely failed to recognize the important contribution that reflexive law can make to this area.³⁵ This Article seeks to remedy this gap. In so doing,

32. See *TRI Explorer: Introduction*, ENVTL. PROT. AGENCY, <http://www.epa.gov/triexplorer/introduction.htm> (last visited Nov. 4, 2010) (TRI Explorer is a tool that can be used to construct rankings).

33. For example, Green Media Toolshed uses the Toxics Release Inventory (TRI) data to build its Scorecard website that allows users to construct "a detailed report on chemicals being released from any of 20,000 industrial facilities, or a summary report for any area in the country. Scorecard spotlights the top polluters in the U.S., and ranks states and counties by pollutant releases." *Pollution Locator*, SCORECARD, <http://www.scorecard.org/env-releases/us-map.tcl> (last visited Nov. 4, 2010).

34. JOHNSON, *supra* note 31, at 210–11.

35. Some excellent work has been done on reflexive law and environmental regulation more generally. See, e.g., Orts, *supra* note 26. There has also been highly insightful scholarship on the connections between regulation and environmental innovation. See, e.g., Richard B. Stewart, *Regulation, Innovation, and Administrative Law: A Conceptual Framework*, 69 CALIF. L. REV. 1256 (1981). But few have made the connection between reflexive law and green business. In a 2003 essay, Professor Sanford Gaines discussed the relevance of reflexive law for sustainable development. Sanford E. Gaines, *Reflexive Law as a Legal Paradigm for Sustainable Development*, 10 BUFF. ENVTL. L.J. 1, 23–24 (2003) (arguing that

it attempts to provide policymakers with a conceptual tool for identifying and coordinating the reflexive laws and policies that haphazardly dot the environmental regulatory landscape, and for determining where they could most effectively expand and build on these programs to better foster green business.

This Article is structured as follows: Part I will describe what firms do when they “go green” and what motivates them to do so. Having laid this foundation, Part II will evaluate the three main mechanisms that scholars have argued could promote green business: the market, traditional technology-based standards, and Professor Porter’s choice, outcome-based regulation. It will show that while each of these has an important role to play, each is ultimately insufficient. In particular, it will show that the transaction costs involved in setting an appropriate outcome-based target, and in measuring and monitoring the environmental results, make outcome-based standards an ineffective tool for promoting many green business activities. Part III will argue that reflexive law would work better for promoting these activities. It will explain in more detail Teubner’s theory of reflexive law, including its connection to Continental systems theory. It will then describe reflexive law’s three principal methods: information-based regulation, communication-based regulation, and procedure-based regulation. It will demonstrate that these regulatory mechanisms can motivate the very aspects of green business that outcome-based standards cannot. It will conclude that the best strategy is one that combines all four approaches—the market, technology-based standards, outcome-based standards, *and* reflexive law methods—while remaining sensitive to the strengths and weaknesses of each. That is what Michael Porter did not say.

I. WHAT IS GREEN BUSINESS, AND WHY ARE FIRMS PURSUING IT?

Before exploring how environmental regulation can foster green business

environmental regulation should focus more on “democracy and social discourse” as a means of promoting communication between subsystems). More to the point, Daniel Fiorino’s insightful book, *The New Environmental Regulation*, identifies reflexive law as one of a number of strategies that regulators could use to promote green business. FIORINO, *supra* note 6, at 189–224. Fiorino makes a highly important contribution to the field by connecting reflexive law and green business. This Article explores some of the same terrain but attempts to do so in greater depth. It explains the theoretical underpinnings of reflexive law, identifies reflexive law’s three regulatory mechanisms, analyzes the extent to which each of these mechanisms can promote green business, and explains how reflexive law fills the gaps in Professor Porter’s regulatory theory. In these ways and others it seeks to contribute to the scholarly exploration of how reflexive law can promote green business.

(or, as some call it, “beyond compliance”³⁶ business behavior), I must first describe green business itself. What do firms do when they go green, and why are they investing scarce resources in such efforts?

A. *What Is Green Business?*

Our definition of green business, set out above,³⁷ is broad and encompasses many different types of activities. I identify nine principal categories of green business behavior. When firms go green, they exceed legal requirements by: (1) directly reducing their own regulated—or unregulated—environmental impacts in ways that will reduce regulatory risk, improve company brand, and allow firms to get out in front of anticipated regulations; (2) reducing their customers’ environmental impacts and decreasing their customers’ exposure to unhealthy substances; (3) increasing their reuse and recycling of materials used in the production process; (4) improving their energy efficiency or that of their customers; (5) improving their resource productivity or that of their customers; (6) implementing systems to identify waste reduction, pollution prevention, energy efficiency, or resource productivity opportunities throughout the company or facility; (7) collecting and disseminating more information about the firm’s environmental impacts and performance than the law requires; (8) providing more opportunities for stakeholder input into corporate environmental decision making than the law requires; and (9) financing and investing in green products and business models, such as those described above.

Here, I describe these common approaches to corporate greening and provide illustrative examples.

1. *Reduce Regulated or Unregulated Environmental Impacts*

One way that companies go green is by reducing their own environmental impacts. Sometimes, regulation already governs these impacts. For example, 3M used to employ solvent-based coatings. The Clean Air Act required the company to reduce its solvent emissions by

36. CARY COGLIANESE & JENNIFER NASH, *BEYOND COMPLIANCE: BUSINESS DECISION MAKING AND THE US EPA’S PERFORMANCE TRACK PROGRAM* (2006). Others call it “environmental stewardship.” See, e.g., Paulette L. Stenzel, *Can the ISO 14000 Series Environmental Management Standards Provide a Viable Alternative to Government Regulation?*, 37 AM. BUS. L.J. 237, 271 (2000) (using this term). Whatever the label, the concept remains the same. Private companies, for reasons that make sense to them and in the absence of regulatory requirements, take affirmative steps that yield positive environmental results.

37. See *supra* note 6 and accompanying text.

90%.³⁸ Rather than simply comply, 3M came up with a water-based solution for coating its products. This allowed it to eliminate solvents, and their emissions, from its production process altogether,³⁹ thereby avoiding the need for regulatory approvals and shortening the company's time to market for new products.⁴⁰ In other instances, companies reduce impacts that are not yet regulated. For example, in 2008, Xerox Corp. (Xerox) announced that it had met its 2012 goal of a 10% reduction in greenhouse gases as compared to 2002 levels and set a new goal of a 25% reduction.⁴¹ S.C. Johnson & Son (SC Johnson), acting on its own initiative, decided to reformulate some of its most popular products—products like Windex, Drano, and Pledge—to reduce the amount of potentially dangerous chemicals.⁴²

2. *Provide Products or Services that Reduce Customers' Environmental Risk or Impacts*

Other firms go green by developing new products or services that are safer than comparable products or that reduce customers' environmental impacts.⁴³ Perhaps the best-known example is Toyota Corp.'s Prius, the first commercially successful gasoline-electric hybrid vehicle.⁴⁴ GE developed a new generation of jet engines that uses 15% less fuel, emits 30% less nitrous oxide, and costs less to operate.⁴⁵ In 2008, Target Corp. initiated a voluntary campaign to reduce the amount of toxic substances in its products, focusing on the elimination of polyvinyl chloride (PVC) from

38. Porter & van der Linde, *Green and Competitive*, *supra* note 13, at 126.

39. *Id.*

40. *Id.*

41. MAKOWER, *supra* note 5, at 4. Nike announced that it would be "climate-neutral" by 2011 in many respects, and Dole Food Co. similarly announced that its banana and pineapple supply chains would be carbon neutral. *Id.*

42. ESTY & WINSTON, *supra* note 1, at 118. Taking this concept in another direction, Whole Foods has stopped using plastic bags at all of its 270 stores. To replace the plastic bags, the company has expanded its sales of reusable bags and supplied paper bags where requested. ENVTL. DEF. FUND, *supra* note 5, at 26.

43. ESTY & WINSTON, *supra* note 1, at 123–24; *see also* Forest L. Reinhardt, *Bringing the Environment Down to Earth*, HARV. BUS. REV., July–Aug. 1999, at 149, 150–52 (discussing how firms can enhance their competitiveness through "environmental product differentiation").

44. ESTY & WINSTON, *supra* note 1, at 10–11. The Prius contributed to Toyota's record \$11.8 billion in profits in 2006, helping Toyota to nearly become the largest automaker in the world. *Id.* at 11.

45. *Id.* at 138. Many other companies have also sought to compete by developing more environmentally friendly products. For example, Ciba Specialty Chemicals came up with a dye that could be fixed to fabric using less salt. Reinhardt, *supra* note 43, at 150. When Ciba's customers—textile manufacturers—used the new dye, they were able to save on their costs for salt, as well as reduce their costs for wastewater treatment, because their discharges no longer contained as much salt. *Id.* at 150–51.

products and packaging, including products intended for children.⁴⁶ Sears, Roebuck and Co., Kmart. and Wal-Mart Stores, Inc. (Wal-Mart) followed suit.⁴⁷

3. *Increase Reuse and Recycling*

Some companies have increased their reuse and recycling of materials. Hewlett-Packard Co., for example, exceeded its 2007 goal of recycling one billion pounds of e-waste.⁴⁸ Staples accepts most used computers and associated equipment free of charge and recycles them,⁴⁹ a program that the company says increases valuable foot traffic in its stores.⁵⁰ Some firms go beyond the standard recycling model. Chaparral Steel Co. and TXI Cement engaged in “by-product synergy”⁵¹ in which Chaparral’s steel slag by-product became a raw material for TXI’s cement production process.⁵² Patagonia employs a “closed loop” process in which it takes back its used apparel, breaks the garments down into fibers, and uses the material to make new garments.⁵³ At least eight General Motors facilities have been certified as “zero waste” plants that reuse or recycle all excess material, thereby saving both on raw material and disposal costs.⁵⁴

4. *Enhance a Firm’s Own Energy Efficiency or That of Its Customers*

Firms are also benefitting the environment by becoming more energy efficient or by taking steps that enable their customers to do so. At its Reno, Nevada facility, Patagonia uses a “night-flush” ventilation system to move hot air out of the building, bring cooler air in, and then use that air to

46. MAKOWER, *supra* note 5, at 7.

47. *Id.* Other retailers have also sought to distinguish themselves by marketing more environmentally friendly products. Home Depot, Inc., for example, instituted its Eco Options program for labeling such products on display in its stores. *Id.*

48. *Id.* at 8. Similarly, Dell, Inc. declared that it was ahead of schedule in meeting its goal of recovering 275 million pounds of computer equipment. *Id.*

49. ENVTL. DEF. FUND, *supra* note 5, at 25.

50. *Id.* at 26. Along similar lines, Hewlett-Packard Co. initiated its Planet Partners initiative for the reuse of used toner cartridges which has resulted in the reuse of over eleven million cartridges per year. ESTY & WINSTON, *supra* note 1, at 156. Xerox Corp. has embarked on a program to reuse and recycle parts and imaging supplies that has diverted more than two billion pounds of e-waste from landfills. MAKOWER, *supra* note 6, at 8.

51. See Deishin Lee, *Turning Waste into By-Product 2* (Harvard Bus. Sch., Working Paper No. 07-098, 2010) (defining “by-product synergy” as “the conversion of the waste stream (through further processing) into a useful and saleable by-product”).

52. See *Chaparral Steel Company Case Study*, INT’L INST. FOR SUSTAINABLE DEV., <http://www.iisd.org/business/viewcasestudy.aspx?id=51> (last visited Nov. 4, 2010).

53. ENVTL. DEF. FUND, *supra* note 5, at 13.

54. MAKOWER, *supra* note 5, at 12.

cool the building during the day. The facility does not employ any artificial air conditioning despite average ninety-five degree heat during the day.⁵⁵ E.I. du Pont de Nemours and Co. (DuPont) met its goal of keeping its energy use constant, even as the company grew substantially. The company accomplished this by finding “a hundred ways to get leaner and meet its energy targets.”⁵⁶ Wal-Mart surpassed its goal of selling 100 million compact fluorescent light bulbs in a single year.⁵⁷

5. *Improve a Firm’s Own Resource Productivity or That of Its Customers*

A firm improves its resource productivity when it reduces the amount of resources needed to produce one unit of a given product or service.⁵⁸ This can benefit the environment by decreasing resource extraction and waste disposal while simultaneously reducing the firm’s resource and waste disposal costs.⁵⁹ For example, Stonyfield Farm redesigned its yogurt containers with a single-layer aluminum foil lid instead of plastic lids with inner seals.⁶⁰ The foil tops used less energy and water to produce, were lighter and easier to ship, and saved the company over \$1 million per year.⁶¹ Wal-Mart arranged to sell only concentrated laundry detergent and estimates that it will save 125 million pounds of cardboard, 95 million pounds of plastic, and 400 million gallons of water over the next three years, while considerably reducing its shipping volume.⁶²

6. *Systematic Initiatives to Improve Environmental Performance*

Sophisticated firms seek to enhance their environmental performance,

55. ENVTL. DEF. FUND, *supra* note 5, at 9. In other examples, Sun Microsystems’ “open work” program allows employees to decide whether they would like to work primarily at home, thereby avoiding the use of fuel for commuting and reducing the need for office heating and cooling systems. This initiative has reduced the company’s carbon dioxide emissions by 29,000 tons and saved it \$68 million in real estate costs. *Id.* at 20.

56. ESTY & WINSTON, *supra* note 1, at 105.

57. MAKOWER, *supra* note 5, at 9.

58. ESTY & WINSTON, *supra* note 1, at 101–02.

59. Porter & van der Linde, *Green and Competitive*, *supra* note 13, at 122.

60. ENVTL. DEF. FUND, *supra* note 5, at 16.

61. *Id.*

62. *Id.* at 17. Similarly, the computer chip maker AMD reinvented its “wet processing” tool for cleaning silicon chips so that it uses less than one-third the amount of water, thereby reducing the facility’s water bills. ESTY & WINSTON, *supra* note 1, at 106. Nike redesigned its athletic shoes to reduce the amount of wasted material, decrease the use of toxic adhesives, and integrate more recycled materials. ENVTL. DEF. FUND, *supra* note 5, at 10. General Mills changed the shape of the noodles in its Hamburger Helper product, which allowed it to reduce packaging volume 20% and save 890,000 pounds of paper fiber per year, reducing shipping volume by 500 truckloads per year. *Id.* at 16.

not by setting their sights on a few discrete goals, but by putting into place management and planning systems that search for improvement opportunities throughout the company's operations. These systematic approaches can take various forms: comprehensive environmental management systems (EMS), in which firms establish policies and procedures to track environmental results and seek opportunities to improve them;⁶³ pollution prevention initiatives, in which firms seek to change their processes or raw materials in ways that will decrease their pollution or waste;⁶⁴ life cycle assessments, in which companies examine their products' entire life cycle from resource extraction to disposal to search for ways to reduce environmental impacts;⁶⁵ "Design for Environment" initiatives, in which firms seek to design products and processes to minimize pollution and waste, rather than simply cleaning up the pollution at the "back end" of the production process;⁶⁶ and attempts to "green" the supply chain by demanding that suppliers provide more environmentally friendly products or improve their own environmental performance.⁶⁷ Such initiatives can yield dramatic results. For example, 3M's 3P initiative called upon employees throughout the organization to search for opportunities to improve energy and resource efficiency and to reduce pollution and waste. As mentioned briefly above, the program has yielded nearly 5,000 projects that have decreased pollution by 2.2 billion pounds and saved the company roughly \$1 billion in only the first year of project implementation.⁶⁸ Johnson & Johnson's Enhanced Best Practices program requires each of its facilities to work through a ten-stage checklist to identify energy-saving measures. Between 2003 and 2006, the company increased its sales by 27% while increasing its energy use by only 0.5%.⁶⁹

63. FLORINO, *supra* note 6, at 101–02.

64. See generally Kurt A. Strasser, *Preventing Pollution*, 8 FORDHAM ENVTL. L.J. 1 (1996) [hereinafter Strasser, *Preventing Pollution*].

65. ESTY & WINSTON, *supra* note 1, at 169–70.

66. *Id.* at 198.

67. *Id.* at 154–55.

68. *Id.* at 107; see *supra* note 2 and accompanying text.

69. ENVTL. DEF. FUND, *supra* note 5, at 12. In other examples, Louisiana-Pacific Corp. realized through its environmental management systems (EMS) that it could turn its wood-product shavings, which it had previously thrown away, into fiber board products. REGULATING FROM THE INSIDE: CAN ENVIRONMENTAL MANAGEMENT SYSTEMS ACHIEVE POLICY GOALS? 3 (Cary Coglianese & Jennifer Nash eds., 2001). In 2008, Wal-Mart Stores, Inc. (Wal-Mart) announced plans to require that its suppliers source 95% of their products from factories that have scored the highest in environmental and social practices audits. Stephanie Rosenbloom, *Wal-Mart to Toughen Standards*, N.Y. TIMES, Oct. 22, 2008, at B1. Ford requires its suppliers to institute an EMS if they want to continue selling to the company. David Monsma & John Buckley, *Non-Financial Corporate Performance: The Material Edges of Social and Environmental Disclosure*, 11 U. BALT. J. ENVTL. L. 151, 164 (2004).

7. *Collecting and Disseminating Environmental Performance Information*

Some companies demonstrate environmental responsibility by collecting and disseminating more information about their environmental performance than they are legally required to disclose. Such disclosures can allow the public to compare the firm's performance to that of its peers. For example, after benchmarking its environmental performance against the best in its industry, Bristol-Meyers Squibb Co. announced a 2010 goal of reducing by 10% (from 2001 levels) its energy use, greenhouse gas (GHG) releases, and water use. It then began to report annually on its performance in these areas, as well as on its air and water releases, generation of waste, and supplier environmental performance.⁷⁰

8. *Stakeholder Input into Corporate Environmental Decisionmaking*

Some companies invite more stakeholder input into environmental decision making than the law requires. As mentioned above, Chiquita Corp. partnered with the Rainforest Alliance to develop environmental and social guidelines for the company's banana-growing operations.⁷¹ McDonald's Corp. (McDonald's) worked closely with Environmental Defense in deciding to switch from Styrofoam "clamshell" packaging to paper containers, a move that substantially reduced the company's contribution to the nation's landfills.⁷²

9. *Financing and Investing in Green Products and Activities*

Some firms make green investment and financing decisions. For example, Google, Inc. announced that it would invest hundreds of millions of dollars in the development of renewable energy.⁷³ In 2008, Bank of America Corp. and Citibank, N.A. stated that they would direct \$31 billion and \$20 billion, respectively, toward investments in sustainable business practices, clean energy, and alternative environmental technologies.⁷⁴

70. FIORINO, *supra* note 6, at 100. In 2005, 52% of Fortune Global 250 firms issued a separate corporate environmental report. *Id.* at 99 (citing KPMG, INTERNATIONAL SURVEY OF CORPORATE ENVIRONMENTAL REPORTING 9 (2005)).

71. See *supra* note 4 and accompanying text.

72. ESTY & WINSTON, *supra* note 1, at 185-86; Editorial, *Topics of the Times: Greening of the Golden Arch*, N.Y. TIMES, Nov. 7, 1990, at A30.

73. MAKOWER, *supra* note 5, at 10.

74. ENVTL. DEF. FUND, *supra* note 5, at 27. The financial crisis, which hit both firms hard, may have caused them to change these commitments. Along similar lines, some lenders have begun offering "location-efficient mortgages" that give borrowers credit for choosing a location closer to their jobs and allows them to walk to public transportation, stores, parks, and schools. The premise is that such borrowers can afford more since they

B. *Why Are Companies Going Green?*

The reasons that firms pursue green business are relevant to the design of laws and policies that seek to promote such behavior. We must, therefore, understand not only what green business is, but also *why* companies are engaging in it. For the purposes of this analysis, I will focus exclusively on reasons that relate to the bottom line and company competitiveness. It is true that the people who work in corporations are social beings subject to the values of their communities and that these values can, at times, influence corporate behavior.⁷⁵ Nonetheless, consistent with our definition of green business,⁷⁶ I will limit this discussion to the ways in which firms can either increase firm revenues, reduce costs, or both by engaging in green business.⁷⁷ Insofar as green business can achieve these ends more effectively than other methods, it will claim corporate resources and attention.

1. *Opportunities to Increase Revenues*

Greening can enhance revenues in a number of ways. It can better enable firms to satisfy customer preferences, build corporate brand and goodwill, meet investor preferences, stimulate innovation, and redefine markets.

Satisfy customer preferences. Many customers prefer products that are safer and cause less harm to the environment. Companies that can produce safer and more environmentally benign products can gain a competitive advantage.⁷⁸ For example, the market for organic food has been growing despite the fact that it often costs more than comparable non-organic

will be saving on driving costs. *Id.* at 27–28.

75. FIORINO, *supra* note 6, at 108; GUNNINGHAM ET AL., *supra* note 5, at 22; David B. Spence, *The Shadow of the Rational Polluter: Rethinking the Role of Rational Actor Models in Environmental Law*, 89 CALIF. L. REV. 917, 970 (2001); see ESTY & WINSTON, *supra* note 1, at 164 (stating that surveyed executives reported the reason for their beyond-compliance behavior was that it was “the right thing to do”). In some instances, this motivation may overlap with competitiveness concerns: a company’s positive social reputation can often increase its revenues and profits, while a negative reputation can hurt its brand and impose costs. See ESTY & WINSTON, *supra* note 1, at 14 (“Doing the right thing attracts the best people, enhances brand value, and builds trust with customers and other stakeholders.”).

76. See *supra* note 6 and accompanying text.

77. See ESTY & WINSTON, *supra* note 1, at 10; FIORINO, *supra* note 6, at 93 (distinguishing between greening strategies that aim for “bottom-line value . . . by reducing costs” and those that seek to enhance “top-line value in terms of enhanced market share”).

78. GUNNINGHAM ET AL., *supra* note 5, at 32 (companies may go green when they compete in markets where “consumers have displayed a market preference for those perceived to be environmentally benign”).

products.⁷⁹ Customers also appreciate products that reduce their own consumption of resources or environmental impacts. As mentioned above, the Toyota Prius, which reduces customers' gasoline usage, has been a market success.⁸⁰

Build corporate brand and goodwill. Some companies pursue greening to enhance corporate brand and goodwill.⁸¹ For example, GE's "ecomagination" initiative consists not only of a \$1.5 billion investment in environmental technologies and a 1% reduction in company-wide GHG emissions, but also of an advertising campaign touting the company's new, environmentally friendly products.⁸² This seeks both to establish new markets for GE products and to "creat[e] intangible value by building trust in GE's brands."⁸³ Strategies of this type tend to have the greatest impact on firms like GE that have high name recognition. It also can prove important to firms that seek to market environmentally friendly products and, therefore, need a good overall company reputation in this area (e.g., The Body Shop).⁸⁴ In some cases, however, such initiatives can raise important questions about "greenwashing," the practice of creating a green image to deflect attention from the environmentally harmful aspects of the business.⁸⁵ For example, in 2000, BP invested over \$200 million in a campaign to rebrand itself as a company that was interested in moving "Beyond Petroleum."⁸⁶ The company made significant investments in renewable energy technologies and achieved meaningful GHG reductions. At the time, analysts viewed the effort as a great success and concluded that

79. ESTY & WINSTON, *supra* note 1, at 127. By the same token, Melita Corp. markets brown, unbleached coffee filters on the same shelf as its white, bleached ones. *Id.*

80. See *supra* note 44 and accompanying text. Similarly, Sun Microsystems has developed a popular "green [computer] server" that requires less energy to run. ESTY & WINSTON, *supra* note 1, at 124.

81. ESTY & WINSTON, *supra* note 1, at 11, 104; GUNNINGHAM ET AL., *supra* note 5, at 32 ("Companies with widely recognized consumer brand names often seem especially concerned about their reputation for good environmental citizenship.").

82. ESTY & WINSTON, *supra* note 1, at 138.

83. *Id.* at 138–39.

84. GUNNINGHAM ET AL., *supra* note 5, at 32 (noting that "general environmental reputation will be crucial" for those firms that seek to "differentiate [their] products on environmental grounds"); see ESTY & WINSTON, *supra* note 1, at 127 (discussing the Body Shop brand).

85. See Dorit Kerret & Alon Tal, *Greenwash or Green Gain? Predicting the Success and Evaluating the Effectiveness of Environmental Voluntary Agreements*, 14 PENN ST. ENVTL. L. REV. 31, 35 (2005) (defining greenwashing as "cosmetic attempts by industry to appear environmentally conscientious—when industry is in fact resistant to meeting its responsibilities").

86. ESTY & WINSTON, *supra* note 1, at 135.

it had increased BP's brand value by \$3 billion.⁸⁷ Of course, BP has now presumably lost this value, and much more, as a consequence of the Deepwater Horizon oil spill disaster.⁸⁸ The succession of events—from the Beyond Petroleum campaign to the “far too much petroleum” disaster in the Gulf—raise important questions. Are there links between the initial effort and the risky practices that led to the spill? Or did time and changing company priorities turn an improving corporate culture into a dangerous one? Further research into BP's structure, culture and practices during the period between 2000 (the launch of the Beyond Petroleum campaign) and 2010 (the Deepwater Horizon spill) could provide useful lessons about the relationship between green branding and greenwashing.

Meet investor preferences. Some investors prefer companies with strong environmental performance and compliance records. They see this as a sign both of decreased environmental risk and of superior management ability.⁸⁹ A firm that demonstrates environmental excellence might be rewarded with an increase in its stock price.⁹⁰ Some investment advisors use this criterion as a basis for advising clients.⁹¹

Stimulate innovation. Environmental imperatives can stimulate engineers and product designers to conceive a company's products or business in new ways.⁹² For example, Hitachi redesigned its washing machines so that it could put them together with only six screws, thus staying ahead of Japanese recycling laws.⁹³ The newly designed product also reduced manufacturing time by 33% and required fewer service calls: “Hitachi's efforts resulted in an environmentally preferable washing machine that's also a higher-value product with improved customer satisfaction, lower

87. *Id.* at 137.

88. Ronald D. White, *BP Sees Gulf Spill Result in Record Loss: Oil Giant \$17 Billion in Red for Quarter; New CEO Vows to Keep Focus on Cleanup*, CHI. TRIB., July 28, 2010, § 1, at 19.

89. ESTY & WINSTON, *supra* note 1, at 66; GUNNINGHAM ET AL., *supra* note 5, at 153.

90. GUNNINGHAM ET AL., *supra* note 5, at 153.

91. For example, Innovest Strategic Value Advisors, a part of RiskMetric Group, Inc., specialized in analyzing the environmental and social performance of publicly traded companies and used this information to identify firms likely to outperform the market. The company concluded in 2002 that, in many sectors, “environmental leaders . . . consistently out perform in the stock market by 300 to 3000 basis points (30 percentage points) per year.” FIORINO, *supra* note 6, at 98 (internal quotation marks omitted). The company attributed this to the fact that “environmental performance turns out to be an excellent proxy for management quality, the primary determinant of stock market returns.” *Id.* (internal quotation marks omitted).

92. See ESTY & WINSTON, *supra* note 1, at 11 (“Our research suggests that companies using the environmental lens are generally more innovative and entrepreneurial than their competitors.”).

93. *Id.* at 199; Porter & van der Linde, *Green and Competitive*, *supra* note 13, at 127.

production costs, and reduced disposal costs.”⁹⁴

Redefine markets. In some instances, environmentally inspired innovation can lead to a unique product that competitors cannot match. For example, Xerox decided to change itself from a business that sold office equipment, to one that sold copying services but retained ownership of its machines.⁹⁵ Given that Xerox would now be taking its machines back at the end of their leases, it redesigned them so that they were easier to disassemble and reuse. The company saved hundreds of millions of dollars per year because it was remanufacturing old models rather than building entirely new machines.⁹⁶

2. *Opportunities to Decrease Costs*

Corporate greening can reduce costs by enhancing eco-efficiency; reducing regulatory costs, employee turnover, environmental risk, and community opposition; anticipating or preempting regulation; and reducing costs relative to competitors.

Eco-efficiency. A company that can produce its product with fewer raw materials, less energy, or less waste will reduce both its costs and its environmental impacts.⁹⁷ Many have referred to such efforts as “eco-efficiency.”⁹⁸ The energy and resource efficiency strategies mentioned above⁹⁹ illustrate eco-efficiency. The opportunity to achieve such savings is one of the most important drivers behind industrial greening.

Reduce regulatory costs. Firms that reduce pollution or waste beyond legal requirements can also decrease the costs of pollution control and waste disposal.¹⁰⁰ For example, SC Johnson’s proactive decision to remove

94. ESTY & WINSTON, *supra* note 1, at 199.

95. Reinhardt, *supra* note 43, at 156; see ESTY & WINSTON, *supra* note 1, at 134–35 (discussing “servicizing,” which is “the idea of . . . recasting a product as a service”).

96. Reinhardt, *supra* note 43, at 157.

97. See ESTY & WINSTON, *supra* note 1, at 101–02 (discussing the reduction of waste); Porter & van der Linde, *Green and Competitive*, *supra* note 13, at 120 (discussing production with less materials); Reinhardt, *supra* note 43, at 154 (noting that some companies have been able to cut costs while improving environmental performance).

98. E.g., ESTY & WINSTON, *supra* note 1, at 13. Some of the earliest users of the term were Stephen Schmidheiny, see STEPHEN SCHMIDHEINY, CHANGING COURSE: A GLOBAL BUSINESS PERSPECTIVE ON DEVELOPMENT AND THE ENVIRONMENT 9–10 (1992), and the 1993 President’s Council on Sustainable Development, which appointed an “Eco-Efficiency Task Force,” see PRESIDENT’S COUNCIL ON SUSTAINABLE DEVELOPMENT, ECO-EFFICIENCY TASK FORCE, http://clinton1.nara.gov/White_House/EOP/pcsd/tf-reports/eco-efficiency.html (last visited Nov. 4, 2010).

99. See *supra* notes 55–62 and accompanying text.

100. ESTY & WINSTON, *supra* note 1, at 112; GUNNINGHAM ET AL., *supra* note 5, at 23 (discussing how firms can save money by “preventing pollution and thereby cutting costs and avoiding waste directly”).

dangerous substances from its most popular products¹⁰¹ allowed the company to adapt more quickly than its rivals to European regulations, passed some years later, that set stringent limits on these substances.¹⁰² Such initiatives can also promote a more trusting and cooperative relationship with regulators¹⁰³ and create a “margin of safety” with respect to regulatory requirements so that operational malfunctions do not cause violations.¹⁰⁴

Reduce employee turnover. Corporations that go green are often more able to retain employees who value such improvements.¹⁰⁵ This saves on the costs of recruiting, hiring and training new employees. For example, Jack Welch, the Chief Executive Officer (CEO) of GE, stated his belief that future recruitment depended, in part, on the company’s efforts to address its past hazardous waste dumping. In his words, “[g]ood people won’t want to work for us if we don’t get on the right side of this.”¹⁰⁶

Decrease environmental risk. Firms can reduce overall costs by investing in proactive environmental risk management.¹⁰⁷ For example, Kellogg Corp.’s Spidey Signals toy, included in cereal boxes, turned out to contain toxic mercury, causing three state attorneys general to complain and forcing the company to offer a major recall.¹⁰⁸ By contrast, McDonald’s Corp. put in place an “anticipatory issues management” system that identified mercury in toy batteries as a potential problem and removed this toxic substance before the company ever faced an issue.¹⁰⁹ Some firms

101. See *supra* note 42 and accompanying text.

102. ESTY & WINSTON, *supra* note 1, at 118–19. In other examples, 3M Corp.’s (3M’s) Pollution Prevention Pays (3P) program, mentioned above, with its nearly 5,000 projects, eliminated 2.2 billion pounds of pollutants, and saved the company \$1 billion. *Id.* at 107. When DuPont’s CEO learned that his company was spending over \$1 billion each year on waste treatment and pollution control, he insisted that the company reduce these costs. Since that time, DuPont has reduced its waste treatment and pollution control costs to \$400 million. The company estimates that, but for this initiative, these costs would have grown to \$2 billion. *Id.* at 111.

103. FIORINO, *supra* note 6, at 114; GUNNINGHAM ET AL., *supra* note 5, at 21, 24, 31–32.

104. GUNNINGHAM ET AL., *supra* note 5, at 24, 149 (noting that a study of the pulp and paper industry shows that some beyond-compliance measures were motivated by “margin of safety” concerns).

105. See ESTY & WINSTON, *supra* note 1, at 66, 91 (recognizing the pressure of employees’ desire to match their personal and professional values and its effect on a company’s ability to keep its best employees).

106. *Id.* at 91.

107. GUNNINGHAM ET AL., *supra* note 5, at 23 (discussing firms’ ability to reduce costs through “more effective risk management (including minimizing the risk of accidents, costly cleanups, and environmental liability)”).

108. ESTY & WINSTON, *supra* note 1, at 114.

109. *Id.* at 114–15.

apply this risk-management approach, not only to their own operations, but also to those of their entire supply chain. They worry that the public may attribute a supplier's environmentally damaging actions to the firm itself, thereby punishing the company. These firms take steps to ensure that their suppliers are environmentally sound.¹¹⁰ For example, as mentioned previously, IKEA rates each supplier in terms of its social and environmental performance.¹¹¹ Firms pay attention to these risks because they can have profound effects on the company's future. A company that violates, or whose supplier violates, legal and social values too severely may provoke boycotts or calls for government officials to deny permits, increase enforcement, or even shut a plant down.¹¹² The leak of toxic gases at Union Carbide's Bhopal, India plant that killed several thousand local residents so damaged the company that its competitor, Dow Chemical, was able to acquire it.¹¹³ Thus, environmental and other social missteps can pose existential threats to even the largest companies. Environmental actions and supply chain audits that bolster a firm's reputation and decrease the possibility of serious violations can protect against this.¹¹⁴ Such management approaches can also serve to bring down the cost of capital and insurance.¹¹⁵

Reduce community opposition and project delays. Firms that go green can reduce public opposition to their projects and the delays associated with such objections.¹¹⁶ For example, Alberta-Pacific Forest Industries faced stiff opposition to a new pulp mill.¹¹⁷ The company developed a plan that would significantly reduce clear cutting and lower pollution from the mill. This improved community relations and allowed the project to move forward more quickly.¹¹⁸

Anticipate or preempt future regulation. Some firms go beyond current pollution control requirements to prepare themselves for anticipated future tightening of these standards and avoid having to install expensive retrofits.¹¹⁹ An in-depth study of beyond compliance measures in the pulp

110. *Id.* at 116–17.

111. *See supra* note 3 and accompanying text.

112. ESTY & WINSTON, *supra* note 1, at 12; GUNNINGHAM ET AL., *supra* note 5, at 37.

113. ESTY & WINSTON, *supra* note 1, at 12.

114. *See* GUNNINGHAM ET AL., *supra* note 5, at 22 (stating that companies may go beyond what regulations mandate to protect their reputations).

115. ESTY & WINSTON, *supra* note 1, at 102.

116. *See id.* at 103; GUNNINGHAM ET AL., *supra* note 5, at 24.

117. Reinhardt, *supra* note 43, at 155.

118. *Id.*

119. ESTY & WINSTON, *supra* note 1, at 118–19; FIORINO, *supra* note 6, at 108 (positing that firms may go beyond compliance “when they anticipate the need to comply with more stringent rules later and when they overcomply by building a margin of safety into

and paper industry showed that “anticipatory compliance” concerns motivated at least some of these behaviors.¹²⁰ Some companies may undertake such actions hoping that they will substitute for and prevent more stringent future regulation.¹²¹

Reduce relative costs. Some actions that increase costs in absolute terms can nonetheless benefit a company if they impose greater costs on competitors.¹²² For example, gasoline manufacturers in California helped regulators design new rules for reformulated gasoline that would reduce air pollution. These rules gave California manufacturers a competitive advantage over out-of-state suppliers who were less able to supply this commodity.¹²³

C. *Regulatory Theory: Now or Later?*

The illustrations of green business above are encouraging but anecdotal. Is it really possible to improve environmental performance while also enhancing business competitiveness? One scholar has asserted that “micro level . . . evidence of the economic payoff from responsible and innovative environmental [corporate] policies is accumulating at an impressive rate.”¹²⁴ Others are not yet so convinced. Indeed, some have questioned the very notion of green business. They argue that the true purpose of corporate green initiatives is to greenwash the company’s reputation by making it appear that the company is environmentally responsible when it really is not.¹²⁵ More empirical studies of green business and its actual environmental benefits are needed.¹²⁶ Until such studies are available, we

environmental investments”); GUNNINGHAM ET AL., *supra* note 5, at 17, 21, 24.

120. GUNNINGHAM ET AL., *supra* note 5, at 149.

121. *Id.* at 21.

122. Reinhardt, *supra* note 43, at 152 (“A company may need to incur higher costs to respond to environmental pressure, but it can still come out ahead if it forces competitors to raise their costs even more.”).

123. *Id.* at 153. Along similar lines, leading members of the chemical industry, facing the threat of more stringent regulation in the wake of the Union Carbide Bhopal tragedy, convinced the Chemical Manufacturers Association to require member companies to commit to six management codes covering such areas as pollution prevention, process safety, and emergency response or lose their membership in the organization. *Id.* at 152–53. This “Responsible Care” program actually improved the competitive position of the large corporations that organized it because they were able to comply more easily than their smaller competitors. *Id.* at 153.

124. FIORINO, *supra* note 6, at 16.

125. See, e.g., Kerret & Tal, *supra* note 85, at 35 (defining *greenwashing* as “cosmetic attempts by industry to appear environmentally conscientious—when industry is in fact resistant to meeting its responsibilities”).

126. *Id.* at 35.

cannot be certain about the claimed benefits of the green business endeavors described in Part II, or the extent to which the benefits are representative of a broader trend.

This Article does not seek to resolve this debate. It focuses on regulatory theory, not empirical analysis. Nonetheless, it takes the issue seriously and so must ask whether this is the right time to develop a regulatory theory of green business, or whether it makes sense to wait until more empirical work has been done. There are three reasons to work on the theory now. First, governments are not waiting for conclusive data but are already beginning to take action to promote green business. A refined theory may enable them to establish sounder policies at this important early stage. Second, while the empirical verdict is not yet in,¹²⁷ there is a theoretical reason to believe that self-initiated corporate actions should be able to reduce pollution at less cost than traditional regulations. The scholarly literature on pollution prevention has repeatedly shown that it is cheaper to reduce pollution through upstream changes to product and process design than by installing pollution control technologies at the end of the pipe.¹²⁸ Environmental regulation has traditionally focused on “end-of-pipe” solutions, not because regulators dispute this finding, but because government officials are highly reluctant to get involved in the design of products or of production processes. They worry correctly that such interventions could disturb operations and hurt economic performance. Corporate green business initiatives do not suffer from this problem. Company employees *do* understand the business and should be able to undertake upstream product and process changes without causing damage to the company.¹²⁹ In fact, many of the green business activities described above involve upstream changes that company employees, but not government officials, were in a position to identify.¹³⁰ Pollution prevention theory predicts that green business activities such as these should be able to

127. For an initial assessment of the empirical literature, see Strasser, *Voluntary Corporate Efforts*, *supra* note 5, at 554–55 (concluding in preliminary fashion that voluntary firm adoption of an environmental management system is associated with reduced environmental impacts but that voluntary firm commitments to achieve specified environmental performance goals are not).

128. *E.g.*, Dennis D. Hirsch, *Second Generation Policy and the New Economy*, 29 CAP. U. L. REV. 1, 7 (2001).

129. See Noah Sachs, *Planning the Funeral at the Birth: Extended Producer Responsibility in the European Union and the United States*, 30 HARV. ENVTL. L. REV. 51, 63 (2006).

130. For example, consider 3M's substitution of water-based for solvent-based coatings, *supra* notes 38–40 and accompanying text; IKEA's system for auditing the environmental performance of its wood suppliers, *supra* note 3 and accompanying text; or Patagonia's closed-loop process for recycling the fibers in its garments, *supra* note 53 and accompanying text.

reduce pollution at less cost than traditional regulation. This should yield at least some situations in which green initiatives can produce both environmental and financial benefits, at least when compared to a baseline situation of firms being subject to direct regulation. Finally, a regulatory theory of green business already exists: Professor Michael Porter's. It is influencing the development of law and policy today. If this theory contains some important gaps, then regulators should understand what they are and how to fill them.

II. LAW AND POLICY TO PROMOTE GREEN BUSINESS

This takes us to our central inquiry: How, if at all, can environmental regulation promote green business? In this Part, I examine the three main candidates that scholars have suggested for this task: (1) the market backed by common law, (2) traditional technology-based standards, and (3) outcome-based standards. Professor Porter has written about each of these approaches and reached important and insightful conclusions about them. Rather than starting from scratch, I begin by summarizing and assessing Professor Porter's views on each of the three mechanisms. I then present my own ideas.

A. *The Three Main Approaches and Professor Porter's Assessment of Them*

In his articles, Professor Porter evaluates each of the three mechanisms just mentioned. He concludes that: (1) while improvements to environmental performance can make firms more competitive, the market alone will not lead companies to identify all green business opportunities—government has a role to play; (2) traditional technology-based standards deter green innovation rather than promoting it; and (3) outcome-based regulation is the most effective way to foster business innovations that improve both environmental performance and competitiveness.¹³¹

1. *The Market Will Not Lead Firms to Act on Many Green Business Opportunities*

Professor Porter argues that economists have erred in the way that they have thought about environmental regulation's economic effects. Economic theory has long assumed that regulated industries will remain static in the face of regulation and that environmental requirements will accordingly impose costs that hurt business competitiveness.¹³² Professor

131. See generally Porter & van der Linde, *Green and Competitive*, *supra* note 13; Porter & van der Linde, *New Conception*, *supra* note 13.

132. ENVTL. LAW INST., *supra* note 7, at 1 ("[T]raditional economic theory . . . indicates that regulations imposing additional environmental requirements on industry would tend to

Porter argues that this view is wrong. Businesses do not remain static in the face of pressures such as new competitors, new technologies, or new environmental regulations. Rather, they are *dynamic* entities that respond by changing their products and processes so that they can address these new pressures better than their competitors.¹³³ These innovations can lead firms to become more efficient. Where they do, they offset the costs imposed by the environmental regulation or other external pressure. Professor Porter refers to these as “innovation offsets.”¹³⁴ Where the value of innovation offsets is greater than the cost that the new factor imposes, the requirement to deal with the new pressure can make firms more competitive, not less.¹³⁵

Professor Porter believes that this dynamic is particularly present in the environmental area. Pollution, he argues, is a form of economic waste because it reflects incomplete or inefficient utilization of a raw material.¹³⁶ Some businesses respond to environmental regulation by figuring out ways to utilize their raw materials more fully and to decrease their pollution. Environmental regulation can thus promote a particular kind of innovation: changes designed to increase a company’s “resource productivity.”¹³⁷ Enhanced resource productivity not only brings down the costs of regulation, it also makes the company’s processes more efficient, and so enhances its overall competitiveness.¹³⁸ For example, such innovations can result in

reduce profitability and competitiveness. Indeed, much of the economic literature points to such a negative correlation between environmental regulation and costs.”); Porter & van der Linde, *New Conception*, *supra* note 13, at 108 (citing studies that reach the same conclusion); Jaffee et al., *supra* note 18, at 133, 150, 158.

133. Porter & van der Linde, *Green and Competitive*, *supra* note 13, at 120.

134. Porter & van der Linde, *New Conception*, *supra* note 13, at 98.

135. *Id.* at 101 (“In some cases, these ‘innovation offsets’ can exceed the costs of compliance. This . . . sort of innovation is central to our claim that environmental regulation can actually increase industrial competitiveness.”).

136. Porter & van der Linde, *Green and Competitive*, *supra* note 13, at 122; Porter & van der Linde, *New Conception*, *supra* note 13, at 105 (“Fundamentally, [pollution] is a manifestation of economic waste and involves unnecessary, inefficient or incomplete utilization of resources, or resources not used to generate their highest value. In many cases, emissions are a sign of inefficiency and force a firm to perform non-value-creating activities such as handling, storage and disposal.”); *see also* ENVTL. LAW INST., *supra* note 7, at 2 (referring to Professor Porter’s view that “pollution represents wasted resources which could be more effectively used”).

137. Porter & van der Linde, *Green and Competitive*, *supra* note 13, at 122.

138. Porter & van der Linde, *New Conception*, *supra* note 13, at 97–98; *see also* ENVTL. LAW INST., *supra* note 7, at 12 (“A fundamental tenet of the Porter hypothesis is that regulation may lead to process innovations and other improvements that are more efficient and hence profitable.”).

higher process yields . . . materials savings . . . better utilization of by-products, lower energy consumption during the production process, reduced material storage and handling costs, conversion of waste into valuable forms, reduced waste disposal costs or safer workplace conditions. These offsets are frequently related, so that achieving one can lead to the realization of several others.¹³⁹

Thus, Professor Porter argues, environmental requirements need not hurt competitiveness. To the contrary, “firms can actually benefit from properly crafted environmental regulations that are more stringent (or are imposed earlier) than those faced by their competitors in other countries. By stimulating innovation, strict environmental regulations can actually enhance competitiveness.”¹⁴⁰

But why should regulation be necessary? If it is true that increased resource productivity produces competitive advantages, will not firms undertake these actions on their own even in the absence of regulation?¹⁴¹ Why not just leave this to the market, backed by the common law? Professor Porter argues convincingly that most companies do not have perfect information, and that organizational incentives are not always aligned with innovation.¹⁴² To the contrary, companies are frequently faced with “highly incomplete information, organizational inertia . . . , and limited attention.”¹⁴³ Firms are fallible and miss opportunities to implement changes that could make them more competitive.¹⁴⁴ While the market alone will bring about some green business activities, it will leave many such opportunities untapped. It is here that environmental laws can play a useful role. Regulations can focus firms’ attention on enhancing resource productivity, thereby “overcoming organizational inertia and fostering creative thinking” that will lead to cost-saving changes.¹⁴⁵ In other words, environmental regulations can bring the pressure that will cause firms to innovate in ways that improve their competitiveness. Government

139. Porter & van der Linde, *New Conception*, *supra* note 13, at 101.

140. *Id.* at 98.

141. See generally Porter & van der Linde, *Green and Competitive*, *supra* note 13, at 127 (posing this question).

142. *Id.*

143. Porter & van der Linde, *New Conception*, *supra* note 13, at 99.

144. See, e.g., *id.* (discussing the “Green Lights” program, in which the Environmental Protection Agency (EPA) gave participating firms recommendations on how to make their lighting, heating, and cooling operations more efficient and found that, while “80 percent of the projects had paybacks of two years or less,” the firms had not yet taken advantage of them); Porter & van der Linde, *Green and Competitive*, *supra* note 13, at 127 (refuting the idea that companies have “perfect information” about innovation and incentives).

145. Porter & van der Linde, *Green and Competitive*, *supra* note 13, at 128.

has a role to play.¹⁴⁶

2. *Technology-Based Standards Deter Green Innovation*

As Professor Porter sees it, all environmental regulations are not equal in this regard. Regulation promotes competitiveness only where it leads to innovation offsets. Thus, to have its procompetitive effect, environmental regulation must give firms flexibility to come up with their own innovative ways of enhancing resource productivity and reducing pollution, preferably through upstream pollution prevention measures rather than end-of-pipe controls.¹⁴⁷

Professor Porter maintains that technology-based standards do not do this.¹⁴⁸ They push firms to adopt government-chosen, end-of-pipe control technologies, thereby preventing firms from looking upstream and “almost guarantee[ing] that innovation will not occur.”¹⁴⁹ Accordingly, Professor Porter argues that traditional regulation will not generate innovation offsets.¹⁵⁰

3. *Outcome-Based Regulation Is the Best Way to Foster Green Business*

Instead, Professor Porter argues for outcome-based regulation or, as it is often called, “performance-based regulation.”¹⁵¹ Outcome-based regulation specifies the required level of environmental performance—the desired outcome—but leaves it up to the regulated party to figure out how best to get there. Professor Porter maintains that such rules put pressure on firms while giving them flexibility, which encourages the creation of innovation offsets.¹⁵² Moreover, he argues that outcome-based rules allow firms to look upstream for changes that will reduce pollution, rather than just implementing end-of-pipe technologies. Professor Porter’s chief policy recommendation is, accordingly, that “[e]nvironmental regulation should focus on outcomes, not technologies.”¹⁵³

146. See *id.* (listing six reasons why regulation is needed).

147. *Id.* at 129 (arguing that regulations should “[c]reate maximum opportunity for innovation by letting industries discover how to solve their own problems”).

148. *Id.*

149. Porter & van der Linde, *New Conception*, *supra* note 13, at 110–11.

150. Porter & van der Linde, *Green and Competitive*, *supra* note 13, at 129.

151. Coglianese & Lazer, *supra* note 21, at 691 (defining *performance-based regulation* as rules that “require that certain outcomes will be achieved or avoided” but do not prescribe the means of achieving the outcomes).

152. Porter & van der Linde, *Green and Competitive*, *supra* note 13, at 129; see also ENVTL. LAW INST., *supra* note 7, at 9 (describing Professor Porter’s theory of regulation, including his “design factors for innovation-friendly regulation”).

153. Porter & van der Linde, *New Conception*, *supra* note 13, at 110. In his articles,

To support this point, he compares Scandinavian and American regulation of the pulp and paper industry's discharge of chlorine, an agent used to bleach paper.¹⁵⁴ American regulators identified a specific, end-of-pipe control technology—secondary treatment—and required industry members meet the rate of discharge that the technology would achieve. American firms installed the secondary treatment technology and did not generate innovative ways of reducing chlorine.¹⁵⁵ By contrast, the Scandinavian countries set an outcome-based pollution level that was not tied to any particular technology, gave firms abundant time to comply, and served notice that the required level would become more stringent over time. Scandinavian pulp and paper manufacturers responded by developing new types of pulping and bleaching equipment that reduced chlorine discharges.¹⁵⁶ Eventually, they created a new type of paper that was completely chlorine-free. A market for environmentally friendly papers developed, and the Scandinavian firms were able to charge a premium price for their new product.¹⁵⁷ In short, the more flexible, outcome-based Scandinavian regulation led to an innovation—low chlorine and chlorine-free paper—that gave Scandinavian firms a competitive advantage and offset their compliance costs. Professor Porter believes that rules of this type can push firms to find ways to make upstream changes that will both improve their environmental performance, and enhance their competitiveness.¹⁵⁸ That is, they will promote green business.

B. Building on Professor Porter's Views

I now evaluate Professor Porter's ideas on the market, traditional regulation, and outcome-based regulation. In so doing, I offer my own assessment of these three mechanisms for promoting green business.

1. Will the Market Promote Green Business?

The literature largely supports Professor Porter's assertion that businesses suffer from imperfections that can lead them to miss potentially

Professor Porter does endorse certain forms of information-based regulation. *See id.* at 112; Porter & van der Linde, *Green and Competitive*, *supra* note 13, at 128. His regulatory theory, however, clearly centers on outcome-based methods; his mention of information-based strategies is supplemental to his main thesis.

154. Porter & van der Linde, *Green and Competitive*, *supra* note 13, at 129.

155. *Id.*

156. *Id.* at 129–30.

157. *Id.* at 130.

158. *Id.* at 129–30.

profitable green business opportunities.¹⁵⁹ As “bounded rationality” theory suggests, managers often work with imperfect information.¹⁶⁰ Moreover, they may have been trained not to look to environmental performance as a source of competitiveness. “[S]tudies . . . consistently point to this issue. Firm management [do] not regard waste reduction as within their priority concerns. Their training concern[s] other issues, and there [is] little institutional focus on the issue absent regulation.”¹⁶¹ Company executives may be further inhibited by a “static mind-set and industry inertia,”¹⁶² institutionalized conservatism, and resistance to change.¹⁶³ Moreover, those involved in design and production decisions and those responsible for environmental decisions often do not work together.¹⁶⁴ As a result, “many firms overlook sources of savings such as energy reduction and pollution prevention . . . in favor of either increased output or direct cost reductions related to production.”¹⁶⁵ Finally, even where managers want to pursue green opportunities, they may not be able to make individual employees believe that it is in their interest to do so¹⁶⁶ or to accurately monitor employee performance in this area.¹⁶⁷ This principal-agent problem can

159. See, e.g., ENVTL. LAW INST., *supra* note 7, at 13 (“[I]nternal systems for knowing, communicating and managing are more imperfect within firms than is appreciated.” (citation omitted)); H. Landis Gabel & Bernard Sinclair-Desgagné, *The Firm, Its Routines and the Environment*, in THE INTERNATIONAL YEARBOOK OF ENVIRONMENTAL AND RESOURCE ECONOMICS 1998/1999 (Tom Tietenberg & Henk Folmer eds., 1998) [hereinafter Gabel & Sinclair-Desgagné, *The Firm, Its Routines and the Environment*]; Bernard Sinclair-Desgagné & H. Landis Gabel, *Environmental Auditing in Management Systems and Public Policy*, 33 J. ENVTL. ECON. & MGMT. 331 (1997).

160. Coglianese & Lazer, *supra* note 21, at 702–03 & n.6.

161. ENVTL. LAW INST., *supra* note 7, at 18.

162. *Id.* at 18; accord Strasser, *Preventing Pollution*, *supra* note 64, at 44 (“Pollution prevention efforts within business organizations today are more limited by organizational culture than by available technology.”).

163. ENVTL. LAW INST., *supra* note 7, at 14. The literature on business response to technological change supports this. Consistent with Professor Porter’s findings in the green business area, these studies show that there is “considerable rigidity in business response to potential opportunities for change.” *Id.* at 18; accord Strasser, *Cleaner Technology*, *supra* note 11, at 19. Studies also show that firms “systematically under-invest in research,” such as research into cost-saving green opportunities. ENVTL. LAW INST., *supra* note 7, at 15.

164. ENVTL. LAW INST., *supra* note 7, at 16.

165. OFFICE OF TECH. ASSESSMENT, U.S. CONGRESS, OTA-ITE-586, *INDUSTRY, TECHNOLOGY, AND THE ENVIRONMENT: COMPETITIVE CHALLENGES AND BUSINESS OPPORTUNITIES* 247 (1994).

166. ENVTL. LAW INST., *supra* note 7, at 16; cf. OFFICE OF TECH. ASSESSMENT, *supra* note 165, at 246 (“[The] responsibility for finding pollution prevention solutions may not rest with those most capable of doing so.”).

167. ENVTL. LAW INST., *supra* note 7, at 16; OFFICE OF TECH. ASSESSMENT, *supra* note 165, at 246–47 (discussing constraints on managerial time and attention).

prevent meaningful action. For all of these reasons, firms can often “fail[] to pick the ‘low-hanging fruit’” of costsaving through pollution prevention, even where such opportunities are available.¹⁶⁸ Regulation can play a useful role by giving executives the needed push and “focus[ing] management attention on new concerns or approaches”¹⁶⁹ A group of scholars that studied business environmental decisions observed that “waste reduction alternatives were seldom considered until circumstances virtually forced plants to review their waste management practices.”¹⁷⁰ For all of the above reasons, Professor Porter is largely right in asserting that, left to its own devices, the market will neglect many profitable green business projects and that law and policy can help to correct for this.

But he is not completely correct. There are instances when the market does promote green business. For example, there is a growing demand for green products. Where the environmental benefits of a product are clear and visible enough to be understood by and conveyed to consumers, the

168. ENVTL. LAW INST., *supra* note 7, at 16 (quoting Gabel & Sinclair-Desgagné, *The Firm, Its Routines and the Environment*, *supra* note 159).

169. Coglianese & Lazer, *supra* note 21, at 703 n.6. This is an interesting twist. It is common knowledge, promulgated and repeated by politicians, that government is rigid and slow moving, whereas business is nimble and creative. In fact, reality is a bit more complex. Just as government can be static and require private industry to inject dynamism and innovation, so can private corporations (especially large ones) adopt rigid and bureaucratic management styles that require government intervention to break through and generate more flexibility, creativity, and risk taking. The recent federal takeover of General Motors and the government’s attempts to shake up management and inject more dynamism into the company may be examples of this.

170. DAVID J. SAROKIN ET AL., CUTTING CHEMICAL WASTES 143 (1985). Some firms may have valid reasons to resist investments in green business, even where these investments would provide a positive return. An existing, comprehensive business strategy may preclude making such investments. ENVTL. LAW INST., *supra* note 7, at 15; James Boyd, *Searching for the Profit in Pollution Prevention: Case Studies in the Corporate Evaluation of Environmental Opportunities* (Res. for the Future, Discussion Paper No. 98-30, 1998), available at <http://www.rff.org/rff/Documents/RFF-DP-98-30.pdf> (discussing instances in which corporations decided not to invest any more resources in the underperforming aspect of the business where the pollution prevention opportunity was available). A company may set a lofty “hurdle rate” for new investments that a given green business investment, as promising as it may be, cannot meet. ENVTL. LAW INST., *supra* note 7, at 14. A company that has already invested in highly expensive capital equipment may experience a “lock-in effect” that precludes investment in new equipment for a period of time. *Id.*; Boyd, *supra*, at 38 (discussing high hurdle rates as barriers to pollution prevention). Where small firms dominate an industry, the relevant companies may simply lack the research or financial capacity to make the required investments. ENVTL. LAW INST., *supra* note 7, at 14, 19. Finally, the search costs involved in identifying competitiveness-enhancing green opportunities may exceed the expected gains from these investments. Coglianese & Lazer, *supra* note 21, at 702–03. In each of these instances, firms have a legitimate reason for not pursuing green investments.

market can generate green innovation. Even where products are not specifically billed as green, market pressures may be directly aligned with environmental pressures. For example, success in the food production industry requires that a company produce food that is safe. Many food manufacturers will pursue product safety for purely market reasons.¹⁷¹

Tort liability—which I view as part of the market (i.e., non-regulatory) system—can also play an important role. Firms that know, *ex ante*, that consumers can sue them for products or processes that damage health or the environment will have an incentive to make design or process changes that will prevent this damage. Thus, tort liability can generate business-driven, upstream green behavior. But its powers are limited. Many environmental problems result from the actions of a large number of different polluters, making it very difficult for the traditional tort model to work.¹⁷² It can often be difficult to prove causality given the synergistic effects of the polluting substances. Finally, collective action and free rider problems can prevent victims from bringing suit, even where the aggregate harm would warrant such legal action.¹⁷³ Tort liability is only a partial and highly imperfect means of encouraging upstream green behavior. It tends to work best in those instances where the environmental and public health damage is substantial, visible, and targeted, and the causal connection is clear.

Accordingly, I hypothesize that the market best promotes upstream green activity where environmental benefits (e.g., in green products) or injuries (e.g., in tort suits) are targeted, significant, and clear. It does not perform as well where environmental goods and injuries are diffuse and shared by many,¹⁷⁴ appear insignificant to individuals, and are difficult to discern. Many environmental and public health impacts fall into this latter

171. Coglianese & Lazer, *supra* note 21, at 702. Even in the food industry, these incentives are not always perfectly aligned. For example, it was recently reported that a peanut butter manufacturer ignored repeated warnings about salmonella contamination. Consumers got sick until regulators demanded a recall of the product. See Rebecca Cole, *Salmonella Alerts Ignored: E-mails Reveal that a Company Owner Discounted Warnings About Contamination at His Georgia Plant*, L.A. TIMES, Feb. 12, 2009, at A12.

172. See JAMES SALZMAN & BARTON H. THOMPSON, JR., ENVIRONMENTAL LAW AND POLICY 45 (2d ed. 2007) (“When there are multiple sources of pollution, establishing proximate cause becomes difficult.”).

173. See generally PETER S. MENELL & RICHARD B. STEWART, ENVIRONMENTAL LAW AND POLICY 60 (1994) (describing collective action and free rider problems with tort model). Class action suits do not adequately solve this problem. Attorneys only invest in the minority of cases in which causality is relatively clear and the damages are large.

174. For example, the market provides too little of “public goods” such as clean air or clean water due to the collective action and free rider problems, described above. *Id.* at 54–55.

category.¹⁷⁵ Tort liability and the market will promote some green investments but will leave many such opportunities unexplored.¹⁷⁶

2. *Technology-Based Standards*

To evaluate the role that traditional technology-based standards can play, I must first describe this approach a bit more. Traditional, technology-based environmental regulation consists of two types of rules: design standards, and performance standards based on the “best available technology.”¹⁷⁷ Design standards specify the design of the pollution control technology that firms must use.¹⁷⁸ For example, EPA is authorized to require that companies use two or more liners when they construct a new hazardous waste landfill.¹⁷⁹ Regulated entities must comply with this technology specification or face enforcement.

Best available technology (BAT) standards work differently. Here too, regulators evaluate and choose a pollution control technology—the best technology that is currently available in the industry.¹⁸⁰ However, they do not require facilities to install this “reference technology.”¹⁸¹ Instead, they calculate the rate of pollutant emissions per unit of product that the facility would emit if it *had* installed the reference technology, and then require that the facility not exceed this rate.¹⁸² In theory, this should leave the facility discretion to achieve the required rate by means other than the reference technology. In practice, however, most firms install the reference technology. Should the technology fail to achieve the required emissions rate, these firms can argue that the regulators who chose the technology are to blame, not the firms that followed the regulations.¹⁸³ Given the variability and unpredictability of most production processes, this “safe

175. *Id.* at 55.

176. See Coglianese & Lazer, *supra* note 21, at 702 n.5 (“[B]y itself even [tort] liability is sometimes inadequate to induce firms to act in socially optimal ways, especially for problems such as pollution.”).

177. ROBERT V. PERCIVAL, CHRISTOPHER H. SCHROEDER, ALAN S. MILLER & JAMES P. LEAPE, *ENVIRONMENTAL REGULATION: LAW, SCIENCE, AND POLICY* 132–33 (5th ed. 2006) (distinguishing between “design” and “performance” standards); Bruce A. Ackerman & Richard B. Stewart, *Reforming Environmental Law*, 37 STAN. L. REV. 1333, 1335 (1985) (describing the “Best Available Technology” (BAT) approach).

178. PERCIVAL ET AL., *supra* note 177, at 132–33.

179. Solid Waste Disposal Act, 42 U.S.C. § 6924(o)(1)(A)(i) (2000).

180. Ackerman & Stewart, *supra* note 177, at 1335.

181. *Id.*

182. See PERCIVAL ET AL., *supra* note 177, at 132; Porter & van der Linde, *New Conception*, *supra* note 13, at 110–11; Byron Swift, *How Environmental Laws Work*, 14 TUL. ENVTL. L.J. 309, 407 (2001) (discussing the rate-based approach).

183. PERCIVAL ET AL., *supra* note 177, at 133.

harbor” holds great value for firms that want to avoid compliance issues.¹⁸⁴ Thus, while in theory firms have the flexibility to choose how they meet rate-based BAT standards, in reality virtually all decide to install the reference technology.¹⁸⁵ BAT standards essentially function as de facto design standards.¹⁸⁶ I refer to traditional regulation as “technology-based standards,” and use this term to encompass both de jure technology requirements (i.e., design standards), and de facto ones (i.e., BAT standards).

Professor Porter is correct when he says that traditional regulation—in both its design standard and BAT standard forms—essentially prescribes specific control technologies.¹⁸⁷ He is also largely right when he says that this deters innovation and upstream changes.¹⁸⁸ Design standards, by their very nature, dictate the means of pollution control and almost always focus on end-of-pipe controls. For the reasons just discussed, BAT standards also push firms toward specific, end-of-pipe solutions. Moreover, by directing firms to shoot for the best control technology *currently available*, BAT standards give firms no incentive to come up with something new that will achieve even better results, so there is no incentive to engage in green business.¹⁸⁹

Yet, once again, Professor Porter leaves out something important. There are circumstances in which technology-based standards *can* promote upstream changes that go beyond legal requirements. For example, the Resource Conservation and Recovery Act’s (RCRA’s) technology-based standards governing hazardous waste disposal have made it extremely

184. *Id.*

185. ENVTL. LAW INST., *supra* note 7, at 11 (“[BAT standards] blunt[] experimentation and innovation . . . because the adversarial and conservative nature of permitting under this method tends to reject the innovative or new.”).

186. *See id.* at 10 (“[BAT standards] emphasize, or even dictate, end-of-pipe compliance solutions instead of the process changes which can lead to the results suggested by the Porter hypothesis.”); PERCIVAL ET AL., *supra* note 177, at 133 (“[P]erformance standards become de facto technology specifications.”).

187. Porter & van der Linde, *Green and Competitive*, *supra* note 13, at 129 (noting that traditional regulations “mandat[e] specific technologies”).

188. *See* ENVTL. LAW INST., *supra* note 7, at 10 (“‘[B]est available technology’ type standards . . . are inflexible and may severely limit innovation, creating higher costs than necessary.”).

189. *Id.* at 2 (“[M]any of our environmental regulations are designed in a way that discourages precisely such a re-examination of process technology.”); Ackerman & Stewart, *supra* note 177, at 1336 (finding that BAT controls discourage development of superior environmental technologies); Neil Gunningham, *Environmental Management Systems and Community Participation: Rethinking Chemical Industry Regulation*, 16 UCLA J. ENVTL. L. & POL’Y 319, 327 (1998) (“[BAT regulation] provides little ongoing incentive for continuous improvement.”).

expensive for firms to dispose of hazardous waste. This has led many companies to change their raw materials and processes to minimize, or even eliminate, the production of waste deemed "hazardous."¹⁹⁰ They have used upstream innovations to prevent pollution and thereby taken themselves outside the scope of the regulatory scheme. Thus, technology-based standards can promote beyond-compliance innovative behavior by imposing expensive requirements but allowing an "out" for companies that prevent pollution through upstream changes.¹⁹¹ This phenomenon does not undermine Professor Porter's insightful point about technology-based standards because most such regulations either do not allow, or seriously discourage, such an "out." But it does qualify it to some extent.

Technology-based standards can also promote beyond-compliance behavior in other ways. A credible threat of such regulation can lead companies to improve their environmental performance in the hope of staving off the anticipated regulatory action.¹⁹² Moreover, the prospect that regulators may tighten existing technology-based standards may lead firms that are building new facilities to over-comply to avoid expensive retrofits

190. PERCIVAL ET AL., *supra* note 177, at 321.

191. FIORINO, *supra* note 6, at 96, 239 n.23; JOHNSON, *supra* note 31, at 331-32; see Michelle Ochsner, *Pollution Prevention: An Overview of Regulatory Incentives and Barriers*, 6 N.Y.U. ENVTL. L.J. 586, 597 (1998) ("[R]esearchers have consistently found that regulatory compliance is important in motivating companies to investigate pollution prevention alternatives . . ."). The Clean Air Act definition of "major source," which imposes technology requirements only on those facilities whose air emissions exceed the major source threshold, offers another example of this. Many companies have sought to avoid regulation by keeping their emissions below the designated levels. In another example, Minnesotans created an organization, Clean Air Minnesota, to prevent the Twin Cities area from losing its Clean Air Act attainment status and becoming subject to stringent nonattainment, technology-based requirements. Clean Air Minnesota, *About Clean Air Minnesota (CAM)*, MINNESOTA ENVIRONMENTAL INITIATIVE, <http://www.mn-ei.org/cam/about.html> (last visited Nov. 4, 2010). Clean Air Minnesota, a voluntary partnership of government, industry, and environmental group representatives worked together to implement beyond-compliance air emission reductions that preserved the Twin Cities' attainment status. *Id.*

192. GUNNINGHAM ET AL., *supra* note 5, at 21 ("Not infrequently, groups of firms have institutionalized voluntary self-regulatory plans more stringent than those required by law in hopes of warding off the possibility of more intrusive and less flexible governmental regulatory initiatives."). For example, in the 1980s, EPA Administrator William Reilly wrote a letter to leading members of the chemical industry in which he invited them to participate in a voluntary program to reduce toxic emissions. Administrator Reilly's letter explained that the voluntary initiative was an alternative to "the detailed direction which is likely to be demanded if voluntary efforts are not fruitful." FIORINO, *supra* note 6, at 113 (internal quotation marks omitted). Many chemical companies signed up for the EPA's 33/50 Initiative, which succeeded in reducing toxic emissions by 33% by 1992 and by 50% by 1995. JOHNSON, *supra* note 31, at 337.

later.¹⁹³ Finally, technology-based standards can motivate firms to overcomply to provide a margin of safety that can prevent variations in the production process from turning into compliance issues.¹⁹⁴ In these and other instances, “firms may prefer to address an issue on their own terms rather than on the terms set by potentially inflexible government rules.”¹⁹⁵ These circumstances qualify Professor Porter’s point about traditional regulation but do not refute it. For the most part, technology-based standards stifle, rather than promote, green innovation and do so for the reasons that Professor Porter describes.

3. Outcome-Based Regulation

Professor Porter endorses outcome-based standards as the most effective way to promote green business. I described his reasons above and need not restate them here.¹⁹⁶ It bears repeating, however, that Professor Porter consistently depicts outcome-based standards as numeric limits on pollution that are not tied to a best available technology and so do not lead to the de facto design standard problem explained above.¹⁹⁷ For example, the Scandinavian regulations, which Professor Porter holds up as a primary model, set increasingly stringent numeric limits on chlorine discharges from pulp and paper mills but did not tie them to a specific technology.¹⁹⁸

Professor Porter’s argument that flexible, outcome-based standards allow businesses to figure out the best way to reach the desired result, and so to look for upstream improvements, is well reasoned and finds substantial

193. GUNNINGHAM ET AL., *supra* note 5, at 21. The growing numbers of companies that are seeking to reduce their greenhouse gas (GHG) emissions are examples of this. Andrew J. Hoffman, *Climate Change Strategy: The Business Logic Behind Voluntary Greenhouse Gas Reductions* 3 (Univ. of Mich. Ross Sch. of Bus. Working Paper Series, Working Paper No. 905, 2004) (noting that one of the reasons some major corporations are setting voluntary reduction targets is that “[t]hey are searching for ways to be prepared for the long term should GHG emission reductions become mandatory”).

194. FIORINO, *supra* note 6, at 108 (“Regulation may even lead firms to go beyond compliance when they anticipate the need to comply with more stringent rules later and when they overcomply by building a margin of safety into environmental investments.”).

195. *Id.* at 113; see ESTY & WINSTON, *supra* note 1, at 118 (positing that one of the reasons firms go green is that they “realize that getting ahead of regulations can save money and time, as well as reduce hassles”).

196. See discussion *supra* Part II.A.3.

197. See ENVTL. LAW INST., *supra* note 7, at 10, 12 (distinguishing between rate-based and mass-based standards and associating Professor Porter with the latter). In fact, Professor Porter criticizes BAT standards and argues that they deter innovation. Porter & van der Linde, *Green and Competitive*, *supra* note 13, at 124.

198. See THE MGMT. INST. FOR ENV’T AND BUS., *COMPETITIVE IMPLICATIONS OF ENVIRONMENTAL REGULATION: A STUDY OF SIX INDUSTRIES* 64 (1994).

support in the literature.¹⁹⁹ The problem lies in what Professor Porter does not say. He fails to explain that outcome-based standards will only function properly in limited circumstances and that they will not work to promote much of what we have come to see as green business. Like the market solution and traditional regulation, outcome-based standards are a useful but ultimately insufficient tool for encouraging firms to go beyond compliance.²⁰⁰

While Professors Cary Coglianese and David Lazer do not expressly address Professor Porter's theory in their 2003 article, *Management-Based Regulation: Prescribing Private Management to Achieve Public Goals*, they nonetheless put their finger on its central problem.²⁰¹ Coglianese and Lazer argue that, for performance-based standards to work, regulators must first be able to measure and monitor the environmental outcome.²⁰² Without this, they will not be able to ascertain whether firms are achieving the desired result and so will not be able to enforce the standard.²⁰³ Regulators must expend resources on this measurement and monitoring. It follows that, viewed from the perspective of society as a whole, performance-based standards are more cost-effective than technology-based standards only when the additional costs involved in administering them—the costs of measuring and monitoring the results—are smaller than the gains achieved from substituting flexible, performance-based standards for prescriptive, traditional ones.²⁰⁴ If the transaction costs involved in measuring and monitoring outcomes exceed the gains from flexibility, then, viewed from the social perspective, a performance-based approach will turn out to be a more expensive way of achieving environmental goals than will traditional rules.²⁰⁵ Coglianese and Lazer conclude that performance-based standards

199. See ENVTL. LAW INST., *supra* note 7, at 11–12 (summarizing the literature).

200. Cf. Strasser, *Voluntary Corporate Efforts*, *supra* note 5, at 546–54 (surveying the empirical literature and concluding that, for the most part, voluntary performance standards have not led firms to reduce environmental impacts or develop cleaner processes or products).

201. Coglianese & Lazer, *supra* note 21. For other informative discussions of management-based regulation, see Cary Coglianese & Jennifer Nash, *Management-Based Strategies: An Emerging Approach to Environmental Protection*, in LEVERAGING THE PRIVATE SECTOR: MANAGEMENT-BASED STRATEGIES FOR IMPROVING ENVIRONMENTAL PERFORMANCE 3 (Cary Coglianese & Jennifer Nash eds., 2006) [hereinafter LEVERAGING THE PRIVATE SECTOR].

202. Coglianese & Lazer, *supra* note 21, at 725 (“Performance-based regulation . . . will likely be appropriate only where the regulator can cheaply measure output and evaluate its social impact.”).

203. *Id.* at 702, 704–05, 720.

204. *Id.* at 701–02, 704.

205. *Id.* at 702 (arguing that where it is “difficult or prohibitively expensive to assess critical outputs . . . the advantages of performance-based standards will be weaker”).

are only preferable when “the costs of measuring social outputs or well-correlated proxies for social outputs are low.”²⁰⁶

Carrying this idea a step further, I would add that, when employing a performance-based standard, regulators face steep information costs not only in measuring and monitoring outcomes, but also in developing sufficient knowledge of the regulated industry to be able to set a realistic outcome-based goal in the first place. If they do not expend the resources needed to define realistic goals, they will likely either set a goal that is too lenient and fails to generate innovation, or will set one that is too strict and either imposes unrealistic burdens or becomes riddled with exemptions (thereby again failing to generate innovation). As with the measuring and monitoring of results, regulators must invest resources in learning about an industry to set a realistic outcome-based target for it. These costs, too, must be considered when evaluating whether a performance-based regulation is truly preferable to a prescriptive one. Thus, building on Coglianese and Lazer, I conclude that performance-based rules are only preferable where the gains from flexibility exceed the transaction costs involved in identifying a realistic outcome-based target *and* in measuring and monitoring outcomes. This limitation applies both to performance standards targeted at a single facility, and to those that lie at the heart of market-based trading programs.²⁰⁷

Are performance-based approaches an effective way to encourage green innovation? Or will the limiting conditions just described restrict their usefulness? Here, our description of green business should prove helpful.²⁰⁸ We can examine the activities that constitute green business and ask whether an outcome-based standard designed to promote them would meet the limiting conditions identified above. As we will see, the answer all too frequently is “no.” This makes outcome-based standards insufficient for the purpose that Professor Porter has assigned to them.

One important form of green business activity consists of systematic initiatives to enhance environmental performance. As described above, this category includes EMS, pollution prevention initiatives, life cycle

206. *Id.* at 704.

207. *See id.* at 701 (stating that limitations apply to all performance standards, whether they are “market-based or uniform”). Trading programs will run up against the same limits as other performance-based approaches. Regulators must be able to set standards and monitor the results at a reasonable cost in order for such programs to be effective. If they cannot—if the transaction costs are too high—then traditional regulation is preferable to trading just as it is to other performance-based approaches. Thus, I focus on the limits of the performance-based approach generally and not on the differences between trading and other performance-based approaches.

208. *See* discussion *supra* Part II.

assessments, design for environment initiatives, and attempts to green the supply chain.²⁰⁹ Could regulators set meaningful outcome-based targets that would cause firms to undertake such activities, and could they measure and monitor the outcomes at a reasonable cost? Probably not. Systematic pollution prevention initiatives often rely on many employees to search for upstream changes that will minimize pollution, and these initiatives frequently yield scores of discrete projects. For example, 3M's 3P program²¹⁰ generated 5,000 pollution prevention projects that decreased pollution by 2.2 billion pounds.²¹¹ How could regulators have predicted this? Assuming that officials had wanted to motivate such behavior, how could they have known where to set the target? Even the company CEO, operating with access to all of the corporation's information, could not have known *ex ante* what pollutants the initiative would reduce and by how much. That is why firms do not dictate pollution prevention measures from the top but rather utilize a systematic approach that draws the knowledge out of many employees throughout the organization. Clearly, regulators working from outside the company would not have sufficient knowledge to set a realistic target.²¹² To do so, they would need intimate knowledge of every facet of the facility, such that they could identify all the pollution prevention opportunities and know approximately what they would cost and how much they would achieve. The search costs involved in uncovering this information would dwarf any efficiency gains that a more flexible, outcome-based standard would provide. The same is true for the costs of measuring and monitoring these improvements. Even if a pollution prevention initiative yielded only one-fifth the number of projects that 3M's 3P program did—1,000, rather than 5,000—regulators would have to expend a huge amount of resources to identify a baseline for each project and then measure and monitor any gains. In short, the regulatory costs involved in setting a target for, and measuring and monitoring the results of, a systematic pollution prevention initiative such as 3M's 3P program would likely exceed any savings from the additional flexibility. Outcome-based rules would not be an effective tool for motivating such behaviors. The same is true for EMS, life cycle assessments, design-for-environment initiatives, and attempts to green the supply chain. The costs of setting

209. See *supra* notes 63–67 and accompanying text.

210. See *supra* notes 2, 23, 102 and accompanying text.

211. ESTY & WINSTON, *supra* note 1, at 106–07.

212. Professors Coglianese and Lazer make this very point. As they explain, “[a] most significant challenge in all of these cases comes about from the large number of sources of hard-to-detect risk. Even with substantially greater inspection resources, government agencies would be hard pressed to identify and test for . . . all the ways that pollution prevention could be achieved.” Coglianese & Lazer, *supra* note 21, at 720.

performance-based goals for such initiatives, and of measuring and monitoring the results, would be exorbitant. There may be ways that regulators can encourage firms to undertake systematic environmental improvement initiatives (indeed, I will argue below that there are),²¹³ but outcome-based standards do not appear to be a good choice for this important regulatory task.

Very similar problems would arise in attempting to use outcome-based approaches to promote two other categories of green business activity: energy efficiency and resource efficiency initiatives. Sometimes a company can achieve significant energy or resource efficiency gains through one or two substantial alterations to its products or processes. Patagonia's use of a night-flush system to replace hot air with cool, thus eliminating its need for air conditioning,²¹⁴ and Wal-Mart's decision to require its suppliers to provide only concentrated laundry detergent,²¹⁵ illustrate this potential. It would be difficult, but not impossible, for a regulator to foresee opportunities of this sort and design performance standards that encouraged firms to take advantage of them. But many energy and resource efficiency initiatives do not resemble these discrete projects. Instead, they look much more like the systematic pollution prevention efforts described above. For example, DuPont's energy efficiency initiative involved "a hundred ways to get leaner and meet its energy targets."²¹⁶ Like systematic programs, these initiatives involve many people searching for incremental gains throughout the operation. This will make it virtually impossible for regulators, who are not intimately familiar with the facility, to predict the level of energy or resource efficiency that such an initiative could realistically achieve, or to monitor each of the many ways in which a company goes about achieving such a goal. Thus, outcome-based standards will not be an effective tool for encouraging wide-ranging energy and resource efficiency initiatives for much the same reasons that they would not work for promoting systematic environmental improvement programs.²¹⁷

213. See *infra* notes 299–306 and accompanying text.

214. See *supra* note 55 and accompanying text.

215. See *supra* note 62 and accompanying text.

216. ESTY & WINSTON, *supra* note 1, at 105.

217. An agency could attempt to accomplish this through benchmarking. That is, it could identify the facility that was "best in class" with respect to energy use or pollution per unit of product and then require other facilities in the sector to meet that performance level. This would be one way to set a performance-based approach without incurring prohibitive transaction costs. Such an approach, like traditional BAT rules, however, could degenerate into a de facto requirement that all facilities employ the same BAT and methods as the reference facility. This would quash, rather than generate, the production of innovation offsets. I am indebted to Professor Stephen Johnson for pointing out this possible solution to

Regulators will also have a hard time using outcome-based standards to motivate beyond compliance environmental reporting and stakeholder involvement.²¹⁸ The reason is that these actions are only indirectly tied to environmental results. While they generally yield environmental benefits, it is anyone's guess as to what, exactly, these outcomes will be. This will make it extremely difficult for regulators to establish an outcome-based standard that will motivate such behaviors. If one cannot know, *ex ante*, the environmental outcome that will flow from such actions, then one cannot design an outcome-based standard to encourage them. The same point can be made about financing and investing in green products and behaviors.²¹⁹ Such investments will likely benefit the environment, but it will be very difficult to predict how much they will do so. This will make it all but impossible to set a realistic outcome-based standard that could motivate such behavior. An agency could specify the number of stakeholder meetings that a company must hold, the frequency with which it must disclose information, or the amount of money it should invest in green products,²²⁰ but these would not be outcome-based environmental standards in the sense that Professor Porter uses the term. Green behaviors that have indirect effects on the environment thus represent another important area that Professor Porter's recommended approach will do nothing to promote.

Outcome-based standards should prove better at prompting firms to invent discrete green technologies—be they products, processes, or pollution controls.²²¹ “Technology forcing” regulation of this type has long been a part (albeit a small one) of environmental law and generally employs outcome-based standards like those that Professor Porter recommends.²²² This approach has yielded striking successes like Congress's requirement of a 90% reduction in automobile tailpipe emissions, which led to the auto industry's development of the catalytic converter,²²³ or the Scandinavian outcome-based standards that prompted the pulp and paper industry to invent chlorine-free paper.²²⁴

the transaction cost problem.

218. See *supra* notes 28–29 and *infra* note 324 and accompanying text.

219. See *supra* notes 124–26 and accompanying text.

220. It would probably make sense to leave such capital investment decisions to the corporation itself.

221. See, e.g., PERCIVAL ET AL., *supra* note 177, at 1053 (explaining how technology-forcing regulations led to the rapid phaseout of chlorofluorocarbons (CFCs)).

222. See generally *id.* at 562–79 (discussing the historical successes with technology-forcing standards concerning automobiles).

223. *Id.* at 565–66.

224. See THE MGMT. INST. FOR ENV'T AND BUS., *supra* note 198, at 14; Porter & van der Linde, *Green and Competitive*, *supra* note 13, at 129.

But experience also provides cautionary lessons about the limits of technology forcing. Such standards tend to succeed where industry has already made progress toward the development of a new technology and a stringent outcome-based standard serves to push the process to completion. Regulation of tailpipe emissions, followed by the development of the catalytic converter, is one example of this.²²⁵ Another example is the phaseout of chlorofluorocarbons (CFCs) and their replacement by substitutes that DuPont was already developing.²²⁶ By contrast, technology-forcing standards have failed where regulators have instituted them without first gaining sufficient knowledge about what industry could reasonably achieve. In these instances regulators have occasionally set unrealistic standards and then been forced to lift them, thereby undermining their own authority to engage in technology-forcing regulation in the future. California's decision to require a certain percentage of zero emission vehicles (ZEVs), and its ultimate relaxation of this standard, illustrates this dynamic.²²⁷

Experiences like these suggest that regulators should employ technology-forcing standards only where regulatory officials already possess a good idea of the innovations they are seeking and have sound reasons for believing that industry can achieve them. This logic cautions against relying on outcome-based standards to encourage zero-waste facilities, closed-loop processes, or by-product synergy arrangements.²²⁸ Here, regulators will not be able to acquire enough information about a given facility and its operations to know whether a technology-forcing requirement is achievable or poses an unrealistic burden. Thus, outcome-based standards are not a good choice for this set of green business activities either.

Regulators may also face an informational deficit when using outcome-based standards to promote another form of green behavior: company decisions to address environmental impacts that are currently unregulated.²²⁹ Government can certainly use outcome-based standards to turn unregulated pollutants into regulated ones. Alternatively, it can threaten to develop such requirements, causing firms to reduce their

225. GREGG EASTERBROOK, *A MOMENT ON THE EARTH: THE COMING AGE OF ENVIRONMENTAL OPTIMISM* 186–89 (1995).

226. DAVID HUNTER, JAMES SALZMAN & DURWOOD ZAEKE, *INTERNATIONAL ENVIRONMENTAL LAW AND POLICY* 579 (2d ed. 2002) (describing how DuPont ultimately pushed for international regulation because its advance work gave it a competitive advantage).

227. PERCIVAL ET AL., *supra* note 177, at 569–71 (noting that California's zero emission vehicle (ZEV) program failed to induce manufacturers to market such a vehicle).

228. *See supra* notes 51–54 and accompanying text.

229. *See supra* notes 41–42 and accompanying text.

pollution to either stave off—or be better positioned to comply with—such future regulation. Recent state initiatives to regulate GHG, and voluntary corporate efforts to reduce GHG emissions in anticipation of a federal law, illustrate these dynamics.²³⁰ Where outcome-based rules are used in this way, they can promote innovation as firms come up with ways to meet—or anticipate—the future standards. Yet some of the most important instances in which firms have addressed unregulated impacts do not fit this model. In these cases, companies knew that they were creating environmental impacts, but regulators did not. The firms nonetheless went beyond legal requirements to address the harm. One example of this is the decision by McDonald's to remove mercury batteries from its toys, though they were perfectly legal at the time.²³¹ Another is SC Johnson's program for removing harmful substances from its products, though they were not required to do so.²³² In each of these cases, firms perceived dangers before regulators did and moved to minimize them.

Beyond-compliance behavior of this type is valuable precisely because it takes advantage of the informational asymmetries between the firm, which knows its operations intimately, and the government, which does not. But this informational divide makes output-based regulation a poor tool for motivating such actions. By definition, regulators will not know of many such opportunities or will face high search costs in trying to find them out. This will make it very expensive for them to set an outcome-based target in these situations, much less to measure and monitor it.²³³ This category, then, also seems ill-suited to performance-based regulation.²³⁴

230. Until recently, the federal and state governments have failed to regulate GHGs. Some states have passed outcome-based regulations, thereby turning this unregulated group of pollutants into a regulated one. See, e.g., REGIONAL GREENHOUSE GAS INITIATIVE, <http://www.rggi.org/> (last visited Nov. 4, 2010) (describing the Regional Greenhouse Gas Initiative, an effort by a group of northeastern states to regulate GHGs from electrical utilities using a cap-and-trade system). Other states and the federal government have been developing such legislation. See, e.g., American Clean Energy and Security Act, H.R. 2454, 111th Cong. (2009) (proposing to regulate GHG emissions at the federal level). In anticipation of these new laws, some firms have started proactively limiting their GHG emissions. See, e.g., *Climate Leaders*, ENVIRONMENTAL PROTECTION AGENCY, <http://www.epa.gov/climateleaders/> (last visited Nov. 4, 2010) (describing the Climate Leaders Program, in which corporations voluntarily commit to reducing their GHG emissions).

231. See *supra* note 109 and accompanying text.

232. See *supra* note 42 and accompanying text.

233. Were regulators to make this investment and set the standard, it would negate the benefit of having firms use their superior knowledge to address hazards proactively.

234. There is also the problem that, as soon as regulators set an outcome-based standard, the pollutants would no longer be unregulated. But that is more of a linguistic problem than a regulatory one.

In sum, drawing on Coglianese and Lazer's helpful framework, it appears that outcome-based standards are likely to be effective where regulators already know quite a bit about the regulated industry's impacts and potential for green innovation such that it is possible to set realistic targets without having to incur excessive search costs and where they can measure and monitor outcomes without great expense. Where these conditions are met, outcome-based standards can productively promote the development of discrete green products, processes, and control technologies.

In contrast, outcome-based standards are likely to be less effective when regulators know less about the industry's impacts and potential for green innovation such that it is very expensive to set realistic targets and where they find it difficult and expensive to measure and monitor environmental results. In these instances, the costs of setting a realistic target or of measuring and monitoring the results are likely to exceed any gains from increased flexibility. Thus, outcome-based approaches are not good tools for promoting: (1) systematic and wide-scale corporate initiatives to improve environmental performance, energy efficiency, or resource productivity; (2) actions that produce environmental benefits indirectly (e.g., beyond-compliance information disclosure, stakeholder involvement, or green investing); (3) product, process, or control technology innovations that regulators cannot foresee due to a lack of information about the industry and its processes (e.g., zero-waste facilities or by-product synergy arrangements); and (4) facility reductions in unregulated impacts that regulators do not yet know about (e.g., beyond-compliance reductions of toxic substances from toys or other products). In short, outcome-based standards are a poor choice for advancing many important aspects of the green business landscape. Professor Porter's regulatory theory, as insightful and groundbreaking as it has been, suffers from a serious gap when it comes to the important question of how environmental regulation can promote the win-win opportunities of green business.

III. REFLEXIVE LAW AND GREEN BUSINESS

How to remedy this gap? If the market, technology-based standards, and outcome-based regulation are all inadequate, are there any alternatives left? Here, the work of German social theorist Gunther Teubner proves useful. Teubner argues that legal systems develop in an evolutionary progression: from common law rules that govern market transactions (which he calls "formal law" systems), to technology-based and outcome-based standards (which he calls "substantive law" systems), to a third form

of regulation that he terms “reflexive law.”²³⁵ Reflexive law does not prescribe technologies or outcomes.²³⁶ But neither does it leave things entirely to the market and common law.²³⁷ Instead, it offers an alternative approach in which the law pushes firms to internalize social norms and objectives, reflect on their own performance with respect to them, and manage their operations to improve this performance. In other words, reflexive law is law that fosters self-regulation.²³⁸ In Part I, I pointed to the TRI as an example of reflexive law, with its requirement that firms report annually on their releases and transfers of toxic substances. As we shall see, reflexive law encompasses not only information-based regulatory strategies but also procedure-based and communication-based methods of promoting self-regulation.²³⁹

I focus on reflexive law not because I agree with Teubner’s idea of an evolutionary progression or his view that reflexive law represents some kind of final stage in the development of legal systems.²⁴⁰ I focus on it because it offers another alternative—a productive one, as it turns out—for thinking about how law and policy can promote green business. To show this, I must first describe Teubner’s evolutionary theory.²⁴¹ I can then elaborate on the three reflexive law strategies—information-based, procedure-based, and communication-based laws—and explain how they can foster the growth of green business.

235. Teubner, *Elements*, *supra* note 24.

236. *Id.* at 254 (noting that reflexive law “retreats from taking full responsibility for substantive outcomes”); *see also* Stewart, *supra* note 25, at 130.

237. Teubner, *Elements*, *supra* note 24, at 254 (reflexive law “shares with substantive law the notion that focused intervention in social processes is within the domain of law”).

238. *See id.* at 246 (“[A] post-modern legal order must be oriented toward self-reflective processes within different social subsystems.”); *see also* David J. Schneider, *Radical or Rational? Reflexive Law as Res Novo in the Canadian Environmental Regulatory Regime*, in *LAW, REGULATION, AND GOVERNANCE* 97, 99 (Michael MacNeil, Neil Sargent & Peter Swan eds., 2002) (“The role of law shifts, therefore, from . . . planning . . . to one of seeking ways to influence the development of self-regulating processes within other social systems.”); Dorf, *supra* note 25, at 391 (reflexive law is “regulation of regulation”).

239. Teubner, *Elements*, *supra* note 24; *see generally* Stewart, *supra* note 25, at 127–34. This is what distinguishes reflexive law from “management-based” regulation, the term used by Coglianese and Lazer. Management-based regulation focuses on planning and, to a lesser extent, on informational approaches that promote such planning. Coglianese & Lazer, *supra* note 21, at 694. Reflexive law assigns important roles to information-based, communication-based, and procedure-based strategies. Teubner’s reflexive law is thus broader in scope than Coglianese and Lazer’s management-based regulation, although they do overlap.

240. *See supra* notes 235–39 and accompanying text.

241. Readers more interested in the practical application of this theory to the fostering of green business than in the theory itself can skip directly to Part II.B.

A. Teubner's Evolutionary Theory of Law

Continental systems theory, a set of ideas propounded by Jürgen Habermas,²⁴² Niklas Luhmann,²⁴³ and others, is a critical component of Teubner's reflexive law idea and is the best starting point for explaining it.²⁴⁴ Stated simply, systems theory asserts that post-modern society has become so complex that it no longer consists of a single social or cultural system but rather many different self-regulating subsystems organized along functional lines.²⁴⁵ Law is one such subsystem. Politics, industry, academia, family, sport, and religion are others.²⁴⁶

Each subsystem is governed by its own "discourse"—its logic, values, norms, and language.²⁴⁷ This makes it difficult for one system (e.g., the law) to influence others (e.g., industry or the family) in the way that the system intends.²⁴⁸ The message often gets distorted in the course of being translated from one discourse into another, sometimes resulting in unforeseen consequences that undermine the intended effect. The Clean Air Act New Source Review (NSR) program can serve as an example from the environmental field. In the NSR provisions, Congress required that major emitters who intended to construct a new plant or significantly modify an existing one install the best available pollution control equipment when they did so.²⁴⁹ Congress assumed that with the natural turnover of capital stock, most emissions sources would eventually install the required technology. Industry, however, interpreted the law according to its own economic logic: instead of building new plants, many companies chose to

242. See, e.g., JÜRGEN HABERMAS, *COMMUNICATION AND THE EVOLUTION OF SOCIETY* (Thomas McCarthy trans., 1979).

243. See, e.g., Niklas Luhmann, *Evolution des Rechts*, in *RECHTSTHEORIE: ZEITSCHRIFT FÜR LOGIK, METHODENLEHRE KYBERNETIK UND SOZIOLOGIE DES RECHTS* 3 (Karl Engisch et al. eds., 1970).

244. See generally Schneider, *supra* note 238, at 99; Dorf, *supra* note 25, at 386.

245. Teubner, *Elements*, *supra* note 24, at 244; David Hess, *Social Reporting: A Reflexive Law Approach to Corporate Social Responsiveness*, 25 J. CORP. L. 41, 49 (1999); see also Schneider, *supra* note 238, at 103.

246. Orts, *supra* note 26, at 1260.

247. *Id.*; Schneider, *supra* note 238, at 104; Gaines, *supra* note 35, at 20; Hess, *supra* note 245, at 49.

248. Orts, *supra* note 26, at 1265 (discussing "different systemic languages"); Schneider, *supra* note 238, at 104 (describing communication as "difficult or even impossible"). In Teubner's terms, each system is partially "closed" in the sense that its own discourse interferes with its ability to assimilate communications from another subsystem. Teubner, *Elements*, *supra* note 24, at 248-49.

249. See Bernard F. Hawkins, Jr., *The New Source Review Program: Its Prevention of Significant Deterioration and Nonattainment Analysis Programs*, in *THE CLEAN AIR ACT HANDBOOK* 98 (Robert J. Martineau, Jr. & David P. Novello eds., 1998).

extend the life of less efficient, dirtier plants to avoid the NSR emissions control requirement.²⁵⁰ These old, inefficient plants remained in service longer than they otherwise would have, resulting in more pollution, not less. EPA had to resort to industry-wide litigation to reestablish some linearity between Congress's action and industry's response.²⁵¹

Teubner argues that the emergence of self-regulating subsystems and the way they distort legal interventions has important implications for the evolution of legal systems. He observes that the first stage of western legal systems consists of relatively simple laws that provide a formal structure within which autonomous individuals make decisions and take actions.²⁵² He calls these formal law systems.²⁵³ The Anglo-American common law system of contract, property, and tort, which form the backdrop for individual market transactions, would be an example.²⁵⁴ Formal law systems find their theoretical justification in Classical Liberalism, which holds that the role of the state is to ensure that all possess equal rights to liberty (e.g., freedom of contract, property rights) and then to let individuals, so endowed, work out their own futures.²⁵⁵

Teubner argues that over time, the growing complexity and externalities of modern society overwhelm formal law. Nuisance law, for instance, which was able to handle the spillover effects between neighboring agrarian landowners, is often unable to address pollution from millions of automobiles and thousands of factories that damage the health of large populations. The collective action, free-rider, and causality problems render it ineffective.²⁵⁶ Teubner maintains that societies have responded to this evolutionary development with "substantively rational law."²⁵⁷ This legal form requires regulated entities to undertake defined actions and to obtain particular results.²⁵⁸ It does not leave social outcomes to the market and autonomous individuals²⁵⁹ but rather aims at achieving "specific goals

250. *Id.*

251. See Peter E. Seley, *Lawmaking Through Litigation: EPA's Gamble on New Source Review*, 15 NAT. RESOURCES & ENV'T. 260 (2001).

252. Teubner, *Elements*, *supra* note 24, at 252–53.

253. *Id.* at 252; see also Stewart, *supra* note 25, at 130 (discussing the roots of reflexive law).

254. Stewart, *supra* note 25, at 130.

255. COHEN, *supra* note 25, at 3.

256. Schneider, *supra* note 238, at 100, 102; Orts, *supra* note 26, at 1256; see also COHEN, *supra* note 25, at 154 ("The task at hand is far too complex for such a simple solution.").

257. Teubner, *Elements*, *supra* note 24, at 240.

258. See COHEN, *supra* note 25, at 4 (describing substantive law as "regulatory, interventionist, and direct").

259. Teubner, *Elements*, *supra* note 24, at 253; see Schneider, *supra* note 238, at 100; Hess, *supra* note 245, at 48; Orts, *supra* note 26, at 1255–56.

in concrete situations.”²⁶⁰ Much current environmental regulation, including both technology-based and outcome-based standards, would fall into this category. Substantive law finds its theoretical justification in the welfare state.²⁶¹ The collective society intervenes in individual market transactions to correct market failures and bring about socially desired results.²⁶²

For Teubner, systems theory is important because it explains the breakdown of substantive law. The welfarist, substantive law paradigm assumes that society can intervene in the marketplace for certain purposes and that the intervention will actually accomplish those purposes.²⁶³ Systems theory, however, says that this is unlikely to happen. Subsystems interpret the commands of the legal system according to their own logic, and their responses to these directives can be decidedly nonlinear.²⁶⁴ Interpreting the directive through the lens of their own discourse, subsystems often distort the message, or even undermine it altogether.²⁶⁵ This can lead centralized directives to misfire²⁶⁶ as in the NSR implementation problems described above.²⁶⁷ Teubner believes that

260. Teubner, *Elements*, *supra* note 24, at 240; see COHEN, *supra* note 25, at 152; Schneider, *supra* note 238, at 100; Orts, *supra* note 26, at 1256 n.117 (“Substantive law instead means that law is used instrumentally in an attempt to regulate the ‘substance’ of social interactions directly.”).

261. Schneider, *supra* note 238, at 97, 100 (explaining the derivation of substantive law from the welfare state).

262. Teubner, *Elements*, *supra* note 24, at 253 (indicating that substantive law is grounded in the “perceived need for the collective regulation of economic and social activities to compensate for inadequacies of the market”).

263. See COHEN, *supra* note 25, at 153 (noting that substantive law is premised on the “‘rather primitive’ model of linear causality guiding purposive legal action: [legislation is] . . . ‘thought to lead to . . . changes [in] social behavior so as to realize the desired goals’” (quoting Gunther Teubner, *Autopoiesis in Law and Society: A Rejoinder to Blankenburg*, 18 LAW & SOC’Y REV. 149, 298 (1984))); Schneider, *supra* note 238, at 115.

264. See Schneider, *supra* note 238, at 105 (“This closed circle, or self-referential quality of social subsystems, is the basis of their resistance to external forms of regulation.”).

265. See *id.* (“Only those components [of the legislation] that contribute to order in the system are selected by the system. . . . [N]either . . . command-and-control . . . nor proposed market-based alternatives directly affect the behaviour of their intended targets, as is posited by current legal theory.”) “

266. See COHEN, *supra* note 25, at 153–54 (“[R]egulatory failure can be attributed to the lack of respect for the autonomy and internal logics of the regulated subsystem.”); Orts, *supra* note 26, at 1265 (“[S]ubstantive reform strategies . . . often miss their mark by misunderstanding the ability of other social systems to respond.”).

267. See *supra* notes 249–51 and accompanying text. The “brownfields” problem in environmental law provides another example. The Comprehensive Environmental Response Compensation and Liability Act (CERCLA) seeks to cleanse hazardous waste sites of harmful substances and return them to productive use. To this end, it requires current

substantive law all too frequently fails to achieve its ends, and that this occurs because of the difficulties inherent in system-to-system communication.²⁶⁸

What to do? Teubner does not advocate a return to formal law. He explicitly rejects the Liberalist model and maintains that property, contract, and tort ceased to be sufficient many years ago.²⁶⁹ Instead, he maintains that, just as systems theory diagnosed the problem, so too did it point the way to the solution. If social subsystems are autonomous, self-regulating entities, then the way to encourage them to achieve social goals (such as environmental protection) is to get them to incorporate social values into their own discourse and build it into their own self-regulation.²⁷⁰ That is, regulation should no longer follow the substantive law model and seek to control social outcomes through centralized directives.²⁷¹ Instead, it should seek to: (1) get firms to internalize social goals (such as environmental values) and adopt them as their own,²⁷² and (2) encourage companies to

owners of these sites to clean them up, often at great expense. *See generally* PERCIVAL ET AL., *supra* note 177, at 366–71 (describing basic principles of the CERCLA statute). In some instances, this does in fact lead to cleaner sites. However, at sites where there is no existing owner and where there is ambiguity about the cost of a CERCLA clean up, the requirement often backfires. Prospective purchasers stay away from the site, knowing that if they purchase it, they may find themselves saddled with a large liability that they cannot quantify beforehand (and so cannot properly discount in the purchase price). *Id.* at 414. Instead of being cleaned up and returned to productive use, many such sites become abandoned, an eyesore for the community and a haven for criminal activity. This is the opposite of CERCLA's intended result. The logic of the market has distorted that of the law.

268. *See* Schneider, *supra* note 238, at 115 (“The difficulty of providing effective environmental protection is a concrete example of the general failing of the substantively oriented, purposive law characteristic of the modern welfare state.”); Dorf, *supra* note 25, at 395 (“Teubner argues that modern society is so complex and fractured that command-and-control regulation is bound to fail.”).

269. COHEN, *supra* note 25, at 154.

270. *See* Orts, *supra* note 26, at 1340 (“Because law itself cannot solve all the problems directly, regulators must begin to find ways to use law to encourage other forces in society to work for environmental improvement.”). In Teubner's terms, integrating social values directly into the discourse of regulated subsystems will overcome the system-to-system “translation” problem that has interfered with the proper operation of substantive law. It will “solve[] the problem of governability.” COHEN, *supra* note 25, at 155–56.

271. Stewart, *supra* note 25, at 130.

272. *Id.* at 127 (explaining that reflexive law's “aim is to promote the internalization of environmental norms by firms and other organizational actors as opposed to directly controlling their external conduct”); COHEN, *supra* note 25, at 155 (positing that the purpose of reflexive law is “to foster internal reflection: to force the organization to internalize outside conflicts in its own decision structure, so as to become socially sensitive” to the externalities caused by its own behaviors, and so “to develop effective internal control structures”); Dorf, *supra* note 25, at 395 (“Reflexive law is thus the best tool for the society in general to influence the individual social subsystems with which the law interacts, because it

reflect on these goals and self-manage to achieve them.²⁷³ It should engage in the “regulation of self-regulation.”²⁷⁴ Teubner calls this type of governmental activity reflexive law both because the subject (regulation) “mirrors” the object (self-regulation)²⁷⁵ and because the law achieves its objectives by getting other actors to reflect on how their behaviors impact the wider society.²⁷⁶

Seen in its historical context, reflexive law is something of a hybrid that draws together elements of the other two legal forms. Government is intervening in the marketplace and seeking to achieve social objectives, as it does in substantive law.²⁷⁷ Yet it is doing so in a way that respects the individual and corporate autonomy that lies at the center of formal law. In this sense, Teubner’s theory can be seen as a type of Hegelian dialectical synthesis²⁷⁸ that seeks to resolve the tension between the liberal and

encourages actors within subsystems to internalize the general norm.”).

273. Stewart, *supra* note 25, at 129; *see also* Teubner, *Elements*, *supra* note 24, at 246 (“[A] post-modern legal order must be oriented toward self-reflective processes within different social subsystems.”); Orts, *supra* note 26, at 1339 (“The idea is to create a climate in which businesses voluntarily adopt procedures to encourage environmentally sound decisionmaking and to monitor environmental progress. This is not an impossible task.”).

274. Dorf, *supra* note 25, at 386; *see also* Schneider, *supra* note 238, at 99 (“The role of law shifts, therefore, from . . . planning . . . to one of seeking ways to influence the development of self-regulating processes within other social systems.”); Teubner, *Elements*, *supra* note 24, at 251 (“Instead of taking over responsibility for concrete social results, the law is restricted to structuring mechanisms for self-regulation . . .”; law should focus on “creating, shaping, correcting, and redesigning social institutions that function as self-regulating systems.”); Stewart, *supra* note 25, at 127 (stating that the “goal of reflexive law is ‘ecological self-organization.’” (quoting Lindsay Farmer & Gunther Teubner, *Ecological Self-Organization, in ENVIRONMENTAL LAW AND ECOLOGICAL RESPONSIBILITY: THE CONCEPT AND PRACTICE OF ECOLOGICAL SELF-ORGANIZATION* 3, 3 (Gunther Teubner et al. eds., 1994))).

275. As Professor Dorf explains, “thinking about thought is reflexive thought, cleaning a vacuum cleaner . . . is reflexive cleaning, and regulation of regulation is reflexive law.” Dorf, *supra* note 25, at 391; *see also* COHEN, *supra* note 25, at 155.

276. *See* Hess, *supra* note 245, at 42–43 (discussing how reflexive law encourages corporations to reexamine and reform their practices); Orts, *supra* note 26, at 1232, 1265 (describing how reflexive law enhances the “self-referential capacities of social systems”). Some argue that reflexive law is also reflexive in a third way, in that it does not assume that one form of law works best in all situations, but rather calls for reflection on the best form of law to use to address a specific problem. *See* COHEN, *supra* note 25, at 152; Orts, *supra* note 26, at 1266. Teubner, however, seems less inclusive than these commentators and is more committed to an evolutionary scheme in which reflexive law supplants the earlier forms. *See* Teubner, *Elements*, *supra* note 24, at 242, 246–48, 252–55, 274–75.

277. *See* COHEN, *supra* note 25, at 155.

278. *See* Raj Bhala, *Hegelian Reflections on Unilateral Action in the World Trading System*, 15 BERKELEY J. INT’L L. 159, 161 (1997) (discussing the “dialectical process of sublation, that is, through an opposition of a pair of ideas—a thesis and antithesis—that is replaced by a new synthesis”).

welfarist models that preceded it. Confronted with the dichotomy between individual autonomy and state directives, reflexive law chooses a third way: “regulated autonomy.”²⁷⁹

Yet Teubner himself maintains that law has difficulty communicating its intentions to industry and other subsystems. How, then, can it get firms to incorporate social values and make them their own?²⁸⁰ That is the problem on which reflexive law sets its sights. In explaining how it approaches the task, it is useful to distinguish between reflexive law’s two core objectives: (1) getting firms to adopt social norms as their own, and (2) encouraging them to self-manage to achieve these goals. It is also useful to focus more specifically on *environmental* law since that is of greatest relevance to our broader inquiry concerning the greening of industry.

B. *Encouraging Industry to Internalize Environmental Norms*

Reflexive law encourages industry to internalize environmental norms in two primary ways: information-based strategies and communication-based strategies.

1. *Information-Based Strategies*

Information-based strategies require firms to collect and disseminate information about their environmental performance.²⁸¹ The TRI, described above,²⁸² is an example of this type of regulation. Such disclosure empowers stakeholders to bring pressure on industry through purchasing decisions, media campaigns, and other actions.²⁸³ It also serves to educate those who work in industry about the environmental impacts of their own actions and so appeals to their moral commitments as social beings.²⁸⁴ The combined effect should be to get industry to take more seriously, and seek

279. Teubner, *Elements*, *supra* note 24, at 254.

280. “[H]ow are we to break out of the closed circle of the law through legislation and penetrate the closed circle of social worlds?” Schneider, *supra* note 238, at 105 (internal quotation marks omitted).

281. Stewart, *supra* note 25, at 131 (“Government’s role . . . is to ensure that appropriate information is generated, conveyed and exchanged.”).

282. See *supra* notes 31–34 and accompanying text.

283. Hess, *supra* note 245, at 66 (suggesting that providing information to stakeholders enables them to bring pressure on the subsystems); Stewart, *supra* note 25, at 134–35 (arguing that information informs market choices); LEVERAGING THE PRIVATE SECTOR, *supra* note 201, at 250 (noting that informed outsiders can “bring pressure to bear upon the firm’s decisionmakers”).

284. Stewart, *supra* note 25, at 142 (indicating that managers themselves may care about others’ opinions of their organization); cf. Hess, *supra* note 245, at 59 (discussing how government regulation seeks to get subsystems to understand what society expects of them).

to reduce, its impacts on the environment and human health.²⁸⁵ It should “lead to environmentally beneficial changes in organizational behavior as a result of influences and interactions generated by consumption of . . . information by public stakeholders.”²⁸⁶ Information-based strategies for getting firms to internalize environmental norms fall into three subcategories: those that, like TRI, collect and disseminate *negative information* about firms’ environmental impacts and so make them want to do better; those that collect and disseminate *positive information* about the companies’ environmental performance and thereby use a carrot, rather than a stick, to encourage improvement; and those that disclose *other* types of relevant information, such as descriptions of green business success stories.²⁸⁷

2. Communication-Based Strategies

Reflexive law also seeks to promote the internalization of environmental norms by enhancing communication between stakeholders and the industries that affect them.²⁸⁸ As mentioned above, systems theory predicts that part of the problem is the lack of communication between the broader society and industry and that part of the solution, accordingly, involves breaking into industry’s own discourse—its norms, values, and language—so that it can better hear, and ultimately incorporate, others’ perspectives on its actions. Communication-based initiatives seek to facilitate this. For example, the government might require industry to reach out to and meet with stakeholders to demonstrate that it has given due consideration to their input regarding environmental management. Alternatively, the government might issue a public challenge to a given industry sector to improve its environmental performance, thereby stimulating dialogue and

285. Stewart, *supra* note 25, at 131 (suggesting that reflexive law gets firms to “understand the impact of their actions and of the actions of others in order to make appropriate decisions”).

286. *Id.* at 134.

287. *See id.* at 134–41 (distinguishing between positive information programs, negative information programs, and neutral information programs).

288. *See* Teubner, *Elements*, *supra* note 24, at 251 (noting that reflexive law focuses on the “organizing of participation” without mandating specific outcomes); COHEN, *supra* note 25, at 155–56 (describing how reflexive law fosters reflection “by the establishment of discursive structures that allow for communication and bargaining within each particular subsystem between various actors conscious of potential external effects of decisions”); Stewart, *supra* note 25, at 129 (“[G]overnment . . . establish[es] communication channels and other structural arrangements, so that the primary conduct of businesses and other organizations and the level of environmental quality achieved would emerge from communications among and within organizations and other societal actors.”); Orts, *supra* note 26, at 1268 (“Reflexive environmental disclosure would focus on setting up a system of social communication.”).

media attention on the topic. In these ways and others, government officials become the “structural engineers of communicative systems.”²⁸⁹ The information-based strategy connects to the communication-based one, since well-informed stakeholders will be more motivated to communicate with industry and more persuasive when they attempt to make their case.²⁹⁰ It is worth noting that neither information-based nor communication-based strategies prescribe specific environmental outcomes. They do, however, enable stakeholders to express their desires to industry and press it to align its norms and behaviors with their own. In Teubner’s terms, law’s role shifts from prescribing specific behaviors or environmental outcomes to “coordinating” the objectives of different sectors of a highly complex and differentiated society.²⁹¹

C. Promoting Self-Reflection and Planning

Once information-based and communication-based strategies have gotten firms to understand and internalize environmental norms and objectives, the next step is to get them to reflect on their own environmental performance and manage their operations to bring them more into line with these values.

1. Procedure-Based Strategies

Here, reflexive law’s primary *modus operandi* is procedural.²⁹² It requires or encourages firms to engage in planning and decisionmaking procedures through which they reflect on and manage their environmental performance.²⁹³ For example, some states require facilities to engage in

289. Stewart, *supra* note 25, at 130.

290. See *id.* at 128–29 (describing government’s role in disseminating public information on environmental performance).

291. Teubner, *Elements*, *supra* note 24, at 242 (“[L]aw becomes a system for the coordination of action within and between semi-autonomous social subsystems . . .”); *id.* at 255 (“The role of reflexive law is to structure and restructure semi-autonomous social systems[], by shaping both their procedures of internal discourse and their *methods of coordination* with other social systems.” (emphasis added and citation omitted)); Stewart, *supra* note 25, at 130 (noting that reflexive law focuses on coordinating the “goals and activities” of different elements of society); *id.* at 134 (discussing how information is necessary for stakeholders to “align incentives or coordinate objectives”).

292. See Teubner, *Elements*, *supra* note 24, at 255; *id.* at 251 (describing a “process-oriented structuring of institutions”); see also Schneider, *supra* note 238, at 101; Hess, *supra* note 245, at 50–51.

293. See Orts, *supra* note 26, at 1254 (arguing that reflexive law is “procedural; it aims to set up processes that encourage institutional self-reflective thinking and learning about environmental effects” (emphases omitted)); Hess, *supra* note 245, at 51 (discussing procedures to encourage subsystems to be self-reflective with respect to their impacts on the

pollution prevention planning as a condition of permit issuance.²⁹⁴ Others provide incentives for such behaviors or technical assistance to facilitate them. Laws like these do not prescribe specific control technologies or pollution levels.²⁹⁵ Instead, they require or encourage firms to undertake planning and decisionmaking steps. The law accepts the environmental outcomes that emerge from these processes.²⁹⁶

In sum, reflexive law seeks to get firms to internalize environmental norms and objectives, reflect on where they stand with respect to them, and manage their operations to perform better. To accomplish this, it uses information-based, communication-based, and procedure-based regulatory strategies.

D. Filling the Gap in Regulatory Theory

Can reflexive law strategies foster the green business activities that Professor Porter's outcome-based methods cannot address? Can they fill the gap in the theory of how regulation can promote green business?

To answer these questions, I first reprise my earlier discussion of outcome-based strategies and their limited ability to foster corporate greening.²⁹⁷ I conclude that outcome-based regulation will likely be *effective* where regulators already know quite a bit about the regulated industry's impacts and potential for green innovation and where they can measure and monitor outcomes without great expense. Assuming these conditions are met, this strategy will be well suited for promoting the development of discrete green products, processes, and control technologies. On the other hand, outcome-based regulations will likely prove *ineffective* where regulators know little about the industry's impacts and potential for green innovation and where they find it difficult and expensive to measure and monitor outcomes. Thus, outcome-based approaches will likely not be a good tool

larger society); COHEN, *supra* note 25, at 155 (describing how reflexive law establishes "norms of procedure, organization, membership, and competencies that can make overall processes of decision making sensitive to side effects and externalities").

294. See JOHNSON, *supra* note 31, at 340–41 (summarizing state pollution prevention efforts). Government can link this procedure-based strategy to its information- and communication-based ones by requiring facilities, as part of the planning process, to disclose environmental information to—or engage—stakeholders, or both.

295. Orts, *supra* note 26, at 1232 ("[Reflexive law] focuses on enhancing self-referential capacities of social systems and institutions outside the legal system, rather than direct intervention of the legal system itself . . ."); Schneider, *supra* note 238, at 103 (characterizing reflexive law as "indirect").

296. See Hess, *supra* note 245, at 50 (asserting that reflexive law establishes procedures that guide behavior but leaves it to private actors to determine their own outcomes).

297. See *supra* notes 200–20 and accompanying text.

for promoting: (1) systematic and wide-scale corporate initiatives to improve environmental performance, energy efficiency, or resource productivity; (2) actions that indirectly result in environmental benefits; (3) product, process, or control technology innovations that regulators cannot foresee due to a lack of information about the industry and its processes; or (4) facility reductions in unregulated impacts where regulators are not yet aware of these impacts.

Are information-based, communication-based, and procedure-based reflexive law strategies better able to foster these important green behaviors? Do any existing programs demonstrate how they might achieve this? I turn now to these questions.

1. Systematic Initiatives to Improve Environmental Performance, Energy Efficiency, and Resource Productivity

When a firm launches a systematic environmental improvement initiative it does not simply tell its employees to seek pollution prevention, energy efficiency, or resource productivity opportunities. Instead, it typically institutes some type of internal procedure for making sure that they are doing this and for assessing the gains—if any—and expenditures.²⁹⁸ While it would be extremely complicated and expensive to set an appropriate outcome-based standard to motivate such activity,²⁹⁹ it would be relatively easy and straightforward to create a procedure-based reflexive law to accomplish this. For example, regulators could sketch out the general contours of a pollution prevention, energy efficiency, or resource productivity planning system and then require firms to implement it. Regulators would not have to calculate outcome targets in advance or even measure the results. So long as the facilities implemented the system and worked through the planning, they would be in compliance. The environmental results would be those that emerged from this process. While some firms might simply jump through the hoops and generate few environmental benefits, our analysis of the motivations behind greening³⁰⁰ suggests that most should not do so. In many cases, firms that take the process seriously should be able to reduce their material, energy, and regulatory compliance costs. The planning requirement could be the push that many companies need to break through the barriers that keep them from pursuing such win-win opportunities.³⁰¹

This is not a new idea. A number of federal and state laws already

298. Strasser, *Pollution Prevention*, *supra* note 64, at 35–36.

299. *See supra* notes 21–23 and accompanying text.

300. *See supra* notes 75–123 and accompanying text.

301. *See supra* notes 169–70 and accompanying text (describing these barriers).

require planning of this type.³⁰² For example, Massachusetts requires firms that use large quantities of toxic substances to develop a toxics use reduction plan, have the plan certified by a trained third-party planner, and submit a copy to the state.³⁰³ The state publishes the plan on the Internet but has no authority to enforce the plan, monitor the company's implementation of it, or require that the plan result in any specific environmental outcomes.³⁰⁴ Nonetheless, the planning requirement has led to significant reductions in the use and release of toxic substances.³⁰⁵ This suggests that a procedure-based reflexive law approach can work in this area.³⁰⁶

Some have argued that *requiring* systematic planning approaches will transform them from an opportunity that companies embrace into an obligation that they resist.³⁰⁷ They recommend using incentives and assistance, rather than requirements, to encourage such planning.³⁰⁸ Governments have already experimented with these reflexive law approaches as well. The EPA waives gravity-based penalties for firms that employ an environmental management system to detect violations and then voluntarily disclose these infractions to the EPA.³⁰⁹ It has established a

302. See JOHNSON, *supra* note 31, at 206 (discussing the sources of major federal environmental planning requirements).

303. *Id.* at 208; *An Overview of TURA*, TOXIC USE REDUCTION INST., <http://turadata.turi.org/WhatIsTURA/OverviewOfTURA.html> (last visited Nov. 4, 2010).

304. JOHNSON, *supra* note 31, at 208.

305. *Results to Date*, TOXIC USE REDUCTION INST., <http://turadata.turi.org/Success/ResultsToDate.html> (last visited Nov. 4, 2010) ("TURA filers have decreased their toxic chemical use by 20% from the 1990 base year to 2008. Using the same method of adjustment, TURA filers are generating 33% less byproducts or waste per unit of product and have reduced releases of TRI reported on-site chemicals by 52%.").

306. Planning requirements also exist in federal law. For example, the National Environmental Policy Act (NEPA) requires federal agencies to prepare and publish an environmental impact statement (EIS) before they undertake any major actions that could significantly affect the environment. Orts, *supra* note 26, at 1272. Private parties can be drawn into NEPA planning where they are seeking a permit or other federal approval that triggers NEPA requirements. The Clean Air Act requires businesses that have more than a threshold quantity of hazardous chemicals on site to develop a risk management plan that assesses the potential damage from accidental releases and identifies a strategy for responding to such an incident. Clean Air Act § 112(r), 42 U.S.C. § 7412(r) (2006); JOHNSON, *supra* note 31, at 334; Orts, *supra* note 26, at 1334–35.

307. See, e.g., Stewart, *supra* note 25, at 147 ("Requiring the adoption of environmental management systems could destroy their voluntary character, which may be vital to their success.").

308. See, e.g., *id.*

309. Incentives for Self-Policing: Discovery, Disclosure, Correction and Prevention of Violations, 65 Fed. Reg. 19,618, 19,620–21 (Apr. 11, 2000); see also Orts, *supra* note 26, at 1276 (self-disclosure policy), 1279 (discussing the prosecution policy), 1281 (discussing the

national database of information on EMS implementation experiences,³¹⁰ published an EMS implementation guide, and established an EMS Resource Center.³¹¹ These and other³¹² reflexive policies, none of which specify environmental outcomes, can promote systematic planning to advance environmental performance.

Information-based strategies could also contribute. Employing a positive information strategy, agencies could offer social recognition, such as the right to display a special logo or membership in an elite program, to companies that undertake rigorous, systematic planning efforts. Recalling our list of factors that motivate firms to go green,³¹³ such recognition would improve the company's brand name with customers, send a signal to investors that the firm has superior environmental management, encourage employees to remain with the company, and bolster relationships with regulators. It should be able to motivate some companies to act. The European Union instituted such a program in 1995 when it implemented the Eco-Management and Audit Scheme (EMAS).³¹⁴ EMAS provides firms with a standard model for environmental management, auditing, and reporting and offers modest incentives, including the right to display the EMAS logo, to those industrial enterprises that voluntarily adopt and successfully implement these practices.³¹⁵ Professor Eric Orts has urged the United States to institute a similar program.³¹⁶ Doing so would promote green business.

In 2000, the EPA did take a step in this direction when it initiated its National Environmental Performance Track Program (Performance Track Program).³¹⁷ The program admitted only those facilities that could

sentencing policy); Stewart, *supra* note 25, at 144, 147–48.

310. U.S. EPA, DRAFT EMS ACTION PLAN FOR PUBLIC COMMENT 6 (Dec. 20, 1999) (copy on file with author); *see also* NAT'L DATABASE ON ENVL. MGMT SYS., <http://ndems.cas.unc.edu> (last updated Mar. 6, 2003) (providing the results of research based on the National Database on Environmental Management Systems).

311. U.S. EPA, *supra* note 310, at 16.

312. Regulators could adopt integrated permit procedures, rather than media-specific ones (e.g., one permit for air, one for water, one for waste, etc.). Some studies have suggested that the process of applying for an integrated permit, which incorporates requirements related to air, water, and waste into a single document, would better enable facilities and regulators to see material and pollution flows as a whole and would allow them to engage more effectively in pollution prevention planning. This too would facilitate the adoption of systematic approaches to improving environmental performance.

313. *See supra* notes 78–123 and accompanying text for a description of these factors.

314. *See* Orts, *supra* note 26, at 1287–311 (discussing this program at length and relating it to reflexive law).

315. *Id.* at 1290.

316. *Id.* at 1339 (recommending that the United States adopt “an American EMAS”).

317. *See generally* Program Description of the National Environmental Achievement

demonstrate that they were environmental leaders with superior compliance records and that they had implemented an environmental management system.³¹⁸ It granted these firms the right to display the Performance Track Program logo, listed them on the program Internet site, and singled them out for praise at EPA events.³¹⁹ EPA used this recognition to encourage more companies to adopt EMASs.³²⁰ By 2009, the program had grown to 547 members.³²¹ Yet the EPA terminated the program in May 2009, not five months after the Obama Administration had taken office.³²² That an administration that supports industrial greening would cancel this program suggests either that, notwithstanding its rising numbers, the Performance Track Program was ineffectual³²³ or that regulators and policymakers do not yet fully appreciate the role that reflexive law can play in promoting green business.

2. *Actions that Indirectly Result in Environmental Improvements*

Outcome-based rules also do not work for those green business innovations—such as enhanced stakeholder involvement, environmental reporting, or financial investments in green business—that indirectly produce environmental benefits. Social recognition might prove more effective here. For example, the Performance Track program required applicants to reach out to public stakeholders by creating a community advisory panel, publishing a community newsletter, and holding public meetings.³²⁴ Such a policy, which combines information-based and

Track, 65 Fed. Reg. 41,655 (July 6, 2000) [hereinafter Achievement Track]; Hirsch, *supra* note 128, at 13–14 (describing the Performance Track program's requirements and incentive system). When EPA launched this program in 2000 it initially called it the Achievement Track. *See* Achievement Track, *supra*. Shortly thereafter, EPA changed the name to the National Environmental Performance Track Program. *See* Notice to Terminate the National Performance Track Program, 74 Fed. Reg. 22,741, 22,742 (May 14, 2009). The initiative came to be known as the Performance Track program, and this Article refers to it as such.

318. Achievement Track, *supra* note 317, at 41,656.

319. *Id.* at 41,659.

320. Orts, *supra* note 26, at 1309; Stewart, *supra* note 25, at 144.

321. U.S. EPA, PERFORMANCE TRACK FINAL PROGRESS REPORT 1 (2009).

322. Notice to Terminate the National Performance Track Program, 74 Fed. Reg. 22,741 (May 14, 2009).

323. Indeed, an initial study of the program revealed mixed results. *See generally* OFFICE OF INSPECTOR GEN., U.S. EPA, EVALUATION REPORT: PERFORMANCE TRACK COULD IMPROVE PROGRAM DESIGN AND MANAGEMENT TO ENSURE VALUE (2007); Strasser, *Voluntary Corporate Efforts*, *supra* note 5, at 550 (discussing the “good and bad news” in the EPA Inspector General’s report on Performance Track).

324. Achievement Track, *supra* note 317, at 41,658.

communication-based strategies, should encourage more stakeholder involvement.³²⁵ Information-based strategies can also promote green investing. The Securities and Exchange Commission requires firms to disclose actual and potential environmental liabilities and material risks.³²⁶ This gives investors insight into firms' environmental performance, thereby facilitating green investing. It creates a strong incentive for firms to self-regulate to minimize such liabilities and risks.

Turning to communication-based strategies, it is clear that company reports on environmental performance would be of much greater use to investors and consumers if all firms were to employ the same metrics to measure that performance. Were the government to establish such metrics, investors and others would likely pressure firms to adopt them since this could increase their ability to compare company performance in these areas. This, in turn, would likely encourage firms to improve their environmental performance. International and European agencies have begun to do this. In 1999, the United Nations Environment Programme joined Ceres, a nonprofit devoted to socially responsible investing, to promote the Global Reporting Initiative (GRI) sustainability reporting guidelines³²⁷—a standard format for reporting on corporate performance with respect to a wide variety of environmental and social indicators.³²⁸ The Netherlands Ministry of Housing, Spatial Planning, and the Environment has since contributed funding to the effort, which is also supported by nonprofits, investor groups, and corporations.³²⁹ The

325. Government can also enhance stakeholder participation by offering technical assistance and funding to stakeholder groups. This is particularly important in the environmental area where the issues can require technical knowledge that most citizens do not possess. The EPA experimented with this in Project XL, giving stakeholder groups the opportunity to apply for grants of up to \$25,000 to hire experts to assist them. Regulatory Reinvention (XL) Pilot Projects, 62 Fed. Reg. 19,872, 19,881 (Apr. 23, 1997); Dennis D. Hirsch, *Lean and Green? Environmental Law and Policy and the Flexible Production Economy*, 79 IND. L.J. 611, 643 (2004) (discussing the Project XL initiative). Agencies could replicate this approach in other contexts.

326. See 17 C.F.R. §§ 229.10–229.1208 (2009) (listing the Securities and Exchange Commission (SEC) instructions on how to comply with Regulation S-K); JOHNSON, *supra* note 31, at 201 (describing the SEC's requirement that companies disclose certain environmental liabilities).

327. See *History*, GLOBAL REPORTING INITIATIVE, <http://www.globalreporting.org/AboutGRI/WhatIsGRI/History> (last visited Nov. 5, 2010).

328. See *G3 Guidelines*, GLOBAL REPORTING INITIATIVE, <http://www.globalreporting.org/ReportingFramework/G3Guidelines> (last visited Nov. 5, 2010) (describing Global Reporting Initiative (GRI) Sustainability Reporting Framework guidelines).

329. See *Funding*, GLOBAL REPORTING INITIATIVE, <http://www.globalreporting.org/AboutGRI/Funding> (last visited Nov. 5, 2010).

transaction costs involved in putting together such a detailed set of metrics and the fact that, to be of much value, such metrics must be public goods, will lead profit-seeking entities to undersupply them. American environmental agencies could expand their involvement in, and support for, such communication-enhancing efforts.

Procedure-based strategies could also be of use. For example, agencies could require facilities seeking permits to meet with stakeholders and discuss each plant's environmental impacts and compliance strategy as a condition of permit issuance. Alternatively, they could provide incentives for this type of stakeholder engagement. Such "front-end" involvement in facility environmental planning would give stakeholders a chance to make their views known before important decisions have been made, and so could prove more effective than "back-end" challenges to permits.³³⁰

3. *Innovations that Regulators Cannot Foresee*

Regulators lose credibility when they impose an unrealistic outcome-based, technology-forcing regulation and then have to back down.³³¹ Thus, outcome-based standards do not work well when regulators cannot sufficiently predict the innovations of which a given industry is capable. Can reflexive law strategies more successfully press a sector to innovate in these situations? One way to do this would be to collect and disclose information about the negative impacts the industry is imposing on the environment and public health. The dissemination of such information activates many of the drivers discussed above.³³² It can allow consumers to make better-informed choices about whether they want to patronize that company, arm stakeholders with relevant information for use in discussions with the firm, affect corporate brand and goodwill, alter potential investors' perception of company management and environmental risks, or attract the attention of regulators. In these ways, disclosure of negative environmental information can push firms to seek ways of improving their environmental performance.³³³ I have already described how the TRI utilizes negative information in this way and how it has resulted in a substantial decrease in

330. See U.S. EPA, ACTION PLAN FOR ACHIEVING THE NEXT GENERATION IN ENVIRONMENTAL PERMITTING 7 (1999) (on file with author); see also JERRY SPEIR, GREEN PERMITS AND COOPERATIVE ENVIRONMENTAL AGREEMENTS: A REPORT ON REGULATORY INNOVATION PROGRAMS IN OREGON AND WASHINGTON 49 (2000).

331. See *supra* notes 221–28 and accompanying text.

332. See *supra* notes 78–123 and accompanying text.

333. See *id.* (discussing drivers); see also GUNNINGHAM ET AL., *supra* note 5, at 152 (noting how community advocacy groups act as "de facto regulators . . . pressuring companies into beyond-compliance environmental performance").

toxic releases.³³⁴ The TRI is a reflexive law success story that is already being replicated in other areas. For example, the EPA recently developed the Greenhouse Gas Reporting Rule, which requires large sources and suppliers to report annually on their GHG emissions.³³⁵ This should eventually make it possible to rank emitters by industry or geographic location. As with hazardous substances, the negative publicity associated with the ranking would likely encourage the highest polluting firms to focus more on reducing emissions.³³⁶

Another way to disclose negative environmental information is to require companies to include it in their product labeling.³³⁷ For example, California's Proposition 65 program requires firms that sell consumer products in California to assess whether they contain one or more listed carcinogenic substances or reproductive toxicants and, if so, disclose this on the product label or face penalties of up to \$2,500 per day.³³⁸ The program has caused firms to explore upstream ways of changing their products to remove the harmful substances and avoid the labeling requirement.³³⁹ In true reflexive fashion, it has achieved this through information disclosure and without the benefit of technology- or outcome-based requirements. The federal government, other states, or both could adopt programs similar to Proposition 65 and could expand the requirement to cover production and process methods in addition to end products.³⁴⁰

Government can also motivate green product and process innovation by collecting and disclosing *positive* information about firm environmental performance. This method, too, activates some of the important drivers that encourage firms to go green. It can influence consumer preferences, especially when it is tied to specific products. It can also affect corporate

334. See *supra* notes 32–34 and accompanying text; see also ESTY & WINSTON, *supra* note 1, at 111 (describing how TRI reports motivated DuPont to undertake a major pollution prevention initiative).

335. See Mandatory Reporting of Greenhouse Gases, 74 Fed. Reg. 56,260 (Oct. 30, 2009) (to be codified at 40 C.F.R. pt. 98).

336. The Carbon Disclosure Project (CDP) is involved in a similar effort on an international level. Acting on behalf of 534 institutional investors that collectively control \$64 trillion in managed assets, this nongovernmental organization sends formal requests to large global companies asking them to disclose their carbon emissions. *Investor CDP, CARBON DISCLOSURE PROJECT*, <https://www.cdproject.net/en-US/Programmes/Pages/CDP-Investors.aspx> (last visited Nov. 5, 2010). Nearly 5,000 such companies have done so, and some investors use this information to allocate their investments. *Id.* This gives companies an incentive to reduce their carbon footprint.

337. Stewart, *supra* note 25, at 139.

338. JOHNSON, *supra* note 31, at 203.

339. Clifford Rechtschaffen, *How to Reduce Lead Exposures with One Simple Statute: The Experience of Proposition 65*, 29 ENVTL. L. REP. 10,581 (1999); Stewart, *supra* note 25, at 140.

340. See Stewart, *supra* note 25, at 140.

brand, investor assessment of managerial capacity, and relations with regulators. Eco-labeling programs, which provide positive environmental information about specific products, are a powerful tool of this type. The European Union's Eco-Label Program is the largest and most successful of these initiatives.³⁴¹ The European Commission has established environmental criteria for fifteen product categories ranging from refrigerators to laundry detergents to personal computers. These criteria relate to the product's entire lifecycle and include overall waste generation, energy and natural resource usage, and air or water pollution associated with the product. Firms can voluntarily apply for certification and, where successful, display the Eco-Label in their product advertising. The EPA has dipped its toe into these waters. For example, it launched the Energy Star program, which establishes energy efficiency standards for a host of consumer products and allows those that meet the standards to display the Energy Star label.³⁴² Federal or state governments could go much further with this reflexive law tool by expanding the assessment to include lifecycle environmental impacts rather than just energy efficiency, and by setting standards for a wider array of products.³⁴³

In its role as the "structural engineer[] of communicative systems,"³⁴⁴ the government can also promote green product and process innovation by policing green marketing claims. This ensures that those who have truly come up with a better product or process gain a competitive advantage from these efforts, and so encourages such innovation. The Federal Trade Commission (FTC), acting under its authority to enforce against "unfair and deceptive" marketing practices,³⁴⁵ has taken steps in this direction by promulgating Guides for the Use of Environmental Marketing Claims

341. See JOHNSON, *supra* note 31, at 205.

342. See *How a Product Earns the Energy Star Label*, ENERGY STAR, http://www.energystar.gov/index.cfm?c=products.pr_how_earn (last visited Nov. 5, 2010); see also Stewart, *supra* note 25, at 136.

343. The market has spawned some private eco-label services. See JOHNSON, *supra* note 31, at 205–06 (describing the Green Seal and Scientific Certification Systems labeling services). One that is becoming increasingly visible and successful is the U.S. Green Building Forum's Leadership in Environmental and Energy Design (LEED) program which ranks buildings in terms of their energy efficiency and environmental impacts. ESTY & WINSTON, *supra* note 1, at 201. As a whole, however, these initiatives have achieved neither the legitimacy nor the penetration of the European program. This may be because consumers do not place as much stock in a private labeler paid by the product producer as they would in a public one.

344. Stewart, *supra* note 25, at 130.

345. See Federal Trade Commission Act § 5, 15 U.S.C. § 45 (2006) (authorizing the Federal Trade Commission to act to prevent "[u]nfair methods of competition in or affecting commerce, and unfair or deceptive acts or practices in or affecting commerce").

(Green Guides).³⁴⁶ The Green Guides provide general instructions on making a valid environmental marketing claim and provide specific guidance for those who would claim that a product is biodegradable, compostable, recyclable, contains recycled content, or is ozone safe.³⁴⁷ The FTC is currently working on an enhanced set of Green Guides that will reflect the expansion of green marketing claims in recent years.³⁴⁸ From a reflexive law perspective, it makes sense to invest more resources in this communication-based tool.

4. *Reductions in Unregulated Impacts of Which Regulators Are Not Yet Aware*

Several of the reflexive law tools already discussed could promote this type of green behavior as well. For example, agencies could provide social recognition³⁴⁹ to firms that reduce unregulated impacts. Moreover, regulators could use incentives or technical assistance to get firms to adopt life cycle analysis tools that include identification of all of a product's environmental impacts. This could lead these companies to acknowledge, and possibly address, unregulated injuries. They could also require or encourage firms to build all environmental impacts, not just regulated ones, into systematic pollution prevention planning initiatives. Some EMSs already do this, leading to reductions in such impacts.³⁵⁰

The purpose of this discussion is not to list all the ways in which reflexive law strategies can promote green business but simply to show that this regulatory approach offers a host of options for doing so. Indeed, the reflexive law strategies just described appear able to promote greening in just those situations where outcome-based and technology-based standards appear unable to do so. The programs described do not owe their genesis

346. 16 C.F.R. pt. 260 (2009); see also JOHNSON, *supra* note 31, at 204; Orts, *supra* note 26, at 1251–52.

347. See *Reporter Resources: The FTC's Green Guides*, FTC, <http://www.ftc.gov/opa/reporter/greengds.shtm> (last visited Nov. 5, 2010).

348. *Id.*

349. See *supra* notes 324–25 and accompanying text.

350. See JAMES MORRISON ET AL., *MANAGING A BETTER ENVIRONMENT: OPPORTUNITIES AND OBSTACLES FOR ISO 14001 IN PUBLIC POLICY AND COMMERCE* 3 (2000) (“EMSs are emerging as key tools in regulatory innovation and have the potential to address a myriad of environmental issues that cannot be addressed through the existing regulatory system.”); Strasser, *Voluntary Corporate Efforts*, *supra* note 5, at 542 (discussing studies showing that voluntary firm adoption of an EMS results in better performance in reducing nonregulated environmental impacts); Cary Coglianese & Jennifer Nash, *Management-Based Strategies for Improving Private Sector Environmental Performance* 30 (Pub. Law & Legal Theory Res. Paper Series, Research Paper No. 06-67, 2006) (“Management systems can be used by companies to identify ways of reducing environmental impacts not currently addressed by government regulation.”).

to Gunther Teubner and his theory of reflexive law. In all likelihood, many of the legislators and regulators who created the initiatives were unfamiliar with the concept of reflexive law and did not have it in mind. The value of Teubner's theory lies not in the way that it has already shaped the fabric of regulatory law, but rather in the way that it allows us to pull together the initiatives just described and see them as part of a broader whole—a reflexive law approach to promoting green business.³⁵¹ Having made these connections, we can begin to evaluate whether these programs are in fact furthering green business, with what benefits, and at what cost. This is an important area for future research. Where the early results warrant it, we can also begin to envision ways (some of which were suggested above) to expand and add to existing information-, communication-, and procedure-based approaches and to sketch out a reflexive law strategy for the promotion of green business.

CONCLUSION

Three important conclusions flow from the analysis above. First, reflexive law's emphasis on pushing firms to self-regulate, rather than on prescribing technology-based or outcome-based requirements for them, enables it to promote dimensions of green business that the other types of regulation cannot successfully address. Reflexive law has an important, yet heretofore underappreciated, role to play in government efforts to foster green business. Policymakers and scholars should pay more attention to these strategies to identify the contexts in which they can prove most helpful.

Second, the critical role that reflexive law can play in promoting green business does not detract from the importance of other approaches. The market, common law, technology-based standards, and outcome-based standards can also contribute to the promotion of green business.³⁵² Reflexive law should supplement, not replace, formal and substantive law. Teubner's evolutionary story is therefore too simplistic on both descriptive and normative levels. This conclusion holds with even greater force when one considers not only green business but also the governance of day-to-day corporate environmental compliance that does not depend on self-initiated innovation.

Finally, the analysis above may hold some lessons for efforts to

351. Professors Eric Orts and Richard Stewart have each provided their own, very helpful descriptions and analyses of reflexive environmental laws. See Orts, *supra* note 26; Stewart, *supra* note 25. This Article builds on their work by identifying additional reflexive environmental laws and by showing how such laws can promote green business.

352. See *supra* notes 159–234 and accompanying text.

encourage corporate social responsibility more generally. The theory of corporate social responsibility maintains that firms can benefit not only from improving their environmental performance (i.e., green business) but also from enhancing their social performance in other areas such as human rights, labor, consumer protection, and anticorruption.³⁵³ Policymakers that attempt to promote self-initiated action in these areas will face many of the same challenges and will have to choose from among the same set of regulatory tools as those that have been seeking to encourage green business. Reflexive law's capacity to foster green business suggests that it may also be able to promote these other types of voluntary social performance. Some researchers have already begun to explore this terrain.³⁵⁴ This, too, is an area that deserves further scholarly attention.

353. See generally David Monsma, *Equal Rights, Governance, and the Environment: Integrating Environmental Justice Principles in Corporate Social Responsibility*, 33 *ECOLOGY L.Q.* 443, 472-82 (2006) (describing the theory of corporate social responsibility and relating it to environmental law).

354. See, e.g., *REFLEXIVE LABOUR LAW: STUDIES IN INDUSTRIAL RELATIONS AND EMPLOYMENT REGULATION* (Ralf Rogowski & Ton Wilthagen eds., 1994) (examining reflexive law principles to the field of labor law as applied in the United States, Canada, Germany, Great Britain, France, the Netherlands, Sweden, and Denmark); Hess, *supra* note 245 (arguing for corporate social reporting).