# ESSAY

## REGULATING FOR SUSTAINABILITY

BY

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*In 2011, the National Academy of Sciences recommended that the United States Environmental Protection Agency (EPA) consider sustainability in its actions and decisions, and the Agency is now taking steps to do so. However, this is harder than it might seem, particularly for the regulatory programs that are EPA's core line of work. While voluntary programs promoting energy efficiency or pollution prevention fit comfortably with such a goal, the relationship between regulation and sustainability is more complex. If anything, experience suggests that there are tensions between them. Sustainability initiatives tend to be characterized by innovation, adaptability, continuous change, and systemic thinking, and these are not always easy to harmonize with a statutorily driven, top-down regulatory system addressing specific issues in a narrowly-targeted way.*

*This Essay analyzes the challenges of using regulatory programs to promote sustainability, looking at how regulatory programs have dealt with those challenges in the past—sometimes successfully and sometimes less so. It concludes that advancing sustainability is not always a natural role for environmental regulatory programs; "win–win" opportunities in a regulatory setting may be the exception rather than the rule. However, it also concludes that, based on the Agency's*

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*past history, opportunities can be found and EPA should look for ways to take advantage of them where it can. This can be done in part by establishing new requirements, but more often by enabling, facilitating, and incentivizing the initiatives undertaken by others. Sometimes this can be done by writing rules in ways that permit or even encourage innovation; in other cases it requires case by case tailoring. The challenges are real, but at a minimum the opportunities should not be overlooked, and should be affirmatively sought out by the Agency and its stakeholders.*

## I. INTRODUCTION

In 2011, the National Academy of Sciences (NAS) recommended that the United States Environmental Protection Agency (EPA) more explicitly incorporate principles of "sustainability" into its actions and decisions.[1] EPA Administrator Gina McCarthy has now made sustainability one of her core themes,[2] and as part of its strategic planning for 2014–2018, EPA has made "working toward a sustainable future" one of its key "cross-agency strategies."[3]

This may all seem unremarkable: sustainability might appear to be almost interchangeable with EPA's traditional mission of environmental protection. In fact, however, adopting sustainability as a goal at EPA presents both a conceptual and a practical challenge, particularly for the regulatory programs that are its core line of work. Sustainability and environmental protection are not identical; furthermore, while voluntary programs promoting energy efficiency or pollution prevention fit comfortably with sustainability principles,[4] the relationship between sustainability and regulation is more complex and has not been well articulated.[5] If anything, experience suggests that there are tensions between

1 NAT'L RESEARCH COUNCIL, SUSTAINABILITY AND THE U.S. EPA 4–6, 41–44 (2011) [hereinafter NAS REPORT]. Although formally issued by the National Resource Council, the report was drafted under the auspices of the National Academy of Sciences and is often referred to as an NAS report. *See, e.g.*, U.S. Envtl. Prot. Agency, *Summary Minutes of the United States Environmental Protection Agency (EPA) of the Science Advisory Board (SAB)*, Mar. 22–23, 2012, at 7, *available at* http://yosemite.epa.gov/sab/sabproduct.nsf/0/B7520F11667EDF858525795600699BA9/$File/Minutes-+03.22&23.12-final.pdf.

2 *See* U.S. Envtl. Prot. Agency, *EPA's Themes: Meeting the Challenge Ahead*, http://www2.epa.gov/aboutepa/epas-themes-meeting-challenge-ahead (last visited July 18, 2015).

3 *See* U.S. Envtl. Prot. Agency, *Fiscal Year 2014–2018 Strategic Plan*, http://www2.epa.gov/planandbudget/strategicplan (last visited July 18, 2015).

4 *See, e.g.*, Energy Star, *About Energy Star*, http://www.energystar.gov/about/ (last visited July 18, 2015) (helping businesses and individuals save money and reduce greenhouse gases); U.S. Envtl. Prot. Agency, *Water Sense: What is Water Sense?*, http://www.epa.gov/watersense/about_us/what_is_ws.html (last visited July 18, 2015). Most of the examples provided by the NAS report of EPA programs that advance sustainability are non-regulatory. *See* NAS REPORT, *supra* note 1, at 94 (Everglades restoration); *id.* at 100 (consideration of environmental justice in transportation planning); *id.* at 105 (green chemistry awards).

5 Some commentators have touched on aspects of this topic, but few have addressed it comprehensively. *See generally* Peter A. Appel, *Improving Corporate Environmental Performance: Encouraging Sustainable Commerce Through Regulatory and Other Governmental Action* (Univ. Oslo Faculty of Law, Legal Studies Research Paper Series No. 2011-27), *available at* http://ssrn.com/abstract=1924808 (addressing some regulatory approaches to encouraging sustainable commerce, such as command–and–control regulation and cap–and–trade systems); John C. Dernbach et al., *Progress Toward Sustainability: A Report Card and Recommended Agenda* (Widener L. Sch. Legal Studies Research Paper Series no. 09-12),

them. Sustainability initiatives tend to be characterized by innovation, adaptability, continuous change, and systemic thinking, and these are not always easy to harmonize with a statutorily driven, top-down regulatory system addressing specific issues in a narrowly targeted way.

As attorneys who have spent most of our careers at EPA, we believe that it is important to understand how environmental regulatory programs can promote sustainability. EPA is primarily a regulatory agency, and cannot be said to have fully embraced sustainability until it is embedded in those programs. Therefore, we offer this Essay as a first step in that direction. Part II clarifies the difference between sustainability and environmental protection, and offers principles for incorporating sustainability into environmental programs. Part III identifies two possible approaches: "mandating" sustainability and "enabling" sustainability, and compares their strengths and weaknesses. Parts IV, V, and VI review the agency's experience to date, showing how regulatory programs have dealt with issues of sustainability in the past—sometimes successfully and sometimes less so. Part VII draws some key lessons learned from that experience, and Part VIII presents recommendations about some specific next steps for the agency and identifies areas where further research would be desirable.

In brief, we do not suggest that sustainability should replace environmental protection as EPA's central mission. Indeed, we conclude that advancing sustainability is not always a natural role for environmental regulatory programs; "win–win" opportunities in a regulatory setting may be the exception rather than the rule. However, based on the agency's past history we also believe that opportunities can be found, and that EPA should look for ways to pursue them where it can. This can be done in part by establishing new expectations, but perhaps more often by enabling, facilitating, and incentivizing the initiatives undertaken by others. At a minimum these opportunities should not be overlooked, and should be affirmatively sought out by the agency and its stakeholders.

*available at* http://ssrn.com/abstract=1389878 (listing a number of regulatory prescriptions for the government); Leroy C. Paddock, *Beyond Deterrence: Compliance and Enforcement in the Context of Sustainable Development*, NINTH INT'L CONF. ON ENVTL. COMPLIANCE AND ENFORCEMENT 589 (2011), *available at* http://inece.org/conference/9/proceedings/64_Paddock.pdf (explaining that regulation alone is insufficient to achieve sustainable environmental outcomes); George B. Wyeth, *"Standard" and "Alternative" Environmental Protection: The Changing Role of Environmental Agencies*, 31 WM. & MARY ENVTL. L. & POL'Y REV. 5 (2006) (analyzing the driving force behind alternative model strategies that agencies are adopting, and what we might expect in the future); Dennis Hirsch, *Green Business and the Importance of Reflexive Law: What Michael Porter Didn't Say*, 62 ADMIN. L. REV. 1063 (2010) (building the case for reflexive law as the superior mechanism for promoting green business activities, Timothy F. Malloy, *Design for Regulation: Integrating Sustainable Production into Mainstream Regulation*, *in* LAW AND THE TRANSITION TO BUSINESS SUSTAINABILITY 1 (Daniel R. Cahoy & Jamison E. Colburn eds., 2014) (analyzing contextual factors that influence regulatory design of sustainability programs); John C. Dernbach, *Sustaining America*, THE ENVIRONMENTAL FORUM, May/June 2012 (urging government to accelerate the variety and effectiveness of sustainability options and tools through policy).

## II. WHAT'S NEW ABOUT "SUSTAINABILITY"?

To begin with, it is important to understand how "sustainability" differs from EPA's traditional mission of "environmental protection," and what EPA would have to do differently if sustainability were incorporated into the goals of its programs.

The classic definition of sustainability is "development that meets the needs of the present without compromising the ability of future generations to meet their own needs."[6] Another common way of describing sustainability is that it means balancing three different priorities: economic, environmental, and social—often referred to as the "pillars" of sustainability.[7]

"Environmental protection" and sustainability are closely related, but they are not the same. The aim of environmental protection is to minimize environmental harms resulting from economic and other activity, whereas sustainability puts a greater emphasis on finding ways of achieving both economic and environmental goals, or at least mitigating the tensions between them.[8] Former EPA Administrator Lisa Jackson likened sustainability to promoting wellness rather than simply preventing disease.[9]

Organizations of all kinds—from businesses to governments to nonprofits—have found strategies that advance more than one goal; for example, finding business value in environmentally beneficial actions.[10]

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6 U.N. WORLD COMM'N ON ENV'T AND DEV., OUR COMMON FUTURE 1 (1987), *available at* http://www.un-documents.net/ocf-02.htm. Remarkably similar language is contained in section 101 of the National Environmental Policy Act (NEPA), written 20 years earlier: "[I]t is the continuing policy of the Federal Government . . . to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans." National Environmental Policy Act of 1969, 42 U.S.C. §§ 4321–4347 (2012). The NEPA text is used as the definition of "sustainability" in Executive Order 13514, section 19(l). Federal Leadership in Environmental, Energy, and Economic Performance, 75 Fed. Reg. 52,126 (Oct. 8, 2009). It was also cited in the NAS Report. NAS REPORT, *supra* note 1, at 28.

7 *See* U.N. Gen. Assembly, *Sustainable Development,* http://www.un.org/en/ga/president/65/issues/sustdev.shtml (last visited July 18, 2015). The three pillars are also reflected in the NAS Report's core recommendation: "EPA should carry out its historical mission to protect human health and the environment in a manner that optimizes the social, environmental, and economic benefits of its decisions." NAS REPORT, *supra* note 1, at 29. *See also* U.S. Envtl. Prot. Agency, *Sustainability Primer*, *available at* http://www.epa.gov/ncer/rfa/forms/sustainability_primer_v7.pdf.

8 *See* FRANK B. FRIEDMAN, PRACTICAL GUIDE TO ENVIRONMENTAL MANAGEMENT 56 (11th ed. 2011) (discussing a "change in the emphasis on traditional environmental [issues] to a much broader value base.").

9 Lisa Jackson, Administrator, U.S. Envtl. Prot. Agency, Remarks to the National Academy of Sciences (Nov. 30, 2010), http://yosemite.epa.gov/opa/admpress.nsf/8d49f7ad4bbcf4ef852573590040b7f6/1c893e457b3cbb25852577ec0054048c!OpenDocument (last visited July 18, 2015). Jackson also distinguished between reactive approaches, such as "banning, reducing, lessening and minimizing risk," and proactive approaches characterized by "creation, innovation, synergy and sustainability." *Id.*

10 *See, e.g.*, DANIEL C. ESTY & ANDREW WINSTON, GREEN TO GOLD: HOW SMART COMPANIES USE ENVIRONMENTAL STRATEGY TO INNOVATE, CREATE VALUE, AND BUILD COMPETITIVE ADVANTAGE

Pollution prevention techniques focused on avoiding the generation of waste and reducing raw material needs can also save money.[11] Energy efficiency measures do the same.[12] On a larger scale, shifting to renewable energy sources holds the prospect of easing the tension between economic growth and environmental quality.[13]

EPA also contributes to these efforts through programs that encourage energy efficiency, promote water conservation, or encourage the use of products that contain fewer toxic chemicals.[14] However, these are primarily voluntary programs or educational and research efforts.[15] Its regulatory programs, on the other hand, tend to focus on limiting pollution and other environmental harms, not advancing other social or economic goals.[16] The question is whether they *could* do so.

One answer may simply be that regulatory programs focused on preventing environmental harms do advance sustainability by strengthening the economy's environmental pillar. Even if they entail economic costs, those costs have not been so great as to stifle growth, and the net effect is a healthier, more balanced economy as a whole. This is how EPA's leadership sometimes invokes sustainability.[17] In this sense, framing EPA's mission in

3–4 (2006) (providing examples of businesses making environmentally friendly changes that have positive impacts on their bottom line). Businesses also promote social benefits as part of their sustainability initiatives, such as forming community advisory groups, and addressing community needs to reduce the adverse impact of business operations. *See, e.g.*, Rio Tinto, *Our Commitment, Communities*, http://www.riotinto.com/ourcommitment/communities-4796.aspx (last visited July 18, 2015) (describing investments by mining giant Rio Tinto in local communities); World Bus. Council for Sustainable Dev., *ITC's Farmer Empowerment Program in India: Building a More Efficient Supply Chain Leveraging the Internet*, INCLUSIVE BUS. PERSPECTIVES, MAY 16, 2012, http://www.inclusive-business.org/2012/05/itc-e-choupal-india.html (last visited July 18, 2015) (describing efforts by Indian company ITC to maintain viability of agricultural communities). *See also* CHRIS LASZLO & NADYA ZHEXEMBAYEVA, EMBEDDED SUSTAINABILITY: THE NEXT BIG COMPETITIVE ADVANTAGE 73–74 (2011) (arguing that implementing sustainability provides positive business opportunities).

11 ESTY & WINSTON, *supra* note 10, at 106–07.

12 *Id.* at 106.

13 *See* U.S. Envtl. Prot. Agency, *State and Local Climate and Energy Program: Renewable Energy*, http://www.epa.gov/statelocalclimate/state/topics/renewable.html (last visited July 18, 2015) (discussing the benefits of renewable energy at the state and local level).

14 U.S. Envtl. Prot. Agency, *List of Programs*, http://www.epa.gov/partners/programs/ (last visited July 18, 2015) (describing programs encouraging energy efficiency, water conservation, and the use of fewer toxic chemicals). EPA also has a sustainability plan to address the agency's own environmental impacts, as required of all federal agencies under Executive Order 13514. U.S. Envtl. Prot. Agency, *Strategic Sustainability Performance Plan*, http://www.epa.gov/greeningepa/documents/sspp2012_508.pdf; 74 Fed. Reg. 52,117 (Oct. 8, 2009). EPA's intra-agency sustainability plan should not, however, be misinterpreted as a plan for incorporating sustainability into the agency's policies and programs.

15 *See* U.S. Envtl. Prot. Agency, *List of Programs*, *supra* note 14 (describing EPA's voluntary, educational, and research programs).

16 *See generally*, U.S. Envtl. Prot. Agency, *Regulatory Information by Topic*, http://www2.epa.gov/regulatory-information-topic (last visited July 18, 2015) (showing EPA regulations focus on pollution control and other environmental harms).

17 *See* Gina McCarthy, Administrator, U.S. Envtl. Prot. Agency, Remarks at the National Academy of Sciences, (April 28, 2014), http://yosemite.epa.gov/opa/admpress.nsf/8d49f7ad

terms of sustainability would not mean doing things differently so much as explaining the agency's programs in a way that recognizes the value of both environmental and economic goals and emphasizes that the two are not mutually exclusive.[18]

However, embracing sustainability can mean more than this. What the NAS Report most clearly suggests is that EPA's regulatory programs should look for ways of advancing *all* the elements of sustainability—including economic and social concerns—while better considering the full range of available policy and program tools.[19]

What would this mean in practice? The abstract definitions of sustainability noted above do not provide much guidance to those operating environmental programs. We believe that truly embracing sustainability would mean doing the following in carrying out regulatory functions:

1. *Seeking benefits in two or all of the three dimensions: environment, economy, and society.* Sustainability principles break the presumption that environmental benefits must come at a cost to social welfare or economic prosperity.[20]

2. *Considering the full range of environmental benefits and costs,* not just those that are the focus of the particular program involved—e.g., considering potential energy and climate benefits in decisions made by the water program—and looking for strategies that do so in a more systemic, less stove-piped, media centric way, which is likely to be more effective and possibly more efficient.

3. *Giving greater attention to conservation and improvement of natural resources*, both in the short and long term; this includes reducing resource consumption, minimizing waste generation, and maximizing reuse of waste when generated.

4. *Taking a more integrated approach:* looking at the entire life cycle of an activity, process, or product, looking at problems with a multimedia perspective, preventing pollution at the source—or finding ways to turn

4bbcf4ef852573590040b7f6/2c0a15a30105f16185257cc8004be075!OpenDocument (last visited July 18, 2015) ("[W]hile the Clean Air Act cut air pollution by nearly 70 percent, the economy more than doubled.").

18 Historically, environmentalism, for all its merits, has left itself open to the charge that it places little value on economic well being or other social concerns. One of the greatest conceptual contributions of sustainability has been to rebalance that perspective.

19 This is clearest in the NAS Report's second recommendation: "EPA should carry out its historical mission to protect human health and the environment in a manner that optimizes the social, environmental and economic benefits of its decision." NAS REPORT, *supra* note 1, at 29.

20 Balancing economic and environmental goals is not new at EPA; the agency has had to do this throughout its existence, *see infra* Part IV, and will continue to do so. What a sustainability focus adds is a new emphasis on the possibility that ways may be found to address environmental concerns in ways that create economic value. This does not necessarily mean that there is no net cost to the economy of an action; it may simply mean that environmental goals are attained in less costly ways. But the way in which this happens is not simply by tilting the balance to give economic concerns more weight. *See infra* Part III.

wastes into usable resources—and considering connections across social and ecological systems.

5. *Enabling or leveraging the independent efforts of other parties*, either within a regulatory setting or by providing information that leads others to take action without regulation.

6. Finally, the holistic nature of sustainability involves *engaging a broad range of stakeholders*, both inside and outside the agency, as part of decision making, to ensure that all aspects of sustainability are considered.[21]

These ideas are not entirely new; as will be seen later, EPA's regulatory programs have, over the years, adopted measures that advance sustainability in a variety of ways:

- EPA's Brownfields program works with communities to encourage economically and socially beneficial development of contaminated property.[22]
- When a power plant near Boston was required to reduce the temperature of the water it discharged to the Charles River, instead of installing costly cooling structures, EPA approved a plan that created steam to provide a heat resource for the city, providing economic value while reducing demand on other polluting power sources, and meeting water quality standards.[23]
- EPA is promoting the use of "green infrastructure" to improve water quality; for example, planting trees to reduce runoff, heat island effects, and associated smog formation.[24]

So promoting sustainability through regulatory programs is not new. What is new is the suggestion that these principles be systematically considered in every action that the agency takes.

This is a bold suggestion, and some caveats may be in order. First, some may question whether EPA should concern itself at all with economic and social considerations, particularly in a time of extreme budgetary constraints. We believe, however, that failing to fully consider economic and

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21 EPA's Strategic Plan identifies a somewhat different set of principles:

1. Conserve, protect, restore, and improve the supply and quality of natural resources and environmental media (energy, water, materials, ecosystems, land, and air) over the long term;

2. Align and integrate programs, tools, incentives, and indicators to achieve as many positive outcomes as possible in environmental, economic, and social systems; and

3. Consider the full life cycles of multiple natural resources, processes, and pollutants in order to prevent pollution, reduce waste, and create a sustainable future.

*See* U.S. Envtl. Prot. Agency, *Fiscal Year 2014–2018*, *supra* note 3, at 44. Our principles overlap considerably with these; however, we have intentionally placed greater weight on some elements, particularly obtaining co-benefits, along with the specific environmental benefits that are the focus of the particular program in question, as well as engaging others and leveraging efforts outside of EPA.

22 *See infra* notes 152–57.

23 *See infra* notes 69–74.

24 *See infra* notes 96–103.

social implications of EPA's decisions would be shortsighted and likely to result in missed opportunities to advance a wider range of benefits from those decisions. Moreover, to do otherwise would disregard the policy stated in the National Environmental Policy Act (NEPA), to "create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans."[25]

Some may think that sustainability cannot be advanced in the current statutory framework, and requires a fundamental change in approach—echoing earlier calls for a "second generation" or "alternative path" in environmental policy.[26] There may be some instances in which statutory change would be helpful, but we believe that a great deal can be accomplished within the existing statutes, which as a practical matter is more realistic. As the examples above indicate, pursuing sustainability does not require an expansion in EPA's programs or authority, but the use of EPA's existing authority in ways that give greater attention to economic or social goals in the course of carrying out current functions.

## III. REGULATING FOR SUSTAINABILITY

In thinking about how EPA's regulatory programs might promote sustainability, it is important to distinguish between two approaches: mandating and enabling. On one hand, EPA can issue regulations that require regulated parties to adopt sustainable practices; this is probably what many would assume it means for EPA to make sustainability part of its regulatory mission. On the other hand, EPA can design or implement its regulatory programs in ways that allow and encourage regulated parties to carry out sustainability practices of their own choosing. Both have an important role to play.

### *A. Mandating Sustainability*

First, sustainable practices can be mandated. Indeed, this is probably what most people would assume it means for EPA to make sustainability part of its regulatory mission. And to some extent EPA does this already—for instance, in its fuel economy standards for cars.[27] The European Union (EU) has adopted requirements broadly limiting the use of chemicals in

25 National Environmental Policy Act of 1969, 42 U.S.C. § 4331(a) (2012).

26 *See, e.g.*, Donald F. Kettl, *Environmental Policy: The Next Generation*, BROOKINGS POL'Y BRIEF SERIES, Oct. 1998, http://www.brookings.edu/research/papers/1998/10/environment-kettl (last visited July 18, 2015); THE ASPEN INST., THE ALTERNATIVE PATH: A CLEANER, CHEAPER WAY TO PROTECT AND ENHANCE THE ENVIRONMENT 9•12 (1996), *available at* http://www.aspeninstitute.org/policy-work/energy-environment/our-policy-work/series-environment-21st-century/-alternative-path-cl-5.

27 *See* U.S. Envtl. Prot. Agency, *Regulations and Standards: Light Duty*, http://www.epa.gov/oms/climate/regs-light-duty.htm (last visited July 18, 2015).

products and requiring manufacturers to take responsibility for products at the end of their useful lives, reusing and recycling where possible.[28] Many states have adopted legislation imposing requirements on manufacturers with regard to product recycling and takeback programs.[29] Regulations can also be drivers for activities such as pollution prevention and waste minimization by raising the cost of waste disposal, or setting regulatory thresholds that provide an incentive to reduce total emissions.[30]

New mandates are not, however, our primary focus. In part this simply reflects political reality; while EPA's current statutes can provide the basis for sustainability-focused mandates, any further legislative changes to EPA's regulatory authority at this time would be controversial. Those who are already concerned about the reach of environmental programs would likely see sustainability as providing a rationale for regulating almost every aspect of economic and even personal activity.[31] The NAS itself described its task as "providing guidance to EPA on how it might implement its *existing* authority to contribute more fully to a more sustainable development trajectory for the United States."[32]

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28 *See, e.g.*, Eur. Comm'n, *Waste Streams: Batteries & Accumulators*, http://ec.europa.eu/environment/waste/batteries/index.htm (last visited July 18, 2015) (discussing the "Batteries Directive," which "prohibits marketing of batteries containing some hazardous substances," provides a framework for a "high level of collection and recycling," and places waste management responsibility on "[p]roducers of batteries and accumulators and producers of other products incorporating batteries and accumulators").

29 *See, e.g.*, Electronics TakeBack Coal., *State Legislation*, http://www.electronicstakeback.com/promote-good-laws/state-legislation/ (last July 18, 2015) (listing details on each state's laws and programs); Jennifer Nash & Christopher Bosso, *Extended Producer Responsibility in the United States: Full Speed Ahead?* (Harvard Kennedy Sch., M-RCBG Associate Working Paper Series, No. 13-03, May 2013), *available at* http://www.hks.harvard.edu/var/ezp_site/storage/fckeditor/file/pdfs/centers-programs/centers/mrcbg/publications/awp/Nash_Bosso_2013-10.pdf (discussing state laws establishing programs that hold manufacturers responsible for recycling or disposing of products consumers no longer want); Cal. Dep't. of Resource Recycling and Recovery, *Product Stewardship and Extended Producer Responsibility*, http://www.calrecycle.ca.gov/epr/ (last visited July 18, 2015) (providing materials to guide statutory proposals for product stewardship programs).

30 *See* Hirsch, *supra* note 5, at 1095–96. It has been argued that even traditional environmental regulations can generate economic value—though not typically acknowledged by those regulated—by compelling regulated entities to take steps that reduce waste and inefficiency. *See* Michael E. Porter & Claus van der Linde, *Toward a New Conception of the Environment–Competitiveness Relationship*, 9 J. OF ECON. PERSP., 1995, at 97, 98. If true—and this has been hotly debated for two decades—this would amount to advancing sustainability. *See* Stefan Ambec et al., *The Porter Hypothesis at 20* (Res. for the Future, Discussion Paper No. 11-01, 2011), *available at* http://www.rff.org/documents/RFF-DP-11-01.pdf (summarizing the extensive literature debating this argument); Hirsch, *supra* note 5, at 1090–105 (analyzing application of the Porter hypothesis to business sustainability initiatives).

31 When the NAS Report was released, some jumped to the conclusion that it was endorsing a broad expansion of EPA's regulatory powers, although the NAS report actually said nothing like this. *See* George Russell, *EXCLUSIVE: EPA Ponders Expanded Regulatory Power in Name of "Sustainable Development,"* FOX NEWS, Dec. 19, 2011, http://www.foxnews.com/politics/2011/12/19/epa-ponders-expanded-regulatory-power-in-name-sustainable-development/print (last visited July 18, 2015).

32 NAS REPORT, *supra* note 1, at 9 (emphasis added).

Even aside from concerns about political feasibility, it is often difficult as a practical matter to impose mandates for such sustainability strategies as pollution prevention or "green" product design and formulation. Changes in products and production processes go to the heart of business activity in a way that end-of-pipe controls do not. With the exception of a relatively small number of products that are sold nationally and have very significant environmental impacts—such as cars and pesticides—it is generally beyond the capacity of regulatory agencies to mandate the design of greener products.[33] Furthermore, sustainability strategies tend to develop from the bottom up, and evolve faster than regulation can keep up; regulations operate from the top down and tend to be static.[34] It is largely for this reason that pollution prevention programs have focused primarily on technical assistance and other non-regulatory measures.[35] An important exception is reuse and recycling, which occurs outside the production process and where, as noted earlier, states and others have taken significant regulatory action.[36]

Thus, when one of the authors of this Essay attended a meeting in which EPA sought feedback from businesses regarding the NAS report, the businesses insisted that it would be self-defeating for EPA to turn sustainability into a regulatory mandate. Sustainability initiatives in businesses and other organizations are internally designed, driven by business goals or the mission of other organizations; companies feared that imposing requirements could drain them of initiative and innovation. They also feared that simply imposing preferred solutions would not allow for experimentation and improvement over time, and might result in cost-effective opportunities being overlooked.

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33 *See* Hirsch, *supra* note 5, at 1099–101; Wyeth, *supra* note 5, at 12–13. At one time, EPA made a concerted effort to include pollution prevention in new rules. However, only a minority of rules actually did so. Barriers included the media-based regulatory structure, which affects planning and information sharing, and means that rules affecting an industry sector are not coordinated; the very local, plant-based nature of much pollution prevention; a lack of information on performance of innovative technologies; and difficulty obtaining information because of legal limits on EPA's authority to gather data under the "Paperwork Reduction Act of 1980," 44 U.S.C. §§ 3501–3521 (2012). *See* U.S. ENVTL. PROT. AGENCY, EVALUATION OF EPA EFFORTS TO INTEGRATE POLLUTION PREVENTION POLICY THROUGHOUT EPA AND AT OTHER FEDERAL AGENCIES 15 (2008), *available at* www.epa.gov/p2/pubs/docs/p2integration.pdf [hereinafter P2 INTEGRATION REPORT].

34 *See* Hirsch, *supra* note 5, at 1099–101 (discussing how regulators may not be able to set outcome-based targets due to regulatory costs associated with such targets, while firms can use an approach that "draws the knowledge out of many employees throughout the organization").

35 Notably, the Pollution Prevention Act created very few new regulatory authorities, focusing instead on information sharing, grants, and other non-regulatory approaches. Pollution Prevention Act of 1990, 42 U.S.C. § 13101(a)(5) (2012). Similarly, state laws aimed at reducing the toxic content of products require manufacturers to do analysis and planning to find opportunities, but generally do not impose specific mandates. *See, e.g.*, MASS. GEN. LAWS ANN. ch. 21I §§ 10–11 (West 2010); OR. REV. STAT. §§ 465.015, 465.018 (2013); *see also infra* Part V.F. (discussing such reflexive laws).

36 *See supra* note 29 and accompanying text.

There is certainly an important role for mandates where they are workable. Purely voluntary business initiatives will not be sufficient, since the "business case" analyses that organizations engage in to design their internal initiatives are not likely to adequately consider external benefits or benefits that are difficult to quantify in economic terms. And while sustainability is being appreciated by a growing share of organizations, there will always be those focused entirely on short-term, self interest. However, the limitations of imposing mandates make it necessary to consider other options.

### *B. Enabling Sustainability*

Regulatory programs can also promote sustainability by creating space for the adoption of strategies that provide economic and social, as well as environmental, benefits in an integrated way. These strategies may be initiated by EPA, but will more often be identified and developed by other parties. Therefore, the regulator's role will often be one of enabling, facilitating, and in some cases incentivizing—complementing its more traditional directive role.[37]

As will be seen below, this can be done in a number of ways. In some cases it is possible to design room for innovation into regulations; in other cases it may be possible to develop local, case-by-case solutions. Another approach can be to require self-evaluative steps that invite regulated parties to improve their own behavior but do not mandate such changes—what is sometimes called "reflexive" regulation.[38]

There may be fears that such an approach would mean weakening regulatory programs. "Regulatory reform" initiatives have triggered this concern in the past.[39] Those initiatives were similar in some respects to what we are discussing here, and can provide some useful lessons.[40] However, it is important to understand that sustainability is not simply a rebranding of regulatory reform; it is not primarily about making environmental protection cheaper or more palatable to regulated parties. Sustainability is about finding positive economic and social value in strategies that benefit the environment: eliminating waste or turning it into an asset, finding socially beneficial substitutes for costly technological solutions, enabling innovation,

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37 A similar distinction is made in Alan B. Horowitz et al., *Law Can Facilitate, Not Dictate*, ENVTL. F., July/Aug. 2003, at 48–49. Horowitz lists a number of roles that regulatory programs can play, several of which are illustrated by the examples we provide below: risk-based regulations and enforcement, performance-based alliances, disclosure requirements, risk-based cleanup and reuse of contaminated land, and sustainable public leadership, such as policies to discourage urban sprawl. *Id.*

38 *See* Hirsch, *supra* note 5, at 1105–15.

39 *See, e.g.*, Rena I. Steinzor, *Reinventing Environmental Regulation: The Dangerous Journey from Command to Self-Control*, 22 HARV. ENVTL. L. REV. 103 (1998) (discussing whether regulatory reform can be achieved without sacrificing environmental protection).

40 *See infra* Part V.

and integrating economic development and environmental protection rather than pursuing them separately.

Thus, enabling sustainability is best seen as supplementing, not replacing or weakening, environmental protection. A sustainability perspective recognizes that while reducing environmental harm is necessary, it is not sufficient. To achieve the broader goal of a sustainable economy and society, EPA will need to expand its toolkit to become an influencer as well as a traditional regulator.

## IV. INTEGRATING REGULATION AND SUSTAINABILITY: THE EXPERIENCE SO FAR

EPA has a great deal of experience already that informs how sustainability can be advanced in its regulatory programs. In a variety of settings, over many years, EPA's regulatory programs have dealt with the potential to advance economic and social, as well as environmental, benefits. That experience sheds light both on the tensions between regulation and sustainability, and the ways in which those tensions can be resolved. We will review that experience in the hope of extracting some general guidelines that could be used by regulatory programs in the future.

### *A. Environmental Standards*

Nowhere has the tension between environmental regulation and the desire to advance economic or social goals been more continually at issue than in the programs that establish and apply standards for environmental quality and pollution control.[41] Those standards are the foundation of much of what has been accomplished environmentally in the past forty years. At the same time, critics have often argued that the way EPA designs and implements standards impedes innovation and discourages industry from developing new ways of achieving the standard that may be cheaper, reduce waste, or have other social or economic advantages—in other words, that are more sustainable.[42] These issues are far from new, but an emphasis on sustainability puts added importance on looking for ways of facilitating innovation without weakening environmental standards.

At the risk of oversimplifying, most standards fall into two categories: environmental quality standards and pollution control standards.[43] Environmental quality standards set the goal—what constitutes "clean air"

41 *See, e.g.*, *infra* Part IV.A.1.

42 *See, e.g.*, Bruce A. Ackerman & Richard B. Stewart, *Reforming Environmental Law*, 37 STAN. L. REV. 1333 (1985); J. CLARENCE DAVIES & JAN MAZUREK, POLLUTION CONTROL IN THE UNITED STATES: EVALUATING THE SYSTEM 16 (1998); Kurt A. Strasser, *Cleaner Technology, Pollution Prevention, and Environmental Regulation*, 9 FORDHAM ENVTL. L. J. 1, 5 (1997).

43 A third and somewhat less common type of standard—management standards—specify work or design practice—for example, the regulations governing the handling of hazardous wastes under the Resource Conservation and Recovery Act (RCRA). Resource Conservation and Recovery Act of 1976, 42 U.S.C. §§ 6901–6992k (2012) (amending Solid Waste Disposal Act, Pub. L. No. 89-272, 79 Stat. 992 (1965)). These are discussed in Part III.C.

or "clean water."[44] Pollution control standards set the limits imposed on individual facilities such as factories, wastewater treatment plants, and many other kinds of sources, in order to attain the goal.[45] We will look first at pollution control standards, where the inherent tensions between regulation and sustainability have been most apparent in the past.

### *1. Pollution Control Standards*

Pollution control standards—the rules that determine what regulated facilities are allowed to emit into the air or discharge into the water, and control the management of hazardous waste—are where environmental laws have direct impact on the behavior of polluters.[46] As a result, it is in the design and execution of these standards that the inherent tensions between regulation and sustainability have been most apparent in the past.

#### *a. Sustainability Tensions*

There has been a longstanding debate over whether pollution control standards discourage the use of innovative approaches and the cleaner production methods typically associated with sustainability.[47] There is room here to do no more than allude to the many issues involved,[48] but the root of the problem is that most pollution control standards are based on what is achievable through the best available control technology.[49] Very few standards actually specify the technology to be used; rather, EPA identifies a technology that meets the statutory standard and measures the rate of pollution reduction that can be achieved using that technology.[50] In theory,

44 *See, e.g.*, National Primary and Secondary Ambient Air Quality Standards, 40 C.F.R. 50 (2012) (specifying air quality standards); Water Quality Standards, 40 C.F.R. § 131.11 (2012) (stating the criteria for setting water quality standards).

45 *See* Clean Air Act, 42 U.S.C. § 7475(a)(1) (2012) (requiring a permit prior to the construction of a major emitting facility); Federal Water Pollution Control Act (Clean Water Act), 33 U.S.C. § 1311(e) (2012) (applying effluent limitations "to all point sources of discharge of pollutants").

46 This brief summary oversimplifies dramatically, of course; pollution is not simply caused by large industrial facilities and does not necessarily consist of chemical contaminants—it may also mean elevated temperature in wastewater and the release of sewage generated by individual households, or runoff of stormwater from streets, neighborhoods, and construction sites.

47 *See* Porter & Van der Linde, *supra* note 30, at 110–11. Strasser argues on the other hand that technology-based standards can stimulate new technology to prevent rather than simply treat pollution, although they do not do so in all cases. Strasser, *supra* note 42, at 21–22.

48 For a thorough analysis of the impact of technology-based standards on business sustainability initiatives, see Hirsch, *supra* note 5.

49 This is a gross oversimplification; the criteria vary greatly across statutes. *See, e.g.*, 33 U.S.C. § 1311(b)(2)(A)(i) (2012) ("[B]est available technology economically achievable . . ."); *Id.* at § 1311(b)(2)(E) ("[B]est conventional pollutant control technology . . ."); 42 U.S.C. § 7479(3) ("[B]est available control technology . . ."); *Id.* at § 7412(d)(2) ("[M]aximum degree of reduction . . . achievable").

50 Hirsch, *supra* note 5, at 1094; Timothy F. Malloy, *The Social Construction of Regulation: Lessons from the War Against Command and Control*, 58 BUFF. L. REV. 267, 314–15 (2010).

other technologies can be adopted if they can equal or exceed that rate. In practice, however, this appears to be uncommon.[51]

There are a number of reasons for this. Some are technical, such as the cost and complexity of assessing the likely results of an innovative approach,[52] the rate-based and end-of-pipe nature of most standards—which make it difficult to compare outcomes with "upstream" pollution prevention strategies[53]—and the risk to regulated parties if a new approach fails.[54]

Other factors have more to do with the nature of regulation itself and the incentives facing regulators. Regulation places great importance on certainty, and regulators are wary of trading a known result for a riskier one.[55] Regulators are also uncomfortable weighing regulatory certainty against other benefits that may come with the alternative approach.[56] In most cases, regulators have no legal authority to do so, and in any case the agency gets little or no credit for other benefits—while it can get in trouble if something goes wrong.[57]

Furthermore, even if these challenges can be overcome, there is a structural tension between the continuously evolving and somewhat unpredictable nature of sustainability and the static nature of regulatory requirements.[58] Sustainability is about continuous improvement, while regulation is about compliance with established requirements. A corporation seeking to reduce energy use or carbon emissions will typically set annual

51 *See* Hirsch, *supra* note 5, at 1094–95. *See also*, Malloy, *supra* note 50, at 318 (arguing that there is little comprehensive empirical research on whether companies adopt alternative methods of compliance, but that it is reasonable to assume that "facilities almost always adopt the reference technology").

52 *See* Malloy, *supra* note 50, at 317–19.

53 *See* Hirsch, *supra* note 5, at 1095; Malloy, *supra* note 50, at 318. When a regulatory entity sets a standard by determining what pollutant reductions are achieved through use of a preferred technology, the result is necessarily the rate by which that technology reduces emissions—e.g., emissions per unit of product or the percentage of emissions destroyed—not an absolute number of tons or pounds of pollutants since that is a function of the size of the facility. This complicates the comparison of alternatives, especially when the innovative option is not just another type of end-of-pipe control. For example, a standard may require that 95% of emissions from a production line be destroyed. If the production process is changed so that fewer pollutants are generated, the end-of-pipe control would still have to eliminate 95% of what remains. A rate-based standard also allows the total amount of allowable pollution to increase with the rate of production, whereas a limit on the total mass of emissions would encourage reductions in per-unit emissions so that production can be increased without exceeding the limit. *See* David M. Driesen, *Air Pollution*, *in* STUMBLING TOWARDS SUSTAINABILITY 257, 268–69 (John C. Dernbach ed., 2002).

54 Hirsch, *supra* note 5, at 1094–95.

55 *See id.* at 1098–99 (highlighting uncertainty and lack of information as major barriers to developing new approaches to regulation).

56 *See, e.g.*, DAVIES & MAZUREK, *supra* note 42, at 16 (noting that regulators "take a dim view of any method for meeting the standard other than the technology on which the standard is based").

57 DAVIES & MAZUREK, *supra* note 42, at 28 (discussing how "the environmental statutes have grown ever more prescriptive and detailed and have granted less and less discretion to EPA").

58 *See* Hirsch, *supra* note 5, at 1100.

and multi-year goals, holding managers responsible for finding ways of achieving them but leaving room for adaptive management over time to reward overachievers and accommodate shortfalls.[59] This will tend to find the most cost-effective conservation measures first, and provide time for the development of innovative or tailored solutions. In contrast, where a regulatory requirement applies it must be complied with at the time it goes into effect,[60] often in the form of capital-intensive technology investments.[61]

A regulatory standard does not leave room for gradual movement toward compliance, nor does it create incentives for further improvement or innovation over time. The company may pursue additional conservation efforts on its own, but if it finds additional savings, it generally would not get any regulatory benefit from implementing them—e.g. the ability to substitute one form of control for another.[62] Nor, for the most part, are standards tightened as technology improves, which would create an incentive for facilities to keep looking for reductions so as to be prepared for new requirements. Furthermore, corporate decisions regarding production methods or product design are unlikely to coincide with the issuance of a rule or permit by EPA, and are unlikely to provide any benefits under rules or permits already in effect.

For all these reasons, regulatory standards generally provide no direct benefit to sustainability initiatives through which organizations continually seek to reduce waste, take toxins out of products or production processes,

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59 *See id.* at 1068, 1100. Hirsch cites the example of 3M's "pollution prevention pays" initiative as a bottom-up, adaptive strategy. *See also GE Energy Treasure Hunt Yields $2.1M Energy Savings at NY Hospital*, ENVIRONMENTAL LEADER, July 30, 2010, http://www.environmentalleader.com/2010/07/30/ge-energy-treasure-hunt-yields-2-1m-energy-savings-at-ny-hospital/ (last visited July 18, 2015) (describing corporate energy savings initiative).

60 *See, e.g.*, Clean Air Act, 42 U.S.C. § 7412(i)(3) (2012) (requiring immediate compliance for new sources and an extended compliance schedule for existing sources). Although new rules may provide time to come into compliance, the timing of rules and the timing of business innovations are unlikely to coincide. The compliance period primarily provides a chance to put into place technology that has been identified when the rule is issued.

61 For example, EPA's guidance on consideration of energy efficiency in air permits as a way of controlling greenhouse gas emissions emphasizes technologies that can be "designed in" to the facility at the outset, since regulators need to ensure that the facility will meet the Best Available Control Technology (BACT) requirement at the time the permit goes into effect and the requirements need to be clear and enforceable. *See* U.S. ENVTL. PROT. AGENCY, PSD AND TITLE V PERMITTING GUIDANCE FOR GREENHOUSE GASES 17 (2011) *available at* http://www.epa.gov/nsr/ghgdocs/ghgpermittingguidance.pdf. EPA's guidance also discourages considering approaches such as replacing inefficient light bulbs, which can be the most cost-effective conservation measures, because their absolute benefits do not warrant the investment of permitting resources. *Id.* at 31.

62 It is reasonable to believe that opportunities for further improvement exist in many cases. Even where pollution control requirements are highly stringent, it is likely that at least some organizations can find additional cost-effective reductions by looking at different approaches—more fundamental changes to production processes, for example, or the redesign of products. Businesses can also look in places that regulators do not, making many incremental improvements in operations over time.

or otherwise shrink their environmental and resource footprints.[63] And they may even inhibit the adoption of such practices.

*b. Resolving the Tensions with Sustainability*

Despite all these barriers, EPA and its co-regulators have sometimes been able to find ways to thread the sustainability needle. This has been done in two ways: by exploiting flexibility that exists within the regulatory structure, and by designing the standards themselves differently to create more room for innovation.

A number of examples can be seen in which flexibility within existing rules was used to enable a sustainable solution. For example, an Oregon water treatment facility was required to reduce the temperature of water it discharged to the Tualatin River.[64] The facility worked with EPA and the state to develop a water quality trading program that would allow it to achieve the temperature limits without building expensive cooling equipment that would normally have been required.[65] A significant cause of the elevated river temperature was the removal of natural shade along the riverbanks by upstream farmers.[66] Part of the effort to restore the river's natural cooling capabilities and reduce the Tualatin River's upstream temperature included developing a trading system and creating credits with thirty-five miles of riparian restoration.[67] The trading program led not only to improved temperatures, but to reduced erosion, increased habitat, reduced pollutant runoff, and a more resilient watershed—at a lower cost than installing cooling structures at the publicly owned treatment plant (POTW).[68]

In another case relating to thermal pollution, EPA approved an innovative permit for a power plant near Boston, the Kendall Generating Station.[69] Under the Clean Water Act, the plant was required to reduce the

63 A specific example of this is the "once in always in" policy. *See infra* Part IV.C. This is not entirely true in all cases; for example, pollution prevention measures may reduce a facility's total emissions below the threshold that triggers regulation, such as the level of air emissions that makes it a "major source" for air permitting. *See, e.g.*, Clean Air Act, 42 U.S.C. § 7412(g)(1) (2012) (allowing for sources to avoid major source thresholds by offsetting pollution increases through decreases in other areas of the facility). Generally, however, these effects are not common.

64 OR. DEP'T OF ENVTL. QUALITY, CLEAN WATER SERVICES REVISED TEMPERATURE MANAGEMENT PLAN 4 (2005), *available at* http://www.deq.state.or.us/wq/wqpermit/docs/individual/npdes/ph1ms4/cws/tmp/plan.pdf.

65 U.S. Envtl. Prot. Agency, *Watershed Approach Reduces Pollution in the Tualatin River*, http://water.epa.gov/polwaste/nps/success319/or_tualatin.cfm (last visited July 18, 2015).

66 OR. DEP'T OF ENVTL. QUALITY, *supra* note 64, at 15.

67 *See id.*

68 OR. DEP'T OF ENVTL. QUALITY, WATER QUALITY CREDIT TRADING IN OREGON: A CASE STUDY REPORT 26 (2007); U.S. Envtl. Prot. Agency, *Watershed Approach Reduces Pollution in the Tualatin River*, *supra* note 65.

69 *See* U.S. Envtl. Prot. Agency, *Modified Discharge Permit for Kendall Station Power Plant in Cambridge, Mass. Significantly Advances Protections for Charles River*, http://yosemite.epa.gov/opa/admpress.nsf/1e5ab1124055f3b28525781f0042ed40/15da68628a5a644a8525782b004eafef!OpenDocument (last visited July 18, 2015) [hereinafter *Modified Discharge Permit*]; Beth Daley,

temperature of the water it returned to the Charles River after using it to cool the generating unit.[70] Ordinarily, this would be done by building cooling towers, a very expensive proposition.[71] EPA and the company found an innovative way to meet the environmental standard while also achieving other environmental, economic, and social benefits: they negotiated a permit that allowed the Station to sell its excess heat in Boston, where the steam could be used to generate electricity otherwise provided by oil-fired boilers.[72] In addition to significantly improved water quality at a lower cost, the arrangement is expected to benefit neighboring communities by improving air quality.[73] This project illustrates several of the sustainability principles listed earlier: generating multiple benefits, having multimedia environmental impacts, and adopting a more integrated approach that also converts a waste stream to a usable product.[74]

In each of these cases, regulators were able to adapt technology-based standards to achieve a more sustainable solution than would typically be used. In the Tualatin case, the approach used achieved the environmental goal of cooler water, at a lower cost and while providing a variety of environmental and social benefits through riparian restoration.[75] At Kendall Station, the permit again met the regulatory requirement, at a lower cost and in a way that provided an economic benefit by converting a waste into an asset.[76] What is most notable is that both involved approaches very different from that anticipated when the applicable rule was written; they do not simply use a different end-of-pipe technology.[77] These examples show that alternative models can be adopted.

*Agreement to Cut Power Plant Discharge, Send Steam Heat to Boston*, BOSTON GLOBE, Feb. 2, 2011, http://www.boston.com/news/science/articles/2011/02/02/power_plant_plan_to_cut_discharge_send_heat_to_boston/ (last visited July 18, 2015). It is worth noting that although the Kendall Station permit is a good example of advancing sustainability and achieving multiple benefits while implementing its regulatory program, EPA has not communicated that in a public way. While the parties were recognized for their agreement on a consensus permit settling long-standing litigation, EPA has yet to develop a comprehensive and compelling public description of this win–win for sustainability. *See* U.S. Envtl. Prot. Agency, *2011 Environmental Merit Award Recipients*, http://www.epa.gov/region1/ra/ema/2011recipients.html (last visited July 18, 2015).

70 *See Modified Discharge Permit*, *supra* note 69; U.S. Envtl. Prot. Agency, Modification of Authorization to Discharge Under the National Pollutant Discharge Elimination System, Permit No. MA0004898 (Dec. 17, 2010).

71 World Nuclear Ass'n, *Cooling Power Plants*, http://www.world-nuclear.org/info/Current-and-Future-Generation/Cooling-Power-Plants/ (last visited July 18, 2015) (explaining that coal and nuclear plants use cooling towers to reduce the temperature of water, and that they are costly to build and maintain).

72 Daley, *supra* note 69.

73 *See Modified Discharge Permit*, *supra* note 69.

74 *Id.*

75 U.S. Envtl. Prot. Agency, *Water Quality Trading*, at 13, *available at* http://water.epa.gov/type/watersheds/trading.cfm.

76 *Modified Discharge Permit*, *supra* note 69.

77 The rules requiring total maximum daily loads for temperature are made pursuant to the Clean Water Act, 33 U.S.C. § 1313(d)(1)(D) (2012).

However, the work required to analyze and implement site-specific flexibility is usually significant.[78] Alternatives to the well-vetted "reference technology" must be analyzed carefully before their use is approved.[79] And making such a comparison is even harder when the new approach involves changes to products or manufacturing processes, rather than simply adopting a new type of pollution control technology.[80] The demands involved are particularly challenging at a time when both federal and state regulatory resources are shrinking.

A more efficient approach can be to change the way standards themselves are designed, to build in flexibility without sacrificing environmental goals. For many years, commentators have urged EPA to use "performance-based" standards, which specify broad environmental goals rather than focusing on particular technologies.[81] Performance-based standards have many advantages from a sustainability standpoint—they do not discriminate between end-of-pipe and prevention-based approaches, and they allow for evolution over time.[82]

In practice, creating such standards has proven harder than expected. Impediments range from the difficulty of measuring the desired goal[83] to the

78 Both cases involved rules that were expensive to implement, so the potential savings from alternatives were large enough to justify the transaction costs involved. DEP'T OF ENVTL. QUALITY, STATE OF OR., WATER QUALITY CREDIT TRADING IN OREGON: A CASE STUDY REPORT 13 (2007); *Modified Discharge Permit*, *supra* note 69. In addition, Kendall Station involved a permit in litigation, so there were significant transaction costs associated with not finding a mutually acceptable alternative. Conservation Law Found., *Conservation Law Foundation Secures Groundbreaking Outcome in GenOn Kendall Plant Case*, http://www.clf.org/newsroom/conservation-law-foundation-secures-groundbreaking-outcome-in-genon-kendall-plant-case/ (last visited July 18, 2015).

79 Nicholas A. Ashford et al., *Using Regulation to Change the Market for Innovation*, 9 HARV. ENVTL L. REV. 419, 453–56 (1985) (explaining the review process for proposed technologies).

80 *Id.* at 454.

81 *See* Porter & Van der Linde, *supra* note 30, at 110–11; Nat'l Acad. of Pub. Admin., *Resolving the Paradox of Environmental Protection*, at xi (1997). Driesen, *supra* note 53, does not advocate performance-based standards per se, but argues for the use of mass-based rather than rate-based limits, which in many ways amounts to a performance standard.

82 *See* Porter & Van der Linde, *supra* note 30, at 111 (advocating for the use of standards that do not mandate a certain approach and that allow more flexibility for innovation).

83 The technology does not always exist to measure goals such as the total mass of pollutants emitted. *See* Hirsch, *supra* note 5, at 1098, 1100. Monitoring technology does not always—or often—directly measure the total volume of pollutants going up a stack or into a water body. It is often much more practical to define the control technology to be used and then establish parameters for the operation of that technology, which are then what is monitored. For example, the permit may require a treatment unit that uses extreme heat to destroy pollutants. The parameter monitored may then be the temperature of the unit. Although the facility may report total emissions, these are actually estimates based on the throughput, the expected impact of the treatment unit, and other factors. *Id.* at 1100.

transaction costs of setting the standard limits,[84] to the lack of a clear theory for establishing the goals if technology is no longer the guide.[85]

However, it is not impossible to write rules that create room for innovative solutions. Perhaps the most prominent example is EPA's recently-issued plan for reducing greenhouse gases from existing power plants under section 111(d) of the Clean Air Act[86]—one of EPA's most important regulatory steps in many years. Rather than creating a traditional technology-based standard, EPA allows the states great flexibility in setting facility-specific requirements—including not only the installation of technology, but also increased use of trading schemes and renewable energy sources.[87] By doing so it opens the doors to a wide range of strategies that may provide economic and social benefits and create a more sustainable economy for the long term. However, the rule has been highly controversial.[88] As this shows, sustainability does not avoid difficult issues regarding the stringency of environmental goals. How EPA's approach fares in the regulatory process in the courts will be an important test for the commitment to sustainability.

Another approach can be to offer options within a regulatory framework. For example, air pollution limits for power generating units at industrial facilities are often stated in terms of a permissible level of emissions per unit of fuel used—an "input-based" standard.[89] This means the facility has no incentive to use energy efficiency measures such as combined heat and power.[90] An alternative approach, basing limits on the amount of

84 *Id.* at 1098.

85 The challenges of creating performance-based standards is illustrated by the plantwide applicability limit (PAL), an approach to New Source Review Permitting under which a single limit is established for all emissions from permitted sources within a facility, and the facility can make operational changes without the need for new permitting as long as it does not exceed that cap. PALs have been incorporated into EPA's permitting regulations and were upheld in *New York v. U.S. Envtl. Prot. Agency*, 413 F.3d 3, 38 (D.C. Cir. 2005). However, they were controversial. The challenges include finding a formula for converting rate-based limits to mass-based, facility-wide limits, creating permits enforceable with available monitoring technology, and determining how to adjust the limits over time as technology evolves. For more on PALs, see *New York*, 413 F.3d at 36–38; Dennis D. Hirsch, *Lean and Green? Environmental Law and Policy and the Flexible Production Economy*, 79 IND. L. J. 611, 649–52. (2004).

86 42 U.S.C. §§ 7401–7671q (2012); Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, available http://www.epa.gov/airquality/cpp/cpp-final-rule.pdf (to be codified at 40 C.F.R. pt. 60).

87 Carbon Pollution Emission Guidelines at 27 (describing three "building blocks" of the Clean Power Plan).

88 *See* Timothy Cama, *Senate GOP Launches Attack on EPA Climate Rules*, THE HILL, May 13, 2015, http://thehill.com/policy/energy-environment/241952-senate-gop-aims-to-overturn-epa-climate-rules (last visited July 18, 2015) ("The rules have drawn intense criticism from Republicans and industry groups.").

89 U.S. ENVTL. PROT. AGENCY, OUTPUT-BASED ENVIRONMENTAL REGULATIONS: AN EFFECTIVE POLICY TO SUPPORT CLEAN ENERGY SUPPLY 1 (2011), *available at* http://www.epa.gov/chp/documents/output_based_regs_fs.pdf.

90 *See* U.S. Envtl. Prot. Agency, *Combined Heat and Power Partnership: Basic Information*, http://www.epa.gov/chp/basic/ (last visited July 18, 2015) (stating that one of the benefits of

energy generated by the power plant—an "output-based" standard—encourages adoption of combined heat and power.[91] To create the proper incentives, the EPA's standards of performance for utilities, industrial boilers, and other combustion sources now allow source owners to comply either with an emission limit based on heat input or an equivalent one based on output.[92]

To sum up, technology-based standards are not fundamentally incompatible with sustainable solutions but do create hurdles. In some cases, site-specific alternatives can be approved, although doing so is usually time consuming and expensive. The holy grail of performance-based standards has proven elusive, but flexible regulatory models do exist.

### *2. Environmental Quality Standards*

Environmental quality standards present fewer obstacles, because they set broad goals and regulatory agencies have a good deal of discretion in implementing them. Two examples will illustrate this.

#### *a. Water Quality Standards and Green Infrastructure*

Water quality standards under section 303 of the Clean Water Act define the acceptable concentrations of pollution in surface water bodies; in effect, they define "clean water."[93] Urban stormwater runoff is a major contributor to exceedances of these standards, especially in cities whose sewers allow untreated sewage to be discharged into surface water in heavy storms.[94] Traditionally, these problems have been addressed through reconstruction

combined heat and power (CHP)—the simultaneous production of electricity and heat from a single fuel source—is the need for less fuel to produce a given energy output).

91 U.S. ENVTL. PROT. AGENCY, OUTPUT-BASED ENVIRONMENTAL REGULATIONS: AN EFFECTIVE POLICY TO SUPPORT CLEAN ENERGY SUPPLY 1, *supra* note 89.

92 *See* Standards of Performance for Electric Utility Steam Generating Units, 71 Fed. Reg. 9866 (Feb. 27, 2006) (to be codified at 40 C.F.R. pt. 60); Standards of Performance for Stationary Combustion Turbines, 71 Fed. Reg. 38,482 (Jul. 6, 2006) (to be codified at 40 C.F.R. pt. 60); Standards of Performance for Stationary Spark Ignition Internal Combustion Engines, 73 Fed. Reg. 3568 (Jan. 18, 2008) (to be codified at 40 C.F.R. pts. 60, 63, 85, 90, 1048, 1065, 1068). For an explanation of the advantages of output-based standards, see U.S. ENVTL. PROT. AGENCY, OUTPUT-BASED ENVIRONMENTAL REGULATIONS: AN EFFECTIVE POLICY TO SUPPORT CLEAN ENERGY SUPPLY 2 (2011), *available at* http://www.epa.gov/chp/documents/output_based_regs_fs.pdf.

93 33 U.S.C. § 1313(d)(1)(C) (2012). To be more precise, the acceptable concentrations of pollutants are a function of "water quality standards," which establish designated uses for specific water bodies, and "water quality criteria," which define concentrations that are protective for those uses. 33 U.S.C. § 1313(c)(2)(A) (2012).

94 At one time it was common to design systems such that the same sewers carry domestic and industrial waste and storm runoff, all flowing into the wastewater treatment facility as so-called combined sewer systems. John Tibbetts, *Combined Sewer Systems: Down, Dirty, and Out of Date*, ENVTL. HEALTH PERSPECTIVES, July 2005, at A465, *available at* http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1257666/pdf/ehp0113-a00464.pdf. In such systems today, the runoff in heavy storms can overwhelm the sewer system or treatment facility, which results in discharging excess wastewater directly into surface waters and often violating water quality standards and permit limitations. *Id.*

of entire sewer systems—so called "gray infrastructure"—which is very expensive.[95] Beginning in the 1990s, cities explored the use of alternative approaches to managing and absorbing stormwater—such as rain gardens and catchment basins built into new developments.[96] So long as the combined plan reduces pollution by enough to meet the applicable water quality standards, nothing in the Clean Water Act precludes the use of such an approach. Such green infrastructure is more sustainable than traditional approaches to stormwater management, because rather than treating water pollution in isolation, it provides a solution that is integrated with other social and economic goals in the community—reducing the cost of meeting water quality goals, while providing public amenities and climate change benefits.[97]

The first case in which green infrastructure was incorporated into a legally enforceable consent decree involved the Combined Sewer Overflow (CSO) abatement program in Onondaga County, New York.[98] Under a 2009 court-approved agreement, the county used an education and outreach program, leveraged state grant funding, and engaged community stakeholders, the city, and Syracuse University in promoting and implementing green infrastructure projects on public and private land—including rain gardens, a robust tree planting strategy, and other stormwater mitigation projects.[99] This project not only advanced multiple benefits and conserved natural resources, but also leveraged the efforts and resources of others and engaged a range of stakeholders across the community.[100]

EPA has now made green infrastructure agency policy—not for every situation, but in those cases where it is effective.[101] In April 2011, the heads of EPA's Water and Enforcement programs issued a joint policy

95 *See* U.S. Envtl. Prot. Agency, *Why Green Infrastructure?*, http://water.epa.gov/infrastructure/greeninfrastructure/gi_why.cfm (last visited July 18, 2015) ("[S]ingle-purpose gray stormwater infrastructure is largely designed to move urban stormwater away from the built environment, green infrastructure reduces and treats stormwater at its source while delivering many other environmental, social and economic benefits.").

96 *See id.; see also* DEP'T OF URBAN AND REG'L PLANNING, UNIV. OF WIS. MADISON, STORMWATER MANAGEMENT 1, 3, 5 (2009), *available at* http://urpl.wisc.edu/ecoplan/content/lit_stormwater.pdf (describing various remediation and prevention strategies for stormwater management).

97 *See* U.S. Envtl. Prot. Agency, *Why Green Infrastructure?*, *supra* note 95.

98 *See* NOAH GARRISON & KAREN HOBBS, NATURAL RES. DEF. COUNCIL, ROOFTOP TO RIVERS II: GREEN STRATEGIES FOR CONTROLLING STORMWATER AND COMBINED SEWER OVERFLOWS, SYRACUSE NEW YORK: A CASE STUDY OF HOW GREEN INFRASTRUCTURE IS HELPING MANAGE URBAN STORMWATER CHALLENGES 1 (2011), *available at* http://www.nrdc.org/water/pollution/rooftopsii/files/RooftopstoRivers_Syracuse.pdf.

99 *Id.* at 4.

100 *See generally id.* (describing the impacts of Onondaga County's Save the Rain Campaign to meet CSO reduction mandates using green infrastructure practices).

101 *See* Memorandum from Nancy Stoner, Acting Assistant Administrator, Office of Water (OW) & Cynthia Giles, Assistant Administrator, Office of Enforcement Compliance and Assurance (OECA), U.S. Envtl. Prot. Agency, to EPA Regional Administrators & OW & OECA Office & Division Directors (Apr. 20, 2011), *available at* http://water.epa.gov/infrastructure/greeninfrastructure/upload/gi_memo_protectingwaterquality.pdf.

memorandum stating that "green infrastructure can be a cost-effective, flexible, and environmentally-sound approach to reduce stormwater runoff and sewer overflows and to meet Clean Water Act (CWA) requirements."[102] To further encourage widespread adoption of this approach, EPA launched a community partnership program to identify cities with which EPA would work on green infrastructure.[103]

The experience with green infrastructure shows that a relatively flexible regulatory framework can open the door to more sustainable options. However, it is also important to recognize that the acceptance of green infrastructure did not happen overnight; it took many years to establish that the new approach was reliable and effective.

*b. State Implementation Plans Under the Clean Air Act*

National ambient air quality standards (NAAQS)[104] play a central role in driving regulation under the Clean Air Act. EPA sets the NAAQS, and states then develop implementation plans for attaining them.[105] Historically, state plans relied heavily on familiar regulatory tools such as permits.[106] However, EPA now allows states to get credit for energy efficiency programs that would result in a reduction of emissions from power plants, even though such programs do not directly regulate the plants.[107] EPA also allows states to obtain credit for land use planning measures that reduce emissions from motor vehicles.[108] This flexibility can be seen as compatible with sustainability because it allows the use of approaches that provide economic or community benefits, and environmental co-benefits, in addition to reductions in the specific pollutants targeted by the standards.

Providing this flexibility was not without challenges. The link between strategies such as energy efficiency campaigns or land use planning and ultimate air quality can be difficult to quantify or forecast with a high degree

102 *Id.*

103 *See* Memorandum from Nancy Stoner, Acting Assistant Administrator, OW, & Cynthia Giles, Assistant Administrator, OECA, U.S. Envtl. Prot. Agency, to EPA Regional Administrators & OW & OECA Office & Division Directors (Oct. 27, 2011), *available at* http://water.epa.gov/infrastructure/greeninfrastructure/upload/memointegratedmunicipalplans.pdf; *see also* 33 U.S.C. § 1313 (2012).

104 National Primary and Secondary Ambient Air Quality Standards, 40 C.F.R. § 50 (2014).

105 *See* U.S. Envtl. Prot. Agency, *SIP Status and Information, Background Information*, http://www.epa.gov/airquality/urbanair/sipstatus/overview.html (last visited July 18, 2015).

106 *See generally* Arnold W. Reitze, Jr., *Air Quality Protection Using State Implementation Plans—Thirty-Seven Years of Increasing Complexity*, 15 VILL. ENVTL. L.J. 209, 211–26 (2004) (describing the evolution of State Implementation Plans and permit requirements through amendments to the Clean Air Act).

107 *See* U.S. ENVTL. PROT. AGENCY, ROADMAP FOR INCORPORATING ENERGY EFFICIENCY/RENEWABLE ENERGY POLICIES AND PROGRAMS INTO STATE AND TRIBAL IMPLEMENTATION PLANS 9, 11–12 (July 2012), *available at* http://www.epa.gov/airquality/eere/pdfs/EEREmanual.pdf.

108 U.S. ENVTL. PROT. AGENCY, EPA GUIDANCE: IMPROVING AIR QUALITY THROUGH LAND USE ACTIVITIES 27 (2001), *available at* http://www.epa.gov/oms/stateresources/policy/transp/landuse/r01001.pdf.

of certainty. On the other hand, such approaches may be more cost-effective and easier to implement than traditional regulation of large sources, may allow standards to be attained more quickly, and may provide a means to target other, harder to reach contributors to air quality problems. This simply illustrates the tensions between the priorities inherent in regulation and sustainability; in this case, EPA was willing to strike a balance between them. And, as in the case of green infrastructure, it took time to develop confidence in the less traditional measures.

### *B. Procedural Impediments to Sustainability*

A very different set of issues is raised by procedural requirements, such as permitting, that create administrative delays and costs that are impediments to operational changes at regulated facilities. Such changes may be made purely for business purposes, but in many cases they may have environmental benefits: for example, improving energy efficiency or implementing cleaner production processes. Operational flexibility also provides economic benefits such as making it possible to adopt innovative production methods more quickly. Facilitating such changes would therefore be a good example of advancing sustainability; the question is whether this can be done without sacrificing environmental values.

These issues have particularly arisen under the Clean Air Act, which requires large sources of air pollution to obtain both "preconstruction permits" under the New Source Review requirements of Title I,[109] and "operating permits" under Title V.[110] Throughout the life of these permitting programs, industry has complained that these permits limited their freedom to make operational changes; these complaints intensified during the 1990s and 2000s as rapid technological change—for example, in the computer industry—became increasingly the norm.[111]

During the late 1990s, EPA approved a number of pilot permits that created flexibility to make operational changes without triggering permit modifications.[112] One way of doing so was to use "plantwide applicability limits" (PALs) under the New Source Review regulations.[113] PALs established facility-wide caps on emissions, in place of rate-based limits on smaller units within facilities.[114] Creating caps not only provided greater freedom to

109 42 U.S.C. § 7475 (2012).

110 *Id.* at §§ 7661–7661f (2012); *see also* U.S. Envtl. Prot. Agency, *Operating Permits*, http://www.epa.gov/airquality/permits (last visited July 18, 2015).

111 *See* U.S. ENVTL. PROT. AGENCY, NEW SOURCE REVIEW IMPROVEMENTS: SUPPLEMENTAL ANALYSIS OF THE ENVIRONMENTAL IMPACTS OF THE 2002 FINAL NSR IMPROVEMENT RULES 1 (2002), *available at* http://www.epa.gov/NSR/documents/nsr-analysis.pdf (describing industry concern over their inability to quickly make changes).

112 *Id.* at 6; *see also* U.S. ENVTL. PROT. AGENCY, EVALUATION OF IMPLEMENTATION EXPERIENCES WITH INNOVATIVE AIR PERMITS 4 (2003), *available at* http://www.epa.gov/airquality/permits/memoranda/iap_eier.pdf [hereinafter "Flexible Permit Evaluation"].

113 *Id.* at 13.

114 *Id.*

choose control technologies, but also made it possible for a facility to make operational changes that had economic value, so long as they did not result in emissions above the caps.[115] EPA also tried other forms of flexibility—for example, writing a permit that anticipated possible operational changes, so that if those changes were made later no permit modification would be required.[116]

When EPA went back to see what had happened under the pilots, it found that the businesses had gained significant economic value from this flexibility, while in every case, emissions had been reduced well below the permit limits.[117] This occurred partly because operational improvements included more efficient and less polluting technologies, and partly because the caps created an incentive to reduce emissions to provide room for increased production later.[118] Today we would say that flexible air permits promote more sustainable outcomes, reducing pollution beyond mandated levels, while allowing for economic growth.[119]

EPA has now finalized rules authorizing both PALs and other tools for allowing operational flexibility under Title I and Title V.[120] This is an unusual case in which the agency consciously designed, tested, and evaluated an innovative approach, and then adopted it for general use. It is necessary to note, however, that although flexible air permits have advantages from a sustainability standpoint, they also raised concerns that highlight the tension with a traditional regulatory model. Flexible permits are more time consuming to establish—although the upfront costs may be offset by a reduction in the number of permit modifications later. Environmental groups opposed making PALs generally available, fearing that the formula for calculating the limit was too generous and would result in increases in emissions.[121] Similarly, states objected to the 2009 flexible air permit rule because they felt the flexibility was available under current law and could be used where needed, but that codifying it could result in inappropriate applications. [122] Since the incorporation of flexibility into the federal rules,

115 *See* Wyeth, *supra* note 5, at 55–58.

116 Flexible Permit Evaluation, *supra* note 112, at 12–13.

117 *Id.* at 5–7.

118 *Id.* at 5, 22.

119 *See* P2 INTEGRATION REPORT, *supra* note 33, at 106.

120 Plantwide applicability limits and other changes to the New Source Review Program were published in the Federal Register at 67 Fed. Reg. 80,186 (Dec. 31, 2002), and upheld over a challenge by environmental groups in *New York v. U.S. Envtl. Prot. Agency*, 413 F.3d 3 (D.C. Cir. 2005). "Flexible" air permits were codified at 40 C.F.R. § 52.21(aa) (2014) and published in the Federal Register at 74 Fed. Reg. 51,418 (Oct. 6, 2009).

121 *New York*, 413 F.3d at 38.

122 State permitting agencies—which issue most air permits—opposed the flexible air permit rule, although their objection was largely that the flexibility could be provided under existing law and that more formal codification might complicate the permitting program. Letter from Nat'l Ass'n of Clean Air Agencies to U.S. Envtl. Prot. Agency (Jan. 14, 2008), *available at* www.4cleanair.org/Documents/FlexpermitletterJAN14.pdf. They also objected to a provision exempting certain units from permitting entirely, and that provision was dropped in the final rule. *Id.*; 74 Fed. Reg. at 51,418, 51,433–34.

uptake of the new authorities has been slow.[123] Nevertheless, the success of these permits on the pilot scale suggests that they deserve a place in the regulatory toolbox.

### *C. Regulatory Barriers to Sustainable Practices*

In almost every discussion of promoting sustainability in a regulatory context, the contention is made that certain regulatory requirements create barriers to sustainable practices by impeding pollution prevention, recycling, and similar practices.[124] The history of EPA's efforts to respond to these claims suggests that the barriers usually exist for legitimate reasons and that they are not easily removed. Nevertheless, the system that has evolved has opened the door for many sustainable practices, and there is certainly room to do more.

The most often cited "regulatory barrier" is the chilling effect that hazardous waste regulations under the Resource Conservation and Recovery Act (RCRA)[125] can have on the reuse and recycling of regulated materials.[126] Reuse and recycling are classic examples of sustainable production practices, and industry has been enormously inventive at finding ways to repurpose "wastes"—in no small part spurred by the high costs of disposal that RCRA created.[127] The problem is that any regulated hazardous waste is subject to strict controls regarding management, such as the types of containers they may be kept in, the storage of those containers, the handling of wastes within a factory, or the way in which they may be transported.[128] In addition, any facility that treats, stores, or disposes of such waste must obtain a permit.[129] If someone wants to reuse a hazardous waste for some other purpose, all of these requirements potentially come into play. For example, processing a hazardous waste to turn it into a useful product may constitute "treatment" and require the company to obtain a permit—an

123 Conversely, Texas sought to provide more flexibility than EPA is comfortable with; EPA and Texas had an extended disagreement over the state's "flexible permits" program, which concluded when EPA approved the program with modifications. 79 Fed. Reg. 40,666, 40,670 (July 14, 2014).

124 *See, e.g.*, Jo Jeanne Lown, *Eco-Industrial Development and the Resource Conservation and Recovery Act: Examining the Barrier Presumption*, 30 B.C. ENVTL. AFF. L. REV. 275 (2003).

125 Resource Conservation and Recovery Act of 1976, 42 U.S.C. §§ 6901–6992k (2012) (amending Solid Waste Disposal Act, Pub. L. No. 89-272, 79 Stat. 992 (1965)).

126 A good overview of the problem and the regulatory complexities involved is contained in Lown, *supra* note 124. *See also* R. Michael Sweeney, *Reengineering RCRA: The Command Control Requirements of the Waste Disposal Paradigm of Subtitle C and the Act's Objective of Fostering Recycling—Rethinking the Definition of Solid Waste Again*, 6 DUKE ENVTL. L. & POL'Y F. 1, 8–10 (1996) (explaining that Congress intended recycling to be a primary objective for RCRA, but in the application of the statute it has become secondary).

127 Alexander Volokh, Reason Found., *Recycling Hazardous Waste: How RCRA has Recyclers Running Around in CERCLAS*, http://reason.org/news/show/recycling-hazardous-waste (last visited July 18, 2015).

128 *See* 42 U.S.C. § 6922 (2012).

129 *See id.* § 6925.

expensive process that may create public fears about handling "hazardous waste" in the community, as well as triggering potentially expensive cleanups unrelated to the waste itself.[130]

EPA has tried, on many occasions over many years, to carve out paths for such reuse that will avoid triggering burdensome waste regulations.[131] However, doing so is not always possible because of other real and significant risks that cannot be disregarded. For example, recycled wastes may contain toxics that would not be present in virgin materials, or unscrupulous parties may take advantage of recycling exceptions.[132] The number of such rules, and of cases reviewing them, reflects the complexity of striking the ideal balance.[133] In announcing the most recent rule addressing the definition of solid waste, EPA emphasized the goal of sustainability, saying that it "promotes safe and responsible recycling of hazardous secondary materials and conserves vital resources, while protecting those most at risk from the dangers of hazardous secondary materials mismanagement. . . . [It also] demonstrates that protecting communities and leveraging economic advantages for sustainable recycling and materials manufacturing can go hand-in-hand."[134]

An illustration of the complexities of balancing these interests is the ash created when coal is burned in power plants. Some of the ash can be reused in products such as wallboard, concrete, and bricks, and EPA has sought to encourage doing so.[135] However, vast quantities still pile up, presenting a very

130 *See* Brian Nearing, *Fears over Waste Plant, Norlite Incinerator Must be Fixed or Shut Down*, TIMESUNION.COM, http://www.timesunion.com/business/article/Fears-over-waste-plant-5843613.php (last visited July 18, 2015) (reporting that Norlite Corp., when faced with the decision of whether to renew its permit for its waste plant, received letters from citizens discussing fear of health problems). As a condition for any permit, RCRA requires that "corrective action" be taken to clean up legacy contamination that may exist at the facility. *See* 42 U.S.C. §§ 6924(u), 6928(h) (2012). This means that a facility seeking to treat wastes to make them reusable may be required to undertake expensive cleanup efforts unrelated to its current activities.

131 *See* U.S. Envtl. Prot. Agency, *Definition of Solid Waste (DSW) Rulemakings for RCRA Hazardous Waste Regulations*, www.epa.gov/osw/hazard/dsw/rulemaking.htm (last visited July 18, 2015) (listing EPA's various regulatory actions addressing this issue).

132 *See, e.g.*, MICHAEL B. GERRARD, WHOSE BACKYARD, WHOSE RISK: FEAR AND FAIRNESS IN TOXIC AND NUCLEAR WASTE SITING 156 (1996) (discussing how RCRA exemptions "invite manipulation of waste categorization" such as "sham recycling").

133 *See* U.S. Envtl. Prot. Agency, *Definitions of Solid Waste*, *supra* note 131. The most recent rule, proposed in 2011 to supersede an earlier rule that had been criticized by environmental groups as insufficiently protective, can be found at 40 C.F.R. §§ 260–61, 266 (2011); *see also* U.S. Envtl. Prot. Agency, *Overview of the Definition of Solid Waste Proposed Rule*, *available at* www.epa.gov/osw/hazard/dsw/docs/overview-2011rule.pdf (describing the 2011 rule).

134 U.S. Envtl. Prot. Agency, *EPA Rule Promotes Responsible Hazardous Materials Recycling, Protects Communities*, http://yosemite.epa.gov/opa/admpress.nsf/596e17d7cac720848525781f0043629e/d66ab83276a9fd6e85257daa005c3459!OpenDocument (last visited July 18, 2015).

135 *See* U.S. Envtl. Prot. Agency, *Coal Ash Reuse*, http://www2.epa.gov/coalash/coal-ash-reuse (last visited July 18, 2015) ("EPA encourages the beneficial use of coal ash in an appropriate and protective manner, because this practice can produce positive environmental, economic, and product benefits.").

significant management problem.[136] After a massive spill of such ash in Tennessee in 2008, EPA began work on new rules for the management of coal ash.[137] Environmental groups sought to have coal ash regulated more strictly to ensure the strongest possible controls; industry, on the other hand, objected that such a classification would discourage beneficial reuse and that the controls required would be extremely costly.[138] EPA issued a final rule on December 19, 2014, regulating ash as a nonhazardous waste.[139] The rule exempts ash that is beneficially reused from regulation under RCRA.[140]

Another regulatory barrier arose in the regulation of facilities that emit toxic air pollutants. At the risk of oversimplifying a very complex issue, the problem is as follows. Under the Clean Air Act, a facility is subject to regulation and must install very stringent control technology if its toxic air emissions exceed—or could exceed—twenty-five tons per year.[141] This raises the question of what to do if those controls reduce the emissions below the twenty-five ton threshold. EPA adopted the policy that in this case, the facility would still require a permit and be subject to regulation—including monitoring, record keeping, and reporting requirements—on the theory that compliance with a rule should not become an exemption from it, and that controls might be adjusted so that emissions remained just below the threshold.[142] This became known as the "once in, always in" policy.[143]

Sustainability-minded companies, however, could lower their emissions below the threshold by changing their products, or their production processes, to require the use of fewer toxics. Should such factories still be required to comply with requirements such as monitoring and reporting, or treatment of remaining emissions, in the same way as a facility that had reduced its emissions through end-of-pipe controls? Applied in that

136 *See* U.S. Envtl. Prot. Agency, *Coal Ash Basics*, http://www2.epa.gov/coalash/coal-ash-basics (last visited July 18, 2015).

137 *See* Shaila Dewan, *Coal Ash Spill Revives Issue of Its Hazards*, N.Y. TIMES, Dec. 24, 2008, http://www.nytimes.com/2008/12/25/us/25sludge.html?_r=1& (last visited July 18, 2015) (describing the 2008 Tennessee coal ash spill).

138 The competing views are summarized in the final coal ash rule. *See* 80 Fed. Reg. 21302, 21319 (April 17, 2015).

139 40 C.F.R. §§ 257, 261 (2014); *see also* U.S. Envtl. Prot. Agency, *2014 Final Rule: Disposal of Coal Combustion Residuals from Electric Utilities*, http://www2.epa.gov/coalash/coal-ash-rule (last visited July 18, 2015) (summarizing the new rule).

140 *See* 40 C.F.R. §§ 257, 261 (2014) (noting that the rule "does not regulate practices that meet the definition of a beneficial use of [Coal Combustion Residuals from Electric Utilities]").

141 Clean Air Act, 42 U.S.C. §§ 7401–7671q, 7412(a)(1), 7412(c)(1) (noting EPA's duty to publish and revise emissions standards for "major sources," defined as sources that emit at least 25 tons per year of listed hazardous air pollutants).

142 Memorandum from Johns S. Seitz, Director, Office of Air Quality Planning and Standards, U.S. Envt'l Prot. Agency, to U.S. Envtl. Prot. Agency Reg'l Air Div. Dirs. 9 (May 16, 1995) *available at* http://www.epa.gov/ttn/caaa/t3/memoranda/pteguid.pdf [hereinafter Seitz Memo] ("[F]acilities that are major sources for HAPs on the 'first compliance date' are required to comply permanently with the MACT standard.").

143 *Id.*

situation, the policy could be viewed as a disincentive for pollution prevention.[144]

EPA struggled with this conundrum over many years, trying to recognize the value of pollution prevention while also satisfying critics that it was not weakening the Clean Air Act. In 2003 it issued a proposed rule exempting facilities whose emissions were reduced through pollution prevention.[145] Several years later it proposed a different approach exempting all facilities that reduced emissions below the twenty-five ton threshold.[146] Following criticism by states and environmentalists,[147] further action was stayed by Congress in a budget rider.[148] Since then, EPA has not touched the issue.

Both of these examples suggest caution about assuming that "regulatory barriers" can be easily removed. There are often tradeoffs that make solutions harder to find than one might expect. However, a second lesson is that the record is not one of complete failure: as complex as the RCRA regulations are, they do provide safe avenues for recycling in many cases, of which industry has taken widespread advantage.[149] The highly visible conflicts over where to draw the line should not conceal the fact that a great deal of industrial byproducts are now reused, fully in compliance with the regulations.[150]

144 *See* P2 INTEGRATION REPORT, *supra* note 33, at 24. EPA tried to provide some time for process changes to be adopted before the standards go into effect, in which case the facility would never be subject to them. *See* Seitz Memo, *supra* note 142, at 5 ("[F]acilities may switch to area source status at any time until the 'first compliance date' of the standard."). However, the timing of process innovation rarely coincides with the regulatory cycle.

145 National Emission Standards for Hazardous Air Pollutants for Source Categories: General Provisions, 68 Fed. Reg. 26,249, 26,249 (May 15, 2003); *See* P2 INTEGRATION REPORT, *supra* note 33, at 24–25 (citing the 2003 proposal as creating a strong incentive for pollution prevention).

146 National Emission Standards for Hazardous Air Pollutants: General Provisions, 72 Fed. Reg. 69, 69 (Jan. 3, 2007). Unlike the 2003 proposal, this proposal did not seem aimed at rewarding pollution prevention, but simply reducing burdens on regulated industries. *See id.* at 70 (replacing EPA's "once in, always in" pollution regulatory standard with a more fluid standard).

147 *See, e.g.*, Letter from Vinson Hellzweig, Co-chair of the Nat'l Ass'n of Clean Air Administrators (NACAA) Air Toxics Comm., to the U.S. Envtl. Prot. Agency (May 3, 2007), *available at* http://www.4cleanair.org/Documents/OIAIrulecomments5307.pdf (containing the critical comments of the NACAA); Natural Resources Defense Council, an environmental group, was also highly critical. *See* Beveridge & Diamond, P.C., *EPA Proposes To Reverse "Once-In-Always-In" Policy*, TEXAS ENVIRONMENTAL UPDATE, Jan. 2007, http://www.bdlaw.com/news-118.html (last visited July 18, 2015).

148 *See* Consolidated Appropriations Act of 2008, Pub. L. No. 110-161, § 432, 121 Stat. 1844, 1852 (2008).

149 *See* Lown, *supra* note 124, at 304–08.

150 *See* U.S. Envtl. Prot. Agency, *Brownfields Program Accomplishments*, http://www.epa.gov/brownfields/overview/bf-monthly-report.html (last visited July 18, 2015) (reporting that the Brownfields program has readied more than 47,000 acres of previously contaminated land for reuse).

### *D. Sustainability in Clean-up and Restoration Programs*

Cleanup programs under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)[151] and RCRA provide some of the best examples of how EPA has taken full advantage of the range of policy and program tools available to advance all of the elements of sustainability, including economic and social concerns, in the implementation of a core regulatory program. The Brownfields program, which focuses on ensuring that contaminated property is put back into productive use, may be EPA's biggest sustainability success story.[152] While participation in EPA's Brownfields program is voluntary, it does complement the existing CERCLA regulatory clean-up programs and facilitates the advancement of sustainability principles through those programs.[153] It also has the effect of helping to ensure that mandated cleanups are coordinated with other development goals of revitalizing communities, putting unproductive land back into productive use, and creating jobs, while improving and protecting the environment.[154]

A primary goal of the Brownfields program was to eliminate regulatory barriers to redeveloping contaminated properties in order to facilitate local economic growth.[155] By definition, a brownfields site is "real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant."[156] Further, the law exempted from Superfund liability certain

151 Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. §§ 9601–9675 (2012).

152 Small Business Liability Relief and Brownfields Revitalization Act, Pub. L. No. 107-118, 115 Stat. 2356 (2002) (codified as amended in scattered sections of 42 U.S.C. §§ 9601–9628). The Brownfields Law was enacted under the Bush II administration in 2002, as an amendment to CERCLA. *Id. See* Spencer M. Wiegard, *The Brownfields Act: Providing Relief for the Innocent or New Hurdles to Avoid CERCLA Liability?*, 28 WM. & MARY ENVTL L. & POL'Y REV. 127, 128–29 (2003). The Brownfields law provides funding for the assessment and cleanup of brownfields sites, as well as liability protection for those who meet certain criteria and conduct the work. U.S. Envtl. Prot. Agency, *Brownfields and Land Revitalization*, http://www.epa.gov/brownfields/basic_info.htm (last visited July 18, 2015) [hereinafter EPA, *Brownfields and Land Revitalization*]. *See also* Wedding & Crawford-Brown, *Measuring Site-Level Success in Brownfield Redevelopments: A Focus on Sustainability and Green Buildings*, 85 J. ENVTL. MGMT. 483, 483–95 (2007), and sources cited therein for history and review of the Brownfields Program and resulting range of benefits from the program.

153 In accordance with the principles mentioned above, the Brownfields program achieves benefits in multiple dimensions, takes a more integrated approach, and leverages the independent efforts of other parties. *See* EPA, *Brownfields and Land Revitalization, supra* note 152; *see also* Joel B. Eisen, *Brownfields Policies for Sustainable Cities*, 9 DUKE ENVTL L. & POL'Y F. 187, 194 (1999).

154 EPA, *Brownfields and Land Revitalization*, *supra* note 152; *see also* City of San Antonio, *Brownfields Program*, sanantonio.gov/CCDO/IncentivesandPrograms/BrownfieldsProgram.aspx (last visited July 18, 2015).

155 Wiegard, *supra* note 152, at 128 (Brownfields Act intended to provide protection against lawsuits for prospective buyers).

156 42 U.S.C. § 9601(39)(A) (2012).

classes of owners and prospective purchasers who did not cause the contamination, but who want to redevelop the property.[157]

EPA is advancing sustainability goals, particularly environmentally focused ones, through other aspects of its regulatory clean-up programs as well. The agency's strategic plan specifically calls for the promotion of sustainable and livable communities, including through its work addressing releases of hazardous substances, addressing new waste issues associated with new methods of domestic energy development, expanding community participation in clean up decisions and actions, and focusing on making sustainable infrastructure investments.[158] Further, EPA has committed to the specific Agency Priority Goal of cleaning up contaminated sites to enhance the livability and economic vitality of communities.[159]

EPA has also developed guidance on Green Remediation principles to ensure that cleanups incorporate sustainability principles related to energy, materials, and water conservation; minimization of air pollutants and greenhouse gas emissions; protecting land and ecosystems; and promoting renewable energy use.[160] In addition to implementing a series of actions in these areas for sites where EPA leads the cleanup, the agency has developed several tools, best management practices, and guidance documents to guide private parties in their remediation work.[161]

Further, EPA was actively engaged in the development of the American Society for Testing and Materials' (ASTM) Standard Guide for Greener Cleanups, which provides a process, technical direction, contracting protocols, and incentives to reduce the environmental footprint of cleanups.[162] The guide complements both regulatory and voluntary cleanup programs.[163] This cooperative work is an example of how sustainability principles can be integrated into a core program through the support of outside parties, thus limiting transaction costs for the agency while advancing EPA's cleanup program and sustainability goals.[164]

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157 *See Id.* at § 9601(40).

158 *See* U.S. ENVTL. PROT. AGENCY, FISCAL YEAR 2014–2018 EPA STRATEGIC PLAN 23–29 (2014) *available at* http://www2.epa.gov/sites/production/files/2014-09/documents/epa_strategic_plan_fy14-18.pdf [hereinafter EPA STRATEGIC PLAN}.

159 *Id.* at 25.

160 *See* U.S. Envtl. Prot. Agency, *Green Remediation Strategy*, http://www.epa.gov/superfund/greenremediation (last visited July 18, 2015).

161 *Id.*; EPA STRATEGIC PLAN, *supra* note 158, at 32.

162 *See* Memorandum from Mathy Stanislaus, Assistant Adm'r, U.S. Envtl. Prot. Agency, to Reg'l Adm'rs, I-X OSWER Office Dirs., on Encouraging Greener Cleanup Practices through Use of ASTM International's Standard Guide for Greener Cleanups (Dec. 23, 2013), *available at* http://www.epa.gov/oswer/greenercleanups/pdfs/oswer-aa-gc-memo_december-2013.pdf [hereinafter Stanislaus]. *See also* Ill. Envtl. Prot. Agency, *Greener Cleanups*, http://www.epa.illinois.gov/topics/cleanup-programs/greener-cleanups/index (last July 18, 2015) (explaining the core principles of the ASTM standards).

163 *See* Stanislaus, *supra* note 162.

164 *Id.* (introducing a guide to regional offices and encouraging its use to efficiently lower environmental footprints during cleanup).

### *E. Compliance and Enforcement Programs*

Perhaps surprisingly, some of EPA's biggest sustainability opportunities lie in its compliance and enforcement programs.[165] There are a range of opportunities to advance sustainability—including focusing on making a difference in communities and sensitive ecosystems—through enforcement priority goals, inspection targeting, case development, settlement negotiations, and settlement document drafting. Enforcement actions that are tailored to specific circumstances provide a vehicle for taking site-specific opportunities into account. Enforcement orders and agreements offer a highly flexible means to advance sustainability on case-by-case bases by piloting alternative approaches while achieving the goals of certainty and assurance within legally enforceable frameworks.[166] And Supplemental Environmental Projects (SEPs) offer the ability to incorporate into a comprehensive settlement additional work to advance sustainability outside of the normal bounds of the regulatory program.[167] Of course this must be done in a way consistent with the applicable statutes and regulations, but careful legal analysis can ensure that tailoring is done appropriately and that comparable situations are handled consistently.

Further, the agency's next generation compliance efforts—to increase compliance and transparency through compliance monitoring and more effective rule design to ensure we better achieve the health and environmental benefits of rules—also present opportunities for the enforcement program to advance sustainability principles.

## V. NEW PARADIGMS

All of the examples discussed so far involved relatively traditional regulations. Over the past twenty-five years, a second generation of policies has emerged that are potentially very compatible with sustainability. These strategies take a variety of forms, but they all emerged from reform efforts in the 1990s—and earlier, aimed at finding ways of achieving environmental goals that had fewer adverse economic impacts and used government resources more cost-effectively. While the new paradigms cannot be reduced to a single common denominator, they generally seek to focus more on ends than means, regulating on a broader scale rather than micromanaging. They also tend to shift responsibility to the regulated community—even in some cases creating incentives for action without specifying the outcome to be achieved. They do not work in every situation,

165 *See* Paddock, *supra* note 5, at 590 (discussing enforcement tools for promoting sustainability).

166 *See id.* at 589–93 (describing how regulators can better use enforcement options to further environmental aims beyond mere compliance).

167 *E.g.*, U.S. ENVTL. PROT. AGENCY, COMMUNITY BASED SUPPLEMENTAL ENVIRONMENTAL PROJECTS: SUNCOR DENVER REFINERY (FORMERLY CONOCO), *available at* http://nepis.epa.gov/Exe/ZyPDF.cgi/P1003NAX.PDF?Dockey=P1003NAX.PDF.

but where they do, their flexibility creates regulatory space that can give sustainability measures room to take root.

### *A. Trading*

Trading has gradually gained acceptance as an alternative to technology-based regulation that allows regulated parties more flexibility to choose and even invent new methods of meeting the regulatory goal.[168] It allows market forces to help advance environmental goals by providing monetary incentives to reduce pollution, without heavy government involvement on the implementation side.[169] Trading has clear advantages over traditional regulation in advancing sustainability, because it does not specify technologies to be used by regulated parties, it creates incentives for innovative solutions that may lower costs or provide other economic benefits, and it may also stimulate development of more effective strategies for reducing overall pollution levels.[170]

The acid rain trading program established in the 1990 Clean Air Act amendments has been widely viewed as a success in terms of allowing regulated facilities to reduce sulfur dioxide more quickly and more cheaply than had been predicted under a traditional regulatory regime.[171] Building on that experience, EPA and states have developed trading programs in both the air and water programs. For example, EPA incorporated trading among sources of air pollution into the control of sulfur dioxide and nitrogen oxides under what it called the Transport Rule, addressing emissions that impact air quality in downwind states.[172] That rule was upheld by the U.S. Supreme Court in *U.S. Envtl. Prot. Agency v. EME Homer City Generation, L.P.* (*Homer City*).[173]

Trading has also been adopted as a tool for improving water quality.[174] It is primarily useful where the marginal cost of reducing pollutants varies greatly among regulated parties.[175] The point sources that have been regulated for many years may be reaching the point where additional reductions are very costly, whereas reductions might be achieved from other

168 *See* Sonja L. Rodman, *Legal Uncertainties and the Future of U.S. Emission Trading Programs*, 24 NAT. RES. & ENV'T, Spring 2010, at 7 (discussing the emergence of emissions trading programs, their traits, and the legal challenges that have been leveled at them).

169 *Id.* (commenting on the use of market forces to create upside potential for pollution reduction, which creates incentives for private industry to innovate in its means of compliance rather than rely on regulatory agencies to prescribe the means).

170 *Id.*

171 *See* Dallas Burtraw & Karen Palmer, *$SO_2$ Cap–and–Trade Program in the United States: A 'Living Legend' of Market Effectiveness*, *in* CHOOSING ENVIRONMENTAL POLICY 41 (Winston Harrington et al. eds., 2004).

172 40 C.F.R. §§ 97.1–.24 (2013).

173 134 S. Ct. 1584 (2014). The trading aspect of the rule was not actually challenged in *Homer City*; the challenge went to the allocation of emissions reductions among states.

174 *See* U.S. Envtl. Prot. Agency, *Water Quality Trading*, *supra* note 75 (endorsing water quality trading where certain conditions are met).

175 *Id.*

sources, such as nonpoint runoff, at a lower cost. For example, EPA has suggested using a trading approach for pollutants affecting the Chesapeake Bay.[176]

Trading is not without its challenges. Environmentalists have voiced concerns ranging from the potential for local "hot spots," to uncertainty about ultimate outcomes, to the lack of incentives for further reductions in pollution.[177] In the case of water trading, for example, pollution reductions from nonpoint sources such as farms may be difficult to quantify and enforce because the sources are so small and dispersed.[178] Therefore, using reductions from those sources as offsets to higher limits for large sources can create uncertainty.

The legal authority for trading can also be unclear where the statute does not expressly anticipate such an approach.[179] For example, EPA's authority to use trading under the Clean Water Act was challenged by an environmental group in *Food and Water Watch v. U.S. Envtl. Prot. Agency*;[180] however, that claim was dismissed on ripeness grounds, so the issue remains unresolved.[181]

Thus, trading illustrates some of the tensions between the regulatory need for certainty and enforceability and the goal of stimulating innovation for sustainability. However, the experience to date shows that it is possible to develop workable trading plans that reconcile these concerns. Where this is possible, trading can be a powerful vehicle for advancing sustainability within an effective regulatory regime.

176 U.S. ENVTL. PROT. AGENCY, CHESAPEAKE BAY TOTAL MAXIMUM DAILY LOAD FOR NITROGEN, PHOSPHORUS AND SEDIMENT 10–3 (2010) *available at* http://www.epa.gov/reg3wapd/pdf/pdf_chesbay/FinalBayTMDL/CBayFinalTMDLExecSumSection1through3_final.pdf.

177 *See* Driesen, *supra* note 53, at 269–70 (arguing that trading only serves to reduce the cost of achieving the pollution target, but does not encourage any further reductions. Typically trading programs address the objection that they do not encourage greater reductions by requiring the party purchasing emissions credits to make reductions larger than those required of the seller. David M. Driesen, *Capping Carbon*, 40 ENVTL. L. 1, 44 (2010). Nevertheless, it is true that trading does not compel continuous improvement over time, beyond the level established in the permit. Driesen, *supra* note 53, at 269–70. Reducing the marginal cost of controls may speed up attainment. A truly effective trading program could also require total limits to be revisited periodically in light of changing technology and increased understanding of the risks and exposures.

178 George A. Gould, *Agriculture, Nonpoint Source Pollution, and Federal Law*, 23 U.C. DAVIS L. REV. 461, 462 (1990) (detailing the nature of the problem in quantifying nonpoint source pollution).

179 It is noteworthy, therefore, that the trading arrangement EPA created under the Clean Air Act in the Transport Rule was not challenged, even though the relevant portion of the Clean Air Act did not expressly discuss trading; the issue presented in *Homer City* related to the allocation of emissions reductions among states. *See U.S. Envtl. Prot. Agency v. EME Homer City Generation*, 1345 S. Ct. 1584, 1593 (2014) (identifying EPA's cost-sensitive interpretation of a Clean Air Act amendment as the issue before the Court).

180 5 F. Supp. 3d 62, 66, 71 (D.D.C. 2013).

181 *Id.* at 79–80, 85 (dismissing for failure to show standing, stating that plaintiffs failed to show final agency action and constitutional or prudential ripeness).

### *B. Information and Disclosure*

Another "second generation" strategy is to require disclosure of information about environmental compliance and performance, without any direct mandate to reduce emissions.[182] Disclosure relies on public transparency, with minimal regulation, to incentivize pollutant reductions and motivate innovation by regulated parties. Using information as a driver for improved performance is particularly compatible with sustainability not only because it provides flexibility, but also because it creates incentives for continuous improvement over time. It melds well with the fluid, innovative nature of many business sustainability initiatives. Additionally, a by-product of such public disclosure can be greater engagement of the public as a response to more readily available information about pollutant sources in a community.

The Toxic Release Inventory (TRI) is the poster child of effective information disclosure programs that lead to positive environmental outcomes such as reductions in use and releases of toxic chemicals.[183] Even with limited regulatory oversight, reported releases have consistently declined since the advent of the reporting program.[184]

EPA now requires facilities that emit large amounts of greenhouse gases (GHGs) to report their emissions and other relevant information; this

182 A great deal has been written about the use of information to create incentives for pollution reduction. *See, e.g.*, Hirsch, *supra* note 5, at 1112–13 (discussing Toxic Release Inventory as an example of information-based strategy); MICHAEL E. KRAFT, MARK STEPHAN & TROY D. ABEL, COMING CLEAN: INFORMATION DISCLOSURE AND ENVIRONMENTAL PERFORMANCE (2011) (discussing how information disclosure works, its effect on reducing community risks, environmental performance by industry, and broader policy implications); Daniel C. Esty, *Next Generation Environmental Law: A Response to Richard Stewart*, 29 CAPITAL UNIV. L. REV. 183, 193–204 (2001) (discussing information-based strategies as a growing and effective method for regulating industry). Hirsch notes that an information-based approach can encourage "green business" strategies. *See* Hirsch, *supra* note 5, at 1112–13 (describing information disclosures as empowering stakeholders and educating industry members, resulting in the combined effect of "get[ting] industry to take more seriously, and seek to reduce, its impacts on the environment and human health").

183 *See* KRAFT ET AL., *supra* note 182, at 181 (describing the substantial decrease in core chemical releases, and EPA's prevailing view about the program's success).

184 *See* Scott de Marchi & James T. Hamilton, *Assessing the Accuracy of Self-Reported Data: An Evaluation of the Toxics Release Inventory*, 32 J. OF RISK & UNCERTAINTY 57, 58–59, 59 n.4 (2006), *available at* http://www.precaution.org/lib/assessing_tri_accuracy.060115.pdf (reporting a 48% drop in releases of core toxic release inventory (TRI) chemicals between 1988 and 2000, noting that "inspections are relatively infrequent and fines relatively low"); Cass R. Sunstein, *Empirically Informed Regulation* 32 (Harv. L. Sch. Pub. Law & Legal Theory, Working Paper Series, Paper No. 13-03, 2011), *available at* http://ssrn.com/abstract=2128806 (stating that, despite seeming like "largely a bookkeeping measure," TRI has had "beneficial effects, helping to spur reductions in toxic releases"); Archon Fung & Dara O'Rourke, *Reinventing Environmental Regulation from the Grassroots Up: Explaining and Expanding the Success of the Toxics Release Inventory*, 25 ENVTL. MGMT. 115, 116 (2000), *available at* http://www.archonfung.net/papers/FungORourkeTRI00.pdf (noting that despite "minimal regulation and lackadaisical compliance," the data on TRI show that "[b]etween 1988 and 1995, total releases and transfers (as wastes) of the roughly 330 chemicals on the TRI list decreased by over 45%").

information is published on EPA's website.[185] Disclosure of this information provides an incentive for sources to look for ways to reduce GHGs, without mandating how they go about doing so.

### *C. Holistic/Integrated Approaches*

Sustainability often requires taking a more integrated approach to regulation that both looks at complex problems or geographic areas in a more comprehensive way, as well as applying the full range of tools available to EPA to address those problems.[186] This can be a challenge for programs designed to focus on narrowly defined environmental issues.

However, more comprehensive approaches can be developed, though it takes some effort. An example of such a holistic approach is the Integrated Municipal Stormwater and Wastewater Planning Approach Framework developed by EPA's Offices of Water and Enforcement.[187] The framework is part of an effort to work more collaboratively with municipalities in helping them to meet their Clean Water Act obligations.[188] Instead of taking a requirement-by-requirement approach to CWA compliance that may not address the most pressing problems first, the Framework allows for a more pragmatic approach. The Framework focuses on reducing overflows from wastewater systems and pollution from stormwater through a range of tools, including sustainable technologies such as green infrastructure, engagement of communities and stakeholders, flexibility in compliance schedules and use of permitting and enforcement mechanisms, and taking into consideration sustainability aspects of different alternatives.[189]

Such approaches do not change applicable regulations; rather they offer flexibility in the implementation and associated timing of regulatory requirements.[190] EPA's support of integrated watershed approaches, such as

185 *See* Mandatory Reporting of Greenhouse Gases, 74 Fed. Reg. 56,260 (Oct. 30, 2009); U.S. Envtl. Prot. Agency, *Greenhouse Gas Reporting Program: GHG Reporting Program Data Sets*, http://www.epa.gov/ghgreporting/ghgdata/reportingdatasets.html (last visited July 18, 2015) (describing the Greenhouse Gas Reporting Program and providing various tools for viewing the collected data).

186 *See, e.g.*, Stoner & Giles Memorandum, *supra* note 103, at 1 ("A comprehensive and integrated planning approach to a municipal government's CWA waste- and storm-water obligations offers the greatest opportunity for identifying cost-effective and protective solutions and implementing the most important projects first.").

187 *See* Memorandum from Nancy Stoner, Acting Assistant Adm'r, OW, and Cynthia Giles, Assistant Adm'r on Integrated Mun. Framework OECA, to U.S. Envtl. Prot. Agency Reg'l Adm'rs 1, (June 5, 2012), *available at* http://water.epa.gov/polwaste/npdes/stormwater/upload/integrated_planning_framework.pdf ("The framework identifies the operating principles and essential elements of an integrated plan.").

188 *See id.* ("Integrated planning will assist municipalities on their critical paths to achieving the human health and water quality objectives of the CWA.").

189 *Id.* at 2–7 (describing the Framework's overarching principles, the elements of an integrated plan, and procedure for implementation).

190 *E.g.*, *id.* at 2 ("The integrated planning approach does not remove obligations to comply with the CWA, nor does it lower existing regulatory or permitting standards, but rather

the use of watershed-based Total Maximum Daily Loads (TMDLs)[191] and watershed-based permitting,[192] are examples of more holistic approaches to geographic areas. These approaches also demonstrate how EPA can play a role as a "civic enabler" in implementing its regulatory programs, advancing community based approaches that support collaborative place-based work.[193]

Challenges to expanding the adoption of more integrated approaches that often use more place-based and collaborative engagement tools and methods include budget limitations for EPA, states, municipalities, and community organizations; capacity building across governments and in the community, including technical training, tool development and distribution; and agency accountability systems.[194] It is also just more complex and therefore harder to do.

### *D. Voluntary Programs*

We have focused on regulatory programs specifically to highlight their differences from the voluntary programs often associated with sustainability. However, it is important to note that the two are often linked; voluntary programs can complement, supplement, and even anticipate regulations. Voluntary programs can encourage the phase out of activities before an anticipated regulation becomes effective or may mitigate risks associated with products already in use.[195] For example, Massachusetts developed a voluntary program to encourage dental practices to install amalgam separators in their facilities in order to keep mercury from dental fillings from entering the state's wastewater treatment systems in advance of an expected regulation.[196] Those dentists who participated in the voluntary effort enjoyed a later regulatory compliance date—by over three years—

recognizes the flexibilities in the CWA for the appropriate sequencing and scheduling of work."); *see also* Robert Barkin, *Under Water*, AM. CITY & COUNTY, Apr. 1, 2013, http://americancityandcounty.com/water/under-water/ (last visited July 18, 2015) (discussing examples of municipalities using expanded compliance schedules and alternative green infrastructure practices to help address economic limitations and promote quality of life while greatly improving regulatory compliance).

191 *See* OFFICE OF WETLANDS, OCEANS & WATERSHEDS, U.S. ENVTL. PROT. AGENCY, EPA'S HANDBOOK FOR DEVELOPING WATERSHED TMDLS (Draft, Dec. 15, 2008), *available at* http://www.epa.gov/owow/tmdl/pdf/draft_handbook.pdf (discussing the TMDL program and describing procedure for identifying watershed candidates for TMDLs, developing TMDLs, and supporting implementation of watershed TMDLs).

192 Memorandum from G. Tracy Mehan III, Assistant Adm'r, U.S. Envtl. Prot. Agency, to Water Div. Dirs., Regions I–X (Jan. 7, 2003), *available at* http://water.epa.gov/polwaste/npdes/basics/upload/watershed-permitting-policy.pdf.

193 Carmen Sirianni, *Can a Federal Regulator Become a Civic Enabler? Watersheds at the U.S. Environmental Protection Agency*, 95 NAT'L CIVIC REV., Fall 2006, at 30.

194 *Id.* at 31–32.

195 *See, e.g.*, 310 MASS. CODE REGS. §§ 73.00–73.07 (2015) (Massachusetts amalgam wastewater and recycling regulations for dental facilities); Energy Star, *About Energy Star*, http://www.energystar.gov/about/ (last visited July 18, 2015) (explaining that Energy Star was developed to promote energy-efficient products).

196 *See* 310 MASS. CODE REGS. §§ 73.00–73.07.

than those who did not participate.[197] While the environmental benefits started immediately, the additional costs to the volunteering dentists associated with the recordkeeping and reporting requirements were delayed.[198] Similarly, the National Vehicle Mercury Switch Recovery Program was designed to reduce the cost to smelters of complying with rules controlling mercury emissions, by creating a voluntary effort to remove mercury switches from junked vehicles before they ever reached the smelters.[199]

Voluntary programs are also commonly used to address legacy issues. For example, the National Clean Diesel Campaign was set up to promote replacement of old, polluting diesel engines to complement regulations setting higher standards for new engines.[200] Voluntary programs can also address problems difficult to address through regulations, for example indoor air risks addressed by the EPA's Radon Program[201] or Green Schools initiative.[202] These programs can also promote product stewardship through labeling efforts, such as Energy Star or Design for the Environment.[203]

### *E. Voluntary Standards*

In addition to voluntary programs, there are many voluntary sustainability standards that set criteria for what it means to be "green"—often with regard to products.[204] Some such standards are set by EPA, but many are developed by the private sector, sometimes with EPA providing input.[205] Although not formally regulatory, voluntary standards can have a similar effect if market forces are strong enough. For example, where a standard such as Energy Star achieves widespread recognition and drives

197 *Id.* § 73.03.

198 *Id.* §§ 73.03, 73.06.

199 U.S. Envtl. Prot. Agency, *National Vehicle Mercury Switch Recovery Program*, http://www.epa.gov/earlink1/mercury/archive/switch/index.html (last visited July 18, 2015).

200 U.S. Envtl. Prot. Agency, *National Clean Diesel Campaign: Basic Information*, http://www.epa.gov/diesel/ (last visited July 18, 2015).

201 *See* U.S. Envtl. Prot. Agency, *Why is Radon the Public Health Risk that it is?*, http://www.epa.gov/radon/ (last visited July 18, 2015) (explaining the difficulty of regulating radon levels when there is no known safe exposure level and radon is found both outdoors and indoors).

202 *See* Green Schs. Initiative, *Green Schools Initiative*, http://www.greenschools.net/ (last visited July 18, 2015) (describing the initiative as a voluntary program promoting healthy and sustainable schools including improving indoor air quality).

203 Energy Star, *About Energy Star*, http://www.energystar.gov/about/ (last visited July 18, 2015); U.S. Envtl. Prot. Agency, *Learn About the Safer Choice Label*, http://www2.epa.gov/saferchoice/learn-about-safer-choice-label (last visited July 18, 2015).

204 U.S. Envtl. Prot. Agency, *Greener Products: Introduction to Eco-Labels and Standards*, http://www.epa.gov/greenerproducts/standards/index.html (last visited July 18, 2015).

205 *Id.* In addition to issuing its own voluntary standards, as an alternative to promulgating regulations, EPA sometimes participates in voluntary industry standard setting. As discussed earlier, EPA supported the ASTM Standard Guide for Greener Cleanups, which provides a step-by-step process for implementing, verifying, and recognizing greener cleanups and site assessments across regulatory and voluntary cleanup programs. *See supra* note 162 and accompanying text.

decisions for many consumers, it can have quasi-regulatory status because manufacturers find they are unable to compete if they do not conform to it.[206] In other cases, standards adopted as voluntary by EPA are converted to regulatory requirements by other agencies; for example, some cities have established energy efficiency benchmarking and disclosure requirements for new buildings, and require that building owners use EPA's Energy Star Portfolio Manager tool in measuring their performance.[207]

As a component of efforts to improve air quality and reduce GHG emissions, cities and states may also include energy efficiency measures, often based on reductions achieved with voluntary programs, as elements of their local and regional air quality planning efforts and in federally enforceable air quality State Implementation Plans (SIPs).[208]

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206 *See* ENERGY STAR, ENERGY STAR PRODUCTS: 20 YEARS OF HELPING AMERICA SAVE ENERGY SAVE MONEY AND PROTECT THE ENVIRONMENT 1, 5–6, 8, 14, *available at* http://www.energystar.gov/ia/products/downloads/ES_Anniv_Book_030712_508compliant_v2.pdf (explaining Energy Star's rise to becoming a standard for consumers and a driving force in the market). As another example, in 2013, Apple announced that it was withdrawing its products from the EPEAT registry, a nongovernmental standard with EPA-provided input. Within a few days, Apple discovered that important customers, such as cities, would not purchase products that were not EPEAT registered. Apple quickly reversed its decision and added even more products to the registry. Kristine Wong & Liz Enochs, *Apple's EPEAT Reversal Shows Sustainability's Clout*, GREENBIZ, July 13, 2012, http://www.greenbiz.com/blog/2012/07/13/apple-reverses-withdrawal-epeat-green-registry (last visited July 18, 2015). It is interesting that no manufacturer has sought to require EPA's voluntary standards to be adopted pursuant to formal administrative proceedings. From EPA's perspective, this is an advantage because it allows standards to be issued—and more importantly updated—much more frequently than if they were rules. *See* U.S. Envtl. Prot. Agency, *EPA Standards Network Fact Sheet: Role of Voluntary Standards*, http://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=20000WU3.txt (last visited July 18, 2015) (explaining that voluntary standards are distinguished from regulatory processes and can be revised and written by different groups). Moreover, Energy Star standards have been incorporated into other agency's regulations; for example, the Department of Energy's Energy Conservation Program for Consumer Products incorporates EPA's Energy Star standards and testing protocols. *See* 10 C.F.R. §§ 430.3(a), 430.3(j)–(l) (2013).

207 State & Local Energy Efficiency Action Network, *Energy Benchmarking, Rating, and Disclosure for Local Governments*, https://www4.eere.energy.gov/seeaction/system/files/documents/commercialbuildings_factsheet_benchmarking_localgovt.pdf (last visited July 18, 2015); Sara Mattern, *Municipal Energy Benchmarking Legislation for Commercial Buildings: You Can't Manage What You Don't Measure*, 40 B.C. ENVTL. AFF. L. REV. 487, 493 (2013) (discussing EPA's creation of the Portfolio Manager as a system for commercial building owners and operators to compare their energy performance against similar buildings). For example, the City of Philadelphia's new energy benchmarking law requires commercial buildings over 50,000 square feet to use Portfolio Manager to benchmark their energy and water use, and publicly disclose those figures in year two, thereby giving them a year to make changes to reduce their energy and water use before having to share the information publicly. City of Phila., *Be Compliant*, http://www.phillybuildingbenchmarking.com/compliance/ (last visited July 18, 2015); PHILA., PA., CODE § 9-3402 (2013), *available at* http://www.amlegal.com/nxt/gateway.dll/Pennsylvania/philadelphia_pa/thephiladelphiacode?f=templates$fn=default.htm$3.0$vid=amlegal:philadelphia_pa.

208 Moneen Nasmith, *Encouraging Energy Efficiency through the Clean Air Act*, CTR. FOR CLIMATE CHANGE LAW, COLUMBIA L. SCH., Apr. 2013, at 3–4, *available at* https://web.law.columbia.edu/sites/default/files/microsites/climate-change/files/Publications/Collaborations-Visiting-Scholars/Moneen%20CAA%20energy%20efficiency_final%20draft.pdf; METRO.

### *F. "Reflexive" Regulation*

Analysts have coined the term "reflexive" to describe regulations that, rather than specifying actions that must be taken to reduce environmental harms, only require regulated parties to take intermediate steps that make them—and others—more aware of their own behavior and create incentives to develop better alternatives.[209] Reflexive regulation is highly compatible with an aim of sustainability because of the flexibility it provides; facilities can come up with their own solutions, on their own timetable and tailored to their own organizational needs.[210]

Information disclosure, discussed earlier, is one example of a reflexive regulatory model. Closely related are requirements relating to sustainability reporting; these do not exist in the United States but are imposed in a number of other countries.[211] Still another example may be the laws adopted by some states that require companies to do pollution prevention assessments, but leave it to the companies whether to adopt any opportunities that may be found.[212] Corporate systems for managing environmental risk, which have become quite sophisticated, reflect the adoption of practices for self-regulation and can also stimulate movement toward sustainability within the business's operations.[213]

## VI. SUSTAINABILITY PROGRAMS?

As EPA begins to think about incorporating sustainability into its regulatory programs, an inevitable question will be whether it should establish programs specifically designed to facilitate or reward actions by businesses, governments, and others that advance economic, environmental, and social goals at the same time. EPA's past experience with programs of this nature is cautionary on this point.

In the past EPA has established programs specifically designed to create flexibility for innovative, sustainable approaches, and create

WASHINGTON COUNCIL OF GOV'TS (MWCOG) AND DEP'T OF ENVTL. PROGRAMS (DEP), PROTOCOL RECOMMENDATION, INCLUSION OF ENERGY EFFICIENCY AND RENEWABLE ENERGY IN STATE IMPLEMENTATION PLANS FOR AIR QUALITY AND CLIMATE CHANGE, Mar. 31, 2010, at 1–2, *available at* http://www.mwcog.org/uploads/pub-documents/rF5fXl420100430081758.pdf.

209 *See* Hirsch, *supra* note 5, at 1105–15.

210 *Id.* at 1125.

211 In 2014, the European Union adopted a directive requiring member states to require businesses to report on sustainability matters. *See* Global Reporting Initiative, *Sustainability Reporting in the European Union*, https://www.globalreporting.org/information/policy/Pages/EUpolicy.aspx (last visited July 18, 2015).

212 *See* Lori Snyder Bennear, *Are Management-Based Regulations Effective? Evidence from State Pollution Prevention Programs*, 26 J. POL'Y ANALYSIS & MGMT. 327 (2007) (finding that pollution prevention planning requirements have a significant effect on adoption of pollution prevention strategies).

213 *See* Hirsch, *supra* note 5, at 1117–18, 1124 (discussing role of environmental management systems in driving sustainability).

incentives for "superior environmental performance."[214] The history of these programs is not, on its face, very encouraging. Neither of the two high profile efforts adopted in the past twenty years survives. While each had its champions, they were both controversial and ultimately each was terminated when there was a change of political administration. A careful look at this experience can, however, provide valuable lessons for moving forward.

"Project XL," a program set up in the Clinton administration, offered regulatory flexibility to allow businesses, government agencies, and communities to develop innovative strategies to test better or more cost-effective ways of achieving environmental and public health protection.[215] EPA issued regulatory, program, policy, or procedural flexibilities to conduct such experiments, though the pilots might have deviated from past practices and, in some cases, existing regulatory requirements.[216]

Project XL led to a wide variety of regulatory experiments designed to facilitate and encourage "superior environmental performance" while also yielding economic savings or other benefits to the regulated parties.[217] Many of these projects raised the kinds of issues discussed above. For example, several projects involved facility-wide or flexible air permits.[218] Others sought to exempt waste streams from RCRA regulation so that they could be recycled, or to reflect the fact that a particular facility had changed its production processes so that its regulated wastes were no longer toxic.[219] Some attempted to tie together particular regulatory flexibilities with a comprehensive environmental management scheme for the facility that included a robust public participation process.[220] Although Project XL did not emphasize the terminology of sustainability, its initiatives were clearly consistent with such a goal.

Unfortunately, Project XL also illustrated the difficulty of looking for win–win scenarios. Regulated parties and environmentalists did not agree on

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214 Regulatory Reinvention (XL) Pilot Projects, 61 Fed. Reg. 47,929, 47,929–30 (Sept. 11, 1996).

215 *See* Wyeth, *supra* note 5, at 45–50; Bradford C. Mank, *The Environmental Protection Agency's Project XL and Other Regulatory Reform Initiatives: The Need for Legislative Authorization*, 25 ECOLOGY L.Q. 1, 3, 5, 41 (1998); Richard B. Stewart, *A New Generation of Environmental Protection?*, 29 CAP. U. L. REV. 21, 64–68 (2001); Dennis Hirsch, *Project XL and the Special Case: The EPA's Untold Success Story*, 26 COLUM. J. ENVTL. L. 219, 220–22 (2001).

216 61 Fed. Reg. at 47,929–30.

217 *See* U.S. Envtl. Prot. Agency, *What is Project XL?*, http://www.epa.gov/projectxl/file2.htm (last visited July 18, 2015).

218 *See* Dennis D. Hirsch, *Lean and Green? Environmental Law and Policy and the Flexible Production Economy,* 79 IND. L. J. 611, 641 (2004).

219 *See* U.S. Envtl. Prot. Agency, *Molex Incorporated*, http://www.epa.gov/projectxl/molex/index.htm (last visited July 18, 2015) (describing project reclassifying waste to allow reuse); U.S. Envtl. Prot. Agency, *Ortho-McNeil Pharmaceutical*, http://www.epa.gov/projectxl/ortho/index.htm (last visited July 18, 2015) (describing project in which production method changed to be environmentally safer).

220 Lisa C. Lund, *Project XL: Good for the Environment, Good for Business, Good for Communities*, 30 ENVTL. L. REP. (ENVTL. L. INST.) 10,140, 10,147–48 (2000).

the benchmark by which to judge whether the arrangement was "superior."[221] Federal and state regulators tended to subject proposals to serious scrutiny to ensure that inferior projects were not approved, but this also created delay and transaction costs.[222] Public participation processes designed to build consensus further increased transaction costs.[223]

Project XL ended when the George W. Bush administration took office.[224] In part, this was simply a rejection of anything associated with the Clinton–Gore initiative on "reinventing government."[225] The Bush administration turned its attention to more sweeping, fundamental changes in the underlying regulations, while environmental groups certainly expressed no disappointment at its termination.[226] Even the industries that had benefited from it made little or no protest, suggesting that whatever appeal it might have had as a means for providing flexibility to industry was outweighed by the cost and difficulty of acting on a facility-by-facility basis.

A second flagship program was Performance Track, a public-private partnership launched late in the Clinton administration but primarily implemented in the Bush administration.[227] Performance Track offered public recognition to facilities that maintained good compliance records, adopted robust environmental management systems, disclosed information about their performance to the public, and undertook other environmentally beneficial actions.[228] The program made an extended effort to find regulatory benefits that could be offered to its members on the theory that they were better managed and more compliant than most regulated parties.[229] However, in the end, EPA's program offices were either unwilling or unable to identify more than a few marginal benefits—e.g., ability to store hazardous waste onsite for a somewhat longer period than otherwise allowed.[230] Participants did receive low priority for routine inspections.[231]

By 2008, Performance Track had attracted over 500 member facilities.[232] However, it also attracted critics, who questioned whether the participants

221 *See* Stewart, *supra* note 215, at 67; Wyeth, *supra* note 5, at 47–49.

222 *See* Wyeth, *supra* note 5, at 49–50.

223 *See id.* at 46–50.

224 *Id.* at 50.

225 *See* Charles S. Clark, *Reinventing Government: Two Decades Later*, GOV'T EXEC., Apr. 26, 2013, http://www.govexec.com/management/2013/04/what-reinvention-wrought/62836/ (last visited July 18, 2015) ("When George W. Bush entered the Oval Office in 2001, there was a noticeable chilling toward reinventing government." (internal quotation marks omitted)).

226 *See* Wyeth, *supra* note 5, at 44, 47 (stating that environmental advocates viewed Project XL "as a retreat, not an advance").

227 For a detailed explanation of the program's history, design, and outcomes, see Cary Coglianese & Jennifer Nash, *Performance Track's Postmortem: Lessons From the Rise and Fall of EPA's "Flagship" Voluntary Program*, 38 HARV. ENVTL. L. REV. 1 (2014).

228 *See id.* at 23–26.

229 *See id.* at 29–30.

230 *See, e.g.*, *id.* at 29 (listing prolonged hazardous waste storage as one out of only a few regulatory benefits for Performance Track members).

231 *Id.*

232 *Id.* at 66.

were doing anything more than they would have in the absence of a government program.[233] Groups with a skeptical outlook on industry were suspicious of the low inspection priority.[234] They also found what appeared to be evidence of significant violations by some members; although EPA concluded that this was not the case, the appearance problem was never put to rest.[235] It did not help that the Bush administration had an image of being overly pro-industry; the Performance Track program became to some extent a poster child, whether this was deserved or not. Ultimately, Performance Track was terminated a few months after the Obama administration took office.[236]

The experience with these programs suggests that creating a special vehicle for sustainability is not an attractive strategy. Their transaction costs were high,[237] and in both cases the appearance that they were designed to provide benefits to industry made them unpopular with EPA's core constituencies. From an internal agency perspective, locating the programs outside EPA's main program offices created organizational tensions. Ironically, the high level of visibility they received as administration priorities made decisions more complicated and time consuming,[238] and made them targets when administrations changed.

These programs did, however, provide some useful experience on which EPA can draw as it explores the potential for sustainability today. First, they demonstrated that the environmental statutes provide a good deal of flexibility to accommodate sustainable approaches; programs used to doing things a certain way often found, when pushed, that other options were available. It has been the authors' observation that experience gained in these programs has also created greater willingness to experiment, and has made EPA staff aware that such experimentation could lead to better policy options for the future. They also demonstrated the need for sustained attention from senior agency managers for unconventional strategies to succeed.

Nothing prevents EPA from using these lessons to create regulatory space when it is needed to advance sustainability, even without setting up a formal program such as Project XL. Some of the examples discussed earlier,

233 *See id.* at 62–63; Jonathan C. Borck, Cary Coglianese & Jennifer Nash, *Environmental Leadership Programs: Toward an Empirical Assessment of Their Performance*, 35 ECOLOGY L.Q. 771, 780 (2008).

234 *See, e.g.*, Eric Schaeffer, ENVTL. INTEGRITY PROJECT, *Press Release: EPA "Honor System" Leads to More Pollution at 10 out of 13 Industrial Sites Getting Less Oversight*, Feb. 8, 2006, http://64.78.8.68/publications/Press_Release_EPA_Honor_System.php (last visited July 18, 2015).

235 *See* Coglianese & Nash, *supra* note 227, at 7–8 (recognizing environmental groups' criticism of Performance Track, and EPA's continued support and defense of the program).

236 *Id.* at 8.

237 *See id.* at 69–70, 73 (demonstrating that participation levels in sustainability programs decreased as transaction costs increased). Transaction costs were also high for EPA because of the effort required to review applications.

238 *See id.* at 34 (discussing that because these voluntary sustainability programs became a priority, they consumed too much staff time and were not "a wise use of agency resources").

such as the trading system for the Tualatin River in Oregon, or the Kendall Station power plant in Boston, suggest that similar arrangements may be workable when carried out within EPA's existing regulatory programs.

## VII. WHAT HAVE WE LEARNED?

The experience described above shows that EPA has found opportunities on many occasions to foster economic and social benefits, as well as environmental ones, in its regulatory programs. At the same time, it is apparent that there are challenges in doing so. We can draw a number of essential lessons from the examples discussed above.

First, where EPA has advanced sustainability through its regulatory programs, it has done so sometimes by directing that result, but more often by enabling or facilitating actions taken at the initiative of others, such as corporations or cities.[239] This is not surprising, since EPA's expertise lies in environmental protection, whereas other entities are more likely to find economic or social opportunities.

Second, win–win opportunities will not present themselves in every case; they may be the exception more than the rule, because of inherent tensions between regulation and sustainability. Regulations are most effective when they are specific and unambiguous. Uniformity is also an important regulatory principle, to ensure that parties are treated consistently.[240] Regulation is top-down, and generally static.[241] Sustainability, on the other hand, is unpredictable, may involve initial uncertainty, emphasizes improvement over time—often stemming from technical or other innovations—and often grows out of particular local circumstances.[242]

Furthermore, most regulations advance only one of the three pillars of sustainability: the environmental goal, and within that, typically the narrower goal of a particular program. Social and economic goals tend to be viewed as secondary, if not constraints on how far environmental aims can or should be advanced.[243] Sometimes there are tradeoffs among the pillars of sustainability, rather than the hoped-for synergies.

Third, as a result of these tensions, promoting sustainability can be resource intensive, particularly when developing a tailored solution for unusual or localized circumstances. Assessing the environmental effect of new methods for controlling pollution often takes time, and regulators need

239 *See supra* notes 95–103 and accompanying text (discussing EPA's incorporation of city directed green infrastructure projects, including rain gardens, into consent decrees).

240 *See supra* notes 165–166 and accompanying text (discussing how enforcement regulatory actions can serve as a way to tailor sustainability solutions to specific circumstances while "achieving the goals of certainty and assurance within legally enforceable frameworks" and ensuring that "comparable situations are handled consistently").

241 *See supra* note 34 and accompanying text.

242 *See supra* notes 58–59 and accompanying text.

243 *See supra* notes 8, 16, 20, and accompanying text (discussing how regulatory programs have traditionally promoted only environmental goals while attempting to, at best, minimize tradeoffs with economic goals).

to ensure that they are not creating undesirable precedents.[244] With shrinking state and federal resources, it's hard enough to carry out basic program requirements; it is very challenging to find the time and resources to review and address other non-mandated changes, even if they have environmental, economic, or social benefits.[245] Furthermore, if claimed social or economic benefits are identified first by other parties—often regulated entities—regulators and others will tend to be skeptical and will seek to ensure that they are not sacrificing environmental goals.[246] This means that projects may require a certain critical mass, both in terms of benefits and support, to warrant the effort involved.

Fourth, other institutional and cultural factors can also impede embracing sustainability in a regulatory context. Organizational accountability systems tend to discourage tailoring rules or permits to innovative sustainable practices if the added complexity means a reduction in the number of deliverables—e.g., permits—on which the program is graded each year.[247] Budget constraints similarly tend to encourage uniformity rather than adaptation and force a focus on short term costs; EPA's foreseeable budget situation will be one of the greatest impediments to sustainability. Another well-known organizational impediment is the media-based structure of EPA and state agencies, which creates silos that are difficult to work across.[248]

Fifth, these barriers are not, however, insurmountable. Regulators can, to some degree, accommodate the fact that sustainability is unpredictable and may arise out of unique local circumstances.[249] Furthermore, over time it may be possible to identify recurring patterns in what seemed at first to be local anomalies, and develop broader policies accordingly; green infrastructure is a good example of this. Most fundamentally, regulations can be designed to provide greater room for innovation without weakening standards, particularly through trading and other second generation approaches.[250] The holy grail of performance-based regulation has proven more elusive than anticipated, but is still worth pursuing. EPA's "clean

244 See *supra* notes 52–63 and accompanying text.

245 Patrick Ambrosio, *President Proposes Cut to EPA Funding for Fiscal Year 2015*, BLOOMBERG, Mar. 6, 2014, http://www.bna.com/president-proposes-38-n17179882596/ (last visited July 18, 2015).

246 *See supra* notes 131–134 and accompanying text.

247 See Karen Horsch, *Results-Based Accountability Systems: Opportunities and Challenges*, THE EVALUATION EXCHANGE, Winter 1996, http://www.hfrp.org/evaluation/the-evaluation-exchange/issue-archive/results-based-accountability-1/results-based-accountability-systems-opportunities-and-challenges (last visted July 19, 2015) (noting that a significant challenge to the development of accountability based systems is that they "may become indicator driven rather than outcome driven; people may choose measures that are easy to collect or affect rather than address more challenging problems").

248 OFFICE OF THE INSPECTOR GENERAL, STUDIES ADDRESSING EPA'S ORGANIZATIONAL STRUCTURE 7–8 (Aug. 16, 2006), *available at* http://www.epa.gov/oig/reports/2006/20060816-2006-P-00029.pdf.

249 *See supra* notes 75–77 and accompanying text.

250 *See supra* Parts V.A.–V.B. and accompanying text.

power plan" proposal can be seen as a performance-based rule, setting goals but providing very broad discretion in how they can be achieved.[251]

Transaction costs may also decline to some extent as EPA's staff develops expertise, and as the agency develops institutional knowledge to build on. Furthermore, in some cases, initial costs may be offset by later savings in resources associated with permit changes, challenges, and litigation. EPA may be able develop early screening criteria to sort out which projects are worth investing in.

Sixth, an important lesson has been that states play a critical role. The federalized nature of the regulatory system means that state—and sometimes local—as well as federal regulators need to be involved. On one hand, this can increase transaction costs and expands the number of people with the ability or motivation to veto an innovative approach, regardless of how much support it may have from an EPA region and headquarters. However, in many cases, states have also been the greatest proponents of sustainability, being closer to the resulting economic and social benefits.[252] Their involvement can also bring greater energy to the process, and as front line implementers they often bring a focused problem-solving approach to bear. Also, as the direct implementers, states will need to be fully engaged as partners in implementing many of the ideas in this paper.

## VIII. HOW DO WE GET THERE?

Given these lessons, what steps could EPA take to embed principles of sustainability into its regulatory programs? Innumerable reports have been written only to sit on shelves because no one took the trouble to figure out a specific action plan for turning their recommendations into action. It would be a shame if that were to happen to the NAS Report, so we offer the following as a series of steps that could be taken to turn "Sustainability at the U.S. EPA" into a reality.

### *A. Embed Sustainability in Agency Planning*

EPA has already taken a first step by incorporating sustainability into the agency's strategic planning process. As part of the proposed 2014–2018 Strategic Plan, EPA has included a Cross Agency Strategy for sustainability.[253] This includes outreach to stakeholders, in-reach to agency staff and management, and the incorporation of sustainability into the regulatory programs—and specifically into regulations and enforcement programs.[254] Going forward, as EPA develops program and regional annual work plans and annual action plans for the Cross Agency Strategy, it should

251 *See supra* notes 86–92 and accompanying text.

252 *See* Envtl. Council of the States, *Innovation and Sustainability in the States*, http://www.ecos.org/content/innovations (last visited July 18, 2015).

253 EPA STRATEGIC PLAN, *supra* note 158, at 44–45.

254 *Id.*

specifically address what it will do to incorporate sustainability principles into its core regulatory programs.

### *B. Communicate Support and Key Information to Agency Staff*

Ultimately, sustainability will only take root if it is part of the daily work of regulatory staff in providing regulatory interpretations, state oversight, technical assistance, and compliance assistance. An important next step may be simply to provide clear guidance that advancing multiple goals is a legitimate and desirable aim for regulatory programs, so long as environmental goals are not sacrificed.[255] More broadly, EPA should explicitly adopt practical principles of the kind we set out in Part I, to translate lofty definitions of sustainability into terms that programs can act upon. Part of this education process must be highlighting that sustainability means more than reducing costs—it means creating value in multiple spheres, including economic and social value. This is why sustainability deserves to be an organizing principle for the agency.

Another basic step would be to make program staff aware of past successes such as those we've highlighted here. This will help overcome skepticism and help them draw analogies to situations they may be facing. It will also help staff and managers to recognize success when they see it and encourage them to claim credit for that success. Over time, programs can actively monitor additional lessons.

Most importantly, EPA line and senior managers should ask questions regarding every decision: How is sustainability advanced by this decision? How have you thought about advancing sustainability with this decision? What potential co-benefits will result or could be gained as part of this decision?

### *C. Provide Guidance to Staff*

Of course, it will ultimately be necessary to go beyond illustration to provide guidelines that staff can rely on. EPA can provide guidance that captures what others have already learned, which can be built on by others. Some such lessons might include:

- Types of circumstances that are more promising—or less so—based on past experience
- Regulatory models that tend to be more sustainability-friendly
- General criteria; for example, that environmental goals should not be sacrificed to obtain other benefits

255 A precedent may be the agency's extended effort to embed environmental justice as a desired goal in all its activities rather than treating it as an isolated sidebar activity. See U.S. ENVTL. PROT. AGENCY, PLAN EJ 2014 i–iii (2011), *available at* http://www.epa.gov/environmentaljustice/resources/policy/plan-ej-2014/plan-ej-2011-09.pdf.

- How particular sustainability principles can be advanced—e.g. effective engagement of a range of stakeholders, application of life-cycle assessment tools

Assistance can also be provided to staff in other ways. One basic need is to provide training related to sustainability terminology, methods, and mechanisms, particularly as applied at EPA—including pursuant to EPA grants and other funding mechanisms. EPA should also track what happens over time, revising and expanding its policies and guidance to hardwire that experience into a new institutional capacity.

### *D. Provide Legal Guidance*

Agency staff responsible for administering regulatory programs will be very reluctant to make sustainability a goal unless they are satisfied that the authorizing statutes allow it. Therefore, another important step will be to provide guidance on when and how sustainability can be squared with EPA's current statutes. This is probably not something that can be done in the abstract; it will require case-by-case analysis. However, early guidance might be used to make staff aware of examples of how statutes have been interpreted in the past to allow sustainable approaches as a guide for handling new cases.

### *E. Get the Incentives Right*

EPA should also tweak accountability systems so that agency staff get credit for doing work that advances sustainability.[256] This means more than just giving occasional awards—which in our experience are not effective motivators. For example, regional and state program commitment systems could include premiums for those commitments that advance multiple sustainability principles or have clearly defined co-benefits. Furthermore, staff and manager annual performance agreements could include elements that require the advancement of sustainability principles.

### *F. Create a Governance Structure*

It is not necessary to create new, dedicated programs for sustainability, and past history suggests it is not a promising model. EPA's shrinking budget makes this impossible in any case. However, there is a need for a cross-agency governance structure to address the need to work across media lines, and ensure that there is some strategic focus to the work across the agency. Such a structure should include senior political and career

256 The same should be done with regard to the system of state commitments required by EPA as a condition for federal assistance. States should probably not be required to adopt sustainability as a goal, but should at least be rewarded when they find opportunities.

leadership, headquarters and regional senior managers, as well as middle managers directly responsible for program implementation. EPA has already taken steps in that direction and should continue to work on its governance model.[257] It will be very easy for a commitment to sustainability, even when embedded in the strategic plan, to be overtaken by urgent program priorities or the difficulties of working across organizational lines.

### *G. Future Research*

Further research can also help. While we are not researchers, some topics that we would suggest deserve attention include the following:

First, many of the examples described in Parts III and IV would be useful case studies to assess whether they are useful models. Were the Tualatin River trading program[258] or the Kendall Station permit[259] examples that could be widely followed, or were they tied to unique local circumstances? If they were to some extent unique, do they suggest strategies that could be used to facilitate tailoring in other cases? Sustainability is often organic, growing out of a particular situation. How can national programs, designed to operate uniformly, also deal with those situations on a case-by-case basis?

Second, legal analysts spend many hours framing arguments relating to options for design of regulations, but tend to pay little attention to their implementation. Flexible air permits appeared to have very attractive features when they were piloted—giving companies the ability to make rapid operational changes while creating incentives for reduced emissions.[260] However, it appears to date that they have not been widely implemented. Why is this? Were there institutional barriers in regulatory programs, or was there a lack of interest in industry? Where they have been adopted, were the anticipated benefits achieved?

Third, while the topic of performance-based regulation has been written about extensively, the current situation is something of a standoff.[261] While the potential advantages of setting broad, facility-wide limits that provide operational flexibility are clear, so are the practical challenges of doing so. However, the advantages of such an approach from a sustainability standpoint are clear enough that some creative thinking on how to establish such limits would be extremely valuable. It is likely that any solution would require an entirely new approach and changes to the relevant statutes.

Fourth, are there more opportunities than have been identified here to directly mandate the adoption of more sustainable approaches to production and consumption? If so, are these appropriate for federal regulation, or are they more appropriate for state or local action?

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257 EPA STRATEGIC PLAN, *supra* note 158, at 51–52.

258 *See supra* notes 64–68 and accompanying text.

259 *See supra* notes 69–74 and accompanying text.

260 *See supra* notes 81–92.

261 *See supra* notes 88–92 and accompanying text.

Finally, a study of how organizational factors affect agency policy might generate interesting results. Do programs have any incentive to look for economic or social benefits? If not, how could such incentives be created? How do budgeting and accountability systems affect behavior? Often direction is given by agency leadership, but institutional barriers, or interests of particular groups in a position to block action, impede implementation. Understanding these dynamics, and whether they might be changed, would be a very worthy research endeavor.

## IX. CONCLUSION

As we have emphasized, it will not always be possible to advance social and economic goals through environmental regulatory programs; "win–win" scenarios are probably the exception rather than the rule. However, the agency's history shows that it is possible. It will take sustained, concerted effort, but we believe that the principles of sustainability can be embedded in the agency's regulatory DNA.

We have focused on EPA's regulatory programs because, on one hand, they remain the largest part of its work, and on the other they tend to be overlooked in discussions of sustainability. Moreover, the fact that they are being overlooked is usually not explained or justified. We believe EPA should recognize sustainability as a goal, and casually disregarding what that would mean for most of the agency's programs will not do.

Our review of the record indicates that regulatory programs have been seen as barriers to sustainability as often as ways to advance it. Regulation and sustainability are very different in style, one emphasizing certainty and conformity, the other innovation and change over time. For EPA to fully embrace sustainability, it will be necessary to identify those cases where regulatory programs have succeeded in advancing sustainable practices, and learning from them so they can be replicated.

EPA is being buffeted by many headwinds these days; its budget and workforce are shrinking and some of its most prominent proposals are under political attack. It will be difficult at best under these circumstances to introduce new concepts, certainly concepts as complex as sustainability. Nevertheless, EPA should make the effort wherever it can, to ensure that it remains on the forefront of environmental thinking.