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ARTICLE

Engines of Environmental Innovation: Reflections on the Role of States in the U.S. Regulatory System

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Ralph Waldo Emerson said, “[d]o not go where the path may lead, go instead where there is no path and leave a trail.”1 This reflection from an American poet with a passion for the environment seems to set the stage well for an article reflecting on the role of state environmental regulatory, programmatic, and

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1. Ralph Waldo Emerson.
management innovation. States are often referred to as “laboratories” within the American federal system, where innovative approaches to challenging problems facing society and our nation’s governance are pioneered and refined—with the most successful and promising ideas setting the stage for national application. The arena of environmental statutes and regulation is no exception.

Think, for example, of California’s Porter Cologne Act, widely acknowledged as the model for the federal Clean Water Act. However, referring to states as laboratories in the realm of environmental regulation may not fully reflect the role they have come to play over time, particularly in the environmental field. Rather, when we fully consider states’ role as co-regulators in the American system of cooperative federalism, with reflection on and assessment of the volume of purely state-level environmental regulation, we might more properly term states as “engines” of environmental regulation.

This article focuses on the role that states play in environmental regulation. Specifically, this article offers examples of the central part in the evolution of United States

2. See Oregon v. Ice, 555 U.S. 160, 160 (2009); United States v. Lopez, 514 U.S. 549, 581 (1995) (Kennedy, J., concurring); New State Ice Co. v. Liebmann, 285 U.S. 262, 311 (1932) (Brandeis, J., dissenting) (“It is one of the happy incidents of the federal system that a single courageous state may, if its citizens choose, serve as a laboratory; and try novel social and economic experiments without risk to the rest of the country.”). Consider, for example, that Massachusetts’ health care system is widely acknowledged as the basis for the Affordable Care Act. See The Henry J. Kaiser Family Found., Massachusetts Health Care Reform: Six Years Later 2 (2012), available at https://kaiserfamilyfoundation.files.wordpress.com/2013/01/8311.pdf, archived at https://perma.cc/YK8H-DKZK.


4. History of the Water Boards, State Water Res. Control Bd., http://www.swrcb.ca.gov/about_us/water_boards_structure/history_water_policy.shtml (last updated Sept. 20, 2011), archived at http://perma.cc/4WQ7-VEDF (“Porter-Cologne, named for the late Los Angeles Assemblyman Carly V. Porter and then-Senator Gordon Cologne, was recognized as one of the nation’s strongest pieces of anti-pollution legislation . . . . The new state law was so influential that Congressional authors used sections of Porter-Cologne as the basis of the Federal Water Pollution Control Act Amendments of 1972, known as the Clean Water Act.”).
environmental regulation states played in the past, continue to play today, and will play in the future. First, this article explores the history of state environmental regulation, demonstrating that despite a lack of resources, states were actively engaged in environmental regulation before the advent of the modern era of federal environmental regulation in the 1970s. This article relates not only the regulatory efforts of states, but also the practical benefits of state regulation. Further, this article discusses the ways in which state environmental regulations were used to form the first federal environmental laws, demonstrating that states have been environmental innovators from the outset. Second, this article describes the current environmental regulatory scheme, often referred to as cooperative federalism, which demonstrates the states’ major role in carrying out the nation’s system of environmental statutes and regulation. Third, this article provides several examples of states’ continuing role as environmental innovators, highlighting several state efforts to establish programs and regulatory approaches that exceed the minimum level of environmental regulation established by the federal government. While acknowledging that some states adopt the federal minimum environmental standards as maximum regulatory approaches in their borders, this article nonetheless asserts that states’ actions as innovators is powerful and necessary, as evidenced by their ability to influence the market using their own environmental regulations, their ability to partner with other organizations to create new federal standards, and their ongoing efforts to work with the federal government to improve on the collaborative federalism model. This article concludes that this nation must move to an era of true environmental partnership between states and the federal government to achieve meaningful environmental progress—and to deliver the clean and healthy environment all Americans have come to expect and demand. To do this, we must continue to fuel states with political, fiscal, and public support, so that they may continue their important role as engines of environmental innovation.
I. WHERE THERE IS NO PATH: STATE ENVIRONMENTAL REGULATION PRE-CORE CONTEMPORARY STATUTES

Prior to the 1960s, states were doing substantial work to address activities compromising human health, natural resources, and the ambient quality of air, water, and land. For example, state efforts to control air pollution began as early as 1881, and in fact, “the most extensive research, which focuses on air pollution, shows clearly that states and municipalities were making considerable strides before the federal regulatory era.”

There were forty municipalities with effective controls on air pollution by 1920, and by 1970, the year the first major federal environmental statutes were enacted, there were 107. States were supplementing these local municipal efforts with their own air quality laws, and by 1960, many states had taken significant steps to control air pollution. Just six years later, states had begun to develop more specific laws, and “ten states had adopted at least some ambient air quality standards, which covered fourteen substances as well as deposited matter. In addition, six states had emissions standards covering some stationary sources.” Retrospective studies of the effectiveness of efforts undertaken by the states in the 1960s to late 1970s show ambient air quality improvements, sulfur dioxide reductions, and particulate matter improvements.

7. Revesz, supra note 5, at 580 (“By 1960, eight states had general air pollution control laws; another nine had undertaken measures to control air pollution under their general public health laws; and eight others had authorized local air pollution control agencies to transcend municipal boundaries in their regulatory efforts.”).
8. Id.
9. Id. at 580-82 (discussing studies that “attempted to quantify improvements in the ambient air quality levels for sulfur dioxide and particulates before 1970 . . . [and] which suggest that states responded vigorously to those air pollution problems that were understood at the time”).
State efforts to protect the environment and public health were not exclusively focused on air pollution prior to 1970. Water quality was also a significant concern for state governments, especially as the link between water quality and disease became clearer. For example, New York State began regulating municipal drinking water in 1904. In 1904, the State created the Water Supply Commission and “[a]ll cities except New York were required to submit their plans for new water supplies to the Commission, and the Commission began reporting on water sources, water quality, and methods of sewage disposal.” The Commission supplemented the duties carried out by the State Department of Health, created in 1901, which investigated “diseases caused by ‘overflow of the canals.’” Even before New York’s efforts at the turn of the century, Oregon had enacted a statute, which prohibited “pollution of waters used for domestic or livestock purposes.” In 1938, Oregon established the Oregon State Sanitary Authority, which was later “charged with cleaning up pollution in the Willamette River, with a focus on discharges from industrial and municipal facilities.” In 1944, Oregon began “research and treatment of polluted wastewater,” and began construction on sewage treatment plants. Texas authorized the Texas Department of Health “to enforce drinking water standards for public water supply systems,” in 1945,

10. Id. at 580 (referencing a Brookings Institution study concluding, “sulfur dioxide concentrations fell by 11.3% per year between 1964 and 1971 . . . but fell by only 4.6% per year in the 1970s”).
11. Id. (noting studies that found “the average concentrations of total suspended particulates fell by 2.3% per year between 1960 and 1971, but fell by only 0.6% per year from 1972 to 1980”).
13. Id.
14. Id.
16. Id.
17. Id.
providing a further example of pre-federal environmental protection.\textsuperscript{18}

Notwithstanding this and other state activity, the sentiment of the nation by the mid-1960s called for federal action.\textsuperscript{19} These federal efforts were designed not to supplant existing state regulations, but to “support and prod state-level environmental regulation.”\textsuperscript{20} National environmental groups and Congress viewed the results of this first interplay between federal and state environmental regulation as producing unsatisfactory results, as air and water quality continued to maintain current conditions, and to deteriorate—\textsuperscript{21}—the acknowledged tragedy of the commons.\textsuperscript{22} Although the Commerce Clause provision of the U.S. Constitution\textsuperscript{23} was an acknowledged source of constraint on federal activity, three reasons were advanced for a centralization of environmental regulation: “interstate spillovers of pollution; the poor performance of states as environmental regulators; and interstate competitiveness effects arising from differing environmental standards.”\textsuperscript{24} Other factors that influenced the
centralization of environmental law included a growing desire on the part of industries to reduce varying state requirements, and the presidential politics during the 1972 election. The explosion of federal environmental law during this period has led to some commentators to suggest that “modern environmental law began in the sixties.”

Certainly some of the factors, which led to the centralization of environmental regulation were, and continue to be, valid rationales for a centralized approach. State governments must respond to the demands of the citizens who chose them, and in some states, concerns about environmental regulation for the sake of environmental protection may not be as high as in other areas, or the populous may have other priorities that could compromise the environment or exploit natural resources, such as economic development or urbanization. Research demonstrates that individuals responsible for shaping state economic policy (state legislators, economic development agency officials, and members of state chambers of commerce) believe “that environmental standards were either a ‘fairly’ or ‘very important’ factor in firm location.” Further, these individuals “responded with surprising frequency that concern over industry location or relocation had played a role in prompting them to pressure their state government (or, in the case of legislators, introducing or sponsoring legislation) to relax their state’s environmental standards.” Although not true of a state at all times, research reveals that states at times engage in what is referred to as a “race to the bottom,” in which state actors seek to increase their constituents’ welfare by limiting environmental regulations in order to encourage industry or development to choose their state for operations over another.

In addition, though they contribute significantly to federal work in this area, states cannot match the federal government in

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25. Esty, supra note 3, at 602-03.
26. See 1-1 FRANK P. GRAD, TREATISE ON ENVIRONMENTAL LAW § 1.01 (2014) [hereinafter TREATISE]; Revesz, supra note 5, at 578 (noting 1970 as the year that Congress enacted first major federal statutes).
27. Engle, supra note 24, at 352.
28. Id. at 353.
29. Id. at 351; Esty, supra note 3, at 603-04.
its ability to collate environmental data. Before 1970, the federal government did little research on the effects of pollutants, and states “may not have regulated significantly because they lacked this data.” However, in instances where states had access to clear data on pollution effects, they did act.

Certainly today, the federal environmental regulatory approach is premised on the idea that the federal government should have a leading role in determining environmental regulation. However, arguments in favor of “federal environmental regulation [which] rest in part on the empirical claim that states largely disregarded environmental problems before 1970” ignore the substantial work states were doing prior to the advent of environmental cooperative federalism. Further, as the next two sections show, states continue to play a vital part in fulfilling current environmental regulatory mandates and also developing exciting innovations to push both industry and the federal government forward in environmental regulations.

II. THE PATH: COOPERATIVE FEDERALISM AT THE HEART OF SOME, BUT NOT ALL, ENVIRONMENTAL STATUTES

The current federal environmental system of statutes and regulations administered largely by the U.S. Environmental Protection Agency (EPA) relies on the theory of cooperative federalism, “an enduring, organizing concept in environmental law.” Cooperative federalism is “a system under which the federal and state governments share some degree of regulatory

30. See Revesz, supra note 5, at 578.
31. See id. at 578.
32. Id. at 581-82. For example, of the pollutants covered by one study mentioned above, “only particulate matter and sulfur dioxide were perceived as outdoor air pollutants before 1950,” and for these two substances, the pre-1970 improvements were significant.” Id. at 582.
33. See CAA NUTSHELL, supra note 26, § 1.03.
34. Revesz, supra note 5, at 578; see also Esty, supra note 3, at 601.
authority.”36 In cooperative federalism “[t]he federal government is typically seen as the ‘dominant partner’ . . . but because the Constitution reserved to states all powers that were not explicitly allocated to the federal government, and because federal resources are limited, the federal government often relies heavily on state cooperation and involvement.”37 A review of the Clean Air Act’s State Implementation Plan provision and the Clean Water Act’s Total Maximum Daily Loads (TMDLs) provision provide examples of statutes with a cooperative federalism core, and highlights the essential state role.38 In contrast, the Toxic Substances Control Act is an example of a “chemicals in commerce”39 statute that does not rely on cooperative federalism to accomplish its goals.

A. National Ambient Air Quality Standards Under the Clean Air Act

The Clean Air Act “is the comprehensive federal law that regulates air emissions from stationary and mobile sources.”40 The law was originally passed in 1963, and its basic structure was established in the Clean Air Act Amendments of 1970, with major revisions also made to the law in 1977 and 1990.41 While Congress found “that Federal financial assistance and leadership is essential for the development of cooperative Federal, State,
regional, and local programs to prevent and control air pollution,” it explicitly stated “that air pollution prevention (that is, the reduction or elimination, through any measures, of the amount of pollutants produced or created at the source) and air pollution control at its source is the primary responsibility of States and local governments.”

A central component of the Clean Air Act is its regulation of common and widespread pollutants. In particular, the EPA’s use of air quality standards and the state’s implementation of those standards is an example of the cooperative federalism that underlies so much of the current environmental regulatory scheme. Under the Clean Air Act, the EPA is required “to set and revise national ambient air quality standards (NAAQS) for certain common and widespread pollutants.” EPA sets primary and secondary standards, and is required to review scientific data every five years and determine whether the standards need to be revised.

Implementation of the standards is a shared responsibility between the states and the EPA, unlike the setting of the NAAQS, which is the sole responsibility of the EPA. After the EPA has made a determination regarding a new NAAQS or revising a current NAAQS, it determines whether an area is an “attainment area,” which meets the standards, or a “non-attainment area,” which does not. These determinations are made in consideration of state recommendations.

To address the problems of the non-attainment areas and preserve the attainment areas, the Clean Air Act requires states to create state implementation plans (SIPs). The Clean Air Act has both generic and specific requirements for SIPs for

44. CAA NUTSHELL, supra note 40, at 3.
45. Id.
46. Id.
47. Id. at 4.
48. Id.
49. Id.
nonattainment areas. The generic provisions generally require SIPs for nonattainment areas within three years of a new or revised NAAQS, and “[t]hese plans must provide for attainment of the standard as expeditiously as practicable and within 5 years of designation—or up to 10 years if EPA determines additional time is warranted considering the severity of pollution and availability of controls.” For specific pollutants, the schedule for a SIP may differ.

If a SIP has not been submitted or carried out, or if EPA disapproves a SIP, then the Agency can issue sanctions. For example, “[i]f the state has not cured the deficiency within 18 months of EPA’s finding or disapproval, new major stationary sources in the nonattainment area must obtain offsetting emissions reductions from the same source or other sources at a 2-to-1 ratio.” In two years, if the deficiency is not remedied, “restrictions apply to the state’s use of federal highway funds for projects in the nonattainment area,” and “if EPA finds that a state has failed to submit an approvable state plan to demonstrate attainment or disapproves a submitted plan, EPA is required to develop a federal implementation plan to ensure improvement of air quality for citizens living in that area.”

B. Total Maximum Daily Loads Under the Clean Water Act

The Clean Water Act is the federal law that regulates pollutant discharge into the waters of the United States. The Clean Water Act has its origins in the 1948 Federal Water Pollution Control Act, but its modern form came into being in

50. CAA NUTSHELL, supra note 40, at 5.
51. Id.
52. Id.
53. Id. at 7.
54. Id.
55. Id.
The establishment of TMDLs, as required by the Clean Water Act, is another example of cooperative federalism at work in the federal environmental regulatory scheme, with significant reliance on state capabilities.

Under the Clean Water Act, states are required to develop lists of impaired waters. Impaired waters are waters “that are too polluted or otherwise degraded to meet the water quality standards set by states.” Lists of impaired waters are required every two years. The Clean Water Act then requires that the states “establish priority rankings for waters on the lists and develop TMDLs for these waters.” A TMDL “is a calculation of the maximum amount of a pollutant that a waterbody can receive and still safely meet water quality standards.” If the EPA Administrator disapproves a state’s list and its TMDLs, the Administrator must “identify such waters in such State and establish such loads for such waters as he determines necessary to implement the water quality standards applicable to such waters and upon such identification and establishment the State shall incorporate them into its current plan.”

In December 2013, the EPA announced a new collaborative framework for implementing the section 303(d) program. The framework, entitled A Long-Term Vision for Assessment, Restoration, and Protection under the Clean Water Act Section 303(d) Program, was the result of collaboration between states
and the EPA that began in 2011.\textsuperscript{66} The Framework describes “a new, long-term Vision and associated Goals for the Clean Water Act Section 303(d) Program, as well as present implementation plans for achieving the Vision and Goals,” and “reflects lessons learned from the past two decades of CWA 303(d) Program implementation and . . . anticipates new challenges that are likely to present themselves in the coming years.”\textsuperscript{67}

C. In Contrast, the Toxic Substances Control Act

In contrast to the Clean Air Act and the Clean Water Act, both of which envision a role for states in the federal environmental regulatory scheme in multiple programs—beyond just the two examples provided—the Toxic Substances Control Act (TSCA) embodies virtually no elements of cooperative federalism. The TSCA “provides EPA with authority to require reporting, record-keeping and testing requirements, and restrictions relating to chemical substances and/or mixtures.”\textsuperscript{68} Various sections of the TSCA allow the federal government to engage in various activities, including: requiring pre-manufacture notification for new chemical substances; requiring testing of chemicals by manufacturers, importers, and processors; issuing Significant New Use Rules; and maintaining the TSCA Inventory.\textsuperscript{69} None of these roles are shared with the states.

Thus, while cooperative federalism is the primary principal that guides federal environmental regulation, it is clear that federal environmental regulation still remains diverse in the roles it perceives for states. Within the Clean Air Act conception of NAAQS and SIPs, states cannot set ambient air quality standards, but states have a vital role in creating the plans that will achieve the EPA’s attainment area goals. Under the Clean Air

\textsuperscript{66} Id.


\textsuperscript{69} Id.
Water Act section 303(d) program, the states have a large role in not only setting pollutant loads but also determining how to best protect water quality given those TMDLs. Finally, under TSCA, the federal government shares little with the states. The following section demonstrates that no matter what role the federal government envisions for the states in environmental regulation, they continue to innovate and regulate, within the confines of the technical, fiscal, and political limitations which face all levels of government.

III. LEAVING A TRAIL: STATES AS ENGINES OF ENVIRONMENTAL REGULATORY, PROGRAMMATIC, AND MANAGEMENT INNOVATION

In addition to the dynamic role, which states occupy in cooperative federalism and the federal environmental statutes that embody that philosophy, states continue to innovate in the environmental regulation space. State innovation has not only advanced environmental regulation within the borders of whatever state has chosen to pass new environmental legislation, but has often, when a critical mass of support has been reached, advanced environmental legislation across the country.

A. Phasing Out Toxic Chemicals to Protect Waterbodies

Copper can have a number of adverse effects in aquatic environments and “is a primary pollutant of concern found in highway stormwater runoff.” 70 One significant source of copper is vehicle brake pads which, when they wear down, can land on roadways, end up in stormwater, and eventually be discharged in waterways. 71 The states of California and Washington both noticed significant releases of copper into their environment as a result of brake pad wear-down. In California it was estimated that 1.3 million pounds of copper was released into California’s

71. Id.
environment in 2010 in the form of fine dust from vehicular braking. In Washington, in 2011, it was estimated that 250,000 pounds of copper was released into the environment from vehicular braking.

In response to the release of copper, both California and Washington passed laws requiring the reduction of copper in motor vehicle brake pads. Washington issued final implementing regulations in 2012, and since June 2014 California has been developing regulations to implement its law and conducting a series of workshops. The California and Washington laws have “percent-by-weight requirements for brake friction material formulations sold in each state.” Since the passage of the California and Washington laws, “brake system manufacturers, friction material manufacturers, vehicle manufacturers, parts retailers and service providers have all engaged and worked collaboratively with states, nongovernmental organizations and other interested stakeholders to address concerns related to these pollutants,” and as a result, “the California and Washington laws are effectively driving an industry de facto standard, leading brake friction material manufacturers to change all of their U.S. product lines to be compliant with those laws.” The national changes being driven by California and Washington “will ultimately benefit the entire nation’s watersheds and waterways, not just those in California and Washington.”

However, regulators and industry were aware that while California and Washington were driving a national trend, it was still possible for a regulatory patchwork of compliance and enforcement mechanisms to develop. On January 21, 2015, the EPA, the Environmental Council of the States, and eight

73. Id.
74. Memorandum of Understanding, supra note 69, at 3.
75. Id.
76. Id.
77. Id. at 3-4.
78. Id. at 4.
79. Id. at 5.
automotive industry groups signed a Memorandum of Understanding on Copper Mitigation in Watersheds and Waterways (MOU). As a result, “the signatories agree[d] to a voluntary memorandum of understanding. This document can ensure that there is a streamlined, national approach on this environmental issue that will create a transparent framework for all parties . . . to phase out copper and other constituents found in brake pads.”\(^8^0\) The MOU “calls for reducing copper in brake pads to less than 5 percent by weight in 2021 and 0.5 percent by 2025,” and also “reduces mercury, lead, cadmium, asbestiform fibers, and chromium-6 salts in motor vehicle brake pads.”\(^8^1\)

The Copper Brake Pad MOU is an excellent example of states identifying an on-going environmental issue, legislating and regulating to address that issue, and driving significant national change. California and Washington crafted laws that “effectively driv[ing] an industry de facto standard, leading brake friction material manufacturers to change all of their U.S. product lines to be compliant with those laws.”\(^8^2\)

**B. Filling Gaps by Addressing Chemicals of Concern**

Another manner by which states are driving environmental regulation is by using environmental regulation to fill gaps left by the federal environmental regulatory scheme. One of the most compelling examples of this is action taken by states in the chemical substances arena. The 1976 enacted TSCA has not been the subject of a substantive amendment.\(^8^3\) This has led stakeholders to call for TSCA reform, in order to meet the changing realities of scientific and technological capabilities, and to address new information concerning the relationships between human and environmental health and chemical substances, among other concerns.\(^8^4\) In the interim, states have pursued a

\(^8^0\) Id.

\(^8^1\) Copper-Free Brake Initiative, *supra* note 71.

\(^8^2\) Memorandum of Understanding, *supra* note 69, at 4.

\(^8^3\) Subsequent additions to the law have been made to address concerns about specific standards, but the substantive provisions of Title I remain as originally enacted.

\(^8^4\) ABA Section of Env’t, Energy, and Res., *Toxic Substances Control Act (TSCA) Reform*, ABA, http://www.americanbar.org/groups/environment_
number of strategies to fill in the gaps. In 2014, 537 bills on chemical safety were introduced in forty-three states.85

One strategy taken by states has been to urge TSCA reform. Many states have advocated for TSCA reform through legislative resolutions. For example, Arkansas HR 105586 urges Congress to reform TSCA, as does Illinois HR 6087 and SR 70,88 Michigan HR 74,89 and Maine SP 679.90 Various interstate organizations have also advocated for TSCA reform. In 2013, the National Pollution Prevention Roundtable called for federal action to make necessary reforms to TSCA.91 Also in 2013, the National Conference of State Legislatures encouraged Congress to reform and modernize TSCA in a letter to the Senate Environmental and Public Works Committee.92 State environmental commissioners advocated for TSCA reform in a resolution updated in 2013.93

85. Doug Farquhar, Chemicals are Essential to our Way of Life, but Who’s Ensuring Their Safe Use?, NAT’L CONF. OF STATE LEGISLATURES (Dec. 1, 2014), http://www.ncsl.org/research/environment-and-natural-resources/chemical-quandry.aspx#RegulationPurviewProblem, archived at http://perma.cc/6C43-7E7X. As this article goes to press meaningful efforts in the U.S. Congress are underway to reform TSCA.


Another strategy taken by states to address the gaps in TSCA has been legislating to implement restrictions on specific chemicals. Chemical substance-specific restrictions are often decided upon through the use of chemicals of high concern lists and alternatives assessments.  

Some states have chosen to enact bans on a single chemical substance. These bans are often enforced through prohibitions on the commercial use of all products containing more than a certain amount of the chemical substance. For example, Oregon prohibits the introduction into commerce of any product containing more than one-tenth of one percent by mass of decaBDE. States have also banned certain uses of groups of chemicals. For example, California has banned the manufacture, sale, or distribution in commerce of toys or child-care articles that can be placed in a child’s mouth if they contain phthalate, in concentrations exceeding 0.1%. Finally, some states have not banned a chemical substance, but rather a certain use of a chemical substance. For example, Illinois bans the use of a weight or other products to balance vehicle wheels if the product contains mercury or more than 0.1% lead by weight, and Nebraska bans the distribution of liquid mercury thermometers within the State.

These state actions have served a two-fold purpose in driving environmental law forward. First, they have moved environmental law forward within their own jurisdictions, as well as others. It is not unreasonable to think that other states have

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96. CAL. HEALTH & SAFETY CODE § 108937(b) (West 2008).

97. 415 ILL. COMP. STAT. 5 / 22.23c(b)-(d) (2010).

adopted chemical regulations similar to those of other states as information has been shared, and as a result of attempts to harmonize regulations in different geographic regions for efficiency—see, for example, the Copper Brake Pad MOU. Second, these state actions seem to have helped to spur Congress in its attempts to reform TSCA. TSCA reform is reportedly more hopeful in the 114th Congress than in the past.  

C. Advancing Community Concerns Through Environmental Justice Requirements

States have also moved environmental law forward in the area of environmental justice (EJ). One important role state environmental agencies play is “in promoting fairness and transparency via the process of limiting and managing discharges to the environment through permitting or otherwise authorizing industrial and other developmental activities.”

There are a variety of approaches to environmental justice currently being pursued by various states. One approach is that followed by Illinois, which has developed an EJ Public Participation Policy.

That Policy is triggered “when proposed Agency permitting activities . . . may significantly and adversely affect EJ areas or when the community has made the Illinois EPA aware of EJ concerns for the proposed Agency action.”

Each Bureau’s permit section must review all permit applications to determine if they trigger the EJ Public Participation Policy.

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102. Dunn & Weiss, supra note 99, at 756 (quoting ILL. ENVTL. PROT. AGENCY, supra note 99, at 4).

103. Id.
triggered, the Illinois EPA (IEPA) encourages the permit applicant to engage community stakeholders in open dialogue.\textsuperscript{104} Then, IEPA must make fact sheets and plain language summaries of the major aspects of the proposed project.\textsuperscript{105} The majority of the public outreach requirements and their related costs are placed on the IEPA under Illinois’ EJ policy.\textsuperscript{106}

Another approach being adopted by states is exemplified by New York’s EJ policy, which incorporates EJ concerns into the New York State Department of Environmental Conservation (NYSDEC) permitting process. New York’s policy requires the NYSDEC first to “identify whether potential adverse environmental impacts from the proposed action are likely to affect a potential environmental justice area.”\textsuperscript{107} If a potential area of concern is identified, “the applicant will be required to submit a written public participation plan.”\textsuperscript{108} Applicants “must also hold informational meetings throughout the permit review process at locations and times convenient to project stakeholders to keep information flowing.”\textsuperscript{109}

A third EJ approach is Connecticut’s statutory approach. Under Connecticut’s statute, “the permit applicant must identify measures to facilitate meaningful public participation in the regulatory process and certify that they will undertake their proposed public outreach efforts.”\textsuperscript{110} In Connecticut, “[a]pplicants seeking a permit from the Connecticut Department of Environmental Protection (DEP) or Siting Council, for a facility that will be located or expanded in an EJ community, are required to file a ‘meaningful public participation plan’ (MPPP) with the appropriate agency.”\textsuperscript{111} Applicants are also required to

\textsuperscript{104} Id.
\textsuperscript{105} ILL. ENVTL. PROT. AGENCY, supra note 100, § V(D)(3); Dunn & Weiss, supra note 99, at 756-57.
\textsuperscript{106} Dunn & Weiss, supra note 99, at 757.
\textsuperscript{107} Id. at 758.
\textsuperscript{108} Id.
\textsuperscript{110} Dunn & Weiss, supra note 99, at 761; CONN. GEN. STAT. § 22a-20a(b)(2) (2015).
\textsuperscript{111} Dunn & Weiss, supra note 99, at 762; CONN. GEN. STAT. § 22a-20a(b)(1).
“consult with the elected official of the town or towns in which the facility would be located to evaluate the need for a Community Environmental Benefit Agreement (CEBA); to develop accountability; and designate within the MPPP a convenient time and place to hold an informal public meeting.”

States, as demonstrated in the preceding examples, have proven to be engines of environmental regulation with respect to environmental justice. While the federal government has established examples of EJ “through policy, plan, and actual permitting . . . because states are closer to EJ concerns, they have gone farther.” The programs profiled above, though different in approach, all hold parties responsible for EJ.

D. Working Within and Across Boundaries to Promote Air Quality

As the President’s Clean Power Plan is discussed extensively, it is important to take a look at actions the states are taking to advance air quality and to respond to climate change. Some states are working within their boundaries, while others are working across boundaries and even across nations. These examples stand as evidence that states will lead where there is no path. The failure of federal cap and trade legislation to address carbon has not kept several states from developing sophisticated programs to improve air quality. Now, these state examples are being incorporated into the EPA’s current proposal.

112. Dunn & Weiss, supra note 99, at 762; Conn. Gen. Stat. § 22a-20a(b)(1)(B), (b)(2), (c).
113. Dunn & Weiss, supra note 99, at 765.
The State of Washington is an example of a state working within its borders to advance air quality and respond to climate change.\textsuperscript{115} In 2008, Washington set greenhouse gas limits that were, at the time, lower than levels committed to by several nations and states.\textsuperscript{116} Specifically, Washington committed to reduce overall emission of greenhouse gases in the state to 1990 levels by 2020.\textsuperscript{117} To do this, the Department of Ecology was directed to “submit a greenhouse gas reduction plan for review and approval to the legislature, describing those actions necessary to achieve the emission reductions.”\textsuperscript{118} Actions that the Department could take without additional authority from the Legislature were approved, and the Department was also directed to develop and implement a system for monitoring and reporting emissions of greenhouse gases, track progress toward meeting the emission reductions established, and report every other year on the total emissions of greenhouse gases for the preceding two years.\textsuperscript{119} As part of the state’s efforts to address climate change, the Carbon Pollution Accountability Act was recently introduced in both the Washington State Senate and the Washington State House of Representatives.\textsuperscript{120}

Hawai‘i and Minnesota have also taken action.\textsuperscript{121} Minnesota’s energy policy, created by statute, requires,

\begin{itemize}
\item \textsuperscript{118} Id.
\item \textsuperscript{119} Id.
\end{itemize}
(1) annual energy savings equal to at least 1.5 percent of annual retail energy sales of electricity and natural gas be achieved through cost-effective energy efficiency; (2) the per capita use of fossil fuel as an energy input be reduced by 15 percent by the year 2015, through increased reliance on energy efficiency and renewable energy alternatives; and (3) 25 percent of the total energy used in the state be derived from renewable energy resources by the year 2025.122

Hawai‘i’s energy agenda currently calls for it to exceed seventy percent clean energy in the next fifteen years.123 In addition, Hawai‘i’s Greenhouse Gas Emissions Reduction Law aims to reduce the state’s greenhouse gas emissions to 1990 levels in the next five years.124 In pursuit of these goals Hawai‘i has completed an updated greenhouse gas emissions inventory125 and the Greenhouse Gas Emissions Reduction Task Force has submitted a work plan and proposed regulatory scheme and legislation.126 Hawai‘i’s government has also passed the Climate Change Adaptation Priority Guidelines, which must be considered in all land use, capitol improvement, and program decisions made by the state and counties.127

New Jersey and Washington State have set vehicle emission standards, which serve to advance air quality standards within their borders.128 Beginning in 2009, New Jersey required all

passenger vehicles or light duty trucks with model years of 2009 or later to meet California’s Low Emission Vehicle Program standards. Effective in 2005, Washington generally adopted California’s motor vehicle emission standards. The Washington Department of Ecology was directed to adopt rules to implement those standards for passenger cars, light duty trucks, and medium duty passenger vehicles.

The Northeast states’ Regional Greenhouse Gas Initiative (RGGI) is an example of a multistate effort to advance air quality and respond to climate change. RGGI, an effort of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont, “is the first market-based regulatory program in the United States to reduce greenhouse gas emissions.” RGGI, which covers 168 facilities throughout its borders, “reduces [carbon dioxide (CO2)] emissions by establishing a regional cap on the amount of CO2 that power plants can emit through the issuance of a limited number of tradable CO2 allowances.” The CO2 emissions cap was set at 88.7 million short tons in 2015 and will decline 2.5% each year from 2016 to 2020. Following the CO2 auction, RGGI states invest the proceeds in consumer benefit programs. The investment from these proceeds demonstrates that the RGGI is not only a leader in reducing CO2 emissions, but also in finding

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131. Id.
134. Id.
innovative ways to bolster the economy and help consumers. The first control period (2009-2012) saw a $700 million investment by the RGGI states, which helped create over 16,000 new jobs.\textsuperscript{136} State investment of proceeds from the first control period “is generating $1.6 billion in net economic benefit and reducing consumer energy bills by $1.3 billion through the end of the decade.”\textsuperscript{137}

The California Global Warming Solutions Act of 2006, also known as AB 32, requires the State Air Resources Board to adopt regulations to address statewide greenhouse gas emissions, and is yet another example of state innovation. The Act requires the State Air Resources Board to adopt regulations “to require the reporting and verification of statewide greenhouse gas emissions and to monitor and enforce compliance with this program.”\textsuperscript{138} The State Air Resources Board is also required to “determine what the statewide greenhouse gas emissions level was in 1990, and approve in a public hearing, a statewide greenhouse gas emissions limit that is equivalent to that level, to be achieved by 2020.”\textsuperscript{139} The State Air Resources Board is further required to “adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-effective greenhouse gas emission reductions from sources or categories of sources.”\textsuperscript{140} As part of its regulations, the State Air Resources Board is authorized to include “the use of market-based compliance mechanisms to comply with the regulations,”\textsuperscript{141} and must “monitor compliance with and enforce any rule, regulation, order, emission limitation, emissions reduction measure, or market-based compliance mechanism adopted by the state board.”\textsuperscript{142}


\textsuperscript{137} \textit{Fact Sheet}, supra note 134.


\textsuperscript{139} Id. § 38550.

\textsuperscript{140} Id. § 38560.

\textsuperscript{141} Id. § 38570(a).

adopt by regulation “a schedule of fees to be paid by the sources of greenhouse gas emissions regulated . . . [and] the revenues collected pursuant . . . shall be deposited into the Air Pollution Control Fund and are available upon appropriation, by the Legislature, for purposes of carrying out this division.”

AB 32 has been a successful strategy when viewed individually and as part of California’s overall efforts towards energy efficiency. As required by AB 32, California is scheduled to meet its 2020 greenhouse gas limit. Since California began energy efficiency efforts in the 1970s, “Californians have saved $74 billion in reduced electricity costs,” and “about 23 percent of the State’s electricity comes from renewable power,” a figure which is set to increase to at least thirty-three percent by 2020. In 2013, California took its air quality efforts abroad by signing an Agreement Between the California Air Resources Board and the Gouvernement du Québec Concerning the Harmonization and Integration of Cap-And-Trade Programs for Reducing Greenhouse Gas Emissions.

These examples reveal that when a goal is important to a state, or group of states, the result can be both powerful and precedent setting. The absence of federal activity, today, still does not curtail states’ work as regulatory and innovation engines.

E. Managing Energy and Landscapes: State Hydraulic Fracturing Activities

State innovation is also taking place with respect to hydraulic fracturing, an area the federal government has largely ceded to the states, both in administrative regulation and in

143. Id. § 38597.
145. Id.
exemptions from several major environmental statutes. For example, while the EPA is traditionally responsible for “setting requirements for proper well siting, construction, and operation to minimize risks to underground sources of drinking water,” the EPA is not allowed to set such requirements for hydraulic fracturing, except when diesel fuels are used. Further, while the EPA sets national standards for industrial wastewater discharges under the Clean Water Act, at this time there are no national standards that govern the disposal of wastewater from natural gas extraction—although the EPA is working on effluent limitation guidelines (technology based standards) for unconventional oil and gas extractions. Another statutory gap under the Clean Water Act is that it does not require oil and gas operations or transmission facilities to obtain National Pollutant Discharge Elimination System permits for stormwater discharges, except in limited circumstances.

The federal government has recently decided to engage in hydraulic fracturing regulation in a more substantial manner. On March 26, 2015, the Bureau of Land Management (BLM) issued a final rule on Hydraulic Fracturing on Federal and Indian Lands. The rule is limited in its application “to development on public and tribal lands.” The BLM estimates that the rule will affect around 2,800 hydraulic fracturing operations per year, but


150. Natural Gas Extraction, supra note 147.


admits that this number could rise to 3,800 operations per year.\textsuperscript{153} Compliance costs are estimated to be around $11,400 per operation,\textsuperscript{154} and it is estimated that compliance costs will be around $32 million per year for the industry as a whole.\textsuperscript{155} However, while the federal regulations are seen by some observers as a significant step up in the federal government’s ability to address hydraulic fracturing, it is worth remembering that “the states have jurisdiction over drilling on private and state-owned land, where the vast majority of fracking is done in the United States.”\textsuperscript{156}

Despite the new federal regulation, which only affects federal and tribal lands, the United States still lacks a comprehensive national statute for oil and gas, and states have chosen to take a variety of actions regarding hydraulic fracturing. California passed its first hydraulic fracturing law in 2013, SB 4.\textsuperscript{157} SB 4 created a number of requirements for hydraulic fracturing, including receipt of a permit from the Division of Oil, Gas and Geothermal Resources, provision of detailed information in the permit application about the fluids to be used, and, upon approval of the permit, provision of copies of the permit to all

\begin{itemize}
\item \textsuperscript{153} 40 C.F.R. § 3160.
\item \textsuperscript{154} This is based on the rule affecting 2,800 operations per year.
\item \textsuperscript{155} 40 C.F.R. § 3160. If the Rule impacts 3,800 operations per year, BLM estimates compliance costs could reach $45 million per year. BLM estimates pre-operation compliance costs around 0.13 to 0.21\% of the cost of drilling a well.
\end{itemize}
neighboring property owners and tenants. Final regulations to implement SB 4 go into effect on July 1, 2015.

In December 2014, the State of New York announced a ban on hydraulic fracturing within the State. New York’s ban came after a New York State Department of Health report was released, which recommended against allowing hydraulic fracturing within the state. The report found that while the “science surrounding [high-volume hydraulic fracking] activity is limited, only just beginning to emerge, and largely suggests only hypotheses about potential public health impacts that need further evaluation,” the potential risks and lack of information about safety of hydraulic fracturing necessitated a ban. New York was the second state after Vermont to ban hydraulic fracturing within its borders, but the first with significant natural gas reserves accessible by hydraulic fracturing.

Other states have decided to potentially allow hydraulic fracturing, but with strict controls over the process. The State of Maryland has proposed regulations for best practices and safeguards on hydraulic fracturing, which are out for public comment, and the recently elected Governor has stated that he believes hydraulic fracturing can be done safely. In 2013,
California passed a law that allowed hydraulic fracturing to move forward, provided that oil companies followed a series of regulations requiring permitting, public disclosure of the chemicals used, and other standards.\textsuperscript{164} The EPA’s focus on research and effluent limitation guidelines with regard to hydraulic fracturing has left states with the opportunity to fill in gaps necessary to protect human health and the environment. Some states have chosen to completely prohibit the practice to provide this protection, while others have chosen to allow the practice to go forward, under regulation. Whichever strategy is chosen, states are yet again proving that they can and will regulate without federal models, using the resources they have at their disposal.

\textbf{F. Promoting Efficient Government and Effective Environmental Regulation}

A final example of states as engines of environmental innovation can be found in state efforts to advance lean government. State efforts to advance efficient and effective government rose to new heights when the states, before the federal government, were directly impacted by budgetary shortfalls. To overcome these budgetary shortfalls, as well as losses in staffing levels, states began to implement lean concepts to deliver the same, and even improved levels of environmental services—by improving the efficiency of work processes, employing technological advances—with considerably fewer financial resources.\textsuperscript{165} For example, in 2008, the Connecticut Department of Environmental Protection conducted an evaluation of the Air Planning and Standards Division Permit Modeling Program, and as a result, the Department rewrote its

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modeling guidance, implemented new business rules, and reduced the number of total steps in the process by forty-three percent.  

Connecticut reported that trends indicated a reduction in processing time, a reduction in document transfer time, and the elimination of a time step of approximately ten days for delivery of ambient monitoring data. The Indiana Department of Environmental Management also instituted lean government to improve its permitting process for Permit Renewals and saw a number of improvements: a seventy-one percent decrease in the time it took the Department to issue a Title 5 renewal and a forty-five percent decrease in the time it took to issue a Federally Enforceable State Operating Permit (FESOP) renewal.

One example in particular demonstrates states’ leading efforts in lean government for environmental regulation, namely the E-Enterprise for the Environment initiative. E-Enterprise aims to improve environmental protection by helping federal, state, and tribal governments work collaboratively. The initiative is transformative and more and more states are pushing ahead recognizing that lean and efficient government is the only path down which to continue. The Environmental Council of States’ (ECOS) Past President Pedersen identified two factors that led to the push for E-Enterprise: resource constraints and increasing technological capability. Pederson has also emphasized that E-Enterprise is more than “buying a computer in the sky . . . it’s a way to approach [improving environmental regulation].” As Pederson pointed out, in trying to reduce the paper usage of his Oregon department,

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166. Id.
167. Id.
168. Id.
172. Id.
with E-Enterprise, I can take advantage of that state that has 80 or 90 percent of their stuff electronic, and they’ve figured some of this stuff out. I don’t have to worry about building my own, hoping I’m going to satisfy a federal need, when this is really about taking advantage of all of that [existing work].

E-Enterprise has attracted a significant amount of attention recently, and in its Fiscal Year (FY) 2016 budget request, the EPA requested $15.7 million in funding for grants to state, local, and tribal governments to support the initiative. The Environmental Information Exchange Network, mentioned below, received a $23.5 million request in the FY 2016 budget request.

Using E-Enterprise concepts, Arkansas’ Department of Environmental Quality (ADEQ) is working to improve environmental compliance and inspection. In an effort to improve its Regulated Storage Tanks Program, ADEQ developed and implemented an electronic inspection report system. The

173. Id.
175. Id. at 91. The E-Enterprise Initiative is:

At base, it is a new collaborative process through which states and the EPA will work together. E-Enterprise is designed to share resources among jurisdictions and to enable joint priority-setting. It aims to build upon and benefits from decades of regulation at all levels, harnessing the potential to redesign and reengineer environmental regulation while streamlining it. The result would be a single-system approach, applied across environmental endeavors and states. One component is a web-based data-sharing system where regulated entities would be able to use the system to apply for permits, report air emissions, and check their compliance status. Regulators would be able to speak and share information more efficiently with each other. In this way, E-Enterprise would increase transparency and effectiveness. It would also facilitate the use of newer monitoring technology.


system uses “smart” forms on touch screen computers instead of paper inspection forms. Inspection forms may be customized for each facility and include drop down menus which provide a selection of potential findings for each compliance area,” and are completed during actual inspections. ADEQ’s system also allows individual comments, site diagrams, and photos to be added to the report forms. To provide assurance to facility owners or operators, forms are “locked” once an inspection is complete and the form is signed by the owner or operator, and no changes can subsequently be made to the form.

Massachusetts is using E-Enterprise concepts to improve environmental operations. The Massachusetts Executive Office of Energy and Environmental Affairs (EEA) is in the process of acquiring and implementing the Energy and Environment Public Access and Information System (EIPAS). EIPAS is “an information technology (IT) solution that will advance, align, expand, and transform the manner in which EEA’s six secretariat agencies execute timely, predictable, and cost-effective business functions.” As an example of the problems EIPAS is expected to help address, from 2002 to 2011, the Massachusetts Department of Environmental Protection (MDEP) saw its budget decrease from $62 million to $45 million, and its staffing levels decrease from 1,200 to 840. Further, MDEP’s “outdated and siloed information technology systems impede the Department from fulfilling its critical mission of protecting public health and the Commonwealth’s natural resources.” It is EEA’s hope that EIPAS will allow MDEP and its other agencies to transform the way in which they carry out their responsibilities.

Setting the foundation for E-Enterprise is the Environmental Information Exchange Network. Initially conceived in 1998, the Exchange Network uses a four-step process to allow Network
Partners to share data across the Internet. First, “[t]hrough trading partner agreements, Partners define how they will use the Exchange Network.”

Second, “[a]fter Partners decide what data they will exchange and with whom, each sets up a computer dedicated to sharing data over the Exchange Network.”

Third, the Exchange Network makes data sharing easily compatible through the use of Extensible Markup Language (XML); “[s]ince all data shared on the Network uses XML, all Partners’ data structures are compatible.”

Fourth, “[o]nce Partners connect to the Network, they’re ready to share data. Every Partner has a Network node or node client, and they all communicate through XML.”

The Exchange Network has seen a number of success stories as a result of more effective and efficient sharing of information. For example, the TRI State Data Exchange (SDX), which began as a four-state pilot in 2005, now has twenty-eight participating states and “allows facilities to submit data to EPA and have it forwarded to states automatically.”

Seeking cost reduction and efficiency increases, “Massachusetts integrated its air quality data internally and used the Exchange Network to automate data quality assurance processes and provide real-time air quality data to the public.” In addition, a team of states developed NetDMR, “a web-based, open-source application that allows facilities to securely submit data directly to EPA’s discharge permit data system . . . [and] allows agencies to access the reported data easily and automatically.”

States, working collaboratively with the federal government through E-Enterprise for the Environment and the Exchange Network, are showing that they are catalysts of environmental innovation not only in the regulatory arena, but also in the area


network.net/about/how-does-it-work#, archived at http://perma.cc/SVT5-53EH.

185. Id.

186. Id.

187. Id.


189. Id.

190. Id.
of environmental program operations. The EPA is a partner with the states in this effort, as shown by the joint governance approach to both E-Enterprise for the Environment and the Exchange Network and also by numerous public statements by the most senior levels of the Agency. It is essential to not only have solid regulations on the books, but also to have programs that work efficiently and effectively. Once again, this is an area where states have led the way, and the federal government, slower to move, is coming along as well.

IV. CONCLUSION

States have been, and will continue to be, important engines by which environmental law, regulation, and policy move forward. This is not to say that states are the exclusive vehicle by which environmental law advances; as demonstrated in this article, the federal government plays a prominent role in the environmental regulatory scheme. However, due to the diversity of state interests and needs, states offer new and exciting ways of regulating the environment.

191. See Press Release, EPA, Testimony of EPA Adm’r Gina McCarthy Before House Appropriations Comm. on Proposed FY 2015 Budget (Mar. 27, 2014), http://yosemite.epa.gov/opa/admpress.nsf/596e17d7cac720848525781f0043629e/ dc1fa2e65c2de69e85257ca80055b153?OpenDocument, archived at http://perma.cc/KD4D-6UQH; see also EPA’s Themes – Meeting the Challenge Ahead, EPA, http://www2.epa.gov/aboutepa/epas-themes-meeting-challenge-ahead (last updated Feb. 10, 2015), archived at http://perma.cc/4SHB-8268 (As the EPA realizes, “[g]ood government, as well as the reality of scarcer resources, require that EPA work in concert with the states, tribes, local governments, and sister federal agencies that constitute our country’s environmental protection enterprise, to ensure the efficiency, efficacy, and coordination of our overlapping and complementary efforts. . . . EPA must work with our co-regulators . . . to build new tools and strategies that enhance coordination, establish joint priorities, manage resources effectively, and share information through E-Enterprise.”).

192. See Whitney Blair Wyckoff, Could EPA Take a Cue from Amazon.com?, FEDSCOOP (Jan. 28, 2015, 5:45 PM), http://fedscoop.com/could-epa-take-a-cue-from-amazon.com, archived at http://perma.cc/P2SL-2GCW (describing EPA’s efforts to build an online portal to “allow EPA-regulated companies and local governments to submit data to the agency and track the status of their paperwork”).
Where will our nation go from here? Our country will ensure a new era of state partnerships. Partnerships are the essential way that we will as a nation ensure that we have a functional federal-state system of environmental regulation. When one cannot accomplish something alone, one must move to a partnership system. This is why states’ long history of activity pre-federal law, and current motivation, as well as philosophies of joint governance like E-Enterprise for the Environment, will take our country forward. The result will be better, more effective, and more comprehensive environmental regulation—and more appropriate, based on state needs and environmental conditions—than ever before. It is imperative keep the states fueled—through public support, federal and state investment, and political support—so that they can continue to play their essential role as engines of environmental innovation.

193. See The Fiscal Year 2016 EPA Budget: Hearing Before the Subcomms. on Energy & Power and Env’t & the Econ. of the H. Comm. on Energy & Commerce, 113th Cong. (2015) (statement of Gina McCarthy, Administrator of the United States Environmental Protection Agency), available at http://democrats. energycommerce.house.gov/sites/default/files/documents/Testimony-McCarthy-EP-EPA-FY-2016-Budget-2015-2-25.pdf, archived at http://perma.cc/ME8A-ESTH (EPA Administrator McCarthy testifying in support of budget appropriations which EPA provides directly to states, noted that, “[e]ffective environmental protection is a joint effort of EPA, states and our tribal partners, and we are setting a high bar for continuing our partnership efforts...we are also including opportunities for closer collaboration and targeted joint planning and governance processes...with our co-regulatory partners, we are working collaboratively to streamline, reform, and integrate our shared business processes and related systems.”).