

# Pollution prevention through performance-based initiatives and regulation in the United States

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## Abstract

This paper documents over 20 years of progress in the United States to advance environmental protection through pollution prevention and other performance-based initiatives and regulations. This paper highlights a number of different approaches and strategies used at the state and federal government levels while outlining emerging barriers to the overall effectiveness of the existing US environmental protection system. As a result, the authors provide specific recommendations to accelerate the use and evolution of performance-based initiatives and regulations to achieve the goal of sustainable consumption and production systems.

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## 1. Introduction

Imagine a medium-size metal fabrication business that volunteered in 1997 to be the training ground for almost 100 state regulators to identify pollution prevention opportunities during routine compliance inspections. Over the course of three weeks, these small groups of inspectors from the state of Illinois looked closely at all aspects of the plant's operations trying to identify options where the facility might adopt pollution prevention measures not required by regulation. They could potentially, however, also have spotted regulatory violations.

However, the facility manager recognized the training program as an opportunity for producing better results. For the first time, management was recognizing that the environmental department had the potential to be a profit center — using environmental analysis to improve plant efficiency and increase the bottom line.

In 1988, 10 years earlier, an event like this would have been unlikely. Twenty years earlier, unimaginable. It illustrates a gradual change in perspective on environmental management by at least some of America's businesses in the decades since Congress enacted most of the nation's environmental statutes. For an increasing number of facilities, there has been a growing awareness that environmental information about an operation, and improved environmental performance, is critical to improving production efficiency. As business executives from DuPont and Shell write in *Walking the Talk*:

It was this conceptual breakthrough that began to convince us that a business case could actually be made for sustainable development. Before this, we had acknowledged it was an important moral concept, but we worried over whether this ethical duty could be linked to good business practice [1].

Environmental regulations played a major role in this increasing business awareness — in large part by imposing previously externalized costs on facilities, driving them to explore cost-effective alternatives they might not otherwise

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have sought. And regulations continue to play a critical role in requiring companies to understand the connections between operational and environmental efficiencies. Not only are there environmental impacts from company operations for which the costs to prevent or remediate far outstrip potential financial benefits of enhanced efficiency, but, even where efficiency gains are feasible, this recognition did not lead inevitably to operational implementation. As business expert Michael Porter observed:

The belief that companies will pick up on profitable opportunities without a regulatory push makes a false assumption about competitive reality — namely, that all profitable opportunities for innovation have already been discovered, that all managers have perfect information about them, and that organization incentives are aligned with innovating. In fact, in the real world, managers often have highly incomplete information and limited time and attention [2].

The regulatory system can take advantage of this increasing business awareness of efficiencies gained from environmental management. Regulations can place increasing emphasis on performance goals, focusing on stringent changes required to protect public health and the environment, and be less tied to specific reference technologies that much of our existing regulatory system requires. Such approaches can promote pollution prevention-based efficiency changes or broader breakthroughs in process or product design. They can also provide a framework that makes effective use of voluntary initiatives possible. We discuss below some examples of regulatory and voluntary program innovations that have helped to expand both incentives and requirements for superior environmental performance, and how these trends could be more fully developed.

## 2. Environmental regulation for the 21st century

What steps should states and the federal government take to advance the United States' long-term capacity for effectively solving the 21st century's environmental problems? How should the regulatory framework used, with much success, to respond to the more publicly visible environmental crises of the 1960s and 1970s be modified to meet today's challenges? To what extent have the states and EPA developed or implemented measures to focus greater attention and resources on multimedia environmental performance goals that adopt a precautionary approach to emerging problems — an approach that can subsume, without being limited to, the media-specific restrictions against pollution in current statutes and regulations?

Over the last two decades, EPA and state environmental agencies have taken steps toward environmental management approaches emphasizing pollution-prevention, multimedia considerations and beyond-compliance performance in tackling priority environmental problems. But in spite of this increased attention, a broader performance orientation continues to be dwarfed by the media-specific technology-driven regulatory programs grounded in the federal environmental statutes of

the 1970s. And while individual states have taken action on issues such as chemical use and reduction of toxic chemicals in products, there continues to be only a limited effort to address these problems at the federal level.

There has been some significant growth, however, in regulatory approaches emphasizing performance and providing incentives to achieve or exceed performance targets. We will outline some of the major strands of that progress in what follows.

In the 1960s and 1970s, the United States established a national environmental policy and statutory framework focused on single-media approaches to environmental problems — i.e., the Clean Air Act, the Clean Water Act and the Resource Conservation and Recovery Act (RCRA). In most cases, state environmental statutes have mirrored the federal statutes. The regulatory and organizational structure that naturally flowed from this statutory structure has dominated subsequent environmental management and problem-solving — both for government agencies and the regulated companies. The regulatory framework that emerged provided an effective initial mechanism for addressing the immediate environmental challenges that faced the nation at the time, and has achieved admirable results over the years. Ratcheting down emissions and discharges of critical pollutants through imposing regulatory restrictions on specific types of emission points provided a readily enforceable set of rules to force changes on the worst sources of pollution.

For some polluters and some types of pollution problems this form of regulation is still necessary. But this approach is now running into the law of diminishing returns in the face of complex environmental challenges such as global climate change, energy and water shortages, endocrine disruptors, and persistent, bioaccumulative toxics that pass easily from one medium to the next. It has had only limited success in addressing the opportunity for changes in chemical use or manufacturing processes to reduce releases to all media; media-based control and treatment requirements often reduce releases of a given pollutant to only one medium, with the other environmental impacts continuing largely unabated. And individual-source control and treatment-based regulations have provided many facilities limited incentive to strive for significant beyond-compliance environmental performance.

Today's problems demand more innovative and vigorous approaches to achieve better results. This could include, for example, an increased reliance on more demanding regulatory-enforced environmental goals combined with greater flexibility in how to meet those goals. And such well-enforced regulatory goals could help to make voluntary initiatives to leverage innovative change more effective [3].

While there is widespread recognition of the need for change toward an environmental regulatory system that promotes superior performance, several obstacles have hampered the development of such a system:

- The federal environmental statutes remain single-media. Future changes to the statutory framework for

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