

# Reinventing Environmental Regulatory Approaches: Prototypes for Petroleum Refineries

*Many industrial, regulatory, and community representatives have expressed concern that current environmental regulations disregard multimedia environmental impacts, provide few incentives to develop and use new technologies, and fail to consider site-specific conditions. For the U.S. petroleum refining industry, faced with the need to produce higher-quality fuels using poorer-quality feedstocks, such criticisms are expected to increase. To help address this situation, Environmental Assessment Division (EVS) has developed alternative environmental regulatory prototypes for petroleum refineries operating in the future. These prototypes are multimedia in scope, provide for new technology development and use, and allow flexibility in the means for meeting environmental goals.*

## PROBLEM/OPPORTUNITY

The 25-year-old “command-and-control” structure of environmental regulations has resulted in significant environmental improvements. Recently, however, its limitations (rigid application regardless of site-specific conditions, disregard of multimedia impacts, limited incentives for applying new technology) have become apparent. New regulatory approaches are needed that recognize today’s economic constraints, new information about environmental processes and impacts, and the benefits of new technologies. Such approaches will be especially important for the U.S. petroleum refining industry, which operates under thin profit margins, can adversely affect the environment, and must meet the technological challenges of producing more highly refined fuels by using poorer-quality feedstocks.

## APPROACH

Under a grant from the Environmental Technology Initiative, EVS has developed alternative regulatory prototypes for future petroleum refinery operations. EVS recognized that the changing operational characteristics of future refineries and their associated environmental impacts will require different environmental, regulatory programs. These programs cannot simply modify existing medium-specific regulations but must address the fact that pollutants can affect more than one environmental medium. They must also allow refineries flexibility

in achieving environmental protection goals, thereby stimulating new technology development and use. EVS used an iterative approach to explore these issues and develop new regulatory prototypes. First, it analyzed the existing regulatory framework and prototype future refinery operating environment. It then identified legislative, regulatory, and policy options to help meet the potentially conflicting goals of reducing net environmental impact, stimulating use of new technologies, and reducing costs. EVS integrated the options into two prototypical environmental regulatory programs. One is goal-based; release limits are negotiated, and the resulting agreement serves as a facility-wide multimedia permit. The other is risk-based; risk is the basis for setting limits, and releases can be traded across environmental media and pollutants.



*EVS has developed prototype alternative environmental regulatory programs for petroleum refineries operating in the future.*

---

EVS designed a basic structure for each option and obtained input from refiners, regulators, local citizen groups, and other interested parties via a series of workshops. EVS is using the insights gained from these workshops and analyses of potential implementation issues to refine the approaches, soliciting further feedback, and test prototypes.

## RESULTS

EVS has developed two future-oriented environmental regulatory approaches for petroleum refineries. These prototypes are now ready for further analysis and testing by interested parties.

Several organizations have expressed interest in tracking and participating in case studies to test the prototypes. Through the U.S. Department of Energy reinvention efforts, and potentially applying the prototypes to other industrial sectors.

## FUTURE

Near-term plans include examining potential implementation issues in the context of state statutory constraints and presenting the prototypes to a large gathering of industry representatives (e.g., the American Petroleum Institute) for comments. Mid-term activities include conducting additional workshops and research on the availability of technologies to implement the approaches (e.g., fence-line emissions monitors). Longer-term plans include launching a case study of the prototypes at an actual or hypothetical refinery. EVS may also develop a Web site to facilitate information exchange.

(DOE), EVS is providing information to the Venezuelan government for a possible test of the prototypes at its crude-oil upgrading facilities. The Environmental Protection Agency's (EPA's) Regulatory Reinvention Office is also following the activities. State regulators have offered to help launch pilot tests. National environmental groups have suggested expanding the prototype approaches to the entire petroleum industry. Several citizens groups have endorsed EVS's approach, thereby increasing the potential for successful implementation.

Benefits of the prototype work include sharing scientifically based information on environmental regulatory approaches with interest groups, providing lessons learned to the EPA for its broader

## COMMUNICATION OF RESULTS

EVS published a report summarizing its efforts to develop alternative regulatory approaches in 1997. It presented information on the project methodology at the 1996 Pacific Basin Conference on Hazardous Waste in Malaysia. It gave a poster presentation on using stakeholder input to develop the approaches at the 1997 X-Change Conference in Florida, and an article on the same topic is scheduled for publication in *Technology* in 1999. The prototypes have been presented to local citizens, environmental groups, oil and gas industry representatives, and state and federal regulators.