Environmental Policies in the New Millennium

Incentive-Based Approaches to Environmental Management and Ecosystem Stewardship

A Conference Summary

Prepared by Julie Harlan

World Resources Institute
in cooperation with
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J.H.

FOREWORD

Poised at the dawn of a new millennium, we face an unprecedented challenge to integrate our approach to human development, environmental stewardship, and economic progress. All life and human prosperity depends on the healthy functioning of our biosphere and climate systems. Yet, for the first time in human history our patterns of economic development and population growth are significantly diminishing the capacity of these systems to provide the goods and services that sustain us. Analysts predict that population growth will increase over the next four decades, regardless of what we do to curtail it. Thus, economic production must also increase to support the basic needs of these burgeoning populations. But how can we continue to meet these human needs without further degrading the capacity of our biosphere and climate systems to sustain life?

Ultimately, we must break the connection between increased prosperity and greater material consumption and ecosystem degradation. Our traditional command-and-control regulatory system rarely encourages or rewards improvements in material efficiency. Generally, it simply sets limits for industrial pollution. Such a system is protective, yet it is not *proactive*. Increasingly, however, regulators and others are experimenting with *incentive-based* programs to provide rewards for improved environmental performance and ecosystem stewardship. They understand that progress in this arena is likely to come through innovative approaches that use both a range of incentives and a coevolving regulatory framework that together ensure environmental improvement at the least cost.

Such challenges are not for governments alone. In today's world, self-authorizing alliances, including business and nongovernmental organizations (NGOs), now articulate societies' needs and expectations nearly as much as governments. Recognizing this trend, the World Resources Institute, in conjunction with the U.S. Environmental Protection Agency (EPA), brought together a group of practitioners from governments, NGOs, and the business community to develop an Action Agenda for encouraging more widespread use of proactive, *incentive-based* approaches to environmental management and ecosystem stewardship. The November 1999 conference, "Environmental Policies in the New Millennium," provided an opportunity for this diverse group to meet face-to-face to discuss obstacles and opportunities for the use of incentive-based mechanisms. Crucial to this exercise was an atmosphere of trust and shared vision. Throughout their two days together, participants heard about many examples in which coalitions of business, government, and NGOs were better able to accomplish their goals by finding ways to work together toward effective solutions. Such an open, honest dialogue would not have been possible without the participants' enthusiastic sharing, as well as the tremendously skillful facilitation of the Meridian Institute staff.

I invite you to review the synthesis of conference participants' collective wisdom and practical experience *(see Appendix C for a list of participants)* and to read about some of the innovative programs discussed during the Incentives Conference. Both are intended to inspire further experimentation with the use of incentives and are based solely upon the dialogue and presentations that took place during the two-day conference. Note that this report is not an original piece of analytical research, nor is it intended to provide a comprehensive set of guidelines for implementing incentive-based programs. The organization of the text reflects the three-part conference agenda *(see Appendix B)*, which focussed on the use of information and economic instruments as incentives and how these tools can be applied to improve both industrial environmental performance and ecosystem stewardship. Much of the case study material presented here draws heavily upon background papers prepared for the conference. These papers are referenced in the bibliographical note on page 22 and their full text may be accessed on the World Resources Institute's Website at: www.wri.org/wri/incentives. I hope this report will be of value to you and to a broad range of practitioners and stakeholders as they experiment and innovate with incentive-based programs.

Jonathan Lash
President
World Resources Institute

I. Action Agenda: Guidelines and Challenges of Incentive-Based Programs

In November 1999, the World Resources Institute, in conjunction with the U.S. Environmental Protection Agency (EPA), brought together one hundred members of the business community, NGOs, federal and state regulators, and others to share on-the-ground experiences with implementing incentive-based programs for improved environmental management and ecosystem stewardship. The following Action Agenda is a synthesis of these discussions and is based upon collective wisdom and experience. It is not comprehensive, nor does it define a set of guidelines applicable in every situation. Yet, the Incentives Conference organizers and participants hope that it will spur readers to experiment and innovate with incentive-based programs. The Action Agenda is geared toward government regulators, the business community, NGOs, local communities, and grantmaking institutions, all of whom have important roles to play in improving environmental management and ecosystem stewardship, and all of whom have opportunities to pursue incentive-based solutions to these challenges.

Business leaders must voice their preferences for incentive-based programs. They must actively work to create corporate cultures that strive to exceed regulatory requirements and become leaders in material and energy efficiency. These efforts must ultimately go beyond public relations efforts to improve corporate images. They must originate out of a genuine understanding that what's good for the environment is good for business *and* the bottom line. Industry leaders must be willing to work with NGOs, communities, and other nonregulatory stakeholders to develop innovative, win-win solutions to environmental management issues.

NGOs and communities must recognize the importance of moving beyond solely a finger-pointing, "gotcha" approach to work *with* industry to build trust and develop workable solutions. Good facilitation may help to establish these partnerships. These groups can also provide guidance and incentive program management services for both companies and at the community level. In addition, they can publicly lend their support to a company's green initiatives.

Communities and individuals may have one of the largest roles to play. The need to advocate for better environmental management and ecosystem stewardship rests largely on their shoulders. Consumers hold enormous power to influence companies' environmental management practices. Private citizens are free of the innovation constraints sometimes faced by government regulators. Community members have the advantage of geographical proximity and historical context of the challenges faced by their communities.

Foundations and grantmaking institutions may also have a special role to play in leveraging the use of incentive-based approaches. They can provide financial resources that are not tied to congressional legislation and cannot be cut because of

shifting political winds. These institutions can fund public and private-sector outreach efforts about the fundamental need to properly value natural resources in the marketplace and the benefits of incentive-based programs. And foundations are uniquely positioned to support policy research initiatives to develop incentive-based tools, as well as demonstration projects at the local level that might be difficult to fund otherwise.

Incentives Conference participants agreed that institutional and cultural barriers to more widespread use of incentive programs do exist. These issues urgently need the time and innovative problem solving skills of regulators, industry, NGOs, and others. They have been presented at the end of this Action Agenda as "Innovation Challenges for the Next Millennium."

General Principles for Developing and Implementing Incentive-Based Programs

- Properly identify and engage the community of interest. Partnerships among government, industry, NGOs, and local communities have been very effective in pilot incentive projects around the country, particularly when leaders invested time up front to engage all potentially interested and affected parties early in the information sharing, strategy development, and decisionmaking processes. Good facilitation can help to overcome distrust among stakeholders groups and create process transparency
- Establish clear goals, indicators, and end points. Clear environmental, economic, and social outcomes for incentive-based programs must be established, along with *credible* indicators to measure progress towards meeting them. Developing a clear understanding of the needs and incentives for each constituency is key.
- Target incentives and language to stakeholder needs. Stakeholders must be able to value, understand, and interpret the goals of incentive programs. For example, the average citizen may not care about parts per billion of effluent. Instead, they may care more about the availability and edibility of fish in their streams. Incentives must be attractive to their intended beneficiaries in order to be effective.
- Establish strong, consistent leadership and a clear statement of principles around which stakeholder efforts can coalesce. Shared vision and strong, consistent leadership are crucial to conceptualizing and implementing incentive-based solutions. Such guidance can come from governments, NGOs, business leaders, or community members.
- Experiment with demonstration projects. Pilot efforts to use new tools, or combinations of tools, are necessary to learn what works and promote new ideas. Monitoring the progress of these projects and evaluating their outcomes is key. Such efforts may be driven by NGOs, industry,

governments, or private citizens. Foundations can help catalyze these efforts by providing critical financial support.

- Acknowledge and plan for culture shock. Incentive-based approaches often run counter to the accepted regulatory culture. Leaders need to explicitly plan for this and address it through, for example, training programs and patience as practitioners learn to work within a new paradigm.
- Create equal-opportunity incentive programs. Recognize the potential for perceived inequity in offering certain incentives to some companies, communities, or individuals, and not to others. If circumstances dictate the necessity of an unequal distribution of incentive-based benefits, be prepared to explain them.
- Design programs to appropriate scales. People want information and economic-based incentives that are directly relevant to the needs of their company or community. A single program, developed by national regulators, may be inappropriate when applied at the community level or within a small company.
- Build flexibility, practicality, and adaptability into programs. The needs of people and institutions involved with an incentive-based program may change over time. Thus, a program's capacity to adapt is crucial if it is to succeed over the long term.
- Learn from previous successes. By understanding what motivates progressive companies and communities to act, regulators, NGOs, and others can offer similar incentives to others. It is important to initiate an ongoing dialogue with these environmental performance and ecosystem stewardship leaders to learn from their success.
- Establish credibility and comparability of information. Consumers must be able to distinguish factual, unbiased corporate environmental information from that used in public relations and advertising campaigns. Companies and consumers alike must know that interpretations and rankings of corporate environmental data are not biased. And all parties must trust that corporate environmental data are comparable across a particular industry to allow an equitable distribution of regulatory sanctions and rewards.
- Where appropriate, help industry associations to understand incentive-based approaches. Trade associations are often the most difficult segment of the private sector to influence. Yet, they fill a crucial advocacy role for industry and often influence corporate decisions on environmental management. Thus, it may be useful to work first with opinion leader companies within associations to help them understand and value the benefits of incentive-based approaches.
- Work with appropriate level decisionmakers within companies and develop succession plans. Staff turnover at companies and other organizations can thwart efforts to

implement incentive-based programs. It is, therefore, important to identify leading decisionmakers who are less likely to abruptly leave the company in the middle of the project. However, prearranged succession plans and alternate leadership can provide for a smoother transition in the event that leadership must change hands.

- Establish clear guidelines on how far states can go with efforts to innovate. Such guidelines can help to remove roadblocks for the implementation of incentive-based programs at both state and local levels.
- Develop metrics to help industry and consumers assess costs and benefits of production or behavioral changes. For example, homeowners can be encouraged to build homes with more energy-efficient products by calculating and demonstrating how much money such features can save the homeowner over time. Industry can be encouraged to improve environmental performance by understanding how such improvements can positively affect the bottom line and reduce regulatory burdens.
- Recognize and address industry fears about incentive-based programs. Companies considering investing in new environmental management technologies and practices are often concerned that a new incentive program will emerge to *pay* competitors to upgrade their environmental management systems to the same level. Regulators and others must take steps to assure companies that they will continue to reap financial benefits over time and may gain a distinct competitive advantage over competitors by taking such early action.
- Establish externally imposed deadlines for change. For many companies, an environmental management challenge that promises a net financial benefit with a reasonable, externally imposed deadline is a powerful incentive. For example, during the months prior to the signing of the Kyoto Protocol on climate change, such companies as British Petroleum understood the clear competitive advantage they would gain by taking early action to reduce carbon emissions. In so doing, they set their own pace for changing their corporate culture and environmental management practices, instead of reacting to a regulatory mandate later.
- Consider using combinations of trading and tax incentives. Such mixing and matching may help incentive programs appeal to more constituencies.
- Consider moving beyond industry reporting toward self-auditing, with required disclosure. Self-audits could be more effective in encouraging better environmental performance in smaller companies than a permitting process, which requires government intervention.

Innovation Challenges for the Next Millennium

The following list of barriers to more widespread use of incentive-based programs arose from discussions during the Incentives Conference.To overcome these barriers will generally require larger paradigm and culture shift. What follows is a partial list of longer-term challenges for all stakeholders to address during the next millennium.

- Natural resources are not properly valued in the marketplace. Society urgently needs to develop a language and an economy that reflects the true price of goods and services so that corporations and consumers can make more informed decisions about their manufacturing practices and consumption choices.
- Environmental management and ecosystem stewardship information must be integrated into education curriculum at all levels. To shift the current cultural paradigm, an environmental ethic must be instilled in students at all levels of education. It is especially important to inculcate a sense of responsibility among the public, business, and political leaders, and others for environmental stewardship.
- Financial analysts who understand how corporate environmental strategies can strengthen financial performance are an untapped source of incentive for environmental improvement. Companies should exercise leadershp by defining for the financial community how their enviornmental strategies contribute to the financial health of the company. Financial analysts need both the information and the analytical capability to translate environmental performance into financial terms that are comparable to other aspects of their financial analysis.
- Strict divisions among government agencies and lack of appropriate incentives for regulatory staff hinder innovation. For example, lack of influence on tax policy may prevent EPA from implementing more financial incentives. And the performance of regulatory staff may be based on false proxies, like the number of permits they generate, rather than the environmental outcomes they achieve.

II. Background

For the past three decades, the United States has primarily relied on the regulatory approach to obtain improvements in the environmental performance of business. These early regulations were often based on end-of-pipe solutions with little focus on pollution *prevention* through more systemic changes to core production process or product design. Nevertheless, these regulations have been successful in securing the first round of emissions reductions from previously unregulated industries. But nearly three decades after their introduction, many now view them as increasingly burdensome. As we move into a new millennium, a growing number of regulators, companies, NGOs, communities, and others see value in moving beyond the use of

regulatory measures alone. Many want flexible, practical strategies for environmental management, as well as ecosystem stewardship, that *build upon* the existing regulatory framework and create momentum for innovation and adaptation. Incentive-based approaches can do just that.

The Incentives Conference, and this summary, focused on two major types of incentive programs: 1) those based on providing *information* about companies and their products, or about ecosystem status, and 2) those based upon some *economic reward or penalty*. Whether one views something as an incentive depends upon the circumstances and perceptions of the target company, organization, or individual. Moreover, an incentive that works today might work less effectively, or not at all, tomorrow. And an incentive that works for one sector, company, community, or individual might not work for another. Thus, it is crucial to remain flexible and focus on practicality when applying these tools.

Some of the most effective uses of incentives are those arising from social pressures and cultural expectations. For companies, the promise of better standing and trust within a community can spur improved environmental management. Among individuals and within communities, social norms that ostracize ecologically destructive behavior may encourage greater stewardship. Though not always explicit, such social incentives were often integral to the success of the innovative programs that follow.

III. Information as an Incentive for Improving Environmental Performance and Ecosystem Stewardship

Improving Environmental Performance

One of the most basic and effective incentive tools for improving environmental performance is information itself. Efforts to make information about facilities and products available to the public, especially consumers, can lead to greater accountability and voluntary improvement in performance on the part of industry. To draw conclusions about the environmental performance of a particular company, a consumer might want to understand such variables as waste reduction policy, energy sources, regulatory compliance record, product stewardship program, and whether or not the company uses or stores hazardous wastes within its facilities. Information programs can make some, or all, of these details available to the public.

One such program, the Toxics Release Inventory (TRI), was designed to share environmental performance information with the public. Based on the notion that citizens have a right to know about toxic chemicals in their communities, the TRI was mandated by the EPA in 1986 to provide information to citizens about local releases of toxic chemicals. Information from the TRI helps citizens and public officials hold companies accountable for their releases, make informed decisions about the management of these pollutants

in their communities, and understand potential risks to human health. Currently, some 23,000 U.S. facilities are subject to the law and must report on their releases of over 650 toxic chemicals and chemical categories (EPA, 1999). TRI has been credited with a greater than 40 percent reduction in overall toxic chemical release, although some have criticized it for perceived data weaknesses (Outen, 1999). Recognizing consumers' aversion to the release of toxic chemicals and the potential for savings through reduced raw material wastage, many companies quickly found ways to decrease their toxic emissions. *(See Box A for contact information.)*

As information-based incentive programs become more widely implemented, NGOs and others may step in to interpret this raw data to make it more useful to consumers. A good example is the Environmental Defense Fund's Scorecard Website. Scorecard plugs TRI release data into a mathematical prediction model that ranks facilities according to their relative toxic chemical release risk. This Website is presented in a user-friendly format that allows visitors to navigate quickly through the site, find risk-ranked lists of facilities, and even send a message to those facilities or the EPA. *(See Box A for contact information.)*

Improving Ecosystem Stewardship

Not only can information be used to sound alarms about a company's *negative* practices, such as the release of toxic pollutants, it can also be used to help consumers make *positive* choices to purchase products arising from responsible ecosystem management practices. Ecosystems produce a wide range of goods and services, some of which can be marketed: timber, clean water, and food. Frequently, however, the production of these goods and services generates serious ecological damage through, for example, the use of pesticides and fertilizers in agricultural production or clear-cut practices in timber harvesting (Parker et al., 1999). To help consumers make informed choices, some organizations have begun to certify those products generated through sustainable management practices. This is also known as "ecolabeling," based

Box A: *Information-Based Incentive Programs for Improving Environmental Management*

Contact Information

- Toxics Release Inventory Program, Website: www.epa.gov/opptintr/tri phone: (202) 260-1531
- Environmental Defense Fund's Scorecard Website: www.scorecard.org/
- Green Seal, Website: www.greenseal.org. Arthur Weissman, President, 1001 Connecticut Avenue, NW Suite 827, Washington, DC 20036-6400, phone: (202) 872-6400 Email:labeling @energystar.gov
- Energy Star Program, Website: www.epa.gov/energystar
- Green Purchasing Network Secretariat, Website: www.wnn.or.jp/wnn-eco/gpne/index.html Hiroyuki Sato, Deputy Director General, Cosmos Aoyama, 5-53-67, Jingumae, Shibuya-ku, Tokyo 150, JAPAN, phone: 81 3 3406 5155 Email: hv6h-stu@ashahi-net.or.jp

on the common use of labels or symbols to designate preferred products. Certification is becoming a major factor in the marketing of timber, agricultural products, and fish. The incentives for producers to certify their products include higher prices and expanded market share.

One of the better known examples of ecolabeling involves the standards established by the Forest Stewardship Council (FSC). Composed of representatives from environmental organizations, the timber trade, forestry professionals, indigenous groups, and forest product certification organizations from around the world, the FSC uses an independent certification system to evaluate environmental performance against a set of standards. The FSC evaluates and accredits forest management certifiers, such as Scientific Certification Systems and Smartwood, based on a set of 10 principles addressing environmental, social, and economic issues. As of August 1999, over 39 million acres of productive forest land are certified worldwide (5 million of those in the United States) in accordance with FSC standards. The U.S. market for certified forest products is growing rapidly as such business leaders as The Home Depot, Nike, and the architectural firm HOK turn to certified forest products as a means of putting their environmental policies into action (FSC, 1999). *(See Box B for contact information.)*

Ecosystem stewardship can also be improved through programs that provide basic information on ecological conditions and trends. Encouraging volunteers to collect data on important indicators of ecosystem condition is an effective way of generating this information. For example, both the Penobscot Bay Network and the Casco Bay Estuary Project in Maine use volunteers to monitor water quality. The state of Minnesota has instituted the Minnesota Citizen Lake Monitoring Program in which volunteers collect water quality information. Such backyard monitoring efforts, when they are well designed, can generate the intense and sustained interest of volunteers, who frequently become engaged in other efforts to protect ecological conditions (Keystone Center, 1996). *(See Box B for contact information.)*

IV. Economic Incentives as a Tool for Improving Environmental Performance and Ecosystem Stewardship

Improving Environmental Performance

Economic incentives are yet another powerful tool for improving environmental performance and ecosystem stewardship. They have the potential to achieve the same level of overall environmental protection, through pollution reduction and material efficiency, as traditional regulatory schemes at a lower total cost. In addition, they often allow for more hands-off regulation and decentralized decisionmaking, giving greater freedom to firms and plants in deciding how to comply with existing regulations, while reducing the administrative burden on regulators (Austin, 1999). But how do economic incentives work?

Currently, manufacturers have a permanent incentive to reduce labor, material, machinery, and energy inputs, all of which cost money. By attaching a cost to the release of pollutants, the manufacturers are more likely to incorporate the pollution costs, along with those of labor, material, and energy inputs, into the decisionmaking process. Through the use of economic incentives, the regulator, thus, influences environmental quality by providing companies with an ongoing incentive to reduce pollution over time. A permanent incentive is also created for engineers and designers to generate new processes or equipment, develop new product designs, create new abatement methods, and reconfigure existing production lines to reduce the outflow of targeted pollutants (Austin, 1999).

One of the crucial properties of economic incentives is that they not only allow firms to take different actions, but they also allow them to end up with varying levels of emissions. Because manufacturing plants, even those within the same industry, differ widely in their levels of technology and production processes, some will find it less expensive to undertake certain reductions than others. An economic instrument can achieve a given level of environmental protection for lowest overall cost by creating a framework that allows for companies to respond according to their ability to make reductions. Ultimately, firms are either rewarded or penalized for their efforts. One company may continue to emit more pollution, but pays a price for doing so. Another may undertake further control measures and reap a lower tax bill, revenues from sold permits, and so on. The impact on the environment will be the same, but the aggregate cost of the regulation will be reduced. In practice, the key issue is to design mechanisms for economic incentives to complement and integrate with a well-established regulatory system (Austin, 1999).

One type of economic incentive program that allows for such varying responses involves the use of tradable permits. Such incentive programs require manufacturers to hold permits to release a given quantity of pollution. Because these permits are tradable, the manufacturer can pay other holders to obtain more permits if it needs them or can sell existing permits by reducing its own pollution levels. By managing the aggregate number of permits, the regulator effectively controls the total release of pollution.

Working in partnership with state agencies, local stakeholders, and the World Resources Institute, such a tradable permitting scheme was recently tested in three watersheds of the Upper Midwest: the Saginaw Bay in Michigan, the Rock River in Wisconsin, and the Minnesota River Valley. The goal of the analysis was to explore the cost-effectiveness and environmental performance of various strategies to improve water quality by capping total nutrient loading from agricultural run-off and municipal and industrial waste discharge in these watersheds. The collaborators tested several scenarios, some more traditional and some incentive-based, that could be considered for the three sites and

Box B: *Information-Based Programs for Improving Ecosystem Stewardship*

Contact Information

- Forest Stewardship Council United States, Website: www.fscus.org, Hank Cauley, Director, 1134 29th Street, NW, Washington, DC 200037, Toll Free Phone: 1-877-372-5646, Fax: (202) 342-6589
- The Marine Stewardship Council, 119 Altenburg Gardens, London SW11 1JQ, United Kingdom, Phone: 44 0 171 350 4000, Fax: 44 0 171 350 1231, Email: Secretariat@msc.org
- Penobscot Bay Marine Volunteer Program, University of Maine, Cooperative Extension, Website: www.umext.maine.edu/resources/aboutumc.htm, Phone: (207) 832-0343
- Minnesota Citizen Lake Monitoring Program, Minnesota Pollution Control Agency (MPCA), Website: www.pca.state.mn.us/netscape.shtml, Phone: (651) 296-6300, Jennifer Klang, 520 Lafayette Road, St. Paul, MN 55155-4194, Phone: (651) 282-2618, 1-800-657-3864, Email: jennifer.klang@pca.state.mn.us

applied to other sites with similar conditions (Faeth, 1999).

Ultimately, the analysis showed a wide range in the cost-effectiveness of the different approaches, with more conventional regulatory approaches showing the least benefit per dollar spent. Whereas, the study found that the more flexible strategies could potentially provide greater improvements in water quality, over a larger range of reductions, and at much lower cost. These findings do not suggest that conventional regulatory strategies have failed. Indeed, the water quality in each of the text case sites would have been far worse without them. But the results show that, because the remediation costs for conventional approaches and programs that involve trading widely vary, trading has potential in all of the case study watersheds. One would expect that such programs could also work for other, similar watersheds (Faeth, 1999). For more information on these nutrient trading case studies, visit the Incentives Conference Website at: www.wri.org/wri/incentives.

Shifting taxation from actions deemed good by society, such as earning an income or owning property, to those deemed bad, such as emitting industrial pollution, is yet another type of economic instrument. In 1997, Minnesotans for an Energy-Efficient Economy, also known as ME3, made an early, state-level attempt at such a tax-shift. Founded in 1991, ME3 is a coalition of leaders in Minnesota's public interest and environmental communities that works to advance public policy in energy, environment, public health, and economic development. ME3 designed the Minnesota tax-shift proposal to tax carbon emissions with a net offsetting reduction of existing taxes on property. Extensive economic modeling of the proposal showed net reductions in cost for a wide range of businesses if best industry practices in process efficiency were applied. In other words, the industrial sector modeling showed that the tax would work as designed: to squeeze waste and ineffi-

ciency out of industrial processes, and improve, not reduce, competitive positions over time (Noble, 1999). Yet, many large industries, energy producers, and other businesses in the state saw the tax-shift harming Minnesota's competitive position and did not believe that the shift would be revenue-neutral. Although the public liked the idea of a tax-shift in general, the proposal failed to garner enough political support for passage by the state legislature. Among other reasons, ME3 concluded that such a sweeping structural shift in the tax system ultimately would require a stronger strategy for engaging important constituencies, as well as strong gubernatorial leadership (Noble, 1999).

Since the 1998 Minnesota general elections, the Tax Reform Program has reinvented itself under the umbrella of Renew Minnesota to collaborate on a broader program of environmental tax reform analysis and communications. Renew Minnesota is moving ahead, having learned from their previous experience that efforts towards environmental tax reform must incorporate the best new ideas, incentives, and messages to provide more engaging opportunities than those offered under a revenue-neutral tax-shift. The Minnesota example provides valuable lessons for those who seek to design and implement a tax-shift program. For further information on the Minnesota Environmental Tax Reform Initiative and Renew Minnesota, visit the Incentives Conference Website at: www.wri.org/wri/incentives.

Box C: *Economic-Based Incentive Programs for Improving Environmental Management*

Contact Information

- ME3 Sustainable Minnesota,Website: www.me3.org, John Bailey, Webrarian, Email: Bailey@ilsr.org
- BP Amoco's Greenhouse Gas Emissions Trading Program, Website: www.bpamoco.com Phone: 44-171-496-4353, Simon Worthington, Email: worthis@bp.com
- Natural Resources Defense Council (NRDC), Reports available at Website: nrdc.org/nrdcpro/fppub1.html
- Meridian Institute, Website: www.merid.org Phone: (970) 513-8340
- California Capital Access Program, Website: www.treasurer.ca.gov/calcap.htm, CPCFA, Attention: SBAF Program Manager, 915 Capitol Mall, Room 466, Sacramento, CA 95814 Phone: (916) 654-5610

Improving Ecosystem Stewardship

Economic incentives are increasingly being used to prevent or reduce industrial pollution, but they are only now being adapted and used to encourage ecosystem protection and stewardship.

The same type of taxes and charges used by regulators to prevent industrial pollution can be applied to discourage behaviors that damage ecosystems. At the other end of the spectrum, subsidies can be used to encourage behaviors that protect eco-

systems. For economic incentives to effectively improve ecosystem stewardship, the charge, tax, or subsidy has to be set high enough to change the behaviors that affect the ecosystem function or condition. The mechanisms should also be spatially targeted, coupled with monitoring efforts, and evaluated in terms of their impact on ecosystem functions or conditions. Few programs meet all of these criteria, but many meet some of them (Parker et al., 1999).

The pricing mechanisms most commonly used for ecosystem protection are subsidies, which are defined here as payments for providing desired ecosystem conditions or services. Subsidies can take many forms, including reductions of nonenvironmental taxes and direct payments. Income tax and property tax deductions can create powerful incentives for conservation activities, such as conservation easements, land donations, habitat restoration, and wildlife management (Brown 1999). For example, Minnesota encourages land donations and conservation easements to protect wetlands and native prairie by making the donations and easements tax-deductible. Conservationists have also widely, but unsuccessfully, advocated reductions in federal estate taxes for inherited lands placed in conservation easements as a strategy to maintain natural habitats and open lands in the face of escalating land prices and development pressures (Keystone Center, 1996). Elsewhere, namely in several New England states, property taxes for lands maintained in current uses, such as forestry, agriculture, or wildlife habitat, qualify for tax rates that are stable or increase at less than real estate market values.

The Public Benefit Rating System (PBRS), a land tax program in Jefferson and King Counties in Washington state (Brown 1999), illustrates how tax reductions can be tailored to encourage ecosystem protection. The state usually bases property taxes on appraised fair market value, which primarily reflects the property's development potential. The PBRS complements this way of determining property taxes with a scoring system in which points are assigned to specific open-space resources of public benefit. For example, property owners in King County receive points if they preserve or restore open space features, such as salmon and wildlife habitat and stream buffers. The more points the landowner accrues, the lower the property tax — and the lower the pressure on the landowner to exploit the land's development potential. Although the PBRS targets tax reductions on lands with valuable ecosystem conditions or services, it is not coupled with a monitoring program. *(See Box D for contact information.)*

The U.S. Department of Agriculture's Environmental Quality Incentive Program (EQIP) is a well-known example of using direct payments to encourage conservation. EQIP, which was established through the 1996 Farm Bill, targets financial, educational, and technical assistance to priority areas based on environmental sensitivity and natural resource concerns. The financial assistance includes incentive payments for such practices as nutrient management, manure management, integrated

Box D: *Economic-Based Incentives for Improving Ecosystem Stewardship*

Contact Information

- Washington State's Public Benefit Rating System (PBRS), Website: splash.metrokc.gov/wlr/lands/incentiv.htm, Ted Sullivan, PBRS Coordinator, Phone: (206) 205-5170 Email: ted.sullivan@metrokc.gov
- U.S. Department of Agriculture's Environmental Quality Incentives Program (EQIP), Website: www.nrcs.USDA.GOV./NRCSPROG:Html#Anchor-Environmental
- The Nature Conservancy's Forest Bank Program, Website: www.forestbank.org, International Headquarters, 4245 North Fairfax Drive, Suite 100, Arlington, VA 22203-1606 Phone: (703) 841-5300
- New Jersey Pinelands Commission, Website: www.state.nj.us/pinelands/index.htm, Pinelands Commission, PO Box 7, 15 Springfield Road, New Lisbon, NJ 08064, Phone: (609) 894-7300 Fax: (609) 894-7330, Email: info@njpines.state.nj.us

pest management, irrigation water management, and wildlife habitat management (USDA, 1999). Economists are now exploring ways to target agricultural financial assistance even more carefully so that it can more effectively pay for providing environmental services, such as carbon sequestration and nutrient cycling from farmland (Mooney and Antle, in press). *(See Box D for contact information.)*

Direct payments for ecosystem services do not have to flow from public funds. For example, water and electric utilities are paying landowners for conservation actions that protect water quality or water flow regimes in Costa Rica and the United States (Castro et al., 1998; Landry, 1999). The Nature Conservancy's pilot forest banks in Virginia and Indiana represent another innovative approach to direct payments for ecosystem services. In exchange for depositing the right to grow, manage, and harvest trees on their land in a Forest Bank, landowners receive a regular financial return or dividend payment. In turn, the Bank manages timber production in a way that will sustain ecosystem functions. *(See Box D for contact information.)* Finally, although they are a controversial strategy for reducing greenhouse gas emissions under the Framework Convention on Climate Change, carbon sequestration projects have attracted more than $30 million in investments from electric utilities. These projects may involve forest protection, improved forest management, reforestation, or agroforestry activities (Brown et al., 1997; Dixon et al., 1993).

Just as with pricing instruments, quantity instruments like tradable permits are less commonly used for ecosystem protection than for more overall environmental goals. In general, quantity instruments are used to achieve two aspects of ecosystem protection: limit pollution to levels that the ecosystem can assimilate; and restrict the total quantity and the configuration of development in ecosystems that need to retain a large, contiguous area of natural vegetation to maintain their basic functions. Tradable permits are often used to achieve the former goal, while transferable

development rights are for the latter (Parker et al., 1999).

The New Jersey Pinelands Commission uses two systems of transferable development rights. For both systems, the commission categorizes land based on ecological features, among others, and the Pinelands Commission and the National Park Service carry out environmental and economic monitoring programs (New Jersey Pinelands Commission, 1998). The first system, which began 18 years ago and functions at the regional level, is the Pinelands Development Credits (PDC) system. Under this system, the Pinelands Commission allocates development credits to landowners in areas that are designated for preservation or agricultural production. Developers owning land in areas designated for growth can purchase the credits and use them to increase the densities at which they can build. To date, the PDC program has protected more than 13,000 acres.

The second system, which was established in 1992 and works at the local level, is a density transfer program. This program addresses areas designated for rural development and forest management that the PDC system does not cover. Under this system, developers can purchase land, rather than development credits, and transfer the density allowed for the purchased parcel to land already under development. The New Jersey Legislature amended the Municipal Land Use Law in 1996 to allow all municipalities to use this growth management tool (Liggett, 1999). *(See Box D for contact information.)*

Incentives represent a second generation of tools to protect ecosystem functions and promote sound stewardship. Compared to regulatory approaches, incentives have both advantages and disadvantages. They are more flexible, easier to adapt to local circumstances, and often more economical, but the transition to using incentives can be difficult and time consuming. Moreover, given our limited experience with incentives, predicting their effects on ecosystem functions and conditions is an inexact science.

Regulatory Incentives as Tools for Improving Environmental Performance and Ecosystem Stewardship

Regulatory regimes themselves can include incentive measures. Many such programs seek to encourage regulated industries to go beyond compliance by reducing regulatory burden and risk for companies that demonstrate superior environmental performance. The regulatory incentives employed in these programs take many forms, including cross-compliance, streamlined permitting or reporting requirements, and assurance that efforts to improve environmental management will not be penalized in the future. As with the use of economic incentives, relatively few regulatory incentive programs are geared toward ecosystem functions and conditions per se, although a few notable programs do explicitly seek to protect them. Those that do not can still help by reducing the burden of pollutants on ecosystems.

The Green Tier program, proposed for Wisconsin, would reward demonstrated environmental performance with increased regulatory flexibility (Meyer, 1999). The program is a possible addition to the groundbreaking Environmental Cooperation Pilot Program, a comprehensive innovation agreement between EPA and the state. Firms participating in the Green Tier program would be able to choose between a Control Tier and a Green Tier. The former would involve complying with the usual, relatively inflexible regulatory framework. The option of participating in the second, more flexible tier would primarily be available to businesses with a solid record of compliance in the control tier. However, under certain conditions it would also be open to those with a less than perfect compliance record as an opportunity to shift from subperformance to exemplary conduct. In either case, participants would be required to enter into a performance contract negotiated to meet the needs of all parties involved. The parties could include business, local or state government, nonprofit groups, or other entities. As currently proposed, the performance contracts would address many threats to ecosystems, including diffuse sources of water pollution and unsustainable forest management. *(See Box E for contact information.)*

In Delaware, a coalition of industry, government, and community representatives jointly designed a regulatory-based incentive program to protect the coastal zone from ecologically harmful development while maintaining the competitive position of the state's industries. The regulations required establishing a technical advisory committee, comprised of interested members of the public and government representatives, to develop a list of goals for the coastal zone and a set of prioritized environmental indicators related to those goals. These goals and indicators were developed in public meetings and subject to public comment prior to their adoption. They will be used to assess environmental conditions, track trends, and identify cumulative impacts on the coastal zone. These findings will be contained in periodic reports on the state of the coastal zone, upon which permitting decisions will be based. Although offsets affecting the same environmental medium (e.g., air or water) as the impact are preferred, flexibility is enhanced by allowing a broad range of offsets that benefit the coastal zone environment. Thus, an increase in air pollution emissions could be offset by the restoration of coastal wetlands. Companies will be able to rely on the list of prioritized environmental indicators to determine which offsets would provide the greatest benefits and would be most likely acceptable to the agency and the public. The Coastal Zone Amendment permitting process is the first of its kind, relying on the use of publicly developed environmental indicators to assess the condition of the environment and provide a basis for guiding beneficial investments and permitting decisions (Tulou, 1999). *(See Box E for contact information.)*

EPA's Project XL also offers the incentive of increased regulatory flexibility to project sponsors, such as Weyerhaeuser Company and the Massachusetts Department of Environmental Protection, who

implement beyond-compliance measures to improve environmental management and ecosystem stewardship. For example, Weyerhaeuser Company's pulp manufacturing facility in Oglethorpe, Georgia, is striving to minimize the environmental effects of its manufacturing processes on the Flint River and surrounding environment by pursuing a long-term vision of a minimum impact mill. The company is taking immediate steps by decreasing water use and meeting or exceeding all regulatory targets. In exchange, EPA is offering Weyerhaeuser the flexibility to consolidate routine reports and use alternative means to meet new regulations prescribing maximum achievable control technology. EPA also is waiving government review prior to certain physical modifications, provided emissions do not exceed stipulated levels. *(See Box E for contact information.)*

Other examples of regulatory incentive programs within industry include the Colorado Environmental Leadership Project, EPA's Common Sense Initiative, and the team permitting option under Florida's Ecosystem Management Agreements. *(See Box E for contact information.)*

Box E: *Regulatory-Based Incentive Programs for Improving Environmental Performance and Ecosystem Stewardship*

Contact Information

- Wisconsin's Green Tier Project, Website: www.dnr.state.wi.us/org/caer/cea/reinvention/green_tier
- Delaware's Coastal Zone Act Regulations, Website: www.dnrec.state.de.us/, Phone: (302) 739-3451, Email: scooksey@dnrec.state.de.us
- EPA's PROJECT XL, Website: www.yosemite.epa.gov/xl/xl_home.nsf/all/homepage
- The Colorado Environmental Leadership Project, Website: cdphe.state.co.us/od/elp.html
- Colorado Department of Public Health and Environment, Tamera Van Horn, Colorado Environmental Leadership Program, 4300 Cherry Creek Drive South, Denver, CO 80246-1530, Phone: (303) 692-3477, Email: tamera.vanhorn@state.co.us
- EPA's Common Sense Initiative, Website: www.epa.gov/ooaujeag/csi/index.html ***[Note: page scheduled to change to www.epa.gov.sectors]***
- Florida Ecosystem Management Team Permitting Option, Website: www.dep.state.fl.us, Linda Long, Phone: (850) 425-2477
- Defenders of Wildlife's Wolf Compensation Trust Fund, Website: www.defenders.org/wolfcomp.html, Defenders of Wildlife, 1101 14th street, NW, #1400, Washington, DC 20005, Phone: (202) 682-9400
- Gray Ranch Grass Bank Program, Website: www.fourcorners.com/tnc/gray.htm, (505) 548-2622

Regulatory instruments can also create incentives for ecosystem stewardship by insuring people against or compensating them for risks associated with the reintroduction of ecosystem functions or species that people have tried to eliminate. For example, efforts to reintroduce fire in forest ecosystems in the western United States have met stiff opposition from homeowners that live in the suburban-wildland interface where many homes have been built in recent decades (Cleaves and Haynes, 1999).

One example of such a risk-reduction incentive is Defenders of Wildlife's Wolf Compensation Trust Fund. The fund was designed to reimburse livestock owners for documented losses resulting from wolf predation. This fund is used in areas, such as in the Northern Rockies, where wolves have been reintroduced or are naturally expanding their ranges from populations in Canada. Some states, such as Minnesota, have similar programs to compensate livestock owners for losses resulting from endangered species' predation. Defenders has also set up a Wolf Habitat Fund that awards landowners $5,000 if they allow wolves to raise pups on their land (Brown, 1999*). (See Box E for contact information.)*

For further information on the use of regulatory-based incentive programs, visit the Incentives Conference Website at: www.wri.org/wri/incentives.

Bibliographical Note

In addition to the references cited throughout the text, this report has drawn heavily on several of the following background papers prepared for the Incentives Conference. We wish to thank the authors for their permission to use this material. All background papers can be accessed on the WRI Incentives Conference Website at: www.wri.org/wri/incentives.

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Barnett, Ernest. Florida Department of Environmental Protection. *Florida Incentive-Based Environmental Protection: Alternative Regulatory Approaches.*

Faeth, Paul. World Resources Institute. *Market-Based Incentives and Water Quality.*

Feeney, Ralph C. BP Amoco Corporation. *Greenhouse Gas Emissions Trading in BP Amoco.*

Gilges, Kent. The Nature Conservancy. *The Forest Bank: A Market-Based Tool for Protecting Our Working Forest Landscapes.*

Herb, Jeanne, Allen White, and Susan Helms. Tellus Institute. *The Patient is Waiting: Rebuilding Environmental Reporting to Drive Regulatory Innovation.*

Moffet, John and François Bregha. Resource Futures International. *Using Third-Party Public-Information-Based Initiatives to Promote Public Policy*.

Noble, Michael. Minnesotans for an Energy-Efficient Economy. *Environmental Tax Reform in the States: Can Major Change Happen?*

Outen, Ron. Jellinek, Schwartz & Connolly. *Designing Information Rules to Encourage Better Environmental Performance.*

Parker, Gwen, Nels Johnson, and Paige Brown. World Resources Institute. *An Overview of Incentive Approaches to Ecosystem Protection.*

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Appendix A: Additional References and Reading

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Appendix B: Incentives Conference Agenda

TUESDAY, November 2

7:30 – 8:30 AM Registration and Continental Breakfast

8:30 – 9:30 AM Opening Remarks
Jonathan Lash, President, World Resources Institute
Susan Moore, Gemi Incentives Workgroup
John C. Sawhill, President, The Nature Conservancy

9:30 – 10:30 AM Information as an Incentive
Overview and Case Study Presentations
Information has emerged as a key component of effective and efficient environmental regulation in the U.S. and around the world over the past few decades. In most cases, it is used to verify whether or not a company is complying with a given environmental regulation. Information could potentially be used to develop effective incentive-based regulations that help move companies beyond compliance and toward enhanced environmental performance. However, several barriers stand in the way. To overcome them, the regulatory community needs greater knowledge of the range of existing information-based systems and frameworks for evaluating the lessons from these early systems and for concrete applications. This stream will explore some of these opportunities.
Moderator: Ron Outen, Vice President & Principal, Jellinek, Schwartz & Connolly, Inc.
Speakers: Jeanne Herb, Senior Scientist, Tellus Institute John Moffet, Vice President, Public Policy, Resource Future International Donald Reed, Deputy Director, Management Institute for Environment and Business, World Resources Institute

10:30 – 10:45 AM Break

10:45 – 12:15 PM Information Small Group Discussion

The objectives of this discussion will be to
- provide an opportunity to reflect and discuss the overview presentation
- identify opportunities for implementation of information-based incentive approaches based on participants' experience
- identify barriers to the application of these approaches, and
- develop recommendations for policy actions to overcome barriers

12:15 – 1:15 PM **Luncheon Speaker**
Richard Farrell, Associate Administrator, Office of Policy and Reinvention, U.S. Environmental Protection Agency

1:15 – 2:00 PM **Summary of Information Discussion**

2:00 – 3:00 PM **Economic Instruments**
Overview and Case Study Presentations
Over the past few decades, many environmental problems in the U.S. have been with "command and control" regulations. However, it has been recognized – in theory if not in practice – that fiscal instruments can offer a more cost-effective approach to many pollution abatement issues. This stream will consider options for use of these instruments on a larger scale.
Moderator: Duncan Austin, Associate, Economics Program, World Resources Institute
Speakers: Paul Faeth, Director, Economics Program, World Resources Institute Ralph Feeney, North American Issues Manager, Group HSE Team, BP Amoco Michael Noble, Executive Director, Minnesotans for an Energy-Efficient Economy

3:00 – 4:30 PM **Economic Instruments Small Group Discussion**
The objectives of this discussion will be to
- reflect on and discuss the overview presentation
- identify opportunities for the application of incentive-based financial mechanisms based on participants' experience
- identify barriers to the use of these financial mechanism approaches
- develop recommendations for policy actions to overcome the barriers

4:30 – 5:15 PM **Summary of Economic Instruments Discussion**

5:30 – 6:30 PM **Reception (Cash Bar)**

WEDNESDAY, November 3

8:30 AM — Continental Breakfast

9:00 – 9:30 AM — Recap of Day One

9:30 – 10:30 AM — Ecosystem Stewardship

Overview and Case Study Presentations

Considerable progress has been made in addressing many "end-of-pipe" environmental problems in the U.S. over the past three decades. Yet ecosystem degradation has continued, and many ecological functions – including water quality and quantity, soil productivity, and habitat – are impaired or inadequately managed. Economic instruments, information policies and other incentives can help to address these problems and to protect ecosystem condition and functions. This stream will examine opportunities for making the use of these approaches more effective and more widespread.

Moderator: Nels Johnson, Senior Associate, Biological Resources Program World Resources Institute

Speakers: Ernest Barnett, Director of Ecosystem Planning and Coordination, Florida Department of Environmental Protection
Kent Gilges, Director, Forest Bank Program, The Nature Conservancy Douglas Wheeler, Partner, Hogan & Hartson

10:30 – 12:00 PM — Ecosystem Stewardship Small Group Discussion

The objectives of this discussion will be to

- reflect and discuss the overview presentation
- identify opportunities for the application within ecosystems of incentive-based information and financial mechanisms
- identify barriers to the use of these mechanisms
- develop recommendations for policy actions to overcome the barriers

12:00 – 12:30 PM — Summary of Ecosystem Stewardship Discussion

12:30 – 2:00 PM — Working Buffet Lunch/ Strategy Session

2:00 – 2:15 PM — Closing Remarks

Appendix C: Incentives Conference Participant List

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