IMPLEMENTING INCENTIVES: EXPERIENCE AND EXPECTATIONS

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"Waste minimization" (WM) has become "pollution prevention"---a term which has been forcefully incorporated in bills to make EPA a Cabinet department,[1] and implies reduction of residuals throughout the production cycle, not just at disposal. The term also confuses means and ends, since it implies that continued reduction is good per se. But the goal is defined reductions in risk or environmental impact. Reducing to zero is not an end in itself in a world of limited resources; if the goal cannot be stated or little reduction in risk or impact would result, there is no apparent justification to "prevent." Finally, the term implies new tensions between regulatory means, since prevention entails changes in behavior and debate is already rising over the best mechanisms---pollution fees, marketable permits, or the negative incentives of command-and-control regulation---to effect such change.

Regardless of whether prevention means more than a shift away from end-of-pipe controls to avoid intermedia transfers and diminishing regulatory returns---and regardless of whether it applies just to hazardous waste, to solid waste, or to air and water emissions as well---it envisions unprecedented changes in raw materials, products, production processes, and disposal practices. These changes will collide with the inherent limits of traditional regulation, requiring use of incentives for their successful implementation.

This paper first suggests why use of incentive approaches for pollution prevention will likely be incremental, even where

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[1] See, e.g., H.R. 3847, 101st Cong. 2d. Sess. § 110, passed by House March 28, 1990 (requiring a new EPA Assistant Secretary for Pollution Prevention).

rules are being written on a clean slate. It then traces this country's considerable use of such approaches to transcend traditional regulatory limits---experience which will shape future applications. Finally, it distills some principles for implementing pollution prevention as that concept moves towards a reality difficult to foresee.

I. INCENTIVES AS SUPPLEMENTS

Incentive or market-based approaches will likely be used as supplements to current regulatory systems, not as alternatives or replacements. First, for most pollution this country is not writing on a clean slate. Detailed regulatory systems mandated and closely monitored by Congress already exist, and the power of the familiar cannot be overstressed. Neither industry, states or environmental groups, nor the public is prepared to scrap those systems for uncertain and potentially disruptive alternatives. However imperfect, they will stick with the devil they know.

Second, existing regimes are savage competitors against innovative alternatives. Regulatory systems are like natural ones---they have evolved to stable equilibria, and resist attempts to push them in different directions. Less often noted are the reasons for such competition, which range from asserted ease of enforcement ("is the required equipment installed?") to fears that government jobs will be transformed. The most powerful of these reasons is the fact that the traditional approach has produced large environmental gains, for costs that have mostly been hidden. Any alternative which seems to erode such gains in the name of efficiency will be rejected. Incentives must first be justified on environmental grounds---as ways to preserve or extend these gains. Only a hybrid system, in which incentives supplement direct regulation by addressing specific, acknowledged shortfalls in securing further progress, is likely to do that.

Third, one trend on Capitol Hill is strongly in the opposite direction---towards more detailed mandates which seek to limit both Agency discretion and industry compliance flexibility. E.g., the 1984 amendments to RCRA progressively banned all solvents, chemicals and other wastes listed or characterized as hazardous from disposal even in properly permitted double-lined landfills, unless EPA promptly issued national technology-based standards requiring pretreatment to "best demonstrated technology" (BDAT) levels for each specific waste disposed in such facilities. Even pending clean air bills which incorporate sweeping incentive mechanisms feature stringent reductions and bristling commands---a connection which is not accidental.

Fourth, much Congressional effort has been spent buffering the effects of environmental policy---in assuring there are not too many big losers too soon. Yet pure incentives approaches are intended to produce large groups of winners and losers very rapidly---by efficiently "internalizing pollution costs" or "making polluters pay." Moreover, as acid rain debates demonstrate, many of these losers are likely to be clustered in the same Congressional districts. Thus, the "pure" approach does not stand much political chance.

Finally, past experience with incentive approaches will critically shape both future approaches and industry's response. E.g., constraints that make it difficult to use emissions trades for cost-effective compliance with current smog rules will discourage investment in surplus SO_2 reductions for acid rain. Even for pollution prevention a clean slate may be hard to find: beyond current incentives to reduce created by Superfund or tort liability, explicit incentives for process or product reformulation to escape the Air Toxics Title of pending Clean Air bills mean that prevention has already arrived.

II. LIMITS OF TRADITIONAL REGULATION

The problem is no longer large uncontrolled steel plants or utilities susceptible to standard engineering solutions. The stresses of dealing with the remaining universe, combined with budget shortfalls, trade deficits, and concerns over international competition, have faced regulators with the structural constraints on direct regulation:

- poor agency information about further feasible ways to control the thousands of diverse, changing products and processes that contribute most remaining pollution;

- soaring control costs, estimated by EPA to have exceeded a half-trillion dollars since Earth Day 1970 and now run $80 billion per year, not counting state laws, recordkeeping and reporting (e.g., SARA Title III) or opportunity costs;

- slow government response to new knowledge and rapidly-changing industrial circumstances through centralized rules tailored to individual processes or chemicals. Such rules require volumes of feasibility data, take years to complete, and often freeze past control technologies in place rather than stimulating new ones;

- little motivation for regulated emitters to do or disclose more than the minimum required (or unregulated

emitters to disclose anything), since disclosure offers no benefits while making them targets for further regulation; and

- the "pollution problems of the 1990's": filling stations, farms, commuters and millions of other small dispersed sources of smog, runoff or groundwater contamination whose effective control often turns on local or site-specific factors, land use, or lifestyle changes; and regional or global problems caused either by hundreds of dispersed activities involving products rather than classic pollution (stratospheric ozone depletion), or by large controlled sources whose further direct control often means new ways of doing business and invokes vicious regional disputes (global warming or acid rain).

Such problems already dominate the environmental universe, and are not very amenable to centralized regulation or enforcement. Whether the incentives are financial, informational or technical, only a shift from regulation towards incentives can begin to overcome them by better matching individual private interests with environmental goals.

III. EXPANDING EXPERIENCE

In response EPA and the Congress have embraced or begun seriously exploring a broad range of incentive-based approaches. EPA's Final Emissions Trading Policy (51 FR 43814; Dec. 4, 1986)---which set federal rules authorizing emitters to create, store ("bank") and substitute inexpensive "extra" emission reductions for costly required ones---is merely one example. But because this "Bubble" policy was the first, has been thoroughly tested, and provided the base for broader applications, it is worth noting that it has saved American industry nearly a billion dollars over the cost of uniform stack-by-stack controls, with equal or better environmental results; balances flexible compliance with environmental integrity through stringent safeguards against "non-surplus" reductions, adverse ambient effects or incidental toxics increases; provides needed safety valves allowing adjustment of national rules to site-specific conditions; and protects sources that bank or trade against loss of credits if further reductions to meet health standards are required. Moreover, the central issue it resolves---how to construct an objective, predictable "baseline" which fairly measures "extra" reductions without penalizing early ones or crediting those that "would have happened anyway" through routine compliance or business decisions---is crucial for any use of incentives. Such

certainty is essential where sources are asked to invest in extra reductions, and show they have made them.[1/]

A short list of related initiatives might include:

- EPA's NSPS Compliance Bubble Policy (52 FR 29046; Aug. 4, 1987), which expressly authorizes emissions trades between different "new facilities" to meet technology-based New Source Performance Standards (NSPS). The first approved NSPS bubble was estimated to save a single utility station up to $22 million annually over the cost of conventional compliance, with about 2000 tons per year additional reductions in SO_2.

- EPA "Netting" Guidance (Feb. 27, 1987) giving states broad discretion to allow plantwide bubbles that encourage modernization without cumbersome "new source review" (NSR). Past "netting" transactions may have saved at least $5 billion over the costs of conventional NSR, without adverse air quality effects. See Hahn & Hester, "Marketable Permits: Theory and Practice," Ecology Law Quarterly, Vol. 16 No. 2 (1989).

- EPA's Stack Height Policy authorizing utilities required to reduce SO_2 emissions under tall stack rules, to make such reductions through statewide bubbles based on total loadings. (53 FR 480; Jan. 7, 1988). The final Policy selected the least constrained options; opened the door to bubble credits from Least Emissions Dispatching (under which utilities direct more generation to lower-emitting rather than lower-cost facilities); and was estimated to save affected sources as much as 60% of compliance costs, with nearly 50,000 tons per year more reductions.

- Lead Phasedown Trading which effectively implemented a nationwide marketable permit system, based on ordinary business records, for refiners who reduced average lead content of leaded gasoline below a shrinking EPA limit. The approach yielded "lead reduction credits" which were sold or bought by most of the industry; accelerated a 90% reduction of lead in gasoline while avoiding risks to small refiners and gasoline supplies; and saved several hundred million dollars over the cost of uniform compliance at each refinery. See, Hahn & Hester, supra; 50 FR 13116 (April 2, 1985).

1/ See, e.g., Levin, "Statutes and Stopping Points: Building a Better Bubble at EPA," Regulation (March/April 1985). See also, Levin & Elman, "The Case for Environmental Incentives," Environmental Forum (Jan./Feb. 1990); "The Clean Air Act Needs Sensible Emissions Trading," Id. (March 1986).

- CFC permits to reduce stratospheric ozone depletion. U.N. protocols mandating a freeze and 50% phasedown in manufacture of these substances provide a continent-wide bubble for EEC countries and transboundary bubbles for others. EPA is implementing this first global regulatory effort through a system of marketable phasedown permits for CFC manufacturers and importers, allocated by historical production factors. Proposed supplementary fees to remove windfall profits have been superseded by Congress' first-ever environmental excise tax on these substances. See Levin & Elman, supra.

- Mobile source trades. EPA has long allowed use of emission reduction credits from mobile sources to meet stationary-source requirements. 51 FR at 43834 (April 7, 1982). It has also authorized use of fleetwide bubbles to comply with truck emission standards under the Clean Air Act, saving an estimated several hundred million dollars per year over the costs of engine-by-engine compliance (see 50 FR 10606 (March 15, 1985)), and recently proposed interfleet, multiyear trading among different engine makers to expand these effects. 54 FR 22652 (May 25, 1989).

- Risk Bubbles. In 1986 the Conservation Foundation proposed authorizing EPA to approve up to 10 applications waiving compliance with traditional regulatory requirements if applicants showed under specified criteria that significantly greater risk reduction would result from alternative actions. The approach, meant to use existing rules as an engine for better knowledge and risk reduction, has effectively been included in EPA's draft pollution prevention bill (March 15, 1990 draft, § 203).[1/]

1/ Similar developments include: expanded ability to use emissions credits from past shutdowns without EPA review, 54 FR 27274, 27290 (June 28, 1989); plantwide trades to meet effluent guidelines, 49 FR 21024 (May 17, 1984); interplant trades to meet ambient water quality standards, 40 CFR § 130.2(l), 130.7 (1989); point/non-point source trades to reduce nonconventional or toxic loadings, EPA/OW, Draft Final Guidance: § 304(l) of the Clean Water Act, § IV.C.d.2. (Sept. 1987); differential user fees for pesticide registrations, see 51 FR 42974 (Nov. 26, 1986), 53 FR 19108 (May 26, 1988); a pending measure to automatically phase out risky chemicals as safer substitutes become available, see Memo, "Proposed 'Safer Pesticides' Federal Register Notice," D. Campt, Director, OPP/EPA, to J. Moore, AA (OPTS), (June 17, 1987); and use of wetlands mitigation banks to reclaim ecological values at Superfund sites or preserve them at others. See Memo, "Wetlands Mitigation Banking," R. Hanmer, Acting AA (OW) to L. Fisher, AA (OPPE) (May 1, 1989).

- The new Clean Air Act, which features a national trading/banking/auction system of true marketable permits for SO_2 credits to achieve a 10-million-ton annual reduction in acid rain precursors for roughly half the cost of plant-by-plant controls, but may also envision plantwide bubbles to meet new air toxics requirements, plus broad regional trades to meet mandates for smog reduction, clean cars and fuels. The Act represents a quantum leap in Congressional and environmental-group support for incentive approaches (as well as in industry reliance on them for flexible compliance), and has already accelerated their use elsewhere.[1/]

- Recycling Tickets. EPA's 1986 Report to Congress on Waste Minimization suggested that if further controls on waste generation become needed, a route preferable to WM standards or bans on waste streams might be tradeable phasedown permits which let market forces determine the location and pace of individual reductions. Under a similar approach developed by EPA to address the millions of gallons per year of used engine oil that are dumped due to negative prices, virgin oil refiners would need tickets representing one gallon of properly recycled oil for every four new gallons produced; tradeable tickets would be generated by oil recyclers or rerefiners; and recycling could yield substantial returns from these tickets' sale.

The original approach was meant to help finance recycling facilities by allowing them to generate a double revenue stream (from sales of tickets plus recycled oil). But it could also have endangered lube oil supplies if the recycling ratio was set too high or the recycling market could not promptly respond. Pending House and Senate bills to establish similar ticket systems would correct this problem by imposing on producers or importers of virgin oil, newsprint and tires an escalating recycling mandate (rather than a production constraint), which can be met either by self-recycling or purchase of covering tickets from downstream recyclers. See, e.g., H.R. 3735, § 208 (used oil); H.R. 3483 (newsprint); H.R. 4147 (scrap tires). The tire bill attempts to address the fact that scrap tires cannot be recycled into new virgin product

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1/ See, e.g., Project 88: Harnessing Market Forces to Protect Our Environment: Initiatives for The New President. A Public Policy Study Sponsored by Sen. T. Wirth [D-Col] and J. Heinz [R-Pa] (Dec. 1988), advancing a comprehensive bipartisan program of which acid-rain trades were only the first step.

through a differential credit system aimed at drawing scrap tires towards their highest-value secondary use.[1]

These bills would shift responsibility to producers for minimizing waste caused as a result of their products. They provide suggestive models for aspects of pollution prevention discussed below.

IV. TRADEABLE POLLUTION PREVENTION PHASEDOWN PERMITS: ANOTHER ROUTE?

Clearinghouses for further WM seem unlikely to provide incentives to use that data beyond those already created by landfill bans, potential Superfund/tort liability, and rising tip fees.[2] Indeed, to the extent downstream liabilities cannot be quantified to overcome internal company "hurdle rates" for returns on additional WM investment, such data may not be used at all.

Two major models currently seek to address this issue: proposals for (a) mandatory WM audits and reduction plans, applicable to facilities that must file annual Toxics Release Inventory (TRI) reports under SARA Title III and enforceable by public disclosure; and (b) per-pound or differential fees, imposed either on facilities' TRI inventories or on new materials ending as solid waste (e.g., plastic resins). There are arguments for both. But mandatory WM plans turn on companies' good-faith execution of WM audits, could promote risky substitutes because they cover only a small segment of the HW universe, and seem likely to generate a flood of paperwork seldom reviewed. Meaningful fees require detailed data on industry cost curves and total releases; could not be set high enough to affect behavior because new materials represent only a small slice of most finished products; and imply reductions to zero regardless of risk or location. Moreover, even a small fee imposed on the last slice of allowable pollution -- meant to move those assessed in desirable directions and get company management involved -- ducks the issue of what reduction goal is appropriate, and

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1/ See Levin, Written [Testimony], Hearing on Scrap Tire Management & Recycling Opportunities, House Small Business Subcommittees on Environment & Labor etc. (April 18, 1990).

2/ See, e.g., Levin, "The Trash Mess Won't Be Easily Disposed Of," Wall Street Journal (Dec. 15, 1988), p. A 18.

could undermine valuable behavior if, e.g., materials being recycled are also taxed.[1/]

Tradeable phasedown permits for solid or HW generators based on historical waste generation could overcome many of these problems, link means with ends, and force decisions on how much prevention is appropriate. While what follows deals with SW involving only reductions in volume, the same implementation issues apply to HW, since "toxic hotspot" concerns are reduced by the fact that all HW generated remains subject to RCRA management rules.[2/] Those issues include who to permit; how to measure creditable reductions; whether and how to use "trade ratios" to encourage reduction of riskier substances; how to minimize such perverse effects as use of riskier nonpermitted substitutes; and how to construct safety valves that will allow the permit system to be expanded or tightened without penalizing those who have already participated. Past experience suggests numerous answers.

Suppose EPA, instead of mandating reductions by generators, were to issue tradeable permits requiring municipal/private landfills to receive 2% less waste/year for the next 10 years, beyond pending 25% recycling goals. A city like Seattle which recycles 40% would get both assets to sell and a double revenue stream (from sale of credits plus extended landfill capacity). A city like New York which bought those credits to cover excess landfilling would pay a double penalty, since it both exhausts capacity more rapidly and pays Seattle to do so. This approach would mirror the credit system for used oil, with

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1/ Despite their attraction as potential revenue-raisers and possible use as a "Clarke tax" to encourage more accurate pollution reporting, see, e.g., "Apple-Pie Aspect of Environmental Taxes Draws Proponents . . .," Wall Street Journal (May 21, 1990), p. A 30; "Truth or Consequences," Sonstelie & Portney, Journal of Public Policy Analysis, Vol. 2 No. 2 (1983), fees represent a declining revenue stream if they work properly, and could distort other environmental programs by diverting industry choices to counterproductive ends.

2/ Cf., e.g., S. 1113, 101st. Cong. 2d Sess. Title III, § 305, tacitly authorizing plantwide bubbles by SARA § 313 facilities required to reduce total hazardous-substance releases to no more than 5% "of production throughput" of such substances within 10 years. Facilities reducing more or earlier could be allowed to sell credits nationwide to those whose reduction costs were much higher.

responsibility imposed on the "end-user" rather than the producer. It raises classic questions, not least of which is how to credit landfills that shut down. But it could also reward innovative SW management steps and provide funds for such measures, while strengthening recycling and recognizing that the test is reduction of overall environmental impacts, not waste.

In implementing such approaches, some do's and don't's drawn from past experience should be kept in mind. The do's include: (1) keep the approach small so bugs can be worked out, but address the ability to expand it up front (e.g., by incorporating "trade ratios" for dealing with incidental toxics). Note that "small" can refer either to the universe of sources covered, the number of pollutants covered, or the initial size of the reduction required; (2) keep it simple and easy to use; (3) keep it predictable, so potential preventers feel comfortable they won't be penalized for their actions and can make rational investment decisions; (4) get it out on the street to be used, so specific applications can provide vehicles for midcourse corrections and dispel regulatory fears; (5) include safety valves that allow for such corrections and for inevitable evolution, without penalizing those who have already participated.

The don't's include avoid: (1) over-loading incentive approaches with constraints aimed at achieving other program or environmental goals; (2) defining the experiment to fail by seeking optimality in credit markets or reductions to zero, both of which are unrealistic and divert resources from tasks based on sensible expectations; (3) the belief that every problem will be solved by mandated technology or reduction requirements; (4) discouraging new technologies (e.g., by treating potential recyclables as pollution); the belief that government has all the answers and knows "how to do it" better, or that states are incompetent and spineless, therefore not to be trusted; and (5) the belief that incentive approaches (or conventional rules) must be written to treat all industrial managers like criminals by precluding every chance of abuse, rather than being written to be usable and leave abusers to enforcement.

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