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Thinking Ahead

If you don't like an EPA regulation, make a counterproposal; if it meets the same standards, the EPA will probably accept it

Getting smarter about regulation

William Drayton

Any manager who has had to deal with regulations—whether from the EPA, the FCC, or the FDA—knows that any one regulation will not exactly fit his or her situation. Inevitably, the rule is too inflexible to allow managers to meet the requirements in ways that make sense for their operations.

Recognizing that managers and engineers probably know better than rules writers how to meet emission requirements in specific situations, the EPA has proposed three "controlled trading" reforms to the Clean Air Act that allow managers to batch sources and mix controls. In this article, the author describes how controlled trading works and enjoins managers to take the initiative in proposing new ways to meet pollution standards. He also suggests that this counterproposal process could be adapted to many other kinds of regulation as well, not only saving industry billions of dollars but also providing the same benefits intended by the regulations.

William Drayton was assistant administrator for planning and management of the U.S. Environmental Protection Agency. He has taught regulatory and management reform at both Stanford Law School and Harvard's Kennedy School of Government. Before that he worked for six years as a consultant with McKinsey & Co.

Over the last four years, the Environmental Protection Agency has been putting in place a new, smarter approach to regulating air pollution. If a company can find a more efficient, less costly way of getting the regulatory job done than the EPA's rules require—which in almost every case it can—the government will let the company do the job its way.

Companies that have tried this new approach have achieved substantial savings, chiefly by "trading" expensive controls for cheaper, often innovative alternatives. For example, the 3M Company plans to save $5 million at its Bristol, Pennsylvania plant next year by using water-based coatings and a new solventless "hot melt" process to reduce emissions more than required on three production lines in return for reduced controls on seven other lines.

Managers should be looking to see how they can benefit from this proven new approach. They can do so confident that it has the new administration's strong support. One of President Reagan's first environmental acts was to make it easier for certain large urban plants to make these kinds of trades.

The idea behind controlled trading is very simple. Rules, even the best possible rules, can't do what the manager on the spot can: find the most efficient way of getting the job done. Rules writers can only produce a series of generalizations that apply regardless of each situation's particular facts (and that usually also ignore other regulations affecting that case). The more a rules writer tries to adapt a rule to particular circumstances, the more detailed and inflexible it becomes.

Controlled trading gives the manager back the flexibility to find the best way of getting the job done that traditional regulation took away. Instead of simply writing rules and then enforcing them ("command and control" regulation), controlled trading encourages business to propose smarter alternatives before government moves on to enforcement ("command, *counterproposal*, and control"). This simple change promises to be the most significant innovation since the 1930s in how this country regulates.

Managers can either counterpropose changes within one plant, as 3M has

Author's note: A great many people worked very hard to make these reforms a reality. However, Henry Beal, Barbara Blum, Michele Corash, Doug Costle, Roy Gamse, Dave Hawkins, John Hoffman, Jim Kamihachi, Bob Kerr, Frans Kok, Mike Levin, John Palmisano, Steve Seidel, Deborah Taylor, and, most particularly, Jodie Bernstein were all key colleagues.

done at Bristol, or they can negotiate trades with other plants in the same area—e.g., by paying another company to reduce pollution more than it is required to do as a means of avoiding a more expensive equal reduction at their own facilities. They can also "bank" any such excess reductions for future use or sale. Government, as trustee for the public's interest, makes sure that such counterproposals are both environmentally equivalent to and as enforceable as the rules they replace.

Business can save a great deal by using these new tools. A Du Pont study of roughly 50 of its plants, for instance, suggested that the company could cut its costs for controlling hydrocarbon pollution by more than 60%, or $80 million annually, if it were allowed to make a simple switch in the mix of its controls. Because its calculations assume no innovation and no trading across plant lines, Du Pont's eventual savings will probably be much greater.

For example, at its Deepwater, New Jersey chemical complex, Du Pont will save $12 million by reducing emissions from five large hydrocarbon stacks more than 97% in exchange for not having to meet 85% reduction requirements at 200 small, difficult-to-control process sources. The air will be cleaner after this switch than before. Further, since Du Pont will now have to control and the state environmental agency monitor only five point sources, the trade will result in faster compliance and better enforcement.

It is easy to understand how Du Pont could achieve such results in view of the extraordinary range of control costs that industry after industry now experiences. Companies commonly incur vastly different costs for removing a pound of the same pollutant from different parts of a plant. In 1977 the EPA looked at a number of plants to get a quick sense of the range of costs. At the first plant it found that the cost of removing one pound of dust from the emissions of different processes, each subject to its own regulation, ranged from less than 25 cents to $100.

Even a rule setting a performance standard for one process (e.g., paint spray booths) is likely to prove crude and wasteful. A plant engineer who is responsible for 20 such booths knows that some are big and new while others are old and small; that they have different engineering qualities; that some are used all the time and others only for special jobs or at peak load capacity; that several will be scrapped soon. If only the rule that all paint spray booths must meet a fixed standard were not in the way, the plant engineer could accomplish the same result much more efficiently by controlling big, new, easily controlled, heavily used machines more and small, old, peak-load booths less. Or he or she could ignore some of these small booths by controlling more tightly another process emitting the same pollutant elsewhere in the plant.

Swaps across plant lines and industries make even more sense than those within a regulated process or among different processes within a plant. The average cost of removing a pound of a pollutant in industries with high abatement costs is a hundred times greater than the average cost in industries with less expensive options. Taking such huge variations in cost both within and among industries into account, managers can achieve truly dramatic savings by trading increased controls on low-cost processes in a low-cost industry such as chemicals for less stringent requirements for high-cost processes in a high-cost industry such as nonferrous metals.

This reform will eventually save billions of dollars a year. With air and water pollution clean-up costs alone running at roughly $40 billion per year, even a 10% savings would be worth $4 billion annually. Actual savings are likely to prove much greater than 10%, especially once trading across plant boundaries becomes common. The EPA is working to create new market institutions to facilitate this trading. Applying the counterproposal idea to other areas of regulation will, of course, further multiply the savings.

This reform has passed the initiative back to business. These very substantial savings, which go to the businesses innovating better controls and trading in this new market, should provide them with ample incentive to take the initiative.

Investing management time here will help the public as well as profits. Society urgently needs a markedly increased flow of new pollution-control techniques. Controlled trading provides business the same powerful, bottom-line incentive to find new, more efficient pollution-control methods to cut production costs. In the absence of such innovation we cannot solve the environment's core strategic dilemma: how to fit a volume of pollution that grows with the economy at a compound rate year after year into the forever fixed carrying capacity of our air, land, and water (see the ruled insert on p. 40).

Controlled trading should also help solve the environment's second-generation enforcement dilemma—industry's dismal failure to operate or maintain efficiently its control equipment. Recent EPA studies show that the average "complying" source of air pollution currently emits in excess of 25% more pollution than it legally should, even netting out periods when it emits less. This problem, already critical, will get steadily worse as equipment ages unless we give plant managers and engineers new incentives. Now they commonly neither understand nor care much about their control equipment. However, once they design their own controls, they will have both the understanding and the psychological investment that are critical to keeping them working.

Finally, regardless of how Congress may modify the Clean Air Act's environmental standards, these benefits will stand. Whatever standards and rules (inevitably wasteful) the EPA sets, managers can always make counterproposals. (See the ruled insert on p. 52 for a summary of steps a business can take to find better, cheaper methods for cleaning up.)

Trading a pound of pollution

Controlled trading is a new reform strategy. Most regulatory reforms have worked to regulate the rules writers—to force them to do a better job. Rules writers must consider everyone's opinion. They must follow detailed legal procedures; routinely consider environmental, economic, consumer, energy, urban, rural, equal opportunity, and a steadily expanding host of other concerns; and, increasingly, calculate cost-benefit ratios.

Escaping an environmental dead end

The environment is caught in a very dangerous cycle. Every year there are more people in the world, and every year the amount of economic activity per person increases. Consequently, the volume of pollution grows at a compound rate, and every year the absolute increase in our pollution problem grows bigger and harder to manage than the year before. Unfortunately, the amount of air, land, and water never grows.

The resulting accelerating imbalance between pollution and our natural resources is the chief reason our environmental problem is so difficult. Several decades ago people hardly worried about pollution. But by Earth Day in 1970 many felt conditions had become intolerable. Since then, because of strong regulatory interventions, as a nation we've reduced the levels of most traditional pollutants. For example, the air contains 17% less sulfur now than in 1970. Had we not acted, however, sulfur levels would have become dramatically worse, not better. If our country does nothing more for even a few years, sulfur levels will again rise rapidly.

This annual compound growth in the volume of pollution is driving the United States toward a very painful dead end. Just to maintain current, often unhealthful air levels – let alone to make any progress – the EPA and state environmental agencies must move down two very expensive, politically painful, and increasingly resistance-prone paths.

First, growing pressure forces the EPA and state agencies to require those they regulate to remove progressively larger proportions of the pollution they generate. To reduce pollution 85% typically costs much more per additional pound removed than it does to remove 60% – and 98% costs much, much more. As we move up this cost curve, resistance increases. Understandably, people want to know whether it makes sense to remove the next few tons of pollution if it costs as much to do so as removing the last several hundred tons.

The second path is at least as unattractive. Environmental managers are being forced to regulate larger and larger numbers of smaller and smaller people. Whereas the EPA and the states originally regulated only major polluters, they are now struggling to force car owners in some 20 cities to submit to annual inspections of their pollution control equipment. Although this program costs relatively little per ton of pollution removed, few car owners (or the affected local governments) are enthusiastic. Similarly, environmental agencies have been compelled to reach out to small industries like dry cleaners and local printers. Visualize the reaction your local printer had when an environmental officer informed him that some of his presses emitted invisible pollutants and needed expensive controls. With each step down this path, the hassle factor per pound of pollution removed increases geometrically – as do the administrative costs incurred by the environmental agencies.

In other words, as the volume of pollution continues to compound, the real price of maintaining any given level of air quality increases sharply. And as this trend continues, society may eventually be tempted to compromise its public health standards. In either case, it is impoverished.

Finding a third path that leads away from this dead end is the most important strategic objective of thoughtful environmental managers, public or private. The only serious possibility lies in greatly accelerating the rate at which society discovers new, improved means of environmental control. If the country can increase this innovation rate sharply, it may be able to cut control costs as fast as compounding pollution pushes them up.

The EPA's research staff can't possibly do all or even a significant portion of this job. Society will succeed only if it releases the creative energy and focuses the technical ability and specialized knowledge of thousands of managers and plant engineers all across the country on this problem. That is what controlled trading is designed to do and why it is environmentally essential.

Until now almost all controls have been end-of-the-pipe black boxes (scrubbers, bag houses, and so forth). Probably because of the noninvolvement of plant engineers to date, relatively little control has occurred through modification of the underlying production processes. Process change is one of the most obvious areas where the innovation stimulated by the positive incentives of controlled trading should take hold.

We're getting better rules today as a result of these efforts. However, a rule is still a rule—unavoidably overgeneralized and rigid.

Controlled trading doesn't try to regulate the regulators further; rather, it frees managers to find better solutions.

Managers, plant engineers, and corporate environmental officers, unlike rules writers, can identify and install the most sensible mix of controls for each facility, innovating where necessary and taking into account all its unique circumstances as well as those of nearby plants and of the area's air quality conditions. They can do this by negotiating case-by-case trades—if government lets them—in exactly the same ways companies deal with one another in every other aspect of commerce. The essence of EPA's controlled trading reforms is to make such trading possible. They are designed to free management ingenuity and initiative through three key, closely interrelated tools: the bubble, offset trading, and banking.

The bubble: Managers can use this reform to escape the narrow scope of existing process-by-process regulation and to look at their facilities as a whole. In planning their counterproposals, they can imagine that their facilities are covered by an enormous plastic bubble or dome. Managers may control the several sources of pollution under the bubble in whatever way they think makes sense, as long as no more pollution escapes than would have under the former process regulations. As long as air quality is protected, the bubble can stretch well beyond one plant's boundaries. It applies to all existing processes that emit the same pollutant.

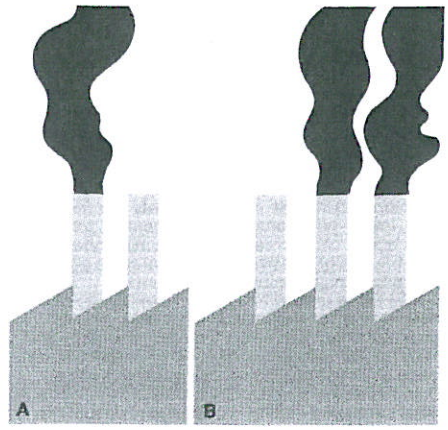
Within nine months of the EPA's announcement of the bubble policy in December 1979, industry had started to develop more than 70 bubble trades. The average trade promises to save more than $2 million. The trades are as varied as the companies' circumstances:

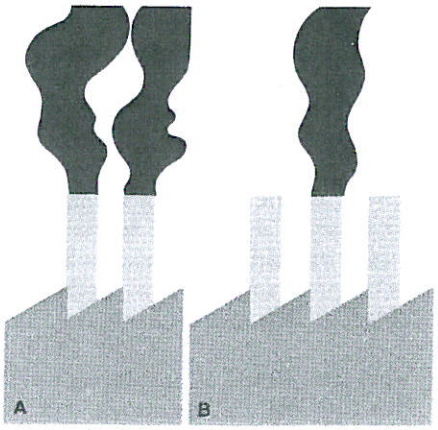
☐ With a multiplant bubble covering two of its generating stations in Providence, Rhode Island, Narragansett Electric is saving its customers upward of $3 million and the country 600,000 barrels of imported oil per year while cutting sulfur dioxide emissions by 30%. Both stations now burn imported low-sulfur oils; in exchange for use of domestic natural gas at one plant, the company will switch to higher-sulfur oil at the other.

☐ Through an analogous fuel switch, Kodak's Eastman Gelatin subsidiary in Peabody, Massachusetts, where unemployment is high, avoided laying off 350 workers. And a small Pennsylvania nursery company proposes similar trades at three of its greenhouses.

☐ At its printing and packaging facility in Boulder, Colorado, Coors Beer expects to save between $300,000 and $2.5 million per year. Emissions on one printing line can exceed regulatory limits as long as that excess is offset by another line emitting less than it is allowed that day.

☐ U.S. Steel's bubble at its Fairless Works will save it $15 million by substituting the use of low-sulfur fuel in six production processes for the installation of very expensive coke oven gas desulfurization equipment.





The 3M and Du Pont cases discussed previously illustrate two other types of bubble trades.

As business and the EPA continue to gain more experience with this central innovation, they will work out its remaining bugs and make it steadily easier to use. For example, one change New Jersey made in January affecting one industry in that state alone produced 50 new bubble proposals by April. As the volume of bubble trading increases, it will become increasingly easy to use—to the benefit of both the environment and the country's need to modernize its plants and generate new jobs.

Offset trading: It is illegal to build a new facility or expand an existing plant in an area where the air is too contaminated to meet basic health standards if doing so will aggravate the area's air quality problem. To prevent an intolerable conflict between the need for local economic growth and modernization on the one hand and this statutory public health requirement on the other, the EPA developed the offset policy: the new source of pollution can move in as long as it (1) controls its emissions as tightly as possible and (2) offsets whatever it can't control with reductions not already required by law of the same pollutants from other facilities elsewhere in the community.

☐ When Pennsylvania successfully attracted Volkswagen to a site in the western part of the state, one element in its package of inducements was the provision of sufficient offsetting reductions of the area's smog-causing hydrocarbon pollutants to meet this requirement. The state provided these offsets itself in large part by shifting to water-based rather than petroleum-based asphalt in its road building and repair work in 16 nearby counties. The VW plant now needs additional offsets, and it and the state are exploring several prospects at nearby steel facilities.

☐ The chambers of commerce in Shreveport and Oklahoma City made room for new General Motors plants in their communities by inducing local oil companies to close marginal facilities and reduce storage tank emissions.

☐ Management of General Portland Cement paid Parker Brothers $520,000 to install dust collectors on its facility in New Braunfels, Texas so that General Portland could add a new coal-fired preheater to its plant there without pushing the area over the health standards for particulates.

During the start-up years of 1978 and 1979, business completed nearly 700 documented offset trades. The third and newest element of controlled trading, banking, will make such trading much easier and should increase its volume substantially.

Banking: Swapping clean-up requirements among pollution sources is the essence of controlled trading. Where one source can provide the same pollution reduction far more cheaply than another, everyone gains. When the sources lie beyond a company's boundaries, however, trading becomes more difficult. Companies, especially those opening a facility in an unfamiliar community, have inadequate information regarding both what reductions are available elsewhere and what their price tags are. Consequently, despite the opportunities offered by huge variations in the costs of removing a pound of the same pollutant both among companies and industries, 95% of all completed offset trades have involved different parts of the same company.

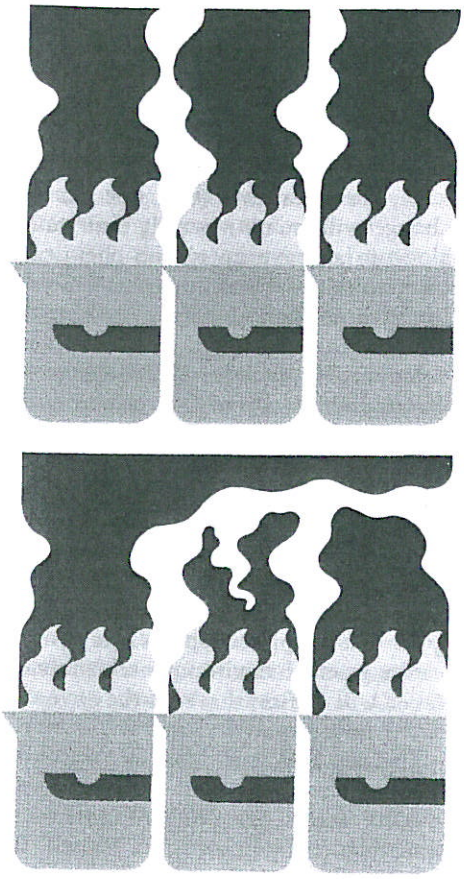
Trading is difficult for another reason: most clean-up decisions involve capital investments that are implemented at one moment in time. Even if two planned investments are obvious trades, a switch may nonetheless prove impossible if the investments are timed differently. This is especially likely if each decision is driven by independent regulatory deadlines.

Banking solves these problems. A pollution reduction bank works simply: it (1) purchases or takes emission reduction credits (for abatement beyond what the law requires) on consignment from pollution sources in its service area, (2) stores them, or (3) acts as a clearinghouse to facilitate subsequent trading. For example, a company may decide to install a larger, more efficient piece of control equipment than it legally must and sell the additional reductions to the bank if the price is attractive. Or a plant may switch to natural gas and sell or consign the resulting pollution reduction to the bank.

Some local governments have been working actively to help their banks build up their emission reduction accounts. Boston, for instance, is considering providing free technical assistance to private building owners seeking to cut their fuel bills in return for control over the offset credits that will flow from the accompanying pollution reductions. By August 1980, San Francisco, Seattle, and Louisville had full-scale banks in operation, and another 20 communities or states were developing them. (Even without such institutions, many companies have stockpiled reductions or potential reductions both to safeguard future growth and, with the help of the bubble, to phase in control investments more economically than existing regulatory deadlines allow.)

A pollution control bank can be a for-profit or not-for-profit organization; in the latter case, local environmental control or economic development agencies or perhaps chambers of commerce are most likely to manage them.

Once it has established such a bank, a community will have a competitive



advantage in attracting industry. As soon as a company expresses interest, the community can immediately offer at a known (perhaps subsidized) price a supply of emission reduction credits that the company can use to satisfy pollution standards. Management saves not only money but also a good deal of regulatory uncertainty, delay, and frustration. A working bank will also benefit established companies. Before investing in expensive controls, a manager can quickly and efficiently determine whether it might be simpler or cheaper to buy a reduction from the bank.

Banks may also provide brokerage services to help extend the efficiencies of controlled trading to smaller companies and make the market more liquid. In this role, a bank can further stimulate the market by providing free audits to help companies evaluate the potential for creating extra reductions. Brokers providing some or all of these services may, of course, operate independently of a bank.

A formal banking system creates a continuing incentive for companies to do more than required when replacing control equipment or meeting new control standards. The banking reform helps make these cheap extra reductions valuable commodities that management can use to satisfy future control obligations, to offset planned expansions, or to sell to other companies locating or expanding in the area. The bank charter's legal guarantees can encourage investment in pollution reductions by protecting the credits against confiscation and by specifying what will happen if, for example, the EPA demands further reductions.

Safeguards: This new market approach to regulation could not survive laissez-faire. If the EPA or the states allow these reforms to become loopholes, controlled trading will collapse instantly. The environmental community and the public would, quite sensibly, reject it. Consequently, the EPA has taken great care to design this new approach to be loophole resistant. The bubble policy incorporates a number of safeguards, for example:

☐ Hazardous elements (e.g., benzene) of a class of pollutants (e.g., hydrocarbons) can be traded only if the volume of that element declines. The presence of trace elements cannot, however, be used to block a trade.

☐ The EPA discourages trades of road and storage pile dust for production process emissions, chiefly because the former may be less harmful and harder to measure or model. However, the EPA has approved a bubble involving just this sort of trade at Armco's Middletown, Ohio steel plant because Armco actually demonstrated that its counterproposal removed more than six times the pollution—4,000 tons a year instead of only 650 tons. (This bubble saves Armco from $14 million to $16 million in capital costs and $2.5 million to $3 million a year in operating costs.)

In addition to these substantive safeguards, the EPA has, at least initially, limited both those who can use bubbles and where they can do so. The EPA will only consider bubble applications from companies that have complied with current emission limits or are keeping to an agreed compliance schedule. Frankly, this provision was written to keep cheaters out of the new marketplace, especially during its sensitive start-up years. There are very few such companies. Of Connecticut's 12,000 registered sources of air pollution, for example, only 20 to 30 required serious enforcement action during the first four years of environmental regulation in that state. And only 3 or 4 of these were hard-core scofflaws. However, every regulatory agency knows which companies in its jurisdiction these few are. (The staff has suffered at their hands before.) To let one of these companies be an early applicant would be to ensure a worst-case response, setting a precedent that could limit needlessly the bubble's applicability.

The policy's chief geographic limitation is in areas that have not met minimum national air quality standards. Companies in such areas must demonstrate that their bubbles will not interfere with the area's making satisfactory progress toward achieving compliance.

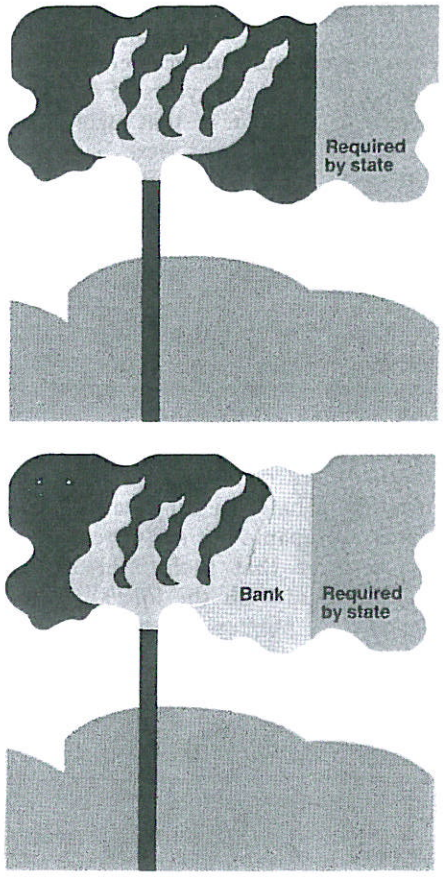
The ultimate safeguard of everyone's interest is, of course, the environmental agencies' final reviews of each counterproposal. Acting in the public interest, these agencies will approve a trade (or bank transaction) only if it respects their policies and, most important, passes the cornerstone tests of environmental equivalency and equal enforceability.

Now let's look at the U.S. experience with controlled trading to date, point up what the problems have been, and summarize the major outstanding policy issues.

Making a regulatory market work

Turning the idea of a regulatory market that supports extensive controlled trading into reality is an ambitious undertaking. Literally thousands of people—business managers and engineers, state and local officials, EPA staff, legislators, environmental activists, and the press—must learn to use regulation and to work with one another in fundamentally new ways. Although controlled trading is now a proven, widely used approach producing very substantial benefits, it will still take years before it is fully institutionalized where it is most crucial—in these people's heads. (It took 15 years for American farmers to accept hybrid corn.)

Over the next several years the Congress, the EPA, the states, and both



the business and environmental communities will continue to develop and refine the reform's basic legal structure. They will close the odd loophole. More important, they will extend the market's coverage and continue to loosen restrictions that prove unnecessary. Business must also organize to take advantage of this new opportunity; it must provide the chief case-by-case initiative.

The experience so far: The simple common sense of the counterproposal idea quickly won full support. Although initially some environmentalists feared that the reform might become an enforcement loophole or take too much staff time, much of this initial concern has abated with actual experience and as the reform's environmental advantages have become more apparent. Recently, one environmental leader commented that this approach is probably the wave of the future. A number of line managers quickly saw the practical implications for their companies. John Barker, Armco's director of environmental engineering, described his first bubble as follows: "We can control six times as much [pollution] for one-third the cost in half the time and at a tiny fraction of the energy consumption."

After several years and more than a thousand completed trades, offset trading is reasonably well established. Because so little cross-company trading occurs, however, much of the possible benefit remains untapped. The new banking and brokerage reforms should help.

The bubble is now beginning to gain considerable momentum. Its start-up year was much slower, in large part because the EPA was very cautious when it launched the bubble policy in December 1979. It took great care to avoid either falling on its face administratively or creating an enforcement loophole (which it felt might well prove politically fatal to the whole policy).

The agency was probably too cautious, however. It imposed a series of restraints on the policy that—in fact or as a matter of perception—frustrated many of the state environmental agencies and companies seeking to use it and that, with 20-20 hindsight, were not necessary. Irving Shapiro of Du Pont, one of the bubble policy's early supporters, expressed this common frustration in an April 1980 letter to the EPA: "I am quite concerned that procedural problems may prevent its [the bubble's] effective implementation."

Midcourse correction: In September 1980, the EPA convened a conference of businessmen, congressional and White House staffs, environmentalists, and state and local environmental agency managers to help it design a midcourse correction for the bubble policy. Since then it has removed a number of unnecessary barriers:

☐ The EPA will now approve classes of trades proposed by the states rather than insist on reviewing each case itself. This change responds to the most loudly voiced complaint of both industry and the states. They have found the added delay and second-guessing of a formal federal review of each counterproposal, on top of a formal state review, maddening. The EPA responded first by offering to do its review simultaneously with the state whenever the state and company were willing.

Then, in November 1980 the EPA agreed to allow New Jersey to approve hydrocarbon bubbles by direct permit changes as long as the procedure met a few simple criteria. The EPA would have 20 days to object to such bubbles, but federal approval would no longer be required. (New Jersey believes that this one small change will in 1981 permit that state alone to approve up to 300 chemical companies' bubbles, worth several hundred million dollars in savings.) The EPA has urged other states to develop similar generic regulations governing bubble approvals, and a growing number are doing so. State and industry initiative is what's needed now.

☐ The EPA no longer routinely requires detailed mathematical modeling—the time-consuming, expensive, and unavoidably judgment-filled black art of air pollution regulation. For 90% of the applications, where much easier tests of environmental equivalence will suffice, that's all the government now requires.

☐ The EPA no longer restricts trades in areas with unacceptable air quality across the different processes emitting hydrocarbons for which it has developed technical guidelines.

☐ The agency now allows the can-coating industry to exceed its emission limits with some batches of cans as long as it offsets those excesses. This change will be worth $135 million to this small industry in 1981 alone—another precedent other industries can follow.

☐ In March 1981, the Reagan administration changed the definition of *source* in the EPA's nonattainment regulations. This change allows companies locating large new facilities at existing sites to trade control requirements between new and old parts of the plant. Two refineries and two GM plants in California will be immediate beneficiaries.

These and a number of other simple recent changes have made it much easier to use the bubble.

Four major, difficult issues are still outstanding, however. How they are resolved will importantly influence the speed and degree to which our country benefits from controlled trading:

1. *Should government limit the use of the bubble in areas that have not met national air quality standards for health—that is, most of our cities?* During the year after it announced

the bubble policy, the EPA in effect prohibited its use in nonattainment areas with two limited exceptions—if a company could demonstrate that, taking all sources of pollution into account, either its part of the city did meet air quality standards or had an adequate plan for doing so or, alternatively, that certain limited types of hydrocarbon trading (exempted for historical purposes) were involved.

This sweeping restriction is not what the EPA intended. The original policy approved trading once an area had a fully accepted plan for coming into compliance. The agency then expected to approve plans for most areas within months after the bubble policy was promulgated. Good intentions notwithstanding, however, although the agency has partially or conditionally approved a great many state plans, it has given final permission to very few even now. Consequently, urban bubbles proved to be available to only those few companies that could fit into one of the two exceptions.

Now the EPA allows bubbles in nonattainment areas regardless of the finality of the state/local compliance plan. It has, however, imposed a new condition: companies proposing bubbles in such areas must meet a higher standard of control, "reasonably available control technology," than previously applied to them. The rationale for this added requirement is that, once the area gets a finally approved control plan in place, the company will probably have to meet a higher standard. If the government lets the company go ahead with capital investments that fall short of this future need, it will, a year or so later, either have to force the company to go through expensive retrofits or accept inadequate levels of controls.

This new condition will clearly discourage some, perhaps many, companies from proposing bubbles. A higher standard is a more expensive standard, and only the more profitable trades are likely to make accepting these extra costs worthwhile. However, if managers believe that in a few years they will face a higher standard in any case, they will probably give only limited weight to this temporarily increased expense. They may even prefer to get an early, firm reading of what will eventually be required.

Delay and uncertainty are likely to be a more serious barrier. Definitions of reasonably available control technology do not exist for a great many processes. Must a plant manager seeking to develop a bubble under this provision first get his or her state agency to define standards for those processes the plant wishes to put under a bubble and for which no standard has yet been set? If so, given the difficulty of setting such standards and the press of many other demands on state air pollution agencies' staffs, the manager may have to wait some time to get an answer.

Fortunately, in most cases governments that allowed companies to use the bubble without this added requirement would not be confronted with a retrofit-or-nothing Hobson's choice. As long as a company or its community has a number of ways of reducing pollution, there will be no need to force sources that have just executed a trade to retrofit. If the government revises a community abatement plan and asks companies in the area to reduce their emissions, they can comply by controlling any source of the same pollutant within the area using controlled trading techniques.

Most cities are not suffering extreme levels of pollution and could meet clean air standards in a number of different ways. At least these cities could approve bubbles within the limits of existing requirements without risking the inability to meet standards. Such a liberalization would go a long way toward realizing the full potential of the bubble.

2. *Should the companies that must be in compliance with air quality standards by 1982 (or face financial penalties) have to install unduly expensive control equipment because they cannot get their bubble proposals approved in time?* The EPA has taken a step toward solving this problem by informing companies that are interested in using the bubble and that are proceeding satisfactorily toward compliance that it won't use its limited enforcement resources to investigate their cases, thus de facto removing the penalty deterrent to using the bubble.

3. *How can managers be assured that the reduced control requirements they purchase in exchange for a greater abatement effort elsewhere won't be expropriated?* Some managers have expressed concern that these relaxed requirements will prove an all too easy and visible target for environmental agencies looking for new ways to offset the compounding growth of pollution. Many business people need strong guarantees against such capital expropriations before they enter the controlled trading market. Policy and the law must safeguard against seizures either of a banked or otherwise stored pollution reduction credit or of a relaxed permit requirement purchased with offsetting reductions elsewhere.

Ultimately, business's chief protection is the fact that both legislatures and the courts understand how counterproductive expropriation is. If allowed, expropriation would wreck the market. The EPA will certainly oppose any threat of expropriation as strongly as it can. It is now working on a regulation designed to settle this and a number of other controlled trading issues permanently.

4. *Should new plants be prohibited from trading emissions reductions with existing facilities?* At present, new plants must meet very specific, tight standards. They cannot lower the often steep marginal costs of these controls by purchasing reductions from existing nearby facilities. Supporters of this policy argue that new sources should be controlled as tightly as possible: they will be with us for a long time and should be built to perform at a high standard. Whereas it may never be politically possible to

Finding a better way

Each plant's managers should try to find better, less expensive ways of cleaning up their processes than are required by the several rules that apply to their plant. The procedure is simple:

○ Calculate the marginal cost of cleanup for every process emitting the same pollutant.

○ See if it is feasible and still economical to cut more emissions from the least expensive sources (or from any easy-to-control unregulated sources of the same pollutant).

○ Check to see if any nearby sources of the same pollutant might be willing to sell a reduction inexpensively (which is easy if a bank serving the plant's community already exists).

○ Make a counterproposal to the state environmental agency and let the EPA know.

clean up existing plants efficiently, it is much easier to regulate new sources. Some environmentalists consequently believe that the gradual replacement of dirty existing facilities by tightly controlled new plants is the only hope for cleaning the air.

Those who hope to allow new plants to trade respond that it doesn't make sense to force a company to pay up to 10 times more to remove a pound of pollutant than it could by trading the undiminished cleanup responsibility with another facility. They ask, Why should the EPA care how companies discharge their responsibilities as long as they do? They also point out that the "new" control equipment installed in the early 1970s is already old and in growing need of replacement. The vision of solving the country's air quality problem without existing sources bearing much of the load is a chimera.

Cleaning up

Encouraging industry to counterpropose better ways of getting the public's job done is as basic and broadly applicable an idea as it is simple. Many different kinds of regulation—such as those controlling noise in factories, allocating airport landing rights, or even governing children's supervision in our schools—could be revised to allow industry to propose cheaper, but still effective, control methods.

The United States needs this smarter form of regulation. Over the last few years, business and the EPA have demonstrated that it works. Public and business managers must now finish the job both of implementing the reform in the air pollution area and of extending it to new areas.