Currents

Making Sense of Safety

Few dimensions of modern life reflect a larger divergence between the perceptions that affect government policy and the available evidence than those that bear on the safety and health of the American population. As expressed by the political scientist Aaron Wildavsky, "What are Americans afraid of? Nothing much, really, except the food they eat, the water they drink, the air they breathe, the land they live on, and the energy they use." The popular press has amplified these anxieties by alarmist stories about chemicals in the soil at Love Canal and Times Beach, residues of the pesticide EDB in food and Alar in apples, and nuclear radiation from Three Mile Island. The government has responded to these anxieties by environmental regulations that now cost over 3 percent of GNP and a broad range of other safety and health regulations.

The available evidence, however, provides a very different perspective on the safety and health conditions of the American population. None of the several recent "crises" mentioned above, for example, had a significant effect on the health of the exposed populations. Chemicals in the environment account for only about 2 percent of the avoidable (nongenetic) incidents of cancer. The age-adjusted rates of cancer incidence have declined for several decades for all forms of cancer except lung cancer among women. The infant mortality rate has declined about 50 percent each twenty years since 1900. And, most generally, the average expected life of Americans at birth has increased about 60 percent since 1900, somewhat more among women and substantially more among minorities. In fact, the safety and health of the American population have increased substantially for many decades and compare favorably, with the exception of such conditions as homicide and the infant mortality rate among minority groups, with conditions in any nation.

Making sense of safety was the focus of a conference organized by the Cato Institute in March 1991. The major objectives of the conference were to understand the large differences between risk perceptions and the available evidence and, more important, to suggest changes in government safety and health programs that would increase the expected well-being of the American population. The speakers and most of the participants at the conference were risk analysts but represented a broad range of professions—economists, lawyers, public health specialists, public officials, and the occasional biologist, engineer, psychologist, physicist, political scientist, journalist, and even one bioethicist. The conference proved to be a remarkably productive dialogue among this group. There is more reason to be concerned about whether anyone else is listening.

Most of the articles in this issue of *Regulation* are based on the papers presented at this conference. As an editor, my most difficult task was to select those papers to be published. Most of the other papers were also quite good and merit at least a brief summary. Michael Gough, a microbiologist, summarized the evidence, from both epidemiology and animal experiments, of the effects of environmental chemicals on human health and concluded that "if we eliminate all of the carcinogens that EPA can regulate, we will see no improvement in cancer rates." Baruch Fischhoff, a psychologist, summarized the typical relations between risk perceptions and objective measures of risk. Howard Kunreuther, an economist, addressed the special case of low-probability, high-consequence events. (A paper on airline safety by Richard McKenzie, an economist, was published in the Summer issue of *Regulation*.) William Evans, an economist, summarized the effectiveness of various automobile safety regulations and concluded that they are relatively efficient. Alan Katzenstein, a chemical engineer, reviewed the studies of the effect of environmental tobacco smoke on cancer and heart disease and concluded that the evidence is not yet sufficient to merit regulation. Lyn Weiner, a public health specialist, summarized the evidence on the effects of alcohol consumption during pregnancy on the health of the child and concluded that public

attention should be focused on those with the highest rate of consumption. Alan Schwartz, a law professor, evaluated the implicit logic of product liability law and concluded that it should be replaced entirely by an improved national system of warnings and safety instructions. Margaret Maxey, a bioethicist, criticized the ethical basis for many current safety regulations. And Lester Lave, an economist, addressed the limitations on the use of benefit-cost analysis to choose safety policies. Copies of those papers are available from the authors or from the Cato Institute.

We were also blessed by three fine luncheon or dinner speeches for which papers were not prepared. Aaron Wildavsky treated us with his synthesis of economic, political, and cultural insights about safety policy; those of you who know Wildavsky will understand my comment that he was on a roll. James MacRae, the acting administrator of the Office of Information and Regulatory Affairs, summarized the limited but still valuable role of that agency. And federal judge Stephen Breyer concluded the conference with some proposed institutional reforms to improve safety policy.

The conference, including the papers published in this issue, conveyed three general themes. First, individual perceptions about risk are reasonably accurate when such perceptions are based on individuals' own experience. (The variance of individual perceptions about very low probability events, in contrast, is quite high and provides little basis for rational behavior.) Government safety warnings and alarmist news stories, however, lead people to overestimate the risks, for example, of cigarette smoking and toxic waste dumps. Moreover, individual responses to risk, with some exceptions, seem quite rational (consistent) when the individuals who bear the risks also bear the costs of risk-reducing behavior. For example, most of the studies about how much people are willing to pay to reduce risk estimate that the revealed value of a "statistical" life is in the range from $2 million to $10 million. And people who are more willing to accept some types of risks, such as cigarette smoking, also appear to be more willing to accept other types of risks, such as not wearing a seat belt. There may be some exceptions to this general conclusion. From the perspective of risk analysts, for example, more people should wear seat belts and buy earthquake or flood insurance. Even in these cases, however, individual behavior may be rational; the implicit cost of wearing a seat belt may be higher than what other people consider reasonable, and the small amount of private earthquake and flood insurance may be based on a reasonable expectation that government will bail out the affected parties.

Second, government safety and health programs and regulations, in contrast, are extraordinarily inconsistent. For example, the EPA now imposes costs of over $100 million per statistical life saved by regulating environmental carcinogens. At the same time, identifiable changes in highway design and infant health programs costing less than $1 million per life saved remained unaddressed. Even the same agencies treat different risks inconsistently. The Food and Drug Administration, for example, is extraordinarily careful not to approve an unsafe drug but seems indifferent to the lives lost by the delay in approving a safe and effective drug. Similarly, the National Highway and Traffic Safety Administration has imposed progressively more costly auto safety standards for twenty-five years but seems indifferent to the lives lost due to the fuel economy standards. These comparisons, and the many others documented in these articles, lead to a conclusion that a reallocation of the same level of safety expenditures could greatly increase safety. A somewhat more controversial conclusion is that all safety programs and regulations that cost more than $10 million per life saved should be eliminated.

The third general conclusion of the conference was unstated and self-serving but still probably correct: Both the public and government officials would benefit by paying more attention to the

available evidence and the recommendations of professional risk analysts.

Somewhat to my surprise and disappointment, the conference did not address one major issue. Should safety policy differ as a function of the conditions in which a person is subject to some risk? Most of the papers appeared to endorse a common cost per life saved or a common benefit-cost standard for all types of risks. Only the paper by Lester Lave suggested some reservations about a general application of a benefit-cost standard to choose safety policies, but he did not develop the implications of his reservations. For that purpose, there are three types of risks: those imposed by others without our consent, those imposed by others that are accepted by individuals as part of a contract relation, and those that are a consequence of our own behavior.

Environmental pollution is an example of the first type of risk. Risks in the workplace and home are examples of the second type of risk. And smoking, eating junk food, and not wearing a seat belt are examples of the third type of risk. There is a reasonable basis for government safety standards affecting the first type of risk, and a benefit-cost analysis is probably the best basis for setting such standard. It is much less obvious that the government should set safety standards affecting the recurrent interaction of people within firms or families; in such a case, benefit-cost analysis may be useful to advise people about safety standards within those organizations but is not a sufficient basis for setting the standards. And for my part, I strongly object to government standards affecting my choice to smoke, drink, eat, wear a seat belt or bicycle helmet, etc., where I bear the full costs of these choices. In that case, all I want from the government is succinct unbiased information about the consequences of my own choices. Our government has enough important things to do without wasting our taxes and reducing our liberties by playing Uncle Nag.

W.N.

Improving Chemical Risk Assessment

Members of Congress had no particular interest in the methods of chemical risk assessment until recent debates over the Clean Air Act amendments of 1990. Environmentalists persuaded Sen. David Durenberger to introduce a bill that would have required the closing of any industrial facility with toxic emissions that imposed unacceptable cancer risks on nearby residents. Shutdowns would have been mandatory if plants could not reduce estimated lifetime cancer risks to less than one chance in 10,000 lifetimes. Even if that standard were met, additional pollution controls would ultimately be required to reduce lifetime cancer risks to less than one chance in 1,000,000 lifetimes. By way of comparison, the average American's lifetime risk of cancer mortality from all causes is about one chance in four.

The risk levels in the Durenberger bill were designed to be "technology forcing" and were to be enforced without regard to their feasibility or economic impact. Preliminary work done by EPA analysts suggested that a substantial fraction of American industry might have difficulty complying with the terms of the Durenberger bill. Most coke oven batteries, several major oil refineries, and numerous chemical plants were thought to be in jeopardy. In light of the economic implications of the bill, several senators—including Daniel Patrick Moynihan, John Breaux, and Pete Dominici—began to ask some probing questions about the scientific basis of the EPA's risk assessment process.

EPA's Cancer Risk Estimates

The Durenberger bill contained a list of about 200 toxic chemicals, many of which are considered "carcinogens" by the EPA. If an industrial facility emits one or more of these carcinogens, the EPA estimates the incremental cancer risk from the plant by assessing the risk to a hypothetical "maximally exposed individual." The EPA assumes that this person lives 200 meters from the emission source (or at the plant fenceline). The person is assumed to breathe outdoor concentrations of the pollutant continuously for every minute of a seventy-year lifetime. The outdoor concentration is not usually measured, but it is predicted on the basis of historical emission rates and a theoretical model of atmospheric dispersion.

Since there are limited statistics available on human cancer risks from chemical air pollution, the EPA assumes that the hypothetical resident is as susceptible to cancer as the most sensitive tested animal species (usually rats or mice). But the experimental doses used in rodent tests are often 1,000 times larger than the highest air concentrations predicted by dispersion models. To extrapolate

tumor responses from high to low doses, the EPA uses a linear, nonthreshold model. For example, since six parts per million of formaldehyde cause about a 1 percent tumor incidence in rats, the EPA predicts that six parts per *billion* of formaldehyde are associated with an incremental lifetime cancer risk of no more than one chance in 100,000. By way of comparison, six parts per billion of formaldehyde is typical of the formaldehyde concentrations measured in the air of most American cities.

Although the Durenberger bill passed the Senate Committee on Environment and Public Works, it never reached the Senate floor for a vote. A bipartisan coalition of Republican and Democratic senators was not prepared to threaten factory shutdowns on the basis of the EPA's cancer risk estimates. Intensive negotiations, which occurred under the credible threat of a filibuster, led to major modifications of the original Durenberger bill.

The Senate negotiations persuaded environmentalists that risk assessment could not be exploited to advance their interests. Hence, they abandoned the revised Durenberger bill and sought a better deal in the House of Representatives. The final law signed by President Bush calls for technology-based controls of toxic air pollution but contains no numerical test of acceptable risk—except for the use of one chance in a million as a trigger for regulatory consideration. In addition, the 1990 amendments call for the National Academy of Sciences to review the scientific basis of EPA's risk assessment procedure. In light of the academy's review and consultation with the surgeon general of the United States, the EPA is required to revise its risk assessment guidelines. A Bipartisan Commission on Risk Management is also authorized to recommend how risk assessment should be used in risk management decisions. The multiyear review process is intended to extend beyond clean air to examine the role of risk assessment in the regulation of pesticides, hazardous wastes, drinking water, and indoor air pollution.

At the Harvard Center for Risk Analysis, a group of us are developing some new approaches to chemical risk assessment. Our goal is to present risk managers with both central estimates of risk and complete risk distributions. This approach to risk assessment will force risk managers to make the key policy judgments.

Beyond the Maximally Exposed Individual

The EPA's approach to estimating maximum individual risk is so simplistic that it lacks credibility. For example, frequently no one lives within two hundred meters from the emission source, and in some cases that location remains within the plant boundary. Moreover, few people live in the same residential location for seventy years, and the expected lifetime of many industrial facilities is less than seventy years. People spend most of their time indoors, where the concentrations and sources of air pollutants are markedly different from those measured in outdoor air.

These criticisms of the EPA's standard exposure assumptions are more than just nitpicking. Dr. Neil Hawkins has demonstrated that more realistic exposure assumptions reduce estimated risk to the maximally exposed individual by a factor of ten or more. If we are determined to threaten shutdown of industrial facilities on the basis of individual maximum risk, we should make sure that the hypothetical person we are protecting is not imaginary.

More important, risk assessors should estimate exposure to everyone who might be affected by an industrial facility. Although equity considerations justify paying some regulatory attention to the upper end of the exposure distribution, regulators should also insist on more stringent controls of industrial sources that impose risks on large populations. Moreover, regulators should use information about public health risks to determine which industrial source categories should be the highest priority targets for regulation. In a recent paper Dr. Bernard Goldstein revealed some of the perversities in risk management that arise from an exclusive focus on the maximally exposed individual.

In its recent benzene decision, the EPA took an important conceptual step forward by estimating how many people were exposed to various levels of risk due to certain industrial sources of benzene. The EPA now needs to go further and replace unrealistic exposure assessments with available data about factors such as population mobility, facility lifetime, indoor versus outdoor sources of pollutants, and the amount of time spent indoors and outdoors.

The use of science in exposure assessment may also operate to increase risk estimates in certain situations. For example, EPA scientists have shown that standard dispersion models underestimate pollutant concentrations in some geographical settings (for example, mountainous terrain). Moreover, risk assessors often focus on the risks of inhaling toxic air pollution and neglect secondary pathways of exposure that occur when people ingest food and water that have been contaminated by the pollutant. Secondary exposures have been shown to be quanti-

tatively significant for dioxin and various metals. Thus, regulators should insist on information about the complete distribution of human exposures to toxic pollution.

Beyond Animal Cancer Tests

Since it is unethical and impractical to study cancer risk in controlled human studies, scientists have developed standard protocols for animal cancer tests. About 60 percent of the chemicals that have been tested in long-term laboratory animal bioassays have been shown to be carcinogenic. More of these chemicals might have tested positive if doses had been elevated further, if pathology work had been more extensive, if more relaxed tests of statistical significance had been employed, or if the animals had lived long enough to allow tumors to develop. Some scientists believe that virtually all chemicals can be shown to cause cancer under some exposure conditions.

The EPA's standard procedure for estimating cancer potency tends to "punish" chemicals that have tested positive and to "exonerate" those that have not yet been adequately tested in long-term animal studies. For most existing chemicals, the EPA implicitly assumes that a chemical's carcinogenic potency is zero unless it has tested positive in a long-term animal study. This assumption is hardly prudent. Suppose that a chemical in widespread commercial use has not yet been adequately tested in a long-term animal study but is acutely toxic, damages DNA in short-term tests, and is structurally similar to a known human carcinogen. Does it make sense to assign this chemical a potency value of zero?

Risk assessors can do better. For chemicals that have been tested in animals, there is a good correlation between carcinogenic potency and the results of acute toxicity and mutagenicity tests. Using classical statistical methods, we can predict with a surprising degree of reliability the carcinogenic potency of a suspect chemical that has not yet been studied in a long-term animal bioassay. Dr. Richard Wilson has been a pioneer in this work.

At the Harvard Center for Risk Analysis we are developing methods that would give appropriate weights to all the available evidence. For example, a negative animal study should not generate a carcinogenic potency rating of zero if the total data base on the chemical provides cause for concern. Likewise, a positive animal test could reflect a spurious experimental outcome, which means that there is still a small chance that carcinogenic potency is zero. Bayesian statistical procedures, in which prior information is formally combined with sample data, can be used to generate probability distributions on the true, but unknown potency value. These distributions can be modified as scientific knowledge improves. Under some circumstances, the Bayesian procedure has the additional benefit of creating strong incentives for additional testing. Alison Taylor and Dr. John Evans are tackling this challenging problem.

An even more difficult challenge is the development of risk assessment methods for noncancer endpoints, such as neurobehavioral effects and developmental and reproductive effects. Standard animal tests are not considered good models for detecting those effects. As people begin to look beyond the current cancer phobia about chemicals, they will ask questions about those more subtle health effects. Our nation needs a sustained research program to better understand the effects of chemicals and other factors on health endpoints other than cancer.

Beyond Linear Extrapolation

Animal cancer tests are rarely conducted at prevailing levels of human exposure because too many rodents would be required to detect a tumor response. If we are searching for cancer risks as small as one chance in a million lifetimes, a huge study of a million rodents would be necessary to observe one expected case of cancer.

Faced with this reality, experimentalists typically increase the tested doses until they are near the point of chronic toxicity to the animal, the maximum tolerated dose. The crucial question becomes how to extrapolate tumor responses at these high doses to the small doses that people experience in their daily lives.

In the 1970s federal agencies embraced the assumption that any exposure to a cancer-causing chemical, no matter how small, is associated with some increase in cancer risk. In particular, agencies adopted a default position that a linear, nonthreshold model should be used to extrapolate tumor responses to low doses.

The science of the 1990s suggests that the default position is inappropriate in certain circumstances. Some chemicals, such as vinyl chloride, are believed to have a supralinear dose-response curve. Other chemicals, such as formaldehyde, are believed to have a sublinear dose-response curve. In the case of

dioxin, a growing number of scientists believe in a receptor-mediated theory of cancer causation, which implies that a certain amount of dioxin—as yet unspecified—is necessary to cause cancer. For chemicals that cause cancer only near the maximum tolerated dose, Bruce Ames and others have suggested that the animal test results are probably not relevant to the low levels of human exposure found in the environment. In each of these examples the gradual changes in scientific opinion reflect new understanding of how chemicals are handled in the body and the biological mechanisms that govern chemical carcinogens.

Although federal agencies have been slow to respond to scientific developments, there are clear signs of progress. EPA scientists are working on a new potency estimate for formaldehyde that will soon be reviewed by the agency's Science Advisory Board. The EPA has also published a draft report suggesting that the male rat kidney tumors caused by some chemicals arise from a biological mechanism that is unique to the male rat. The FDA has judged that the linear model is probably inappropriate for some chemicals that cause thyroid tumors in rodents. Indeed, EPA Administrator William Reilly recently announced that the EPA—in consultation with other federal agencies—would reassess the potency of dioxin in light of new scientific developments.

As we encourage government scientists to use the best available science, we should also respect their caution about accepting preliminary mechanistic data or speculative mechanistic hypotheses. Science is a dynamic process governed by consensus formation, and we should not expect federal agencies to move any faster than the predominant body of scientific opinion.

Federal agencies should also do a better job of quantifying the scientific uncertainties in their risk estimates and acknowledging minority scientific opinions. Dr. George Gray and Sarah Spedden are considering how to express uncertainties and minority scientific opinions in cancer risk assessment.

In the upcoming review of the EPA's risk assessment process, we urge the National Academy of Sciences to make specific recommendations about how agencies should quantify scientific uncertainty in risk estimates. Although a formal uncertainty analysis is not worth the effort for every risk management decision, it probably makes sense to analyze uncertainty more carefully when the stakes in the risk management decision are large.

The Myth of One in a Million

There is a movement throughout the country to reduce human exposure to toxic chemicals until the estimated lifetime cancer risk from each chemical exposure falls below one chance in a million lifetimes. Although the 1990 Clean Air Act amendments narrowly skirted this outcome, the one-in-a-million standard is increasingly advocated in decisions about hazardous wastes, drinking water contaminants, and toxic air pollution. But where did this number come from?

The Food and Drug Administration made the first recorded use of the one-in-a-million standard in 1973. Congress required the FDA to assure that no detectable levels of cancer-causing food additives would remain in the meat supply. The FDA chose the one-in-a-million risk level because it was essentially zero, it was readily achievable, and it was preferable to a detectability standard that could change unpredictably as detection technologies improved.

In choosing the one-in-a-million risk level, the FDA made a public health decision to protect the large meat-consuming population in the United States. No one seriously suggested that such a stringent standard should be applied to a hypothetical maximally exposed individual. In recent years the FDA's decision has been manipulated and advocated out of context.

When advocates of zero risk insist that they are making a concession by accepting one chance in a million instead of zero risk, we should understand that they are not really offering a compromise. They are still insisting that vanishingly small risks be reduced without regard to the consequences for our standard of living, our quality of life, or our public health. Risk assessors have an obligation to inform regulators that risk numbers alone are insufficient to make an informed risk management decision.

The most telling argument against the one-in-a-million standard is that it distorts public health priorities. The major sources of involuntary risk in this country are not cancer-causing chemicals. They are murderers, drunken drivers, and politicians who refuse to vote for comprehensive health and nutrition services aimed at reducing infant mortality. When we worry about minute human exposures to chemicals, we are diverting scarce resources and national attention from more serious public health problems. At the Harvard Center for Risk Analysis,

we are dedicated to fostering a more reasoned national process of setting public health priorities.

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Death by Regulation

There are certain universal truths widely recognized by careful observers of the Washington scene. First, politicians want to "do something positive." This wish exists regardless of whether there is any real need to do anything at all, and to question the need for action is anathema. Responses to Love Canal, Chilean grapes, and Alar indicate how often government safety programs are launched, not on the basis of science, but on sensationalism.

Second, an important asymmetry exists between action and inaction. There are risks associated with an agency's decision to act, and there are risks associated with a decision not to act. The latter, however, are usually much more visible than the former. For example, a program to improve automobile side impact protection will also increase the retention rate for older, less safe cars by making new vehicles more costly. But consider how much easier it is for a journalist to focus on the first story rather than the second—the photographs of crumpled cars, the videotapes of crash tests, the interviews with victims' families. By comparison, how would one even begin to identify the accidents that result from the price effect of a new standard? In short, one photographable injury outweighs a thousand unphotographed fatalities.

Finally, there is political power. All government agencies like it. They will often act to increase it, and they will rarely turn it down—even when increased political power comes at the direct expense of the public safety the agency is charged with promoting.

Frequently, these factors result in safety measures that are ineffective and overpriced—attributes that are no surprise in government programs. Occasionally, however, the results are inadvertently lethal. And sometimes programs are not only lethal, but their nature is deliberately concealed by the administering agency. These latter two outcomes comprise what I call death by regulation. Death by regulation should be a sobering counterweight to the notion that, when it comes to public safety, less-than-ideal markets are a sufficient condition for government involvement. Unfortunately, death by regulation is alive and well in Washington today.

Safer Drugs, Fewer Drugs

The Food and Drug Administration's drug approval process is the foremost example of asymmetrical political risk. There are two types of errors the FDA can make in reviewing a new drug application: it can approve a drug that turns out to have unexpectedly adverse side effects, or it can delay or deny a beneficial drug. From a public health standpoint, both of these errors can be equally deadly, but from a political standpoint, they are worlds apart.

Incorrectly approving a drug can produce highly visible victims, highly emotional news stories, and heated congressional hearings. The paradigmatic example is thalidomide, a sedative introduced in several countries (not including the United States) before being linked to severe fetal deformities in 1961.

Incorrectly delaying a drug, on the other hand, will produce invisible victims and little more. The FDA's ten-year delay in approving beta-blockers (from 1967 to 1976), for example, was probably responsible for upwards of ten thousand deaths—a toll as huge as it is unappreciated.

Not surprisingly, the FDA's fundamental approach to drug approval is designed to reduce the likelihood of the first type of error while paying little attention to the second. The well-documented result of this excessive caution is drug lag—the frequent unavailability of major new drugs in this country long after they have been approved elsewhere. Despite numerous reform efforts by the FDA over the past decade, this phenomenon continues unabated.

The FDA's overcaution is reinforced by a similar bias in Congress. One former FDA commissioner asserted: "In all of FDA's history, I am unable to find a single instance where a Congressional committee investigated the failure of FDA to approve a new drug. But, the times when hearings have been held to criticize our approval of new drugs have been so frequent that we aren't able to count them. . . . The message to FDA staff could not be clearer. Whenever a controversy over a new drug is resolved by its approval, the Agency and the individuals involved likely will be investigated. Whenever such a drug is disapproved, no inquiry will be made. The Congressional pressure for our negative action on new drug applications is, therefore, intense. And it seems to be increasing."

This same asymmetry appears in media coverage

of the agency. Every FDA announcement of a major new drug approval should raise an obvious question: If this drug is going to start saving lives tomorrow, how many people died yesterday waiting for the agency to act? But the question is hardly ever asked, much less answered. Finding the victims of the drug's side effects is far easier than identifying the victims of its unavailability.

Can the FDA be reformed? Probably not in any fundamental sense. The AIDS crisis has produced some incremental changes because it is the first time that drug lag's potential victims have organized themselves into a powerful political constituency. But it may also be the last time, and it is still unclear whether the AIDS-inspired reforms, such as liberalized distribution of drugs before full approval and more lenient standards for test data, will be significantly utilized. (See the article by Joanna Siegel and Marc Roberts.)

The ultimate issue continues to be one of asymmetry in public perception and in institutional incentives. When the agency approves a new drug, it could easily compute the therapeutic benefits that were lost to the public during the approval process. This loss is a major cost of the FDA's approval process; quantifying (let alone minimizing) it is central to any attempt to truly protect public health. Absent some major shift in public recognition of this fact, deadly overcaution will continue to be the FDA's dominating inclination.

Air Safety versus Highway Deaths

Mandatory airline child seats represent another issue that is fueled by the political asymmetry of risks—in this case one death in a publicized airplane crash outweighs a hundred anonymous highway fatalities.

Under current Federal Aviation Authority regulations, children under two may ride on their parents' laps. As a result, airlines allow these children to fly free. In the United Airlines Sioux City crash in July 1989, however, two lap-held children were torn from their parents' grasp at impact; one of them died, as did 111 other passengers. Because a child restraint seat could have saved the child's life, a push for mandatory airline child seats has begun.

Mandatory child seats would mean that families flying with young children would have to purchase tickets for children who had been flying at no charge. Faced with substantially increased costs, some of these families would undoubtedly shift at least some of their air travel to highways, where fatality and injury risks are far higher. Thus, mandatory child seat requirements would not only increase the costs to consumers traveling by air by several hundred million dollars annually, but would also result in a net *loss* of life.

Politically, a child's death in a major airline crash counts far more than a highway fatality. The former is national news, while the latter is a back-page story in a local paper. Within months of the Sioux City crash, the FAA faced both petitions and congressional proposals to require child seats on planes.

As of this writing, the FAA has made no final decision, but it has opposed congressional legislative efforts on safety grounds. This position is encouraging, but it also appears to be at least partly fortuitous. The FAA's request for public comment did not initially raise the highway fatality issue. Fortunately, several academic researchers did consider the impact of higher air travel costs on highway travel, and the FAA incorporated their findings, presented at a congressional hearing, in its analysis. But the FAA's attempt to consider the total impact on safety drew fire from the National Transportation Safety Board. NTSB Vice Chairman Susan M. Coughlin argued that the FAA was out of bounds. She testified: "We are confusing the issues when we start comparing aviation safety to highway safety. The FAA [is] responsible for aviation safety. There is no one who is making the argument that we are not safer buckled in and restrained in those seats during the critical phases of flight. So I have a hard time accepting the intertwining of those issues. Even if it were to drive more people to the highway, what we are dealing with here today is aviation safety and the right thing to do is to require all occupants to be restrained."

Lest anyone be distracted by the broader issue of overall safety, Rep. Jim Lightfoot, sponsor of the congressional bill, quickly dismissed the FAA spokesman: "I would only say that if your assumptions are correct, and my baby is the one baby that dies, I don't give a damn about your assumptions." Although this may be an understandable emotional response to a tragedy, it is a disastrous basis for policy.

A Safety Agency Becomes a Killer

Finally, in auto fuel economy standards we find an instance of a safety agency's concealing the lethal effects of its own activities. Before the 1975 enactment of the Corporate Average Fuel Economy (CAFE) program, the National Highway Traffic Safety Administration's major responsibilities were to issue motor vehicle safety standards, to order recalls,

and to assist state highway safety programs. In this area NHTSA is generally credited with improving new car safety, although there is disagreement about the magnitude of this improvement, and the agency has made some major blunders. For example, NHTSA's passive restraint requirement was accompanied by several attempts to conceal unfavorable air bag data, and its promotion of air bags as obviating the need for seat belts was characterized as "misleading" by a federal court.

CAFE gave NHTSA a degree of power over the automobile industry that the agency never before possessed. CAFE essentially requires that each automaker's yearly output meet a specified minimum average fuel economy standard, now set at 27.5 miles per gallon. To the extent that this standard differs from manufacturers' assessments of market demand for fuel economy, it is an important factor in product design, manufacturing, and marketing decisions and even in plant location. CAFE often requires full-line producers such as General Motors and Ford to engage in massive juggling acts to comply with the standard because their large-car sales often imperil their compliance with CAFE.

Downsizing is one of the most powerful tools for improving auto fuel efficiency. According to NHTSA, "each 10 percent reduction in weight improves the fuel economy of a new vehicle design by approximately 8 percent." The doubling of new-car fuel efficiency that occurred from 1975 to 1985 was due in large part to the 1,000-pound reduction in average new car weight during the period.

But large cars are generally more crashworthy than small cars owing to their heavier construction, their greater crush space to absorb collision forces, and their larger occupant space. The occupant death rate in the smallest cars on the road is more than twice that of the largest cars. This relationship between vehicle size and occupant safety holds true in single-vehicle accidents as well as in multivehicle collisions, and it is supported by a wide range of studies. Thus, although CAFE has increased NHTSA's jurisdiction, it has also threatened NHTSA's safety accomplishments.

NHTSA could have admitted that CAFE exacts a toll in increased traffic deaths and injuries and then attempted to achieve some balance between conservation and safety in setting CAFE standards. Such an approach would certainly be advantageous from the standpoint of informed decisionmaking and public awareness of the true price of its fuel conservation measures.

Institutionally, however, such an approach is difficult. No agency, and particularly not one whose middle name is safety, wants to admit that one of its programs kills people. Thus, in administering CAFE, NHTSA's course has been to acknowledge possible safety problems in the abstract while denying their existence in any one particular model year. Each time the safety issue arises, NHTSA exonerates the particular standard in question and announces that the matter is best left for future consideration.

In a report to Congress in 1974—before CAFE's enactment—the agency examined this very safety issue, however. At the time NHTSA characterized the size-safety relationship as "well known" and stated that "[a] sustained or increased shift to more fuel economical cars, without a concurrent upgrading of their crashworthiness or increased utilization of effective passenger restraints, will result in a rise in the serious injury and death rate on the highway."

But NHTSA began to backtrack from this position after CAFE was enacted. By 1977, when the agency issued CAFE standards for model years 1981 to 1984, its view of the size-safety relationship had become far more equivocal than earlier. NHTSA argued that crashworthiness was not dependent on size in single-vehicle accidents. As for multivehicle crashes, NHTSA claimed that the adverse effect of downsizing was only temporary, and that it would "apparently be offset by the reduction in the range of passenger automobile weights which is projected to occur as the larger automobiles are downsized." NHTSA also claimed that smaller cars were less accident-prone and that large cars were more dangerous to other cars and to pedestrians.

While NHTSA was obfuscating the size-safety issue in the context of CAFE, however, it took a totally different position when it came to *safety* standards. In a 1980 study NHTSA stated that "[s]afety standards have saved more than 64,000 lives since 1968, but these gains are being outweighed by the shift to smaller cars." In a similar publication in 1981 it noted: "The traffic safety problem will become even more serious during the 1980s.... One of the most worrisome problems is the changing vehicle mix and the general downsizing of all passenger cars and light trucks. With these smaller and lighter vehicles joining an increasing number of heavy trucks and older, heavier cars already on the road, the risk of death and serious injury will increase markedly." The more NHTSA could portray the small-car trend as a safety hazard, the better its case for issuing more safety standards. And if this posed a problem for the agency when it came

to CAFE, that was nothing that a little creative writing could not solve.

In 1985 the president's Council of Economic Advisers raised the safety issue as a justification for reducing the 1986 model year CAFE standard below the 26.0 miles per gallon proposed by NHTSA. The CEA noted that NHTSA's proposed standard had not even mentioned the safety issue posed by CAFE. According to the CEA, "NHTSA's failure to consider the adverse safety consequences of its decision can only mean that its proposed 26.0 mpg standard is set higher than it would be if safety factors were taken into account."

NHTSA responded by denying the existence of any real size-safety relationship. The agency noted that occupant deaths had dropped in recent years despite downsizing: "Passenger car occupant deaths have in fact dropped from 28,200 in 1978 to 23,500 in 1984, a 17 percent decline. This occurred during a time when the average new car's weight was reduced by 1,000 pounds." Another NHTSA document of the period stated that "deaths per VMT [vehicle miles of travel] have dropped nearly 20 percent."

Appealing as that argument sounds, for anyone familiar with traffic death rates it is an obvious piece of statistical legerdemain. The car occupant death rate has been dropping not only since 1978, but for the past fifty years. In all likelihood it would have dropped even more in recent years but for downsizing. Using NHTSA's logic, one could just as well argue that AIDS is not a health hazard because since it first appeared in the United States in 1981, average life expectancy has increased by about nine months. Then again, life expectancy has been increasing since colonial times.

In subsequent CAFE rulemakings the safety issue was raised by a broadening array of groups, including the Insurance Institute for Highway Safety, the Competitive Enterprise Institute, and the National Safety Council. A 1988 study by Brookings senior economist Robert W. Crandall and Harvard public health professor John D. Graham found that cars produced under a 27.5 miles per gallon standard would experience a 14 to 27 percent increase in occupant deaths—2,200 to 3,900 additional fatalities per model year fleet. NHTSA rejected the study as methodologically flawed.

NHTSA's treatment of the CAFE-safety issue became increasingly strained. For example, in 1986 NHTSA argued that crash test results from its New Car Assessment Program (NCAP) showed that small and large cars were equally crashworthy. In the agency's words, the program "demonstrates that in crashes with cars of equal weight, small cars can provide equivalent protection as do large cars when they crash into other large cars.... [A] number of small cars ... have exhibited good occupant crashworthiness in NCAP testing." But NHTSA's interpretation of these test results was directly contradicted by the program's actual report, whose cover sheet carries the following warning: "**Large cars usually offer more protection in a crash than small cars.** These test results are only useful for comparing the performance of cars in the same size class."

Although after fourteen years of CAFE the agency has yet to find cause for concern over the safety effects of even one CAFE standard, NHTSA has taken one significant step in 1990 by raising the safety issue as a reason for opposing congressional proposals to boost CAFE to 40 miles per gallon. At a September 1990 press conference, the agency released new reports demonstrating the applicability of the size-safety relationship to single-vehicle accidents, and NHTSA Administrator Jerry Curry characterized one bill as "a killer" that "exchange[s] body bags for oil barrels." Ironically, both Curry and Transportation Secretary Samuel Skinner emphasized that their new safety-size studies were consistent with the earlier Crandall-Graham study. NHTSA has not changed its position on the innocence of its existing CAFE program, however. The agency's criticism of the 40 miles per gallon bill is carefully worded to avoid any admission that current standards reduce safety.

Finally, NHTSA proved prescient with its 1980 prediction that the benefits of its safety standards were being wiped out by the shift to small cars. The protection offered by an air bag, for example, has been estimated to be equivalent to approximately 400 pounds of increased car mass. The Crandall-Graham study concludes that, absent the 27.5 miles per gallon CAFE standard, average new car weight would be 500 pounds higher. In effect, the current CAFE program has more than offset the safety benefits of air bags. Having paid the cost of new safety standards, the public is left with downsized cars that offer little if any net safety gains, and NHTSA continues to claim credit for saving both gasoline and lives.

Reform, Recidivism, or Incorrigibility?

These are discouraging tales. Occasional hopeful signs can be undone by a new agency head or wiped out by a new administration. The intractable nature of the problem stems not from the fact that agencies

err (we all do), but from the inherent lack of correcting mechanisms in centralized decisionmaking. Couple this with the asymmetry of political risks, and it is surprising that matters are not worse.

It would be one thing if agencies only advised. We could view them as elderly kinfolk fixated on safety, who dependably remind us to wear our galoshes but rarely tell us when to remove them. As long as we understood that they only gave us one side of the story, we would not be badly misled. Agencies not only overadvise, however; they overregulate. And as these stories demonstrate, sometimes agencies even regulate against safety.

What can be done? Certainly the asymmetry can be minimized by making less visible risks more prominent. Suppose that the FDA accompanied every drug approval announcement with a public estimate of the therapeutic loss caused by its review process. Pressures to reduce those losses would introduce new competing agency incentives. Whether they could ultimately triumph over various forms of administrative gamesmanship is an open question.

Public health and safety are often viewed as representing one of the strongest cases for government regulation. Many who trust competition to give them low prices and wide variety are less sure of market results when it comes to product safety. But death by regulation, whether unintentional or deliberate, is the relatively unknown opposite side of that coin. Its recognition as an aspect of government regulation would be a significant step forward in civic education.

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NIMBY and LULU

Modern society requires places to put hazardous wastes, halfway houses for prisoners, radioactive detritus, and trash. Government officials carefully write rules so that these LULUs (locally unwanted land uses) are reasonably safe. But when the broad studies are completed and a specific area or community is selected, residents there usually say, "It's a fine idea to store wastes (or prisoners, or mentally retarded people) in a well-designed building. But put it somewhere else." As James Goldberg, a consultant on public policy issues, writes, "[i]f the State Office of Leprechaun Affairs wanted to site a pot of gold, the war-cry would go up, 'Not in my back yard!'"

Consider some examples. In April 1990 residents of Allegany County in western New York were strongly opposed to the county's being one of the two sites proposed for a low-level radioactive waste site. (A survey showed 91 percent of county residents were hostile to the idea.) When officials from the siting commission showed up to inspect a possible site, rioting erupted. Citizens attempted to keep the officials away by rolling giant snowballs on them, blocking their path with horses, and chaining themselves across bridges. As an indication of the intensity of feeling in the county, none of the rioters was indicted by the county grand jury convened to investigate the disturbance. This was despite the facts that the activities had been captured by still and video cameras and that state police were willing to testify.

On November 8, 1990, rioting broke out in South Korea about plans to dispose of low- and medium-level radioactive wastes. A police station was burned to the ground in the battle, 73 people were arrested, 22 were injured, and as many as 10,000 were said to have protested. The minister of science and technology was replaced as result of the clash.

For the past four years Nevada has been engaged in legal skirmishes against the U.S. government. Nevada was designated by the Nuclear Waste Policy Act amendments of 1987 as the sole state to be investigated for the purpose of constructing a high-level nuclear waste repository. This has naturally led Nevada residents to surmise that they will host the eventual location. The Supreme Court held in February 1991 that Nevada cannot prevent the federal government from proceeding with the project, but few individuals are placing bets that the Department of Energy will begin construction any time soon.

If the residents of Allegany County, South Korea, or Nevada were asked whether those wastes should be stored in a well-designed facility somewhere, they would almost certainly say, "Yes, but not here." The NIMBY problem only *seems* insoluble, however. In fact, similar problems are resolved every day by a "reverse Dutch auction."

Consider the problems facing an airline manager. He knows that a percentage of the passengers on a specific flight will not have shown up when the aircraft is ready to take off. As a result, the airline may sell more tickets for a flight than there are seats available in the expectation that a normal

proportion of "no-shows" will hold. If the expected fraction of no-shows is 20 percent, for example, the airline may sell 110 percent of the seats for a given flight. If this is a typical flight, 90 percent of the seats will be filled when the plane departs. But such decisions are based on statistical averages. On any given flight, the no-show percentage may be higher or lower than the average. For example, on one specific flight the no-shows may constitute only 5 percent of the tickets sold. If the airline has sold 110 percent of the seats, something must be done with the excess passengers.

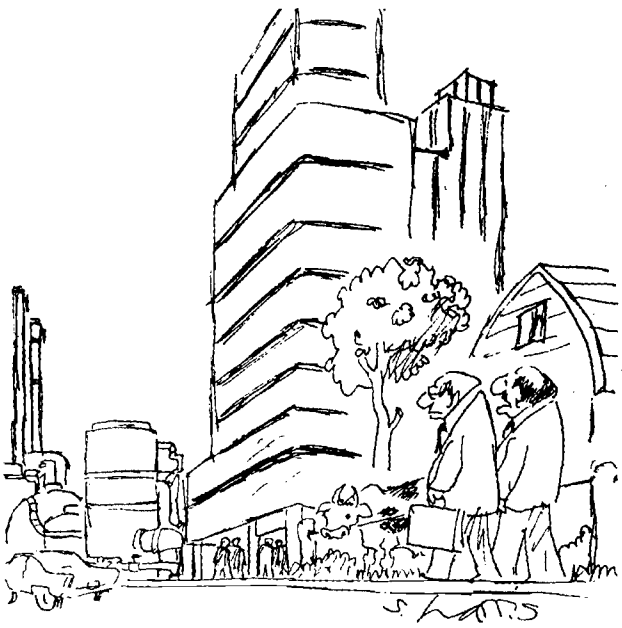
At first, the airline's problem may appear to have no relationship to the problem of finding waste sites. But in both cases some cost—lost time for "excess" airline passengers or possible health risks for neighbors of waste sites—could be imposed on unwilling citizens. The cost is different, but the principle is the same.

Consider how the airline situation is handled. The flight attendant asks, "Is anyone willing to take the next flight to the same destination for a payment of $50? No volunteers? Well, how about $100? $150?" These auctions are invariably over in a few minutes, often before many of the passengers are even aware that they are happening. A volunteer comes forth at a price that is acceptable to him.

Now consider what would happen if the command-and-control system used for finding most LULU sites in the United States were employed. In this system, some unwilling victim is selected for the good of society by a higher authority.

One can imagine flight attendants going up and down the aisles asking passengers to fill out lengthy and complicated questionnaires. They could contain such questions as, "On a scale from one to ten, rate how desperate you are to get to the destination." Or they might ask, "How many people are waiting for you?" Passengers would no doubt be asked to provide information about their age, sex, and social security number as well as other pertinent information that might bear on the question of who should be forced to wait for the next flight.

Of course, some replies could be falsified to avoid being selected. A passenger might respond, "I'm desperate to get to Dayton to see my dying mother," for example, when he really just wanted to make the party at his girlfriend's house. So there would have to be some type of verification effort to ensure that the passengers were not lying. Finally, the answers to all these questions would be ranked, and the person or persons to be ejected from the aircraft would be chosen. Suppose that the flight



attendants concluded that the bald-headed man in row 15 had to depart. "Now Mr. Jones, don't make any trouble. We have objectively determined that of all 100 passengers, you would suffer least if we put you off. Just look at this computer printout. Take your time. The equations and the charts should convince you."

Would Mr. Jones depart without a protest? There would more likely be threats to write the airline's president, promises to take the airline to court, intervention by other passengers sympathetic to Mr. Jones, and perhaps even a wrestling match in the aisles. In short, the situation would be a smaller-scale replication of the arguments that rage about siting hazardous wastes.

The reverse Dutch auction employed by airlines in selecting which passengers will delay their travel plans works well because each passenger *decides for himself* just how valuable his time is. Nobody else, no matter how well-meaning or scientific, can do that for him. Further, no passenger is required to participate in the auction. Someone solely interested in getting to the destination as soon as possible need only sit tight and do nothing.

The Reverse Dutch Auction and LULUs

The standard Saturday-morning auction is known as an English auction. In an English auction bids rise, and there is almost always more than one. By

contrast, the Dutch auction has a decreasing price level. The auctioneer chooses what he thinks is a price higher than the expected bid, and then he comes down in price until he receives a bid. Thus, a Dutch auction has only one bid.

To take account of the undesirability of LULUs, the Dutch auction must be reversed. That is, the price for accepting the LULU should rise, but there will still only be one bid. That is what happens on an overbooked airline. The purpose of the airline auction is to find a passenger who is willing to delay his travel plans. The price rises until someone raises his hand. The passenger is paid, he leaves, and the auction is over. The problem of getting one or more passengers to leave the plane without objection is resolved.

Applying the reverse Dutch auction to LULUs would involve a three-stage process. In the first stage the environmental and safety rules and criteria would be published, and interested communities would be asked to volunteer for the LULU. Under the reverse Dutch auction, no environmental criteria would need to be abandoned or modified to achieve the goal of finding a site. The rules could be as strict as society wished. The addition of financial considerations to the search would not imply a diminution of environmental quality.

If no volunteer community appeared, the second stage would commence. The siting authority would offer a payment, or bonus, to the community willing to accept the LULU. The bonus would be gradually raised until a volunteer appeared, much as an airline raises its offer until it finds a sufficient number of volunteers to leave booked seats. The volunteer community could use its bonus for whatever purpose it chose—to build new parks or schools, to provide additional services, or to offer a tax rebate to citizens, for example.

Would a volunteer community come forward? When the true social cost of the facility was reached, a community would volunteer. Although social costs are a subject of debate among economists and sociologists, the reverse Dutch auction is the only mechanism that generates an exact value.

Suppose, for example, that the bonus rose in increments of $10 million, perhaps every month or so. When the bonus was at $20 million, community X might have 15 percent of its population in favor of their elected representatives' making a bid. When it rose to $50 million, 40 percent might be pro-LULU. When the bonus reached $100 million, perhaps 80 percent might be in favor, but at the same time, other communities would be watching the bonus rise. If residents of community X waited too long, they would receive nothing. Community Y might volunteer while residents of X were dickering. Thus, a reverse Dutch auction would also encourage the more timely choice of LULU sites.

In the final stage of the reverse Dutch auction, the site proposed by the community would be evaluated to ensure that it met the agreed-on environmental standards. To ensure that communities were adequately informed when volunteering proposed sites, the siting authority should pay for the cost of any consultants communities hired. No community could then claim, "But we didn't have the money to pay for adequate studies." Furthermore, the siting authority's bearing the cost of necessary consultants would make the process equally accessible to all communities—large and small, rich and poor.

Concluding the Dutch Auction

At the conclusion of the third stage of the reverse Dutch auction, all of the goals of the process would have been met. A LULU that meets acceptable environmental standards would have been built. The community that hosts it would have been adequately compensated by its own reckoning. And the rest of us would not have the facility in our back yard.

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A Market without Rights: Sulfur Dioxide Emissions Trading

In November 1990 Congress adopted the Clean Air Act amendments. Title IV of that legislation deals with acid rain and contains what has been described by the EPA administrator and the chairman of the Council of Economic Advisers as "an innovative program to harness the power of the market place to combat acidic deposition using tradeable allowances and free market incentives." In the Spring 1991 issue of *Regulation* Robert Hahn described the program as "a pathbreaking market-based proposal to control acid rain." Even before there is experience with the trading of reductions in sulfur dioxide

(SO_2) emissions, the program has been recommended as a "cost-effective and practical instrument for controlling carbon dioxide emissions at the international level (that could conceivably be used domestically as well)." This is rather heady stuff, at least for economists, since there is no underlying science linking the acidity of lakes and the atmospheric emissions of SO_2 from upwind electric power plants. Moreover, even if there were a link, the cost of reducing the acid rain problem is much greater than the benefit.

The key question now is whether the government, after having muddled the science and the cost-effectiveness of reducing acid rain, could have designed the implementation mechanism correctly. In other words, is the SO_2 emissions trading system really going to work?

The SO_2 Trading System in the Clean Air Act

The premise behind emissions trading is that there are two kinds of electric utilities. One has high costs of reducing SO_2 emissions, and the other has low costs. Utilities with low costs reduce their emissions below a target level set in the legislation and earn extra credits, called allowances. They then sell the allowances to the utilities with high costs. Supposedly, both types of utilities benefit because the total cost of achieving the target reduction in emissions is less than if each had to invest in actually reducing its SO_2 emissions.

An allowance permits a power plant to release one ton of SO_2 in a particular year or thereafter. This implies that a utility could bank extra allowances for future use. The total number of allowances and each individual allocation to a power plant are related to the SO_2 emissions reduction target. There are two phases and two emissions targets. They are summarized in Table 1.

Table 1: SO_2 Emissions Reduction Targets

Targets	Phase I: 1995-1999	Phase II: 2000-?
Lbs./mmBtu Target	2.5	1.2
Maximum SO_2 Tons	15.4 Million	8.9 Million
Reduction Tons	3.5 Million	10.0 Million
Power Plants	261	2,456

There is an elaborate calculation to impute the total reduction target to individual power plants. It is based on the "actual 1985 emission rate" for the power plant, which is really an estimate. The list for phase I is a part of the act. The list for phase II has not yet been issued, but will be, presumably before the December 31, 1991, deadline required in the act.

Phase II is the comprehensive period. Phase I, on the other hand, is a practice period. Nonetheless, phase I contains legal requirements for 261 power plants, and there are penalties for not meeting them.

Property Rights

Pollution is mainly the result of ill-defined property rights. When people are not responsible for the full consequences of their deeds, the costs spill over to innocent third parties. By contrast, rights that are clearly defined and enforced provide a discipline on the decisionmaker to take all of the consequences into account. Moreover, when rights are transferable, the values of others not a party to a transaction are taken into account because they are potential buyers of the affected asset.

Given the importance of this attribute, it is surprising to learn that the act explicitly says that allowances are *not* property rights: "An allowance allocated under this title is a limited authorization to emit sulfur dioxide in accordance with the provisions of this title. Such allowance does not constitute a property right." As if this were not enough of a problem, the act goes on to say that "nothing in this title or in any other provision of law shall be construed to limit the authority of the United States to terminate or limit such authority."

An electric utility considering participating in the allowance trading system has two problems to accommodate. First, it cannot be sure that others with whom it trades will act responsibly. Second, the government has put everyone on notice that it will not be responsible for its actions. Specifically, the federal government is entitled to destroy the value of the allowances in the possession of the utility, and that act cannot be challenged as a violation of the Fifth Amendment of the U.S. Constitution that would ordinarily prohibit such a taking.

This may be enough to keep the trading of allowances from developing past a rudimentary stage. Indeed, another part of the 1990 Clean Air Act amendments has already halted trading of some contracts at the New York Mercantile Exchange. If uncertainty about EPA regulations can halt the

trading in an existing market, then it can surely retard the emergence of the emissions trading.

No Judicial Review for Data Base Errors

As indicated earlier, the emissions data for each power plant that will be used for assigning allowances in phase II will not be completed until the end of 1991. The act refers to this data base as the 1985 National Acid Rain Precipitation Assessment Program Emissions Inventory, Version 2, National Utility Reference File. Version 1 already exists. It is not clear, however, that version 1 is a reliable guide to the contents of version 2.

Suspicions about creative changes are intensified after reading the act in this regard. One section says: "Corrected data shall be used for purposes of issuing allowances under the title. Such corrections shall not be subject to judicial review, nor shall the failure of the Administrator [of the Environmental Protection Agency] to correct an alleged factual error in such reports be subject to judicial review." Why would Congress go out of its way to make it very difficult to correct errors? One answer is that some errors are superior to others, especially if they accrue to the benefit of politically favored utilities. Such errors are less likely to be corrected voluntarily in a system that is not subject to judicial review.

An only slightly less sinister possibility is an "honest" mistake. An error could be unintentional, or it could be the result of a disagreement between reasonable people. In either case the consequences of ignoring even a simple mistake could be quite severe. Doing without an important dispute settlement mechanism is, therefore, a serious loss.

One such loss has to do with investment decision-making. Utility investments tend to be very long-lived. As such, the values of the investments are very vulnerable to changes in the rules. Consequently, the utility will have to incur extra costs to protect itself from governmental errors. Clearly, there are going to be more than the usual number of errors because the federal government is under no obligation to rectify its mistakes.

Special Reserves for Special Constituents

A completely neutral allocation of allowances to a power plant in, say, phase II would be the product of 1.2 pounds of allowable SO_2 and the millions of Btus of fuel that the plant burned in 1985. The sum of these allowance assignments over all 2,456 power plants would be 8.9 million, corresponding to the SO_2 emissions limit of 8.9 million tons.

It will probably not come as a surprise that the initial allocations are not a product of this simple formula. There are instead several "special reserves" of allowances that will be dispensed by the administrator of the EPA. The special reserves for phase I are:

3,500,000	burning coal with scrubbers
1,000,000	Kyger Creek, Ohio, Clifty Creek, Ind., Joppa Steam, Ill.
?	early reductions in emissions
300,000	conservation and qualified renewable energy
?	overreductions (less than 1.0 lb./mmBtu, more than a 60 percent reduction since 1980, and part of the system with an average less than 1.0 lb./mmBtu)
35,000	small diesel refiners
?	a plant in Wisconsin
2.8 percent	independent power producers, direct sales, auctions, and the remainder at the administrator's discretion.

The special reserves in phase II are:

300,000/yr.	conservation and qualified renewable energy
530,000/yr.	EPA's bonus allowance fund
50,000/yr.	to ten midwestern states
7,000/yr.	to a utility serving a city plus a contiguous county
2,000/yr.	to a state authority serving a city plus a contiguous county
40,000/yr.	to plants in Florida
5,000/yr.	to a mystery utility
?	to municipals with low emissions
125,000/yr.	to plants emitting less than .8 lb./mmBtu
2.8 percent	independent power producers, direct sales, auctions, and the remainder at the administrator's discretion.

Some might argue that the sum of these special reserves is small relative to the total number of allowances. Therefore, any distortion would be correspondingly small. Such claims are hauntingly similar to those of central bankers who have in the past insisted that just a little bit of inflation does not hurt. Of course, what develops after the initial debasement is an even larger subsequent skewing.

An important precedent was set in the phase I list with the extra allowances reportedly given to one of the Wisconsin utilities. Because of the complicated calculations involved in the initial allocation for each power plant, it is difficult to identify the granting of undeserved extra allowances.

The phase II list has yet to be completed. Thus, it should not be surprising if the EPA follows the lead of Congress and dispenses some favors of its own, particularly since the new list is not subject to judicial review.

The reality is that no one knows the extent to which small distortions in phase I will develop into large distortions in phase II. As a consequence, electric utilities are well advised to behave defensively, especially when it comes to making long-term investments in reducing emissions of SO_2. Another strategy for a risk-averse utility is simply not to trade emissions allowances with other utilities. Then the favored recipients from special reserves will not be able to monetize their extra allowances.

It is not clear that Congress understood the consequences of putting special favors in the emissions trading system where participation is voluntary. If a utility wants to avoid subsidizing the recipients of the extra allowances, it always has the option of actually reducing emissions. In that case the extra allowances are not converted into cash, and the whole system becomes more neutral with respect to the technology or choice used to achieve the SO_2 emissions reduction. What also happens is that fewer congressional favors are bestowed.

The Bias for High-Sulfur Coal with Scrubbers

As we have seen, there is a definite bias in the allowance trading system that favors the continued use of high-sulfur coal with flue gas scrubbers. There are additional biases in the command-and-control portion of the act.

Utilities that are chosen for the "qualifying phase I technology" program get an extra two years to meet the requirements to limit emissions. There is also an extension in phase II. Utilities selected for the "qualifying clean-coal technology" receive a four-year extension in meeting the requirements to limit emissions. Those are significant extensions and tend to lock utilities into burning high-sulfur coal. With little time to make the long-term investment decisions before the start of phase I in January 1995, those extensions might trap a utility that procrastinates.

A further incentive is the promise of a direct subsidy for the clean-coal technology. The act allows up to $2.5 billion "for commercial demonstration of clean-coal technology." One might ask, "Goodness, where did such a powerful incentive for burning high-sulfur coal come from?" Mae West contributed the answer long ago: "Goodness had nothing to do with it."

The fact that the Clean Air Act specifies the amount of the subsidy does not necessarily mean that it is assured. The funds will still have to be appropriated in separate legislation. If the pressure to reduce the federal deficit continues, two arguments could be made for eliminating the funding for clean-coal technology: the deficit would be reduced by as much as $2.5 billion, and the technical neutrality of the SO_2 emissions reduction program would be improved. Thus, it is not clear that the subsidy for clean-coal technology is sufficiently certain to encourage utilities to commit themselves for phase II.

The Geographical Distortion

There are inherent defects in the environmental aspects of the SO_2 emissions trading system. Even if there were no problems with property rights and no political favoritism, the national nature of the trading system is a fatal flaw. Unlike the "bubble concept" that restricts emissions trading within a particular air basin, the SO_2 allowance system does not localize the effects. Thus, the pollution externality would not be internalized, even if the system were to work as intended.

First, the trading system does not differentiate between reducing emissions in densely populated urban areas and reducing emissions in sparsely populated rural areas. Moreover, reducing emissions downwind from the prevailing currents is just as good as reducing emissions upwind from large population centers and a lot of economic activity.

The incentives in the trading system do not encourage emissions reductions where the demand for that activity is greater. They encourage emissions reductions where the costs are less. There is no reason to believe that high demand and low cost occur in the same locality. A decidedly more plausible condition is that the demand for improved air quality is highest precisely where the costs are also highest. Otherwise, the improvement would have long since taken place.

The second geographical distortion has to do with the way that the system is intended to work. Some utilities will supposedly overreduce their emissions and sell the extra allowances to other utilities that do not reduce their emissions to the target level. It can be safely assumed that a utility will not buy allowances unless it can pass on the cost to its ratepayers. The result, then, is that customers of

such a utility will be paying higher rates, but not getting a corresponding improvement in air quality. Incredible as it may sound, a new environmental externality is actually created when the emissions trading system operates precisely as intended.

Risk-Reward Symmetry for Allowance Costs and Revenues

The EPA recognized very early that the state public utility commissions would have an important effect on SO_2 emissions trading. One of the issues that has been raised relates to the treatment of the costs and the revenues that might emerge from the purchase or sale of allowances.

At a conference sponsored by the Illinois Commerce Commission in April 1991, two views were presented. One, presented by the Citizens' Utility Board, is that part or all of the costs from purchasing allowances should be borne by the utility, its shareholders, or both. Another view was expressed by Phillip R. O'Connor, the former chairman of the Illinois Commerce Commission and currently chairman of the subcommittee that is advising the EPA on how to establish the emissions trading system. O'Connor's recommendation is that there should be symmetry in the assignment of the risks and the rewards of allowance trading. That is, the costs and revenues should be apportioned as a package to either the utility or the ratepayers.

A third view, universally renounced at the conference, was that the costs should be assigned to the ratepayers and the revenues should be retained by the utility. Ironically, this third view may be the only way that the system could operate, although symmetry sounds like a more plausible arrangement.

Consider the following decision matrix:

	Utility	Ratepayer
Costs:	No Trades	Trading Possible
Revenues:	Trading Possible	No Trades

If a public utility commission were to insist that the utility itself bear the costs of allowance purchases, then the company would choose instead to invest in the actual equipment or to switch fuel to comply with the emissions target. The reason, of course, is that the real costs of complying with environmental regulations can always be imposed on the ratepayers. Consequently, allowances will only be purchased if the utility can pass on the costs.

Now look at the revenues from selling allowances. If the regulatory commission requires the utility to pass on to customers the revenues from selling allowances, then the utility will not sell the allowances. It will keep them for future use or not earn them in the first place.

Therefore, for trading to occur, the selling utility would keep the revenues and the buying utility would put the cost of allowances in the rates that it charged its customers. For all utilities to have the choice of being either a buyer or a seller the arrangement would have to be universally asymmetric. Needless to say, the political obstacles to such a policy are formidable.

It is possible that if the public utility commission knew which utility would likely be a buyer and which a seller, then the commission could fashion the appropriate arrangement in its jurisdiction. But a public utility commission is unlikely to have the detailed engineering and economic knowledge to pick the right policy (and change it when appropriate). Moreover, it is not clear that all utilities in a particular state would fall into the same category.

After a more careful examination, it is clear that the simple prescription of symmetry in the treatment of costs and revenues from allowance trading is a flawed policy. While it seems reasonable to assign both the risks and the rewards from trading to the utility decisionmaker, such a rule will retard rather than facilitate trading.

The Cap on Total SO_2 Emissions in Year 2000

The clincher argument for little or no trading is associated with the act's absolute cap on total U.S. emissions of 8.9 million tons of sulfur beginning in the year 2000. That translates into an emission rate of 1.2 pounds per million Btus of fuel used to generate electricity. Achieving that is possible for power plants using high-sulfur coal with 85 percent efficient flue gas scrubbers, but just barely. If a utility expects growth in future demand, then it will not sell allowances. It will retain them instead as insurance. The consequence of not providing for a margin of safety is a fine of $2,000 per ton of extra emissions and the requirement to make up the reductions in future years.

Conclusion

Notwithstanding the assertion that the SO_2 emission trading system is market-based, it actually fails the crucial test for any functioning market. Allowances are not property rights, and the data that will be used to assign the initial endowments are

not subject to judicial review. The absolute cap on emissions starting in the year 2000 will also deter the trading of allowances. Instead of selling allowances, electric utilities will tend to bank their extra allowances to meet future demand growth in their service areas. Moreover, the 1990 Clean Air Act amendments bestow extra allowances on preferred constituents, some of whom are unknown at this time. The indications thus far are that the government intends to bias the investment decisions in favor of burning high-sulfur coal and using stack gas scrubbers. The distortion for high-sulfur coal includes extra allowances, compliance time extensions, and direct subsidies, which are yet to be fully appropriated. As if this were not enough, the likely contribution by the state utility commissions—assigning both the risks and rewards of emissions trading to the utilities—will further inhibit the emergence of the allowance market.

Therefore, the typically risk-averse electric utility will take on an extraordinary amount of uncertainty in its investment decisionmaking if it intends to participate in the emissions trading program. If the utility chooses instead to meet the SO_2 emissions limits without emissions trading, then there will be less uncertainty and more neutrality in the choice of technology and fuel. There is an interesting bit of irony here. The command-and-control part of the Clean Air Act amendments produces better results than the "market-based" system.

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Timely Accounting and Budgeting for Deposit-Insurance Losses

In the Watergate scandal the public sought the answer to two key questions: What did the president know and when did he know it? In the deposit insurance mess the parallel concerns are: How much have the federal insurance funds lost and when did they lose it? In both cases the ultimate issue for taxpayers is to determine which public officials they should blame both for distressing breaches of the public trust and for subsequent acts of coverup.

Perverse Incentives in Deposit Insurance Accounting

An institution is economically insolvent when, without an implicit or explicit contribution from outside sources, it can no longer cover its obligations as they accrue or become due. Whether an insurance fund is insolvent is determined by the algebraic sign of the fund's net reserve position—whether the difference between the value of the insurer's implicit and explicit corporate reserves and the expected value of insured parties' current and future claims for payment from these resources is positive or negative.

Public debate about the time path of deposit insurance finances is polluted by the misleading accounting system federal authorities have used to measure each fund's income, expenditures, liabilities, and net reserves. This system accounts and budgets explicitly for cash flows as they occur, not as the obligations are accrued. The opportunity to delay obligating funds to cover accruing losses gives officials discretion to report the value of accumulating financial commitments inaccurately and to leave the value of unackowledged contingent liabilities unfunded until specific payments actually need to be made. Because the obligations of each deposit insurer are backed by the full faith and credit of the U.S. Treasury, these unfunded (or off-budget) obligations are financed implicitly by federal taxpayers.

Letting deposit insurance managers delay for long periods of time the accounting recognition of economic costs that their enterprise is currently accruing is poor public policy. As I pointed out in *The S&L Insurance Mess*, such a policy avoids timely accountability for policy mistakes and compounds the financial obligations that accumulating deposit-institution weakness ultimately transfers to federal taxpayers. A rosy picture of fund finances aggravates system losses because it stifles pressure that taxpayers would otherwise exert on regulators to force decapitalized "zombie" institutions to resolve incipient insolvencies promptly. Moreover, such a picture helps lobbyists for insured institutions sidetrack various structural reforms that would shift the burden for financing accumulating fund losses back onto the industry.

Methods Used to Mask the Deterioration of FSLIC and BIF

Until the size of the roughly $180 billion insolvency of the Federal Savings and Loan Insurance Corporation (FSLIC) began to be acknowledged in 1988

and 1989, FSLIC's capital shortage was disguised by massively underreserving for its anticipatable losses and pretending that its visible funding imbalance was only a temporary one. Until very late in the 1980s, thrift industry spokespersons proudly proclaimed that taxpayers had yet to "lose a nickel" in the federal deposit insurance system.

Today, FDIC officials and bankers are offering similarly exaggerated claims of taxpayer safe harbor from unpaid damages accumulating in the counterpart insurance fund for banks that is operated by the Federal Deposit Insurance Corporation (FDIC). Although my own analysis as well as Office of Management and Budget efforts suggest that at year end 1990 the Bank Insurance Fund was at least $40 billion under water, the FDIC accounting system initially assigned the Bank Insurance Fund a positive $8.4 billion in net reserves. In its audit of the FDIC for that date, the General Accounting Office opined that the fund's reported net-reserve position was overstated, but only by about $4 billion.

In an August 5, 1991, letter a prominent banker pointedly stated the prototypical industry perspective on the Bank Insurance Fund's condition. He admonished the editor of the *American Banker* that, "of all publications," his newspaper "should be acutely aware that the BNE 'debacle' [i.e., the Bank Insurance Fund's estimated $2.5 billion loss in the Bank of New England], like all failures of FDIC-insured banks, was financed not by taxpayers but out of the assessments paid by all insured banks. Taxpayers have not had to shoulder the burden. Most bankers want it to remain that way."

The banker's argument wove a chain of partial accounting truths into a gigantic economic falsehood. Yes, BNE and other Bank Insurance Fund cash-flow losses have so far been charged *formally* against assessments that banks previously paid into the fund. Yes, taxpayers have not yet *explicitly* been asked to recapitalize the fund. Yes, bank lobbyists have worked hard with Congress and the Treasury to prevent the Bank Insurance Fund from making *direct* use of taxpayer resources.

Nevertheless, to clarify the economic untruth lurking behind the accounting smoke screen, we have only to view taxpayers as having given the FDIC an unlimited right to put its expenditures on a credit card for whose use taxpayers remain responsible. Putting losses on this card allows the FDIC to conserve its cash and thereby to meet a technical condition of cash-flow solvency. The extent of the credit support taxpayers are providing the FDIC remains unknown to them because the FDIC is free to account for its contingent liabilities as incompletely as its managers can persuade the General Accounting Office to accept. As long as the FDIC is not made to show taxpayers more than a few of its outstanding credit slips and creditors of troubled banks do not demand that the Bank Insurance Fund's accumulating bill be paid, taxpayers need not actually be asked to cough up any cash.

Accounting for Accountability

The missing ingredient in the largely palliative financial reform bills that wended their way through Congress in 1991 is the requirement that elected and appointed officials be more accountable for deposit insurance losses as they accrue. Cash budgeting for deposit insurance has proven to be a recipe for disaster. By suppressing timely warnings of fund weakness, this information and budgeting system rationalized the repeated acts of regulatory gambling that fed the burgeoning FSLIC debacle. In recognition of that, the Omnibus Budget Reconciliation Act of 1990 required the Office of Management and Budget (OMB) and the Congressional Budget Office (CBO) each to study options for improving the accounting and budgeting for federal deposit insurance programs.

In reaffirming the essential adequacy of the current reporting and budgeting system, past FDIC and FSLIC studies of those options have been colored by bureaucratic and managerial self-interest. The CBO and OMB reports, which represent the first *official* documents to analyze the information problem wholly from the taxpayer's point of view, convincingly demonstrate that better ways to estimate deposit insurance costs are available. Those reports importantly shift and enrich the deposit insurance debate. They frankly acknowledge the role of public-service incentive defects in the growth of the deposit insurance mess. In particular, the OMB report bluntly characterizes the bill taxpayers are getting for deposit insurance today as largely the cost of past forbearance.

Most important, the two reports courageously put the weight of the OMB and the CBO behind the industry-opposed and regulator-denigrated "academic" view that we *can* measure the extent to which a taxpayer-backed deposit insurance fund cannot reasonably finance itself from premium income and that we *can* feed such measures into a system of budget constraint to provide effective cost control. In this respect the two studies are highly complementary. As shown in Table 1, both analyze

Table 1: Net Outlays for Federal Deposit Insurance, 1977–1996 (in millions of dollars)*

Year	Banks	Thrifts	Credit Unions	Total
		Actual		
1977	−852	−424	−19	−1,295
1978	−567	−404	−14	−985
1979	−1,218	−489	−26	−1,733
1980	−922	553	−11	−380
1981	−1,726	373	−21	−1,374
1982	−1,440	−591	−40	−2,071
1983	−613	−452	−80	−1,145
1984	−248	−562	−34	−844
1985	−1,942	614	−815	−2,143
1986	705	1,060	−248	1,517
1987	−1,438	4,767	−198	3,131
1988	2,146	8,084	−222	10,008
1989	2,846	19,237	−43	22,041
1990	6,429	51,847	−44	58,232
		Projected		
1991	12,600	102,800	−100	115,300
1992	4,100	93,300	−120	97,280
1993	−2,300	49,700	−75	47,325
1994	−3,600	28,200	−50	24,550
1995	−4,100	−42,800	−50	−46,950
1996	−5,900	−36,800	−50	−42,750

*Includes outlays for the Bank Insurance Fund, the Savings Association Insurance Fund, the National Credit Union Share Insurance Fund, the Resolution Trust Corporation (RTC), and the Federal Savings and Loan Insurance Corporation Resolution Fund. The tabulation does not count the funds provided by the Resolution Funding Corporation and the Financing Corporation to the RTC and FSLIC, respectively, as offsetting collections.

Source: Congressional Budget Office using data from the Office of Management and Budget. Figures for 1991 through 1996 are CBO projections. Budget data indicate that corresponding OMB projections for net Bank Insurance Fund outlays in 1991 through 1996 are, respectively: 15,881; 9,731; 8,002; 6,881; 941; 588.

estimates of projected net cash outlays for deposit insurance over the recent past and near future. Each discusses the pros and cons of better ways of incorporating this information into the federal budgetary process. They also describe ways in which bank call reports could be improved and reinsurance markets could be used to develop more meaningful cost data.

The two reports agree about the advantages and disadvantages of integrating accrual accounting information into the federal budgeting process. The principal advantage lies in creating a dependable early-warning system. If accrual costs are incorporated fully into the primary budget, authorities would be forced to finance explicitly the extent to which premium income and other additions to reserves fail to render each deposit insurance fund self-sustaining. The principal difficulties are technical and political: the problem of establishing the reliability of particular ways of estimating a fund's net reserve position. Those technical issues are addressed and resolved in the OMB report.

The CBO Report

The CBO report, *Budgetary Treatment of Deposit Insurance: A Framework for Reform,* may be described as a treatise in applied budgeting theory. The report carefully reviews the advantages and difficulties of adopting each of a series of bureaucratically more restrictive budgeting mechanisms for acknowledging and funding accruing deposit insurance costs.

Neither report explicitly mentions the incentive conflicts a sitting Congress and president face in jettisoning the current system. Nevertheless, the recognition that elected politicians value the option of shifting responsibility for emerging problems to their successors' watch importantly shapes the logical flow of the CBO document. In emphasizing that every budgeting alternative is a potential improvement, the CBO report's authors raise "a series of questions that only the Congress—as policymaker—can answer."

Both reports call for accrual estimates of deposit insurance costs to be officially produced and publicized at least as "supplementary" budget information. Without trying to force Congress' hand, both build a logical case for going beyond this to plug the information into the federal budget in some formal way.

The OMB Report

The OMB report, *Budgeting for Federal Deposit Insurance,* begins by explicitly adopting an economist's definition of what constitutes the annual cost of deposit insurance: "Gross cost equals: (1) the present value (at year end or at closure during the year) of the resolution costs of firms with negative net worth at the end of the year or at closure, minus (2) the present value (at the beginning of the year) of resolution costs previously estimated for firms that had negative net worth at the beginning of the year. Net worth, as used here, is the net present value of all projected income and expenses. Note that this difference would include the resolution costs of firms that had positive net worth at the beginning of the year but that became insolvent

during the year—as well as the incremental costs for deeper insolvency for insolvent firms that continue operating. Both calculations of resolution costs would include a factor for additional loss of asset values in transfer of ownership and for carrying cost during resolution. Net cost equals gross cost less premiums paid during the year. Administrative costs not allocated to case resolutions would be recorded on a cash basis. The definition of gross costs is essentially the amount of premium that would have to be paid to cover the full incremental cost of providing insurance during the specified year. This parallels other definitions of Federal outlays. If this measure were substituted for cash disbursements as the measure of deposit insurance outlays, as has been done for loan guarantees, costs would be 'recognized' much sooner than under the current definition of outlays."

The distinguishing feature of the report lies in carefully developing illustrative calculations of that cost for the Bank Insurance Fund and FSLIC. OMB calculations employ and compare estimates obtained from two alternative methods of measuring costs: discounting a fund's potential cash flows and applying option pricing techniques. The authors recommend that, beginning with the 1993 budget, accrued liabilities should be acknowledged in the budget document and recorded in condition reports filed by each deposit insurance fund. They further recommend that the reliability of each set of estimates be improved to prepare for the possibility of integrating such cost figures into the budget process in "two or three years." They emphasize that in the interim resources ought to be allocated to refining both estimation models and adapting bank call reports to produce more detailed information on the maturity and yield structures of bank assets and liabilities.

A Summary Perspective: The Uselessness of Blind Watchdogs

Watchdog institutions cannot adequately monitor government efforts to manage obligations whose value is not itself appropriately measured. The smoke and mirrors of deposit insurance accounting kept the press from reporting deposit insurance losses until long after the red ink had been spilled and given taxpayer balance sheets a good soaking. Even now, news reports on the evolving mess remain misfocused. Sporadic threats of concentrated loss to the depositors and stockholders of individual deposit institutions are treated as a more important story than the continual threat of diffuse loss that taxpayers face. Similarly, the press failed to identify the critical flaw in the Bush administration's 1991 deposit insurance reform bill, which is that it preserves regulatory options to cover up and forbear that have been consistently misused in the past. Although each twist and turn that overrated bill encountered in Congress was headline financial news, the implications of CBO and OMB espousals of vital accounting and budget reforms have received virtually no media attention at all.

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The Search for Affordable Housing

A special housing panel report released last summer, *Not in My Back Yard: Removing Barriers to Affordable Housing,* could prompt fundamental changes in the way America builds cities if the federal government acts on the thirty-one recommendations contained therein.

Not in My Back Yard, or the NIMBY report, summarizes the work of the Affordable Housing Commission. The commission was charged with assessing federal, state, and local regulations governing construction and rehabilitation. Its resulting report recommends ways to reduce the barriers to affordable housing raised by those regulations. Accordingly, the report of the commission spotlights issues that have not before taken center stage in the national political debates concerning housing: exclusionary zoning, excessive building codes, rent control, and even federal provisions such as environmental regulations and the Davis-Bacon Act. The report cites evidence that the cost of new housing may be increased by as much as 20 to 35 percent in some areas as a result of excessive regulation.

Although written by an independent panel, the report reflects the personality of Housing and Urban Development Secretary Jack Kemp. It argues idealistically on the side of those who are priced out of the housing market. At the same time, the report avoids the temptation to offer a one-size-fits-all federal solution. Rather it seeks to address a national problem through remedies at the state and local levels and through regulatory relief, not federal spending.

The commission does seek to "jump start" the state and local review of housing regulations, however. In one of its most controversial recommendations, the NIMBY report evokes the activism of groups that once called for HUD to cut off monies from cities that fail to enforce fair housing policies. The commission suggests that HUD housing assistance should be conditioned on the existence of state and local initiatives to remove unnecessary barriers. Although the 1990 National Affordable Housing Act specifically forbids such actions, the NIMBY report recommends that Congress revise the statute to allow HUD to deny federal funds to cities that foster discriminatory land-use practices.

The report seems to have caught many housing policy organizations off guard. For example, Barry Zigas of the Low Income Housing Coalition reacted sarcastically to the initial release of the NIMBY report, saying that it might be of interest to realtors but would do nothing to help poor people. It is hard to believe that Zigas was aware at the time that the commission had recommended permanent extension of the low-income housing tax credit in exchange for legislative authority to compel cities to adopt strategies to remove barriers.

Such features of the NIMBY report clearly announce the interest of both Kemp and the Bush administration in striking compromises with housing advocacy groups. The NIMBY report signals the administration's willingness to allow budget increases for the sake of bringing about fundamental change.

Secretary Kemp's objective is to increase the attention paid to the role played by the complex web of local, state, and federal regulations that unnecessarily force up the cost of housing. He wants the dialogue on housing policy to encompass not just budgetary issues but the many other factors that affect the overall supply and distribution of housing.

If taken seriously, the NIMBY report and eventually the measures it proposes could make HUD a kind of Pied Piper for land-use and housing reform. Instead of being the federal agency that builds housing for the country (a dubious enterprise to be sure), HUD might be regarded as the place to look for leadership. In a country that gives its states broad latitude in regulating land use, wide variations in local policy can and do occur. And much policy is unfair, especially to low-income families.

Many of the NIMBY report's recommendations relate to the commission's seeming irritation with petty local requirements—the disconcerting trend

toward bureaucratization, even at the municipal level: more forms, more permits, more inspections, more waiting, higher housing costs. Other policies criticized by the report, such as rent control, are the product of misguided attempts to help the aged and infirm. Even many liberals who once defended rent control now understand that it actually undermines the housing stock, and policymakers in several cities are looking for ways to change rent control. The NIMBY report has some good ideas here, and it opens the door to more suggestions.

The report properly takes on excessive environmental rules, including the maze of overlapping local, state, and federal regulatory responsibilities and the often unnecessary delays caused by environmental impact statements. It also reflects the Bush administration's concern about the increasingly inclusive definition of wetlands. But to its credit, the NIMBY report does not take an ideological position in the wetlands debate. The commission identifies the costs of an expanding wetlands program and of increasingly aggressive enforcement of the Endangered Species Act in terms of lost housing opportunities. The report then suggests that ways should be found for developers to comply with national environmental policies without being forced to engage in excessive, time-consuming regulatory proceedings that drive up costs.

The component of the report that should stand

apart from the others in terms of moral and policy leadership, however, is its broadside against exclusionary land-use regulation. Commission member Anthony Downs of the Brookings Institution described the evils of exclusionary zoning over twenty years ago. According to Downs and others, overly restrictive land-use regulations are insidious tools of discrimination, dressed up as good planning. Here the commission takes on a force no less formidable than the vast and amorphous hypocrisy of the middle class.

Indeed, why is it that exclusionary zoning has never become a cause célèbre for compassionate, reform-minded liberals? The NIMBY report could have huge implications in this regard; it could become a rallying cry for one political party or a coup for bipartisanship. On one level the NIMBY report is aimed at those who pity the homeless and demand more federal spending on public housing but would not want a high-rise apartment building in their neighborhoods. On another level NIMBY is a straightforward appeal to all sides to question why it is becoming more difficult to realize the American dream.

The NIMBY report is strong on suggested responses to the many problems it identifies. Beyond legislative remedies, which depend on congressional action, it recommends practical measures, such as development of new model state land-use and building codes. It proposes experimentation. It envisions federal incentives for local innovation. It welcomes debate of issues and talks of the need for educating the public on matters that usually are brushed over as routine local planning decisions. It is refreshing to see a housing policy commission recommend less regulation rather than more.

Finally, the NIMBY report is bold enough to suggest that the federal government push for judicial review of state and local land-use rules that reduce the supply of affordable housing. The commission stops short of challenging *Village of Euclid* v. *Ambler Realty Co.*, the Supreme Court decision that authorized states to regulate land use through zoning. But then, why not? The NIMBY report's account of the case reveals that when the Court sanctioned zoning in 1926, the justices believed that segregating the community, at least by income groups if not by race, was a legitimate exercise of state police powers.

The NIMBY report suggests that cities should be urged or coerced to adopt codes that would make zoning a kinder and gentler process. But if zoning law is based on principles that we recognize today as patently discriminatory, should not its legitimacy at least be tested by modern legal standards?

This is a question that bedevils planners. In a recent article in *Planning*, Charles M. Haar and Jerold S. Kayden noted: "Suburban communities have employed zoning requirements to lock the doors on city residents. Too often, local ordinances still employ large lot and minimum floor space requirements as mechanisms for exclusion of low-income and minority families striving to leave the city, locate near job opportunities, and enjoy the good life." Haar and Kayden go on, however: "Zoning is here to stay, as firmly entrenched a part of the landscape as the buildings it regulates. In the final analysis, its future success or failure will depend not so much on modifications to the technique itself, but upon its application by those who write and administer its provisions, and the willingness of the public to oversee those officials."

Not all planning critics are so trusting of planners and the goodwill of suburban decisionmaking bodies. Norman Williams, Jr., author of the six-volume seminal work, *American Land Planning Law*, has been in the vanguard of those who view zoning as a fundamentally flawed concept. In one of his many critiques of zoning he wrote: "I am not referring to a change that will give everything a new label but keep the same tool. I am talking about a new set of controls. We are now quite clearly in a period of major transition, both in planning policy and in the law of land use, from which a new set of controls may develop."

The thought of life without zoning may seem like a return to the Dark Ages. But consider the work of Bernard Siegan and the experience of Houston, Texas, which until recently was the only major American city without a zoning ordinance. Siegan found that even without zoning, land-use patterns in Houston developed more or less the same way they do in cities with zoning. Commercial enterprises bid for space along the major thoroughfares and housing generally arranged itself on secondary streets. But unlike most cities, Houston permitted anomalies such as the corner grocery store, and the mixed uses often benefitted both the entrepreneur and the neighborhood.

Part of the intellectual underpinning of urban planning itself has been that land uses must be neatly separated by zoning to promote harmony. To do otherwise would be to invite confusion. Professional planners, in short, are wed to zoning just as astrologers are wed to stargazing. Today, however, even planners understand that an intermingling of land uses can be part of the vitality

of cities and will not lead to their ruin. That is why cities now have more sophisticated zoning techniques, such as the "planned unit development," which permits combinations of commercial and residential uses—provided they have the benediction of a planner.

In a way urban development has come full circle. But determination of how property is used now is in the hands of a political bureaucracy rather than the marketplace. The losers in this process are those who lack the resources or guile to master the regulatory maze created by modern planning and zoning.

Anyone who buys property and hopes to alter its use is considered, almost by definition, to be in violation of a land-use plan. No matter how benign the change or how constructive the use, an owner is likely to run into a series of time-consuming and costly technicalities. And even when those hurdles have been cleared, the process may yet hold the owner up to neighborhood-level scrutiny. He may need to justify any proposed changes to a local board that worries about totally subjective matters.

Zoning and the related array of subdivision regulations have become a system that in every way assumes the newcomer to be an intruder. And when the intruder is a developer, any decision to exclude can be justified as an action needed to protect the community from the forces of greed. Whether through amendments to state and local codes or through yet unidentified new policies, the guilty-until-proven-innocent approach to planning should be reversed.

Without coming out and saying it, the NIMBY report yearns for a return to the time when people worked out those matters among themselves without the need for an adversarial process. It was a mode of community building that served America well through most of its history. Given a measure of old-fashioned tolerance, it is possible to protect neighbors against true externalities (such as storm-water runoff) resulting from development, while giving the individual the right to do more or less what he wants with his own land. It is not always possible to assure one set of homeowners ever-appreciating property values without putting up a barrier to others.

The Bush administration should use the good start offered by the NIMBY report as a springboard for a long-term and even more ambitious campaign to make housing more accessible to Americans. The goal should be to identify new approaches to development that let the free market do more of the work of sorting out land uses and housing opportunities.

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American Association of Enterprise Zones

The Greening of the First Amendment

Arguing that "as more and more manufacturers turn to environmental claims to market their products, the need for federal standards to control and regulate these claims is more important than ever," eleven state attorneys general, dozens of environmental lobbies, and a coalition of business groups are urging the Federal Trade Commission to restrict the rights of manufacturers to publicize the environmental impact of their products and packaging.

The first question to be asked is why? The mere fact that information is being disseminated does not justify regulating the content of that information.

Aware that public surveys indicate that consumers are increasingly motivated by environmental concerns in their buying decisions, businesses have acted to present their products as environmentally friendly whenever possible. That is not necessarily an alarming development. If businesses believe that there exists a true demand for "green" products, businesses will produce them.

A second dynamic is political. Environmental advocacy groups have targeted a number of products, materials, and packages as environmentally harmful and have campaigned to have them banned from the marketplace. In fact, thirty-seven states had, as of January 1991, prohibited the sale of certain products or packages for environmental reasons. In response, many businesses have used product labels and advertising to educate the public about their products' environmental impact.

Consequently, the environmental debate has spilled over into the realm of consumer advertising. Under the guise of protecting the public from misleading information (as defined by political officials), twenty-two states have acted to regulate the use of certain environmental terms and phrases in private-sector advertising campaigns and labelling programs. Environmentalists would like to strengthen those regulations and make them universal. Even the business community would rather deal with one censor than with fifty. Thus,

the pressure on the FTC to act is intense.

It is important to keep in mind, however, that terms such as *misleading* and *deceptive* are deceptive. In a strict sense virtually all facts and data have the potential to mislead, and any statement can be misinterpreted. Thus, determining what is potentially misleading or deceptive is an arbitrary and uncertain exercise. A brief examination of one of the most significant environmental advertising cases brought against the business community indicates the difficulty of judging what is misleading.

In June 1989 in response to several years of intense consumer and legislative pressure, Mobil released a biodegradable version of its best-selling Hefty bag. Although Mobil had long opposed biodegradable plastic mandates and questioned the environmental desirability of biodegradable plastic, consumers' strong preference for biodegradable products led Mobil to produce a biodegradable bag to increase market share. In addition, when fourteen states mandated yard waste separation and composting, they created a growing market for biodegradable bags. Finally, the mandate by four states that *all* trash bags be biodegradable indicated to Mobil executives that nonbiodegradable plastic bags could be legislated out of existence.

Mobil's biodegradable plastic bag did biodegrade under the right set of circumstances—prolonged exposure to the elements—but it did not biodegrade in municipal solid waste landfills, where exposure to water, sunlight, and bacteria is intentionally minimized. Therefore, six state attorneys general filed suit against Mobil for misleading advertising and forced Mobil to remove all environmental claims from Hefty bag packaging.

Was the biodegradable label misleading? No. If one is to argue that nothing can be called biodegradable that does not biodegrade in a municipal solid waste landfill, then nothing on earth is biodegradable. The fact that a trash bag is otherwise biodegradable, however, is useful information for those who compost their yard waste. In fact, approximately 49 percent of the U.S. population is under *orders* to separate its yard waste from the rest of its trash. Moreover, attorneys general in Florida, Iowa, Nebraska, and South Dakota would find such information relevant, since Mobil's biodegradable bag met the standards of those states' laws, while many other garbage bags did not.

Mobil's claim of biodegradability was no more false than the claim of many paper manufacturers that their products are biodegradable, but those six state attorneys general made no attempt to prosecute the paper industry. They simply decided that consumers were not intelligent enough to make sensible use of Mobil's truthful information. Thus, they have limited the amount of potentially useful environmental information available to consumers.

It is also instructive to further examine some of the examples of allegedly misleading environmental advertising that various petitioners have asked the FTC to restrict and regulate.

Vague or Incomplete Claims. The more accurate, detailed, and qualified information is, the more helpful it is to consumers. But space often does not permit the extensive assessment of environmental issues that some would like to mandate as a precondition for advertising. Moreover, businesses must present material in a form that a shopper can quickly assimilate.

Counterbalancing the demand for brevity is the fact that advertisers are well aware that generalized claims are rarely effective. The more detailed a claim, the more likely consumers are to believe it and not dismiss the claim as mere puffery. Few are likely to be deceived by a completely unqualified claim that a product is environmentally friendly. Consumers are no more threatened by such a statement than they are by automobile advertisements that simply state that a car is "a good car at a good price."

Guidelines banning vague or incomplete claims are not only unnecessary; they are potentially harmful to consumers and environmental interest groups as well. For example, a number of environmental organizations sponsor various "green stamp" programs that, for a fee, affix a simple green seal to products and packages they deem environmentally superior. Sometimes those seals are merited, sometimes not. But the purpose of such programs is to provide an easily identified signal of ecological friendliness to the green shopper. There is nothing wrong with private organizations' endorsing various products or packages as environmentally friendly. In fact, one could argue that those organizations have a constitutional right to do so. Consumers can make their own judgments about the merits of those organizations' endorsements. But guidelines or regulation aimed at overly broad environmental representations would silence such programs and deprive the consumer of potentially useful information.

Misleading Factual Statements. Having discouraged businesses from making overly broad claims, the environmental lobby then turns its attention to

specific, truthful statements that might mislead the public. Eleven state attorneys general warn that asserting that a product "'contains no CFCs' may also mislead because the phrase 'no CFCs' may mean 'safe for the ozone' to many consumers." Thus, such a standard would discourage businessmen from making specific claims, no matter how truthful.

It is unclear how businesses are expected to resolve the conflicting demands of truth. If an aerosol spray can manufacturer eliminates the use of CFCs in the propellant and reduces the ozone-depleting potential of the product by 75 percent, he cannot use that fact to his advantage in the marketplace. He cannot state that the product is ozone friendly—an overly broad generalization not strictly true. Nor can he state that the product contains no CFCs since the propellant still has certain ozone-depleting chemicals, although in greatly reduced quantities. Only by a lengthy qualification can he say anything at all about his improved product, but an aerosol can may not have sufficient space for him to present his qualification so that it will be useful to the consumer. Thus, the manufacturer is likely to refrain from making any claim at all. Not only is he unfairly penalized, but consumers are materially affected since valuable information has been arbitrarily denied to them.

Prohibition of Life-Cycle Analysis. Eleven state attorneys general have proposed that the results of product life assessments not be used until uniform methods for conducting the assessments are developed and a general consensus is reached among government, business, environmental, and consumer groups on how such an environmental comparison can be advertised nondeceptively.

Scientific life-cycle analyses of products and packages have been a common business tool for examining the ultimate cost of using certain materials. Life-cycle analyses are, however, new to the policy arena, where they are being used to an unprecedented degree to examine and substantiate claims such as the one that paper is environmentally superior to plastic. Such studies are not always uncontroversial, however. A variable in any study is the methodology employed, and scientists often have different opinions about appropriate methodology. Moreover, there are inevitably disagreements about the assumptions scientists make.

An alarming precedent would be set by granting the federal government the authority to squelch the discussion of studies that do not follow the rigid methodological guidelines it has arbitrarily set. One can certainly question the assumption that the government could set guidelines that would be appropriate in every instance or that the government should attempt to mandate methodologies, given the obvious ramifications for free intellectual discourse.

Most important, however, is the not-so-hidden fact that virtually *every* life-cycle analysis undertaken recently has obliterated environmental "common wisdom" about disposable products, plastics, and other widely perceived ecological threats. For example, a recent report by Franklin Associates, a frequent contractor for the Environmental Protection Agency, found that, given current recycling and incineration rates, the manufacture and disposal of 128 ounce bleached paperboard milk containers consume 19 percent more energy, generate nearly twice as much air pollution, result in nearly four times as much water pollution, create four times as much industrial solid waste, but generate 15 percent less postconsumer solid waste (by volume) than do the manufacture and disposal of 128 ounce high-density polyethylene milk containers per 1,000 gallons. This study has yet to be challenged on any scientific basis, but it would be withheld from consumers if the FTC adopted proposed guidelines.

Is it merely a coincidence that environmental organizations and sympathetic attorneys general are attempting to restrict the dissemination of these life-cycle findings until they can control the assumptions and methodologies used to produce them? After all, if one can dictate the assumptions and methodologies of a study, one can often dictate the final result.

Claims of Recyclability. It is generally acknowledged that, although most materials are technically recyclable, not every consumer who purchases that material may have the opportunity to deposit it after use at a recycling collection facility. It is thus argued that consumers may be misled by labels promising recyclability.

Petititoners before the FTC argue that unless recycling opportunities for a given material are universal or nearly so, claiming that the material in question is recyclable should be discouraged or prohibited. Since only a few materials meet this "universal" test (aluminum, glass, and a few grades of paper), the petitioners urge extensive and nearly impossible qualifications upon the use of any claim of recyclability.

Not only are the consumer harms from unqualified claims of recyclability dubious, but the practical

effect of regulation will be to eliminate truthful information from the marketplace.

Safe Disposability Claims. Where the deception lies in such representations is unclear. There is ample scientific evidence that certain materials present no significant environmental risk when disposed of at certain types of facilities.

For example, plastic presents absolutely no threat to the environment in a landfill. Since it does not biodegrade, it does not contribute to leachate runoff or groundwater contamination. Likewise, because it does not biodegrade, it does not generate methane gas, a common landfill hazard. Nor does plastic present any health or environmental threat when it is incinerated, because plastic has a higher heating value, or Btu, than even Wyoming coal. Scientists and health experts have long known that the higher the "burn temperature" in an incinerator, the more pollutants are removed from air emissions. Thus, the more plastic in an incinerator, the less pollution that incinerator will emit.

It is therefore not misleading or deceptive to label plastic materials "safe for incineration" or "landfill safe." The existence of such labels is, however, inconvenient for the environmental lobby, for they undercut opposition to certain packaging materials.

Trivial or Irrelevant Claims. Consumers should be allowed to decide for themselves what is and what is not a trivial or irrelevant claim. Otherwise, the government is asked to decide what information is important enough to reach the public, a dangerous and constitutionally questionable proposition.

Consider the argument put before the FTC by eleven state attorneys general: "An example of a technically accurate but irrelevant claim is a polystyrene foam cup that claims to 'preserve our trees and forests.' It is simply irrelevant, and perhaps deceptive, to suggest that a product made of petroleum products, a scarce nonrenewable natural resource, provides an environmental benefit because it does not use trees, the natural renewable resource that would have been used if the cup had been made of paper instead of polystyrene."

What the attorneys general apparently fail to understand is that relevance is in the eye of the beholder. For example, a recent study by James Guillet of the University of Toronto concluded that a complete shift from plastic to paper would require "an additional 161 million acres of forest land devoted to paper production. To put this into perspective, this is the area of six U.S. states the size of Tennessee."

Furthermore, a recent study published in *Science* concluded that a paper cup consumes 28 percent more petroleum in its manufacture than a polystyrene cup, requires thirty-six times more chemicals to manufacture, consumes twelve times more steam, thirty-six times more electricity, and twice as much cooling water, generates 580 times more waste water, and emits three times more air pollutants. Why should manufacturers be prevented from communicating such information to consumers? How does the consumer benefit by remaining ignorant of such findings? On what basis do the attorneys general find that such reports are misleading? Unfortunately, government officials are often the least informed about the issues on which they make policy.

Disposable Products and Environmental Burdens. The attorneys general argue that "such claims convey an implicit message that disposal of a single-use item—perhaps the most environmentally distressing aspect of the product—does not contribute to the overall solid waste problem. These claims therefore run the risk of leading consumers to ignore or reject more durable alternatives to single-use products."

Of course, deciding what is an environmental burden is a subjective matter about which people may disagree, but on what basis do the attorneys general conclude that disposables contribute to the overall solid waste problem? According to William Rathje, director of the Garbage Project at the University of Arizona, fast-food packaging constitutes only one-tenth of 1 percent of the municipal solid waste stream. One could reasonably conclude that fast-food packaging "does not contribute to the overall solid waste problem."

In fact, a number of recent studies indicate that disposable packaging is responsible for a net reduction of the total waste stream because it eliminates food waste. After comparing the municipal solid waste stream in Mexico City with those of several American cities, Rathje found that although Americans discarded twice as much packaging as Mexicans, Mexicans discarded three times as much food waste as their American counterparts. Thus, there was a 33 percent net increase in the solid waste stream.

Rathje's findings are corroborated by studies conducted by Harvey Alter of the U.S. Chamber of Commerce, who has found that each pound of metal packaging eliminates 1.89 pounds of food waste. Each pound of plastic packaging decreases food

waste by 1.65 pounds. Likewise, each pound of paper packaging reduces food waste by 1.41 pounds.

Therefore, it is not misleading to claim that certain disposable packaging materials do not contribute to "the overall waste disposal problem." One could truthfully go further and argue that certain kinds of packaging help alleviate waste and label certain materials accordingly.

The attorneys general also explicitly presume that excess waste contributes to "the overall solid waste problem." But there is ample evidence that waste generation has nothing to do with "the overall solid waste problem." If the entirety of America's annual municipal solid waste stream were piled to a height of 100 yards (considerably less than that of the Fresh Kills landfill on Staten Island), only two-thirds of a square mile of landfill space would be required. One thousand years' worth of trash would require less than thirty square miles of landfill space. National landfill requirements could be further reduced by half were we to adopt Japanese methods of trash compaction.

There is ample reason to conclude that America's "overall solid waste problem" has more to do with a shortage of disposal capacity than with the rate at which we generate trash. Such representations are not self-evidently misleading or deceptive. Prohibiting businesses from making this point on product labels amounts to political censorship.

More important, FTC action restricting advertising would also serve to further erode the public's First Amendment right to free speech. Although the Supreme Court has maintained that the federal government has some vague right to regulate commercial speech (based, it must be pointed out, on absolutely no constitutional authority whatsoever), differentiating commercial from noncommercial speech is a very subjective process. Environmental advertising often has two objectives—to induce consumers to purchase the product and to counter political efforts to ban, restrict, or tax the product. For example, manufacturers of polystyrene food packaging argue in the political arena that their products do not contribute significantly to the solid waste stream and therefore should not be restricted or taxed. That same message is sometimes delivered directly to the public on a product's label. The FTC is asked to restrict the latter activity although the former activity, with much greater public consequence, is afforded protection. But the only difference between the two activities is the means by which the statement is delivered.

Efforts to regulate environmental advertising provide a convenient avenue for denying protection to parties who have something unpopular to say regarding the ecological issues facing America today. The FTC is best advised to continue monitoring environmental advertising on a case-by-case basis, with the caveat that the commission carefully restrict its regulatory activities to the realm of fraud as understood by common law jurisprudence.

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