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RESOURCES FOR THE FUTURE

WINTER 1996, NO. 122

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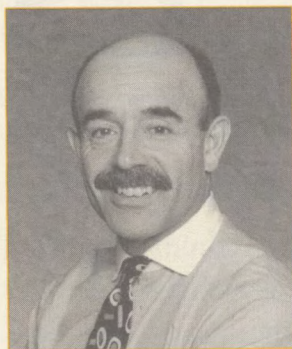
While debate about the methods and values of comparative risk analysis captures the nation's headlines concerning regulatory reform, practitioners at the state and local levels have been making the abstraction into a useful tool for democratic institutions. A former state director describes the states' experiments and identifies emergent benefits.

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"Car Talk"—the Clinton administration's vehicle for reducing greenhouse gas emissions from passenger cars and light-duty trucks—hit the wall amid charges and countercharges hurled by its frustrated participants. A careful post-mortem reveals lessons that can redeem the process for dealing with future public policy controversies.



From the president

Expanding the agenda

"So, what are you going to change?" I've found this to be the question most frequently asked the new president of any organization, and one appropriate for me to address it in this, my first message to readers of *Resources* as president of RFF.

My somewhat glib but not inaccurate answer to the question is, "Not too darned much." In virtually every respect, RFF is a healthy and happy place, and for that I owe a great debt of thanks to my predecessor, Bob Fri. Nevertheless, change at the top will inevitably mean new emphasis for certain lines of inquiry and new thoughts about communicating results. That will be the case at RFF.

RFF's agenda of research and policy analysis is sound. I believe, however, the time is right for RFF to expand its portfolio of work related to global climate change. The second major report of the influential Intergovernmental Panel on Climate Change, to be issued soon, will stimulate renewed interest in questions about the goals of climate policy as well as the most cost-effective way to meet those goals. RFF is one of the places to which people will look for answers, and we have a responsibility to provide them.

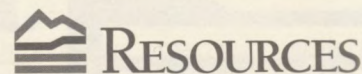
I would also like to see RFF do more work on variations in environmental and natural resource policies between countries, and the effects of these differences on such issues as trade and competitiveness, the location of manufacturing and resource extraction, and environmental quality. Such questions cannot help but become more important in an increasingly open world economy. Finally, I think it important that RFF expand its study of the natural resource "indus-

tries"—forestry, agriculture, energy, minerals and mining, fisheries, and the like—in the United States and abroad.

I also intend to give added emphasis to improving the way RFF communicates the results of its work. We are now distributing one-page summaries of the findings of RFF projects with immediate relevance to important policy problems. These "research briefs" are being enthusiastically received. Also, we now have a Journalist in Residence at RFF—John Anderson, who until his recent retirement wrote editorials for the *Washington Post* on energy, environmental, and economic topics. His contributions will help RFF to better communicate to non-technical audiences. Pay close attention to *Resources*, for it, too, will be changing in ways to improve its effectiveness as a communications vehicle.

Expanding RFF's efforts in the areas I have touched on requires financial support, and securing funding is, of course, a major responsibility of any president, new or old. For those readers of *Resources* who currently provide such support to RFF, please know how important your contributions are and how hard we work to stretch their effectiveness. If you enjoy *Resources* and appreciate the work of RFF but do not yet contribute, we'd very much like you to consider doing so. Your tax-deductible donations would help secure RFF's future and, not unimportantly, make the work of this new president much easier! Thank you very much.

Paul R. Portney



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Trading Emissions to Clean the Air: Exchanges Few but Savings Many

Dallas Burtraw

The allowance trading program for sulfur-dioxide (SO₂) emissions is a good example of a legislative initiative that is both an environmental and an economic success. As the centerpiece of Title IV of the 1990 amendments to the Clean Air Act, the allowance trading program is reducing annual emissions of SO₂ by nearly 50 percent and is doing so for about one-half to one-third of the cost that would have been incurred using the approach taken throughout the first twenty years of federal air pollution control.

At the same time, however, the volume of trading between utilities of SO₂ emission allowances is well below original expectations, with only about 2 to 3 million allowances traded in 1995, the first year of the program's first phase (one allowance equals one ton of SO₂).

How is it that the program has generated tremendous cost savings with few allowances changing hands? The major reason is, in a word, flexibility.

The new flexibility

The success of the SO₂ program comes as no surprise to many scholars. They predicted that the largest share of economic benefits from a trading program would come not from the trading of allowances per se, but from what economists call "dynamic efficiency"—innovation, competition, and discovery of new ways of compliance. Title IV freed electric power companies from the constraints of traditional regulations, which effectively spelled out exactly how a requirement was to be met, and instead gave the utili-

ties the flexibility to figure out for themselves how to achieve compliance.

Given the new flexibility, many firms have found ways to reduce the cost of controlling SO₂ emissions that do not rely either directly or very heavily on the allowance trading program. For instance, some utilities have switched entirely to

Many firms have found ways to reduce the cost of controlling SO₂ emissions without relying directly on the allowance trading program.

low-sulfur coal, whose price has fallen substantially over the last five years. Other power plants have begun blending coals with varying sulfur content in order to reduce average SO₂ emissions, something thought impractical just a few years ago. Deregulation of the railroad industry has also led to a steep drop in the cost of shipping low-sulfur coal from west to east.

The fact that few emission allowances have been traded may be seen as ironic as well as paradoxical, given the controversy that the program provoked at the time of its enactment. Many environmentalists opposed the program for authorizing (and implicitly endorsing) the sale of the right to pollute. But as groups such as the Environmental Defense Fund point out, traditional command-and-control regulations had been giving away the right to pollute for free. Federal air pollution regulations, for example, have allowed SO₂

emissions from electric utilities to grow along with increased production and as new plants are built.

Under the Title IV amendments, however, the utilities face the first cap ever on SO₂ emissions. In Phase I of the program (1995–2000) the nation's 110 dirtiest coal-fired electric power plants are required to reduce SO₂ emissions averaged across these facilities to about 2.5 pounds per million British thermal units (mmBTUs) of electricity generated. In a quid pro quo for the cap, the facilities receive annual allowances for emissions, which they can transfer to other plants within their own systems, sell to other utilities, or save for later use. In the absence of robust inter-utility trading, the program's cap on emissions operates like a performance standard applied to individual utilities.

Few trades, low prices

Just as the volume of trading is lower than what was expected at the time the Title IV program was enacted, so are the prices of allowances. As the table on page 4 indicates, before passage of the Clean Air Act amendments in 1990 estimates of marginal emission abatement costs were as high as \$1,500 per ton, which is the figure stipulated in the act for direct allowance sales by the U.S. Environmental Protection Agency (EPA). In debates surrounding the 1990 amendments, EPA cited estimates of marginal abatement costs about half as high, which became the bases for estimates of allowance prices. After passage of the amendments, estimates plummeted still further. In early 1995, the price of allowances traded privately was about \$170 per ton and fell to the low \$100s by year end. The marginal price of 1995 allowances in the EPA auction administered by the Chicago Board of Trade (CBOT) ranged from \$122 to \$140 per ton.

The fall in prices was a product of low demand relative to supply. But the new flexibility that the utilities are enjoying under Title IV and the array of low-cost

Marginal cost estimates and realizations for compliance options (dollars per ton).

Industry estimates pre-1989	EPA 1990 estimate	Early allowance trades	Current allowance trades	1993 CBOT allowance auction	1994 CBOT allowance auction	1995 CBOT allowance auction
\$1,500	\$750	\$250	Low \$100s	\$122	\$140	\$126

compliance options they have to choose from are not the only reasons the market is not more active. In trying to explain the low prices, the role that state public utility commissions (PUCs) play has to be considered.

Many of the rules that states have imposed on the utilities potentially inhibit allowance trading. Depending on what the rules say, allowances may look less attractive than other available cost-cutting strategies. What the rules say, for example, about the recovery costs of investments (such as the allowed rate of return, the depreciation rate, and the risk that expenses might not be passed on to ratepayers) often differs across compliance strategies and sometimes is designed to create preferences for one strategy over another.

Furthermore, what the rules say is not always enough to go on. Neither the Federal Energy Regulatory Commission nor the PUCs has provided adequate guidance about cost recovery rules yet. Uncertainty about what shape these regulations will take has contributed to the cautious reception allowance trading is receiving.

A related problem is explicit prohibition by legislatures on trades that might undermine local economic activity. Nearly every state with substantial Phase I compliance obligations has enacted rules or incentives to promote the use of local coal, for instance, by offering pre-approval for cost recovery of investments in scrubbers.

Not a perfect program

In trying to understand the program's few trades and low prices, many analysts also

have criticized EPA's annual auction of 2.8 percent of allowances, which began in 1993 to jump-start the market. As set out in the statute, the auction is a discriminating-price, sealed-bid one that provides bidders and sellers with strategic incentives to underbid their reservation prices. Critics say it is a poorly designed mechanism that generates prices below those emerging from trades between utilities.

Low allowance prices are best explained by the changing market fundamentals in coal and scrubber markets, rail transportation of coal, and equipment suppliers.

Still another reason for low prices is the extra 3.5 million allowances introduced in Phase I. The purpose of this provision in the 1990 amendments was to subsidize utilities that install scrubbers and thus cushion the blow to states producing high-sulfur coal. The effect has been to encourage scrubbing even if it is not really the least-cost option, as well as to increase the supply of allowances and depress the price.

The most important explanation for low allowance prices, however, has to do with changing market fundamentals in coal markets, rail transportation of coal, and equipment suppliers. In particular, falling prices in the coal and scrubber markets have had a profound effect on how the industry has complied with the

SO₂ emissions cap in Phase I of the program. In 1990 many analysts projected average prices for low-sulfur central Appalachian coal to reach \$40 per ton by 1995, but last year the price was less than \$25. According to the U.S. Government Accounting Office (GAO), scrubber prices fell by nearly half over this same period.

One explanation for this turn of events is the unanticipated degree to which markets have been drawn into direct competition. The result is a decline in prices below those forecast in every potential option for compliance.

Compliance options of choice

Using the freedom that Title IV gave them, electric utilities have met their clean air requirements in innovative ways. The process of fuel switching to and fuel blending with low-sulfur coal is the most widely used compliance option. The low cost of this strategy is one reason; that it is relatively noncapital-intensive in a period of general change in the industry is another.

Like fuel switching, fuel blending has lower capital costs associated with it than scrubbing. Experimentation prompted by Title IV has led to an improved understanding of the ability to blend coals with varying levels of sulfur contents. Detrimental effects of incompatible blending on plant equipment designed to operate using a particular type of coal are fewer than originally supposed.

Many observers of the development of the 1990 amendments foresaw bottlenecks in rail transport that would preclude western coal from playing a big role in the compliance plans of eastern utilities. Thus, forecasts hinged on prices for low-sulfur Appalachian coal locally available to eastern utilities. But these bottlenecks have failed to materialize.

One reason rail has responded so enthusiastically to the potential new markets for low-sulfur coal created by Title IV is that rail itself was deregulated under the Staggers Act of 1980. Lines moving low-sulfur coal out of the Powder River

Basin in northeast Wyoming and southeast Montana are now the busiest in the world. Indeed the experience of the deregulated railroads may foreshadow the experience to come of utilities subject to the Clean Air Act, which follows a pattern of regulatory reform that has also touched telephones, airlines, and natural gas over the last two decades.

Title IV has also inspired a reduction in costs within the scrubber industry to stay competitive. For the first time, an incentive exists to improve the efficiency of scrubbers, since each ton of SO₂ saved is one allowance earned. New scrubbers exhibit increased efficiency and reliability. Improvements in scrubber design and use of materials have reduced maintenance costs and increased utilization rates.

Title IV "star" is still in the wings

Inter-utility allowance trading—the aspect of the Title IV program that observers anticipated would be the leading star—thus far has been the option least commonly used. Illinois Power is the only utility to rely heavily on allowances for Phase I compliance. Only Carolina Power and Light and Georgia Power seem likely to do so in Phase II.

Even in the absence of extensive trading, however, allowances are proving useful. For example, utilities are saving millions by not having to purchase spare scrubber modules for use during maintenance periods and outages; they are relying on allowances instead. Similarly, utilities are able to delay capital investments in scrubbers by relying on allowances. This is particularly useful at a time when many utilities are reluctant to make new investments until more is known about the direction that the regulation of the electricity industry is likely to take.

In the face of uncertainty surrounding compliance strategies, performance standards alone may be inadequate to stimulate innovation because utilities may be unwilling to experiment if failure has a high cost. The allowance offers a conve-

SO₂ Program Saves Billions—and Could Save a Billion More

The table below presents two sets of estimates of the relative annual costs associated with three different scenarios for implementing the sulfur-dioxide emission reduction goals of the Clean Air Act: a command-and-control approach, limited allowance transfers within firms, and active allowance trading across firms. EPA produced the first set of estimates, which were used by Congress to develop the program as a key provision of Title IV. GAO produced the second set, which summarizes what has happened since Title IV took effect.

Projected annual costs under alternative implementations for 2001 (in billions of dollars).

	Command-and-control baseline	Constrained trading (internal transfers)	Flexible interutility trading
EPA (1989)	—	\$3.3–\$4.7	\$2.7–\$4.0
GAO (1994)	\$4.3	\$2.5	\$1.4

Sources: U.S. Environmental Protection Agency. 1989. "Economic Analysis of Title IV (Acid Rain Provisions) of the Administration's Proposed Clean Air Act Amendments," prepared by ICF Resources Incorporated, Washington, D.C.

U.S. Government Accounting Office. 1994. "Air Pollution: Allowance Trading Offers an Opportunity to Reduce Emissions at Less Cost," GAO/RCED-95-30, Washington, D.C.

Three important points emerge from the data in the table. First, GAO estimates that, by the beginning of Phase II, costs resulting from limited allowance transfers within a company—the implementation scenario we have observed to date—will be almost 40 percent less than under a command-and-control baseline. The baseline that GAO used was an emission rate applied to each facility, which yielded lower estimates than specific technology requirements would and thus yields a conservative estimate of these cost savings.

The second point emerges in the comparison between estimates for each category of implementation scenario. EPA estimates are relatively low compared with the other projections made before passage of the Clean Air Act amendments in 1990. In part, this is because ICF Resources, which conducted the analysis for EPA, maintains a sophisticated coal market model, and correctly anticipated that low-sulfur coal would play the prominent role in compliance at least through Phase I of the program.

Nonetheless, even under the most optimistic implementation scenario of active trading, EPA's lower bound for the cost of the program was \$2.7 billion per year in 2001. In contrast, GAO found that constrained trading conditions would yield a cost of \$2.5 billion, which is lower than the most optimistic projection made before the amendments were passed.

By way of comparison, a command-and-control program to reduce SO₂ emissions was estimated to cost as much as \$7 billion annually if every utility had been required to install scrubbers, or \$4.3 billion annually if uniform emission rates had been applied to individual power plants.

The third point evident in the table data is that sizable savings still remain available through an improved trading program. GAO estimates that potential savings total another billion dollars a year, which is more than 20 percent of baseline estimates.

nient value as insurance, even if it is not a primary compliance strategy in itself.

What the future holds

One question looms: will de facto performance standards that exist in the absence of active allowance trading remain sufficient to keep down the costs of controlling emissions? This uncertainty becomes especially pertinent with regard to Phase II of the Title IV program, which will take effect in 2000 and apply to all fossil fuel power plants greater than 25 megawatts in size. To add to the challenge in Phase II, utilities also will have to cut the total amount of averaged emissions to 1.2 pounds of SO₂ per mmBTUs.

Right now, the availability of low-priced, low-sulfur coal has allowed most utilities to comply with Phase I of Title IV relatively cost-effectively. Even without institutional obstacles to allowance trading, robust trading would not be expected when this low-cost option is commonly available. Obstacles to a more liquid allowance market are not too important in the short term. But that may change.

Whether low-sulfur coal will continue to provide a commonly available low-cost compliance strategy may be the crux issue. Current estimates show costs increasing over time as the result of an expected depletion of Appalachian low-sulfur coal and of allowances banked during Phase I.

If the supply does in fact dwindle, some utilities will turn to other options, such as the installation of scrubbers. Such a move will likely result in significant differences in marginal costs across companies. It is then that utilities may take a second giant step by moving beyond performance-based standards to broad-scale trading of emission allowances among themselves.

For that reason, flaws in how trading is currently implemented in Title IV and the obstacles to it created by state regulators should be addressed before Phase II is under way. Unless corrected, inadequate and parochial regulations that stymie

allowance trading will grow in importance, and Title IV may be much less successful than it has been to date.

Will allowance trading ever become the star that its fans expected it would become when the 1990 amendments to the Clean Air Act were being drafted? Projected annual costs using alternative compliance options indicate that significant cost savings may continue to accrue mainly from the flexibility afforded by Title IV. But that doesn't rule out the possibility of an active trading program

waiting in the wings. If utility regulators decide to improve the prospects for a more liquid allowance trading market, the savings will be all the more dramatic.

Dallas Burtraw is a fellow in the Quality of the Environment Division at Resources for the Future. This article is based on his RFF discussion paper 95-30, "Cost Savings Sans Allowance Trades? Evaluating the SO₂ Emission Trading Program to Date," which will appear in a forthcoming issue of Contemporary Economic Policy.

Comparative Risk and the States

Richard A. Minard Jr.

Since 1988, the lights have been blazing at those laboratories of democracy, the states, as comparative risk practitioners like me have tried to make the abstraction of "comparative risk" a useful tool for democratic institutions. Among the mistakes we've made has been staying too quiet about our successes and near-successes. As a result, the national debate about the methods and values of comparative risk analysis (CRA) has often appeared disconnected from the discipline as it is actually practiced today. To whatever degree early CRA at the U.S. Environmental Protection Agency (EPA) ever was, as some critics hold, undemocratic, contrary to the will of the people, antithetical to pollution prevention, or a mere propaganda tool, the states have made it otherwise.

In truth, the extensive comparative risk projects (see the map on page 8) of states, cities, and tribes have made CRA into many things. It is foremost a tool to compare a wide range of environmental problems and reach some understanding of their relative seriousness. Using that information, agencies, legislatures, and individuals can set better priorities for action and investment. Such a tool takes on increasing importance as states assume more and more responsibility for environmental management.

In short, CRA as a discipline is evolving as different levels of government adapt it to suit their needs. These adaptations generally are making the discipline more democratic, more inclusive, more closely tied to locally defined public values, more honest about its own limitations, and, hence, more likely to be productive. This article describes some of these developments, which were identified in a study I made in 1993 with Kenneth Jones and Christopher Paterson on state comparative risk projects while at the Northeast Center for Comparative Risk (NCCR) of the Vermont Law School.

EPA and the evolution of comparative risk projects

Analysts have been comparing activities on the basis of risks—particularly the risk of premature death—for decades, trying for much of that time to persuade the government to use the comparisons as the basis for setting priorities. However, the state comparative risk projects we studied have a common root in a similar project conducted by EPA in 1986. It was an analysis of the relative risks posed by thirty-one pollution sources over which EPA had jurisdiction,

and the results were published in February 1987 as a multivolume report, *Unfinished Business: A Comparative Assessment of Environmental Problems*. The report concluded that the problems posing the biggest risks to the nation (such as indoor air pollution and radon, global warming, ozone depletion) were generally not EPA budget priorities. Some weren't even explicitly part of EPA's statutory mandates. *Unfinished Business* is still talked about because it concluded what most subsequent comparative risk projects have concluded: the biggest remaining environmental risks tended to rank low in the public's ranking of risk, as revealed by opinion polls.

Senior EPA managers found *Unfinished Business* compelling enough to encourage its replication out of town. By 1988, comparative risk projects were under way in three EPA regional offices and in three states: Washington, Colorado, and Pennsylvania. Administrator William Reilly charged the agency's independent panel of experts, the Science Advisory Board (SAB), to peer review *Unfinished Business* and offer suggestions on how to respond to any issues it might raise. The result in 1990 was a report, *Reducing Risk: Setting Priorities and Strategies for Environmental Protection*. The SAB acknowledged many of the problems with the comparative risk method and *Unfinished Business*, but soundly endorsed CRA as a valuable guide for setting priorities. The SAB also encouraged EPA to use the method and concluded that EPA should target its environmental protection efforts based on the opportunities for the greatest risk reduction. Five years later, the National Academy of Public Administration would make a similar recommendation.

Particularly noteworthy to what would become state comparative risk projects was the SAB's emphasis that no amount of science could or should completely replace subjective judgment. Especially because of the subjective nature of ranking various types of health effects, the SAB recommended that lay people be involved in any CRA processes.

As will be described below, state CRA practitioners were quite receptive to this advice, and used it to expand the scope of comparative risk work.

Comparative risk projects: processes and priorities

The sponsors of comparative risk projects attempt to answer two fundamental questions: What are the most serious environmental problems here? How can we most effectively address them?

Most state and city officials who initiate a comparative risk project hope that answering these questions will improve their environmental management decisions. They also hope that the *process* of answering the questions will help them build the political momentum they might need to make changes in policies and priorities. Some officials specifically hope to use the *results* of the projects as tools to reshape their relationship with EPA; most seem to view the projects primarily as ways to reshape their own agencies and their relationships with their staff and the public. We at NCCR saw the projects as particularly effective ways to bring the public into agency deliberations and decisionmaking.

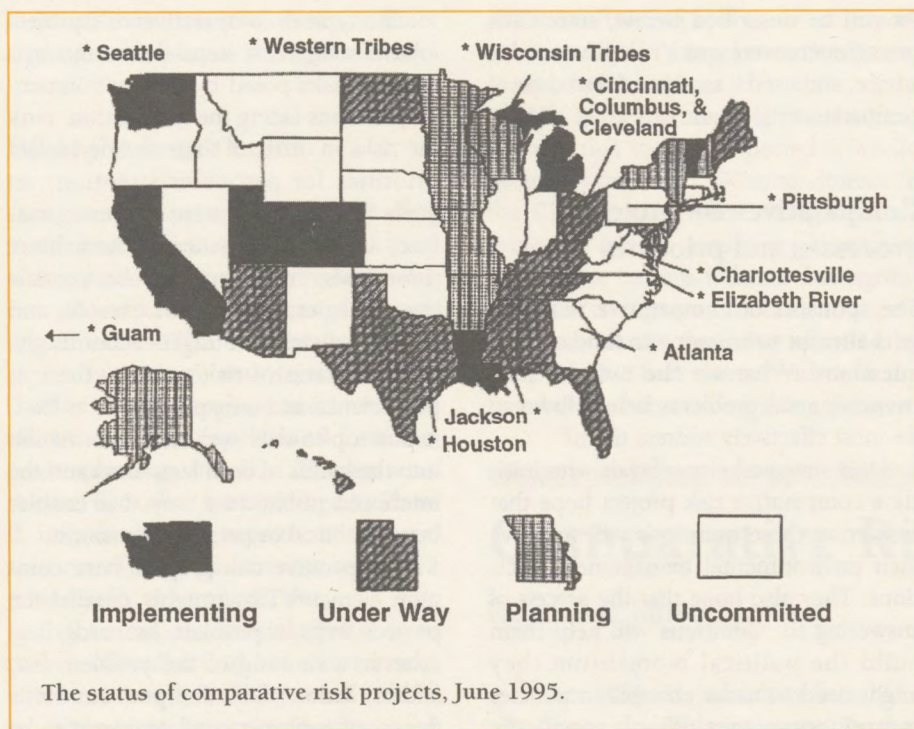
The comparative risk process is part science and part politics, giving current technical information to both legislators and the interested public to enable better decisionmaking.

Because of their breadth, CRAs are crude tools: they have to make sweeping generalizations about pollution levels and exposures, as well as about how people or ecosystems respond to those exposures. In this respect, the projects are like laws or regulations: as the size of the jurisdiction decreases, the fit improves.

The typical comparative risk project follows some basic steps: define and analyze the risks posed by the environmental problems facing the jurisdiction; rank the risks in order of their severity; select priorities for particular attention; set goals for risk reduction; propose, analyze, and compare strategies to achieve those goals; implement the most promising strategies; and monitor results and adjust policies or budgets accordingly. The comparative risk process, then, is part science and part politics: at its best, it puts up-to-date technical information into the hands of both legislators and the interested public in a way that enables better political or personal decisions.

Comparative risk projects have common elements that roughly parallel the project steps: a problem list, analytical criteria, a ranking of the problem list, and an action plan. The problem list is the set of environmental problems to be analyzed and compared. (Drafters usually pick about two dozen problems—say, from sewage and Superfund sites to global climate change—that can lead people to a new and broader perspective on the environment.) A set of analytical criteria defines what the participants consider important to measure or estimate, such as various types of risks to human health, to ecosystems, or to a population's quality of life. Most projects take at least six months to gather data and characterize the problems.

The ranking process follows, and is used to sort out the data, draw conclusions about the relative severity of the listed problems, and, in some projects, to select priorities for action. Observers may fail to distinguish a risk ranking from a priority ranking, a serious mistake if one took the rankings—the simple lists—as a sufficient guide for budget decisions. The rankings—the lists—are effectively the headlines on a more detailed and useful story: they serve primarily to get people's attention and force some questions: How can it be possible that indoor air pollution is a greater health threat than Superfund sites? What does this mean? How do they know? If



one believes in participatory democracy or not, public policy ultimately flows from the people, and the only way to change public policy will be with the people's blessing. Thus, it should come as no surprise that the most effective comparative risk projects have been the ones that set out specifically to include key representatives of the public in addition to technical experts.

Project participants share a strong conviction that their insights are important and should be used to influence public policy.

The projects have an impact on their participants, whoever they are. The ordeal of working as a group to rank problems forces group members to clarify their own thinking as they search for points of agreement with their colleagues or sharpen points of disagreement. The ranking process exposes weak arguments, poor data, and fuzzy thinking. The process tends to break down preconceptions about the problems. The process also breaks down individuals' prejudices about the other participants. The result: members of ranking committees have discovered that they agreed on far more than they had expected. They have come to share a strong conviction that their insights are important and should be used to influence public policy. In short, the process has frequently built coalitions for change.

State projects have expanded their problem lists beyond EPA-managed problems in order to answer public questions; so too have they expanded the analytical criteria by which they measure the relative magnitude of the problems. Most of the projects have had separate teams to analyze risks to human health, to ecosystems, and to what is variously called social welfare, the quality of life,

it's true, what should I do? These questions return people to the data, to the analysis, and to a level of detail that will be necessary to confront if they—or their state agencies—choose to address the problems seriously and target their actions appropriately.

Thus, the action plans tend to grow from the information of the first phase of the process, either as legislation, recommendations for new programs, or adjustments to old programs and budget priorities. The most effective plans have identified priorities through a process of comparing the risk-reduction potential of a number of alternative proposals.

In a political system that is generally more responsive to the public than to experts, priorities tend to follow the public's understanding of problems. EPA's most expensive programs (such as those addressing hazardous waste facilities, abandoned hazardous waste sites, underground storage tanks, and so forth) tend to address problems about which the public is most deeply concerned. In contrast, active participants in most state and local CRA projects have concluded that these problems pose relatively lower risks

than problems receiving less regulatory attention.

As noted, EPA's Science Advisory Board concluded in 1990 that it was critical that lay and expert views about risks be brought together in CRAs. Though largely ignored at the national level, practitioners in the states were more receptive to the advice. Washington, Vermont, and many other states demonstrated by their projects the potential for lay citizens and technical experts to work together productively on comparative risk projects.

How the states are using CRA

Why have so many states and communities invested so much effort in the process? Does the CRA process do any good?

The answer is mixed. In state capitals, just as in the nation's, making any fundamental change in policy or approach is enormously difficult in the absence of a crisis. A fairly stable status quo provides precisely what the public has most vehemently asked for: protection from the risks it most fears or abhors. Whether

or simply societal impacts. Vermont's approach to the "quality of life" question illustrates how states have broadened the analysis from its original technical basis.

The example of Vermont's values

The Vermont Agency of Natural Resources asked participants in its 1989 project to answer the open-ended question, "What environmental problems pose the most serious risks to Vermont and Vermonters?" A public advisory committee (PAC) of volunteers—characteristic of state projects—began its work by asking Vermonters what they thought the most serious problems were and why: What was it about each problem that made it objectionable? The answers came back through eleven public forums, as well as more than 400 responses to a survey designed to elicit Vermonters' values and perceptions.

Vermonters often said that they abhorred problems that threatened their own health and that of future generations and Vermont's ecosystems, that are unfairly imposed on people, or that threaten property values or their ability

Early rhetoric about CRA was that "risk" could be a "common metric" for comparing environmental problems. State practitioners discovered that no single metric would suffice.

to relate to their land the way their families had for generations. Through these answers, Vermonters defined risks in terms of Vermont values and gave the PAC a sense of the relative importance of the values. The PAC then consoli-

dated the responses in a set of seven criteria for evaluating the impact of the problems on the state's quality of life: aesthetics, future generations, sense of community, recreation, peace of mind, fairness, and economic well-being. The latter two criteria are illustrative.

Vermont's project was the first to make fairness an explicit consideration. Residents had told the PAC that they cared deeply about the distribution of risks and benefits. From this came a working definition of fairness that captured much of the outrage that people feel about "involuntary" risks. With a little critical thinking, the participants found the fairness criterion remarkably easy to apply, which suggests that other projects might use similar criteria to consider how different problems affect poor or minority communities.

Vermont approached its economic well-being criterion much as EPA had and as the states of Washington and Colorado had in their welfare analyses: economists attempted to capture the costs that each problem was creating in the state. These conventional techniques satisfied neither the staff economists nor the advisory committee. In only a few cases were the economists willing to add up their damage estimates for a problem and present the result as a bottom line: the analysts simply didn't believe that their numbers would convey an accurate picture of reality because so much of the picture couldn't be filled in.

Washington and Colorado also had thrown out or played down most of the economic analyses they commissioned for their projects, out of a lack of confidence in the numbers and a fear that the numbers would drive all subsequent decisions and that the familiarity and apparent simplicity of dollars would make it too simple to compare dissimilar problems and dissimilar risks. The early rhetoric about CRA was that "risk" could be a "common metric" for comparing environmental problems. Practitioners discovered that no single metric—not even dollars—would suffice. Seen in this light, Vermont's quality

of life analysis was an attempt to organize relevant data on as few different scales as possible, but no fewer.

The benefits of comparative risk

One of NCCR's findings was that among the most important outcomes of the initial state projects was a more sophisticated and cohesive staff. The participants better understood their own programs and those of colleagues: how, for example, a waste division's policy on the incineration of used motor oil might affect air and water quality. The state projects suggest that this educational process makes for better public management, though no one has attempted to quantify the results.

The strength of the comparative risk process is in framing important public policy questions and engaging people to productively answer them. Its weakness is that so many of the answers are uncertain, or unwelcome, or both.

The strength of the comparative risk process appears to be its capacity to frame important public policy questions and to engage people in a productive attempt to answer them. Its weakness is that so many of the answers are uncertain, or unwelcome, or both. As used by the states, comparative risk approaches have added depth to policy debates and helped decisionmakers set priorities, both in times of budgetary expansion and contraction. (Washington's Department of Ecology, for instance, used the knowledge from its project to target cuts to *minimize* their impacts, an approach far superior to the more typical across-the-board squeeze.)

With or without comparative risk projects, states and cities have continued to make environmental investments in response to federal requirements and public expectations. In addition, though, these projects have brought together—often for the first time—scientists and laypeople, industrialists and environmental activists, bureaucrats and the people they are paid to serve, state regulators and their federal counterparts.

CRA has added depth to policy debates and helped decisionmakers set priorities.

Participants often leave with deep new insights into both their natural and political environments, and can continue to influence environmental management decisions from town halls to Congress. Indeed, the experiences gained by states and cities now inform successive projects as the states continue to assert their own competence to set priorities and manage environmental problems.

Richard A. Minard Jr. is associate director of the Center for Competitive Sustainable Economies at the National Academy of Public Administration in Washington, D.C., which produced the recent report, Setting Priorities, Getting Results: A New Direction for the EPA. The former director of Vermont's comparative risk project, he was also the founding director of the Northeast Center for Comparative Risk at Vermont Law School. This article was adapted from the author's chapter in RFF's newly published book, Comparing Environmental Risks: Tools for Setting Government Priorities, edited by Terry Davies (see page 15).

“Car Talk”: An Autopsy

George C. Eads

Car Talk was the Clinton administration's 1994–1995 effort to achieve consensus on how to reduce America's greenhouse gas emissions from passenger cars and light-duty trucks. Specifically, the objective was to find the most cost-effective policies that, if adopted, would return emissions to 1990 levels by the years 2005, 2010, and 2025 and keep them there. The Car Talk Advisory Committee consisted of individuals whose activities ran the gamut from environmental and public interest advocacy to the manufacture of motor vehicles and gasoline. The idea was that the deliberations of these representatives of competing interests would lead to a consensus on policies that could be recommended to the President to achieve the 1990 emissions “return” objective. That never happened. As one of thirty members of the Car Talk Advisory Committee, I was there to witness the eventual crash.

A cautionary tale

Was Car Talk destined to fail? I don't think so. To succeed, however, certain elements would have had to have been present that were not, such as an atmosphere conducive to risk-taking. To get individuals who have fought each other for a quarter of a century to risk abandoning old positions and cooperate inevitably takes a great deal of hard work. If properly organized and structured, processes like Car Talk offer hope for easing the highly confrontational and legalistic approach the country has been taking to deal with some of its most controversial public policy issues. It is because I wish to see efforts like Car Talk succeed in the future that I have set out here the story of how we maneuvered

our way along what was always a rocky road until we finally reached our impasse. I have chosen to characterize my account as an “autopsy” because I hope we can learn from what went wrong, just as we would from the critical evaluation contained in a coroner's post-mortem.

On the rocky road to gridlock

From the start, Car Talk was bound to be bumpy. Anticipating growth in greenhouse gas emissions after 2000, the President's 1993 Climate Change Action Plan among other things committed the administration to the establishment of a process by which to develop measures to reduce greenhouse gas emissions from personal motor vehicles, including cars and light trucks. Furthermore, the plan promised to examine a combination of measures that offered the potential to improve new-vehicle fuel efficiency “in an amount equivalent to at least 2 percent per year over a 10 to 15 year period.”

The commitment the administration made to such a “process” was not met with great enthusiasm by any of the parties that later would participate in Car Talk. Most of the prior twenty-five years of controversy surrounding fuel use had focused on the number of miles per gallon that each motor vehicle manufacturer selling in the United States was required to average in its passenger car and light-duty truck fleets. Environmental proponents believed the case had been made already for increasing Corporate Average Fuel Economy (CAFE) standards for new light vehicles. To them, the action plan process they were being asked to participate in seemed little more than a delaying tactic.

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INSIDE RFF NEWS AND PUBLICATIONS

Opposite attractions in new seminar series

The Smithsonian Institution and Resources for the Future recently joined forces to bring together two groups often thought of as opposites—ecologists and economists. The Ecology and Economics Seminar Series, a monthly exchange designed to encourage dialogue between these two groups, addresses emerging environmental issues such as sustainability, endangered species, forestry, and the value of natural ecosystems and wetlands.

Recognizing that future legislation may require regulatory agencies to more explicitly balance economic considerations with health or ecological concerns, the series is intended to stimulate better policy decisions by both the government and the private sector. During the second seminar in the series, ecologist and demographer Joel Cohen and economist Lant Pritchett proved that opposites sometimes do attract, as evidenced by the following excerpts from their oral remarks about Cohen's recently published book, *How Many People Can the Earth Support?*

Joel E. Cohen, Professor of Populations and Head of the Laboratory of Populations, Rockefeller University:

Scientific uncertainty about how (and indeed, if) the Earth can support its projected human population has led to public controversy. Will humankind live amid scarcity, or abundance, or both? The Earth's capacity to support people is determined both by natural constraints and by human choices concerning economics, environment, culture, and demography. Therefore the planet's supportive capacity is dynamic and uncertain. Moreover, human choice is not necessarily subject to the same ecological notions of carrying capacity that apply to nonhuman populations. Mathematical

continued on page 13



RFF staff participate in the forum on International Investment and China's Sustainable Development. Pictured from the left are: Raymond J. Kopp (director of RFF's Quality of the Environment Division), Professor Ma Zhong (president of BEDI), Bai Baohua (president of China Iron and Steel Industrial and Trade Group of Companies), Edward F. Hand (RFF vice president of finance and administration), and Walter O. Spofford Jr. (senior fellow and director of RFF's Environment and Development program).

RFF hosts sustainable development forum in Beijing

Resources for the Future recently helped the Beijing Environment and Development Institute (BEDI) introduce itself to the world business community by co-hosting a forum on international investment and China's sustainable development. BEDI is China's first independent, nongovernmental research institute to address issues of economic development and environmental management.

Held in the Great Hall of the People in Beijing in November 1995, the forum included presentations by RFF and BEDI staff followed by a discussion of innovative approaches to achieving China's sustainable development goals. International development will remain an important factor in how well such development goals succeed, Mr. Li Ruihan told participants. Li is chairman of the People's Consultative Conference and a member of the Political

Bureau of the Central Committee of the Chinese Communist Party.

The one-day event concluded with a banquet with BEDI's board of directors. Companies that participated included Amoco, AT&T, the Bank of America, Beijing Royalstone Technical Development Co. Ltd., BHP, Chevron, China Iron and Steel Industrial and Trade Group, CHP, Coca-Cola, Ford, General Electric, International Business Machines, and United Technologies.

RFF has been working with Chinese officials and scholars to promote the integration of environmental concerns in development decisions since 1989. In the most recent collaborative project conducted for the World Bank, RFF, BEDI, and researchers from Chongqing assessed the effectiveness of the regulatory framework for industrial pollution control in Chongqing. Based on the findings of the study, the recommendations are expected to help the heavily industrialized municipality control industrial air and water pollution affecting the region's approximately fifteen million people.

Tinker grant won to help reduce emissions from Mexican kilns

Throughout Mexico, an estimated 20,000 small-scale "traditional" brick kilns burn cheap but highly polluting fuels like garbage, motor oil, used tires, and woodscrap. These kilns are a leading source of air pollution in a number of cities, but local authorities generally do not have the resources to regulate them. The most promising solution may be to create incentives for brickmakers to adopt cleaner fuels and more energy-efficient kilns.

To support progress toward this solution, the Tinker Foundation has awarded a two-year \$100,000 grant to Allen Blackman, a fellow in RFF's Quality of the Environment Division, and co-researcher Geoffrey Bannister, an assistant professor of economics at the University of New Mexico's Anderson School of Management, who are studying how such incentives might be created.

Blackman and Bannister will use the grant money to finance case studies in several Mexican cities. They are currently

examining brickmaking in Ciudad Juárez, where 350 traditional brick kilns are the third leading contributor to the worst air pollution on the U.S.-Mexican border and where a local nonprofit organization has led a campaign to induce traditional brickmakers to switch from dirty fuels to clean-burning propane gas.

To identify the chief incentives and disincentives for switching to propane, Blackman and Bannister surveyed 95 traditional brickmakers in Ciudad Juárez last summer, using seed money provided by RFF. Based on that survey, the two are now completing their first paper on the project, "Cross-Border Environmental Management and the Informal Sector: The Ciudad Juárez Brickmakers' Project," to be published as a chapter in a book on cross-border environmental management later this year.

Next summer, Blackman and Bannister will attempt to see how their findings from Ciudad Juárez might apply to brickmaking in other Mexican cities.



Photo courtesy of Patrick Deason Photography

Karen Turner Dunn

Karen Turner Dunn named new fellow at RFF

Karen Turner Dunn is RFF's newest fellow. A Ph.D. candidate in economics at the University of Maryland-College Park, Dunn has joined the staff of RFF's Center for Risk Management, where she is currently exploring alternatives for regulating the cleanup of the nation's nuclear weapons complex.

One of Dunn's major areas of research has centered on how environmental liability affects the waste management decisions of businesses. She also has examined price and competition policies as they relate to political transition.

From 1991 to 1993, Dunn helped coordinate a U.S. AID project in Mongolia to support that country's economic transition from socialism. In addition, she has devoted considerable attention to energy and health issues in Pakistan, where she was a fellow with the American Institute of Pakistan Studies in 1990.

Dunn also served as a lecturer in the Department of Economics at the University of Maryland-Baltimore County from 1993 to 1994.



Photo courtesy of Allen Blackman

In traditional Mexican brickmaking, cheap fuels like used tires and woodscrap fire the kilns. These kilns are a leading source of air pollution in some cities.

RFF directory of research and staff

In December, Resources for the Future published the 1995-96 edition of the *RFF Directory of Research and Staff*. This directory is prepared to help people outside RFF locate information about the research program and research staff at Resources for the Future. With the directory, users can look up a topic related to natural resources and the environment and find out what work RFF is doing in that area right now, what landmark studies have been published by RFF during the past decade or so, and who at RFF has the expertise to answer questions on that topic.

The *RFF Directory* is divided into two main sections: a directory of research and a directory of staff members.

The directory of research, organized by RFF's major areas of interest, contains brief descriptions of current research projects and selected RFF publications.

The directory of staff members contains profiles of RFF's senior research staff as well as RFF's university fellows; the profiles include areas of interest, career highlights, and some selected publications. The directory also includes indexes.

According to RFF President Paul R. Portney, the *RFF Directory* will make access to RFF staff and work easier than in the past. "Members of the media, policymakers, and others interested in RFF's research will find the directory extremely useful," Portney said. "It will help them direct inquiries to the RFF staff who are best suited to provide the expert information that they're seeking."

To obtain a copy of the *RFF Directory*, call 202-28-5025, or e-mail your request, with your name and mailing address, to info@rff.org.

An electronic version of the *RFF Directory* will be soon available online via RFF's World Wide Web home page (<http://www.rff.org>).

"SIRFF'n" the Net

To supplement monthly seminar discussions, the Smithsonian Institution has also organized an electronic discussion group. To subscribe, use the following directions.

E-mail LISTSERV@SIVM.SI.EDU. Leave the subject line blank and in the body of the message type:

Subscribe SIRFF-L [Your first and last name]

Please note: If you have an automatic signature that attaches itself to every message you send out, you must include the characters below after typing the above subscribe line.

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Upcoming seminars dates and topics will also be posted on RFF's World Wide Web home page (<http://www.rff.org>).

Seminar Series

continued from page 11

models of the relations between human population growth and human carrying capacity can account for faster-than-exponential population growth followed by a slowing growth rate, as observed in recent human history. These models suggest that a key variable influencing the Earth's future human carrying capacity is the incremental effect additional people would have on the resources available to support them.

Lant Pritchett, Senior Economist, Poverty and Human Resources Division, World Bank:

Professor Cohen is right to point out that biological models designed to study nonhuman populations are limited in their usefulness because they ignore deliberated choice. As an economist, the aspect of human choice I (predictably) focus on is the basic human behavior of *economizing*: using less of what is dear and more of what is abundant. Unfortunately, current predictions of the future evolution and implications of population that are based on technological assumptions about consumption or production, or even reproductive behavior itself, are bound to go badly wrong,

as they have so many times in the past. The reason is that such predictions ignore the human being's potential to economize through induced innovation in the long run.

This is not of course to say that letting the market "rip" will solve all problems, population and otherwise. An unfettered market might well rip right through precious and irreplaceable environmental resources, such as biodiversity and global atmosphere. The important question for concerned citizens is not so much "how many people can the Earth support?" but "how can (many) people make choices that support the Earth?"

* * * * *

The March RFF-Smithsonian seminar features Andy Solow of the Woods Hole Oceanographic Institution and Stephen Polasky of Oregon State University in a discussion of the "Measurement of Biodiversity and its Use in Conservation" with Deborah Jensen of the Nature Conservancy. For more information about the series, contact Sarah Boren at the Smithsonian (202-357-4282; sab@ic.si.edu) or Stacey Wilson at RFF (202-328-5154; swilson@rff.org). The Smithsonian-RFF seminar series is supported by a grant from the Winslow Foundation.

Congressional testimony on a strategy for clean air

Even as they rightfully take credit for the successes of Title I of the Clean Air Act, Congress, EPA, the states, and the public must correct the "disconnects" that exist between the law and scientific and economic realities. So concluded Alan J. Krupnick, senior fellow in the Quality of the Environment Division at Resources for the Future, who testified before the House of Representatives in November. At issue were the implementation and enforcement of the act's 1990 amendments. Causing the disconnect between regulation and reality, Krupnick said, are several false or obsolete assumptions that Congress and the EPA made in writing and executing the amendments. Fortunately, he sees remedies within reach, provided certain steps are taken.

EPA doesn't have to wait for further Clean Air Act amendments to take effect before it can make its programs more effective, Krupnick told the Committee on Commerce's Subcommittees on Oversight and Investigations and on Health and Environment. Already EPA is

responding to new scientific findings that contradict earlier assumptions, and a number of its current initiatives show promise, Krupnick noted.

As for changing the act, Krupnick suggested that Congress consider, among other things, adopting a standard-setting process incorporating two stages. Minimum health protection standards could be set in the first stage; costs and health/nonhealth benefits could then be taken into account in the second stage, if tighter standards were to be pursued.

Beyond the boundaries of current law, Congress needs to give EPA the statutory guidance it needs to improve its programs. Meanwhile, the states need to "push the system" and be "laboratories of change," according to Krupnick, and the American public needs to own up to its role in degrading air quality, particularly when driving cars. The complete text of Krupnick's testimony is available via RFF's World Wide Web home page (http://www.rff.org/testimony/9511_ajk.htm).

Former *Washington Post* writer joins RFF staff

John Anderson is RFF's first "Journalist in Residence." A distinguished writer, Anderson joined the RFF staff in February after retiring from the *Washington Post's* editorial page staff this past December. During his more than thirty-eight years at the *Post*, he wrote frequently on economics, energy, and the environment.

At RFF, Anderson will work on a book about the performance of the U.S. economy since 1973. He will also assist in strengthening the organization's communication efforts and in making RFF's research more useful—two goals set this year by RFF President Paul Portney.

"John has the right kind of experience to show us how to communicate the results of our research in ways that are more immediately accessible—and possibly more entertaining," Portney said.

A graduate of Williams College, Anderson occasionally has offered a month-long course there on European history since 1945. He began his career as a journalist by working for newspapers in York and Reading before joining the *Post* in 1957.

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Discussion papers

RFF discussion papers convey to interested members of the research and policy communities the preliminary findings of research projects for the purpose of critical comment and evaluation. Unedited and unreviewed, they may be ordered from RFF (see next page). The following papers have recently been released:

- "Public Choices between Life-Saving Programs: How Important Are Qualitative Factors versus Lives Saved?" by Maureen L. Cropper and Uma Subramanian. (95-31)
- "Solid Waste Reduction and Resource Conservation: Assessing the Goals of Government Policy," by Molly K. Macaulay and Margaret A. Walls. (95-32)
- "The Cost of Reducing Municipal Solid Waste: Comparing Deposit-Refunds, Advance Disposal Fees, Recycling Subsidies, and Recycling Rate Standards," by Karen Palmer, Hilary Sigman, Margaret A. Walls, Ken Harrison, and Steve Puller. (95-33)
- "Sustainability: Ecological and Economic Perspectives," by Bryan G. Norton and Michael A. Toman. (95-34)
- "On the Private Provision of Public Goods: A Diagrammatic Exposition," by Eduardo Ley. (95-35)
- "Evaluating the Costs of Compliance with Mobile Source Emission Control Requirements: Retrospective Analysis," by Virginia McConnell, Margaret A. Walls, and Winston Harrington. (95-36)
- "Temporal Reliability of Estimates from Contingent Valuation," by Richard T. Carson, W. Michael Hanemann, Raymond J. Kopp, Jon A. Krosnick, Robert C. Mitchell, Stanley Presser, Paul A. Ruud, and V. Kerry Smith. (95-37)
- "Why Do Firms Overcomply with Environmental Regulations? Understanding Participation in EPA's 33/50 Program," by Seema Arora and Timothy N. Cason. (95-38)
- "Green Giving: An Analysis of Contributions to Major U.S. Environmental Groups," by Jerrell Richer. (95-39)
- "An Overview of Adaptation to Climate Change," by Michael A. Toman and Rosina Bierbaum. (95-40)
- "Should 'State of the Art' Safety Be a Defense Against Liability?" by James Boyd and Daniel E. Ingberman. (96-01)

New book

Comparing Environmental Risks: Tools for Setting Government Priorities

Edited by J. Clarence Davies

The budgetary squeeze occurring at all levels of government in the 1990s has made it obvious that the nation cannot address every existing and prospective environmental problem. Criticism of current programs focuses on the low levels of risk posed by many of the problems being subjected to regulation while more important problems may go unaddressed. Comparative risk assessment is increasingly advanced as the appropriate means for setting realistic priorities.

Comparing Environmental Risks: Tools for Setting Government Priorities illuminates the increased efforts of the executive branch of the federal government to use risk assessment in its decisionmak-

ing. While the U.S. Environmental Protection Agency pioneered the use of comparative risk assessment (CRA) in its programs and routinely uses risk assessments of individual pollutants, the agency has not made use of CRA throughout the full range of its activities. Nor has any other federal agency. The President's Office of Science and Technology Policy has sought the assistance of Resources for the Future in formulating methods to make broader use of CRA throughout the executive branch.

RFF's Center for Risk Management commissioned background papers from leading experts on CRA for presentation at a meeting with federal regulatory officials in February 1994. *Comparing Environmental Risks* presents the papers of this workshop, revised to include input from the meeting. The book outlines the evolution of CRA and its surrounding controversy, summarizes lessons learned from past efforts at implementation, and identifies new ways for using CRA.

Representing the state of the art on programmatic CRA, the methodological analyses and practical recommendations contained in *Comparing Environmental Risks* will be invaluable to all public officials and other analysts faced with the challenge of setting environmental priorities. Interested members of the public will also receive insight into an increasingly important public policy tool.

The editor, Terry Davies, is the director of RFF's Center for Risk Management.

January 1996. 157 pages.

\$27.00 cloth. ISBN 0-915707-79-9

Ordering books and reports

To purchase books and reports, add \$3.00 for postage and handling per order to the price of books and send a check payable to Resources for the Future to: Resources for the Future, Customer Services, P.O. Box 4852, Hampden Station, Baltimore, MD 21211.

Books and reports may be ordered by telephoning 410-516-6955. MasterCard and VISA charges may be made on phone orders.

Ordering discussion papers

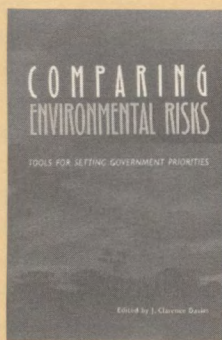
Discussion papers may be ordered through RFF. The price per paper covers production and postage costs and is based on delivery preference: domestic, \$6 for book rate and \$10 for first class; international, US\$8 for surface and US\$15 for air mail. Canadian and overseas payments must be in U.S. dollars payable through a U.S. bank.

To order discussion papers, please send a written request and a check payable to Resources for the Future to: Discussion Papers, External Affairs, Resources for the Future, 1616 P Street, NW, Washington, DC 20036-1400.

Additional information about RFF books and discussion papers may be obtained on the World Wide Web (<http://www.rff.org>).

Comparing Environmental Risks: Tools for Setting Government Priorities

Edited by J. Clarence Davies



"Presents the reader with a wealth of insights.... The practical advice in this distinctive volume should help greatly to increase risk assessment literacy among policy analysts, policy-makers, and citizens at every level of government."

Michael E. Kraft,
University of Wisconsin-Green Bay

"Full of the wisdom and experience of those who have thought a lot about how to set environmental pri-

orities based on the magnitude of the risk. Terry Davies is quite simply the most insightful and practical authority on risk assessment I know."

William K. Reilly,
former administrator, U.S. Environmental
Protection Agency

"A state-of-the-art consideration of comparative risk assessment that addresses the full array of technical, political, and institutional questions.... The essays are sufficiently informative and sophisticated to satisfy the wonk and yet accessible and lucid enough to educate the nonspecialist. This is must reading for those who are concerned about the future course of environmental policy."

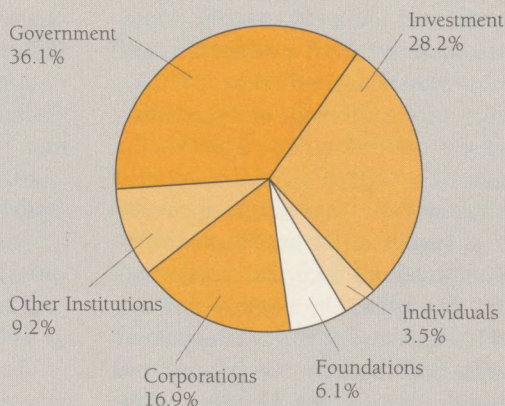
Marc Landy, Brandeis University

RESOURCES FOR THE FUTURE

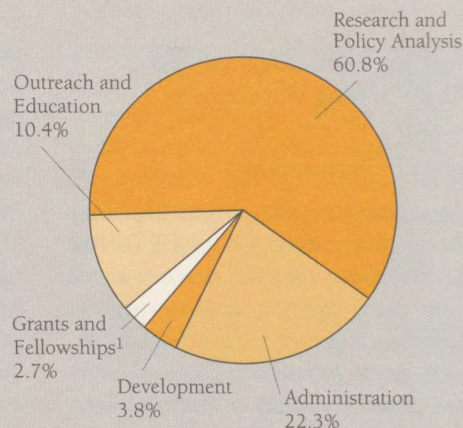
1995 revenues and expenses

Friends and supporters of RFF frequently ask where the institution's support comes from and how the money is spent. These charts provide a graphical breakdown of revenues and expenses. (For more detailed information, please consult RFF's 1995 annual report.)

REVENUES



EXPENSES



¹External grants and fellowships awarded to university researchers.

RFF fellow ends year on the Council of Economic Advisers

In light of the Republican "revolution" and the Clinton administration's interest in "reinventing" government, this was an especially interesting year to be on the staff of the President's Council of Economic Advisers (CEA), Michael A. Toman says. The quest for cheaper, smarter, better government policy through economic efficiency and economic incentives seemed to gain an added sense of urgency, given the political context. "I was glad to play a part in the CEA's efforts to show how economics can contribute to the process of setting priorities and improving the effectiveness of policies."

Toman completed a term on the staff of the council that began in September 1994. He returned to RFF in February, where he is a senior fellow in the Energy and Natural Resources Division. Like Alan J. Krupnick, the RFF senior fellow who served on the council staff the year before, Toman handled almost all of the council's environmental issues and most of the natural resource policy issues (except those involving agriculture).

Among the efforts that Toman cites as noteworthy during his tenure was working with the Office of Management and Budget and a variety of agencies in revis-

ing the government's guidelines for economic analysis of regulations. He also worked with EPA and other agencies on efforts to improve the cost-effectiveness of the Superfund program and to expand the scope of emissions trading as an economic incentive to reduce air pollution.

"I have made a number of good friends in different White House offices and in the agencies," Toman says, "people who are very smart and skilled and for whom I have great respect, whether or not we agreed on a specific issue. I don't think the average person fully appreciates how hard these people work to serve the public interest, notwithstanding debates over how best to do so."

In reflecting on his experience serving on the council staff, Toman notes his involvement in debates over regulatory reform, climate change, hazardous waste policies, and compensation to landowners for "takings" (that is, for losses incurred as the result of regulatory action). "All of this has given me a lot to think about and work on at RFF."

Toman is succeeded on the council staff by Raymond Prince, an environmental economist with the U.S. Department of Energy.

Summer interns sought

Every summer, RFF offers several paid internships to students. Interns assist RFF staff with projects ranging from technical studies to applied policy analyses. Interested students are invited to apply for RFF internships at this time. Applicants should have outstanding academic records in the undergraduate or graduate programs in which they are enrolled, and they should have undertaken course work in one or more of the following fields: microeconomics; statistical and quantitative methods; agricultural, environmental, or natural resource management; or environmental sciences.

Applications must be received or post-marked no longer than March 15, 1996. The internships begin on or about June 1 and last from two to three months. Stipends are commensurate with experience and length of stay. For further information about applying for internships, contact the Office of the President, Resources for the Future, 1616 P Street NW, Washington, DC 20036-1400. Telephone: 202-328-5067. E-mail: mmoran@rff.org. Additional information may also be obtained via RFF's World Wide Web home page (<http://www.rff.org/aboutrff/fellowship/interns.htm>).

Especially for RFF donors: why give securities?

How you choose to make a charitable gift can make a difference. Gifts of cash are essential and always gratefully received. For many people, however, giving securities as gifts may be an especially beneficial way to combine charitable giving with effective estate and financial planning.

Why would someone give securities rather than simply write a check? The answer is quite simple. Our tax laws offer special incentives for gifts of noncash property—especially when the property has increased in value since it was acquired. Many securities you own may be worth much more than what you originally paid for them. As *appreciated* property, they can make very attractive charitable gifts.

The deductible amount includes both what you paid *and* your gain. So, you can use the amount of the “paper profit” as a tax deduction even though it has never been taxed. This can dramatically reduce the cost of making a charitable gift or help increase the amount you can afford to give.

For example: John and Mary Doe usually make a gift of about \$1,000 to RFF. They have been considering increasing their gift but want to do so in the most economical manner. They have 150 shares of XYZ stock they purchased five years ago for \$600. The shares are now worth \$1,500. By making a gift of securities, they increased the size of their gift by \$500 (50 percent) for little additional after-tax cost. They enjoyed both ordinary income tax savings *plus* capital gains tax savings.

There are many advantages of giving publicly traded stocks, shares in mutual funds, and certain other assets. Publicly traded securities are usually the types of securities that are simplest to give, because of the ease of transferring them and determining their value for deduction purposes. Closely held stocks may also be given, but special rules apply to them. More information is available on this option.

RFF's home page address on the World Wide Web is <http://www.rff.org>.

Recent contributions from individuals

The following individuals made gifts of \$100 or more between September 10 and December 31, 1995, in support of research and education programs at Resources for the Future:

Anonymous (six)	James Graham	Howard W. Ottoson
Hans A. Adler	John Graham	Paul and Susan Portney
Jack Alterman	C. Boyden Gray	Neal Potter
Peder Andersen	Edwin T. Haeefe	William C. Rense
John Antle and Susan Capalbo	Kenzo Hemmi	William Riley
Kenneth B. Armitage	Fisher Howe	Carol M. Rose
Kenneth J. Arrow	Tetsuya Imai	Hisao Saka
Scott A. Barrett	Robert James	Sam H. Schurr
Michael and Marilyn Barth	Dr. and Mrs. Charles Jorgensen	Daigee Shaw
C. F. Bentley	H. Felix Kloman	William R. Sizemore
Lynn Bergeson	Nathan M. Koffsky	Sally A. Skillings
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On the other hand, domestic motor vehicle manufacturers feared that the process was a "back door" way to pressure them into agreeing to an increase in CAFE standards, something they were determined to resist.

Roadblock to alternative routes

Unfortunately, this volatile issue of fuel economy standards was the major roadblock for Car Talk participants. Not only was this impasse frustrating, it was ironic. Car Talk's Analytical Support Group, which consisted of analysts from various federal agencies chaired by a representative of the President's Council of Economic Advisers, was tasked with identifying the factors involved in reducing emissions as well as the magnitude of the changes required to achieve a return to 1990 levels in the years specified. The group made a strong case that it would

A key challenge was how to finesse the new vehicle fleet fuel economy issue, which was politically and symbolically laden.

not be possible to achieve this return merely by increasing new motor vehicle fuel economy. Other policies, either in addition to or substituting for fuel economy standards, would be necessary. These alternatives included policies to reduce vehicle miles traveled and to encourage the use of lower carbon content fuels.

A key challenge, then, was to find some way to finesse the politically and symbolically laden new vehicle fleet fuel economy issue, which the committee was in the process of discovering was relatively insignificant, certainly in the short term and maybe even over the long term.

We did not manage to do so. Consequently, not much "car talk" ever converged on the alternatives, even though they were thought to offer the most significant long-term opportunities for cost-effective greenhouse gas reductions.

The "C" word

Perhaps our failure is not so surprising, considering the legacy with which Car Talk was stuck. Legislation establishing the federal government's program to regulate new light vehicle fleet fuel economy was enacted in the 1970s when energy prices in the United States were controlled at below-world levels. Many were also predicting that the world would soon "run out" of petroleum. At the time, CAFE standards seemed to many to be a natural solution, given the criticality of petroleum as a transportation fuel, the significance of personal-use, light-duty motor vehicles as a share of total U.S. transportation energy demand, the low fuel efficiency of American cars and light trucks, and the strength of the belief in the regulatory powers of the federal government.

By the mid-1980s, however, U.S. energy prices had been decontrolled for half a decade, the energy efficiency of the new light-duty cars and trucks had almost doubled, and the notion of energy scarcity had been put to rest. But the CAFE regulations still remained on the books. In part, this was because the domestic motor vehicle manufacturers considered them only a minor annoyance. With the increase in energy prices, meeting them had proved relatively easy. Indeed, during much of the late 1970s and early 1980s, the industry average levels for new car and light-truck fuel economy remained comfortably above the standards, and the industry built up so many "carry forward" credits that many of them expired unused.

Once energy prices plunged in 1986, however, CAFE once again became a concern to the industry. The domestic producers began to foresee the exhaus-

tion of credits carried forward that had not expired. Moreover, because of the surge in the popularity of minivans and sport utilities, the light-duty truck CAFE standards, which were set by a somewhat different process from the passenger car standards, began to be troublesome. The industry managed to secure a rollback of the standards, including those for passenger cars throughout the 1986-1989 model years.

Car Talk participants weighed virtually everything they discussed in terms of either obtaining or blocking higher CAFE standards or their equivalent.

The domestic auto industry's success in forcing the CAFE rollback and in defeating efforts to increase CAFE in the early 1990s was interpreted by many, especially in the environmental and public interest areas, as epitomizing the industry's continued opposition to virtually all forms of regulation—highway safety, vehicle emissions, and emissions from vehicle assembly plants. Not surprisingly, the industry viewed things differently. To them, it made little sense to be required to build vehicles marketable only if energy prices were high and expected to rise at a time when energy prices were at close to historic lows and were expected to remain that way. Thus they interpreted efforts to force greater fuel economy as just another way to "get" the industry.

It is with this legacy that participants in Car Talk weighed virtually everything they discussed in terms of either obtaining or blocking higher CAFE standards or their equivalent. The advisory committee did manage to explore prospects for various forms of alternative fuels and means by which, over time, urban and suburban areas of the country could

reconfigure themselves to reduce the need for personal automobile and light-duty truck travel. Even in discussing these issues, however, the "C word," as one participant put it, was never far below the surface.

Arrival at an impasse

Given the assumptions that the advisory committee was able to agree on, it became increasingly clear that, to guarantee a credible return to 1990 levels of greenhouse gas emissions in 2005, some form of fuel tax or some way of charging for vehicle miles traveled (VMT) would have to be implemented. Alternative fueled vehicles could have little impact by that date and it appeared that VMT policies that did not rely on pricing tools (such as expanded access to transit) would produce little "bang." An increase in the CAFE standard could not accomplish much, either, given the slow rate at which the vehicle fleet turned over. Only policy tools that affected the entire existing fleet could guarantee a 2005 "return." The one tool that could be implemented quickly enough to do that, at least in theory, was a motor fuels tax—or something that closely resembled it.

To achieve return to 1990 emission levels in 2005, the Analytical Support Group's work showed that an inflation-adjusted tax increase in the gasoline tax of some 7.5 cents per year would be required every year until 2005. Furthermore, even if a Corporate Average Fuel Economy Standard of 45 miles per gallon (mpg) could somehow be obtained for passenger cars (and its equivalent for light-duty trucks), an annual inflation-adjusted increase of about 4 cents per gallon per year starting in 2000 would still be needed. But the "if" involved in obtaining a CAFE level of 45 mpg by 2005 was purely theoretical. The motor vehicle producers viewed a CAFE of 45 mpg as outlandish—a point concurred in by a National Research Council (NRC) panel, which in 1992 indicated that a CAFE level of 32 or 33 mpg might well be "tech-

nically achievable" "with higher confidence" (and a level a couple of miles per gallon greater, possibly achievable "with lower confidence" by the midpoint of the first decade of the next century). However, the NRC panel declared that not even that more modest level of fuel economy improvement was necessarily "economically practical."

To cut to the chase, Car Talk participants found they would have to agree to recommend some form of a fuel tax to achieve the prescribed goal. Simply put, it was the inability to agree to such a tax or to find a detour around it that caused participants in Car Talk to reach gridlock and then stall out for good.

The opposition of Car Talk's oil industry representatives to an energy tax darkened the prospect of ever reaching an agreement. The oil industry's refusal collided head on with the motor vehicle industry's willingness to support such a tax. This collision blocked the path on which the representatives of the motor vehicle industry were prepared to join environmentalists to find a way to reach the Car Talk goal.

It was the inability to agree to a fuel tax or to find a detour around it that caused participants in Car Talk to reach gridlock and then stall out for good.

The advisory committee went round and round trying to find some way to skirt this impasse. Various pricing tools that weren't gasoline taxes but that ostensibly might have produced the same effect on driving behavior were considered. None proved acceptable.

There also was a great deal of discussion about whether the motor vehicle manufacturers might find a "market solution" with a "regulatory backstop" acceptable. A number of possibilities

were floated, featuring different backstops and different triggers. In the end, however, environmentalists and their allies refused to countenance the notion of any backstop that was not mandatory. That is, backstop regulations would have to be implemented regardless of whether motor vehicle producers ever found a market solution and put it in place. This closed the door on any possibility of compromise as far as the motor vehicle manufacturers were concerned. The Car Talk Advisory Committee was unable to produce a consensus.

Autopsy results: prescription for the future

What can this particular "corpse" teach the living? First, trust among participants with competing interests has to be cultivated. Given the history of sparring between certain Car Talk participants, a lack of trust was to be expected at the outset. Unfortunately, in spite of certain small steps forward, Car Talk only reinforced the problem so that trust actually shrank over the course of the Advisory Committee's life.

If a process of this sort is to work, explicit opportunities need to be created for parties to take small, inconsequential risks that lead to positive results. Those facilitating the process and especially those sponsoring it need to work hard to provide such opportunities.

Longtime opponents need to be reminded forcefully but privately not to take cheap shots. Confidences, even trivial ones, must be observed scrupulously. (Failure to observe confidences was a continuing problem throughout Car Talk.) And opportunities must exist for private, off-the-record discussions in which individuals can search for solutions through mutually beneficial compromises.

The phrase "mutually beneficial" is important. Collaborative processes like Car Talk need to be structured so that all parties have a more or less equal stake in seeing the effort succeed, or at least not fail conspicuously. Although inclusive-

ness in assembling such forums is ostensibly a virtue, a roster of participants with a marginal interest in the outcome can have a deleterious effect. Everyone participating in Car Talk did seem to have some stake in the outcome, but both the stake in and the level of commitment to the success of the process varied widely.

Finally, those who sponsor an activity like Car Talk must maintain enough interest in the process to intervene knowledgeably and frequently to encourage the parties to make progress. They must provide credible threats of sanctions against those who do not participate in good faith or whose activities disrupt the work of the group. Likewise, sponsors need to provide ongoing support to those participants who run risks with their constituencies in an effort to achieve breakthroughs during difficult negotiations. Such facilitators must be able to demonstrate the clear interest of

“higher ups” in the progress and in the eventual success of the effort. This obligation requires more of the sponsors than periodic briefings, infrequent phone calls and “drop ins” at staged events, or meetings that only reveal how unaware they really are of what is transpiring.

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To get individuals with conflicting interests to cooperate does take hard work. It doesn't happen rapidly and it doesn't happen automatically. But if this

nation is to effectively deal with issues as complex as global warming, old positions will have to be abandoned and risks will have to be taken. Forums that bring together adversaries can be indispensable in helping them to sort through their competing interests and find workable solutions. But such forums must be structured and nurtured more carefully than Car Talk was. That, I believe, is the true lesson of Car Talk.

George C. Eads is a vice president in the Washington office of Charles River Associates. From March through December of 1995 he was a visiting scholar in the Energy and Natural Resources Division at Resources for the Future. From 1994 to 1995 he was one of thirty members of a presidentially appointed advisory committee charged with recommending ways to return greenhouse gas emissions from personal motor vehicles to 1990 levels by the years 2005, 2010, and 2025.



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