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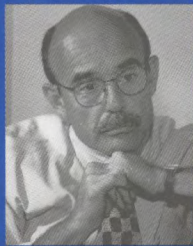
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Fortune in the New Year



Paul R. Portney

This message is penned at the turn of a new year, and barely five weeks after the death of a friend and highly valued colleague, Walter O. Spofford Jr. Both events provide reason for reflection.

We at RFF are very fortunate, indeed. We work on issues at once intellectually challenging and of great importance, both in the United States and around the world. In this issue of *Resources*, Heather Ross's article on the new congressional powers to review regulations provides a most interesting "domestic" example. David Simpson's provocative but carefully reasoned piece on biodiversity prospecting pertains mainly (though not exclusively) to decisions concerning habitat preservation in the developing world. And our feature on electricity deregulation is relevant just about everywhere, since even those countries that have yet to begin down the path toward a competitive electricity industry will probably do so soon.

At the same time that they are hard at work on these issues, my colleagues are also thinking about climate change, the cleanup of nuclear and hazardous waste, air quality standards, forestry policy, remote sensing from satellites in space, and the use of sound science in regulation, to name but a few. Knotty problems, each and every one, but fun to work on for exactly that reason.

At RFF we are also fortunate to work in a collegial setting. It is the norm to read carefully and offer comments on each other's work, and to help nurture the careers of young researchers. Perhaps more than anyone else, Walter Spofford exemplified this collegial spirit, making his loss all the more difficult to bear.

Another respect in which RFF is fortunate is the quality of its "volunteer leadership," a euphemism for the members of our board of directors and of the advisory groups to research divisions and programs. The labor of these busy people is entirely one of love—we do not pay our directors or advisory group members. (In fact, we solicit them for contributions each year and they virtually all contribute!) No organization could be better served by its governing bodies.

Last, but by no means least, we are fortunate to work at a place with a reputation for independence and objectivity. RFF's endowment income and mix of other support from diverse sources mean we are not overly dependent upon any one sector and are, therefore, free to call 'em as we see 'em. In that respect, then, we are beholden to all of you readers of *Resources* who support RFF, and hopeful that others will soon join you.

May 1997 be a rich and rewarding year for you all, both personally and professionally.

Paul Portney

Paul R. Portney



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GOINGS ON

Cleaner Mexican kilns with help from friends

Trying to reduce some of the worst air pollution in North America gets complicated when it affects cities on both sides of the border, as it does Ciudad Juárez in the Mexican state of Chihuahua and El Paso, Texas. The complication grows when the sources of pollution are so-called "informal" firms; that is, low-tech, unlicensed micro-enterprises, such as the approximately 300 kilns used to make bricks in Cd. Juárez. Fired by cheap, highly polluting fuels like tires and contaminated wood scrap, the kilns are virtually impossible to regulate by conventional means.

Yet kiln pollution can be reduced, RFF Fellow Allen Blackman believes, not only in Cd. Juárez but in cities across Mexico where thousands of similar operations are an important source of employment.

Blackman and his colleague,


Geoffrey J. Bannister of the University of New Mexico, came to that conclusion after assessing the ongoing efforts of a binational coalition of stakeholders that has been trying since 1990 to get the brickmakers of Cd. Juárez to fire their kilns with cleaner burning fuels, such as propane instead of debris. The coalition succeeded in convincing more than half of the city's brickmakers to switch to propane before a nationwide rise in the price of the fuel in 1994 caused many to abandon its use.


Before embarking on the second half of a two-year study supported by the Tinker Foundation, Blackman and Bannister reported what they learned in Cd. Juárez. Perhaps the most significant of their findings, Blackman says, is that enlisting the cooperation of local organizations is critical when trying to get informal entrepreneurs like brickmakers to adopt clean technologies. Community pressure applied

by trade and neighborhood organizations can generate strong incentives for workers to support environmental initiatives such as the Cd. Juárez Brickmaker's Project, even in the absence of formal regulatory pressure.

Blackman and Bannister also concluded that private-sector-led environmental initiatives can be at least as effective as government programs in dealing with informal polluters. And, to their surprise, they found that intensely competitive small-scale firms can be convinced to adopt clean technologies even when doing so raises operating costs.

Among their other findings are that the most technologically advanced strategies are not necessarily the most workable for pollution control in micro-enterprises like brickmaking, and that educating workers about the health risks associated with dirty technologies can create incentives to adopt clean ones.

This year Blackman and Bannister are building on what they learned in Cd. Juárez as they extend their study to three other Mexican cities. 

 See page 22 to order the researchers' related discussion papers, "Cross-border Environmental Management and the Informal Sector: The Ciudad Juárez Brickmakers' Project" (96-22) and "Community Pressure and Clean Technologies in the Informal Sector: An Economic Analysis of the Adoption of Propane by Traditional Brickmakers in Ciudad Juárez, Mexico," (97-16).

RFF workshop on classifying SO₂ trading

Environmental Protection Agency officials, scholars, and industry representatives gathered at RFF in November to examine EPA's method for classifying private sulfur-dioxide (SO₂) allowance transactions using the Allowance Tracking System (ATS). Participants in the one-day workshop at RFF evaluated how well EPA's classification scheme meets the needs of those with an interest in allowance trading and explored whether other methods would be more beneficial.

The ATS provides a central registry of recorded allowance transfers for purposes of emissions compliance. It is unusual as a mechanism for monitoring market activity because it provides information about the buyer and seller of an allowance but does not provide price information.

In establishing the allowance market, EPA has opted to limit its collection of information solely to those data necessary to ensure compliance with environmental goals. The agency believes that ensuring compliance—not monitoring transactions—is its primary mission. EPA has further limited its role by not approving individual allowance trades, and has ruled out expanding its data collection effort.

Congress and the public have interests that extend beyond strict compliance with environmental goals, however.



Kiln-made bricks, Ciudad Juárez, Mexico



GOINGS ON

They would also like to see those goals met cost-effectively, something allowance trading is expected to make happen. Furthermore, widespread interest exists in developing SO₂ emission allowance trading as a prototype for other potential trading programs.

The ATS is a potential model for the oversight role of the environmental regulator in programs such as these. Thus, another goal of the RFF workshop was to assess how well the ATS performs in promoting the development of allowance trading in general and in responding to constituencies interested in the SO₂ allowance trading program.

Based on their analysis and discussion at the workshop, participants concluded that EPA should proceed with its current classification methodology, noting that it provides accurate information of broad interest. In an upcoming discussion paper, RFF will supply detailed analysis of the methodology along with some additional minor recommendations to EPA. ☞


RFF launches program on climate change

Although uncertainty still exists about the likelihood of significant climate change—and the impacts it would have should it occur—the world's policymakers are shifting their attention from the hard sciences to appropriate policy responses. To help decisionmakers design policies that are efficient and effective,

RFF inaugurated this past fall a new program to introduce economic principles into the long-term debate as well as into the specifics surrounding negotiations under the United Nations Framework Convention on Climate Change.

Drawing on forty-five years of environmental policy analysis from an economic perspective, RFF designed the program to integrate the many different aspects of climate change with ongoing basic and applied research involving energy markets, water and forest resource management, air pollution, environmental regulation, and sustainable development. Principal areas of program investigation include economic and environmental consequences of climate change; domestic and international policy design issues; interactions between climate change and other policies; equity, efficiency, and other criteria used in decisionmaking; and development of analytical tools.

Focusing on these five main areas, the program will involve basic and applied research, policy analysis, and dissemination of the results to academic, business, and environmental institutions. As part of the program, agencies like the Environmental Protection Agency are also funding RFF to evaluate some of their climate change models and to help them develop better ones. ☞

 For more information, contact Michael Tebo, 202-328-5019.

Workshop views long-term care at nuclear weapons sites

Recognizing that long-term stewardship is a major aspect of the challenge the U.S. Department of Energy faces in cleaning up the nation's nuclear weapons production sites, RFF hosted a workshop in January to discuss how best to protect human health and the environment from the hazards posed by the sites over the long term.

Currently, DOE expects to complete within a decade the Herculean task of cleaning up and managing the vast quantities of hazardous and radioactive materials left behind from years of cold war nuclear weapons production in thirty-four states.

Even if all goes according to plan, portions of many of the more than 100 sites DOE is cleaning up across the country will not be returned to a state safe enough for unrestricted use, senior fellow and workshop coordinator Katherine N. Probst told some forty people at the two-day event. In fact, Probst said, after all planned cleanup activities are completed, some site areas will remain highly contaminated, and will house long-term storage and disposal facilities for dangerous wastes and materials or harbor uncertain levels of residual contamination. To ensure that adequate protections will be in place after the cleanup is completed, Probst said the long-term stewardship of these sites

needs to be addressed now.

Taking up the call to action, workshop participants—including DOE officials, stakeholders, and experts on land use and risk management—discussed the likely components of such a maintenance program. These components include reliable institutional controls to prevent inappropriate land and groundwater use; surveillance and maintenance of disposal facilities to ensure continued containment of disposed wastes; establishment and preservation of information systems to keep future populations apprised of site hazards; and long-term site surveillance of remaining hazards.

This spring RFF will issue workshop proceedings and a discussion paper outlining a possible long-term stewardship program for the nuclear weapons production sites. Both will be posted to RFF's Internet site at <http://www.rff.org>. ☞

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How Will Congress Review Rulemaking?

New Power Could Improve Regulations

by Heather L. Ross

Federal agencies write regulations to implement the laws enacted by Congress. Last spring, Congress gave itself the power to review the results of agency actions. Will this new review authority be a turning point in regulatory reform—and, if so, in what direction?

The 104th Congress devoted a lot of attention to regulatory reform in 1995-96, particularly to omnibus bills modifying the regulatory process as a whole (See RFF President Paul R. Portney's related article in *Resources*, Fall 1995, no. 121). Failure to enact those centerpiece bills became the headline story of the lengthy legislative debate. However, with less notice, two smaller initiatives were approved—the Unfunded Mandates Reform Act and the Small Business Regulatory Enforcement Fairness Act. The latter statute contains some really big regulatory news—a largely unheralded provision called “Congressional Review of Agency Rulemaking.”

President Clinton signed this new provision into law on March 29, 1996. It grants members of Congress sixty days to review major new regulations before they can become effective. It also establishes expedited procedures through which Congress may enact joint resolutions to disapprove such rules. These arrangements for disapproving individual rules are the legislative equivalent of the President's line-item veto of individual budget expenditures.

How will Congress use these new teeth? Many people say it won't. They see the sixty-day review as just another formality that federal agencies will have to observe as part of the rulemaking process. Many oth-

ers say that Congress shouldn't use the review powers. They see the sixty-day period as a window of opportunity for special-interest lobbying on the part of those who were unsuccessful when the laws were written and/or when the regulations were formulated by agencies like the Environmental Protection Agency, the Occupational Safety and Health Administration, or the Food and Drug Administration. But there are some people who are thinking about how the new review can be used to leverage improvements throughout the regulatory system. While the latter may be difficult to achieve, it is neither impossible, nor unprecedented.

The Need

The need for improvement in the regulatory system can be stated simply: good regulation requires good information. Proposed rules must be routinely accompanied by good descriptions of their potential outcomes—both favorable and unfavorable—and good estimates of their likelihood of occurrence for anyone to make a responsible judgment on their merits.

Since regulatory merit is principally substantive, not procedural, useful regulatory review is also necessarily substantive. There must be a mind at work looking at the content of a regulatory agency's decision and the information supporting it. Given the breadth

of federal regulatory activity today, no generic checklist of steps and decision rules can be used to grind out a sound conclusion on the merit of specific actions.

Herein lies the rub. How can good substantive oversight be exercised—by Congress or anyone else—in a regulatory system whose principal failing is a lack of adequate information upon which to base good decisions in the first place? Evaluations of the regulatory process show that decisionmakers often do not receive information of the quality that could and should be used to support major decisions. In those cases where they do receive it, such information is seldom instrumental in their decisions. Successful oversight must introduce into the system precisely the information—and its use—that is now systematically missing.

Why is that information presently missing? Limited resources (and occasionally limited skills, too) play some role. By far, however, the biggest problem is compartmentalization. The special-purpose missions of regulatory agencies and narrow focus of most authorizing legislation rigidly elevate particular regulatory objectives over other considerations and put a minimal or even negative value on information that would recognize tradeoffs in the overall public interest. Oversight must be a countervailing force, pushing the regulatory system in the direction of breadth and balance.

The Executive

In the first instance, regulatory oversight is an executive branch concern—indeed, a presidential concern, since the chief executive appoints the top officials of regulatory agencies. A special White House unit—the Office of Information and Regulatory Affairs (OIRA) in the Office of Management and Budget—provides assistance, and recent presidents have issued executive orders—currently President Clinton's E.O. 12866—that lay out how regulatory development and review are to proceed in their administrations.

Apart from judicial oversight, this White House review is the only governmental consideration that regulatory activity receives outside the agencies' own processes. Historically, these reviews have varied widely—contrast the industry-oriented activism of President Bush's Competitiveness Council with the slightly sentinel that OIRA is today. These swings may be seen as inevitable in a process that takes place inside the White House, and some would consider them desirable. But it is hard to argue that the welfare of the public is as volatile. Notwithstanding the com-

peting horror stories of regulatory excess on the one hand and deregulatory endangerment on the other, there really is some persistent, balanced understanding of the public interest. Big swings in oversight deny that truth and undermine reform.

The Congress

If the need in regulatory oversight is to take a broad, objective view across competing interests and continuing political cycles, what is the basis for thinking that Congress could perform any better than the executive branch? How can it be a constructive influence, operating in the last sixty days of an elaborate and often very technical rulemaking process, engaging people who have not been involved in that process and whose principal duties lie elsewhere?

Operationally the answer must lie in leverage. Using its veto threat, Congress could encourage good regulatory analyses inside the agencies, where the greatest ability to perform and use these analyses resides. The National Environmental Policy Act (NEPA) serves as illustration. Under that law, the threat agencies faced that their actions could be stopped—in that case by the courts—was sufficient over time to generate an array of agency-developed information on likely environmental impacts, as well as procedures for scoping, developing, and reviewing it, that had until then been missing in agency decision-making.

Substantively, the answer must lie in information. Again, there is a precedent—the Congressional Budget Office. Congress created the CBO to bring to the legislative branch of government expert, objective information concerning the federal budget. It has succeeded, and the CBO's output provides the authoritative base for budget deliberations year after year. Success in the case of regulation will come from getting agencies to do good analyses, not from doing them independently. But the central element of success will remain the same—a way for Congress to get timely, expert, nonpartisan information on highly technical, highly charged issues.

The Outlook

Getting to this point may be a tall order, but not because the analytic capability is a reach. The state of the art of risk assessment and benefit-cost analysis is far beyond what occurs in most rulemaking deliberations today. And the resources required to do better—

it is emphatically a question of doing better, not more—are relatively modest. Many agencies can already supply much of the capability required, despite a certain atrophy in periods of weak demand from their own leadership. The challenge is to create a consistent demand for that capability, as NEPA has for environmental impact analysis, and a sustained capacity to evaluate the results, as CBO has for the budget process.

NEPA has shown us the power of credibility. Courts, responding to interested parties and conducting no analyses of their own, can nonetheless be relied upon to stop proposed actions lacking adequate analytic support. Agencies have recognized NEPA's requirements as a significant hurdle, not a peripheral "speed bump," and have changed their behavior accordingly.

NEPA also illustrates the power of example. While some federal programs were held up as agencies figured out what the law required, government action by no means came to a halt. A handful of major test cases stopped the clearest violations and helped define compliance for the mass of ongoing federal activity. Similarly, identifying and stopping regulations for which there is virtually no justification can prevent the worst regulatory excesses while influencing the terms of debate and the standard of merit throughout the system.

Regulatory oversight is different from review under NEPA in that it is substantive. It goes beyond asking "is the analysis adequate" to "is the action justified." Congressional review is the time to watch for rules that are clearly unjustified and these generally stand out even on a weak record. Identifying these outliers is a substantive task, requiring analytic skill which is presently lodged principally in the regulatory agencies. Congress must now acquire some of that skill itself to execute the oversight role it has assumed.

CBO shows that Congress can build such an analytic capability and use it in a nonpartisan way. A Congressional Regulatory Office (CRO) could be established and patterned after CBO, if much smaller in size. Such a new office could learn from the elements of CBO's success: a committed set of congressional champions, a committee structure to direct and utilize its work, a first-class director in the tradition of Alice Rivlin, and a high-quality, purpose-built staff—the peer of OIRA as CBO is of OMB. It could also use

an advisory group with respected membership from across the spectrum of regulatory interests and expertise to give support and counsel.

A CRO would need a home, either as an independent unit or as part of some other entity. Two candidates for the latter are the General Accounting Office, which presently provides Congress with brief letter reports on individual rules under the sixty-day provision, and CBO, which has new regulatory analysis responsibilities under the Unfunded Mandates Reform Act. Locating a CRO where it would perform most effectively would be an important part of Congress' organizing itself to handle the regulatory responsibilities it is beginning to take on. This organizing task needs to be accomplished soon, before further regulatory assignments proliferate and before resolutions to disapprove of particular regulations start to come up for votes. The latter may happen as early as this summer, when EPA is scheduled to promulgate new ozone and particulate standards under the Clean Air Act that some members have already cited as a disapproval candidate.

One of the first things a CRO would face is the degree to which bad rules are legislatively driven. From limiting the ability to balance costs and benefits to specifying inefficient command-and-control mechanisms to micro-managing myriad administrative processes, Congress itself is easily the single greatest source of excess costs in the system. Thus another major measure of sixty-day review success, as important as altering agency behavior, will be spurring Congress to right its own wrongs. This is a further difference from NEPA. Not only must Congress exercise substantive judgment, not just procedural oversight, but it must pass that judgment on itself, not just on agencies.

To many, this will seem like mission impossible. But it is worth noting how much more effective and far-reaching both NEPA and CBO have become than even their proponents first imagined. Sixty-day review is historic in its power to move beyond jawboning and put real teeth in regulatory reform. It should be honed in the public interest, not left to become a toothless wonder or to provide special interests with a final bite at the regulatory apple.

Heather L. Ross is a visiting scholar in RFF's Energy and Natural Resources Division.



Electricity Deregulation and the Consumer

Competition is coming to the electricity industry, but can individual consumers really expect lower prices and an attractive array of new products and services?

The way Americans buy electricity is changing. Advances in technology, combined with pressures to reduce prices, are transforming the industry from one comprised of monopolistic, turf-bound utilities to one featuring more competitive firms vying for customers across state lines. In many ways, the industry is responding to the same forces that transformed the banking, telecommunications, and airlines industries just a few years ago. Only this time, change is expected to come fast—within the next few years rather than over a decade.

A restructured industry could mean lower consumer prices, just as it did when the airline industry and long-distance telephone service were deregulated in the 1970s and '80s. Then again, maybe not. Getting a better price is not a sure outcome if you are a residential as opposed to a large commercial or industrial consumer. It all depends on how deregulation plays out.

Right now, with few exceptions, all types of consumers receive power from local regulated electric utility companies at prices set by state public utility commissions. Eventually, however, we might all power our homes by shopping for bargains among the competing offers of companies nationwide. California, Rhode Island, and New Hampshire already have adopted policies that point in this direction.

This article is adapted from the RFF primer *A Shock to the System: Restructuring America's Electricity Industry*. Published last July, the book was written by RFF Fellows Timothy J. Brennan, Karen L. Palmer, Raymond J. Kopp, Alan J. Krupnick, Dallas Burtraw, and Visiting Scholar Vito Stagliano. To order a copy, see page 22.

“Going retail” in this manner would enhance opportunities for customization. Certain industrial and commercial customers, for instance, might contract to have their energy generated at power plants using local coal; or they might purchase interruptible service if the price were right. Households might opt to purchase electricity in a package deal that includes more efficient heating, cooling, and lighting equipment.

But alongside these potential benefits, restructuring the industry introduces complications and raises some concerns. Competition insofar as it exists today is the result of the Energy Policy Act that Congress passed in 1992. That law required all utilities to share their transmission lines. So now a utility in a high-rate state like New Hampshire can buy much cheaper electricity from West Virginia and have it delivered for a fee across regional transmission lines. Large electricity customers, such as factories and office buildings, are pressuring states to let them jump directly into the market and buy cheaper power out of state, too.

Some industry observers question the fairness of letting such well-positioned customers corner the benefits of new technology by purchasing power directly from a supplier of choice. The bargaining power of individual consumers would be puny compared with that of these commercial and industrial enterprises, which have the economies of scale and scope to command good deals. For equity's sake, these analysts maintain, utilities should continue to act as “portfolio managers” for all customers.

Even those who advocate direct retail sales between suppliers and consumers say government regulators

will have to help individual consumers create large, more effective bargaining units (buying cooperatives) to keep from being elbowed to the pricing sidelines. To similar effect, some state plans now in the offing guarantee cuts in residential electricity bills, although the objective is to encourage local purchases once retail competition kicks in and interstate shopping begins.

But we are getting ahead of ourselves. Even though electricity is one of the most commonly consumed goods or services in the developed world, few of us understand how it is produced, how it is delivered where we need it, and how the prices we pay for it are determined. To understand the implications of future changes, we need to take a quick look at the present situation.

Defining Terms

Today the U.S. electricity industry has a vertical shape. Typically, a single company in a given geographic area generates electricity, transmits it to cities and towns, and then downloads and distributes power to factories, businesses, and homes. The industry's three functions—power generation, long-distance transmission, and local distribution—have long been regarded as “natural monopolies.” Keeping costs low has meant relying on one entity—usually an electric utility—to provide all three functions. Thus, although electricity is a top item of consumption, consumers—whether commercial, industrial, or residential—have had little say in its purchase.

Now, however, the old monopolies are coming apart. Generating electricity has become viable as a competitive enterprise. New high-efficiency gas turbines and combined-cycle gas turbines that generate electricity have lower combined capital and operating costs than traditional generators. Consequently, small, modularized systems can be manufactured to generate electricity at the same low cost as that from very large central power stations built only a few decades ago. What's more, these new, smaller units are mobile, and can be shipped and plugged into existing transmission systems that deliver electricity to towns or to a single unit, such as a factory.

It is the economic savings arising from these new technologies in generation that is changing the “look” of the electricity industry. By reducing the size of generating plants, electricity generation can now be “unbundled” from transmission and distribution—the

other two functions that traditionally were monopolized and provided as a package deal.

Between the electricity generator and the distribution company or customer stretches the system of transmission lines, termed the grid. Once electricity is generated, its transmission involves conducting the flow of electricity at high voltages from the points of generation to groups of electricity users, such as residential neighborhoods, industrial parks, or commercial centers. In addition to transmission lines, the transmission system consists of substations with voltage transformers, circuit breakers, and other equipment needed to transmit power. Besides delivering electricity, transmission networks or grids connect utilities and facilitate electricity sales among them. Because this process continues to involve substantial fixed costs, transmission is bound to remain more economical if it is provided by one utility in a given geographic area.

Traditionally, selling and physically delivering electricity to individual consumers have been done jointly in what is known as distribution. Until recently, virtually all retail customers have purchased power from the utility that delivers it to their premises. Distribution occurs after electricity has been transmitted to a geographic area. The process involves transforming or “downloading” the high voltages into lower voltages and then physically delivering them to individual households, industrial facilities, commercial establishments, government offices, and other users.

Like transmission, the physical distribution of electricity involves large fixed costs for capital equipment. But marketing it does not. Thus the sales aspect of distribution can be unbundled to become a competitive enterprise, and in the last few years new companies have mushroomed to broker interstate electricity sales to large industrial customers. Most of the electricity delivered to consumers, however, still is generated by distributing utilities and not priced in competitive markets.

Pricing Policies

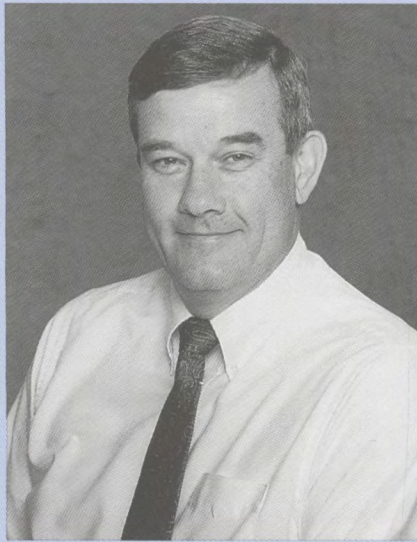
At the same time that technological advances have begun to chip away at old ways, the tradition of basing electricity prices on costs has come under increasing criticism. Closely regulated local utilities, each enjoying a government-protected franchise territory and the luxury of setting prices based on costs, have felt little pressure to adapt or expand their service offerings to

Will Retail Deliver?

Retail competition certainly has its attractions, among them lowering electricity prices, accommodating individual consumer preferences, increasing the available array of products and services, and speeding innovation in power supply. But will consumers really get all these things out of a retail market?

"Not unless competition truly does develop," Douglas R. Bohi says. And that won't happen, he adds, unless a number of small, vigorous companies are out there competing to offer genuine differences in products and services at attractive prices.

Bohi, who until recently directed RFF's Energy and Natural Resources Division, has been keeping a close watch on the electricity industry in the first throes of its latest transformation. He says states



Douglas R. Bohi

have to make sure that the distribution companies that now deliver and market electricity to customers are broken up in a way that promotes competition, not only from the outset but over time. It is Bohi's observation, however, that the very states that favor retail competition have not been sufficiently concerned about how to achieve it. "They are focusing on how generating companies should be broken up and who should control transmission,

but not about competition in distribution," Bohi says. "They'll worry about the way retail competition plays out later." That's a mistake, he believes, because if there isn't competition in distribution, the benefits of retail will not be realized.

Even if existing distribution companies are broken up, competition may not be sustained. If the costs of selling electricity decline as company size increases, Bohi explains, the minimum efficient size of such companies might be so large that only one or two could survive in the same market. If that's the case, he says, true competition will never develop and the feasibility of a retail market for electricity itself will become questionable.

meet changing customer needs. Cost-based prices give utilities little incentive to run lean operations, since their revenues and profits would take a corresponding hit through lower prices.

Cost-based pricing also means that prices dip and peak even among closely located utilities, depending on local fuel rates and other variables. You can live in Pittsburgh and pay six cents more for every kilowatt hour—nearly twice as much—than your cousin does in Uniontown, fifty miles away. Prices yo-yo across the continent of franchised territories that each utility dominates. In many high-rate states in the Northeast and in California, you may pay 50 percent above the national average. As of September 1996 consumers in the State of New York were paying the highest residential price for electricity at about 14.7 cents per kilowatt hour. At the other end of the spectrum consumers in the State of Washington were paying about 5.0 cents per hour (Energy Information Administration, U.S. Department of Energy).

Competition provides a remedy to these disparities. Proposals to deregulate electricity generation and expand competitive electric power markets have been adopted by some states and are under consideration by many others. Some analysts argue that the benefits of efficient, low-cost, and high-quality electricity service can be had even without consumer participation. What is needed, they say, is for states to adopt methods that give utilities incentives to reduce their costs. Other observers argue, however, that only if consumers enter directly into the market will the full benefits of competition be realized. The lines of debate are largely set by opposing views of the outcome of each of these two scenarios.

Prospective Scenarios

The potential benefits of bringing more competition into the electricity industry—lower prices, reduced production costs, more services—ultimately will depend on how competition is put into effect. Although otherwise quite varied, proposals now under consideration are based on two distinct approaches: expanded wholesale competition and the introduction of competition at the retail level.

Changes in the law in the last decade have already created a limited wholesale market for nonutility generators to sell electricity to utilities. This market could be expanded to allow owners of newly deregulated

generating capacity to sell electricity directly to any utilities they want at whatever prices the market would bear; utilities could pick and choose. Distribution companies could buy transmission services from one utility and generation services from another—or from a nonutility generator. They would then transmit and distribute the electricity to industrial, commercial, and residential customers. Expanded wholesale competition would involve deregulating generation only. Customers would still purchase electricity as they do now—from a single, local, state-regulated utility.

If competition were extended to the retail level, though, consumers would enter directly into the competitive fray. Large industrial customers could contract with generators for power at prices negotiated by the two parties. As these markets developed, residential customers might buy electricity directly from generators, too. In addition to generation, the sales aspect of distribution would be deregulated and separated off from the other industry functions. Generating companies would sell power to electricity retailers or customers instead of to a local distributor with a monopoly franchise for selling power. Transmission would operate and likely be regulated the same as under expanded wholesale competition, except that power retailers, generators, or customers—not local distributors—would arrange for services.

Each of these two basic proposals is affected by how existing regulations are relaxed or reformed at both the state and federal levels. The diversity within each of the proposals is raising many unresolved issues about who has authority to do what, including which regulatory body, if any, has the authority to implement retail competition.

Many anticipate a shift in the balance of authority away from the states to the federal government. As the primary federal regulator of electricity policy, the Federal Energy Regulatory Commission (FERC) now

regulates use of the grid and pricing of transmission services. FERC also controls rates for wholesale power sales and authorizes most utility mergers. States now set retail electricity prices and most of the rules for entry into the generation business, as well as the boundaries that define a utility's exclusive service territory.

Despite the long history of states' deciding how electrical service should be provided to household customers, Congress may ultimately need to act before full retail competition can occur. To fully implement the policies that California, Rhode Island, and New Hampshire are adopting to favor retail choice will definitely require changes in federal law, some industry analysts say. What's more, since electricity transmission does not conform to state borders, a regional approach gains importance, leading some to argue that an overarching federal plan for deregulation makes more sense than piecemeal, state-by-state action.

Another jurisdictional issue involves identifying the dividing line between transmission, which is regulated by FERC, and distribution, which is regulated by the states. The distinction becomes crucial if utilities are going to sell transmission and distribution services separately to independent, retail electricity providers and customers.

What does all this imply for ordinary households? Probably nothing that most of us will notice if competition is limited to wholesale transactions. If competition extends to the retail level, however, households will play a more active role. In fact, we may have to "shop" among electricity providers for services in much the same way we do for the long-distance telephone services that used to be provided by the Bell system alone. This will mean more choices for households (and a deluge of advertising claims to sort through, too) but also an opportunity to tailor a service package suited to each household's needs. ☰



Biodiversity Prospecting

Shopping the Wilds Is Not the Key to Conservation

by R. David Simpson

Preserving biodiversity may have little bearing on whether the next miracle drug is found. Better arguments should be stressed in developing conservation policies.

Some people say “biodiversity prospecting” offers a compelling reason to save as much as possible of the world’s immense variety of genes, species, and ecosystems. Sifting among genetic and biochemical resources for something of commercial value, as biodiversity prospectors do, could lead to the discovery of a wild plant or animal that contains the key for curing AIDS, cancer—or some other disease the world has yet to identify. The desire to capitalize on new and better products for industrial, agricultural, and especially pharmaceutical applications provides strong incentives for conserving nature, so the argument goes. What’s more, by acting on advances in biotechnology, researchers are better equipped than ever to investigate organisms at the genetic level, providing fresh financial reasons to conserve as many product leads as possible.

But several RFF studies show that losses in biological diversity may have little bearing on whether the next miracle drug is found. That’s because there are so many wild plants and animals that can be used by researchers engaged in biodiversity prospecting. With millions and millions of species, sources of useful products are either so common as to be redundant or so rare as to make discovery unlikely. Either way, the sheer numbers involved weaken the argument that biodiversity prospecting generates any appreciable economic value.

That is not to say natural leads are not important in the development of new products. Natural organisms have evolved a staggering variety of chemical com-

pounds to escape predators, capture prey, enhance reproductive success, and fight infection. Some of these chemical compounds have proved to be of great value when adapted for industrial, agricultural, and pharmaceutical uses. In the United States, for instance, nearly 25 percent of prescription medicines contain active ingredients derived from plants, while many other drugs are synthesized to replicate or improve naturally produced molecules. Today we treat leukemia with medicines derived from the rosy periwinkle of Madagascar, and the bark of the Pacific yew tree is the source of a promising treatment for ovarian cancer.

It is not surprising, then, that natural scientists, legal scholars, and even economists often cite nature’s contribution to new product research and development as one of the most important considerations in formulating biodiversity conservation policy. Given the passions that biodiversity and its protection arouse and the varied backgrounds of the people making proposals, however, it is also not surprising that many of the arguments are less than watertight.

Thinking clearly about the values that surround biodiversity is important, since destruction of a habitat is often irreversible. Over and above its potential as a source of new products, a plant or animal may be valuable for any number of commercial, ecological, esthetic, and ethical reasons. Given this fact, we should be cautious in making related policy decisions and choose to devote scarce funding to only the most

effective strategies. Placing too much emphasis on biodiversity prospecting may divert attention—and funds—from potentially more effective conservation strategies.

The Value of the "Marginal Species"

As a source of leads in new product research, natural organisms would be very difficult to replace. There is simply no substitute for biodiversity as a whole.

Economically speaking, however, biodiversity is valuable to the extent that it makes sense to save a little bit more, and not to the extent of its admittedly astronomical value overall. That is because we typically are not concerned with actions that would wholly eradicate biodiversity, but rather with the costs and benefits of actions that would result in incremental reductions. In thinking about the role that biodiversity plays in new product development, therefore, it is important to consider the contribution of biodiversity on the margin.

In economics, the worth of something is its "marginal" value; in other words, the incremental benefit that a little bit more of the thing provides. In the case of biodiversity prospecting, the value of the "marginal" species is the contribution an additional species makes to the probability that researchers find what they are looking for. Put in another way, things are valuable to the extent that there are few substitutes for them. Within the immense set of living organisms, many species are likely to be adequate substitutes for one another as leads in the development of commercial products.

This may not be apparent, however. After all, aren't different species identified as such precisely because each is genetically unique, and therefore not a perfect substitute for any other? Biologically, yes; but let's consider the economic interpretation of this fact. Each species represents a research opportunity, and is a substitute for another in the sense that time and costs incurred in pursuing one research opportunity could be devoted to another. The question of economic interest is "how valuable is an additional research opportunity?" This, in turn, really boils down to the question "how much does having additional species to test increase the probability that a new product will be found?"

Let's consider a couple of extreme cases. While species are genetically different, different species can produce the same chemical compound (caffeine, for

The Values of Biological Diversity

Recent research at RFF has focused on the value of biodiversity for use in the development of new commercial products. This is certainly not the only, and may not even be the most important, reason for preserving as much variety in genes, species, and ecosystems as possible. Taken together, the reasons might be classified in three categories:

- New agricultural, industrial, and pharmaceutical products, as discussed in the article.
- Harvested resources like lumber, fish, and game, but also things such as water and nutrient cycling, erosion protection, climate moderation, and the combination of these basic support services that makes it possible for society to function at all.
- Esthetic, ethical, and spiritual benefits.

Since the goods and services described in the second category are either sold themselves or support the production of other goods and services, they might be valued by investigating particular markets or looking at macroeconomic performance as a function of environmental conditions.

The final category of values is the most elusive and most controversial. The contingent valuation method—surveying people to ask them what biodiversity is worth to them—is perhaps the only way to elicit this information, but it is extremely controversial.

Considering these broader categories of values and ways in which they might be estimated is the subject of the book RFF Fellow R. David Simpson is now writing.

example, is found in both tea and coffee). Suppose, then, that it is relatively likely that several species produce the same chemical compound. How helpful will it be to maintain additional biodiversity for use in the search for new products? The answer is "not very," as species are very likely to prove redundant when there are large numbers from which to choose for testing.

Now consider the opposite extreme. Suppose that it is very unlikely that two or more species among the millions in existence will prove to contain a chemical useful in the treatment of AIDS, cancer, or some other condition. But if it is very unlikely that two or more species among millions will prove redundant as sources of new product leads, it must mean that useful leads are so rare as to make it very unlikely that any species will contain the key for a cure.

Researchers at RFF have shown that, regardless of the probability that any one species chosen at random will yield a particular commercially valuable product, the value of the marginal species is negligible when there are large numbers of species available for testing. The value of the "marginal" species is equal to the expected payoff from testing it times the probability that all other species fail to provide the product that researchers seek. This figure is necessarily small when there are lots more species to choose from.

Pharmaceutical company willingness to pay to preserve a hectare of land in eighteen biodiversity "hotspots"

| Hot spot | Value in dollars per hectare |
|---|------------------------------|
| Western Ecuador | \$2.29 |
| Southwestern Sri Lanka | 1.87 |
| New Caledonia | 1.38 |
| Madagascar | .76 |
| Western Ghats of India | .53 |
| Philippines | .52 |
| Atlantic Coast Brazil | .49 |
| Uplands of western Amazonia | .29 |
| Tanzania | .20 |
| Cape Floristic Province of South Africa | .18 |
| Peninsular Malaysia | .16 |
| Southwestern Australia | .14 |
| Ivory Coast | .13 |
| Northern Borneo | .11 |
| Eastern Himalayas | .11 |
| Colombian Choco | .08 |
| Central Chile | .08 |
| California Floristic Province | .02 |

Sources:

R. David Simpson and Roger A. Sedjo, 1996, "Valuation of Biodiversity for Use in New Product Research in a Model of Sequential Search," RFF Discussion Paper 96-27.

R. David Simpson, Roger A. Sedjo, and John W. Reid, 1996, "Valuing Biodiversity for Use in Pharmaceutical Research," *Journal of Political Economy* 104, 163-185.

Norman Myers, 1990, "The Biodiversity Challenge: Expanded Hot-Spots Analysis," *The Environmentalist* 10, 243-256.

Norman Myers, 1988, "Threatened Biotas: 'Hot Spots' in Tropical Forests," *The Environmentalist* 8, 187-208.

Arriving at a numerical estimate of the value of a marginal species depends on how many species are available for testing, how many new products are being sought, the financial rewards earned from developing new products, and the relative value placed on future, as opposed to current, earnings. Even if these conditions are fairly favorable, however, the estimated economic value of biodiversity for use in new product research is modest.

Incentives for Habitat Conservation

The greatest threat to biodiversity probably comes from the conversion of natural habitats, particularly those in tropical rain forests, to agricultural or residential use. Such conversions take place because those undertaking them expect to gain some benefits. Making the economic case to preserve biodiversity means showing that the benefits to be had from preservation are as good or better than those to be had by converting the habitat for other purposes.

But such a case seems hard to make. RFF research shows that pharmaceutical researchers are not willing to pay much to preserve natural habitats even in some regions that are highly imperiled and rich in biodiversity.

RFF researchers arrived at the estimated prices shown in the table on this page first by using a formula often employed by biologists to predict how species extinctions are related to habitat loss to estimate the effect of a "marginal hectare" in preserving species. That is, we considered the effect of such a plot of land in supporting and sustaining endangered species. Taking the estimated effect of an extra hectare of land, we then multiplied it by our estimate of the value of the marginal species to be sustained. This procedure yielded an estimate of only a couple of dollars per hectare for the preservation of even some of the hottest of global biodiversity "hot spots."

Even in some relatively biodiverse regions of the globe these figures might amount to only pennies per hectare. Values on the scale shown in the table might have some small impact on biodiversity preservation incentives in some of the more isolated parts of the regions indicated. Many of these habitats are, however, imperiled by metropolitan expansion; the incentives provided by biodiversity prospecting are negligible in proportion to the pressures for land conversion in these areas.

Estimates of Value and Conservation Strategies

Estimates of value on the margin are important for devising workable conservation strategies. In particular, they raise some serious doubts concerning the efficacy of two popular strategies intended to encourage the conservation of biodiversity.

One of these strategies involves expanding biodiversity prospecting activities with the idea that conservation will follow. The fact that a resource may have a relatively low value on the margin does not imply that the activity in which it is used is not worthwhile: water tends to be relatively cheap, but it is essential to businesses that use it in producing important products and services. By the same token, however, investment in businesses that use water does not necessarily have much effect on the value assigned to this plentiful resource.

Similarly, increasing investment in biodiversity prospecting activities may have some socially desirable effects—the number of new products discovered may, for example, increase—but it is unlikely to increase the value assigned to the marginal species by much. It may be a little too simplistic simply to say that “you can’t get something from nothing,” but attempts to increase the value added in biodiversity prospecting operations is unlikely to have any appreciable effect on conservation incentives. Biodiversity will remain plentiful with respect to the needs of new product research.

A second focus of conservation efforts has been on

the establishment of property rights in biological diversity. The argument here is that when people own a resource with commercial value, they take effective measures to conserve it. Increasing incentives for preservation will be irrelevant, however, if the values generated by protection do not outweigh the costs of forgoing alternative uses of the land. The RFF estimates of value suggest that incentives for conservation would still be negligible even if property rights were perfectly well defined and the owners of a hectare of land were entitled to all benefits arising from the biodiversity prospecting conducted on it.

Prospecting and Preservation

The point of recent RFF research on biodiversity prospecting is *not* that diversity in nature is without value. In fact, the point is almost the opposite.

Biodiversity may be important for any number of commercial, ecological, esthetic, ethical, or even spiritual reasons. However, when it comes to commercial prospecting among natural sources for new products, the value of biodiversity is not as high as some conservationists might suppose. Since that is likely to remain the case, it is important that other, more workable, incentives for conservation be developed. ☞

R. David Simpson is a fellow in RFF's Energy and Natural Resources Division. He is currently writing a book on the economic analysis of biodiversity and ecological systems to be published by RFF.

For an in-depth look at RFF research in this area, see the author's several latest discussion papers, which are available at <http://www.rff.org>. To order hard copies of any of these papers, see instructions on page 22.

- In 96-14, “Investments in Biodiversity Prospecting and Incentives for Conservation,” the author and RFF Senior Fellow Roger A. Sedjo argue that added investments in biodiversity prospecting are unlikely to increase incentives for conservation by much. If a living organism's existence makes a difference in finding a new product, researchers will already have an incentive to invest in it. If the organism's

existence doesn't make a difference, additional investments are unlikely to transform it into something consequential.

- In RFF 96-27, “Valuation of Biodiversity for Use in New Product Research in a Model of Sequential Search,” Simpson and Sedjo describe development of a mathematical model of biodiversity prospecting applied to new product research in the pharmaceutical industry, and a statistical model of optimal search intensity with simultaneous samples. Their results indicate that the sheer numbers involved weaken the argument that biodiversity prospecting generates much economic value.

- In 96-33, “The Social Value of Using Biodiversity in New Pharmaceutical Product Research,” Simpson and 1996 summer intern Amy B. Craft of Stanford University developed a model of competition using pharmaceutical industry data from twenty-three countries. The researchers found that the magnitude of losses from even a catastrophic decline in biodiversity would be negligible when compared with the production of the world economy.
- See also R. David Simpson, Roger A. Sedjo, and John W. Reid, “Valuing Biodiversity for Use in Pharmaceutical Research,” *Journal of Political Economy* 104 (February 1996), 163–185.



INTERVIEW

Sound Science, Sound Energy Policy: A Senator Reflects

Sen. J. Bennett Johnston (D-La.) arrived in Washington in 1973, the year of the first oil crisis. Nearly two decades later, as chairman of the Energy and Natural Resources Committee, he was the principal author of the Energy Policy Act of 1992, generated by another Persian Gulf crisis. He has now retired and, in late November, as his staff was packing up his office, he took the following questions from J. W. Anderson, RFF's journalist in residence.

RFF: On the subject of energy, what do you think the order of priorities ought to be as the administration heads into the second term?

Johnston: Well, clearly the most important thing is electricity restructuring.

RFF: And that got under way—

Johnston: —with the Energy Policy Act of 1992. We provided there for wholesale wheeling [requiring utilities to transmit other companies' power on their lines]. It was a real surprise, I think, to virtually everyone that these competitive markets work so well in electricity. When I came here in 1973 electricity was considered to be a natural monopoly beautifully serving the electric consumer, prices going down every year. It was only through the happenstance of PURPA [the Public Utility Regulatory Policies Act of 1978] that we found out about competitive markets. They would have auctions, you know, when so many utilities would determine avoided cost through competition. That's when we found out about how competitive markets could really reduce costs and still have reliability.

RFF: Is there a future for nuclear power?

Johnston: I believe there will be. The problem is not safety. The problem is

economics. The reactors finished in 1982 took fourteen years to build, and those were years of very high interest rates. So you have outrageously costly reactors. With the new generic designs and with your sites being banked and I'd say something like a five-year time schedule to build a reactor, can they be economically



competitive? My guess is they can. They wouldn't with today's prices of natural gas, but prices will go up over time. In the meantime, I believe, they're going to prove up the viability of nuclear power in Asia, particularly in the PRC [People's Republic of China], and then it will come back to the United States.

To the extent that people are really serious about global warming they must use nuclear power.

RFF: Regulatory reform has been a major issue, particularly in this Congress now ending. Where should we go on that?

Johnston: We should provide for maximum safety and environmental protection, but consistent with sound science. Now the problem has been that they [the administration] have not used sound science. They have been driven by emotion, ignorance, zeal, etc. We see it time and again.

The best news I've heard lately was the study my subcommittee promoted on EMF [electromagnetic fields]. That's the kind of sound science you need.

RFF: This is the issue of power lines?

Johnston: Yes, and they [a commission under the National Research Council] said there is no reasonable evidence of connection between EMF at those levels and cancer. That's what you need to do—have real scientists.

When I proposed the first risk assessment amendment in the Senate—we passed it twice in the Senate in the last Congress—it was done because EPA had come out with a preliminary rule on carbon-14 which was set at one-6300th of the carbon-14 that occurs in the body

naturally or one millionth of background radiation, and it was going to cost \$3 billion to comply with that rule. Now there had been no studies done. They didn't know what it was going to cost. They didn't make a finding about it being harmful to health. They just did it because that's where it had been set previously [in another area]. Frequently one law will say, let's set the radiation standard at the lowest measurable amount and it might be in an area like drinking water which is fairly easy to deal with. And they carry that forward in other cases where it doesn't make any sense, where it does cost a lot of money, and never having in the first instance based the standard on health.

RFF: How seriously should this country be addressing global warming right now?

Johnston: In my view the science is absolutely clear that there are increasing greenhouse gases. That is measurable and increasing rapidly. There is fairly good consensus on temperature increase—with some dissenting voices, but overall pretty good consensus. A large disagreement exists as to what the future will be—whether it will be very bad, or how fast it will accelerate.

All those things being so, I believe we should pursue clearly a no-regrets policy, that is, to do things that make sense anyway—energy efficiency, conservation. We are pursuing those things. But we should be very careful of not getting captured by the agenda crowd, those people who have an agenda of promoting ethanol or whatever and use global warming as their excuse—the same crowd who, if you should ever mention nuclear, will run for the hills. And, as I say, we ought to allow nuclear to be pursued, certainly in China.

Air pollution and greenhouse gas increases are really a big problem in China. With the expenditure of modest sums, you

can get much more payoff in Asia and other developing countries than you can in this country.

RFF: Of all the things you've done in this broad area of energy and the environment, what gives you the most satisfaction as you look back?

Johnston: I think the Energy Policy Act, because that was very broad, covering all aspects of energy. We made almost no compromises with sound policy. It got the competitive market really going in a very big way, allowing American companies to compete abroad with energy projects. The energy efficiency and conservation and renewables part was really quite good.

We should provide for maximum safety and environmental protection, but consistent with sound science.

Energy efficiency and conservation—people expect one big action that's going to lead to revolution. Really, what energy efficiency and conservation amount to is hundreds of little acts pursued assiduously and constantly and then they give a big payoff. That part of our bill was very good. The whole package, I think, was a great one and difficult to pass, and so that gives me the greatest satisfaction.

RFF: In 1973, talk of conservation was anathema in the energy-producing states. Here a senator from Louisiana is the principal author of major legislation getting into all of these areas. Am I right in thinking there's been real political evolution in this country?

Johnston: Yes, there has been political evolution. Also we've learned what's effective. In those silly days of the early energy crisis, for example, they [federal regulators] were turning up the thermostats [to reduce the power used in air conditioning]. Down in New Orleans where it's terribly humid people were sweating and cussing the federal government. They did stupid things like that.

Also at that time, in addition to the silly things like thermostat control, there was control of prices so that in my state producers of both natural gas and oil were being held to artificially low prices.

The one consistent lesson we have learned through all of that is that the market really works. It works very well in energy—electricity, natural gas. There's no oil rationing, the price of oil is very low. Now we have got natural gas deregulation, not only at the wellhead but in the pipelines. The whole system is much more rational and efficient, and serves the consumer much better. ☺



Voluntary Incentives Are No Shortcut to Pollution Abatement

Federal programs designed to convince businesses to reduce pollution voluntarily often have not achieved much beyond good intentions. That's the conclusion Terry Davies, director of RFF's Center for Risk Management, reached after studying five such programs this past fall. Davies and CRM staff members Nicole Darnall, Jan Mazurek, and Kieran McCarthy conducted the study for the Global Environmental Management Initiative (GEMI), a nonprofit group of twenty-five U.S.-based companies interested in corporate environmental improvement efforts.

Believing that voluntary efforts might work better than command-and-control regulations, GEMI tested its premise by asking CRM to evaluate the most prominent of the voluntary federal programs. The Environmental Protection Agency initiatives that CRM looked at were the Common Sense Initiative, the "33/50" Program, Project XL, and the sulfur-dioxide emissions trading program. CRM also reviewed the Occupational Safety and Health Administration's Voluntary Protection Programs.

Instead of finding evidence of a "win-win" situation for regulators and private enterprise, CRM found an effect closer to "null-null." The programs were mostly judged "peripheral" to solving the important problems that contribute to the nation's "badly broken" pollution control regulatory system. From the point of view of industry, CRM judged the incentive programs to be no better. The exception was the sulfur-dioxide emissions trading program, distinctive because it is statute-based and offers participants the chance to save significant money.

To a large extent, the voluntary programs were conceived to work around a system of laws and regulations that is disliked on both sides of the regulatory divide, CRM noted in its report to GEMI. But Davies, et al. came away from their examination more convinced than ever

that no shortcut will be found around the difficult task of legislating a better pollution control system.

"It's difficult to create strong incentives for industry action without legislative change," Davies says. "The SO₂ trading program succeeds because of its statutory base. 33/50 may have succeeded some, too, but that's mostly because so little is required to join the program." Relief from command-and-control regulations will change business behavior, he believes. So will financial incentives, "but probably only Congress or state government has the power to make such incentives work."

Alternatively, consensus might provide the necessary clout. But, unfortunately, nothing close to consensus exists on how to fix the system's shortcomings, despite widespread dissatisfaction with the current legal framework. "Businesses, environmentalists, EPA, the states, and Congress tend to be mutually adversarial," Davies says. Attempts like the voluntary, incentive-based programs that CRM studied for GEMI "do not fare well in the mistrustful atmosphere of pollution control." Without a consensus, a mechanism for negotiating binding compromises is necessary.

"It so happens," Davies elaborates, "that the Founding Fathers provided just such a mechanism in the form of the U.S. legislative system." Redefining legislation need not rule out incentives. In fact, incentives will be more effective if woven into law, Davies notes. Again, a good example is the SO₂ program, where the standards are set by law but industry is given financial incentives to comply in efficient and innovative ways.

For its part, GEMI is not giving up on agency initiatives but does concede that the RFF study shows the need for bolder programs than exist now if incentives are to hold promise. Environmental objectives need to be made clearer and more measurable, and incentives more substantial. Advance program planning is needed to

avoid mistakes and delays from the outset. Follow-through evaluation is needed to critique what an agency program actually offers and to offset the temptation to put a political spin on it.

Federal Incentive-Based Programs

Common Sense Initiative: Establishes a forum for competing interests to develop joint environmental management plans based on industrial function rather than on the specific environmental medium to be protected. **33-50 Program:** Is premised on the notion that giving participants flexibility in their approach would speed the process of meeting the initial goals for which the program was named: a 33-percent reduction by 1992 and a 50-percent reduction by 1995 in the release of seventeen chemicals. **Project XL:** Waives certain EPA requirements when participating facilities demonstrate they can attain better environmental results by not having to comply fully with present laws and regulations. **Sulfur-dioxide emissions trading program:** Permits firms to transfer or sell surplus SO₂ emission allowances to meet the limits under Title IV of the Clean Air Act. **Voluntary Protection Programs:** Reward with fewer inspections firms that already exceed OSHA safety and health workplace standards and aims to encourage others to do the same.

For a full analysis of each program's strengths and weaknesses, see the RFF report "Industry Incentives for Environmental Improvement: Evaluation of U.S. Federal Initiatives," on sale for \$25 from GEMI, 1090 Vermont Avenue, NW, Washington, DC, (tel) 202-296-7449; <http://www.gemi.org>



Walter Spofford Remembered

RFF has lost one of its own. Walter O. Spofford Jr., a senior fellow and director of RFF's Environment and Development Program, died of a heart attack over the Thanksgiving holiday.

If, in the words of one of his colleagues, Walter personified the "spirit of RFF," his name was also closely associated with RFF's China Program, which he helped launch in 1989. Working with Senior Fellow Allen V. Kneese and Chinese scholar Ma Zhong, Spofford oversaw the program's initial project, which involved translating into Chinese fifteen books written by RFF researchers that are seminal in outlining the economic analysis of environmental issues.

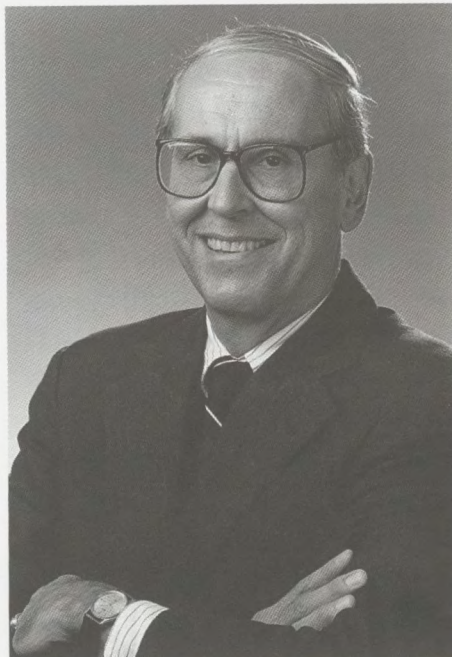
Over the years Spofford worked closely with the World Bank: under his guidance RFF produced the bank's first environmental report on China. His most recent series of reports to the World Bank and other international organizations recounted his research into China's struggle to balance environmental management and economic development. His many visits to that country included teaching stints at Beijing University and Renmin University.

The author of three books and monographs, Spofford wrote hundreds of articles and papers. Of his work, Senior Fellow Michael A. Toman observed that "he wasn't in it for the ego gratification or the academic accomplishment—he did it because it was interesting and important to him."

Although in recent years Spofford's work was devoted primarily to China, his long career in regional environmental

economics and management included extensive research into air and water quality problems in Australia, Egypt, and Korea, as well as places closer to home, such as the Columbia River System and the lower Delaware River Valley.

"Talking to Walter was like talking to Lawrence of Arabia," recalls Jim Boyd, a fellow in the Energy and Natural



Resources Division. "He had that old explorer attitude, with lots of stories of his travels abroad that were always fun to hear."

Spofford first came to RFF in 1968 as a visiting scholar in the Quality of the Environment Division. From 1974 to 1980, he directed that division and continued there as a senior fellow, taking on

directorship of the Environment and Development Program in 1989.

Unlike many of his colleagues at RFF, Spofford was not an economist but an engineer. From Harvard University he earned a master's degree in environmental engineering in 1960 and a Ph.D. in water resources engineering in 1965. He maintained membership in professional affiliations such as the American Society of Civil Engineers and the U.S. National Committee on Scientific Hydrology.

Although Spofford's educational background was unusual at RFF, it was a boon to his research. "He brought a combination of engineering, science, and economic analysis to bear on complex problems in a very systematic way," RFF Vice President—Finance and Administration Edward F. Hand notes. "He was a big thinker but a personable one. He always had time to talk, to share his thoughts, to give advice. He will be missed by me and many of his colleagues."

In a eulogy, RFF President Paul R. Portney said, "Walter Spofford was dedicated to and enormously proud of his wife and three daughters. Nevertheless, he spent long hours at work talking to and improving the work of his colleagues, so that he could also be proud of them and of the institution he and they represented. In the end, he made everyone at RFF proud to say they worked with such a man."



Memorial contributions may be made to the Walter O. Spofford Jr. Memorial Fund c/o Resources for the Future, 1616 P St., NW, Washington, DC 20036.



INSIDE RFF

Palmer on electricity— federally and locally speaking

Federal forum

RFF Fellow Karen L. Palmer is spending six months at the Federal Energy Regulatory Commission's Office of Economic Policy, where she is bringing an outside economist's views to the thinking going on there about greater competition in the electricity industry. As



COURTESY PATRICK DEASON PHOTOGRAPHY

the primary federal regulator of electricity, FERC faces many policy questions raised by industry restructuring to which Palmer has devoted considerable research and analysis. She was a lead author of the RFF primer on electricity deregulation *A Shock to the System*, published last July.

At FERC, Palmer is focusing on the impact and other outcomes of "unbundling" or separating the generation, transmission, and distribution of electricity services traditionally provided by a single electric utility. Eventually, she expects to collaborate with FERC economists to produce a

paper on her findings.

Meanwhile, Palmer is also helping FERC economists evaluate proposals filed by industry players with their own ideas on how to shape a more competitive environment. These ideas include proposals to create "independent system operators"—new entities to operate the transmission grid and to ensure equal access to transmission facilities for all suppliers of electricity.

"I'm getting exposure to how the regulatory process really works," Palmer says, and a new appreciation of the complications that can arise when trying to apply economic theory to the real world.

Palmer will return to RFF in May.

Local forum

Karen Palmer was also tapped to discuss restructuring the electricity industry with the chief administrative officers of the Metropolitan Washington Council of Governments in November. The council's favorable impression of the RFF primer on electricity deregulation prompted the invitation.

In her special briefing, Palmer emphasized issues likely to be of concern to local government, since the council is the federally designated regional planning organization for metropolitan Washington.

For instance, she discussed the potential impact of the industry's restructuring on local tax revenues and electric utility employment, outlining potential business opportunities for

local governments and organizations. She also described the potential impact of restructuring, depending on whether a utility customer is small or large, as well as what the impact might be on the environment and on reliability of service.

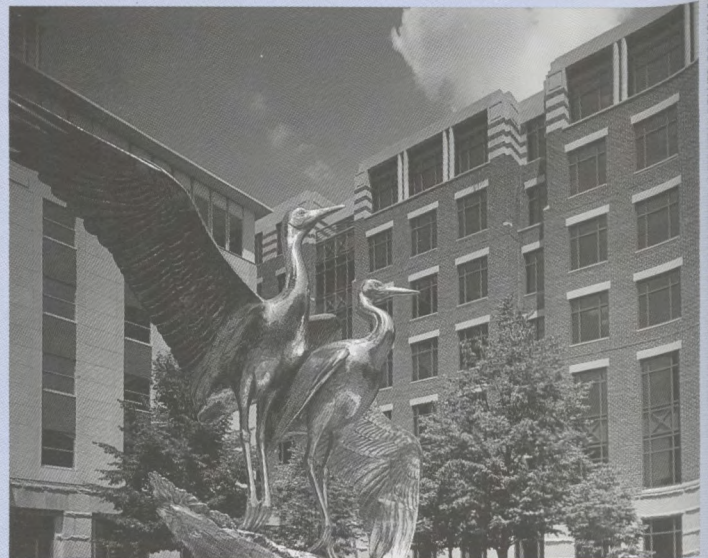
One of the issues that sparked the council's interest in meeting with Palmer was the long-term prospect of including electricity in the mix of energy resources available through the organization's cooperative purchasing program. Member governments already purchase gasoline and oil and other supplies at a discount through the council. And, although retail competition in electricity isn't yet on the horizon in the Washington area, the regional planning council is thinking ahead.

The council's sister organization in the San Francisco Bay Area (the Association of Bay Area Governments, or ABAG)

has a similar cooperative purchasing program for natural gas and plans to start one for electricity as soon as retail access is fully implemented in California. ☰

RFF building selected as national showcase

When RFF and the National Wildlife Federation (NWF) joined forces in 1983 to renovate an existing building and build a new one at a site they owned in Washington, D.C., it was only natural that energy-saving, environmentally friendly technologies would be a high priority. That priority has carried through into the final concept of the 242,150 square-foot complex that stands at Sixteenth and P Streets, N.W. today. Although NWF has since sold its share of the complex to RFF, the Resources and Conservation Center remains a tribute to state-of-the-art technology that makes



COURTESY DAN E. POYUROM, POTOMAC ELECTRIC POWER COMPANY

both good economic and environmental sense, something the two organizations accomplished together.


With its innovative design and subsequent energy upgrades, overall annual energy costs at the center are about \$1.50 per square foot—as compared with the typical cost of \$1.75 for a well-run office building in the Washington metropolitan area.

One of the biggest sources of savings is participation in the Potomac Electric Power Company's Custom Rebate Program. PEPCO offers customers like RFF cash rebates for purchasing and installing technologies that reduce electricity use. By participating in the utility's Early Chiller Retirement Program, for example, the center found a cost-effective way to boost energy efficiency and comply with federal chlorofluorocarbon regulations.

The center replaced its electric chiller with a high-efficiency unit that relies on ozone-friendly refrigerants for a total cost of just under \$94,000. A rebate from PEPCO defrayed more than half that cost. The center's new chiller is expected to reduce peak demand by 88.0 kilowatts annually and thus save about 96,800 kilowatt hours each year. Likewise, the center received a rebate on its complex-wide lighting upgrades that should result in cumulative annual energy savings of more than a million kilowatt hours.

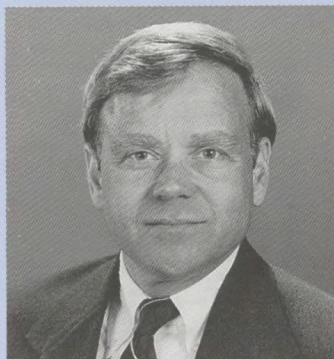
With rebates for all upgrades totaling close to

\$191,000 and cumulative energy cost savings of \$96,000, the payback period for the center's latest conservation measures is just under two years.

In recognition of efforts so far, the U.S. EPA selected the center to be one of fifteen showcase buildings nationwide in its Energy Star Building Program. And Ted Hand, RFF's vice president for finance and administration, received the Fiabci Prix D'Ex-celle for his instrumental role in developing and updating the center's energy-efficient design from the outset. 

Former USDA official is RFF visiting scholar

Michael R. Taylor, one of the country's leading experts on food safety regulation and public health, is spending 1997 at RFF's Center for Risk Management. He will conduct research on regulatory reform and policy issues. He will also be of counsel to the law firm King and Spalding.



A top official in the Food and Drug Administration before moving to the top spot at the U.S. Department of Agriculture's Food Safety and Inspection Service (FSIS), Taylor brings a

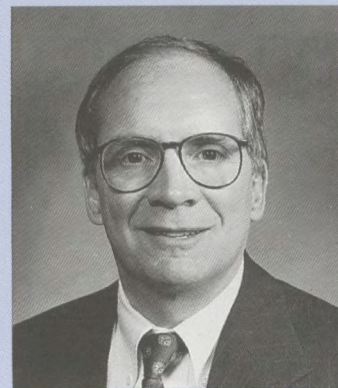
wealth of knowledge and experience to the regulatory reform debate. Until his recent resignation from USDA, he served as both the acting undersecretary for food safety and as administrator of FSIS, an agency of 10,000 employees responsible for ensuring that meat, poultry, and egg products are safe, wholesome, and accurately labeled.

Under Taylor's leadership, USDA moved meat and poultry inspection beyond command-and-control supervision to a system that relies on performance-based standards to prevent hazards to the food supply. As a crusader for reform, Taylor identified over 400 pages of regulations whose elimination or amendment, he argued, would allow inspectors and producers to focus more on food safety. Taylor also increased funding for food safety research, accelerated the review of requests for trials of technologies to improve food safety in meat and poultry plants, and developed public information programs and educational materials about safe food handling.

Luchini joins RFF board

Lawrence U. Luchini, a partner and portfolio manager at Denver Investment Advisors, is the newest member of the RFF board of directors. Luchini brings twenty-eight years of securities market experience to the task of overseeing the management of RFF's endow-


ment. Elected to the board this past fall, Luchini helps to manage more than \$9 billion worth of assets for corporate and public pension plans, charitable and university endowments, and insurance company portfolios at Denver Investment



Advisors. He has been with the firm and its predecessors for the past eighteen years.

Since 1990, Luchini has also served as an adjunct faculty member at Regis University in Denver, where he lectures on investments and portfolio management and heads the faculty team of fundraisers.

Before joining Denver Investment Advisors, Luchini was with National City Corp. in Cleveland, where over the course of a decade he was an analyst, director of research, and, finally, vice president and portfolio manager.

Luchini holds bachelors and masters degrees in economics from Alma College and Northwestern University, respectively. He is a chartered financial analyst and a member of the Association for Investment Management and Research. 



In November, we had our 200,000th visitor to www.rff.org.
So what are we doing to keep you coming back?

First, we have completely overhauled our web page to offer more information that is up to the moment about RFF research and staff. Here are the main entries you'll find on our web page now:

- What's New?
- About RFF
- Books
- Conferences and Workshops

- Discussion Papers
- Educational Seminars
- Employment Opportunities
- Fellowships and Internships
- Press Releases
- Research Briefs, Programs & Reports
- *Resources*, RFF's Quarterly Publication
- RFF on Capitol Hill
- RFF Links

Second, we are tracking our new FTP site to see who's looking for what. That way, we can add more of the kind of information most people want most often.

We've also put RFF's latest discussion papers in PDF format, the most commonly used application to download large documents. These papers contain preliminary findings of research projects for critical comment and evaluation. As always, any comments or suggestions you may have for improving or adding to the site are welcome. Write to us or send us e-mail at tellus@rff.org. We hope you'll visit us soon—and come back again.

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