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Paul R. Portney

Looking Ahead

As I pointed out in a recent issue of *Resources*, it is difficult to predict the environmental issues of the future. Yet that sort of prognostication is critical to the success of an organization like Resources for the Future. Only by anticipating future developments can we illuminate today's debates and ensure that we are ready with answers when new problems arise.

In this issue of *Resources*, we look ahead to identify several key issues the new administration will face once the dust settles from this fall's presidential campaign. As we have done for previous elections, we posed questions on four quite important environmental issues to the Republican and Democratic candidates for president. Their answers, which begin on page 5, show important differences in the way Vice President Gore and Governor Bush think about climate change, the role of benefit-cost calculations in setting air regulations, the future of nuclear energy, and the proper approach for curbing nonpoint sources of water pollution. Our goal is not to tell our readers how to vote, but to help them make better-informed choices when they head to the polls on November 7. My thanks to both the Bush and Gore campaigns for accommodating our request.

In addition to asking the presidential candidates how they will deal with today's pressing environmental concerns, we also present a look at what RFF researchers are doing. This issue features an update on RFF's work in the climate policy arena, which continues to escalate along with negotiations among the nations that have signed, but not yet ratified, the Kyoto Protocol. As with any negotiations, the devil is in the details. RFF's climate experts are working to help fill in those missing details that will ensure countries can meet the challenge of climate change with policies that are as sound environmentally as they are economically.

We also describe an important but often overlooked problem—how to regulate small but heavily polluting businesses in developing countries. Because of their size, such businesses often fail to gain the attention of regulators. And we preview new work by RFF researchers on topics as diverse as investigating new approaches to fighting malaria to evaluating the role of public participation in environmental regulation.

We hope you enjoy this issue of *Resources*, and that it helps you feel better informed when you head to the polls. Be sure to vote, but only once!

Paul R. Portney



RESOURCES FOR THE FUTURE
1616 P Street, NW
Washington, DC 20036-1400
202-328-5000

FAX: 202-939-3460

E-MAIL: day@rff.org

WORLD WIDE WEB:

<http://www.rff.org>

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GOINGS ON

RFF Scholars Studying Influence of Stakeholder Involvement in Environmental Decisionmaking in the United States

Over the past decade, stakeholders—individual citizens, members of advocacy groups, and regulated industry—have come to play an increasingly regular, public role in environmental decisionmaking in this country. Once ignored, stakeholders now routinely offer their views on the structure and direction of regulations and projects at the state and federal levels. There is growing recognition that all sides bring important perspectives to the table, from the birdwatcher worried about habitat loss to the plant engineer seeking a flexible approach to meeting emissions limits.

The U.S. Environmental Protection Agency (EPA), under Administrator Carol Browner, has heavily promoted the growth of public participation in environmental decisionmaking. But now, with several years of experience to draw from, the agency's Science Advisory Board (SAB) is raising questions about whether the inherently "political" nature of such processes may sacrifice substantive quality for political comity. In particular, there is concern that good science will not be used adequately in these processes nor reflected in their decision outcomes.

SAB has been convening a series of workshops on the role of science in stakeholder processes as part of its effort to draft a report for EPA Administrator Browner on the subject. In the second workshop of the series, RFF Fellow Tom Beierle outlined preliminary results from his research on the success of stakeholder processes, focusing on the question of particular importance to the SAB—whether these processes have consistently led to decisions of lesser (or greater) substantive quality.

Beierle, along with RFF researchers Jerry Cayford and David Konisky, analyzed over 240 case studies of stakeholder involvement in environmental decisionmaking in order to identify what value public participation has added to decisionmaking. Approximately 100 attributes of each case were coded, and the data were pooled for quantitative and qualitative analysis.

To a great extent, the studies Beierle reviewed do not consist of high-profile, federal-level decisionmaking, but rather relatively routine cases of planning, management, and implementation activities carried out by environmental and natural resource agencies at many levels of government. The cases reflected an often-misunderstood reality of environmental decisionmaking: namely, that much of it happens at the state and local levels, either through state and local programs or delegated federal programs.

About half of the cases dealt with pollution-related issues, such as environmental cleanup, facility siting, and health assessment, and the other half with natural resource issues, including habitat management and land use planning. Around 80% of the cases dealt with site- or region-specific issues rather than overarching policy questions, and more than half described decisionmaking at the state and local levels.

Little Need for Concern

"Overall, the case study record suggests that there should be little concern that stakeholder processes are resulting in substantively inferior decisions," Beierle told the SAB panel. No matter what criteria are used to measure the substantive

quality of decision, the majority of cases contain evidence of increasing, rather than decreasing, quality, he said. "Even if we narrow the definition of quality to criteria reflecting only the technical and scientific aspects of decisions, there is still evidence—although much less and more indirect—that stakeholder processes are not resulting in inferior decisions. Moreover, it appears that processes that stress consensus score higher on substantive quality measures than those that do not."

The data suggest interesting relationships between the political and technical aspects of stakeholder-based decisionmaking, Beierle said. "It may be that the process of negotiation and consensus seeking actually works to increase the quality and amount of technical information underlying decisions," he said. "Moreover, simply asking how we should measure substantive quality raises interesting questions about what a 'quality' decision is in the first place."

Beierle's research is part of a larger project at RFF on public participation in environmental decisionmaking funded by the National Science Foundation. The larger project looks not just at the question of the substantive quality of decisions, but also at the ability of stakeholder-based processes to educate and inform the public, incorporate public values in decisionmaking, resolve conflict, and build trust. A final report will be issued next year; for more information on RFF's work in this area, visit our Web site, at http://www.rff.org/proj_summaries/99files/davies_envdecmaking.htm.



GOINGS ON

RFF Scholar on World Health Organization Task Force Investigating New Approaches to Fight Malaria

Each year, over 300 million people contract malaria and nearly one million people die from the disease. Malaria, caused by protozoan parasites that develop in the guts of mosquitoes, is mainly confined to Africa, Asia, and Latin America, where the control of malaria transmission and effective treatment is hampered by inadequate health planning and poor socioeconomic conditions.

In the past few years, the situation has become even more severe, as increases in parasites' drug resistance have rendered commonly used antimalarial drugs inef-

fective. However, the use of combinations of antimalarial drugs has shown some success in slowing down pathogenic resistance. Obviously, treatment that combines drugs is more costly than single drug treatment, an issue of particular concern in very poor, rural populations—areas that are also particularly hard-hit by malaria.

To date, little research has been done on the sociological and economic benefits of combination therapy. The World Health Organization (WHO) is working to address this issue, as part of a larger effort to curb the spread of malaria worldwide. RFF Fellow Ramanan Laxminarayan has been serving on the WHO Task Force on Drug Resistance and Policies along with anthropological, medical, and drug procurement experts to widen the understanding of the costs and benefits of combination therapy.

Focus on Artemisinin, Successful Chinese Herbal Remedy

The WHO team is specifically focusing on the use of the drug artemisinin and its derivatives. In Thailand and Vietnam, combining artemisinin and its derivatives with other antimalarial drugs has been effective in accelerating recovery, reducing transmission, and delaying resistance development. Artemisinin has also been used successfully in herbal remedies in China for over 2,000 years. Recently, the U.S. Food and Drug Administration has approved it for the treatment of malaria.

The WHO task force will oversee implementation trials in six countries in Africa. These trials will help assess the effective-

ness of combination therapy in reducing the transmission of malaria and curtailing the evolution of parasite resistance. Further, the trials will help measure the private and social economic benefits and costs of using combination therapy with artemisinin derivatives.

Laxminarayan's specific role on the task force is to oversee the economics component of these trials, which will help determine if these benefits are large enough to justify the associated increase in the cost of treating malaria. He also reviews study proposals and trains workers at specific study sites on the role of economic analysis in making the case for combination therapy.

Editor's Note

In the summer issue of *Resources*, we announced the arrival of Sandra Hoffmann, a new fellow in RFF's Center for Risk Management. Her law school was listed incorrectly; she graduated from the University of Michigan Law School. In the same issue, the article on marine protected areas incorrectly described the IUCN. The acronym stands for the World Conservation Union.

The next issue of *Resources*, Winter 2001, will appear in early January. We'll update you on developments at the upcoming Conference of Parties to the UN Convention on Climate Change (COP-6). We will also preview new work by RFF researchers on biodiversity as a primary land use; the relationship among resource quality, poverty, and population growth in India; and forestry policy.

WHO/TDR/CRUMP



Navrongo Hospital, Ghana: Two young mothers sit with their infant children (who are sick with malaria), holding attendance cards, as they wait for medical attention for their children.



FROM THE CANDIDATES

Gore and Bush Address Key Environmental and Energy Issues

With an eye on the upcoming election, RFF asked the Democratic and Republican presidential candidates to respond to four questions on environmental and energy policy. What follows are the verbatim responses developed by their campaign staffs.

RFF: Should the administrator of the Environmental Protection Agency be allowed to consider costs to regulated parties when setting national air quality standards?

Bush: I believe the EPA should carefully assess both the benefits and costs of each of its air quality standards and then select the standard that best balances benefits and costs at the margin. The EPA's current policy of considering only the benefits, and not the costs, of its air quality standards does not produce the most effective environmental policy and, in the end, it results in the misallocation of our environmental resources.

The current, benefits-only policy also leaves the EPA with too much unaccountable power. For this reason, a federal court held that the agency's standards for ozone and particulate matter—EPA's most ambitious undertaking during the Clinton-Gore Administration—were unconstitutional. That case is now before the U.S. Supreme Court, where more than 40 leading economists and environmental-policy experts have urged that the EPA should consider costs as well as benefits—and do so at the standard-setting phase rather than the enforcement phase. This respected group includes two Nobel Prize winners and all three former chairs of President Clinton's Council of Economic Advisers.

Gore: Al Gore believes that the current approach to regulatory review under Exec-

utive Order 12866 provides for appropriate consideration of the costs and benefits. The process of developing every major regulation should include assessment of the costs of different approaches, comparison of costs and benefits of each option, and identification of alternatives that might achieve public health and environmental protection more cost-effectively.

He also supports expanded use of market mechanisms in lieu of, or in addition



to, the more traditional approach of standard setting through regulation. The administration's climate change technology initiative, and his proposal for a national energy security and environmental trust fund, would establish a wide range of market incentives to address the threat of global climate change and other environmental challenges we will face in the coming century.

Al Gore believes that there is also room to improve the analysis of costs and benefits that the current regulatory review produces. For example, there is substantial evidence that costs of compliance often are far lower than predicted when regulatory standards are developed because of the pace of technological change. The methods and data available to assess the public health and environmental benefits of regulation are quite limited, presenting the risk that we may fail to take actions that are cost-justified. Critical attention to these areas offers greater promise for improved consideration of cost in regulatory decisionmaking.

RFF: What role should nuclear power play in meeting the nation's growing electricity needs?

Bush: Nuclear power is a vital part of our nation's energy supply mix, currently supplying over 20% of our country's electric needs without polluting the air. The New Economy is increasingly placing a heavy burden on our electric generation capabilities, at the same time that we are trying to limit emissions and keep the air cleaner. Today, we are importing 56% of oil requirements. Therefore, it is imperative that we cultivate and protect clean, domestic energy sources. Nuclear power must continue to play an important role if we are to meet the energy requirements of the New Economy and the air quality that Americans rightly demand.

More broadly, our country desperately



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needs a comprehensive energy policy, one that reflects the realities of our energy consumption as well as our policy goals for the future. Our dependence on foreign oil concerns me. We currently import 56% of our petroleum needs—up from 50% in 1993—and Iraq is our fastest growing oil supplier. We need to encourage domestic exploration for oil and natural gas and reduce our dependence on foreign supplies. Nuclear power must continue to thrive. We should also develop alternative sources of energy, and the government should focus on basic science to support growing these resources. Government should not be picking corporate and technology winners and losers, however. That is a throwback to the Carter era of command-control energy policy, which had disastrous results.

Gore: Al Gore does not support an increased reliance on nuclear power for electricity generation. However, as long as nuclear power plants meet federal health and safety regulations, decisions about constructing new plants should be left to public utility commissions and private investors. Given current economies of power generation, however, he would not expect that utilities constructing additional generating capacity would choose nuclear power. Furthermore, he strongly supports efforts to limit the need for additional power generation through energy efficiency and to use the appropriate mix of regulation and incentives to ensure that utilities constructing new capacity choose generating sources with the least environmental impact.

We must also recognize that both our economic and environmental goals require a vision of the future that does not simply assume ever-expanding consumption of

fossil fuels and an ever-growing base of centralized power generation. That future requires a smooth transition to an energy system that meets our needs without overheating the planet. Proposals for restructuring and deregulating the electric power industry present an opportunity to help create this future.

RFF: Most experts agree that if the United States is to significantly reduce its emissions of carbon dioxide, the prices of gasoline, home heating oil, natural gas, and electricity (at least that derived from oil, natural gas, or coal) will have to rise. Will you support policy measures that will have this effect?

Bush: I oppose policies like the Kyoto Protocol that would drastically increase the cost of gasoline, home heating oil, natural gas, and electricity. That treaty would impose high and unfair costs on the U.S. economy without protecting the climate. That's why there is strong bipartisan opposition to it.

The Kyoto Protocol is ineffective, inadequate, and unfair to America because it exempts 80% of the world from compliance, including major population centers such as China and India. As president, I will work for a comprehensive, fair, and effective agreement—one in which developing nations are full partners, new technology is central, and the power of the marketplace is harnessed. I believe reductions in global pollution through market-based mechanisms, such as the use of appropriately structured pollution credit trading, has worked in the past and can work in the future.

In addition, my administration will provide incentives—not roadblocks—for states to effectively deregulate their electric



and natural gas markets. Deregulation will increase competition and foster innovation, leading to lower prices and better customer service. America must work with businesses and other nations to develop new technologies to reduce harmful emissions. I support investing in technologies that rely on clean, abundant, renewable energy sources, as well as the development of cleaner cars and cleaner-burning fuels and alternative sources of fuel and new fuel alternatives.

I believe that natural gas will play an important role in helping America reduce its dangerous dependence on foreign oil and meet its energy needs in the 21st century. Because natural gas is hemispheric in nature, it's not subject to global supply disruptions. It is also environmentally friendly, releasing fewer greenhouse gases and criteria pollutants per energy unit than other fossil fuels. In addition, a majority of incremental electric generation under construction is gas-fired, providing an important role in electric deregulation efforts nationwide.

The federal government can encourage the use of cleaner fuels by working with

companies seeking long-term, “green energy” solutions. As president, I will set high environmental standards and clear environmental expectations. I will tear down regulatory barriers to innovation and provide market-based incentives to develop new technologies so Americans can meet—and exceed—those standards.

One of the best ways to encourage clean, efficient, and affordable energy technologies is the R&D tax credit. I will make the R&D tax credit permanent, which will increase private sector innovation, boost productivity, and create more jobs. A recent study found that a permanent tax credit would generate \$41 billion more in new R&D spending over 13 years and provide a 31% return on investment.

Finally, the federal government can serve as a model for the private sector by committing to greater energy efficiency in its own operations.

Gore: Al Gore has realistic, practical proposals to offer Americans secure energy, without higher costs. His National Energy Security and Environment Trust Fund would use market-based mechanisms to help consumers purchase energy-efficient items ranging from appliances, to vehicles, to homes. Here’s how:

Tax Credit for Solar Energy Systems: Under current law, a 10% investment tax credit is provided to homes and/or businesses for qualifying equipment that uses solar energy to generate electricity, to heat hot water, or to provide solar process heat. Al Gore is proposing to expand this tax credit. Under this proposal, the credit would be equal to 20% of qualified investment up to a maximum of \$1,000 for solar water heating systems and \$2,000 for rooftop photovoltaic systems

Consumer Tax Credits for Clean Power: In

some states consumers have the option to choose cleaner energy sources. However, utilities often charge a higher rate for these cleaner sources of energy. To ensure that individuals and families have a real choice of energy sources, Al Gore is proposing to provide a tax credit that would partially reimburse consumers on a per-kilowatt-hour basis, for the cost of purchasing a cleaner energy alternative. This credit would phase out in 2010.

Assistance to State and Local Government Efforts to Help Families and Businesses Cut Energy Bills and Save Money: Some 20 states have launched efforts aimed at helping families and businesses cut their energy bills by reducing their energy use. The Clinton-Gore Administration has proposed a fund to match state investments in electric energy efficiency dollar for dollar. In addition, Al Gore will provide additional resources to support natural gas, fuel, oil, and liquid propane gas users.

Assistance to Communities that Come Together to Solve Environmental Problems: Using the highly successful empowerment zone legislation as a model, Al Gore will create a competition to provide \$100 million in financial incentives to each of 20 communities that develop comprehensive strategic plans to reduce pollution and greenhouse gas emissions, while promoting economic development and jobs. One of the goals of this initiative will be to bring together industry, local organizations, and governments in order to address the unique environmental and energy needs of each community.

Al Gore supports measures to increase America’s capacity to generate and distribute power cleanly and reliably. His plan would:

Extend and Modify the Tax Credit for Producing Electricity from Renewable and

Alternative Sources: Al Gore supports tax credits to help make electricity products produced from energy products that produce virtually no greenhouse emissions (i.e., wind, biomass, and landfill methane).

Provide Tax Incentives to Encourage Distributed Power: Distributed power technologies can be more energy efficient and generate fewer greenhouse gases than conventional electrical generation methods. Al Gore is proposing to provide accelerated depreciation for distributed power property. This proposal costs \$1 billion over 10 years.

Establish Standards and Upgrade Infrastructure to Ensure the Reliability of the Electricity System: Al Gore supports legislation that would create an organization to adopt mandatory standards and penalties for any utilities that endanger the reliability of the power system. He also supports providing financial support to owners of electricity transmission infrastructure who upgrade their plants and avoid losses of power that take place during transmission.

Increase the Supply of Gas for Electricity Generation: The current administration has supported a successful policy in the western part of the Gulf of Mexico to promote expanded exploration of natural gas. This program involves economic incentives for exploration and will expire in November 2000. Al Gore supports legislation extending the program beyond November 2000.

Al Gore would propose legislation which offers a menu of financial mechanisms such as tax incentives, loans, grants, bonds, or other financial instruments to those power plants and industries that come forward with projects that promise to dramatically reduce climate and health-threatening pollution.

Financial assistance will be competitively based, with assistance going to those



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plans that are most likely to produce the greatest pollution reductions for the least cost.

Spurring Private Investment in New and Innovative Technologies: Al Gore will provide incentives to encourage the private sector to identify and support innovative energy and transport-related technologies that: (1) have promise in reducing pollution and bolstering energy security, but (2) are not yet commercially viable. His plan will reduce dependence on unreliable imported oil by increasing the use of domestic energy and transportation technology that could help reduce pollution. The plan would expand investment in the Small Business Innovation Research Program (SBIR) and the Advance Technology Program (ATP). It would target these increases in order to provide businesses with incentives to both develop new energy-efficient, environmental technologies and to put them in the marketplace.

RFF: Agricultural runoff is the major source of water pollution in many parts of the country. Should we impose mandatory controls on this form of water pollution, as we have with both municipal and industrial sources?

Bush: I believe we need to make greater progress in cleaning America's rivers, lakes, and drinking water supplies. Recent fig-

ures confirm that nonpoint-source pollution accounts for more than half of the remaining water pollutants. But our current command-and-control approach to point-source pollution is poorly suited to addressing water pollution caused by agricultural runoff.

Successfully addressing agricultural runoff will require high federal standards based on the best science and a focus on achieving real improvements in water quality. Citizens and localities should be given the resources, the flexibility, and the incentives to get the job done. We must also significantly improve the quantity and quality of information to support these changes. Better information is essential for determining whether our efforts are having the desired results. Above all, we need to unleash and reward technological innovation. To this end, the states, with EPA support, need to provide incentives for farmers to innovate and develop the best management practices to reduce runoff.

Indeed this is already happening. Some farmers are now using tractors equipped with computers that give precise information about soil moisture and content so they can tailor fertilizer applications according to need. This precision agriculture can improve yields while dramatically reducing the use of agricultural chemicals. Several states have begun to work with the farming community and conservation

groups to develop a list of best practices that reduce agricultural runoff while preserving profitable farming.

Gore: The process of developing total maximum daily loads (TMDLs) under the Clean Water Act has to be tailored to the impairments at issue on individual stream segments. The administration has made clear that discharges from the very largest livestock operations must be permitted under the law. For smaller agricultural operations and other sources of "nonpoint-source pollution," a voluntary approach—providing resources and support to farmers and ranchers adopting best management practices to control polluted runoff—can meet the goals of the TMDL program as long as those voluntary measures provide "reasonable assurance that TMDL goals will be met."



Small Is Not Necessarily Beautiful

Coping with Dirty Microenterprises in Developing Countries

Allen Blackman

Urban clusters of small firms in developing countries can generate enormous amounts of pollution. To control it, policymakers have a number of practical, if unconventional, strategies at their disposal.

Sizable cities in developing countries typically host thousands of small manufacturers engaged in pollution-intensive activities such as leather tanning, metalworking, ceramics, textiles, and food processing. Collectively, these firms, which are often located in poor, densely populated neighborhoods, can have devastating environmental impacts. Nevertheless, pollution control efforts in developing countries have generally focused on large industrial sources. This bias stems in part from an enduring misperception that small-scale sources are relatively unimportant. It also is a matter of practicality—small firms are difficult to regulate by conventional means. Numerous, cash-strapped, and frequently unlicensed, they are often hard for regulators to identify, much less monitor and sanction.

Yet recent RFF case studies of small-scale brick kilns and leather tanneries in Mexico demonstrate not only that cutting small manufacturers' pollution yields large benefits, but also that the barriers to pollution control are far from insurmountable. Policymakers have at their disposal a number of cost-effective and practical—if unconventional—pollution control strategies.

Brick Kilns in Ciudad Juárez

In Mexico, small-scale traditional brick kilns fired with cheap, highly polluting fuels like scrap wood, plastic refuse, and used tires are notorious sources of urban air pollution. Ciudad Juárez—a sprawling industrial city on the U.S.-Mexico border with some of the worst air pollution in North America—is home to approximately 350 such kilns clustered in eight brickyards.

A study of the benefits and costs of controlling emissions of particulate matter smaller than 10 microns (PM10)—a pollutant responsible for a large share of the noncarcinogenic adverse health impacts from air pollution—clearly demonstrates that the Ciudad Juárez's brick kilns inflict significant harm. Because these kilns do not have smokestacks, over 90% of their PM10 emissions are deposited less than a third of a mile away, a critical problem since most kilns are situated in residential neighborhoods. Thus, the kilns are partly responsible for over a dozen cases of premature mortality and hundreds of cases of respiratory illness each year in that city (see Table 1), damages that are valued at between \$20 mil-

lion and \$90 million. By contrast, the annual cost of pollution control programs that would virtually eliminate these impacts is estimated at less than \$300,000.

Although brick kilns are widely recognized to be a leading source of air pollution in Ciudad Juárez and its sister city, El Paso, Texas, a number of factors make it politically difficult to require brickmakers to bear the full costs of pollution control: brickmaking provides over 2,000 jobs, most brickmakers are impoverished (profits per kiln average \$100 per month), and most belong to a trade association or other local organization that can lobby against pollution control efforts.

Despite these obstacles, efforts to control brick kiln emissions had considerable success in the early 1990s. In 1989, the municipal environmental authority initiated a “clean technology” project aimed at substituting propane for dirty fuels. The next year, the propane initiative was handed off to the *Federación Mexicana de Asociaciones Privadas de Salud y Desarrollo Comunitario* (FEMAP), a private, nonprofit social services organization. FEMAP was able to attract considerable funding and participants from both sides of the border including local propane companies, universities, and Los Alamos National Laboratory in New Mexico.

Leaders of the propane initiative used a number of carrots and sticks to encourage participation. First, they subsidized various costs associated with adopting propane. Mexican propane companies provided most of the requisite equipment and training free of charge. To make propane more attractive, despite the fact that it was more expensive than traditional fuels, engineers at Los Alamos National Laboratories designed new energy-effi-

cient kilns. Unfortunately these kilns proved prohibitively expensive and complicated.

Second, the initiative’s leaders worked to ratchet up pressures on brickmakers to adopt propane. Most importantly, they convinced brickmaker trade unions in several brickyards to prohibit their members from using dirty fuels. Also, the city government banned the use of particularly dirty fuels and set up a telephone hotline to register complaints about brickmakers violating the ban. Enforcement teams with the power to jail and fine violators were dispatched in response to complaints.

Third, FEMAP initiated an educational campaign to raise brickmakers’ awareness of the health hazards associated with dirty fuels. Finally, project leaders tried to reduce competitive pressures for brickmakers to use cheap dirty fuels by organizing a boycott of bricks fired with dirty fuels. However, the boycott was quickly undone by rampant cheating.

By the end of 1993, over half of the Ciudad Juárez brickmakers were using propane. Unfortunately, this success proved short-lived. In the early 1990s, as part of a nationwide economic liberalization program, the federal government was phasing out long-standing propane subsidies. As propane prices continued to rise in 1994, propane users switched back to dirty fuels. By 1995, only a handful of brickmakers were still using propane. However, the propane initiative has had some lasting impacts: local organizations and city officials continue to enforce a ban on particularly dirty fuels such as tires and plastics.

Leather Tanneries in León

The city of León in north-central Mexico produces about two-

Table 1: Estimated annual health effects of PM10 emissions from traditional brick kilns in Ciudad Juárez (number of cases above baseline = zero kiln emissions; mean values and 95% confidence intervals)

Health endpoint (number of cases)	Ciudad Juárez			El Paso		
	Low	Mean	High	Low	Mean	High
Mortality	2.5	14.1	31.0	0.5	2.6	5.8
Respiratory hospital admissions	0	262	770	0	37	107
Emergency room visits	0	607	1,719	0	85	240
Work loss days	0	3,216	8,500	0	448	1,185
Adult respiratory symptom days	91,610	376,600	794,000	14,430	59,300	125,000
Adult restricted activity days	2,704	138,000	349,100	377	19,240	48,670
Asthma attacks	180	42,680	108,600	25	5,950	15,130
Children's chronic bronchitis	0	1,637	4,416	0	184	497
Children's chronic cough	0	1,878	5,017	0	211	564
Adult chronic bronchitis	0	93	242	0	15	38

(Source: Blackman, Newbold, Shih, and Cook 2000)

thirds of the country's leather. Of the 1,200 tanneries in the city, about half employ fewer than 20 workers. Virtually all of León's tanneries dump untreated toxic effluents directly into municipal sewers where they flow untreated into the Turbio River. The resulting pollution has contaminated ground water, destroyed irrigated agricultural land, and caused serious health problems. Regulations governing water pollution have been on the books for decades, but most are simply not enforced. By all accounts, the main reason is that, as one of the city's principal employers, tanners have considerable political power.

Concerted efforts to control pollution from tanneries in León began in 1986. Tannery representatives signed a *convenio* (voluntary agreement) with regulators in which they agreed to comply with written regulations within four years. But when it became apparent in 1990 that the tanners had not taken any action, they were given a second four-year grace period. At the end of this second grace period, tanneries still had made no progress, so they were granted yet another grace period. This cycle has continued until today.

In addition to the succession of *convenios*, there has also been an attempt to control pollution by relocating the tanneries. In the early 1990s, the city built the infrastructure for a tannery industrial park with a common wastewater treatment facility. Tanners were required to purchase land and build new facilities in the park. In consideration, they were to be provided with subsidized loans and tax credits. However, tanners ultimately refused to foot these costs, and today the industrial park stands empty.

Perhaps the most successful means of controlling tannery emissions in León has been the largely voluntary adoption of clean tanning technologies, including sedimentation tanks, that allow particulate matter to settle out of waste streams; low-chemical tanning recipes; enzymes that substitute for sulfur compounds used to rid hides of hair; recycling tanning baths; and chrome recovery. Estimates of the percentage of tanneries using these technologies range from 90% for sedimentation tanks, which are required by law (this law appears to be enforced), to less than 5% for chrome recovery.

In view of the proven political and economic constraints on relocation and conventional regulation, clean technologies currently represent the best hope for controlling tannery pollution. To assess the barriers to and incentives for adoption of clean technologies, a team of researchers from RFF and the University of Guanajuato in Mexico recently administered a detailed



Typical traditional Mexican brick kiln.

survey to the owners and managers of about 170 tanneries. Preliminary analysis of the survey data suggests that for most technologies, firm size is not determinative: small tanneries are just as likely to adopt cleaner methods as large ones. Rather, access to information about the technology as well as the education of tannery managers appears to be critical. Many clean technologies are simply not well known or well understood by tanners. Surprisingly, key sources of information and assistance are private sector entities, including chemical supply companies, fellow tanners, and the tannery trade associations.

Another finding is that adopters of certain technologies tend to be spatially clustered, suggesting that demonstration effects are important. In the case of one technology—sedimentation



Brickmaker throws a tire into a kiln.

tanks—laws requiring installation are clearly driving adoption. Finally, even though most of these technologies lower materials costs (and sometimes labor costs), several entail significant set-up costs that act as a significant barrier to adoption.

Lessons Learned

Political constraints. In both Ciudad Juárez and León, city regulatory authorities have been able to enforce regulations that impose minimal costs on polluters. For example in León, they have compelled tanneries to install sedimentation tanks. But they have not been able to consistently enforce more burdensome regulations. A key reason is that brickmakers in Ciudad Juárez and tanners in León are numerous and well-organized and, as

a result, have the power to block enforcement. In general, when dealing with severe pollution problems created by small firms, political considerations are likely to be quite important, if not paramount. Severe pollution problems arise when small polluters are numerous, and when polluters are numerous, they are bound to have political power. Consequently, unless the victims of small manufacturers' pollution can be galvanized into action, successful policies will need to accommodate polluters' concerns about the costs of pollution control.

Informal regulation. The case studies suggest that so-called "informal" regulation—pressure generated by private sector actors that have day-to-day contact with polluters—is probably the most important ingredient of a successful pollution control program for small firms. In Ciudad Juárez, brickmakers trade unions played a critical role in promoting propane by enforcing prohibitions on the use of traditional fuels in some brickyards. Also, citizen complaints facilitated enforcement of a municipal ban on dirty fuels. In León, pollution control efforts have been stymied by the absence of such private sector pressure.

There are a number of explanations for the lack of informal regulation in León. Most households in the city depend on the leather industry for their livelihood so it is difficult to generate public support for measures that raise tanners' production costs. Also, tannery emissions are less noticeable than those of brick kilns, and their health and environmental impacts are less immediate. Hence, informal regulation would seem to be easier to generate when polluters are not the mainstay of the local economy and when emissions are easy to detect and have immediate adverse health impacts.

Clean technological change. Given the barriers to regulating small firms by conventional means, clean technological change represents a particularly promising pollution control strategy. In both cities, technical assistance spurred clean technology adoption, and in Ciudad Juárez, a campaign to educate brickmakers about the health impacts of dirty fuels also appears to have had some impact. Surprisingly, both case studies suggest that private-sector organizations, such as equipment suppliers and trade associations, can be the principal purveyors of technical information, an encouraging prospect given chronic constraints on resources available for public sector initiatives.

The Ciudad Juárez case study also demonstrates that clean technologies need not be "win-win" propositions; that is, they need not reduce production costs as well as polluting emissions. The majority of brickmakers adopted propane and continued

to use it for over a year even though it significantly increased production costs. Part of the explanation may have to do with the interplay between competition and informal regulation. The market for bricks is highly competitive, and as a result, brickmakers that use high-cost clean fuels are liable to be undercut by competitors using dirty fuels. Thus, competition in the market for bricks discouraged adoption initially. But once diffusion has progressed past a certain stage, competition appears to have worked *in favor* of adoption because those who had adopted have an incentive to ensure that their competitors adopt as well. Moreover, adopters generally had some leverage over competitors who were neighbors and/or fellow union members. As a result, once an initial cadre of brickmakers adopted, neighbors and fellow union members quickly followed suit. This suggests that if a critical mass of small firms can be convinced by hook or by crook to adopt a cost-increasing clean technology, eventually diffusion can become self-perpetuating.

Finally, the failure of efforts to successfully diffuse costly, complicated energy-efficient kilns in Ciudad Juárez demonstrates the well-established principle that in developing countries, new technologies must be appropriate, that is, both affordable and consistent with existing levels of technology.

The promise of private-sector-led environmental initiatives. The relatively successful Ciudad Juárez experience suggests that private-sector-led initiatives hold considerable promise as a means of addressing small-firm pollution problems. These initiatives would seem to enjoy a number of advantages over state-run programs. First, the willingness of the majority of the Ciudad Juárez brickmakers to cooperate with the project suggests that private-sector-led initiatives may be best suited to engage unlicensed firms that, by their nature, are bound to be wary of sustained contact with regulatory authorities. Second, the public enthusiasm that the propane initiative generated suggests that private-sector-led projects may be able to draw more freely on public sympathy for environmentalism than top-down bureaucratic initiatives. And finally, the projects' success at consensus

building among a diverse set of stakeholders suggests that private-sector-led initiatives may be better able to sidestep the politics and bureaucracy that often plague public-sector-led initiatives.

By contrast, the León efforts to establish *convenios* have been rife with such problems. The qualified success of the propane initiative, however, does not imply that small-scale pollution problems are best left to private sector organizers. In all likelihood, the propane initiative would not have had as much success without unusually strong public sector support.

Boycotts. In Ciudad Juárez, the attempt to organize a boycott of the brickmakers still using dirty fuels was an utter failure. Buyers simply continued to buy bricks from whoever was selling at the best price. This experience suggests that in most cases, contravening market forces—especially in informal or lightly regulated markets—simply does not work. Monitoring is too difficult and cheating is too easy.

Allen Blackman is a fellow in RFF's Quality of the Environment Division. Funding for this research was provided by the Tinker Foundation.

Further Reading

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Limiting Cost, Assuring Effort, and Encouraging Ratification

RFF Researchers Work to Improve the Kyoto Protocol

Dan Quinn

Perhaps no issue threatens to derail ratification of the Kyoto Protocol more than uncertainty over what it will cost to implement. Estimates of the economic impact of Kyoto vary widely. Some claim it will bring economic ruin, while others believe new technology and important details of the treaty that are still in negotiation will help cushion the blow.

The United States joined with 158 countries in signing the agreement negotiated in Kyoto, Japan, in 1997, but it has not yet been submitted to the U.S. Senate for ratification. Because the decision to ratify the Kyoto Protocol is ultimately a political one, this uncertainty over costs creates a major barrier to its coming into force, according to several RFF researchers. Politicians can design cap-and-trade policies that guarantee the required reductions but such policies may lead to unexpectedly—and perhaps unacceptably—high compliance costs. Or politicians can design domestic policies that limit compliance costs but fail to guarantee the reductions required by the Kyoto Protocol with complete certainty.

To help clear up this uncertainty, RFF researchers Raymond Kopp, Richard Morgenstern, and William Pizer have crafted a new proposal designed to limit the costs of compliance while at the same time providing a transparent and reliable way of tracking whether countries have met their commitments. The proposal was formally unveiled at a workshop RFF co-sponsored in Paris, which was attended by representatives of industrialized and developing countries from four continents. The proposal

will be the subject of further discussions leading up to the critical Sixth Conference of Parties (COP-6) to the UN Convention on Climate Change, which will be held in The Hague in November.

Filling in the Details on Compliance

To understand the Kopp-Morgenstern-Pizer proposal, one must first realize that the details of the Kyoto agreement are still a work in progress. Parties to the agreement have committed to annual limits on greenhouse gas emissions beginning in 2008 (7% below 1990 levels in the case of the United States). But they have yet to agree on important details like how emission allowances can be traded among countries, how emission reductions in developing countries will be counted, how land-use changes and reductions of noncarbon greenhouse gases will be counted, how the parties will determine whether a country has complied, or what will be done to deal with countries not in compliance.

On the subject of compliance the agreement is particularly silent, saying only, “The Conference of the Parties shall... approve appropriate and effective procedures and

mechanisms to determine and to address cases of noncompliance with the provisions of this Protocol.”

The Kopp-Morgenstern-Pizer proposal fills in the details of what this compliance regime would look like and provides assurance about the maximum amount that complying with the Protocol will cost. Here's how it would work. Imagine it is 2012, the treaty has been ratified and is in force, and we find ourselves at the end of the first commitment period. Some countries have either met their emissions targets or obtained additional allowances to cover their excess emissions; others have simply fallen short of their targets.

Under the Kopp-Morgenstern-Pizer proposal, countries that do not meet their emission commitments at the end of the first period would have two options in order to remain in compliance: they can purchase additional permits on the international market at the prevailing market price (whatever that will be), or they can pay a fixed fee per ton of greenhouse gas emissions on all tons in excess of their emission allowance. If this fee were \$50 for example, a country that exceeded its target by a million tons would have the option of paying \$50 million to remain in compliance. That \$50 million would then be used to purchase additional emission reductions from other countries in the future.

The proposal specifically limits costs by providing a fixed-price alternative to the possibly high cost of domestic emission reductions or uncertain prices on the international permit market. Because countries can choose to make the voluntary compliance payment on their excess emissions, no country would be obliged to spend more than the established amount to meet its target and remain in compliance.

Kopp, Morgenstern, and Pizer propose the voluntary compliance payment be set close to \$50 per ton of carbon of greenhouse gases, but the exact charge would be negotiated among participating countries. The actual, agreed-upon level is critical to the proposal's success, they caution. A high payment may not provide a useful compliance alternative. A low payment, on the other hand, may lead some countries to put forth less domestic effort to reduce emissions than the consensus believes is necessary.

The RFF researchers' proposal sets in place incentives that encourage countries to meet the Kyoto goals based on their own self interest by providing a financial reward to those countries that identify and undertake emission reductions that are less costly than the voluntary compliance payment. Consider the earlier example of the country that exceeded its target by one million tons. The country could pay \$50 million to remain in compli-

ance. But if additional domestic reductions are available for \$20 per ton, the country could save \$30 million by pursuing them and avoiding the compliance payment or the need to enter the international permit market. Furthermore, by using the revenues from the compliance payments to reduce emissions in other countries, it is assured that these payments are used to either reduce emissions at home or abroad.

Perhaps most importantly, the proposal puts a ceiling on the overall cost of complying with Kyoto (total emissions multiplied by the agreed-upon permit price), which Kopp, Morgenstern, and Pizer believe could help ease the fears about the economic effects of the Protocol.

International Reactions

Reaching international consensus on the Kopp-Morgenstern-Pizer proposal will likely require compromises, participants at the June workshop said. The first potential sticking point, as noted above, is in setting the appropriate price for permits. Another potential barrier is the notion that by allowing non-complying countries to buy more permits, the proposal could allow more greenhouse gases than the original signers of Kyoto had in mind.

In response, the RFF researchers said that by providing a stronger case for ratifying the Protocol, the proposal's overall benefits outweigh the effects of what is likely to be a modest increase of emissions introduced into the system. Further, providing an incentive for countries to implement strong domestic actions could go a long way in achieving the Protocol's goal that countries pursue strong domestic policies while also seeking international opportunities to reduce emissions. Other participants suggested that the Kopp-Morgenstern-Pizer proposal would reduce the pressure to make generous use of all flexibility mechanisms, specifically the controversial use of carbon "sinks" or "hot air" in the first budget period. (The oceans and forests function as sinks, capturing carbon and keeping it out of the atmosphere. Hot air reductions in greenhouse gases result from economic collapse in places like the former Soviet Union, not international efforts to curb emissions.) This move might have the effect of increasing the overall environmental integrity of the Protocol.

For more information on the Kopp-Morgenstern-Pizer proposal, visit *WeatherVane*, RFF's climate change policy Web site, at <http://www.weatherwane.rff.org/features/parisconf0721/KMP-RFF-CIRED.pdf>.

Dan Quinn is RFF's public affairs manager as well as the managing editor of *WeatherVane*.



Catching Up With Hans Landsberg

RFF will soon mark its 50th anniversary, and so it is an appropriate time to acknowledge the contributions of some of our distinguished scholars and listen to their perspectives on current policy issues. This year marks the 40th anniversary of Hans Landsberg's association with RFF. Now a senior fellow emeritus in RFF's Energy and Natural Resources Division, Landsberg's work has focused on the economics of energy, minerals, and agriculture. The co-author of over 20 books and the author of dozens of articles, he is noted for his entertaining, accessible writing style.

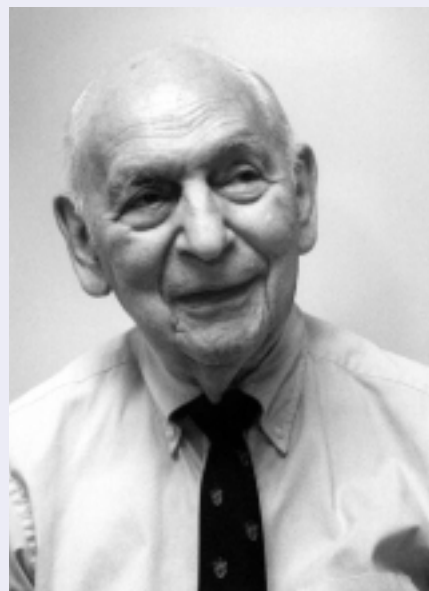
Landsberg built his career during turbulent times. Born in 1913 in East Prussia, he spent much of his childhood in Berlin. Following Hitler's rise to power, Landsberg was forced to leave Germany in 1933. He moved to London and received a bachelor's degree in economics from the London School of Economics in 1936. After emigrating to the United States, he served on a research team at the National Bureau of Economic Research and received a master's degree in economics from Columbia University. During World War II, he was a U.S. Army officer assigned to the Office of Strategic Services. In the 1950s, he worked as a consulting economist and served on the staff of the Office of the Economic Adviser to the Israeli Government.

Landsberg joined RFF in 1960, as the director of the Resource Appraisals Program, at a time when the organization was focusing much of its attention on the availability of key natural resources, notably energy and minerals. One of the major products of those early years was the 1963 publication of *Resources in America's Future*, written with Leonard Fischman and Joseph Fischer, a 1,000-page reconnaissance and long-term projection of requirements and availability of energy, nonfuel minerals, water, land, crops, and numerous industrial materials. Over the next several

decades, Landsberg, like many of his RFF colleagues, focused on rising concerns with economic growth in its link to natural resource requirements and environmental quality.

In a recent interview with *Resources*, Landsberg covered a broad range of energy

SYLVIA JOHNSON PHOTOGRAPHY



issues. Perhaps the most common mistake that politicians make is to consider energy policy as something distinct from other aspects of the economy, he said. When Republican presidential candidate George W. Bush said, perhaps unwittingly, that the current administration has no energy pol-

icy, he was stating a necessary truth, Landsberg said. No such thing as a narrowly defined "energy policy" is possible, since a whole welter of energy issues interconnects with a range of other public policy objectives, from environmental goals to protection of low-income households against high heating oil prices.

Landsberg didn't spare the Democratic candidate, saying Gore seems not always to appreciate that environmental progress must sometimes be judged against other things that must be given up.

Both candidates deserve some credit for not falling for easy solutions, Landsberg said. (See the article on p. 5 for a more detailed look at their perspectives on various environmental and energy-related issues.) Politicians in years past have tended to look for "boutique," backstop technologies—such as shale oil, coal gasification, and tar sands—to help the country solve its energy problems, Landsberg said. In spite of high expectations, few of these approaches have proven to be cost-effective, he said.

These days, other energy technologies are headed for backstop status, Landsberg said. While its appeal to consumers could in time prove to be an advantage, solar power remains expensive because solar cells are costly to produce. Wind power

seems to be doing much better than solar power, perhaps because there is more competition among equipment manufacturers and the technology itself is that much more efficient, he said.

Nuclear power has probably reached its peak or will soon fall into this category, Landsberg said. More and more nuclear plants will be decommissioned in the years ahead and they will not be replaced, the result of public antipathy and the high cost of building new facilities, he said. New hydropower capacity seems to be out of the question as public sentiment grows for breaching even the existing major dams out West, he said.

Conservation as a Resource

As the country's need for energy continues to grow, coupled with growing concern over supply, "we need to consider the notion of conservation as a resource," Landsberg said. The automobile is the key variable in this equation, but achieving any kind of significant change in people's driving habits will be difficult, Landsberg said. "It's very hard to see what the federal government can do; one only has to remember how long it took to legislate a 4-cent per gallon federal tax increase on gasoline."

There have been some small signs of movement, Landsberg said. Two major manufacturers have introduced hybrid electric/gasoline-powered cars, and the federal government is co-sponsoring a research initiative with the automotive industry into new electric battery technologies.

What's missing in the growing debate about urban sprawl, air quality, and our reliance on imported oil is a bipartisan meeting ground, where these ideas could be freely explored, Landsberg said, speaking from personal experience. He was a member of the National Academy of Sci-

ences panel that recommended the establishment of the congressional Office of Technology Assessment (OTA) and continued to advise the agency for a number of years.

From 1981 through 1995, OTA played an important role in informing policy-making regarding technological directions in energy and other fields, Landsberg said. The agency conducted independent research that often relied heavily on the work of experts in the social sciences and technology. Although industry was sometimes critical of its work, OTA's termination still dismays Landsberg.

The Market's Prevailing Role

The federal government's ability to effectively influence innovative technology and "greener" energy choices seems limited, Landsberg said. Ideally, the government should play a larger role in spurring research and development in these areas, "but there are no good examples of successful large-scale R&D projects funded by the government," he said. Past experience shows us that government funding for such projects tends to become clouded by ideology or political favoritism, such as in the case of subsidization of ethanol fuels, he said.

Nonetheless, consumers continue to look to the federal government to fix problems caused by the marketplace, Landsberg said. Press coverage of this summer's high gasoline prices offers a clear example of how quickly people look for easy answers to problems caused by changing marketplace conditions, he said. "I failed to see any clear explanation of the factors driving up the price of gasoline," he said. Consequently, the public was ready to believe, as it has historically, that there must be a simple and single reason: that the oil

companies were engaged in a conspiracy.

But the federal government can do little to directly influence gasoline prices beyond lobbying the OPEC countries, Landsberg said. "In the short run, we're stuck until OPEC loosens up. I wouldn't be surprised if before long we began seeing some divisiveness and cheating on the part of individual OPEC member countries," he said. "In the long run, market forces will prevail and new petroleum sources will come on line."

In reflecting on his 40-year association with RFF, Landsberg pointed to some of the things that have given him particular satisfaction. "I had many opportunities to work with institutions and individuals from a variety of disciplines and this was particularly important to me," he said.

He specifically mentioned his work on a number of National Academy of Science committees, his role as an advisor to Maurice Strong, Secretary General of the UN Environmental Conference in 1972, and, perhaps not least, his chairmanship of a multi-disciplinary panel of social and natural scientists that produced the Ford Foundation-sponsored study, *Energy: The Next 20 Years*. The panel representing political science, law, economics, and the physical sciences illustrated the broad context within which Landsberg believed energy needed to be studied.

It is not surprising that McGeorge Bundy, then-president of the foundation, wrote, in the book's foreword: "Mr. Landsberg's patience, persistence, and fairness, combined with his extraordinary knowledge of the subject, are what have enabled the group to offer powerfully argued conclusions at a time when they can make a difference."



INSIDE RFF

RFF Welcomes Howard Gruenspecht

Howard Gruenspecht has been appointed resident scholar in RFF's Energy and Natural Resources Division. He comes to RFF after nine years with the U.S. Department of Energy (DOE), where he worked most recently as director of the Office of Economic, Electricity, and Natural Gas Analysis.

His past positions include: senior staff economist with the Council of Economic Advisers in the Executive Office of the President; economic adviser to the Chairman of the U.S. International Trade Commission, assistant professor of Economics at Carnegie Mellon University's Graduate School of Industrial Administration, and assistant director, Economics and Business, White House Domestic Policy Staff.

At RFF, Gruenspecht will focus on the analysis of energy and energy-related environmental issues. His current research interests include: the economic, environmental, and reliability implications of electricity restructuring; "grandfathering" in environmental regulations; greenhouse gas emissions reduction strategies; and the design of federal energy-efficiency standards for major appliances.

Gruenspecht has published various books, such as *Horizontal Market Power in Restructured Electricity Markets* (with Tracy Terry), *Supporting Analysis for the Comprehensive Electricity Competition Act* (with John Conti), and *Regulating the Automobile* (with Robert Crandall, Ted Keeler, and Lester Lave), and numerous journal articles.



SYLVIA JOHNSON PHOTOGRAPHY

Gruenspecht received his Ph.D. in economics from Yale University and B.A. in economics from McGill University in Canada.

Libraries in Southeast Asia to Receive Thousands of RFF Books

This fall, one hundred libraries across southeast Asia will receive about 4,500 RFF books on topics ranging from climate change and water policy to urban development and land use. With funding from the International Center for Research in Agroforestry and the Southeast Asian Network for Agroforestry Research, RFF will distribute books to university and environmental nongovernment organizations in Vietnam, Laos, Thailand, Indonesia, and the Philippines.

The International Center for Research in Agroforestry is a nonprofit research body that aims to improve human welfare by alleviating poverty, improving food and nutritional security, and enhancing environmental resilience in the tropics. The Southeast Asian Network for Agroforestry Education is a network of universities and technical colleges dedicated to strengthening agroforestry training and education.

"Southeast Asia, a region where environmental problems are among the most severe in the world, has the potential to undertake effective remedial actions," said Roger Sedjo, senior fellow and director of RFF's Forest Economics and Policy Program. "The education of southeast Asians as to how environmental problems can be viewed and addressed is critical. The provision of RFF books addressing this issue is a small but perhaps important step in enabling the region to adequately address this problem."

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DEVELOPMENT

Planned Giving Options to Help You Meet Your Financial and Philanthropic Goals

With just a few months left in 2000, you might be starting to consider how you will take advantage of the charitable income tax deduction. We hope you will remember RFF. There really is no easier way to reduce your tax burden than by simply making a gift of cash or appreciated stock to a tax-exempt organization. Gifts of appreciated stock are an especially attractive option as they offer a twofold tax savings. First, you avoid paying any capital gains tax on the increased value of your stock. And, second, you receive a tax deduction for the full fair market value of the stock on the date of the gift.

Beyond planning for the end of the tax year, this is also a terrific time to begin thinking about estate planning, to not only ensure the financial security of your family, but to fulfill your philanthropic objectives as well. To help you plan, we would like to provide you with some background information on planned giving options that will offer you the greatest tax benefit while staying consistent with your personal financial goals.

The first and most simple type of planned gift is a bequest. Through a bequest, a donor may leave cash, securities, or real estate in a will to RFF, the value of which is deductible from the estate of the donor. Bequests can take various forms and may be restricted or unrestricted.

Through a specific bequest, a donor may designate that RFF is to receive a specific dollar amount or a specific piece of property, while a contingent bequest will ensure that property passes to RFF if the donor's primary beneficiaries do not sur-

vive him or her. Lastly, a charitable bequest can also be structured to provide income for a beneficiary by directing that the bequest be used to establish a charitable remainder trust or a charitable gift annuity, or be invested in a pooled-income fund. If such a gift is made by will, the principal will pass to RFF only after the donor and designated beneficiary have died.

Beyond a simple bequest, RFF also offers its donors the opportunity to establish an RFF Gift Fund. Through the RFF Gift Fund, a contribution by the donor is placed in an individual account under professional investment management. All income generated from the contribution remains in the donor's account and compounds, tax-free, until charitable distributions are made. The donor advises RFF on the distribution of the fund's assets to any tax-exempt organization, which may include RFF. In addition to obtaining the benefit of an immediate tax reduction, making a contribution of appreciated securities to the RFF Gift Fund offers several additional tax advantages over a bequest or simple cash gift. Some advantages include the avoidance of capital gains tax, the ability to deduct full fair-market value of contributions, and the exclusion of the gift from the estate to avoid probate.

A charitable remainder trust is another terrific opportunity for donors to benefit from making a gift to RFF. A charitable remainder trust may be created during one's lifetime or by will, at which time the donor irrevocably transfers property (cash, securities, or real estate) to RFF as the trustee. RFF will then, in turn, pay the donor and/or another named beneficiary either a per-

centage of the trust principal or a fixed dollar amount either for life or a term of years. At the death of the income beneficiaries, or at the end of the term, the trust ends and the principal is made available to RFF for purposes that the donor had previously determined. The advantage of a trust is that it provides an immediate charitable contribution deduction for federal and state income tax purposes as well as the opportunity to avoid the capital gains tax on long-term appreciated property. Lastly, because of the various tax benefits and the possibility of reinvestment of assets at a higher yield, spendable income may be greater than before the gift was made.

Lastly, life insurance is another option open to donors making planned gifts. There are many ways in which life insurance policies can be used to make a gift to RFF. All provide an immediate income tax deduction and may enable the donor to make a much larger gift than might otherwise be possible.

While the motivations for making a gift to RFF are highly varied and personal, it is important to recognize that planned giving is not only an opportunity for our donors to ensure the financial future of our organization but also to ensure the financial security of family and loved ones. If you would like more information on how to make a planned gift to RFF please contact Lesli Creedon, director for development, by e-mail at creedon@rff.org or by phone at (202) 328-5016. You can be sure your support will be put to good use.



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